



Memorandum from the Office of the Inspector General

May 25, 2022

Jason W. Eggart
Joseph Quinn
Timothy Rausch

REQUEST FOR FINAL ACTION – EVALUATION 2021-17252 – ORGANIZATIONAL EFFECTIVENESS – BROWNS FERRY NUCLEAR PLANT RADIATION PROTECTION

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 Justin B. Franklin, Auditor, at (865) 633-7363 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)

JBF:KDS

Attachment

cc (Attachment):

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OIG File No. 2021-17252



Office of the Inspector General

Evaluation Report

To the Senior Manager, Browns Ferry Nuclear Plant Radiation Protection; to the Plant Manager, Browns Ferry Nuclear Plant; and to the Executive Vice President and Chief Nuclear Officer

ORGANIZATIONAL EFFECTIVENESS – BROWNS FERRY NUCLEAR PLANT RADIATION PROTECTION

Evaluation Team
Justin B. Franklin
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Evaluation 2021-17252
May 25, 2022

ABBREVIATIONS

ALARA	As Low as (is) Reasonably Achievable
BFN	Browns Ferry Nuclear Plant
CR	Condition Report
ECP	Employee Concerns Program
FY	Fiscal Year
INPO	Institute of Nuclear Power Operations
NPG	Nuclear Power Group
NRC	Nuclear Regulatory Commission
NSCMP	Nuclear Safety Culture Monitoring Panel
NSRB	Nuclear Safety Review Board
QA	Quality Assurance
RP	Radiation Protection
SCWE	Safety Conscious Work Environment
SHRM	Society for Human Resource Management
SPP	Standard Program and Process
TVA	Tennessee Valley Authority

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Evaluation 2021-17252 – Organizational Effectiveness – Browns Ferry Nuclear Plant Radiation Protection

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. 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 the Browns Ferry Nuclear Plant (BFN) Radiation Protection (RP) organization, which is an organization within TVA Nuclear.

BFN RP is responsible for ensuring activities are conducted in ways that protect the radiological health of workers and the public by keeping radiation doses as low as (is) reasonably achievable. The objective of this evaluation was to identify factors that could impact BFN RP'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 behavioral and operational factors that are negatively impacting BFN RP's effectiveness and its ability to meet its responsibilities and support Nuclear's vision and core principles.

Behavioral Factors – Most employees expressed having positive relationships with individuals in their own groups, and many indicated they trusted their coworkers to perform their jobs well. However, multiple negative behavioral factors were also expressed, including:

- Concerns regarding interactions between BFN RP groups.
- Concerns regarding management interactions.
- Perceptions of (1) unethical and (2) noninclusive behaviors by certain managers.
- Perceptions that BFN RP personnel cannot stop work and plant operations are placed before radiation safety.
- Perceptions of negative relationships with some plant and corporate nuclear personnel.



Evaluation 2021-17252 – Organizational Effectiveness – Browns Ferry Nuclear Plant Radiation Protection

EXECUTIVE SUMMARY

Operational Factors – We were informed about concerns related to outdated instrumentation and equipment, inadequate supplies, the briefing room environment, and budget and staffing constraints.

We also identified a risk related to the oversight and monitoring of the nuclear safety culture within BFN RP that could impact BFN as a whole.

Based on our observations, we assessed BFN RP’s level of risk related to behaviors and operations and determined risk in both areas was “high.” Ratings are reflected in the following table:

	Low Risk	Medium Risk	High Risk
Behaviors			X
Operations			X

What the OIG Recommends

We recommend TVA Nuclear management address the issues identified in this report related to (1) interactions within and outside of BFN RP, (2) perceptions of being unable to stop work and that plant operations are placed before radiation safety, (3) ethical culture and noninclusive behaviors, (4) resource concerns, and (5) the nuclear safety culture oversight programs.

TVA Management’s Comments

TVA management agreed with the findings related to leadership gaps and described actions planned and taken to address our recommendations. However, they also stated their belief that feedback on the work environment obtained over the past four years indicate the working environment of the BFN RP department is healthier than what is reflected in this report. See Appendix B for management’s complete response. In addition, management made informal comments that were incorporated, as appropriate.

Auditor’s Response

We agree with TVA management’s actions planned and taken to address the recommendations in this report. However, while management stated they believe the working environment of BFN RP is healthier than indicated in this report, we believe the findings are indicative of conditions at the time of our evaluation.

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 the Browns Ferry Nuclear Plant (BFN) Radiation Protection (RP) organization, which is an organization within TVA Nuclear.

BFN RP is responsible for ensuring activities are conducted in ways that protect the radiological health of workers and the public by keeping radiation doses as low as (is) reasonably achievable (ALARA), as required by the Nuclear Regulatory Commission (NRC). According to the Nuclear Industry Standard Process RP-011, *Radiation Protection Fundamentals*, RP professionals achieve protection of plant personnel and the public by implementing a robust program that includes a strong foundation of fundamentals and a culture that strives for continuous improvement. BFN RP consists of four groups: RP, ALARA Support, Technical Support, and Radwaste.

- RP personnel are responsible for implementing the field aspects of the RP program and providing direction and oversight for control measures concerning personnel exposure to radioactive materials and associated radiation during both routine nuclear operations and emergencies. In addition, personnel are responsible for (1) providing technical expertise in the areas of radiological surveillance in the field as well as radiological monitoring and assessment and (2) ensuring that all maintenance and operational activities are conducted in a safe and efficient manner.
- The ALARA Support group's main objective is to minimize radiation exposure to plant employees. The group's responsibilities include implementing the station ALARA program through the activities of planning or using techniques, such as lead shielding,¹ flushing,² and technology to reduce radiation exposure.
- The Technical Support group has responsibilities that include maintaining radiation exposure records as well as radiation monitoring equipment. The group also helps with the development and implementation of BFN RP's dosimetry program,³ respiratory protection, and instrumentation.
- The Radwaste group is comprised mainly of shippers and laborers. The group is responsible for ensuring that the shipment of radioactive materials meets all federal, state, and TVA requirements. Additionally, the group is

¹ Lead shielding is a barrier that provides protection from penetrating radiation, such as gamma rays and neutrons.

² Flushing is a way to reduce buildup of hotspots.

³ The dosimetry program includes the theory and application of principles and techniques involved in measuring and recording doses of ionizing radiation.

responsible for providing performance-based, cost-effective radwaste processing and disposal options that meet TVA Nuclear Business Objectives.

Activities within BFN RP are regulated by the NRC, which is the United States regulator for commercial nuclear plants. The NRC sets forth expectations related to the establishment and maintenance of a positive safety culture. The NRC's Safety Culture Policy Statement includes a list of positive safety culture traits that include, but are not limited to, leadership safety values and actions, personal accountability, an environment for raising concerns, and a respectful work environment. TVA's Nuclear Operating Model also states that the nuclear fleet must, without exception, consistently meet the highest standards of excellence and performance, including embracing the traits of a healthy nuclear safety culture, with the overarching responsibility for protecting the health and safety of the public.

TVA has established the Nuclear Safety Culture Monitoring Panel (NSCMP) and the Nuclear Safety Review Board (NSRB) to monitor and provide oversight of the safety culture at each of TVA's nuclear sites. According to Nuclear Power Group (NPG) Standard Programs and Processes (SPPs) 01.7.2, *Nuclear Safety Culture Monitoring*, NSCMP is responsible for conducting trending of data and discussing information to determine the significance of issues pertaining to the nuclear safety culture. The NSRB is an "independent off-site committee that provides senior level oversight of TVA's nuclear program with respect to nuclear safety."

BFN RP, like other nuclear organizations, provides metrics to the Institute of Nuclear Power Operations (INPO),⁴ including the RP Index metric. The RP Index for BFN RP is affected by a number of contributing indicators, including the RP Dose Control INPO Index. According to Radiological Control Instruction 39, *Radiation Protection Cornerstones*, dose controls metrics include Locked High Radiation Area events,⁵ High Radiation Area events,⁶ and unplanned internal/external exposures.⁷ As of July 2021, BFN RP had not experienced a Locked High Radiation Area event, High Radiation Area event, or uptake⁸ of radioactive material since 2018. As of August 2021, the RP Index demonstrated a high rating for all three units at BFN.

As of June 3, 2021, BFN RP consisted of 74 individuals, including 59 employees, 10 supervisors, 4 superintendents, and the senior manager.

⁴ INPO was established in 1979 to promote the highest levels of safety and reliability in the nuclear industry. The organization collects data from nuclear facilities that the NRC uses in its industry oversight process.

⁵ A Locked High Radiation Area event is a nonconformance with technical specifications or comparable requirements that results in the loss of radiological control over access or work activities within the respective high-radiation area greater than one rem per hour.

⁶ A High Radiation Area event is an occurrence in which controls for a high radiation area less than one thousand millirem per hour were compromised.

⁷ Internal or external radiation exposures that were unplanned, which includes unplanned external exposures of 10 millirem or greater.

⁸ Any event involving the unintended release of airborne activity into an area, unintended uptakes, or the contamination of plant areas from airborne activity.

OBJECTIVE, SCOPE, AND METHODOLOGY

The objective of this evaluation was to identify factors that could impact BFN RP's organizational effectiveness. We assessed operations as of November 10, 2021, and culture at the time of our interviews, which occurred between June 14, 2021, and September 15, 2021. To complete the evaluation, we:

- Reviewed TVA Nuclear's Fiscal Year (FY) 2020 through FY 2022 and FY 2021 through FY 2023 business plans and other documentation to gain an understanding of BFN RP's initiatives and/or risks.
- Reviewed TVA values and competencies (see Appendix) for an understanding of cultural factors deemed important to TVA.
- Reviewed Nuclear Industry Standard Processes, NPG SPPs, NRC regulations, Radiological Control Instructions, and regulatory guides.
- Reviewed relevant NSCMP documentation and NSRB reports to gain an understanding of TVA's process for monitoring and overseeing nuclear safety culture.
- Reviewed relevant Site Leadership Team and nuclear Executive Leadership Team documentation to obtain further information related to safety culture issues within BFN RP.
- Conducted interviews with 71 individuals,⁹ which included management, and analyzed the results to identify factors that could affect organizational effectiveness.
- Conducted interviews with 20 contractors who work in BFN RP and analyzed results to identify factors that could affect organizational effectiveness.
- Surveyed and/or interviewed support personnel and a nonstatistical sample of 514 individuals from other BFN organizations that interact with BFN RP personnel. We obtained 113 responses from individuals in other BFN organizations that interact with BFN RP personnel, and analyzed results to identify factors affecting organizational effectiveness from a business partner perspective.
- Obtained condition reports (CR) from Maximo¹⁰ related to issues within BFN RP that occurred during FY 2020 and FY 2021.
- Assessed the overall effectiveness of BFN RP in behavioral and operational aspects based on TVA's Business Operating Model.

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

⁹ Three individuals were either not available or chose not to be interviewed during the review.

¹⁰ Maximo is TVA's Enterprise Asset Management system.

OBSERVATIONS

During the course of our evaluation, we identified behavioral and operational factors that are negatively impacting BFN RP's effectiveness and its ability to meet its responsibilities and support Nuclear's vision and core principles. We also identified a risk related to the oversight and monitoring of the nuclear safety culture within BFN RP that could impact BFN as a whole. In our opinion, these factors collectively result in a "high" risk ranking for both behavioral and operational areas within BFN RP. Details of our findings are discussed below.

BEHAVIORAL FACTORS

According to the Society for Human Resource Management (SHRM),¹¹ employee engagement relates to the level of an employee's connection and commitment to the organization. In addition, SHRM specifies drivers of employee engagement, including commitment of leaders, trust in leadership, and positive relationships with supervisors. TVA, in its Business Operating Model, states that engagement is one component of effective execution. Furthermore, TVA's Nuclear Operating Model defines employee engagement as "A workplace approach resulting in the right conditions for all members of an organization to give of their best each day, committed to their organization's goals and values, motivated to contribute to organizational success." 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.

While most employees in BFN RP expressed having positive relationships with others in their own group, multiple negative behavioral factors were also expressed, including:

- Concerns regarding interactions between BFN RP groups.
- Concerns regarding management interactions.
- Perceptions of (1) unethical and (2) noninclusive behaviors by certain managers.
- Perceptions that BFN RP personnel cannot stop work and plant operations are placed before radiation safety.
- Perceptions of negative relationships with some plant and corporate nuclear personnel.

Concerns Regarding Interactions Between BFN RP Groups

Most employees expressed having positive relationships with individuals in their own group. Additionally, many employees indicated they trusted their coworkers to perform their jobs well. When asked what was working well in completing their jobs specific examples included teamwork, coworkers working well together, and having a knowledgeable crew.

¹¹ SHRM is a membership organization for Human Resource professionals.

While employees expressed positive relationships with individuals in their own groups, several employees indicated issues existed between groups within BFN RP. Examples given included perceptions from a couple of individuals in two different groups that either the ALARA group oversteps their role or there is a disconnect of what groups are involved in certain plans. In addition, several employees across three groups indicated issues existed between members of BFN RP management. A specific example included perceptions that certain members of management were involved in a power struggle.

Concerns Regarding Management Interactions

TVA leadership competencies reflect that leaders are expected to (1) communicate honestly and effectively with individuals and (2) foster an environment where communication is valued and concerns receive frank responses, empathy, and follow-up. TVA also expects leaders to have an awareness of the impact of their own behaviors on others and to build a positive environment that motivates others to achieve and exceed organizational goals and team aspirations. We asked individuals within BFN RP about relationships or interactions with first-line, middle, and upper management. Responses indicated the need for improvement in managerial interactions at all levels.

First-Line Management

While many employees in BFN RP commented positively on their first-line management relationships, several employees across three groups indicated issues with communication or a lack of trust in first-line management. Some employees indicated that first-line management did not support them or that first-line management was afraid of their own management. When asked about their comfort in raising a different opinion or bringing up concerns, several employees across all groups expressed an unwillingness to raise a differing opinion, bring up concerns to their first-line management, or indicated nothing would be done if they did. Employees indicated a fear of retaliation as an example of why they would not report concerns.

Many employees commented positively on accountability from first-line management; however, several in one group indicated that accountability was inconsistent, that favoritism or chastisement existed, or generally indicated that improvements could be made in accountability. In addition, many employees in three groups did not believe that first-line management did well with recognition.

Middle Management

When asked about their relationship and communication with middle management, many employees who responded commented negatively in relation to both. Examples of reasons for the negative comments included perceptions that middle management is (1) not responsive; (2) insulting, inappropriate, dishonest, or unapproachable; or (3) inconsistent in communication. Other examples included feelings that middle management dismisses or does not listen to concerns or input when making decisions, or only tells people what they want to hear.

Many employees, including several in one group, indicated they do not trust their middle management. Additionally, several employees indicated issues with reporting concerns or offering a differing opinion to middle management. Reasons given by these employees included perceptions that (1) they would be dismissed or lied to, (2) nothing would be done, (3) they would be publicly talked about in a negative manner, or (4) they would face retaliation.

Of those who commented, several employees indicated having concerns with accountability from middle management. Some employees perceived that middle management can be extreme when holding employees accountable, such as implementing mass punishment. Many employees also responded negatively when asked about recognition from middle management, with examples provided indicating perceptions of insincerity or inconsistency with recognition, or a lack of appreciation or recognition for employees.

Upper Management

Of those who commented on their relationship or communication with upper management, many commented negatively. Examples of comments included perceptions that management is out of touch, not involved, or not supportive. Several employees also commented negatively about trust and indicated issues with reporting concerns or offering a differing opinion. Examples included a fear of speaking up or speaking their minds, believing their concerns would not be addressed, or the feeling they would be shut down or dismissed. Several employees commented negatively when asked about accountability from upper management, and many commented negatively when asked about recognition.

When asked, many employees indicated that morale within BFN RP was negative. Examples of drivers behind the negative morale were primarily related to management behaviors, such as (1) dismissing people when issues were brought up, (2) not taking care of employees, (3) not praising or recognizing employees, and (4) exhibiting inappropriate or intimidating behaviors as discussed below.

Perceptions of Unethical Behaviors

When asked about the ethical culture¹² within BFN RP, several employees across three groups provided examples of perceived unethical management behaviors, including untruthfulness, retaliation, and bullying. In addition, some employees described radiation protection events where they believed reporting requirements or regulations were not followed, with a few indicating their perception that BFN RP's favorable INPO performance rating was not a true depiction of the organization's performance because of not reporting these events.

¹² Ethical culture, as defined in this evaluation, refers to the shared concept of right and wrong behavior in the workplace.

Perceptions of Noninclusive Behaviors

According to TVA's value of inclusion, TVA employees are expected to treat everyone with dignity and respect, emphasizing inclusion by welcoming each person's individuality. However, several employees across three groups described inappropriate behaviors exhibited by a few specific individuals in BFN RP management. These behaviors included inappropriate comments or actions, racist comments, or management publicly talking about certain RP personnel in a negative manner. We discussed these concerns with TVA management.

Perceptions of an Inability to Stop Work

According to NPG-SPP-05.1, *Radiological Controls*, RP personnel have the authority to stop or prevent the initiation of a job or any work activity involving radiological protection if continued performance would result in the violation of regulation or plant procedure, or would endanger the safety of personnel. The SPP further states that RP personnel should immediately notify the Shift Manager and the RP Manager, or his/her designated alternate, of their actions.

Despite the authority given by the SPP, multiple employees interviewed indicated concerns with (1) being able to stop work or (2) not implementing dose saving controls in order to speed up work; including, in some circumstances, when unsafe radiological conditions were perceived to be present. A few of these employees also indicated their perceptions that BFN RP management prevents work from being stopped in order to keep BFN RP from looking bad or due to being anxious in terms of not wanting anything to go wrong.

While BFN RP management has the ability to make decisions practical and consistent with the activity being performed, some employees provided examples where they perceived that the continuation of work activities as planned created increased radiological risk to plant employees or resulted in increased radiation exposure or contamination. Specific examples provided are described below.

- During the spring 2021 outage, irradiated incore components¹³ were removed from the reactor. Some employees indicated that it was recommended to lock out¹⁴ the area through which the components were being moved due to the potentially high radiation levels of the components. A few of those employees indicated that BFN RP management dismissed the recommendation and allowed workers in the area while the components were being moved. Further, a few employees indicated that BFN RP management's decision to allow workers in the area while the components were being moved was driven by not wanting to stop work.

According to Radiological Control Instruction 17, *Control of High Radiation Areas and Very High Radiation Areas*, certain areas of the plant are to be locked and posted when moving irradiated incore components, with worker access only being allowed at the approval of the RP manager or his designee.

¹³ According to an RP Technician, the specific irradiated incore components in this example were components in the reactor core that had been exposed to high amounts of radiation.

¹⁴ Locking of areas restricts worker access.

We confirmed through a review of BFN RP documentation that the components contained a dose rate of over one thousand rem per hour on contact,¹⁵ which indicates a significant risk to plant employees if proper controls are not in place. According to BFN RP management, actions were taken to address the employees' concerns, including creation of a CR. According to the CR, BFN RP contacted a few industry peers who confirmed that they would have performed the work in a similar manner; however, it was unclear from the CR if the concern specific to conducting the work while workers were in the area was discussed or addressed. Based on interview comments, employees still perceive that allowing worker access during the movement of irradiated incore components created unnecessary radiological risk to plant employees.

- It was indicated that during the spring 2021 outage, flushing was eliminated from a particular job scope at the request of Operations, and BFN RP management did not advocate for saving dose. BFN RP personnel initiated three CRs about the concern, with all of the CRs warning that the elimination of flushing would result in increased radiation exposure, including one that specifically requested that flushing be added back into the job scope before work took place. Comments included in one of the CRs indicated that flushing "would not lessen much dose" in the area, and stated the risk was weighed, but the decision was made so as "not to burden Ops at the time." According to post-job review documentation, not implementing flushing as planned was one reason, among others, why plant employees' rem exposure was 63 percent higher than originally planned, and the actual effective dose rate was almost 40 percent higher than initially estimated.
- A concern was expressed to BFN RP management that contamination levels within the BFN equipment pit were too high for plant employees to perform work in that area. Despite that concern, BFN RP management allowed plant employees to enter BFN's equipment pit while it contained over a foot of highly contaminated water due to an inoperable drain. According to radiological survey documentation, plant contractors experienced radiation contamination and were not able to clear radiation monitors when leaving the area, which resulted in them having to remove their shoes.

Additionally, some individuals indicated their perception that an emphasis is placed on plant operations or power production rather than radiation protection, while another questioned whether BFN RP management is independent of the plant. A few individuals from other BFN organizations made similar comments to those who suggested an emphasis is placed on plant operations, by indicating that priority is given to the BFN Operations department.¹⁶ Examples included perceptions that BFN Operations moves to the front of the line upon request and boundaries have been moved for the convenience of the BFN Operations department, even if it causes extra dose for another BFN department.

¹⁵ Rem is one of two standard units used to measure radiation dose absorbed by the body. NRC documentation indicates that exposures exceeding 500 rem of radiation all at once will likely result in death without proper medical treatment.

¹⁶ A couple of these individuals, who work in BFN Operations, perceived this as a positive.

Perceptions of Negative Relationships with Other Organizations

When asked about working with outside organizations, a couple of employees indicated plant craft personnel makes BFN RP feel rushed or that BFN RP is seen as a nuisance. Another employee indicated that other BFN departments take issue when BFN RP does not allow them to work beyond what is allowed in terms of time and radiation dose. Further, while individuals from other BFN organizations collectively rated BFN RP above average in radiation safety support, quality of feedback and communication, and timeliness, some individuals indicated issues with support and communication from BFN RP.

In addition, eight individuals expressed concerns related to BFN's Employee Concerns Program (ECP).¹⁷ Some indicated when concerns are brought to BFN ECP, they either disappear or no action is ever taken. A few individuals also indicated they, or others, were reluctant to bring up concerns to ECP. Further, a couple of individuals stated that certain BFN RP management is informed when employees report a concern to BFN ECP, while another indicated a general fear that BFN RP management will find out if a concern is reported to BFN ECP.

OPERATIONAL FACTORS

When asked if they had everything they needed to do their jobs, some employees indicated issues with outdated instrumentation or equipment, or indicated they did not have enough radiation-related supplies, such as radiation tags and postings. A couple of employees also indicated issues with the briefing room. Examples included the briefing room being too crowded and/or too loud, or leaking sewage.

A few employees also indicated issues with budget or staffing constraints. Examples included not being able to purchase better equipment, such as radiation detectors or not having enough people to handle the workload. Similarly, many business partners commented on limited RP resources and issues with BFN RP staffing. In addition, several business partners provided feedback when asked in what areas BFN RP could improve. Examples included briefings for high radiation areas, having more qualified people, and consistently applying standards to all jobs.

¹⁷ ECP is intended to provide nuclear employees and contractors a confidential, alternative avenue to raise and resolve concerns.

OTHER OBSERVATIONS

In FY 2020, work environment issues were identified in BFN RP. BFN RP employees expressed these concerns through multiple avenues, including Human Resources, BFN ECP, and BFN Quality Assurance (QA). According to TVA documentation, the issues identified had the potential of creating a future “Chilled Work Environment.”¹⁸ When describing responsibilities of NSCMP members, NPG-SPP-01.7.2, *Nuclear Safety Culture Monitoring*, states Human Resources, ECP, and QA are to provide specific insights on the safety conscious work environment (SCWE)¹⁹ in other departments as part of their oversight function, and that members, which includes the RP organization, are to provide specific insights on the SCWE of their own department as well. When reviewing relevant NSCMP documentation, we noted that while BFN QA reported nonspecific nuclear safety culture issues,²⁰ there was no evidence the identified risk of a potential future chilled work environment in BFN RP had been discussed or addressed. According to a few NSCMP members, issues at the department level are rarely discussed in NSCMP meetings or discussed at a high level when brought forth by organizations, such as ECP.

A 2018 TVA Nuclear Event Operating Report²¹ documented a safety culture issue within another RP organization in TVA Nuclear. One of the contributing causes identified was that RP management did not follow NSCMP procedure and report out on department specific SCWE issues. While this event and associated causes was shared across the nuclear fleet, it appears that NSCMP procedure was again not adequately followed, which could explain why the identified risk specific to BFN RP was not mentioned in the NSCMP documentation reviewed.

In addition, it was indicated that a member of the NSRB had been made aware of the identified risk from FY 2020. We reviewed relevant NSRB documentation and noted that, while the safety culture of specific departments was documented, BFN RP’s safety culture was reported out as sound, and the SCWE stated as healthy, with no mention of the previously identified risk to the department.

¹⁸ A chilled work environment, as defined by the NRC, is a condition where the chilling effect is not isolated (e.g., multiple individuals). NRC defines a chilling effect as a condition that occurs when an event, interaction, decision, or policy change results in a perception that the raising of safety concerns to the employer or to the NRC is being suppressed or discouraged.

¹⁹ The NRC defines a SCWE as a work environment in which employees are encouraged to raise safety concerns, are free to raise concerns to both their management and the NRC without fear of retaliation, where concerns are promptly reviewed, given the appropriate priority, and appropriately resolved, and where timely feedback is provided to those raising concerns.

²⁰ The nuclear safety culture issues were not attributed to a particular department in the NSCMP report out.

²¹ The purpose of this report was to communicate the event and establish fleet-wide actions.

CONCLUSION

BFN RP's uncompromising commitment to radiological safety is critical to the radiological health of plant employees as well as the public. Interviews with individuals disclosed potential risks in fulfilling that commitment, which has negatively impacted the culture of the organization. The NRC sets forth expectations related to the establishment and maintenance of a positive safety culture, which includes traits, such as an environment for raising concerns and a respectful work environment.

Based on our evaluation, we rate behavioral and operational risks as "high." Behavioral factors included in this report indicate the absence of a respectful work environment and a weakness in the environment for raising concerns. Improved interactions and the rebuilding of trust could reduce the perceptions identified during this evaluation. In addition, improvements should be made to mitigate the risk related to the oversight and monitoring of the nuclear safety culture within BFN RP. Not adequately addressing issues between BFN RP management and employees or providing sufficient oversight and monitoring of the nuclear safety culture within BFN RP could lead to a negative safety culture.

RECOMMENDATIONS

We recommend the Senior Manager, RP, in conjunction with the Plant Manager, BFN:

1. Address the issues identified in this report related to interactions between (1) BFN RP groups and (2) BFN RP and plant personnel.

TVA Management's Comments – TVA management stated they would (1) develop and implement standard meeting agendas to ensure alignment across BFN RP groups, (2) improve BFN RP department integration into the work week scheduling process to allow for improved communications and expectations from BFN RP with other BFN organizations, and (3) develop a communication strategy to educate the workforce on RP stop work criteria and its importance. See Appendix B for management's complete response.

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

2. Address perceptions related to (1) the inability to stop work when necessary and (2) the placement of plant operations before radiation safety.

TVA Management's Comments – TVA management stated that the examples of perceptions related to the inability to stop work were professional disagreements. When a healthy nuclear safety culture exists it is expected that differing opinions will be encountered, in these cases the perspectives are listened to and taken into account in the decision making process. In each case, the risk of evolution was reviewed and understood prior to

conducting the work activity. Specific calculations were performed, nuclear safety and industrial safety were maintained, and no negative impact to dose rates were encountered. TVA management stated they would improve communications within the RP department regarding the facts used to make decisions.

In addition, TVA management stated that BFN is an operationally focused site, with plant operations and safety as the number one priority. TVA management stated they would discuss the importance of being an operationally focused organization with the BFN RP department. See Appendix B for management's complete response.

Auditor's Response – We agree with TVA management's planned actions. In addition, we understand that professional disagreements occur; however, interviews revealed a distrust in BFN RP management and the particular examples included in this report indicated employees perceived concerns were not addressed. Further, while TVA management asserts that there were no negative impact to dose rates encountered in the examples cited, documentation indicates individuals either had contaminated clothing or a higher rem exposure than originally planned in two of the report examples.

3. Assess resource concerns and address as necessary.

TVA Management's Comments – TVA management stated that current staffing levels are at, or above, RP technician staffing levels at similar sites across the industry, and that the BFN RP organization has been authorized to hire for every vacancy resulting from attrition.

TVA management also stated that a project to upgrade the facility, including a new larger briefing area, independent cubicles, and computers for the technicians, was completed in November 2021. In addition, over \$600,000 was spent in FY 2021 for equipment and instrumentation upgrades specific to BFN RP. See Appendix B for management's complete response.

Auditors Response – We agree with TVA management's actions taken.

4. Address the issues identified in this report related to interactions between employees and management.

TVA Management's Comments – TVA management stated improving BFN RP leadership is a focus area for the station. According to management, several superintendents and supervisors have been rotated to new positions for development and to improve communications and relations within those groups. TVA management also stated they will continue to monitor and receive feedback from the technicians through skip-level meetings. See Appendix B for management's complete response.

Auditors Response – We agree with TVA management’s actions taken and actions planned.

5. Address the perceptions related to the ethical culture and noninclusive behaviors.

TVA Management’s Comments – TVA management stated departmental leadership changes were made to address noninclusive behaviors discussed in the report. Management also stated they would continue to monitor and receive feedback from the technicians through skip-level meetings. See Appendix B for management’s complete response.

Auditors Response – We agree with TVA management’s actions taken and actions planned.

6. Periodically monitor the culture of BFN RP and address any issues negatively affecting the safety culture.

TVA Management’s Comments – TVA management stated the Site Vice President and Plant Manager will conduct monthly skip-level meetings for three months with RP technicians to ensure there are no safety culture concerns. See Appendix B for management’s complete response.

Auditors Response – We agree with TVA management’s planned actions.

We recommend the Chief Nuclear Officer:

7. Evaluate the process for overseeing the nuclear safety culture to identify and correct gaps in oversight.

TVA Management’s Comments – TVA management stated the Vice President, Nuclear Regulatory Affairs, will evaluate the oversight process for nuclear safety culture to identify any gaps and required corrective actions. See Appendix B for management’s complete response.

Auditor Response – We agree with TVA management’s planned actions.

Additional TVA Management Comments

In addition, TVA management stated their belief that feedback on the work environment obtained over the past four years indicate the working environment of the BFN RP department is healthier than what is reflected in this report. See Appendix B for management’s complete response. In addition, management made informal comments that were incorporated, as appropriate.

Auditor’s Response

While management stated they believe the working environment of BFN RP is healthier than indicated in this report, we believe the findings are indicative of conditions at the time of our evaluation.

TVA Values	
Safety	We are uncompromising in our commitment to the safety and well-being of our teammates and the communities we serve.
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 potential.
Service	We are proud to be of service in the communities in which we live, work, and play.

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



Tennessee Valley Authority, Browns Ferry Nuclear Plant, PO Box 2000 Decatur, AL 35609

May 6, 2022

David P. Wheeler
Office of the Inspector General
Tennessee Valley Authority
400 West Summit Hill Drive, ET 3C
Knoxville, Tennessee 37902

Dear Mr. Wheeler:

RESPONSE TO EVALUATION 2021-17252 – ORGANIZATIONAL EFFECTIVENESS –
BROWNS FERRY NUCLEAR PLANT RADIATION PROTECTION

Thank you for your organizational effectiveness review of the Browns Ferry Nuclear Plant (BFN) Radiation Protection (RP) Department. We take your concerns and feedback seriously. We agree with the findings in your draft report regarding leadership gaps, as described in more detail below, and plan to incorporate your feedback in these areas as part of our efforts to continuously improve and promote a continuous improvement culture. However, as we reviewed the facts provided in your draft report in the context of other external and internal feedback we have sought out and received in the past four years such as from the Nuclear Regulatory Commission (NRC), Institute of Nuclear Power Operations (INPO), the TVA Fleet Center, the Nuclear Safety Culture Monitoring Panel (NSCMP), Glint Surveys, and skip level meetings, we believe that the working environment of the BFN RP Department is healthier than what is reflected in the report. The next section of this document provides facts and examples which we believe supports the conclusion that the overall health of the BFN RP Department is good. We recognize that as a learning organization and one that seeks to embrace a continuous improvement culture, that there is always room for additional enhancements to the work environment. To that end, we thank you again for your feedback in the report.

Behavioral Factors

We agree with the opportunity to improve departmental communications and the need for improved leadership behaviors within the BFN RP Department. Several actions have been taken to address the communication gaps, explaining the reasons behind decision making and creating department alignment. All individuals in the BFN RP Department including technicians, supervisors and managers are encouraged to speak up and express their opinion. Input is often sought from all levels of the BFN RP Department when changes are being implemented because it is believed that this will produce the best results and outcome. For example, this past year, a decision was made to revise the Radiation Work Permits (RWP) to make them more radiologically risk based. The technicians were asked to participate on the revision committee to obtain their

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feedback and thoughts on how to revise the RWPs. The result was that our RWPs are thought to be one of the best models for risk-based RWPs in the commercial nuclear industry. Another example is that the technicians were given the opportunity to share their ideas for the new RP breakroom and briefing areas. Many of their ideas were incorporated into the design and the finished product.

All Browns Ferry employees, including RP technicians, are encouraged to identify and bring up issues or concerns at all times. The technicians are also encouraged to capture their concerns in condition reports. We have identified several examples of condition reports that were written to capture a concern or where work was stopped due to a safety, dose, or radiological risk concern. For the three examples cited in this report, there were no personnel contaminations, no one received additional or unnecessary dose and the plant was not challenged at any time. The core plate bolts were safely moved and stored in the proper location, all procedures and action plans were implemented for work around the reactor, and there were no dose increases in the hydraulic control unit (HCU) banks.

Operational Factors

With respect to the findings in the area of Operational Factors, the station has taken a number of actions to improve the work area and equipment for the RP department. We started a project in July 2021 to upgrade our facility which included a new larger briefing area, independent cubicles, and computers for the technicians. This project was completed in November 2021. In addition, we spent over \$600,000 in FY 2021 for equipment and instrumentation upgrades in the area of RP. Year after year, additional equipment upgrades are requested, of which we complete 20 percent of our five-year equipment plan to ensure we continue to upgrade/replace our equipment.

Browns Ferry has also run a series of periodic Glint Surveys. The most recent surveys indicated that resources, recognition and pay were some of the issues that staff in the RP Department were most concerned about. The RP Department responded by acquiring new briefing and work areas for the technicians. This addressed concerns about the previous briefing area being noisy and it garnered cubicles and computer stations so the technicians could complete their surveys more efficiently. The RP Department continues to recognize employees for good performance by awarding gift cards, department luncheons, and clothing purchases such as jackets and scrubs. Furthermore, the RP Department adjusted the technician's salaries after the technician pay scale changed and dropped the newer technicians below the lowest range of the new pay band.

Radiological events or situations outside of the normal processes are discussed and reviewed with the Fleet Peer Group and reported as required. In addition to reporting requirements, external agencies frequently perform site visits to validate performance is in line with reported data. In February 2022, the NRC and INPO performed an inspection of the BFN RP Department during the 3R20 outage. The NRC focused on regulatory compliance and INPO focused on excellence and best practices. There were no findings, violations, or areas for improvements (AFIs) noted. Additionally, several members of the Fleet Center and peers from the other sites performed observations and did not identify any practices that were out of compliance with procedural requirements. Finally, the TVA Fleet Center continuously monitors the same indicators as INPO to validate performance and provide an additional check that we are following

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our processes. The performance of the BFN RP Department is closely monitored by organizations external to BFN to ensure that we are following our processes.

TVA Responses to OIG Recommendations

Recommendation:

Address the issues identified in this report related to interactions between (1) BFN RP groups and (2) BFN RP and plant personnel.

Actions to address:

Action 1: Develop and implement standard meeting agendas for department daily briefings and weekly staff meetings to ensure alignment across the RP groups.

Action 2: Improve RP department integration into the work week scheduling process to allow improved communications and expectations from RP with the other organizations with respect to support of work week activities.

Action 3: Develop communication strategy to educate the workforce on RP stop work criteria and its importance.

Recommendation:

Address perceptions related to (1) the inability to stop work when necessary and (2) the placement of plant operations before radiation safety.

Actions to address:

Action 4: Improve communications within the RP department regarding the facts used to make decisions and why the approach was chosen.

- *Additional background and explanation:* The three examples of perceptions related to the inability to stop work when necessary, given in the report, were examples of professional disagreements in our approach to plant activities. In each case, the risk of the evolution was reviewed and understood prior to conducting the work activity. Specific calculations were performed, nuclear safety and industrial safety were maintained, and no negative impact to dose rates were encountered. When a healthy nuclear safety culture exists it is expected that differing opinions will be encountered, in these cases the perspectives are listened to and taken into account in the decision making process. The final decision will ensure we address nuclear safety first followed by industrial safety then radiological safety.

Action 5: Discuss importance of being an operationally focused organization with RP department. This will show how BFN is in-line with the industry and explain why safety priorities will be prioritized by nuclear, industrial, then radiological safety.

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- *Additional background and explanation:* In line with the commercial nuclear industry, Browns Ferry is an operationally focused site. Nuclear plant operation and safety are the number one priority. Site decisions are made finding the best balance between the three safety areas.

Recommendation:

Assess resource concerns and address as necessary.

Actions to address:

In 2018, RP hiring practices were reviewed along with benchmarking similar sites in the nuclear industry to determine if there was a gap that needed to be addressed. Current staffing levels are at, or above, RP technician staffing levels at similar sites across the industry. The BFN RP department has been authorized to hire for every vacancy resulting from any type of attrition. In the past 12 months, the RP department has hired 8 new technicians. TVA does not intend to take any additional actions in response to this recommendation.

Recommendation:

Address the issues identified in this report related to interactions between employees and management.

Actions to address:

Action 6: A focus area of the station is to improve RP leadership. Several of the superintendents and supervisors have been rotated to new positions for development and to improve communications and relations within those groups. These changes were made following the initial debrief of this OIG assessment. We continue to monitor and receive feedback from the technicians through skip level meetings.

Recommendation:

Address the perceptions related to ethical culture and non-inclusive behaviors.

Actions to address:

Action 7: In the last 12 months, departmental leadership changes were made to address the non-inclusive behaviors discussed in this report. We continue to monitor and receive feedback from the technicians through skip level meetings.

Recommendation:

Periodically monitor the culture of BFN RP and address any issues negatively affecting the safety culture.

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Actions to address:

Action 8: For three months SVP/PM conduct monthly skip level meetings with RP technicians to ensure there are no safety culture concerns.

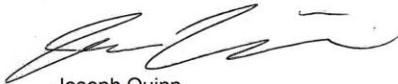
Recommendation:

CNO evaluate the process for overseeing the nuclear safety culture to identify and correct gaps in oversight.

Actions to address:

Action 9: VP Nuclear Regulatory Affairs will evaluate the oversight process for nuclear safety culture to identify any gaps and required corrective actions.

Sincerely,



Joseph Quinn
Plant Manager
Browns Ferry Nuclear Plant

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