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Tennessee Valley Authority, 400 W. Summit Hill Drive, Knoxville, Tennessee 37902-1401

June 9, 2020 Emailed

This responds to your request under the Freedom of Information Act (FOIA) (5 U.S.C. § 552) dated March 22, 2020. You requested a copy of each Management Advisory, Management Advisory Memorandum and Management Advisory Report produced by the TVA Office of the Inspector General (OIG) since January 1, 2017; and a list of the Management Advisories, Management Advisory Memoranda and Management Advisory Reports issued by the TVA OIG since January 1, 2010. Your request was processed under tracking number #5626.

We located three management advisories issued since January 1, 2017, responsive to your request. Enclosed are copies of those advisory memoranda and the OIG report related to each advisory. The TVA OIG does not maintain a list of advisories; therefore, we have no list to provide for the second part of your request.

If you have questions about this response, you may contact me at foia@tva.gov. In addition, the Office of Government Information Services (OGIS) and TVA offer FOIA mediation services. Enclosed is contact information for those services.

You may appeal this response to your FOIA request by writing to Mr. Buddy Eller, Vice President, Communications & Public Relations, Tennessee Valley Authority, at email address foia@tva.gov or Fax to (865) 632-6901. Any appeal must be received within 90 days of the date of this letter.

Sincerely,

Denise Smith
TVA FOIA Officer

Enclosures

Memorandum from the Office of the Inspector General

May 25, 2018

William G. Cronin, BR 4D-C

MANAGEMENT ALERT 2018-15535 – INCLUSION OF SAFETY GOALS IN PERFORMANCE DOCUMENTATION

On September 7, 2017, the Office of Inspector General issued a report on Safety and Performance Improvement's organizational effectiveness.[1] In that report, we noted that TVA's Nuclear site safety consultants' performance documentation included goals related to recordable injuries. The Occupational Health and Safety Administration (OSHA) published a rule in the *Federal Register* effective January 1, 2017, revising its Recording and Reporting Occupational Injuries and Illness Regulation. This rule requires employers to establish reasonable procedures for reporting work-related injuries and goes on to state that a procedure which deters or discourages an employee from reporting a workplace injury is not reasonable.[2] OSHA guidance establishes that reporting procedures which make the use of injuries as criteria for performance incentives impermissible because it could incentivize individuals not to report/classify injuries as recordable. Specifically, OSHA stated that studies and experience indicated that use of recordable injuries or recordable injury rate (RIR) in individual performance evaluations, compensation, and incentives could discourage employees from reporting.

On May 8, 2017, the Senior Vice President, Resource and River Management, communicated to the TVA Leadership Team that effective October 1, 2016, TVA would not use recordable injuries or the RIR as a metric for individual performance evaluations, compensation, or incentives. The Leadership Team was instructed to communicate this change to managers and supervisors. Due to this change occurring midyear, fiscal year (FY) 2017 performance documents were not required to be updated at that time; however, safety goals were not to consider recordable injuries at year-end ratings, even if it was chosen as a safety metric earlier in the year.

As part of our organizational effectiveness reviews, we routinely obtain employee performance documentation to verify goal alignment with the respective business unit's mission, the strategic business unit's mission, and ultimately, TVA's mission. During a recent review, we noted FY2017 performance data for the audited business unit contained goals of recordable injury or RIR measures that do not comply with the OSHA ruling.

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1 Evaluation 2016-15444, *Safety and Performance Improvement's Organizational Effectiveness*, September 7, 2017.

2 Title 29, Code of Federal Regulations, § 1904.35(b)(1)(i).

Based on that discovery, we obtained performance documentation for all TVA employees. Based on our review of rating comments, it appears some managers still considered RIR and recordable injuries as part of year-end ratings. In addition, measures related to recordable injuries were included in performance goals for 186 employees in FY2018.

Because of the potential for OSHA enforcement and risk of employees not reporting safety concerns, we wanted to notify you of this issue. Please contact Lisa H. Hammer, Director, Evaluations – Organizational Effectiveness, at (865) 633-7342 if you have any questions. We would also like to be notified within 30 days of any actions taken in regard to this matter.

Gregory Stimson

(for) David P. Wheeler
Assistant Inspector General
(Audits and Evaluations)
WT 2C-K

JMW:BSC
cc: Robertson D. Dickens, WT 9C-K
William D. Johnson, WT 7B-K
Dwain K. Lanier, MR 6D-C
Jill M. Matthews, WT 2C-K
Jacinda B. Woodward, BR 4D-K
OIG File No. 2018-15535

Memorandum from the Office of the Inspector General

October 15, 2018

William G. Maiden, GFP 1A-GLT

REQUEST FOR FINAL ACTION – EVALUATION 2018-15535 – ORGANIZATIONAL EFFECTIVENESS – GALLATIN FOSSIL PLANT

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 Jamie M. Wykle, Senior Auditor, at (865) 633-7382 or Lisa H. Hammer, Director, Evaluations – Organizational Effectiveness, at (865) 633-7342. We appreciate the courtesy and cooperation received from your staff during the evaluation.

David P. Wheeler
Assistant Inspector General
(Audits and Evaluations)
WT 2C-K

JMW:KDS
Attachment
cc (Attachment):
TVA Board of Directors
Janet J. Brewer, WT 7C-K
Susan E. Collins, LP 6A-C
Sean M. Connors, LP 2K-C
Robertson D. Dickens, WT 9C-K
Megan T. Flynn, LP 3A-C
William D. Johnson, WT 7B-K
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Justin C. Maierhofer, WT 7B-K
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OIG File No. 2018-15535

Office of the Inspector General

Evaluation Report

To the Plant Manager,
Gallatin Fossil Plant

ORGANIZATIONAL EFFECTIVENESS – GALLATIN FOSSIL PLANT

Evaluation Team
Jamie M. Wykle
Justin P. Franklin

Evaluation 2018-15535
October 15, 2018

ABBREVIATIONS

AUO	Assistant Unit Operator
CR	Condition Report
FY	Fiscal Year
GAF	Gallatin Fossil Plant
OIG	Office of Inspector General
PO	Power Operations
SCR	Selective Catalytic Reduction
SPP	Standard Programs and Processes
TVA	Tennessee Valley Authority
UO	Unit Operator

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APPENDIX

A. TVA VALUES AND LEADERSHIP COMPETENCIES

B. MEMORANDUM DATED OCTOBER 9, 2018, FROM WILLIAM G. MAIDEN TO DAVID P. WHEELER

Evaluation 2018-15535 – Organizational Effectiveness – Gallatin Fossil Plant

EXECUTIVE SUMMARY

Why the OIG Did This Evaluation

Organizational effectiveness, as defined in this evaluation, is the ability of an organization to achieve its mission and goals. To achieve and sustain organizational effectiveness, there should be alignment between strategy, operational performance, and team engagement. Specifically, values and behaviors that drive good performance should be embedded throughout the organization's business processes and exemplified by the individuals that manage and work in the organization. The Tennessee Valley Authority's (TVA) 2017 3-year Enterprise Risk Profile recognized that ongoing workforce refinement[i] might negatively affect the performance environment. Therefore, employee engagement is critical.

Due to the importance of alignment between strategy, team engagement, and operational performance, the Office of the Inspector General is conducting organizational effectiveness evaluations of business units across the Tennessee Valley Authority (TVA). This evaluation focuses on TVA's Gallatin Fossil Plant (GAF), which is a coal plant under the Power Operations, Coal, business unit within TVA's Power Operations. TVA's Power Operations' mission is to "serve the people of the valley by working more efficiently and effectively to produce sustainable results by safely providing cleaner, low cost, reliable power". According to the FY2018 Budget Power Supply Plan, GAF is focused on base dispatchable[ii]/intermediate operation.[iii] The objective of this evaluation was to identify strengths and risks that could impact GAF's organizational effectiveness.

What the OIG Found

During the course of our evaluation, we identified strengths that positively affected the day-to-day activities of GAF's personnel and performance. These strengths included (1) organizational alignment, (2) teamwork within departments, and (3) support of first-line[iv] supervisors. However, we also identified issues that could pose risks to GAF's effectiveness and its continued ability to meet its responsibilities. These issues related to (1) ineffective leadership and (2) safety concerns. Specifically, employees expressed concerns about (1) lack of collaboration between departments, (2) perception of inadequate staffing levels, (3) GAF-specific training, (4) GAF's dual unit operator strategy,[v] and (5) equipment. During our

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i Refinement of the workforce includes activities such as reduction in force.

ii High-energy units that produce at full output unless needed to respond to decreased demand.

iii An intermediate plant supplements the power produced by base load plants during high demand times.

iv Management level directly above nonmanagerial workers.

v Operators are responsible for operating two units instead of just one unit.

evaluation, actions were taken by TVA management to address the identified safety risks.

Based on our findings and using TVA's Business Operating Model, we assessed GAF's level of risk in the areas of alignment, engagement, and execution. As shown in the table below, we determined:

- Alignment risk is rated low based on alignment of management and employee goals, which supported Power Operations' and TVA's missions.
- Engagement risk is rated medium. While employees cited support from first-line supervisors as a strength, they also described concerns related to lack of collaboration between departments, which could negatively impact teamwork.
- Execution risk is rated high because of issues related to ineffective leadership, including concerns about collaboration between departments, adequacy of training, and perception of inadequate staffing. Similar issues were identified by TVA in 2017 as contributors to three clearance events.[vi]

	Low Risk	Medium Risk	High Risk
Alignment	X		
Engagement		X	
Execution			X

What the OIG Recommends

We recommend the Plant Manager, GAF:

1. Focus on building relationships within the leadership team and across the plant to improve collaboration and teamwork.

2. Evaluate the impacts of staffing levels on the overtime of GAF Operations personnel.

3. Evaluate selective catalytic reduction and scrubber systems training to determine if Operations personnel have the adequate training necessary to safely and effectively perform their duties.

[vi] Clearance events are any violation of TVA's Safety Procedure 18.613, *Clearance Procedure to Safely Control Hazardous Energy Using Group Tagout*.

TVA Management's Comments

TVA management agreed with our recommendations and described actions planned and completed. See Appendix B for TVA management's complete response.

BACKGROUND

Organizational effectiveness, as defined in this evaluation, is the ability of an organization to achieve its mission and goals. To achieve and sustain organizational effectiveness, there should be alignment between strategy, team engagement, and operational performance. Specifically, values and behaviors that drive good performance should be embedded throughout the organization's business processes and exemplified by the individuals that manage and work in the organization.

In recent years, the Tennessee Valley Authority (TVA) has faced internal and external economic pressures and implemented cost-cutting measures in an attempt to keep rates low and reliability high while continuing to fulfill its broader mission of environmental stewardship and economic development. TVA's 2017 3-year Enterprise Risk Profile recognized that ongoing workforce refinement[1] might negatively affect the performance environment. Therefore, employee engagement is critical.

Due to the importance of alignment between strategy, team engagement, and operational performance, the Office of the Inspector General (OIG) is conducting organizational effectiveness evaluations of business units across TVA. This evaluation focuses on TVA's Gallatin Fossil Plant (GAF), which is a coal plant under the Power Operations, Coal, business unit within TVA's Power Operations. According to TVA's fiscal year (FY) 2018 through FY2020 Business Plan Summary, TVA's Power Operations' mission is to "serve the people of the valley by working more efficiently and effectively to produce sustainable results by safely providing cleaner, low cost, reliable power." According to the FY2018 Budget Power Supply Plan, GAF is focused on base dispatchable[2]/intermediate operation.[3] GAF has four generating units with a combined summer net generating capacity of 976 megawatts.

As of January 2018, GAF was comprised of three departments—Operations, Maintenance, and Engineering:

- According to PO's Standard Programs and Processes (SPP) 10.003, *Power Operations Conduct of Operations*, the Operations department is responsible for the safe and efficient operation of generating units, including monitoring and inspecting plant equipment and reporting any abnormal operating condition as well as writing and issuing clearances. GAF Operations personnel consist of shift operations supervisors, unit operators (UO), assistant unit operators (AUO), and coal yard personnel.
- According to PO-SPP-06.000, *Power Operations Conduct of Maintenance*, the Maintenance department is responsible for safely, effectively, and

[1] Refinement of the workforce includes activities such as reduction in force.

[2] High-energy units that produce at full output unless needed to respond to decreased demand.

[3] An intermediate plant supplements the power produced by base load plants during high demand times.

efficiently maintaining assets. Maintenance ensures standards for material condition are met by the effective planning, scheduling, and execution of maintenance.

- According to Fossil Power Group's SPP-09.000, *Conduct of Engineering*, the Engineering department is tasked with providing technical input to personnel on complex work packages and configuration control[4] and is responsible for system performance monitoring to allow for proactive detection of system or component performance problems.

Power Operations has adopted the Operations Centric operating model with the goal of accomplishing Power Operations fleet- and plant-wide alignment of organizations supporting Operations. According to TVA's Operations Centric fleet-wide rollout package, Operations is ultimately responsible for the safe and efficient production of electricity. As such, Operations personnel hold themselves and other plant-supporting departments to high standards and expectations, including shared accountability for the condition of plant equipment.

In 2011, TVA entered into a Clean Air Act[5] compliance agreement with the Environmental Protection Agency and a similar consent decree with four states and three environmental advocacy groups. As such, the TVA Board of Directors approved the addition of scrubbers to reduce sulfur dioxide emissions at GAF in 2011. The scrubbers were placed into service at GAF Units 4, 3, and 1 in April, June, and November 2015, respectively, and the Unit 2 scrubber was placed into service in February 2016. GAF's dry scrubber design uses a limestone mix to reduce sulfur dioxide emissions. Selective catalytic reduction (SCR) systems were also placed into service in 2017 to reduce nitrogen oxide emissions on GAF units. GAF uses ammonia as the reducing agent in SCR to decrease the amount of nitrogen oxide emissions.

Power Operations FY2017 through FY2019 Business Plan sets forth goals that include GAF. Key metrics identified from Power Operations' Coal Site FY2017 scorecard are Equivalent Forced Outage Rate,[6] Seasonal Equivalent Forced Outage Rate,[7] clearance events,[8] coal Equivalent Availability Factor,[9] Human

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4 Configuration control ensures all changes to a complex system are performed with the knowledge and consent of management. Configuration control tasks include initiating, preparing, analyzing, evaluating, and authorizing proposals for change to a system.

5 The Clean Air Act is the comprehensive federal law that regulates emissions of hazardous air pollutants.

6 The Equivalent Forced Outage Rate measures the percentage of hours the asset was not available to operate due to an unplanned event.

7 The Season Equivalent Forced Outage Rate measures performance for 8 months: January, February, March, June, July, August, September, and December.

8 Clearance events are any violation of TVA's Safety Procedure-18.613, *Clearance Procedure to Safely Control Hazardous Energy Using Group Tagout*.

9 The Equivalent Availability Factor reflects the percentage of available capacity within the period.

Performance Events,[10] Reportable Environmental Events,[11] and total spend.[12] During FY2017, GAF had three clearance events between November 2016 and February 2017. GAF's FY2018 through FY2020 Business Plan Gap Summary states, "GAF has not demonstrated sustainable excellence in behaviors and accountability to achieve an error free workplace in the areas of safety and operational performance."

As of December 2017, GAF had 127 employees. At the time we began our initial interviews in January 2018, the plant manager,[13] maintenance manager, and operations manager roles were being filled with interim positions.

OBJECTIVE, SCOPE, AND METHODOLOGY

The objective of this evaluation was to identify strengths and risks that could impact GAF's organizational effectiveness. We assessed operations from January 2014 through May 31, 2018, and culture at the time of our interviews and fieldwork, which occurred during January through April 2018. To achieve our objective, we:

- Reviewed TVA's FY2017 through FY2019 Business Plan and GAF's FY2018 through FY2020 Business Plan to gain an understanding of GAF's goals and how GAF's responsibilities align with Power Operations' mission.
- Reviewed TVA values and competencies (see Appendix A) for an understanding of cultural factors deemed important to TVA.
- Conducted individual interviews with 67 employees, including management; held focus groups with 43[14] GAF UOs and AUOs and 1 shift operations supervisor[15] and analyzed the results to identify themes related to strengths and risks that could affect organizational effectiveness.
- Obtained and reviewed select TVA SPPs, documents, and other guidelines to gain an understanding of processes.
- Obtained and reviewed GAF site-specific System Operating Instructions, General Operating Instructions, and Abnormal Operating Instructions to gain an understanding of dual unit operator strategy.[16]

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[10] An event that occurs because of latent error or active error related to industrial safety, clearance, regulatory event, radiation exposure, or coal, gas, hydro, or transmission facility operation.

[11] A reportable environmental event occurs when a utility causes an incident that requires notification of an environmental regulatory agency and/or results in enforcement action by an environmental regulatory agency.

[12] Total Spend equals operations and maintenance costs plus capital costs plus change in nonfuel inventory.

[13] A new plant manager began at GAF effective April 16, 2018.

[14] Five additional employees, not in headcount, transferred to GAF from Johnsonville Fossil Plant. This was their first week at GAF, and they sat in on a focus group.

[15] Sixteen GAF employees either (1) declined an interview or (2) were on leave during our site visit.

[16] Dual unit operators are responsible for operating two units instead of just one unit.

- Reviewed industry standards, best practices, and regulatory requirements, as well as TVA safety information, applicable to dual unit operator strategy.
- Selected a nonstatistical sample of 50 of 128[17] management and employee performance management documents based on job title and supervisor to ensure coverage of all plant departments. Analyzed the selection for alignment with departmental and organizational goals.
- Analyzed performance metrics to determine whether (1) GAF metrics are in alignment with that of Power Operations and TVA and (2) if GAF met its FY2017 goals.
- Obtained GAF UO and AUO training records for January 2014 to March 2018 to determine what GAF site-specific training was received related to scrubbers and SCRs.
- Obtained and analyzed GAF employee headcount for FY2015 through May 31, 2018, and overtime data for FY2015 through FY2017.
- Reviewed GAF condition reports[18] (CR) for January 1, 2014, to April 5, 2018, based upon safety and equipment concerns raised during our focus groups.
- Obtained and reviewed August 2017 through December 2017 as well as January and March 2018 GAF Health and Safety Committee meeting minutes to determine what safety concerns related to dual unit operator strategy had been identified.
- Assessed the overall effectiveness of GAF in the following areas, as included in TVA's Business Operating Model:
  - Alignment – How well the organization coordinates the activities of its many components for the purpose of achieving its long-term objectives—this is grounded in an understanding of what the organization wants to achieve, and why.
  - Engagement – How the organization achieves the highest level of performance from its employees.
  - Execution – How well the organization achieves its objectives and mission.

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

OBSERVATIONS

During the course of our evaluation, we identified strengths that positively affected the day-to-day activities of GAF's personnel and performance. These strengths included (1) organizational alignment, (2) teamwork within departments, and (3) support of first-line[19] supervisors. However, we also

[17] The total of 128 includes the previous plant manager who was not included in headcount.

[18] CRs document the evaluation and resolution of concerns identified.

[19] Management level directly above nonmanagerial workers.

identified issues that could pose risks to GAF's effectiveness and its continued ability to meet its responsibilities. These issues related to (1) ineffective leadership and (2) safety concerns. Specifically, employees expressed concerns about lack of collaboration between departments, perception of inadequate staffing levels and GAF-specific training. Additionally, GAF Operations personnel identified safety concerns related to GAF's dual unit operator strategy and equipment.

STRENGTHS

During the course of our interviews, focus groups, and data analyses, we identified strengths that positively affected the day-to-day activities of GAF personnel and performance. These strengths related to (1) organizational alignment, (2) teamwork within departments, and (3) support of first-line supervisors.

Organizational Alignment

Our assessment of performance management documentation for a nonstatistical sample of GAF personnel revealed that performance goals for employees support first-line management goals, and first-line management goals support senior management goals, which supports Power Operations' and TVA's missions. In addition, GAF's initiatives supported Power Operations' and TVA's missions.

Teamwork Within Departments

The majority of employees interviewed provided positive comments pertaining to teamwork within their departments, which is a component of TVA's collaboration value. Some examples of positive teamwork included willingness to help each other and open conversations.

Support of First-Line Supervisors

Many employees indicated they feel supported by and trust their first-line supervisors. In addition, many employees indicated they are comfortable raising a differing opinion. Further, many employees also indicated first-line supervisors are knowledgeable about their jobs and communicate well.

RISKS

We identified issues that could pose risks to GAF's effectiveness and its continued ability to meet its responsibilities. These issues related to (1) ineffective leadership and (2) safety concerns. Specifically, employees expressed concerns about (1) lack of collaboration between departments, (2) perception of inadequate staffing levels, (3) GAF-specific training, (4) GAF's dual unit operator strategy, and (5) equipment.

Ineffective Leadership

Effectively executing TVA's mission not only requires organizational alignment and employee engagement but also leaders that exhibit actions and behaviors consistent with TVA policies, procedures, and expectations. TVA's Leadership Competencies (included in Appendix A) define expected behaviors of leadership, such as communicating effectively and inspiring trust and engagement. While most employees stated they receive support from first-line supervisors, some employees indicated GAF management above first-line leadership does not display behaviors in alignment with TVA expectations. Specifically, many employees indicated concerns stemming from lack of collaboration between departments, and most employees expressed concerns regarding inadequate staffing. Further, four out of five focus groups with Operations personnel indicated concerns related to excessive overtime, and three out of five focus groups indicated lack of GAF-specific training on scrubbers and SCRs.

Lack of Collaboration Between Departments

TVA's value of collaboration states that TVA is "committed to fostering teamwork, developing effective partnerships, and valuing diversity as we work together to achieve results." As previously stated, TVA's Power Operations has adopted the Operations Centric operating model that is designed to promote alignment between operations, engineering, and maintenance personnel. To achieve success, all departments must support operations. However, many employees indicated concerns with the lack of collaboration between the departments, and some believe GAF has developed a "maintenance versus operations" mentality. Based upon our interviews and focus groups, it is our opinion that, because this model is Operations Centric, employees may believe the Operations department is superior to other departments. Additionally, a lack of collaboration between Maintenance and Operations personnel can affect teamwork as well as the safe operation of the plant.

Perception of Inadequate Staffing Levels

Most GAF Operations personnel indicated they did not have necessary staffing. Further, one out of five focus groups with Operations personnel indicated that this lack of staffing may create a safety risk because of the amount of overtime worked.

Based upon these concerns, we obtained and analyzed GAF overtime data for FY2015 through FY2017. According to data provided by TVA,[20] the Operations department overtime has increased by 31 percent from FY2015 to FY2017, as illustrated in Figure 1 on the following page. According to TVA, in February 2018, six employees transferred to the Operations department at GAF from other TVA fossil plants. This increase in headcount could reduce the amount of overtime needed.

[20] We did not validate the information provided by Financial Services.

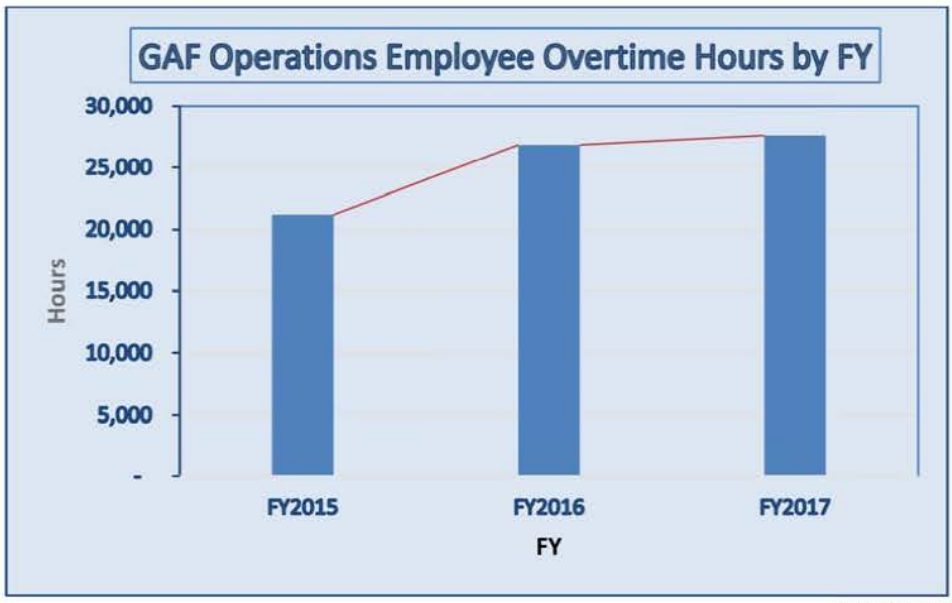

Figure 1

Training

Most focus groups with Operations personnel indicated concerns with training related to scrubbers and SCRs. Some employees indicated the subject matter expert provides scrubber training materials via e-mails, and the only on-site training was conducted by a peer operator. A review of UO and AUO Learning Management System's training records revealed ammonia training has been received, including ammonia awareness, ammonia system overview, and ammonia storage. Although these records indicated some training has been provided, most focus groups with Operations personnel indicated the training received for scrubbers and SCRs is not adequate to effectively perform their roles.

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During FY2017, GAF had three clearance events, which are violations of TVA's safety procedure for controlling hazardous energy. The root cause evaluation of the clearance events identified multiple causes that parallel the issues with ineffective leadership discussed above. Specifically, the root cause identified (1) lack of three-way communication, (2) lack of understanding of ownership, (3) lack of skill set, (4) failure to address inexperience, and (5) being overwhelmed with workload and available resources. The serious safety risk associated with three clearance events in a short time underscores the importance of improving collaboration between departments, addressing training needs, and evaluating available resources.

Safety Risks Identified and Actions Taken to Address

During our focus groups, GAF Operations personnel revealed safety concerns related to GAF's (1) dual unit operator strategy and (2) equipment concerns specifically related to limestone silos and pulverizer gates. During our review, GAF management informed us of actions taken, or in process, to address these issues.

Dual Unit Operating Strategy

Some focus groups with Operations personnel indicated concerns with the dual unit operator strategy. While TVA has addressed this issue in the past, there is increased workload with the addition of scrubbers and SCRs.

Since 1997, GAF has operated its units using a dual unit operator strategy. Under dual unit operator strategy, UOs are responsible for operating two units instead of just one unit. Concerns regarding the dual unit operator strategy date back to 1995, when the International Brotherhood of Electrical Workers sent a letter to the President of the United States expressing concern relative to the implementation of the dual unit operator strategy. In 1997, TVA OIG received a similar complaint, which was specific to GAF due to GAF's implementation of the strategy at that time. The OIG referred this complaint to TVA's Corporate Safety for investigation, which concluded that implementation of the dual unit operator strategy did not increase the likelihood of the occurrence of an undesirable event resulting in injury to the employees.

Some focus groups with Operations personnel discussed continued concerns that UOs are responsible for operating both units. Since implementing that strategy, GAF has added scrubbers and SCRs. These additional responsibilities may increase safety risks. Concerns with this strategy were brought before the GAF Health and Safety Committee in March 2018, after our interviews were concluded. Plant management subsequently acknowledged that with the addition of scrubbers and SCRs that GAF's UOs are monitoring more equipment remotely than in the past. As a result, plant management has made modifications to responsibilities of its UOs and AUOs to optimize UOs ability to (1) safely control and efficiently deliver clean, low cost power to customers and (2) identify equipment abnormalities in a predictive versus reactive fashion.

Equipment Concerns

Two out of five focus groups with Operations personnel revealed safety concerns with GAF's limestone silos. One focus group revealed a safety concern with pulverizer gates. However, as noted below, TVA and GAF management has, or is currently, addressing those risks. Specifically:

- Focus groups with Operations personnel identified safety concerns with GAF's limestone silos. According to Operations personnel, the limestone silo failed on two occasions, allowing limestone to fill the silo. When performing inspections, Operations personnel had to enter the silo while in operation, and they feared a failure would result in them being buried.

  In February 2018, we informed the Vice President of Power Operations, Coal, of the safety concerns regarding the silos. According to TVA management, actions were taken immediately to post appropriate signage and create a limestone silo entry policy. Additionally, on February 21, 2018, a CR was entered to address catastrophic failures of the silos.

- According to some Operations employees, AUO's have to close pulverizer gates with a sledgehammer because the gates have deteriorated and are very

hard to physically operate or inoperable. On April 19, 2018, we discussed these concerns with the GAF engineering manager, who provided documentation of request and approval to fabricate and install two new pulverizer gates. The GAF engineering manager further indicated these projects would reduce the likelihood of injury to employees.

CONCLUSION

Our evaluation identified strengths related to (1) organizational alignment, (2) teamwork within departments, and (3) first-line supervisor support. However, we also identified risks related to (1) ineffective leadership and (2) safety concerns that could pose risks to GAF's effectiveness and its continued ability to meet its responsibilities. Specifically, employees expressed concerns about lack of collaboration between departments, perception of inadequate staffing levels, GAF-specific training, GAF's dual unit operator strategy, and equipment.

During our evaluation, actions were taken by TVA management to address safety risks identified regarding (1) GAF's dual unit operator strategy, (2) limestone silo failures, and (3) inoperable pulverizer gates.

Based on our findings and using TVA's Business Operating Model, we assessed GAF's level of risk in the areas of alignment, engagement, and execution. We determined:

- Alignment risk is rated low based on alignment of management and employee goals, which supported Power Operations' and TVA's missions.
- Engagement risk is rated medium. While employees cited support from first-line supervisors as a strength, they also described concerns related to lack of collaboration between departments, which could negatively impact teamwork.
- Execution risk is rated high because of issues related to ineffective leadership, including concerns about collaboration between departments, adequacy of training, and perception of inadequate staffing. Similar issues were previously identified by TVA in 2017 as contributors to three clearance events.

RECOMMENDATIONS

We recommend the Plant Manager, GAF:

1. Focus on building relationships within the leadership team and across the plant to improve collaboration and teamwork.

   TVA Management's Comments – TVA management stated GAF has made efforts to build a stronger team and improve relationships between departments through (1) the addition of a new engineering manager in September 2018, whose leadership, communication, and people skills will

help improve collaboration and teamwork; and (2) holding an off-site team building activity with supervisors and managers from all GAF departments. Management has moved the Health and Safety Committee meetings from management driven to employee driven in order to give ownership and a voice to employees. TVA management also stated the vacant maintenance manager position would be filled by the end of November 2018, completing the GAF leadership team. Further, TVA management believes the addition of a three-person clearance team, established to improve the focus for the UOs and themselves when performing clearance duties, has also improved cooperation and relationships between Maintenance and Operations staff. See Appendix B for TVA management's complete response.

2. Evaluate the impacts of staffing levels on the overtime of Operations personnel.

   TVA Management's Comments – TVA management stated GAF overtime in Operations has had a significant drop in the last 6 months. Overtime can be further reduced as (1) progress is made moving operators that are on project assignments and restricted activity back on the crews and (2) filling the positions that are being held open due to the potential transferees from other TVA coal plants. See Appendix B for TVA management's complete response.

3. Evaluate SCRs and scrubber training to determine if Operations personnel have the adequate training necessary to safely and effectively perform their duties.

   TVA Management's Comments – TVA management stated GAF was aware of some knowledge gaps since the initial training was given. As a result, GAF provided a weeklong training class related to SCRs and scrubbers during annual refresher training. See Appendix B for TVA management's complete response.

In addition to providing responses to our recommendations, management also provided information related to addressing the dual unit operator concerns and clearance events. See Appendix B for TVA management's complete response.

Auditor's Response – We agree with TVA management's planned and completed actions.

TVA Values	
Safety	We share a professional and personal commitment to protect the safety of our employees, our contractors, our customers, and those in the communities that we serve.
Service	We are privileged to be able to make life better for the people of the Valley by creating value for our customers, employees, and other stakeholders. We do this by being a good steward of the resources that have been entrusted to us and a good neighbor in the communities in which we operate.
Integrity	We conduct our business according to the highest ethical standards and seek to earn the trust of others through words and actions that are open, honest, and respectful.
Accountability	We take personal responsibility for our actions, our decisions, and the effectiveness of our results, which must be achieved in alignment with our company values.
Collaboration	We are committed to fostering teamwork, developing effective partnerships, and valuing diversity as we work together to achieve results.

TVA Leadership Competencies

Accountability and Driving for Results

Continuous Improvement

Leveraging Diversity

Adaptability

Effective Communication

Leadership Courage

Vision, Innovation, and Strategic Execution

Business Acumen

Building Organizational Talent

Inspiring Trust and Engagement

October 9, 2018

To: Mr. David P. Wheeler, Assistant Inspector General

RESPONSE TO LETTER DATED SEPTEMBER 10, 2018 TITLED: REQUEST FOR COMMENTS- DRAFT EVALUATION 2018 - 15535 - ORGANIZATIONAL EFFECTIVENESS - GALLATIN FOSSIL PLANT

The following recommendations are listed on (page ii) for the GAF Plant Manager:

1. Focus on building relationships within the leadership team and across the plant to improve collaboration and teamwork.
2. Evaluate the impacts of staffing levels on the overtime of GAF Operations Personnel.
3. Evaluate selective catalytic reduction and scrubber systems training to determine if Operations personnel have the adequate training necessary to safely and effectively perform their duties.

GAF Status Summary

In reference to the OIG Report dated September 10, 2018 and titled Organizational Effectiveness - Gallatin Fossil Plant. The following is a summary status update on relevant items:

1. **Focus on building relationships within the leadership team and across the plant to improve collaboration and teamwork.**
    a. A new Engineering Manager was added to the Gallatin Team in late September 2018. His leadership experience, good communication skills and good people skills will help improve collaboration and teamwork.
    b. The leadership team will be complete when the Maintenance Managers position is permanently filled. This job will be posted and filled by the end of November 2018.
    c. The Dual Unit Operating Strategy was brought up as a concern at GAF. In an effort to minimize the amount of time our Unit Operators (UO's) are outside of the control rooms for inspections/rounds, we have modified the roles and responsibilities of the UO's and the powerhouse AUO's. This is optimizing our UO's ability to safely control and efficiently deliver clean, low cost power to our customers. This also give them more time to be able to identify equipment abnormalities in a predictive versus reactive fashion. These adjustments place more burden on the Basement and BOP AUO responsibilities. Each Lead SOS has the authority to move personnel from one location to another to efficiently run their shift. If deficiencies are identified, we will work together as a team to

modify the roles and responsibilities should the need arise. This went into effect on May 28th, 2018.

d. In an effort to build a stronger team and improve relationships between departments, a Team Building day was held off-site with Supervisors and Managers from all GAF departments.
e. Safety, environmental, operations & maintenance activities and company updates are discussed each week during the "All Hands Meetings". New safety issues are brought to management's attention and progress is reported back to the employees during the future meetings.
f. The Health and Safety Committee meetings are moving from management driven to employee driven. The employees run the meeting, have a voice in what is prioritized, and see the difference they make improving safety and working conditions. I ask them to hold me accountable if their H&S projects are not getting done in a timely manner. This empowerment gives ownership and a voice to the employees.

2. **Evaluate the impacts of staffing levels on the overtime of GAF Operations Personnel.**
   a. A three employee Clearance Team has been established. Their duties have been separated from the control room to improve focus for the UO's and themselves when performing clearance duties. There hasn't been a clearance violation since the 3 violations mentioned in the referenced report. Clearances are getting done in a timely manner and accurately. This best practice of having a clearance team has also had a side effect of improving cooperation and relationships between maintenance and operations. However, GAF only currently has one employee on the organizational chart for the clearance team. The other two employees came from operations, and OT in operations is being used to fill the open slots.
   b. Although the FY2018 OT in operations remained at a high level, the last six months showed a significant drop in OT in operations. The staffing levels seem to be adequate based on my experience at other coal sites. OT can be further reduced as progress is made moving operators that are on project assignments and restricted activity back on the crews. OT can be reduced when we fill the positions (AUO's and UO's) that are being purposely held open due to the potential transferees from Paradise and Bull Run.

Proj No	(All)		
Earnings Code	(Multiple Items)		
		Values	
Exp Owning Org Name	Month Name	Sum of Burdened Cost Amt	Sum of Qty
⊟D116221000-GALLATIN FOSSIL OPERATIONS	OCTOBER	69,486.13	1,042.00
	NOVEMBER	80,123.05	1,237.50
	DECEMBER	123,091.29	1,864.00
	JANUARY	156,244.63	2,265.50
	FEBRUARY	157,807.57	2,329.25
	MARCH	152,928.65	2,208.50
	APRIL	104,236.79	1,540.00
	MAY	89,935.15	1,279.25
	JUNE	92,359.85	1,328.00
	JULY	95,812.52	1,370.50
	AUGUST	92,589.07	1,368.00
	SEPTEMBER	56,102.73	817.25
D116221000-GALLATIN FOSSIL OPERATIONS Total		**1,270,717.43**	**18,649.75**
Grand Total		**1,270,717.43**	**18,649.75**

3. **Evaluate selective catalytic reduction and scrubber systems training to determine if Operations personnel have the adequate training necessary to safely and effectively perform their duties.**
    a. There was initial training on the Scrubbers and SCRs that was given during ART. GAF had Scrubber Initial training provided by the Vendor during ART approx. 4 years ago, then SCR Hot Water Recirc, and Ammonia Farm training given by the Vendors two years ago in ART. This past year during ART, because we knew there were transfers and some knowledge gaps since the initial training, GAF provided a week long training class, covering Scrubber/SCR/NH3 Farm/HWR operations, Casualty/Excursion Training, and routine items. Copies of the materials, lesson plans, and time spent on each item are available.

William G. Maiden
GAF Plant Manager

Memorandum from the Office of the Inspector General

October 4, 2018

Jacinda B. Woodward, BR 4D-C

MANAGEMENT ALERT 2018-15579 – FAILURE OF EMERGENCY NOTIFICATION SYSTEM AT CUMBERLAND FOSSIL PLANT

According to *Cumberland Fossil Plant Site Emergency Response Plan* (CUF-EP-35.001 Rev. 0005), if an event or accident poses an immediate threat to the safety of employees and contractors at Cumberland, the Emergency Notification System (ENS) should be deployed to sound the proper alarms and provide detailed instructions to those in harm's way via the public address system. On September 26, 2018, we tested ENS functionality at Cumberland as part of ongoing Evaluation 2018-15579, *Coal Plant Emergency Preparedness and Response*. Our testing included the chemical alert function, which is designed to have a rapidly alternating high-to-low pitch siren with an audible voice enunciation at all speakers, strobes, and remote sites. The testing of local ammonia farm horns and the fogging system were successful. However, the auditor and plant escort observed failure of the chemical alert to properly announce in the following locations: dry fly ash silos, limestone unloading area, and southeast of the coal pile near the ammonia farm. Michael J. Rawlings, Plant Manager, was alerted of our observations prior to leaving the site.

We also tested functionality of the ENS at Shawnee and Gallatin Fossil Plants, on September 24 and September 25, respectively, and did not observe failure of the ENS at those sites. We have not tested the ENS at Kingston, Bull Run, or Paradise Fossil Plants; accordingly, we recommend you determine if the ENS is functioning correctly at these plants as soon as possible.

Because of the importance of the ENS to alert employees, contractors, and surrounding communities of any hazardous chemical emergency, we wanted to notify you of this issue. Thank you for your attention to this matter. Please contact E. David Willis, Director, Evaluations, at (865) 633-7376 if you have any questions. We would also like to be notified within 30 days of any actions taken in regard to this matter.

David P. Wheeler
Assistant Inspector General
(Audits and Evaluations)
WT 2C-K

MHP:KDS
cc: See page 2

cc: William D. Johnson, WT 7B-K
Jill M. Matthews, WT 2C-K
Michael D. Skaggs, WT 7B-K
OIG File No. 2018-15579

Memorandum from the Office of the Inspector General

April 12, 2019

Robert M. Deacy, SR, LP 5D-C
Jacinda B. Woodward, LP 3K-C

REQUEST FOR FINAL ACTION – EVALUATION 2018-15579 – COAL PLANT EMERGENCY PREPAREDNESS AND RESPONSE

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 Meghan H. Petty, Senior Auditor, at (423) 785-4812 or E. David Willis, Director, Evaluations, at (865) 633-7376. We appreciate the courtesy and cooperation received from your staff during the evaluation.

David P. Wheeler
Assistant Inspector General
(Audits and Evaluations)
WT 2C-K

MHP:FAJ
Attachment
cc (Attachment):

TVA Board of Directors
Clifford L. Beach Jr., WT 7B-K
Janet J. Brewer, WT 7C-K
Robertson D. Dickens, WT 9C-K
Kris G. Edmondson, LP 2K-C
Melanie E. Farrell, MR 3M-C
Dwain K. Lanier, MR 6D-C
Jeffery J. Lyash, WT 7B-K
Justin C. Maierhofer, WT 7B-K
Jill M. Matthews, WT 2C-K
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Sherry A. Quirk, WT 7C-K
Ronald R. Sanders, MR 5B-C
Michael D. Skaggs, WT 7B-K
Rebecca C. Tolene, WT 7B-K
Michael S. Turnbow, LP 5D-C
OIG File No. 2018-15579

Office of the Inspector General

Evaluation Report

To the Senior Vice President, Generation Construction, Projects and Services and Facilities Management, and to the Senior Vice President, Power Operations

COAL PLANT EMERGENCY PREPAREDNESS AND RESPONSE

Evaluation Auditor
Meghan H. Petty

Evaluation 2018-15579
April 12, 2019

ABBREVIATIONS

C&EM	Crisis and Emergency Management
CCR	Coal Combustion Residuals
CCR Rule	Disposal of Coal Combustion Residuals from Electric Utilities
CPG 101	Comprehensive Preparedness Guide
CR	Condition Report
DHS	U.S. Department of Homeland Security
EPR	Emergency Preparedness and Response
GCP&S	Generation Construction, Projects and Services
GETS	Government Emergency Telecommunications Service
NIMS	National Incident Management System
OSHA	Occupational Safety and Health Administration
PA	Public Address
PPM	Parts Per Million
PO	Power Operations
SVP	Senior Vice President
SPP	Standard Programs and Processes
TVA	Tennessee Valley Authority
WebEOC	Web-Based Emergency Operations Center
WPS	Wireless Priority Service

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A. EMERGENCY RESPONSE SYSTEMS FUNCTIONALLY TESTED

B. MEMORANDUM DATED APRIL 5, 2019, FROM ROBERT M. DEACY AND JACINDA B. WOODWARD TO DAVID P. WHEELER

Evaluation 2018-15579 – Coal Plant Emergency Preparedness and Response

EXECUTIVE SUMMARY

Why the OIG Did This Evaluation

The Tennessee Valley Authority (TVA) could be impacted by a wide spectrum of emergency incidents such as natural, man-made/technological, or terroristic occurrences. In recent years, there have been a number of emergency incidents at TVA's coal plants, including a coal silo failure at Cumberland Fossil Plant and an employee fatality at Shawnee Fossil Plant. TVA's Emergency Management Program is intended to ensure TVA organizations respond effectively and consistently to all incidents.

Due to the importance of an effective response in the event of an emergency, we conducted an evaluation of emergency preparedness and response at TVA coal plants. The objectives of our evaluation were to determine if (1) emergency response plans at coal plants were up to date and (2) required systems were available and functional.

What the OIG Found

We found the majority of emergency plans for active and retired coal plants were not reviewed on a timely basis or were not up to date. Specifically, we found (1) three of six emergency plans for active coal plants[i] were not reviewed timely based on TVA's requirement for an annual review, and all six contained inaccurate contact information; (2) two of four emergency plans for retired[ii] coal plants were not reviewed timely and plans were not executable because of changed plant conditions; and (3) 14 of 15 emergency action plans required for coal combustion residuals storage facilities were not reviewed on a timely basis.

We also found some systems required in emergency response plans were not functional. Specifically, we observed functional issues with emergency alerting and notification systems at two of the three plants we visited. Additionally, we noted two user aids[iii] were unavailable to anticipated TVA users at most active plants.

In addition, we found limited emergency lighting in administrative areas and planned incident command posts during site visits at three plants.

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[i] As of August 1, 2018, TVA had six active coal plants: Bull Run, Cumberland, Gallatin, Kingston, Shawnee, and Paradise.

[ii] TVA retired four coal plants in the prior 5 years: Allen, Colbert, Johnsonville, and Widows Creek.

[iii] Emergency plans provide for services to assist the incident management team in external communications such as the Government Emergency Telecommunications Service, Wireless Priority Service, and Web-Based Emergency Operations Center.

Evaluation 2018-15579 – Coal Plant Emergency Preparedness and Response

EXECUTIVE SUMMARY

What the OIG Recommends

We recommend the Senior Vice President, Power Operations (1) review and update out-of-date site emergency plans, (2) develop transitional emergency plans for retired plants, (3) remediate functional issues with emergency response systems, (4) improve availability of two user aids at coal plants, and (5) evaluate the adequacy of emergency lighting in planned incident command posts and administrative areas of active coal plants and make modifications where necessary.

TVA Management's Comments

In response to our draft report, TVA management stated that actions have been, or will be, taken to address the recommendations. See Appendix B for management's complete response.

Auditor's Response

We concur with TVA management's planned and completed actions and will verify completion prior to closing the recommendations.

BACKGROUND

The Tennessee Valley Authority (TVA) could be impacted by a wide spectrum of emergency incidents such as natural, man-made/technological, or terroristic occurrences. In recent years, there have been a number of emergency incidents at TVA's coal plants, including a coal silo collapse at Cumberland Fossil Plant and an employee fatality at Shawnee Fossil Plant. TVA's Emergency Management Program is intended to ensure its organizations respond effectively and consistently to all incidents.

The U.S. Department of Homeland Security (DHS) issues guidance and best practices on emergency management for all levels of government as well as the private and nongovernmental sectors. In 2004, DHS released its original guide to incident management—known as the National Incident Management System (NIMS)—to provide a common approach to sharing resources, coordinating and managing incidents, and communicating information. NIMS guidance suggests incidents are best handled at the lowest possible organizational level. According to TVA, as an incident grows in complexity and/or size, TVA sites and organizations may require activation of other external response agencies for assistance.

Accordingly, TVA established emergency response plans at multiple organizational levels, including a site plan for each of TVA's coal plants, a Power Operations (PO) emergency plan—Standard Programs and Processes (SPP), PO-SPP-35.001, *Power Operations Emergency Plan*—and an agency level plan—TVA-SPP-35.100, *Agency Emergency Response Plan (AERP)*. TVA-SPP-35.200, *Emergency Preparedness Programs*, indicates emergency programs should address the following areas, among others:

- Compliance with applicable laws and authorities.
- Prevention and mitigation strategies to limit or control the consequences, extent, or severity of an incident.
- Incident management structures consistent with the Incident Command System.
- Identification of threats, hazards, and risks.
- Written emergency plans, processes, and procedures.
- Facilities and equipment to execute the program, including redundant capabilities.
- Mutual aid or agreements for maintaining effective interfaces.

TVA-SPP-35.000, *Emergency Management*, establishes roles and responsibilities for nonnuclear emergency management programs. TVA's Crisis and Emergency Management (C&EM) group is responsible for the establishment, maintenance, and implementation of TVA emergency management activities. Each organization is responsible for emergency management and response programs within their respective organizations, with oversight of emergency plans provided by C&EM.

According to TVA-SPP-35.200, emergency preparedness program coordinators establish their programs to adhere to the provisions of this SPP and ensure the programs are reviewed, maintained, and implemented to provide operational readiness for effective emergency response.

Site emergency response plans define roles and responsibilities of plant personnel, provide for emergency response facilities, identify user aids[1] for the incident management team, and detail emergency reporting and notification requirements. The fire brigade at coal plants serve as emergency responders, and fire brigade leaders are the initial incident commanders for on-site emergencies. Attachments to the site plans provide contact information for off-site emergency support, offsite TVA contacts, federal contacts, and on-site contacts.

Site plans are designed to be multi-hazards plans, with specific appendices providing details regarding specific emergency scenarios. For example, emergency plans detail notification protocols for fires, hazardous material releases (to include ammonia), and failures of on-site coal ash storage facilities. An emergency action plan is required by the Disposal of Coal Combustion Residuals from Electric Utilities (commonly referred to as the CCR Rule),[2] for certain ash storage facilities.

According to site plans, priorities for emergency reporting and notifications are to (1) warn others, (2) summon emergency responders, and (3) make notifications. The plans provide for emergency notification systems to be used to warn employees of emergency conditions. According to Occupational Safety and Health Administration (OSHA) 29 Code of Federal Regulations §1910.165, "Employee alarm systems," employee alarm systems shall provide warning for necessary emergency action as called for in the emergency action plan, or for reaction time for safe escape of employees from the workplace or the immediate work area or both. OSHA requires employers to maintain all employee alarm systems in operating condition except when undergoing repairs or maintenance.

DHS also issued guidelines for the development and maintenance of emergency plans, commonly referred to as the *Comprehensive Preparedness Guide (CPG) 101*. *CPG 101* indicates plan reviews should be a recurring activity, and in no case should any part of the plan go for more than 2 years without being reviewed and revised. *CPG 101* advises planning teams to consider reviewing and updating the plan after certain events including major incidents and changes in operational resources (e.g., policy, personnel, organizational structures, management processes, facilities, equipment). The guidelines caution:

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1 Emergency plans provide for services to assist the incident management team in external communications such as the Government Emergency Telecommunications Service (GETS), Wireless Priority Service (WPS), and Web-Based Emergency Operations Center (WebEOC).

2 The CCR Rule was adopted by the Environmental Protection Agency in response to a large coal ash spill at TVA's Kingston Fossil Plant in 2008. The Rule addresses the risks from the disposal of coal ash generated from the combustion of coal at electric utilities and independent power producers.

> Plans must not be placed on a shelf to collect dust!
>
> Whenever possible, training and exercise must be conducted for each plan to ensure that current and new personnel are familiar with the priorities, goals, objectives and courses of action.
>
> Plan maintenance is also critical to the continued utility of the plans an organization has developed. A number of operations have had setbacks due to old information, ineffective procedures, incorrect role assignments, and outdated laws.

Due to the importance of an effective response in the event of an emergency, we conducted an evaluation of emergency preparedness and response (EPR) at TVA coal plants.

OBJECTIVE, SCOPE, AND METHODOLOGY

The objectives of our evaluation were to determine if (1) emergency response plans at coal plants were up to date and (2) required systems were available and functional. The scope of our evaluation included the plans in effect as of August 1, 2018, and systems included in plans for alerting employees to emergency conditions and making emergency notifications. To achieve our objectives we:

- Reviewed the following SPPs, DHS guidance, and federal regulations to gain an understanding of the EPR process and requirements:
  - TVA-SPP-35.000, *Emergency Management*
  - TVA-SPP-35.100, *Agency Emergency Response Plan*
  - TVA-SPP-35.200, *Emergency Preparedness Programs*
  - PO-SPP-35.001, *Power Operations Emergency Plan*
  - PO-SPP-35.002, *Power Operations Emergency Response Teams Program*
  - Generation Construction, Projects and Services (GCP&S) SPP-27.6.1, *GCP&S Emergency Preparedness for CCR Units*
  - DHS guidance, including NIMS and *CPG 101*
  - OSHA 29 Code of Federal Regulations §1910.165, "Employee alarm systems"
- Interviewed PO, C&EM, and GCP&S personnel to gain an understanding of the EPR processes and systems.
- Obtained and reviewed emergency response plans for active TVA coal plants,[3] in effect as of August 1, 2018, to identify (1) the most recent review dates, (2) contact information, and (3) required emergency response systems.

[3] As of August 1, 2018, TVA had six active coal plants: Bull Run, Cumberland, Gallatin, Kingston, Shawnee, and Paradise.

- Obtained and reviewed emergency response plans for retired[4] TVA coal plants in effect as of August 1, 2018, to identify the most recent review dates.
- Verified the accuracy of the contact information included in the active plant emergency response plans.
- Conducted site visits for a judgmentally selected sample of active coal plants to test availability and functionality of required systems. We ranked the active coal plants by population at risk in the event of an ammonia release, number of personnel onsite, coal ash wet storage volume, and power-producing capability in order to identify the plants at highest risk. Based on these factors, we visited three fossil plants: Cumberland, Gallatin, and Shawnee. For these sites, we:
  - Observed tests of required alerting and notification systems listed in the emergency response plans as provided in Appendix A.
  - Interviewed a selection of emergency responders[5] to identify current or unresolved issues with alerting and notification systems.
- Reviewed access records for the GETS, WPS, and WebEOC to determine whether these user aids were available to appropriate users at active coal plants.
- Conducted keyword searches in Maximo[6] and reviewed relevant condition reports (CR)[7] as well as associated work orders to identify CRs generated related to emergency systems. We used the CRs to corroborate observations and reported issues in interviews.

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

FINDINGS AND RECOMMENDATIONS

We found the majority of site emergency plans for active and retired coal plants were not reviewed on a timely basis or were not up to date. We observed functional issues with emergency systems at two of three plants we visited, and we determined two user aids were not available. In addition, we identified issues with emergency lighting at administrative areas and planned incident command posts.

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4 TVA retired four coal plants in the prior 5 years: Allen, Colbert, Johnsonville, and Widows Creek.

5 We judgmentally selected approximately 20 percent of responders. Plants self-selected from the emergency responders available the day we visited.

6 Maximo is TVA's work management system.

7 CRs are created to record how problems are found, analyzed, and resolved. We searched for conditions reported between January 1, 2017, and August 1, 2018, with keywords for systems related to our evaluation.

MOST EMERGENCY PLANS FOR COAL PLANTS WERE NOT REVIEWED ON A TIMELY BASIS OR WERE NOT UP TO DATE

We found the majority of emergency plans for active and retired coal plants were not reviewed on a timely basis or were not up to date. Specifically, we found (1) three of six emergency plans for active coal plants were not reviewed timely, and all six contained inaccurate contact information; (2) two of four retired plant emergency plans were not reviewed timely and were not executable due to changed plant conditions; and (3) 14 of 15 emergency action plans for coal combustion residuals (CCR) storage facilities were not reviewed on a timely basis.

Emergency Plans for Active Coal Plants Were Not Reviewed on a Timely Basis for Three Plants and Were Not Up to Date for Any of the Plants
TVA-SPP-35.200, *Emergency Preparedness Programs*, Section 3.7, requires annual review of site emergency plans. The PO Program Manager for EPR assigned action tracking items in Maximo to each plant as a reminder to review emergency plans in a timely manner. We reviewed emergency plans in effect for all coal plants as of August 1, 2018, and found three of six active plant plans (Gallatin, Shawnee, and Paradise Fossil Plants) had not been reviewed within the past year. Gallatin's plan was dated January 2017; Shawnee's plan was dated July 2017; and Paradise's plan was dated September 2016. Gallatin, Shawnee, and Paradise each marked the action to review the plans as complete in January 2018 even though they were not completed.

Due to the risk of incorrect information and role assignments in emergency plans negatively impacting a response, we called contact information listed in emergency response plans for active plants. All six emergency plans needed updates to contact information. Specifically, we found 30 percent of off-site support contacts and approximately 50 percent of on-site contacts had errors. The errors included incorrect phone numbers and contact names as well as phone numbers identified as not preferred by the organization for reporting emergencies. For example, we found:

- Incorrect phone numbers for TVA's Balancing Authority,[8] an environmental spill response hotline, and the Federal Bureau of Investigation's Knoxville Office.
- Incorrect contacts for three plant managers as well as three operations managers.
- Nonpreferred phone numbers for reporting emergencies to the Tennessee Department of Environment and Conservation, TVA Security and Emergency Management, and TVA's Information Technology Customer Operations Center.

[8] TVA's balancing authority ensures that power system demand and supply are finely balanced. This balance is needed to maintain the safe and reliable operation of the power system.

Recommendations

We recommend the Senior Vice President (SVP), PO, review and update (1) emergency plans at Gallatin, Shawnee, and Paradise and (2) contact information contained in active plant emergency response plans.

TVA Management's Comments – In response to our draft report, TVA management stated site emergency response plans have been updated at all coal plants and a cadence for future reviews has been established. See Appendix B for management's complete response.

Auditor Response – We concur with TVA management's actions and will verify completion prior to closing the recommendation.

Emergency Plans for Two Retired Coal Plants Were Not Reviewed on a Timely Basis and Were Not Executable

According to PO-SPP-35.001, *Power Operations Emergency Plan,* each facility has its own site-specific emergency plan. The PO Program Manager for EPR indicated nonoperating sites owned by PO also require site specific emergency plans. As discussed above, TVA-SPP-35.200, *Emergency Preparedness Programs*, Section 3.7, requires annual review of emergency plans. In recent years, TVA retired Allen, Colbert, Johnsonville, and Widows Creek Fossil Plants. We reviewed emergency plans in effect for all coal plants as of August 1, 2018, and found two of four retired plant plans were not reviewed on a timely basis and were not executable.

We found GCP&S maintains current plans for Colbert and Widows Creek; however, plans in place for Johnsonville and Allen were established by PO while the plants were operational. Specifically:

- Johnsonville's emergency response plan was effective as dated June 2016, and the plant ceased operations in December 2017.
- Allen's most recent emergency response plan was dated February 2017, and the plant ceased operations in March 2018.

We determined the plans for Allen and Johnsonville were not executable due to limited staffing maintained during the transition into decommissioning. According to both site emergency plans, fire brigade members are the first responders for fires and emergencies involving hazardous materials. In addition, according to the PO Program Manager for EPR, fire brigade members are also trained in CPR and First Aid and can respond to medical emergencies. Fire brigade leaders are identified as the incident commanders of on-site responses to emergencies. However, we determined as of September 2018, there were no qualified fire brigade leaders or members at any of the retired plants.

A TVA manager confirmed the plans were not executable due to limited staffing maintained during the transition into decommissioning. For example, the manager indicated at Allen there were approximately 15 employees at the site, which is manned 20 hours a day. At times, only a guard is on shift. Therefore, it

would be impossible to implement the emergency plan if the fire brigade is required for emergency response.

According to PO-SPP-35.002, *Power Operations Emergency Response Teams Program,* Section 3.2.1, when staffing levels no longer support a full fire brigade, the site may obtain written approval from senior management to revise the contract with the off-site fire department, and convert to emergency response liaison and incipient coverage. Once approved, PO-SPP-35.002 indicates a written transition plan should be developed.

We also identified a gap in responsibility for the site emergency plans during site transition from PO and GCP&S. According to the PO Program Manager for EPR, GCP&S should be responsible for plans when the plant ceases operations. However, GCP&S managers indicated they cannot take ownership of the emergency plan until the plant is formally transferred to their group, which is about 1 year after the plant ceases operation.

Recommendation

We recommend the SVP, PO, develop transitional emergency response plans for retired plants that are feasible with limited staff and designate the organization responsible for maintaining and executing the plans at each phase after operations cease.

TVA Management's Comments – In response to our draft report, TVA management stated site-specific transitional emergency response plans will be developed for retiring plants as plant closures are scheduled. See Appendix B for management's complete response.

Auditor Comments – We concur with TVA management's planned actions and will verify selected site-specific plans prior to closing the recommendation.

Emergency Action Plans Required for CCR Storage Facilities Were Not Reviewed on a Timely Basis

We found emergency action plans required for CCR storage facilities were not reviewed on a timely basis by TVA. GCP&S-SPP-27.6.1, *GCP&S Emergency Preparedness Program for CCR Units*, Section 3.1.3, indicates emergency action plans should have a documented annual review for appropriateness, accuracy, and adequacy to remain current. We reviewed emergency action plans for CCR storage facilities as of September 2018, and found there were no documented annual reviews for 14 of the 15 facilities requiring emergency action plans. We communicated our observations to GCP&S management in November 2018 and confirmed in February 2019 that GCP&S had revised the plans for all 15 facilities.

SOME SYSTEMS IN EMERGENCY RESPONSE PLANS WERE NOT AVAILABLE OR FUNCTIONAL

We found some systems in emergency response plans were not functional. Specifically, we observed functional issues with emergency systems at two of the

three plants we visited. Additionally, we found two user aids were unavailable to anticipated users at the coal plants.

Required Emergency Systems Were Not Functional

Emergency alerting and notification systems are critical in informing employees of life-threatening conditions. We reviewed emergency response plans for active plants to identify systems used to notify and alert employees or other responders. In total, we identified seven systems for testing at each site. Descriptions of the tested systems and their functions are provided in Appendix A.

We visited Cumberland, Gallatin, and Shawnee to observe tests of emergency response systems in September 2018. We observed functional issues with one system tested at Gallatin and five systems tested at Cumberland as shown in Table 1 below:

Emergency Response Systems Functioning as Intended

System	Cumberland	Gallatin	Shawnee
Ammonia Alert	Yes	Yes	Yes
Chemical Alert	No	Yes	Yes
Fire Alert	No	Yes*	Yes*
General/Tornado Alert	Yes	Yes	Yes
Public Address (PA)	No	Yes	Yes
In-Plant Phones	No	No	Yes
Radios	No	Yes	Yes

*Auditor observed functional alerts; however, there were issues in the fire alert systems.

Table 1

To determine whether the observed functional issues had been previously identified, we searched Maximo for relevant CRs and found 52 related reports. Of those, 8 had no associated corrective actions and 14 had corrective actions outstanding. All but 1 with outstanding corrective actions were past due. While not all outstanding CRs corresponded directly to the issues we observed, three of the systems had issues identified during on-site testing that were previously reported to site management.

Chemical Alert

According to site emergency plans, if a chemical event or accident poses an immediate threat to the safety of employees and contractors onsite, the chemical alert should be sounded. At Cumberland, we observed failure of the chemical alert to properly announce in the following locations: dry fly ash silos, limestone unloading area, and southeast of the coal pile near the ammonia farm.

Due to the importance of the chemical alert system and its observed failure at Cumberland, our office issued a memo on October 4, 2018, alerting management and providing details of the observed functional issues. In response to our memo, TVA management stated (1) Cumberland's system was repaired as of October 23, 2018; (2) tests were conducted at remaining coal plants, and

deficiencies would be repaired and verified by November 30, 2018;[9] and (3) a standard planned maintenance action was created for monthly chemical alert testing.

Fire Alert

According to site emergency plans, if a fire event or accident poses an immediate threat to the safety of employees and contractors onsite, the fire alert should be sounded. At Cumberland, we observed inoperable fire-alert speakers in certain locations. We also observed issues with the fire-alert systems at Gallatin and Shawnee. According to TVA personnel, an actual fire in certain areas would not result in an alert because the systems are being overridden to silence the constant false alerts.

In addition, we were informed at both Cumberland and Gallatin that there are false fire alerts.[10] When exposed to false fire alerts, employees may become desensitized to the sound of the fire alert, slowing their reaction times.

PA

The PA system facilitates instructions from the control room in the event of emergency. For example, site emergency plans direct incident commanders to make announcements over the PA system to evacuate the facility in the event of a chemical spill, accident, fire, and/or natural disaster. At Cumberland, we observed inaudible PAs in certain locations. Also, we noted the PA system at Shawnee was functional as designed; however, unlike at Cumberland and Gallatin, the PA system was audible only within the powerhouse. This could limit information available to workers in remote areas of the plant in the event of emergency.

In-Plant Phones

Site emergency plans direct all personnel to dial the emergency phone number from a plant phone to inform the control room or shift operations supervisor upon discovery or suspicion of an emergency or security issue. While operations employees carry hand-held radios, according to operations personnel, the phone system would be the primary method of communication for certain maintenance employees. During our site walkdowns, we randomly tested phones for a dial tone in the powerhouse. At Cumberland, we found instances where phones in the powerhouse did not have a dial tone. The functional issue with powerhouse phones was confirmed in interviews where eight of nine responders indicated phones are not consistently operational.[11] At Gallatin, phones we tested were operational with the exception of the Unit 1/2 passenger elevator.

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[9] According to information provided by TVA, testing was performed but repairs are ongoing as of February 2019.

[10] We corroborated false fire alerts at these sites through CRs 1314631, 1367992, and 1414734, which relate to this issue.

[11] We corroborated functional issues with powerhouse phones through CRs 1433492, 1433489, 1433493, 1433488, and 1433486, which directly relate to this issue.

Radios

Hand-held radios are a primary communication source in the event of an emergency. At Cumberland, we observed difficulty getting coverage for the radios in certain plant locations; in particular, the subbasement and the fire equipment coordinator office area. Interviewees reported such coverage issues were not limited to those areas. At Cumberland and Gallatin, employees also reported the need for replacement batteries at the site because they would not hold a charge throughout a shift.

- - - - - -

In summary, the functional issues we identified with the emergency response systems in conjunction with the number of outstanding and past due CRs indicate a lack of emphasis on keeping the systems functional. Without functional alerting and notification systems there is an increased risk to employee safety.

Recommendation

We recommend the SVP, PO, remediate functional issues with required emergency systems including the chemical alert, fire alert, PA system, phones, and radios.

TVA Management's Comments – In response to our draft report, TVA management stated functional issues identified will be assessed and a strategy will be established to address the existing nonfunctional emergency response systems by April 1, 2020. See Appendix B for management's complete response.

Auditor Response – TVA management subsequently informed us their intent was to complete their assessment and remediation of the nonfunctional emergency response issues by April 1, 2020. Based on this time frame, we concur with TVA management's planned actions.

User Aids Were Not Available to Personnel at Coal Plants

Site emergency response plans identify three user aids for the incident management team to make external notifications:

- GETS cards to prioritize calls made over landlines.
- WPS to prioritize calls made over cell phones.
- WebEOC for documenting and sharing incident information logs.

We did not test functionality for these systems because they are not owned or maintained by TVA. Therefore, we reviewed the three systems to determine if they were available for anticipated users at the six active coal plants and found GETS was unavailable at four plants and WPS was unavailable at five plants.

For small events, site emergency plans state the incident commander is normally the shift operations supervisor. In the case of a larger event, the plant manager may appoint a more experienced incident commander or assume the role

personally. We determined only 1 of 51 shift operation supervisors have an issued GETS card and no shift operations supervisors had a WPS-enabled device. Similarly, we identified only one of six active plant managers have an issued GETS card, or a WPS-enabled device.[12] Plants are provided a common username for the WebEOC system, which allows access to it for all relevant personnel.

The emergency response plans do not identify personnel responsible for maintaining access to the user aids. PO's Program Manager for EPR, who is responsible for coordinating GETS and WPS access with DHS, acknowledged difficulty in managing access to these systems, especially for WPS after TVA allowed employees to use their own cellular devices.

Recommendation

We recommend the SVP, PO, establish plant personnel responsible for maintaining GETS and WPS access and coordinate access through DHS.

TVA Management's Comments – In response to our draft report, TVA management stated GETS and WPS will be assigned for each site by November 1, 2019. See Appendix B for management's complete response.

Auditor Response – We concur with TVA management's planned actions.

ADDITIONAL INFORMATION

In addition to the findings discussed above, during our site visits, we found no emergency lighting in the corridors or stairways leading to exits in the administrative areas at all three sites. In addition, the incident command posts identified in the emergency plans often did not have adequate or functioning emergency lighting. For example, Shawnee's Electric Control Building Control Room lights were mostly broken or nonfunctioning. At Cumberland and Gallatin, there were no emergency lights installed in the Outage Command Centers. Illustrations below show inadequate lighting in administration areas (Illustration 1) and planned incident command posts (Illustration 2). Inadequate emergency lighting could impact the ability of plant management and employees to safely evacuate and coordinate response in the event of an emergency.

[12] The same plant manager had access to both systems.

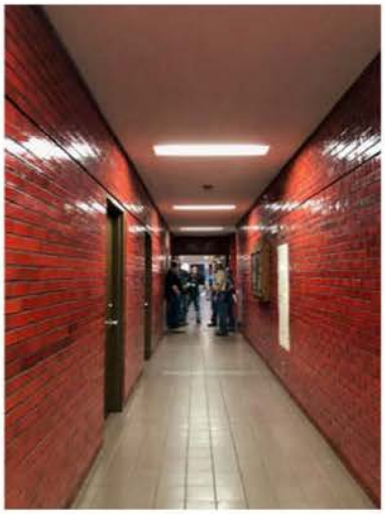

Illustration 1: First Floor Main Corridor at Cumberland

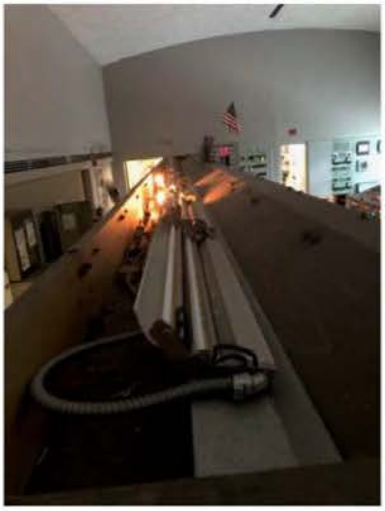

Illustration 2: Electric Control Building Control Room Emergency Lights

We discussed our observations related to inadequate and nonfunctioning lighting with the PO Fire Protection Program Managers. Program managers indicated corporate oversight of preventive maintenance work orders for emergency signage and lighting did not formally exist until October 2018. With revisions to TVA-SPP-18.121, *Fixed Fire Protection and Detection Subsystems – Inspection, Testing, and Maintenance,* PO Program Managers have responsibility for tracking compliance with the preventive maintenance of emergency signage and lighting.

Recommendation

We recommend the SVP, PO, evaluate the adequacy of emergency lighting in planned incident command posts and administrative areas of active plants, and make modifications where necessary.

TVA Management's Comments – In response to our draft report, TVA management stated the adequacy of the emergency lighting in the identified command post[s] and administrative area[s] of the active coal plants will be evaluated against applicable governing standards and if necessary, modifications will be made to emergency lighting by April 1, 2020. See Appendix B for management's complete response.

Auditor Response – We concur with TVA management's planned actions.

Emergency Response Systems Functionally Tested	
Response System	**Description/Purpose**
Ammonia Alert (Sensors, Video Cameras, and Digital Control System Alert)	Ammonia is a strong irritant to eyes, nose, and throat. According to emergency response plans, the level considered immediately dangerous to life and health is 300 parts per million (ppm) and individuals need to be evacuated at 200 ppm. To provide early warning and to minimize exposure from releases, ammonia sensors are located in areas where releases are most likely to occur. If any of these sensors are triggered or if the concentration exceeds 30 ppm at any location for more than 5 minutes, a site-wide emergency alert will be declared. An alarm triggered by an ammonia sensor will also trigger an alarm on the Digital Control System monitor in plant control rooms. Sensors in and around the ammonia tank farm are connected to controls that automatically activate a water fogging system.
Chemical Alert	If a chemical event or accident poses an immediate threat to the safety of employees and contractors onsite, the chemical alert should be sounded.
Fire Alert	If a fire event or accident poses an immediate threat to the safety of employees and contractors onsite, the fire alert should be sounded.
General/ Tornado Alert	If a tornado or other event or accident poses an immediate threat to the safety of employees and contractors on site, the general/tornado alert should be sounded.
Public Address	If an event or accident poses an immediate threat to the safety of employees and contractors onsite, the public address system is used, in conjunction with the appropriate alarms, to provide detailed instructions to those in harm's way.
In-Plant Phones	Emergency response plans direct all personnel to dial the emergency phone number from a plant phone to inform the Control Room upon discovery or suspicion of an emergency or security issue.
Radios	Hand-held radios are a primary communication source in the event of an emergency.

April 5, 2019

David P. Wheeler, WT 2C-K

MANAGEMENT RESPONSE - DRAFT EVALUATION 2018-15579 – COAL PLANT EMERGENCY PREPAREDNESS AND RESPONSE

This is in response to your memorandum dated March 7, 2019. First, we want to thank your team for the professional manner in which this audit was conducted. After review of the draft evaluation, we are providing our response to the Recommendations regarding Coal Plant Emergency Preparedness and Response.

Recommendations

1. We recommend the Senior Vice President (SVP), PO, review and update (1) emergency plans at Gallatin, Shawnee, and Paradise and (2) contact information contained in active plant emergency response plans.

   Response
   Site emergency response plans have been updated at all coal plants. A cadence for future reviews has been established.

2. We recommend the SVP, PO, develop transitional emergency response plans for retired plants that are feasible with limited staff and designate the organization responsible for maintaining and executing the plans at each phase after operations cease.

   Response
   Site-specific transitional emergency response plans will be developed for retiring plants.
   Owner - William Rose
   Due Date - As plant closures are scheduled

3. We recommend the SVP, PO, remediate functional issues with required emergency systems including the chemical alert, fire alert, PA system, phones, and radios.

   Response
   The functional issues identified will be assessed and a strategy will be established to address the existing non-functional emergency response systems as identified in the draft report which are the chemical alert, fire alert, PA system, in-plant phones and radio systems.
   Owner - Curtis Rodenhaber
   Due Date - April 1, 2020

4. We recommend the SVP, PO, establish plant personnel responsible for maintaining GETS and WPS access and coordinate access through DHS.

   Response
   GETS and WPS will be assigned for each site.
   Owner - William Rose
   Due Date - November 1, 2019

5. We recommend the SVP, PO, evaluate the adequacy of emergency lighting in planned incident command posts and administrative areas of active plants, and make modifications where necessary.

   Response
   The adequacy of the emergency lighting in the identified incident command post and administrative area of the active coal plants will be evaluated against applicable governing standards and if necessary, modifications will be made to emergency lighting in planned incident command posts and administrative areas of active coal plants.
   Owner - Todd Butler
   Due Date - April 1, 2020

6. Fourteen of fifteen emergency action plans required for coal combustion residuals storage facilities were not reviewed on a timely basis.

   Response
   All Generation Construction Projects & Services and Facilities Management emergency action plans have been updated.

Thank you for allowing us to provide these comments. If you need additional information, please let us know.

Robert M. Deacy
Senior Vice President
Generation Construction Projects &
Services and Facilities Management
LP 5D-C

Jacinda B. Woodward
Senior Vice President
Power Operations
LP 3K-C

cc: See Page 3

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Memorandum from the Office of the Inspector General

February 15, 2019

James R. Dalrymple, MR 3H-C

MANAGEMENT ALERT 2018-15609 – CONCERNS WITH SYSTEM OPERATIONS CENTER LOCATION

We are currently conducting an evaluation[1] in the Transmission Operations, Reliability, and Supervisory Control and Data Acquisition (TORS) group. During our interviews with TORS' employees, a concern was raised that the new System Operations Center (SOC) site is inside the Sequoyah Nuclear Plant (SQN) 10-mile Emergency Planning Zone (EPZ),[2] putting the transmission system at risk if a radiological event occurred. Based on this information, we researched the location of the new SOC and believe it to be within the 10-mile EPZ radius. According to SOC's site selection team members, the team established criteria that precluded the location of the SOC inside the EPZ radius; however, they reviewed evacuation sectors rather than a 10-mile radius around SQN. Recently, we discussed this with members of the site selection team who, after reviewing a map showing the SQN 10-mile radius, concurred that the selected SOC site is outside the evacuation sectors, but within the EPZ 10-mile radius.

A study conducted for the SQN by ARCADIS U.S., Incorporated, shows the required evacuation routes for various locations within the EPZ. The location of the SOC would require personnel to take a less direct path from the new SOC to the Regional Operations Center, potentially causing personnel to be noncompliant with North American Electric Reliability Corporation (NERC) Emergency Preparedness Operations (EOP) 008-1. NERC-EOP 008-1 states, "Each Reliability Coordinator, Balancing Authority, and Transmission Operator shall have a current Operating Plan describing the manner in which it continues to meet its functional obligations with regard to the reliable operations of the BES [Bulk Electric System] in the event that its primary control center functionality is lost." Further, the NERC standard requires that implementation of backup functionality should occur "less than or equal to two hours" after the initial loss of operations.

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1 Evaluation 2018-15609 – *Organizational Effectiveness – Transmission Operations, Reliability, and Supervisory Control and Data Acquisition*.

2 According to 10 CFR Part 50, *Domestic Licensing of Production and Utilization Facilities*, "Generally, the plume exposure pathway EPZ for nuclear power shall consist of an area about 10 miles (16 km) in radius and the ingestion pathway EPZ shall consist of an area about 50 miles (80 km) in radius."

Based on the information we have reviewed, TVA's planned location for the new SOC site appears to pose a risk to TVA personnel being unable to evacuate as necessary and maintain the reliability of the system. Because of the potential risk to TVA's system we wanted to promptly notify you of this issue. Please let us know if there is other mitigating information TVA has considered regarding the placement of the new SOC location. We would also like to be notified within 30 days of any actions taken in regard to this matter.

Thank you for your attention to this matter. Please contact Lisa H. Hammer, Director, Evaluations – Organizational Effectiveness, at (865) 633-7342 if you have any questions.

David P. Wheeler
Assistant Inspector General
(Audits and Evaluations)
WT 2C-K

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OIG File No. 2018-15609

Memorandum from the Office of the Inspector General

May 22, 2019

Joshua W. Shultz, MR 1A-C

REQUEST FOR MANAGEMENT DECISION – EVALUATION 2018-15609 – ORGANIZATIONAL EFFECTIVENESS – TRANSMISSION OPERATIONS, RELIABILITY, AND SUPERVISORY CONTROL AND DATA ACQUISITION

Attached is the subject final report for your review and management decision. You are responsible for determining the necessary actions to take in response to our findings. Please advise us of your management decision within 60 days from the date of this report. 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 audits 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 Noel K. Kawado, Senior Auditor, at (865) 633-7348 or Lisa H. Hammer, Director, Evaluations – Organizational Effectiveness, at (865) 633-7342. We appreciate the courtesy and cooperation received from your staff during the evaluation.

David P. Wheeler
Assistant Inspector General
(Audits and Evaluations)
WT 2C-K

NKK:KDS
Attachment
cc (Attachment):

TVA Board of Directors
Clifford L. Beach Jr., WT 7B-K
Janet J. Brewer, WT 7C-K
Susan E. Collins, LP 6A-C
James R. Dalrymple, MR 3H-C
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OIG File No. 2018-15609

Office of the Inspector General

Evaluation Report

To the General Manager,
Transmission Operations,
Reliability, and Supervisory
Control and Data Acquisition

ORGANIZATIONAL EFFECTIVENESS – TRANSMISSION OPERATIONS, RELIABILITY, AND SUPERVISORY CONTROL AND DATA ACQUISITION

Evaluation Team
Noel K. Kawado
Justin B. Franklin

Evaluation 2018-15609
May 22, 2019

ABBREVIATIONS

EP&R	Emergency Preparedness and Response
FY	Fiscal Year
GM	General Manager
MTOP	Manager, Transmission Operations
NERC	North American Electric Reliability Corporation
SCADA	Supervisory Control and Data Acquisition
TFO	Transmission Field Operations
TOPS	Transmission Operations and Power Supply
TORS	Transmission Operations, Reliability, and Supervisory Control and Data Acquisition
TPS	Transmission and Power Supply
Training	North American Electric Reliability Corporation, Regulatory, and Operations Training
TVA	Tennessee Valley Authority

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A. TVA VALUES AND LEADERSHIP COMPETENCIES

B. E-MAIL DATED MAY 14, 2019, FROM JOSHUA W. SHULTZ TO DAVID P. WHEELER

Evaluation 2018-15609 – Organizational Effectiveness – Transmission Operations, Reliability, and Supervisory Control and Data Acquisition

EXECUTIVE SUMMARY

Why the OIG Did This Evaluation

Organizational effectiveness, as defined in this evaluation, is the ability of an organization to achieve its mission and goals. To achieve and sustain organizational effectiveness, there should be alignment between strategy, team engagement, and operational performance. Specifically, values and behaviors that drive good performance should be embedded throughout the organization's business processes and exemplified by the individuals that manage and work in the organization. The Tennessee Valley Authority's (TVA) 2018 Risk Assessment Summary recognized that (1) workforce strategy and management risks[i] and (2) workplace environment risks[ii] could negatively affect the performance environment. Therefore, employee engagement is critical.

Due to the importance of alignment between strategy, team engagement, and operational performance, the Office of the Inspector General is conducting organizational effectiveness evaluations of business units across TVA. This evaluation focuses on TVA's Transmission Operations, Reliability, and SCADA[iii] (TORS) business unit under Transmission Operations and Power Supply (TOPS). TOPS falls under the Transmission and Power Supply strategic business unit.

At the time we started our review, the TORS business unit was comprised of (1) Transmission Operations, (2) a North American Electric Reliability Corporation (NERC), Regulatory and Operations Training (Training) department, and (3) a SCADA and Reliability Systems department. According to information provided by TORS' personnel, TORS' mission is to "[e]nsure reliable and compliant transmission system operations through maintaining configuration control over TVA transmission grid, real-time operations of transmission assets, and response to emergency transmission outages."

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[i] Workforce strategy and management risks include failure to maintain key leadership positions, ineffective talent management, and performance management shortfalls.

[ii] Workforce environment risks include lack of organizational adaptability, lack of inclusion and employee engagement, and inappropriate workplace incidents.

[iii] The acronym, SCADA, is defined as Supervisory Control and Data Acquisition.

Evaluation 2018-15609 – Organizational Effectiveness – Transmission Operations, Reliability, and Supervisory Control and Data Acquisition

EXECUTIVE SUMMARY

What the OIG Found

During the course of our evaluation, we identified strengths that positively affected the day-to-day activities of TORS' personnel and performance. These strengths included (1) organizational alignment for the majority of TORS' personnel, (2) teamwork within departments in TORS, and (3) leadership of first-line supervisors (management level directly above nonmanagerial workers). However, we identified risks that could impact TORS' effectiveness and its continued ability to meet its responsibilities in support of Transmission and Power Supply's (TPS) mission. These included:

- Alignment risks due to organizational reporting issues with two functions in TORS.
- Engagement risks related to (1) career development opportunities in the Transmission Operations and Training departments and (2) a perceived lack of accountability of certain System Operations Specialists in the Transmission Operations department.
- Execution risks related to (1) perceptions of inadequate staffing in the Transmission Operations and Training departments and (2) outage scheduling challenges expressed by Transmission Operations' personnel.

Based on our findings and using TVA's Business Operating Model, we assessed TORS' level of risk in the areas of alignment, engagement, and execution. As shown in the table on the following page, we determined:

- Alignment risk is rated low. We found employees' goals generally aligned to management goals, which supported TORS' mission. We also confirmed TORS' mission, action plans, and initiatives aligned with both TPS' and TVA's mission. However, two functions in TORS may be better suited to report to a position above the General Manager (GM), TORS, to more effectively support TPS and TOPS. This issue, in our opinion, did not significantly impact alignment risk within TORS.
- Engagement risk is rated medium based on concerns related to career development opportunities in the Transmission Operations and Training departments and perceptions of lack of accountability with certain System Operations Specialists.

- Execution risk is rated medium based on concerns of inadequate staffing in the Transmission Operations and Training departments and outage scheduling challenges expressed by personnel in Transmission Operations.

	Low Risk	Medium Risk	High Risk
Alignment	X		
Engagement		X	
Execution		X	

What the OIG Recommends

During our evaluation, management took action that addressed certain risks related to career development opportunities (including lack of communication with job rotations, lack of a progression plan, and lack of accountability in Transmission Operations) and inadequate staffing and outage scheduling concerns in Transmission Operations. Based on the remaining risks, we recommend the GM, TORS, address (1) alignment concerns related to organizational reporting of two functions, (2) engagement issues related to career development opportunities in the Transmission Operations and Training departments, and (3) execution risks concerning lack of staffing in the Training department.

TVA Management's Comments

In response to our draft report, TVA management provided informal comments that we incorporated, as appropriate. In addition, TVA Management stated that they agreed with our findings and recommendations and will communicate planned actions.

See Appendix B for TVA management's complete response.

BACKGROUND

Organizational effectiveness, as defined in this evaluation, is the ability of an organization to achieve its mission and goals. To achieve and sustain organizational effectiveness, there should be alignment between strategy, team engagement, and operational performance. Specifically, values and behaviors that drive good performance should be embedded throughout the organization's business processes and exemplified by the individuals that manage and work in the organization.

In recent years, the Tennessee Valley Authority (TVA), has faced internal and external economic pressures and implemented cost-cutting measures in an attempt to keep rates low and reliability high while continuing to fulfill its broader mission of environmental stewardship and economic development. TVA's 2018 Risk Assessment Summary recognized that (1) workforce strategy and management risks[1] and (2) workplace environment risks[2] could negatively affect the performance environment. Therefore, employee engagement is critical.

Due to the importance of alignment between strategy, team engagement, and operational performance, the Office of the Inspector General is conducting organizational effectiveness evaluations of business units across TVA. This evaluation focuses on TVA's Transmission Operations, Reliability, and SCADA[3] (TORS) business unit under Transmission Operations and Power Supply (TOPS). TOPS falls under the Transmission and Power Supply (TPS) strategic business unit. TPS' mission is to safely operate TVA's power grid so customers receive reliable, low-cost power and to do their part to sustain the reliability of the Eastern Interconnect. As part of its responsibilities, TPS plans, designs, builds, operates, and maintains TVA's transmission system, and participates in the market to purchase and sell power for economic and reliability purposes.

Based on its fiscal year (FY) 2018 Annual Report, TVA's transmission system has interconnections with 13 neighboring electric systems and delivered nearly 163 billion kilowatt-hours of electricity to Tennessee Valley customers in 2018. TVA is subject to federal reliability standards set forth by the North American Electric Reliability Corporation (NERC) and approved by the Federal Energy Regulatory Commission. These standards are designed to maintain the reliability of the bulk electric system. According to TVA, it has responsibility for grid reliability in the TVA service area and has operated with 99.999 percent reliability over the last 18 years (as of September 30, 2018) in delivering electricity to customers.

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1 Workforce strategy and management risks include failure to maintain key leadership positions, ineffective talent management, and performance management shortfalls.

2 Workforce environment risks include lack of organizational adaptability, lack of inclusion and employee engagement, and inappropriate workplace incidents.

3 The acronym, SCADA, is defined as Supervisory Control and Data Acquisition.

Consistent with and supportive of TPS' mission and responsibilities, TORS' mission, according to information provided by TORS' personnel, is to "[e]nsure reliable and compliant transmission system operations through maintaining configuration control over TVA transmission grid, real-time operations of transmission assets, and response to emergency transmission outages."

At the time we started our review, TORS was comprised of (1) Transmission Operations; (2) a NERC, Regulatory and Operations Training (Training) department; and (3) a SCADA and Reliability Systems department.

- Transmission Operations is primarily responsible for directing the safe and reliable real-time operation of the TVA transmission system, ensuring connectivity of the bulk electric system, and maintaining compliance with applicable NERC reliability standards. This includes writing, reviewing, and/or directing all switching activities and outages to minimize negative impacts on the generation needs of the TVA transmission system.

  According to TORS' personnel, as of October 2018 Transmission Operations had seven crews consisting of a Manager and System Operations Specialists as well as two other Managers who study outages and plan out the work week. Transmission Operations' responsibilities include working with Transmission Field Operations (TFO) personnel to coordinate outages to upgrade or maintain equipment affecting transmission. In addition, Transmission Operations included a Senior Program Manager, Transmission Emergency Preparedness and Response (EP&R). This Senior Program Manager is responsible for the oversight, management, and support of the EP&R Program for the Transmission SBU.[4]
- The Training department is accountable for the governance, execution, and administration of the TOPS System Operator Initial and Continuing Education training programs and for ensuring all training records are properly documented and stored. Specifically, this department provides training to System Operations Specialists in TORS, as well as System Operators in other TPS business units, including TFO and Transmission Engineering and Construction. Individuals in this department are also tasked with supporting and making recommendations to TOPS management related to NERC training program requirements.
- The SCADA and Reliability Systems department is responsible for managing and ensuring the functionality, operability and reliability of real-time SCADA[5] and Energy Management Systems to facilitate the reliable and economic operation of the TVA power system. According to personnel in this department, part of their job responsibilities include supporting transmission

[4] The Senior Program Manager, Transmission EP&R, currently reports to the GM, TORS.

[5] TVA's SCADA system is a central computing system that monitors and controls the TVA transmission system and balances load and supply in real time. Site control is performed automatically through hundreds of dispersed Remote Terminal Units.

capital projects and using information (data points) to monitor TVA's transmission system through the SCADA system.

According to TORS' personnel, TVA's System Operators (which include System Operations Specialists in TORS) annually perform over 25,000 maintenance and emergency switching orders and operate a transmission system with:

- Approximately 2,500 miles of 500 kilovolt transmission lines, 11,700 miles of 161 kilovolt transmission lines, and 2,000 miles of other voltage transmission lines.
- 508 transmission substations and switching stations.
- 1,321 customer connection points (customer, generation, and interconnection).

TORS tracks metrics primarily related to system reliability. According to the General Manager (GM), TORS, the majority of TORS' operations take place at TVA's System Operations Center, currently located at TVA's Chattanooga Office Complex.[6] As of October 9, 2018, TORS had 56 employees, including a GM,[7] a SCADA and Reliability Systems manager, a Training manager, and nine Transmission Operations managers.

OBJECTIVE, SCOPE, AND METHODOLOGY

The objective of this evaluation was to identify strengths and risks that could impact TORS' organizational effectiveness. We assessed operations from October 1, 2017, through December 2018, and culture at the time of our interviews and fieldwork, which occurred from October 2018 through January 2019. To complete the evaluation, we:

- Reviewed TVA's and TPS' FY2019 through FY2021 Business Plans to determine whether TORS' mission, action plans, and initiatives aligned with TPS' and TVA's mission.
- Reviewed TVA values and competencies (see the Appendix) for an understanding of cultural factors deemed important to TVA.
- Conducted individual interviews with 55 employees,[8] including management, and analyzed the results to identify themes related to strengths and risks that could affect organizational effectiveness.

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6 According to TVA's FY2018 annual report, the TVA Board approved $245 million for the construction of a new System Operations Center, which is being built to accommodate a new energy management system and to adapt to new regulatory requirements. TVA expects the facility to be constructed by 2021 and fully operational by 2023.

7 On October 29, 2018, TORS named a new GM, replacing the prior GM who rotated to another position within TOPS. We did not interview the prior GM.

8 One individual stated he was no longer in TORS when we scheduled interviews, and therefore, was not interviewed. We interviewed 2 interns, but did not include their results as part of this report because interns generally have a more limited exposure to the organization.

- Conducted individual interviews with a judgmentally selected sample of 19 TFO personnel, including Program Managers, Transmission Maintenance; Regional GMs; and Transmission Service Center Managers, to obtain their views about the products and services provided by TORS.
- Obtained and reviewed select TVA Standard Programs and Processes and guidelines to gain an understanding of certain processes.
- Obtained and reviewed TVA documents to gain an understanding of training requirements for System Operations Specialists in TORS.
- Reviewed and analyzed the FY2018 performance documentation for all management and employees of record as of October 18, 2018, for alignment within each department and to TORS' mission.
- Assessed the overall effectiveness of TORS in the following areas, as included in TVA's Business Operating Model:
  - Alignment – How well the organization coordinates the activities of its many components for the purpose of achieving its long-term objectives—this is grounded in an understanding of what the organization wants to achieve, and why.
  - Engagement – How the organization achieves the highest level of performance from its employees.
  - Execution – How well the organization achieves its objectives and mission.

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

OBSERVATIONS

During the course of our evaluation, we identified strengths that positively affected the day-to-day activities of TORS' personnel and performance. However, we also identified risks that could impact TORS' effectiveness and its continued ability to meet its responsibilities in support of TPS' mission.

STRENGTHS

During the course of our interviews and data analyses, we identified strengths that positively affected the day-to-day activities of TORS' personnel and performance. These strengths related to (1) organizational alignment for the majority of TORS' personnel, (2) teamwork within departments in TORS, and (3) leadership of first-line supervisors (management level directly above nonmanagerial workers).

Organizational Alignment

Our assessment of performance management documentation for TORS' employees revealed that generally performance goals aligned with TORS'

management, and those goals supported TORS' mission. In addition, TORS' mission, actions plans, and initiatives supported TPS' and TVA's missions.

Teamwork within TORS

The majority of employees interviewed provided positive comments related to teamwork within their departments. Some examples given were a willingness to help each other and good communication. The majority of individuals also indicated that they trusted their coworkers to do their job well. This strength is consistent with TVA's collaboration value, which includes, among other attributes, teamwork.

Leadership of First-Line Supervisors

Most employees indicated that their first-line supervisors (management level directly above nonmanagerial workers) displayed leadership qualities, which can support them in performing their work. These employees indicated that they trusted their supervisors and were comfortable raising a differing opinion. Most employees also indicated first-line supervisors communicated well.

RISKS

During the course of our evaluation, we identified risks that could impact TORS' effectiveness and its continued ability to meet its responsibilities in support of TPS' mission. These included (1) alignment risk due to organizational reporting issues with two functions in TORS, (2) engagement risks related to career development opportunities and a perceived lack of accountability, and (3) execution risks related to perceptions of inadequate staffing and outage scheduling challenges.

Alignment Risk Due to Organizational Reporting

Although TORS' management and employee performance goals aligned and supported TORS' mission, we noted that the Training and the EP&R functions currently fall under the GM, TORS, although both provide services to other TPS organizations.

- Training employees are tasked with supporting and making recommendations to TOPS management related to satisfying NERC training requirements. The majority of individuals in the Training department expressed concerns that the current reporting structure may present a conflict of interest. Currently, the Manager of the Training department reports to the GM, TORS, even though that department provides training to other individuals outside of TORS.
- The EP&R function for all of TPS resides in TORS, with one individual responsible for carrying out those responsibilities. According to the position's job description, this individual is responsible for establishing and maintaining all required emergency-related procedures, processes, equipment, and facilities to provide for the protection and reliable operations of TVA's transmission system and its critical assets during power system emergencies; for overseeing the preparation for (training and drills included) and recovery from emergency events ranging from natural disasters to acts of

terrorism/sabotage; and for ensuring full regulatory compliance is maintained for the avoidance of severe financial and/or operational consequences. We also noted that this individual's FY2018 performance goals, which centered primarily on EP&R goals within TPS and TOPS, did not align to that individual's manager's FY2018 performance goals, which were generally consistent with TORS' mission.

Reporting to an appropriate level of management could allow easier access to individuals to more effectively and efficiently address issues that come up. This could positively contribute to an organization's ability to achieve its mission.

Engagement Issues in Two Departments

Nearly half of the personnel we interviewed indicated concerns with issues affecting morale. Specific issues that could further erode morale included (1) career development opportunities in the Transmission Operations and Training departments and (2) lack of accountability in Transmission Operations.

Concerns Related to Career Development Opportunities

Many employees interviewed in the Transmission Operations and Training departments expressed concerns around career development opportunities. Specific concerns which were discussed related to the job selection process, career progression, and training opportunities.

- Several employees in the Transmission Operations and Training departments expressed their belief that there had been favoritism when individuals were selected to fill job rotations or permanent positions in Transmission Operations, which some attributed to prior TORS' management. Additionally, a couple of individuals from Transmission Operations indicated that rotations had not been communicated to the entire group.
- Several individuals from Transmission Operations expressed concerns related to career progression for System Operations Specialists. A few of these individuals elaborated that there is no defined path for transitioning to a level above a System Operations Specialist II.
- The majority of individuals in the Training department expressed their desire to obtain more courses to enhance their training skills. However, some of these individuals indicated a lack of staffing prevented them from doing so. According to the Society for Human Resource Management:

  > [E]mployees usually feel more engaged when they believe that their employer is concerned about their growth. . . A career development path provides employees with an ongoing mechanism to enhance their skills and knowledge that can lead to mastery of their current jobs, promotions and transfers to new or different positions. Implementing career paths may also have a direct impact on the entire organization by improving morale, career satisfaction, motivation, productivity, and responsiveness in meeting departmental and organizational objectives.

The GM, TORS, subsequently provided us documentation of recent actions to help address employees' expressed concerns related to communication of job opportunities and career progression. The documentation included:

- A March 2019 e-mail announcing two job opportunities in Transmission Operations. Information about the opportunities was included in this announcement, including desired skills and/or qualifications.
- A copy of a progression plan to transition from System Operations Specialist II to III, which was distributed to Transmission Operations' staff in April 2019. The progression plan included four phases, with each phase including requirements to advance to the succeeding phase. TORS' management acknowledged that because the progression plan is new, it will likely be modified as individuals go through the program and issues are identified and resolved.

Lack of Accountability

Several individuals in Transmission Operations and a couple of individuals in the Training department indicated their perception that management was not holding certain System Operations Specialists accountable to fulfill their job responsibilities. We also noted that a couple of managers in Transmission Operations indicated that it is difficult to hold employees accountable because of the large amount of effort that is involved in doing so.

We discussed these accountability concerns with the GM, TORS, who subsequently informed us, Transmission Operations' managers had been requested (in March 2019) to formally track the work of System Operations Specialists to help document employee gaps and help those employees improve, in an effort to keep TFO personnel safe and maintain system reliability. Different methods for tracking work were included in the communication.

Execution Risks

While most individuals indicated that they had the tools, training, and certifications (where applicable) necessary to do their job we identified risks related to execution of the mission in the Transmission Operations and Training departments. These included (1) perceptions of inadequate staffing in both departments and (2) outage scheduling challenges expressed by Transmission Operations' personnel with certain customers.

Perceptions of Inadequate Staffing – Transmission Operations

Several employees in Transmission Operations and the majority of individuals in the Training department indicated that staffing levels could be improved to more effectively carry out their workloads. For example, a few individuals in Transmission Operations indicated their belief that they have more work than other Operators who work at other utilities. According to these individuals, unlike Operators at other utilities, their workload includes clearance and switching work, which detracts from being focused on the transmission system. In addition, a couple of individuals in Transmission Operations indicated that certain tasks

assigned to them took away from their primary goal of monitoring the transmission system. As previously stated, TORS' mission is to ensure reliable transmission operations. Some examples that Transmission Operations' employees indicated could have a negative impact on staffing included:

- Many individuals expressed that their job responsibilities involve a high level of stress, which a few individuals indicated has or could be contributing to high turnover in their department. A few individuals in TFO (which is a customer group of Transmission Operations) also raised turnover of System Operations Specialists as a concern.
- Some individuals indicated that hiring new individuals does not immediately address staffing and workload concerns because of the training time that is required before an individual can work as a System Operations Specialists.[9]
- Some individuals indicated management's use of the term "job rotation," as previously described, was misleading because those selected for such opportunities did not always rotate back to their original position. A few of these individuals indicated that these rotations have exacerbated the lack of staffing concern because it could result in staffing losses.

To address the staffing concerns, the GM, TORS, provided us with a March 2019 e-mail to be sent to all System Operations Specialists informing them that they had hired five System Operator Initial Trainees with a planned start date of April 1, 2019. Management also stated that it planned to hire four additional individuals as System Operations Specialist IIs, with a planned start date on or around June 1, 2019.

Perceptions of Inadequate Staffing – Training Department

The majority of Training employees indicated that staffing levels should be increased to help them better administer the training program. Several individuals in the Training department stated that previous external reviews had recommended increased staffing, but that no action had been taken to address this recommendation. We obtained the briefing slides, dated 2018, for one of reviews, which was conducted by the North American Transmission Forum. Among other things, the slides included recommendations to allocate additional full time personnel for training, and to invest time and resources towards understanding and responding to the needs of operator training.

Outage Scheduling Challenges

As part of their responsibilities, Transmission Operations' personnel work with TFO to schedule outages and write switching orders in order to isolate possible sources of energy that could pose a danger to TFO personnel performing the work associated with the outage. Many individuals in Transmission Operations

[9] According to TRANS-TRA-SPP-30.043, *Transmission Operations & Power Supply (TOPS) System Operator Training Program*, the trainee is expected to complete all elements of the training program, including self study, computer based, simulator, instructor led, field visits, and on-the-job learning activities, in 6 to 12 months.

expressed concerns about their interactions with TFO personnel related to the outage process. Comments provided by individuals raised concerns about the timeliness and accuracy of outage requests submitted by TFO to Transmission Operations.

- Timeliness – TRANS-SPP-30.003, *Transmission Outage Scheduling and Coordination Process*, provides that short-term outage requests that require new detailed switching orders must be submitted to Transmission Operations a minimum of 7 days in advance of the scheduled start of the outage. Some Transmission Operations' employees indicated that TFO personnel may not submit their requests in accordance with the time lines established by this procedure. A few of these individuals indicated this could increase safety risks because it could shorten the time to prepare and review switching orders. In addition, a couple of Transmission Operations' employees indicated their managers do not appropriately push back when TFO requests are made outside of the prescribed time periods. In our opinion, this could set a precedent that requests do not need to be submitted in accordance with TPS procedures.

  In an e-mail to us dated April 11, 2019, the GM, TORS, informed us of a communication to TFO personnel regarding the time requirements for submitting new switching orders of 7 days and acknowledged that not following this requirement could pose human performance risks to TFO personnel. The e-mail proposed a hard enforcement date beginning June 1, 2019, with the goal of increasing the time requirement to 10 or 14 days, approximately 6 months later.
- Accuracy – Some Transmission Operations' employees indicated that outage requests from TFO personnel may contain missing, unclear, or erroneous information. A few of these individuals indicated that this issue can further strain Transmission Operations resources because of the extra time needed to address those inaccuracies with TFO personnel.

An additional concern provided was the perception that TFO personnel expressed frustration when certain requests could not be accommodated. A couple of individuals indicated that TFO personnel may not understand Transmission Operations' responsibilities in managing the TVA transmission system. These responsibilities include prioritizing requests across all of TVA.

We interviewed a judgmental sample of individuals in TFO to obtain feedback on their interactions with Transmission Operations' personnel. The majority of TFO personnel provided positive comments and/or ratings related to the quality of services provided and timeliness in responding to requests. However, some areas for improvement were offered including (1) changes to the outage scheduling process related to prioritization, scheduling, and cancellations and (2) more focus on staff retention within Transmission Operations.

CONCLUSION

Our evaluation identified strengths related to organizational alignment for the majority of TORS' personnel, teamwork within departments in TORS, and leadership of first-line supervisors (management level directly above nonmanagerial workers). However, we also identified risks that could impact TORS' effectiveness and its continued ability to meet its responsibilities in support of TPS' mission. These included (1) alignment risk due to organizational reporting issues with two functions in TORS, (2) engagement risks related to career development opportunities in the Transmission Operations and Training departments and lack of accountability in Transmission Operations, and (3) execution risks related to perceptions of inadequate staffing in the Transmission Operations and Training departments and outage scheduling challenges expressed by Transmission Operations' personnel.

Based on our findings and using TVA's Business Operating Model, we assessed TORS' level of risk in the areas of alignment, execution, and engagement. We determined:

- Alignment risk is rated low. We found employees' goals generally aligned to management goals, which supported TORS' mission. We also confirmed TORS' mission, actions plans, and initiatives aligned with both TPS' and TVA's mission. However, we identified two functions in TORS that could be better suited to report to a position above the GM, TORS, to more effectively support TPS and TOPS. This issue, in our opinion, did not significantly impact alignment risk within TORS.
- Engagement risk is rated medium based on concerns related to career development opportunities in the Transmission Operations and Training departments and perceptions of lack of accountability with certain System Operations Specialists.
- Execution risk is rated medium based on concerns of inadequate staffing in the Transmission Operations and Training departments and outage scheduling challenges expressed by personnel in Transmission Operations.

RECOMMENDATIONS

During our evaluation, management took action that addressed certain risks related to engagement and execution. Based on the remaining risks, we recommend the GM, TORS:

1. Assess the organizational alignment of the Training and EP&R functions reporting to the GM, TORS, and modify, as appropriate.

2. Address concerns related to career development opportunities by: (1) addressing favoritism concerns around job opportunities in Transmission

Operations and (2) considering the provision of supplemental training for individuals in the Training department to enhance their skills.

3. Evaluate staffing levels in the Training department and modify as appropriate.

TVA MANAGEMENT'S COMMENTS

In response to our draft report, TVA management provided informal comments that we incorporated, as appropriate. In addition, TVA management stated that they agreed with our findings and recommendations and will communicate planned actions. .

See Appendix B for TVA management's complete response.

TVA Values	
Safety	We share a professional and personal commitment to protect the safety of our employees, our contractors, our customers, and those in the communities that we serve.
Service	We are privileged to be able to make life better for the people of the Valley by creating value for our customers, employees, and other stakeholders. We do this by being a good steward of the resources that have been entrusted to us and a good neighbor in the communities in which we operate.
Integrity	We conduct our business according to the highest ethical standards and seek to earn the trust of others through words and actions that are open, honest, and respectful.
Accountability	We take personal responsibility for our actions, our decisions, and the effectiveness of our results, which must be achieved in alignment with our company values.
Collaboration	We are committed to fostering teamwork, developing effective partnerships, and valuing diversity as we work together to achieve results.

TVA Leadership Competencies

Accountability and Driving for Results

Continuous Improvement

Leveraging Diversity

Adaptability

Effective Communication

Leadership Courage

Vision, Innovation, and Strategic Execution

Business Acumen

Building Organizational Talent

Inspiring Trust and Engagement

From: Shultz, Joshua W
Sent: Tuesday, May 14, 2019 10:06 AM
To: Wheeler, David P.
Subject: RE: Request for Comments – Draft Evaluation 2018-15609 – Organizational Effectiveness – Transmission Operations, Reliability, and Supervisory Control and Data Acquisition

David,

We appreciate your team's focus on the organization effectiveness of TORS, and the partnership your team has with us to make our organization and ultimately TVA better! I confirm agreement with the findings and recommendations in the draft report. My management team and I have already addressed and implemented changes to meet several of the concerns, as noted in the draft report. TPS has a Sr. MRC scheduled on May 28 to discuss these and other actions in response to your recommendations. I plan tracking with the CR process, and will share this CR # and actions with your team after this MRC.

Thank you,

Josh

Josh Shultz, PE
GM, Transmission Ops, Reliability and SCADA
TVA Transmission Operations and Power Supply