



Memorandum from the Office of the Inspector General

December 16, 2021

Thomas P. Veitch

REQUEST FOR MANAGEMENT DECISION – EVALUATION 2021-17254 –  
ORGANIZATIONAL EFFECTIVENESS – BROWNS FERRY NUCLEAR PLANT  
CHEMISTRY

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 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)

JLM:KDS  
Attachment  
cc (Attachment):

TVA Board of Directors  
Susan E. Collins  
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OIG File No. 2021-17254



Office of the Inspector General

# *Evaluation Report*

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To the Senior Manager,  
Browns Ferry Nuclear  
Plant Chemistry

# **ORGANIZATIONAL EFFECTIVENESS – BROWNS FERRY NUCLEAR PLANT CHEMISTRY**

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Evaluation Team  
Noel K. Kawado

Evaluation 2021-17254  
December 16, 2021

## **ABBREVIATIONS**

BFN	Browns Ferry Nuclear Plant
CAM	Continuous Air Monitors
FY	Fiscal Year
SHRM	Society for Human Resource Management
TS&P	Technical Support and Programs
TVA	Tennessee Valley Authority

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TVA VALUES AND LEADERSHIP COMPETENCIES



# Audit Evaluation 2021-17254 – Organizational Effectiveness – Browns Ferry Nuclear Plant Chemistry

## EXECUTIVE SUMMARY

### Why the OIG Did This Audit

Organizational effectiveness, as defined in this evaluation, is the ability of an organization to achieve its mission and goals. Due to the importance of alignment, 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 Browns Ferry Nuclear Plant (BFN) Chemistry, which is an organization in TVA Nuclear.

BFN Chemistry is tasked with (1) maintaining the chemical operating environment for all plant systems (including fuel assemblies) in such a manner that systems and equipment will meet or exceed their designed lifetimes, (2) meeting all applicable regulatory requirements, (3) avoiding adverse effects to nuclear fuel, and (4) minimizing plant dose rates. The objective of this evaluation was to identify factors that could impact BFN Chemistry's organizational effectiveness. Specifically, we identified behavioral and operational factors that affect organizational effectiveness.

### What the OIG Found

During the course of our evaluation, we identified behaviors that had a positive impact on BFN Chemistry. These included relationships between employees and most management. However, we also identified a minimal behavioral risk related to management communication. In addition, we identified minimal risks to operations that, if unaddressed, could hinder BFN Chemistry's effectiveness. These risks related to nonfunctioning equipment and perceptions of inadequate staffing. Information from management indicates that actions have been taken or are in process to remediate these concerns.

Based on our observations, we assessed BFN Chemistry's level of risk related to behaviors as "low" and operations as "low." Ratings are reflected in the table on the following page.



# Audit Evaluation 2021-17254 – Organizational Effectiveness – Browns Ferry Nuclear Plant Chemistry

## EXECUTIVE SUMMARY

	Low Risk	Medium Risk	High Risk
Behaviors	X		
Operations	X		

### What the OIG Recommends

We recommend the Senior Manager, BFN Chemistry, address concerns related to management communication and continue actions to address operational concerns related to nonfunctioning equipment and staffing.

### TVA Management's Comments

TVA management reviewed a draft of this report and had no comments.

## **BACKGROUND**

Organizational effectiveness, as defined in this evaluation, is the ability of an organization to achieve its mission and goals. Due to the importance of alignment, 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 Browns Ferry Nuclear Plant (BFN) Chemistry, which is an organization in TVA Nuclear.

BFN Chemistry is tasked with (1) maintaining the chemical operating environment for all plant systems (including fuel assemblies) in such a manner that systems and equipment will meet or exceed their designed lifetimes, (2) meeting all applicable regulatory requirements, (3) avoiding adverse effects to nuclear fuel, and (4) minimizing plant dose rates. These responsibilities align with TVA Nuclear's vision of "Our People, Our Fleet – Generating Excellence 24/7", which is, according to TVA's Nuclear Operating Model, achieved through operational and organizational excellence.

BFN Chemistry is comprised of two departments:

- Technical Support and Programs (TS&P) primarily includes chemists that are responsible for one or more assigned chemistry program areas. These areas include analytical methods, quality assurance/quality control, radio-analytical methods, online monitoring, effluents,<sup>1</sup> primary system chemistry, secondary system chemistry, auxiliary system chemistry (e.g., closed cooling water, raw cooling water, and auxiliary boiler water), chemistry/counting instrumentation, post-accident sampling, chemistry data management, and chemical hygiene.<sup>2</sup> TS&P personnel are also responsible for the trending of data, oversight of the program area (including filling the Contractor Technical Steward role for assigned areas), program optimization and recommendations, and corrective action plan development, coordination, and implementation.
- Nuclear Chemistry is primarily comprised of technicians, who are responsible for sampling and analysis of plant systems, first-line chemistry data review and assessment, documentation of laboratory and sampling activities, and participation in laboratory quality assurance/quality control activities. Nuclear Chemistry's other responsibilities include interfacing with Chemistry management staff and Operations shift personnel, promptly responding to chemistry problems and notifying duty chemistry supervisory personnel, and, if necessary, notifying operations shift/unit management.

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<sup>1</sup> Effluents are defined by the Nuclear Regulatory Commission as liquid or gaseous waste containing plant-related, licensed radioactive material, emitted at the boundary of the facility (e.g., buildings, end-of-pipe, stack, or container) as described in the final safety analysis report.

<sup>2</sup> Chemical hygiene relates to the maintenance of laboratory procedures, equipment and personal protective equipment, and safe work practices that are capable of protecting employees who work in nuclear chemistry laboratories.

As of July 1, 2021, BFN Chemistry consisted of 32 individuals, including 20 employees and 4 supervisors in Nuclear Chemistry, 6 employees and 1 supervisor in TS&P, and the senior manager. A senior secretary, who officially reports to BFN Radiation Protection, also performs administrative tasks for BFN Chemistry.

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

The objective of this evaluation was to identify factors that could impact BFN Chemistry's organizational effectiveness. We assessed operations as of July 2021 and culture at the time of our interviews and fieldwork, which occurred from July 12 through July 23, 2021. To complete the evaluation, we:

- Reviewed (1) TVA Nuclear's fiscal year (FY) 2020 through FY 2022 and FY 2021 through FY 2023 business plans to obtain an understanding of the fleet's initiatives and risks, (2) Nuclear Safety Review Board<sup>3</sup> reports from February and March 2021, and (3) Chemistry Performance Assessment reports from June 2020 through July 2021.
- Reviewed TVA values and competencies (see Appendix) for an understanding of cultural factors deemed important to TVA.
- Reviewed select Nuclear Power Group Standard Programs and Processes, and other documentation to gain an understanding of processes.
- Conducted individual interviews with 30 of 32<sup>4</sup> individuals within BFN Chemistry and a senior secretary who reports to BFN Radiation Protection but performs some administrative tasks for BFN Chemistry. We analyzed the interview results to identify themes related to factors that could affect organizational effectiveness.
- Surveyed and/or interviewed a nonstatistical sample of 94 individuals from other BFN organizations that have interactions with BFN Chemistry personnel and interviewed four individuals responsible for supporting BFN Chemistry. We analyzed results to identify factors affecting organizational effectiveness from a business partner perspective.

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

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<sup>3</sup> The Nuclear Safety Review Board is a standing committee of senior TVA managers and non-TVA advisors who advise the Chief Nuclear Officer on the adequacy and implementation of TVA's nuclear safety policies and programs and evaluates those policies and programs for compliance with regulatory activities.

<sup>4</sup> This included five technicians who had effective hire dates of June 21, 2021. We interviewed three of these individuals but did not include their feedback in our analyses because of their limited exposure to BFN Chemistry. The remaining two technicians chose not to be interviewed.

## **OBSERVATIONS**

During the course of our evaluation, we identified behaviors that had a positive impact on BFN Chemistry. These included relationships between employees and most management. However, we also identified a minimal behavioral risk related to management communication. In addition, we identified minimal risks to operations that, if unaddressed, could hinder BFN Chemistry's effectiveness. These risks related to nonfunctioning equipment and perceptions of inadequate staffing.

### **BEHAVIORAL FACTORS**

According to the Society for Human Resource Management (SHRM),<sup>5</sup> employee engagement relates to the level of an employee's connection and commitment to the organization. SHRM also specifies drivers of employee engagement, including commitment of leaders, trust in leadership, and positive relationships with supervisors. TVA has developed competencies intended to define common characteristics that set the tone for how work is to be performed in the organization. Defined behaviors are associated with the competencies to provide guidance as to how employees can demonstrate their commitment to TVA values. Based on interviews with individuals within BFN Chemistry, we determined behavior-related risk was low.

#### **Positive Relationships with Team Members**

TVA expects employees to treat everyone with dignity and respect, and to act with character, integrity, trustworthiness, and the highest ethical standards. All employees commented positively on interactions with others in their group and most indicated they trusted their coworkers to do their jobs well. Comments included having good teamwork, being supportive of each other, and having good communication. In addition, most individuals believed the ethical culture<sup>6</sup> in the organization was positive. Many individuals indicated teamwork and/or coworker interactions were drivers of positive morale.

#### **Positive Interactions with Management**

TVA expects leaders to inspire trust and engagement by building a positive environment that motivates others to achieve and exceed organizational goals and aspirations. We asked individuals within BFN Chemistry about relationships with their first-line supervision, middle management, and upper management.

Most individuals indicated having positive interactions with their first-line management, with some individuals describing first-line management as being flexible, helpful, and approachable. The majority of individuals also trusted their first-line management and felt comfortable reporting concerns or offering a differing opinion. In addition, most individuals that provided an opinion also indicated no problems with accountability and the majority of individuals

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<sup>5</sup> SHRM is a membership organization for Human Resource professionals.

<sup>6</sup> Ethical culture, as defined in this evaluation, refers to the shared concept of right and wrong behavior in the workplace.

expressed positive comments about recognition from first-line management. Examples of recognition included words of appreciation or the provision of meals or gifts. However, with regards to communication with first-line management, several individuals indicated concerns in this area. For example, some individuals indicated that first-line supervisors could be more transparent or forthcoming with certain information, such as giving them more notice about work they have to complete. Other communication concerns included issues with responding to requests and needing to be more open to feedback.

While some individuals did not provide an opinion on their middle manager due to limited interactions, most individuals that provided an opinion were positive when asked about interactions and communication with middle management. Examples of comments included clear and concise communication and being available/approachable, supportive, and receptive to feedback. In addition, of those that provided an opinion, most indicated they trusted their middle management and all felt comfortable reporting concerns or offering a differing opinion. All individuals commented positively on accountability and recognition from middle management. Examples of recognition included words of appreciation or recognition through e-mails or at morning meetings.

Most individuals indicated they had limited or no interactions with upper management; therefore, most individuals did not express an opinion on their upper management.

## **OPERATIONAL RISKS**

Based on our interviews, we identified minimal risks to operations that, if unaddressed, could hinder BFN Chemistry's effectiveness. While most individuals indicated having the resources needed to do their jobs, several individuals expressed concerns related to nonfunctioning equipment (including Continuous Air Monitors [CAM]). Some of these individuals indicated having to perform more sampling as a result of these equipment issues.

According to a BFN Chemistry employee, issues with the CAMs were related to problems with central processing units and failing hardware. Based on information provided by BFN Chemistry and information in Maximo,<sup>7</sup> six of the CAMs were remediated in FY 2021 and the remaining seven CAMs are expected to be remediated in FY 2022.

In addition, several individuals indicated inadequate staffing and/or workload concerns. As previously discussed, BFN Chemistry recently hired five technicians. While many of the individuals expressing staffing and/or workload concerns acknowledged management's efforts to increase staffing, they also indicated that it can take 1½ to 2 years for a new individual to complete technician training and become well-acquainted with the work. A couple of individuals also indicated that management should be more proactive with staffing and keep a flow of individuals coming into the group to counteract

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<sup>7</sup> Maximo is TVA's Enterprise Asset Management system.

attrition. According to the organization's staffing plan, BFN Chemistry expects to hire four additional staff in calendar year 2022.

Finally, several individuals commented positively on work scheduling and/or planning. Most of these individuals indicated that having a work schedule is helpful because it gives individuals notice about their upcoming work assignments.

In addition, we requested feedback from personnel in other BFN organizations that have interactions with BFN Chemistry personnel. The majority of respondents provided positive ratings related to BFN Chemistry's quality of products and services provided, quality of feedback and communication, and timeliness. Positive comments shared by respondents included BFN Chemistry personnel doing a great job and being supportive and collaborative.

## **CONCLUSION**

BFN Chemistry has a direct impact on the success of TVA Nuclear because of its responsibilities to help BFN plant systems meet or exceed their designed lifetimes and comply with applicable regulatory requirements. While we identified behaviors that had a positive impact on BFN Chemistry, we also identified a minimal behavioral risk related to management communication. In addition, we identified minimal risks to operations that, if unaddressed, could hinder BFN Chemistry's effectiveness. These risks related to nonfunctioning equipment and perceptions of inadequate staffing.

Addressing the concerns identified in this report could help BFN Chemistry better meet its responsibilities in support of Nuclear's vision and TVA's mission, and place BFN Chemistry in a better position to overcome unexpected challenges while continuing to meet its responsibilities.

## **RECOMMENDATIONS**

We recommend the Senior Manager, BFN Chemistry:

1. Address concerns related to management communication.
2. Continue actions to remediate nonfunctioning equipment.
3. Continue to assess staffing needs and take action as needed.

**TVA Management's Comments** – TVA management reviewed a draft of this report and had no comments.

<b>TVA Values</b>	
Safety	We are uncompromising in our commitment to the safety and well-being of our teammates and the communities we serve.
Service	We are proud to be of service in the communities in which we live, work, and play.
Integrity	We are honest and straightforward, always doing the right thing with integrity.
Inclusion	We treat everyone with dignity and respect – emphasizing inclusion by welcoming each person’s individuality so we can reach our full potential.

### **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