



Memorandum from the Office of the Inspector General

March 14, 2019

Kris G. Edmondson, LP 2K-C
William T. Patterson, PAF 1A-DRK

**REQUEST FOR FINAL ACTION – EVALUATION 2018-15557 – ORGANIZATIONAL
EFFECTIVENESS – PARADISE 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 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
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Janet J. Brewer, WT 7C-K
Susan E. Collins, LP 6A-C
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OIG File No. 2018-15557



Office of the Inspector General

Evaluation Report

To the Vice President,
Power Operations, Coal,
and the Plant Manager,
Paradise Fossil Plant

ORGANIZATIONAL EFFECTIVENESS – PARADISE FOSSIL PLANT

Evaluation Team
Noel K. Kawado
Justin B. Franklin

Evaluation 2018-15557
March 14, 2019

ABBREVIATIONS

CR	Condition Report
EA	Environmental Assessment
FY	Fiscal Year
GE	General Electric
HR	Human Resources
LMS	Learning Management System
PAF	Paradise Fossil Plant
PO	Power Operations
TVA	Tennessee Valley Authority
TVA Board	TVA's Board of Directors
VP	Vice President
WO	Work Order

TABLE OF CONTENTS

EXECUTIVE SUMMARY i

BACKGROUND..... 1

OBJECTIVE, SCOPE, AND METHODOLOGY 3

OBSERVATIONS 4

 STRENGTHS 5

 RISKS 5

CONCLUSION..... 12

RECOMMENDATIONS 13

APPENDIX

- A. TVA VALUES AND LEADERSHIP COMPETENCIES
- B. MEMORANDUM RECEIVED MARCH 8, 2019, FROM WILLIAM T. PATTERSON TO DAVID P. WHEELER



Evaluation 2018-15557 – Organizational Effectiveness – Paradise 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, 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) 2017 3-year Enterprise Risk Profile recognized that ongoing workforce refinementⁱ 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 TVA. This evaluation focuses on Paradise Fossil Plant (PAF), which is a coal plant under TVA's Power Operations' (PO), Coal, business unit. TVA's PO's 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 a current Vice President (VP) in PO, PAF is classified as base dispatchable/intermediate,ⁱⁱ with the intent of evolving to an intermediate status over time. The objective of this evaluation was to identify strengths and risks that could impact PAF'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 PAF's personnel and performance. These strengths related to (1) organizational alignment, (2) teamwork within and between PAF departments, and (3) leadership of first-line supervisors (management level directly above nonmanagerial workers). However, we also identified risks that could impact the effectiveness of PAF to achieve its responsibilities in support of PO's mission. These risks related to (1) diminished trust in leadership at PAF and TVA senior management levels due to perceptions that certain actions and behaviors have been inconsistent with TVA's leadership competencies, including a

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

ⁱⁱ Base dispatchable refers to high-energy units that produce at full output unless needed to respond to decreased demand. An intermediate plant supplements the power produced by base load plants during high demand times.



Evaluation 2018-15557 – Organizational Effectiveness – Paradise Fossil Plant

EXECUTIVE SUMMARY

perceived lack of support associated with inadequate staffing; (2) a weak safety climate; and (3) lack of adequate training.

Based on our findings and using TVA’s Business Operating Model, we assessed PAF’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 PO’s mission and initiatives as well as TVA’s mission.
- Engagement risk is high. While employees cited teamwork and support from first-line management as a strength, the majority of employees expressed concerns related to trust in certain plant management. In addition, the majority of employees conveyed their belief that employee morale was low based primarily on the uncertainty of PAF’s future, which several employees indicated has been exacerbated by distrust of TVA’s senior management and the way PAF Units 1 and 2 were retired.
- Execution risk is rated high because of concerns related to inadequate staffing and training and a weak safety climate.

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

What the OIG Recommends

We recommend the VP, PO, Coal, working in conjunction with the Plant Manager, PAF:

1. Focus on building relationships with PAF personnel to help promote trust and reduce angst around PAF’s long-term status.
2. Evaluate PAF’s staffing levels giving reasonable consideration to work needing to be performed at PAF and modify as appropriate.
3. Reinforce the importance of safety among PAF personnel so that reporting of safety incidents are encouraged and prompt actions are taken to address employee safety concerns identified on the job and through safety work orders.
4. Identify training deficiencies with PAF personnel and take immediate actions to rectify those training needs.



Evaluation 2018-15557 – Organizational Effectiveness – Paradise Fossil Plant

EXECUTIVE SUMMARY

TVA Management's Comments

TVA management described actions planned and completed to address our recommendations. 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 refinement¹ 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 TVA. This evaluation focuses on TVA's Paradise Fossil Plant (PAF), which is a coal plant under TVA's Power Operations' (PO), Coal, business unit. According to TVA's fiscal year (FY) 2018 through FY2020 Business Plan Summary, PO's 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 a current Vice President (VP) in PO, PAF is classified as base dispatchable/intermediate,² with the intent of evolving to an intermediate status over time.

PAF became operational in 1963 with two generating units (Units 1 and 2). A third unit (Unit 3) was added in 1970, which more than doubled its generating capacity. In April 2011, TVA entered into an agreement with the Environmental Protection Agency and an agreement with the states of Alabama, Kentucky, North Carolina, and Tennessee as well as other environmental groups to address a dispute under the Clean Air Act. Under these agreements, TVA was required, in addition to other obligations affecting its coal fleet, to upgrade the scrubbers on PAF Units 1 and 2 and to continuously operate emission control equipment on all three PAF units. In April 2013, *POWER* Magazine reported that PAF Unit 2 had achieved a new long-run record for cyclone-fired boilers – 259 days, 16 hours and 40 minutes and attributed this milestone to "excellence in plant operations and maintenance processes, a diligent and well-trained staff, and leadership that

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

² Base dispatchable refers to high-energy units that produce at full output unless needed to respond to decreased demand. An intermediate plant supplements the power produced by base load plants during high demand times.

places high value on both.”³ However, in November 2013 TVA’s Board of Directors (TVA Board) cancelled the project to install emission controls on Units 1 and 2 and approved the construction of a gas-fired facility on the Paradise reservation. During April 2017, this new gas facility, Paradise Combined Cycle Plant, became operational, and TVA retired Units 1 and 2. PAF currently operates Unit 3, which is outfitted with a General Electric (GE) cross-compound turbine and has a net summer generating capacity of 971 megawatts. According to TVA, in May 2017 work was completed by GE Energy Control Solutions, Inc., to upgrade Unit 3’s turbine’s mechanical control system to a Mark VIe™ automated turbine control system.

At the August 22, 2018, meeting of the TVA Board, TVA’s President and Chief Executive Officer announced the initiation of a study to analyze TVA’s entire fleet, which would first focus on those plants that were the least efficient, least cost effective, and highest future cost assets (which included PAF Unit 3). According to the Chief Executive Officer, the study would consider the environment, effects to the resiliency and reliability to the system, and employee and community impacts. At the time of the August TVA Board meeting, the estimated time for completion was approximately three to six months.⁴

As of April 2018, PAF was comprised of three departments—Operations, Maintenance, and Engineering:

- Operations 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. PAF Operations personnel consist of shift operations supervisors, unit operators, assistant unit operators, and coal yard personnel.
- Maintenance is responsible for safely, effectively, and efficiently maintaining assets. Maintenance ensures standards for material condition are met by the effective planning, scheduling, and execution of maintenance.
- Engineering is tasked with providing technical input to personnel on complex work packages and configuration control and is responsible for system performance monitoring to allow for proactive detection of system or component performance problems.

³ <http://www.powermag.com/tvas-paradise-unit-2-sets-new-continuous-operations-record/>. *POWER Magazine* reports on business operations and legal and regulatory news as well as operations and maintenance information affecting the power generation industry.

⁴ In November 2018, TVA issued a draft Environmental Assessment (EA) that was prepared “to evaluate the potential retirement of PAF in 2020 considering load outlook, economic benefits and costs, performance, and environmental and social impacts, with no immediate need to replace the generating capacity currently provided by PAF Unit 3.” At the time of the EA’s release, TVA stated that the EA was one of four studies that will eventually be presented to the TVA Board for their consideration. The other assessments will cover transmission resiliency, fuel security and financial analysis. TVA stated the studies will use a “variety of analyses from multiple perspectives to look at the ramifications of all possible decisions.”

PO's FY2018 through FY2020 Business Plan sets forth goals that include PAF. Key metrics identified from PO's FY2018 scorecard are coal annual Equivalent Forced Outage Rate,⁵ coal Seasonal Equivalent Forced Outage Rate,⁶ recordable injuries,⁷ coal commercial availability factor,⁸ significant human performance events,⁹ reportable environmental events,¹⁰ and total spend.¹¹

As of April 19, 2018, PAF had 136 employees, including the plant manager, an assistant plant manager, maintenance manager, interim operations manager, and interim engineering manager.¹²

OBJECTIVE, SCOPE, AND METHODOLOGY

The objective of this evaluation was to identify strengths and risks that could impact PAF's organizational effectiveness. We assessed operations from October 1, 2014, through October 24, 2018, and culture at the time of our interviews and fieldwork, which occurred during April through July 2018. To complete the evaluation, we:

- Reviewed TVA's and PAF's FY2018 through FY2020 Business Plans to determine whether PAF's mission and initiatives aligned with PO's mission.
- Reviewed TVA values and competencies (see the Appendix) for an understanding of cultural factors deemed important to TVA.
- Conducted individual interviews with 130 employees,¹³ including management, and analyzed the results to identify themes related to strengths and risks that could affect organizational effectiveness.
- 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 certain fossil plant employee classifications.

⁵ The Equivalent Forced Outage Rate reflects the percentage of hours within a defined period that the asset was not available to operate due to an unplanned (forced outage or derating) event.

⁶ The Seasonal Equivalent Forced Outage Rate measures performance for 8 months: January, February, March, June, July, August, September, and December.

⁷ Measures the number of recordable injuries, as defined by TVA.

⁸ The commercial availability factor reflects the availability of a unit when the system needs it the most.

⁹ 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.

¹⁰ 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.

¹¹ Total Spend includes nonfuel operations and maintenance costs, base and strategic capital, regulatory asset spend, Asset Retirement Obligation spend, and change in nonfuel inventory.

¹² The Plant Manager, PAF, was included in the total headcount, but was not interviewed because he was on rotational assignment at another TVA fossil plant.

¹³ Six individuals (including the Plant Manager) were not interviewed for various reasons, including retirement, leave of absence, and scheduling conflicts.

- Reviewed and analyzed the FY2017 performance documentation for all of PAF's unionized employees and FY2018 performance documentation for the remaining management and employees of record as of April 19, 2018 (except for one employee who had been on extended leave), for alignment within each department and to PAF's mission and initiatives.
- Obtained PAF training records contained in the Learning Management System (LMS) as of October 2018 to determine whether certain training had been completed by employees.
- Accessed Maximo¹⁴ to obtain PAF condition reports (CR) with initiation dates from October 1, 2015, through October 10, 2018, related to coal dust and combustible dust and associated suppression equipment.
- Accessed PAF safety work order (WO) data from January through September 2018 on TVA's intranet.
- Assessed the overall effectiveness of PAF 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 PAF's personnel and performance. These strengths included (1) organizational alignment, (2) teamwork within and between other PAF departments, and (3) leadership of first-line supervisors (management level directly above nonmanagerial workers). However, we also identified risks that could impact PAF's effectiveness and its continued ability to meet its responsibilities in support of PO's mission. These risks related to (1) diminished trust in leadership at PAF and TVA senior management levels due to perceptions that certain actions and behaviors have been inconsistent with TVA's leadership competencies, including a perceived lack of support associated with inadequate staffing; (2) a weak safety climate; and (3) lack of adequate training.

¹⁴ Maximo is TVA's Enterprise Asset Management system.

STRENGTHS

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

Organizational Alignment

In general, our assessment of performance management documentation for all PAF employees revealed that performance goals for plant management and employees were in alignment.¹⁵ We reviewed goals for management and employees and generally found those goals supported PAF's goals and initiatives. In addition, PAF's mission and initiatives supported PO's and TVA's missions.

Teamwork Within and Between PAF Departments

The majority of employees interviewed provided positive comments related to teamwork within their departments or crews as well as teamwork with other PAF departments. A couple of examples given were a willingness to help each other and good communication with other crafts. 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 displayed leadership qualities, which can support them in performing their work. These employees indicated that they trusted their supervisors support them and were comfortable raising a differing opinion. Most employees also indicated first-line supervisors are knowledgeable about their jobs and communicate well.

RISKS

During the course of our evaluation, we identified risks that could impact PAF's effectiveness and its continued ability to meet its responsibilities in support of PO's mission. These risks related to (1) diminished trust in leadership at the PAF and TVA senior management levels due to perceptions that certain actions and behaviors have been inconsistent with TVA's leadership competencies, including a perceived lack of support associated with inadequate staffing; (2) a weak safety climate; and (3) lack of adequate training.

Diminished Trust in Leadership

Effectively executing TVA's mission not only requires organizational alignment and employee engagement but also management that exhibits actions and behaviors consistent with TVA policies, procedures, and expectations. TVA's Leadership Competencies (included in Appendix A) include effective communication, accountability and driving for results, business acumen, and

¹⁵ However, we were unable to verify alignment related to performance or competency goals for five individuals due to missing or inaccurate information.

inspiring trust and engagement. Example behaviors associated with these competencies include active listening and being open to feedback, exhibiting ownership of personal and team performance, demonstrating functional and subject matter expertise conducive to achievement of goals and ensuring teams and individuals have the resources they need to be successful, respectively. Based on our interviews, we identified leadership risks at PAF and TVA senior management levels.

PAF Leadership

While most employees indicated they receive support from first-line supervisors, many employees indicated that certain PAF management above first-line leadership do not display some of the behaviors consistent with TVA's Leadership Competencies. Specifically, many employees expressed a lack of trust in the abilities of one PAF manager, which some indicated stemmed from the way certain issues were addressed in the past. Several individuals also indicated that this manager did not appear to have operational and business skills commensurate with that position putting PAF at risk of not meeting its mission. We discussed the specifics of these concerns with the appropriate TVA PO Management.

TVA Senior Management Leadership

Trust in leaders can be diminished when employees perceive that leaders do not provide adequate support or that they have been deceived. During our interviews, employees expressed (1) perceptions related to inadequate staffing and (2) their belief that morale has been negatively influenced by the uncertainty around PAF's future. This uncertainty is fueled, in part, by negative perceptions associated with TVA senior management's handling of the closure of PAF Units 1 and 2. Low morale can impede an organization's ability to be effective because it can lessen employees' focus, motivation, and productivity.

Perceptions of Inadequate Staffing – Most PAF personnel expressed their belief that there was inadequate staffing to accomplish the plant's responsibilities. Specifically, some individuals indicated the staff reductions associated with the retirements of Units 1 and 2 were too significant and left Unit 3 inadequately staffed. A few individuals expressed their perception that there is pressure from Corporate to keep staffing numbers low, while some other employees indicated that PAF's staffing strategy is largely driven by TVA's desire to be in the top quartile for number of employees among its peers. A couple of individuals indicated that the top quartile staffing figures may not be sufficient for PAF because it does not give adequate consideration to the specific circumstances at PAF.

Distrust Stemming from Past Corporate Actions – During our interviews, an overwhelming majority of employees expressed that employee morale was low primarily due to angst associated with the uncertainty around PAF's future. Several employees indicated this uneasiness was reinforced by employees' perception of the events surrounding the closure of PAF Units 1 and 2.

Specifically, these employees indicated that TVA senior management had promised to keep Units 1 and 2 running if PAF employees could demonstrate that they could efficiently and effectively run those units. Some PAF employees expressed that, based on management's assertion, they worked diligently to ensure the plant would remain open. As previously stated, PAF was recognized as having achieved a record run on Unit 2 in 2013. Approximately 7 months later, the TVA Board approved the retirement of Units 1 and 2. While no decision on PAF Unit 3 has been officially communicated, a few employees expressed their belief that TVA Corporate has already decided that PAF Unit 3 will be shut down in the near future.

In addition, according to the PAF Interim Engineering Manager, cracking has been identified on Unit 3's rotors and repair work was conducted on the rotors during the winter of 2017. While the Interim Engineering Manager stated that there is a potential to replace the rotor in 2020, no decision has yet been made, and TVA, in the interim, has a 2-year safe-to-operate letter from GE. Several employees we interviewed indicated that the decision whether to replace the rotor will depend on whether TVA decides to keep PAF Unit 3 running and believe that TVA's failure to order the rotor, due to the time it takes to build it, meant TVA has already made the decision to close the plant.

Safety Climate

TVA defines safety as the shared professional and personal commitment to protect the safety of our employees and stakeholders. As a TVA value, safety should be modeled and practiced by all TVA employees in our day-to-day activities and behaviors. Many employees we interviewed expressed concerns with safety at PAF, which indicates a negative safety climate.¹⁶ These employees cited specific examples that could be perceived as a lack of focus on safety. These examples related to safety incident reporting and perceptions of actions indicating safety is not a top priority.

Safety Incident Reporting

Several individuals we interviewed shared their perception that not all safety incidents, which includes injuries, are reported. Currently, under TVA's Winning Performance incentive program, the recordable incident rate¹⁷ is one of six metrics that the TVA Board considers when determining the final payout. Some employees cited pressure, intimidation, or retaliation by management as reasons why employees may not report safety incidents. Other reasons that were shared included the possibility of management initiating an investigation into the incident and/or blaming the employee in certain circumstances.

¹⁶ Safety climate is the shared beliefs and perceptions of employees related to the organization's emphasis on safety often significantly influenced by recent events.

¹⁷ Defined as the number of recordable injuries (as defined by TVA's safety program) per 200,000 employee-hours worked by TVA employees and staff augmentation contractors (excluding hearing events). At time we conducted our interviews, PAF's recordable incident rate had been zero for nearly 3 years.

Encouraging employees to report safety incidents not only can help that employee obtain the appropriate medical care, in the case of illness or injury, but can also bring to light safety risks at the plant. In addition, sharing this information outside the plant could prevent future injuries at other TVA plants.

Management Actions do not Demonstrate Safety is a Top Priority

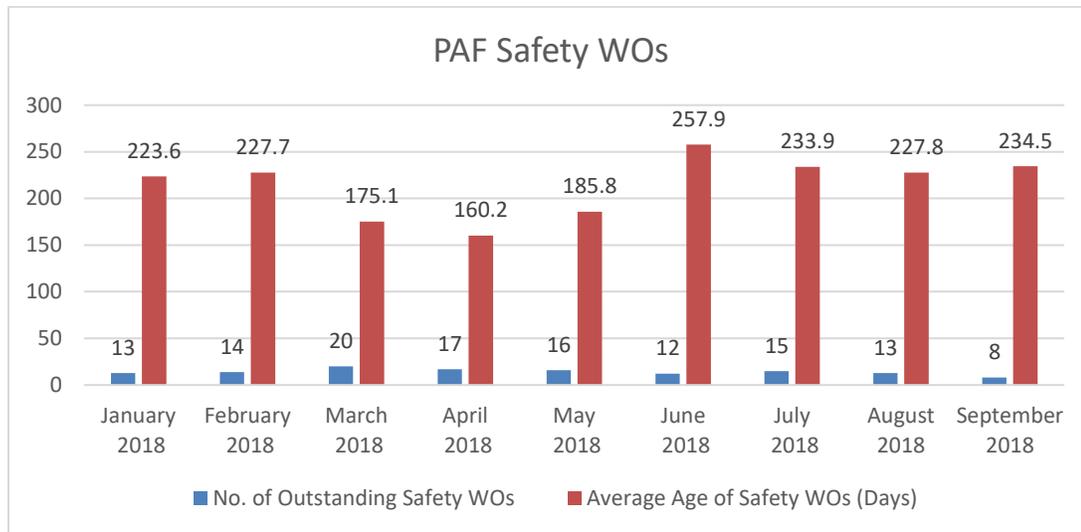
As previously mentioned, safety is promoted by TVA as the shared professional and personal commitment to protect the safety of our employees and stakeholders, and should be modeled and practiced by all TVA employees, including management. However, some employees expressed their perception that management will sometimes place a higher priority on producing electricity than being safe. Specifically, some employees indicated that when an unsafe working condition is identified, management would either require the employee to continue working, discipline the employee if the employee refused to do the work, or assign the work to another person without addressing the original safety concern. For example, a few employees discussed being assigned to work in extremely hot conditions at the plant. Because of the heat, employees requested the performance of a wet bulb test,¹⁸ which is used to determine the maximum time most workers can be expected to work in a heat stress area without developing heat-related disorders. These employees indicated that the test was not conducted in the immediate work area, but rather in a location where temperatures were cooler than the area where the work was actually being performed. This could have resulted in employees being exposed to unsafe work conditions without proper mitigating actions.

In addition, several employees mentioned that while safety concerns are brought to management's attention, those issues are either not addressed timely or continue to go unresolved. As a result, a few of these employees indicated that safety incidents may not be reported. A few other individuals also speculated that safety issues may not get addressed because of budgetary constraints.

Based on these concerns, we reviewed performance data and noted that as of September 30, 2018, PAF had 8 outstanding safety WOs with an average age of 234.5 days. Since January 2018, the number of outstanding safety WOs at PAF has ranged from 8 to 20 and the average age of those WOs have ranged from 160.2 days to 257.9 days as shown in Figure 1 on the following page.¹⁹

¹⁸ According to TVA-TSP-18.906, *Heat Stress*, the wet bulb global temperature is an index that provides a method of measuring the environmental conditions that combines the effects of humidity, air movement, air temperature and radiant heat. This test is used to identify a heat stress environment, which can increase the risk of heat-related disorders.

¹⁹ This information was obtained from TVA's intranet.

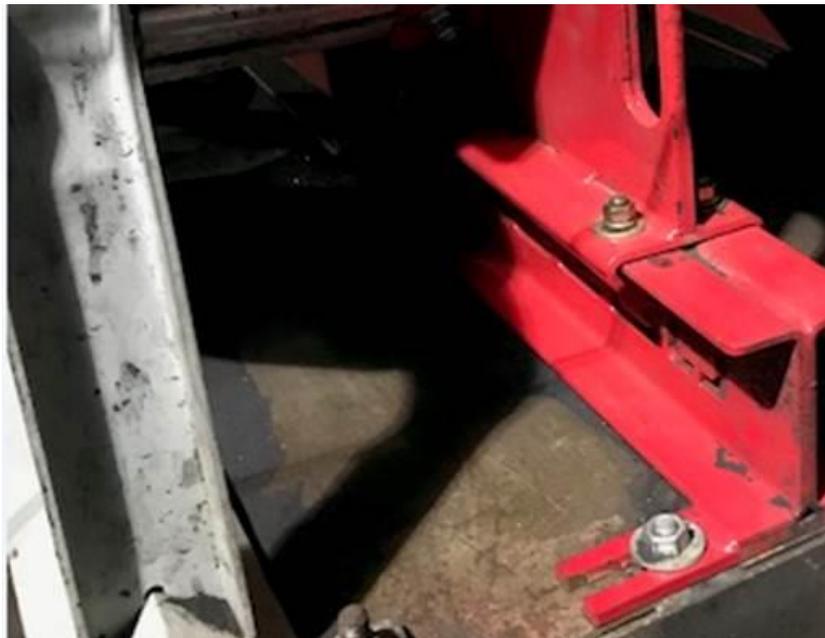
**Figure 1**

Finally, many individuals described assets/equipment at PAF as poor, which a few individuals suggested could present safety concerns. In addition, some other individuals, also alluding to safety concerns, expressed their perception that the general condition of the plant needed attention. Based on these concerns, in May 2018, we toured portions of PAF's powerhouse and yard and confirmed the existence of safety concerns. We noted coal dust accumulations, at least an inch in height, in several areas. We also observed equipment/assets in disrepair, areas showing evidence of prior water leakage, and general housekeeping issues related to clutter and tripping hazards. We reported these issues to the Plant Manager, PAF and VP, PO, Coal, and obtained evidence that the coal dust and some of the equipment/asset issues had been addressed or were in the process of being addressed.²⁰ On the following page, see Picture 1 for an example of coal dust accumulation observed during our tour and Picture 2 for a photo provided by PAF management of the same location after cleanup efforts were conducted.

²⁰ A WO that was initiated for one of the issues remained open as of February 1, 2019.



Picture 1



Picture 2

We also reviewed CRs related to coal dust and combustible dust and noted a history of incidences related to coal dust and combustible dust accumulations and suppression equipment, as follows:

- Fourteen CRs initiated between FY2015 and FY2018 reported issues with PAF's coal dust collection/suppression equipment.²¹

²¹ All of these showed as being closed in Maximo as of October 2018.

- Thirteen CRs were initiated between FY2015 and FY2018 related to coal and/or combustible dust accumulations at PAF.²² Some of these CRs indicated these accumulations presented a risk of fire or explosion.
- One CR that was initiated because of a fire at one of PAF's coal belts in January 2017, which caused a loss of redundancy for coal delivery to the powerhouse and property damage. According to the Root Cause Analysis, the cause of the fire was due to the coal belt area not being washed down, which allowed coal buildup to ignite and burn. According to information in Maximo, the total cost of the damage was approximately \$321,000.

Research has clearly shown that an organization's safety climate is related to employee attitudes towards safety, as well as injuries and accidents. The issues described above could foster a weak safety climate and negatively impact PAF's safety and operational performance, which could prevent it from meeting its mission.

Lack of Training

As previously mentioned, in May 2017 work was completed to upgrade Unit 3's mechanical turbine control system with a GE Mark VIe™ automated control system. Almost a year later, during the time of our interviews, several employees in Operations stated that they have had no training or minimal training on the new control system. Based on these concerns, we reviewed the training records in TVA's LMS for all PAF Operations employees.²³ According to information in LMS, as of October 24, 2018, there was no record of completed training on the new controls for any PAF Operations employees. We subsequently followed up with TVA training personnel, who stated that training on the new controls had been conducted for Operations personnel, but had not been documented in LMS because of the perceived administrative burden involved in using LMS for that purpose. TVA provided a copy of the training materials and the only available training roster showing that ten individuals had completed the course on January 24, 2018. TVA indicated other individuals had taken the course, but was unable to locate rosters documenting the course attendance of those other individuals.

Several employees also mentioned they have been assigned to work on other PAF equipment/systems that they either have had no training, minimal training, or not worked on for several years. A few of these employees stated that the lack of training could present safety concerns. During our interviews, a couple of individuals indicated that management did not consider training a priority. A couple of other individuals speculated that the lack of adequate staffing, as described above, could be a factor that prevents employees from obtaining the training they need.

²² All of these showed as being closed in Maximo as of October 2018, except one that remained open as of February 6, 2019.

²³ Except for three individuals that we could not locate any training records in LMS.

Finally, based on information obtained during our evaluation and review of LMS, we identified two high-level individuals in one PAF department that potentially lacked core technical training required for their current positions. These individuals have been in their current position for several years. Based on their job descriptions, these two individuals are tasked with providing expertise in emergency situations and serve in a significant role to help the plant meet its production goals through oversight of critical plant equipment and systems. Some of the assets these individuals are charged with overseeing could pose significant hazards to PAF and its personnel, if not managed appropriately. In addition, these two individuals are responsible for providing leadership support to the employees they supervise and are tasked with ensuring that those employees are technically qualified to perform their responsibilities in accordance with TVA standard programs and processes.

We discussed this issue with the VP, PO, Coal, on August 6, 2018. A CR was created to assess the technical training/qualifications of these two individuals. According to the CR, a review of the individuals' work history prior to TVA determined that the minimum technical requirements for the position had been met and that all post-hire training requirements were satisfied. We received letters prepared by Human Resources (HR) stating that, at the time of hire, each individual entered into a training agreement, which was designed to assure that they would be fully qualified and competent for their position at the time training was completed and required its completion in order to retain their position. A copy of the respective training agreement was included with each letter,²⁴ which spelled out the specific training requirements and stated that such training "must be completed within six months of hire-in date." The letters from HR stated that both individuals had completed the required training; however, based on each individual's hire dates and the training completion dates provided by HR on the respective letters, one individual did not complete the specified training until approximately 2.5 years after their hire date and the other individual until shortly after 6 months of their hire date. We were unable to verify completion of the training plans because TVA could not provide adequate documentation that the courses included in those plans had been completed.

CONCLUSION

Our evaluation identified strengths related to organizational alignment, teamwork within and between departments, and first-line supervisor leadership. However, we also identified risks that could impact the effectiveness of PAF to achieve its responsibilities in support of PO's mission. These risks related to (1) diminished trust in leadership at PAF and TVA senior management levels, including perceived lack of support associated with inadequate staffing; (2) a weak safety climate; and (3) lack of adequate training. These risks, coupled with overwhelming employee perceptions of low morale, can have significant negative

²⁴ One of the agreements was not signed and dated by one of the individuals. HR stated that they were unable to locate the signed and dated agreement for this person.

impacts to PAF's effectiveness. Further, given the nature and historical context of the concerns expressed by PAF employees, regaining trust with PAF employees may prove to be challenging.

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

- Alignment risk is rated low based on alignment of management and employee goals, which supported PAF's mission and initiatives as well as PO's and TVA's missions.
- Engagement risk is high. While employees cited teamwork and support from first-line management as a strength, the majority of employees expressed concerns related to trust in certain plant management. In addition, the majority of employee expressed their perception that employee morale was low based primarily on the uncertainty of PAF's future, which several employees indicated has been exacerbated by distrust of TVA's senior management stemming from how the retirements of PAF Units 1 and 2 were handled.
- Execution risk is rated high because of concerns related to inadequate staffing and training and a weak safety climate.

RECOMMENDATIONS

We recommend the VP, PO, Coal, working in conjunction with the Plant Manager, PAF:

1. Focus on building relationships with PAF personnel to help promote trust and reduce angst around PAF's long-term status.

TVA Management's Comments – TVA management stated it understood the importance of developing relationships and establishing trust with employees. They provided information on ongoing and completed actions, including (1) efforts to improve and maintain open and honest communications by disseminating information when available via monthly all-hands meetings, plant communication screens, and e-mail; (2) establishing an environment where employees were comfortable presenting comments and/or concerns openly; (3) filling leadership positions through the Vacancy Position Announcements process to support accountability and stability; and (4) increased site visits from senior leadership to enhance communications from a corporate level.

2. Evaluate staffing levels giving reasonable consideration to work needing to be performed at PAF, and modify, as appropriate.

TVA Management's Comments – TVA management stated several actions were taken to reduce shift demands, create additional leave opportunities,

and decrease the need for scheduled overtime, including (1) filling of three maintenance coordinator and unit operator vacancies; (2) changing the Operations work schedule to improve work life balance and overall morale; (3) implementing a two week schedule to volunteer for overtime call out; (4) eliminating one trades & labor project integration position to fill an additional vacancy; and (5) filling of one staff augmented assistant unit operator for ammonia farm operations.

In addition, TVA management stated that following the TVA Board decision to close PAF, Operations will migrate to a schedule to support overtime reduction efforts.

3. Reinforce the importance of safety among PAF personnel so that reporting of safety incidents are encouraged and prompt actions are taken to address employee safety concerns identified on the job and through safety WOs.

TVA Management's Comments – TVA management stated employee safety is and will continue to be their highest priority. Planned and/or completed actions related to this recommendation included (1) changes to the Health and Safety committee to improve engagement; (2) revisions to the safety WO prioritization process to include ownership, expectations and goals; (3) site-wide promotion of the Four Vital Behaviors²⁵ during safety meetings and pre-job briefs; (4) improvements to the safety culture where employees feel empowered to report safety incidents and concerns; (5) management support of monthly safety initiatives to supplement the Four Vital Behaviors; (6) use of the Slip Trip Fall Simulator; and (7) completion of 107 of 112 outstanding safety WOs.

4. Identify training deficiencies with PAF personnel and take immediate actions to rectify those training needs.

TVA Management's Comments – TVA management provided planned and/or completed actions related to this recommendation which included (1) provision of individual on-the-job training by a subject matter expert with Operations; (2) review of existing operating procedures for accuracy; (3) development, approval, and implementation of additional procedures; (4) completion of training in multiple areas; (5) completion of Dry Fly Ash De-water training plan; and (6) closure of gaps related to documentation of SOS qualification records.

See Appendix B for TVA management's complete response.

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

²⁵ According to TVA documentation, this includes identifying hazards before every task; taking actions to remove hazards and reduce risks; protecting yourself and others and intervening when necessary; and taking pride in safety and being involved.

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



2018 PAF OIG - OE Draft / Management Response

February 22nd 2019

On behalf of the Employees at Paradise I would like to extend appreciation to the assessment team for their professionalism and respectful demeanor the duration of the Audit. Our management team values the information and recommendations presented in this draft report and have duly took action to close any organizational weaknesses that were identified. In complying with the 30 Day response requirement I have included Management's response to the recommendations and associated actions that are complete and / or are in progress. The management team will continue to grow and look for improvement opportunities in all areas of competency.

Recommendations:

1.) Focus on building relationships with PAF personnel to promote trust and reduce angst around PAF's long term status.

At the time of the assessment, there were concerns around the long term future of PAF 3. Employees expressed concerns with the outcome and communication of previous decisions on PAF 1-2. The Management team fully understood the need to establish trust and develop relationships by making sure communication was comprehensive and transparent going forward. Action items to help build relationships and promote trust include:

- Improving on and maintaining open and honest communications as information became available. This was accomplished through monthly all hands Communication meetings. This information was also presented through Email and Plant communication screens.
- Establishing an environment where employees were comfortable presenting comments and or concerns openly.
- Leadership positions were posted and filled through the VPA process to support accountability and stability.
- Senior Leadership site visits increased to enhance communications from a Corporate level.

2.) Evaluate Staffing levels giving reasonable consideration to work needing to be performed at PAF, and modify, as appropriate.

PAF management understood the need and was in the process of filling Unit Operator vacancies at the onset of the assessment and was evaluating the benefits of changing from a 9 group to a 5 group rotation. The primary goals of those initiatives were to reduce shift demands, improve employee morale by allowing additional leave opportunities throughout the year, and reduce the need for scheduled overtime. These goals were achieved with the following actions:

- Three of the five Unit Operator vacancies were filled. The remaining two vacancies were offered with no success filling the positions.
- Operations work schedule was changed from a nine group to a five group. This allowed for additional leave opportunities to improve work – life balance and overall morale.
- A two week schedule was implemented with a voluntary OT call out to fill vacant positions versus the previous method of filling open slots through a scheduled OT process.
- To reduce overtime demands, the site also discontinued one T&L project integration position to fill an additional vacancy and reduce overtime required to cover the position.
- Hired one staff augmented AUO for ammonia farm operation which further reduced AUO overtime potential.
- Filled three maintenance coordinator positions to support Work Week Scheduling and Planning activities and reduce workload on current staff.

Following the TVA Board decision to close PAF, Operations will migrate to a four group rotation on or near March 18th 2019. This will proactively support OT reduction due to vacancies as annual employees find other opportunities in the fleet.

3.) Reinforce the importance of safety among PAF personnel so that reporting of safety incidents are encouraged and prompt actions are taken to address employee safety concerns identified on the job and through safety wo's.

Paradise Management at no time would knowingly or intentionally place employees in an unsafe condition or environment. Employee safety is and will continue to be our highest priority. Management did however acknowledge the safety WO back log, understood the need to improve, and developed and executed a recovery plan to significantly reduce the number of safety WO's. This backlog included those associated with Fire Protection impairments. The actions in response to this recommendation are as follows:

- Improved Health & Safety committee engagement by delegating a new Management Co-Chair, gaining equal representation for all crafts and re-assigned the H&S sub-committees for problem resolution.
- Revised the safety work order prioritization process to include ownership, expectations and goals by the PAF leadership team.
- PAF leadership team has improved the culture where employees feel empowered to report safety incidents and concerns.
- Genuinely promoted the 4 Vital Behaviors site wide during safety meetings and pre-job briefs. 4 vital behavior banners and posters were installed in high traffic areas for visibility.
- Supported Monthly safety initiatives to include Slips, Trips & falls and Hazard Identification & Mitigation to supplement the 4 vital behaviors and promote an active interdependent safety culture.
- Employed the Slip Trip Fall Simulator for employees to experience during an Employee Performance appreciation event.
- 107 of 112 safety WO's have been completed with a total spend of 600K routine O/M that was funded through Continuous Improvement savings. 11 of 15 Fire Impairments have been completed and returned to normal operation.

4.) Identify training deficiencies with PAF personnel and take immediate actions to rectify those training needs.

PAF Management identified training gaps associated with the new Turbine Control System (Mark6E) that was installed during the FY18 fall outage and acknowledged the need to ensure completion of procedure development, employee training and DCN closure prior to placing the unit on line in May of 2018. Understanding employee concerns and taking responsibility in owning the process strengthened employees' perception of Managements' commitment in providing the necessary tools to ensure employee success. The actions included:

- Sr. Instrument Mechanic / Mark6E SME worked individually with operations in an OJT (on the job training) environment for knowledge development
- Existing operating procedures were reviewed for accuracy and uploaded into the procedure center and document control database. This included Alarm Response Information (ARI) as well as guidance for the Mark6E control system.
- Additional Mark6E procedures were developed, approved and uploaded into the procedure center.
- Scrubber operations training has been completed on 9 of 13 unit operators per the gap closure plan.
- Ball mill operation training has been completed to support Ball Mill AUO / De-water training activities.
- Gypsum de-water training completed in advance of system commissioning, along with procedure development of 100% complete.
- Dry Fly Ash De-water training plan developed and to be implemented during the SP 19 outage as construction is completed.
- Gaps have been closed regarding SOS documented qualification records.

Summary:

Employees have been receptive of managements' diligent efforts to improve employee relationships and strengthen trust and engagement. Management understands these are key elements in building a winning team. Paradise employees performed exceptionally well in all categories this fiscal year and have been recognized at the fleet level. These accomplishments transpired during times of uncertainty with respect to PAF's future.

Sincerely,

W.T. Patterson
Plant Manager
Paradise Fossil Plant