

Memorandum from the Office of the Inspector General

January 22, 2018

David M. Czufin, LP 3R-C

REQUEST FOR FINAL ACTION – EVALUATION 2017-15465 – TVA NUCLEAR CORRECTIVE ACTION PROGRAM – BROWNS FERRY

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 Christopher E. Sheets, Senior Auditor, at (865) 633-7362 or E. David Willis, Director, Evaluations, at (865) 633-7376. We appreciate the courtesy and cooperation received from your staff during the evaluation.

David P. Wheeler

Assistant Inspector General (Audits and Evaluations)

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ET 3C-K

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OIG File No. 2017-15465



Office of the Inspector General

Evaluation Report

To the Senior Vice President, Nuclear Engineering and Operations Support

TVA NUCLEAR CORRECTIVE ACTION PROGRAM – BROWNS FERRY

ABBREVIATIONS

Browns Ferry Browns Ferry Nuclear Plant

CAP Corrective Action Program

CFR Code of Federal Regulations

CR Condition Report

CWEL Chilled Work Environment Letter

MRC Management Review Committee

NPG Nuclear Power Group

NRC Nuclear Regulatory Commission

PI Performance Improvement

PORC Plant Operations Review Committee

QA Quality Assurance

RP Radiation Protection

SPP Standard Programs and Processes

TVA Tennessee Valley Authority

Watts Bar Nuclear Plant

WM Work Management

WO Work Order

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E-MAIL DATED JANUARY 12, 2018, FROM DAVID M. CZUFIN TO DAVID P. WHEELER



Evaluation 2017-15465 – TVA Nuclear Corrective Action Program – Browns Ferry

EXECUTIVE SUMMARY

Why the OIG Did This Evaluation

The Nuclear Regulatory Commission defines a Corrective Action Program (CAP) as the system by which a utility finds and resolves problems at a nuclear plant. The CAP includes a process for evaluating the safety significance of the problems, setting priorities in correcting the problems, and tracking them until they have been corrected. According to the Tennessee Valley Authority, its CAP identifies and drives the correction of conditions, and is designed to address conditions in a manner consistent with the nature of the condition and its importance to plant safety, personnel safety, or plant reliability.

In March 2016, the Nuclear Regulatory Commission issued a Chilled Work Environment Letter for Watts Bar Nuclear Plant and called into question whether the CAP had been effective at identifying and resolving safety culture issues. As a result of the Chilled Work Environment Letter issued to the Tennessee Valley Authority, we initiated evaluations to determine if the CAPs at Browns Ferry, Sequoyah, and Watts Bar Nuclear Plants were effective in resolving concerns. This report summarizes our review of the CAP at Browns Ferry.

What the OIG Found

In summary, we determined reinforcement is needed on the importance of addressing CAP condition reportsⁱ (CRs) in an effective and timely manner. Specifically, we determined some CRs classified as CAP were not resolved effectively because (1) a corrective action did not adequately address a condition, and (2) some actions were not completed by scheduled finish dates. In addition, we identified a CR that was inappropriately closed because a corrective action stated an employee completed a training course that was never taken.

We also identified areas for improvement related to (1) the classification of CRs, (2) CAP education and training, and (3) the routing of anonymous CRs to appropriate personnel.

A CR is a computer generated or paper form used to document evaluation and resolution of CAP and non-CAP issues. The CR is considered within the scope of CAP if the issue potentially affects structures, systems, components or programmatic elements that are safety-related, quality-related, or related to other key elements such as design, licensing, regulated events, and nuclear safety culture. All other issues are considered non-CAP.



Evaluation 2017-15465 – TVA Nuclear Corrective Action Program – Browns Ferry

EXECUTIVE SUMMARY

What the OIG Recommends

We recommend the Senior Vice President, Nuclear Engineering and Operations Support, reinforce the importance of adequately addressing CAP CRs, develop a more robust review of CRs to ensure items are properly classified, provide additional training and reference material, and require anonymous CR routing documentation. Our detailed recommendations are listed in the body of this report.

TVA Management's Comments

In response to our draft report, TVA management agreed to implement four of our five recommendations, but stated they did not intend to change their review process because the CR screening process is consistent with industry practice and provides acceptable results.

See the Appendix for TVA management's complete response.

Auditor's Response

We concur with TVA management's planned and completed actions for four of the five recommendations. However, we believe TVA could implement further process improvements to ensure CRs are properly classified.

BACKGROUND

The Nuclear Regulatory Commission (NRC) defines a Corrective Action Program (CAP) as the system by which a utility finds and resolves problems at a nuclear plant. The CAP includes a process for evaluating the safety significance of the problems, setting priorities in correcting the problems, and tracking them until they have been corrected. The NRC further states that an adequate CAP supports a safety conscious work environment because it enables employees to identify concerns that may affect facility safety and security and provide a formal mechanism for the review and resolution of such concerns.

NRC's Code of Federal Regulations (CFR) Title 10, Part 50, Appendix B, outlines the expectations of a nuclear plant's CAP. It states:

Measures shall be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and nonconformances are promptly identified and corrected. In the case of significant conditions adverse to quality, the measures shall assure that the cause of the condition is determined and corrective action taken to preclude repetition. The identification of the significant condition adverse to quality, the cause of the condition, and the corrective action taken shall be documented and reported to appropriate levels of management.

The Tennessee Valley Authority's (TVA) Nuclear Power Group (NPG) Standard Programs and Processes (SPP) 22.300, Corrective Action Program, states the CAP (1) identifies and drives the correction of conditions and (2) is designed to address conditions in a manner consistent with the nature of the condition and its importance to plant safety, personnel safety, or plant reliability. The procedure states the scope of CAP includes: (1) documentation and resolution of conditions adverse to quality and (2) documentation of conditions that potentially affect structures, systems, components, or programmatic elements that are safety-related,¹ quality-related,² or related to other key elements such as design, licensing, regulated events, and nuclear safety culture. All other issues are considered non-CAP.

In March 2016, the NRC issued a Chilled Work Environment Letter (CWEL) for the Watts Bar Nuclear Plant which concluded a "chilled work environment"³ existed in the Operations Department because of a perception that operators were not free to raise safety concerns using all available avenues without fear of

[&]quot;Safety" relates primarily to accident prevention and/or mitigation functions.

² "Quality" encompasses quality assurance (QA) program requirements describing activities that affect structures, systems, and components.

According to the NRC Inspection Manual, Inspection Procedure 93100, "A 'chilled work environment' is one in which employees perceive that raising safety concerns to their employer or to the NRC is being suppressed or is discouraged and can occur because of an event, interaction, decision, or policy change."

retaliation. Additionally, the NRC called into question whether CAP had been effective at identifying and resolving safety culture issues. The NRC further stated that information from the CAP had provided opportunities for management to identify changes in certain aspects of the safety culture, but the information was not fully acknowledged and acted upon by TVA. As a result of the CWEL, TVA conducted a root cause analysis, which acknowledged a weakness in the CAP. TVA stated in the root cause analysis, "The administration of CAP was determined to have contributed to the cause of the chilled work environment, as it did not provide opportunities for management to identify issues sooner."

As a result of the concerns raised in the CWEL, we initiated evaluations of the CAPs at Browns Ferry, Sequoyah, and Watts Bar Nuclear Plants to determine if the CAPs were effective in resolving concerns. This report summarizes our evaluation of the CAP at Browns Ferry.

OBJECTIVE, SCOPE, AND METHODOLOGY

Our objective was to determine if the Browns Ferry CAP was effective in resolving concerns. The scope included all Browns Ferry condition reports (CRs)⁴ initiated between January 1, 2015, and December 31, 2016.

To achieve our objective, we:

- Reviewed TVA-NPG-SPPs applicable to our evaluation, including:
 - NPG-SPP-01.16, Condition Report Initiation
 - NPG-SPP-10.5, Plant Operations Review Committee
 - NPG-SPP-22.000, Performance Improvement Program
 - NPG-SPP-22.300, Corrective Action Program
 - NPG-SPP-22.301, Service Request/Condition Report Initiation
 - NPG-SPP-22.302, Corrective Action Program Screening
 - NPG-SPP-22.303, PER Actions, Closures and Approvals
 - NPG-SPP-22.600, Issue Resolution
- Interviewed the Browns Ferry Performance Improvement (PI) manager and employees to gain a better understanding of CAP.
- Reviewed the following internal assessments to identify issues related to the Browns Ferry CAP:
 - Browns Ferry QA reports
 - PI self-assessments
 - Nuclear Safety Review Board quarterly minutes
- Reviewed the following external assessments to identify issues related to the Browns Ferry CAP:

⁴ A CR is a computer generated or paper form used to document evaluation and resolution of CAP and non-CAP issues.

- NRC Problem Identification and Resolution reports
- Institute of Nuclear Power Operations 2016 Browns Ferry Evaluation Report
- Randomly selected 45 of 12,375 CAP CRs to determine if the selected CAP CRs were resolved effectively and timely by:
 - Reviewing the documentation for reasonableness and completeness.⁵
 - Verifying that corrective action plans were developed within the required number of days.
 - Verifying corrective actions for CAP CRs were completed by the scheduled finish date in Maximo.
 - Interviewing the employees who originated the CRs (or worked on the CRs if the originator was unavailable)⁶ to obtain additional information about the CR.
- Randomly selected 45 of 27,328 non-CAP CRs to determine if they were classified correctly. For the selected non-CAP CRs, we interviewed the employees who originated the CRs (or worked on the CRs if the originator was unavailable)⁷ to obtain additional information about the CR classification and the CAP. We did not review non-CAP CRs for effectiveness or timeliness.
- Judgmentally selected 10 employees who completed CAP development of 1 or more of the randomly selected CAP CRs to interview for additional information about CAP. We selected employees from the following departments to provide a broad representation of the working population: PI, Maintenance, Tech Support, QA, Radiation Protection (RP), Engineering, Security, and WM.
- Tested all 80 anonymous CRs submitted at Browns Ferry from January 1, 2015, to December 31, 2016, to determine if (1) anonymous CRs were routed to the appropriate personnel in accordance with the SPP, and (2) actions were completed in a timely manner. We did not examine anonymous CRs to determine if they were addressed effectively because we were unable to speak to the employees who originated the CRs.

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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Supporting documentation included: (1) CR information and related work orders (WOs) obtained from Maximo, TVA's work management (WM) system; (2) interview responses; and (3) PI department responses to our CR questions.

⁶ We interviewed 42 employees who were associated with 45 CAP CRs.

We interviewed 36 employees who were associated with 36 non-CAP CRs. The remaining 9 non-CAP CRs were initiated by 6 of the 42 employees interviewed for the CAP CR sample.

FINDINGS AND RECOMMENDATIONS

In summary, we determined reinforcement is needed on the importance of addressing CAP CRs in an effective and timely manner. Additionally, we identified areas for improvement related to (1) the classification of CRs, (2) CAP education and training, and (3) the routing of anonymous CRs to appropriate personnel.

REINFORCEMENT IS NEEDED ON THE IMPORTANCE OF EFFECTIVELY ADDRESSING CAP CRS

We reviewed a random selection of 45 CAP CRs to determine if they had been resolved in an effective and timely manner. Based on our review of supporting documentation and interviews with employees who were associated with the CRs,⁸ we determined:

- One CR regarding wearing improper clothing in a contamination zone was not addressed effectively and the event subsequently reoccurred.
- Four WO actions for CRs were not resolved within scheduled WO finish dates. Instead, the actions associated with the CRs were resolved between one and five days after the scheduled dates.

In addition to the above randomly selected CRs, a recent evaluation⁹ identified a corrective action that had been closed based on incorrect information. A CR had been created on October 8, 2015, that stated the Browns Ferry Plant Operations Review Committee (PORC) chairperson had not completed the PORC chairperson course. The corrective action stated that Browns Ferry verified the individual completed this course. Our review of the chairman's training record in TVA's Learning Management System¹⁰ showed the course was not completed. According to TVA personnel, the PORC chairperson was appointed by the plant manager and the training was not required at the time he was appointed. Closing CRs based on inaccurate information can impact the effectiveness of the program and prevent needed actions from being completed.

In summary, we could not determine if Browns Ferry's CAP was effective due to the number of errors found. Although the individual errors do not appear to be significant, the cumulative effect of the errors indicates reinforcement is needed on the importance of effectively addressing the CAP CRs at Browns Ferry.

We could not determine if actions were effective or timely for 4 of the 45 CRs because the work associated with the CRs is scheduled for completion at a later date.

Evaluation 2017-15466, Actions to Address Issues Identified in Assessments of Nuclear Quality Assurance, August 31, 2017.

The purpose of TVA's Learning Management System is to track and verify completions of both regulatory and TVA policy training requirements for TVA employees and contractors.

Recommendation

We recommend the Senior Vice President, Nuclear Engineering and Operations Support, reinforce the importance of addressing CAP CRs in an effective and timely manner.

TVA Management's Comments – TVA management stated they have identified gaps related to action plan development and action closure quality that will be addressed through planned fleet improvement initiatives. TVA Nuclear will implement our recommendation through the planned initiatives by July 29, 2018.

See the Appendix for TVA's complete response.

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

SOME CRS WERE NOT PROPERLY CLASSIFIED

We reviewed supporting documentation for (1) a random sample of 45 non-CAP CRs from the population of 27,328 and (2) the population of 80 anonymous CRs to determine if the CRs were classified correctly. We determined that 2 of the 45 non-CAP CRs sampled and 2 of the 80 anonymous CRs should have been classified as CAP CRs.

Non-CAP CR Review

We reviewed the supporting documentation of 45 randomly selected non-CAP CRs and determined 2 CRs should have been classified as CAP rather than non-CAP. These CRs cited concerns regarding:

- A lack of labor support for the U2R18 drywell cleanout. RP technicians
 assisted with the removal of large amounts of hoses and tools that reduced
 their ability to perform RP activities. The corrective action plan stated it was a
 business decision based on budget and funding. Since RP is an oversight
 and regulatory required role, we determined the CR should have been
 classified as CAP rather than non-CAP.
- The use of Action Tracking Items and non-CAP CRs (nonquality processes) to track 26 changes made to quality related documents. However, NPG-SPP-09.3, Plant Modifications and Engineering Change Control, allows only nonconfiguration control impacts to be tracked through Action Tracking Items or non-CAP CRs.

Anonymous CR Review

We reviewed the 80 anonymous concerns submitted in calendar years 2015 and 2016 and determined 2 CRs should have been classified as CAP rather than non-CAP. These anonymous CRs cited concerns regarding:

 Behaviors exhibited by TVA contractor employees that could have potentially violated 10 CFR 50.5 related to deliberate misconduct. According to 10 CFR 50.5, any employee of a contractor may not deliberately submit to a

licensee, information that the person submitting the information knows to be incomplete or inaccurate in some respect material to the NRC.

 Issues with a radwaste foreman's planning that could have potentially violated 10 CFR 50. According to the regulation, activities affecting quality shall be prescribed and accomplished in accordance with documented instructions, procedures, or drawings.

TVA Nuclear is responsible for ensuring that CAP issues are identified, managed, and corrected in accordance with TVA's CAP guidelines (NPG-SPP-22.300, Corrective Action Program). Conditions that enter the CAP go through a more thorough process than non-CAP conditions which are handled under NPG-SPP-22.600, Issue Resolution. If CRs are improperly classified as non-CAP rather than CAP, TVA runs the risk of applying less resources and management attention than would be required under CAP for appropriate resolution.

Recommendation

We recommend the Senior Vice President, Nuclear Engineering and Operations Support, develop a more robust review of CRs to ensure items are properly classified.

TVA Management's Comments – TVA management stated they did not intend to change their review process because the CR screening process is already robust, and is then reviewed by the Management Review Committee (MRC),¹¹ which is consistent with industry practice and provides acceptable results. However, TVA management stated that they would prepare and distribute a lessons learned to the MRC at all three sites and the corporate office by March 1, 2018.

See the Appendix for TVA's complete response.

Auditor's Response – We agree with management's plan to distribute a lessons learned to the MRC at all three sites and the corporate office. However, we believe TVA could implement further process improvements to ensure CRs are properly classified, based on the following gaps in CR classification:

- 4.44 percent of non-CAP CRs at Browns Ferry included in our sample were misclassified.
- Our review of 80 anonymous concerns found that 2 CRs should have been classified as CAP rather than non-CAP.

¹¹ The MRC is chartered with providing oversight of the Performance Improvement Program execution at a site.

NEED FOR ADDITIONAL CAP TRAINING

We interviewed 78 employees to assist in our review of effectiveness and timeliness of CAP CRs and/or to obtain general information about the CAP. Employees provided the most positive responses when discussing the following areas associated with the Browns Ferry CAP:

- Ninety-one percent of all employees interviewed stated the CAP is effective, with another 6 percent stating the CAP is at least somewhat effective.
- Ninety-one percent of all interviewees believe it is worth taking the time to initiate CRs.
- Ninety-two percent of all interviewees responded that there are other methods to escalate a CR if they feel it is not addressed effectively.

Although employees generally responded positively about the Browns Ferry CAP, employees identified areas for improvement related to CAP.

Employees Believe CAP Includes Items Outside the Scope of CAP Eighty-three percent of all employees interviewed believe the CAP includes non-CAP CRs and WOs, 12 which are outside the scope of CAP. Interview responses indicated that when an employee refers to CAP, or a CAP procedure, he or she could actually be referring to a non-CAP item or WO. If employees believe a non-CAP issue or WO is not receiving the proper attention or resolution and associates this issue with the CAP, they may be hesitant to raise actual CAP concerns in the future. Therefore, it is important for employees to know the distinctions between CAP CRs, non-CAP CRs, and WOs.

Employees Would Like More CAP or CR Training

Browns Ferry's PI department provides CAP and CR training to its employees; however, some Browns Ferry personnel indicated a training gap exists. Thirteen percent of all interviewees stated they did not receive adequate CAP training while an additional 8 percent of employees were either unsure or did not explicitly state whether they received adequate training. Interview comments suggested that the process beyond CR initiation needs more explanation and additional training is needed so employees better understand the process.

TVA management began a CAP boot camp at Watts Bar in 2016 that provided employees instructions on how to look up CRs and a step-by-step guide of how CAP and WM processes relate to CRs. In addition to these guides that are provided to employees during the boot camp, Watts Bar also created a CAP Boot Camp Talking Points guide for instructors to use when delivering course material. This guide contains information that would be beneficial as a reference to any user who initiates a CR into the CAP, non-CAP, or WM process. This information includes: (1) CAP initiation, (2) clear distinctions between CAP and non-CAP CRs, (3) interaction between CAP and WM processes, and

WOs are maintenance or modification activities to be performed. Although the CAP frequently relies on WOs for resolution, it is not part of the CAP.

(4) alternatives to CAP. TVA management indicated a CAP boot camp may be implemented at Browns Ferry and Sequoyah as well.

Recommendations

We recommend the Senior Vice President, Nuclear Engineering and Operations Support, provide:

- Additional training to reinforce the distinctions between CAP, non-CAP, and WM processes.
- Employees with all CAP boot-camp guides to use as a reference.

TVA Management's Comments – TVA management agreed with the recommendations and stated they would be implemented as written by July 29, 2018. See the Appendix for TVA's complete response.

LACK OF EVIDENCE THAT ANONYMOUS CRs WERE ROUTED APPROPRIATELY

NPG-SPP-01.16, Condition Report Initiation,¹³ requires an anonymous CR to be routed to the following individuals:

- Employee Concerns Specialist/Employee Concerns Program Manager
- Director of Plant Support/Director of Pl
- Plant Manager
- Site Vice President/Vice President
- Corporate Senior Program Manager, Safety Culture¹⁴

TVA was unable to provide documentation that 54 of 80 anonymous CRs were routed to all individuals specified in the SPP. Additionally, we were unable to locate documentation that 8 of the 54 CRs were routed to any of the appropriate personnel.

Although the procedures governing the routing and disposition of anonymous CRs do not require the retention of routing documentation, without documentation of routing, it would be difficult for management or oversight groups to determine if the appropriate personnel were made aware of potentially significant concerns raised within the plant.

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NPG-SPP-01.16, Condition Report Initiation, superseded NPG-SPP-22.301, Condition Report Initiation, on October 28, 2016.

NPG-SPP-22.301, Service Request Initiation, was revised on December 7, 2015, and added the Corporate Senior Program Manager, Safety Culture, to its routing guidelines.

Recommendation

We recommend the Senior Vice President, Nuclear Engineering and Operations Support, require documentation to be maintained that verifies anonymous CRs are routed to the appropriate personnel.

TVA Management's Comments – TVA management agreed with the recommendation and implemented it in NPG-SPP-01.16 Revision 1, effective January 11, 2018. See the Appendix for TVA's complete response.

From: Willingham, Paula Christine On Behalf Of Czufin, David Miller

Sent: Friday, January 12, 2018 8:34 AM

To: Wheeler, David P.

Cc: Stinson, Greg; Willis, E. David; Jacosalem, John A.; Shields, David S; Ruble, Samuel L.; Meade,

Melissa A; Czufin, David Miller; Willingham, Paula Christine **Subject:** OIG Audits Requests - 2017-15465/15461/15464

David,

Thank you for your review of the BFN CAP Program. We have the following comments regarding the recommendations in the report:

Recommendation: We recommend the Senior Vice President, Nuclear Engineering and Operations Support, reinforce the importance of addressing CAP CRs in an effective and timely manner.

TVA has identified gaps related to action plan development and action closure quality. Planned fleet improvement initiatives will address this issue. Nuclear will implement this recommendation through the planned initiatives by July 29, 2018.

<u>Recommendation:</u> We recommend the Senior Vice President, Nuclear Engineering and Operations Support, develop a more robust review of CRs to ensure items are properly classified.

TVA's process for screening CRs consists of a robust process. We use a multi-discipline team to initially screen CRs. The results of this screen is reviewed and challenged by a multi-discipline, and more experienced, group consisting of Senior Leadership Team members at the Management Review Committee. We do not intend to change our review processes. They are consistent with industry practice and provides acceptable results. The individual discrepancy identified was discussed with the BFN screening committee as a learning opportunity, and we plan to prepare and distribute a lessons learned for all 3 sites and the corporate office Management Review Committees by March 1, 2018.

<u>Recommendation</u>: We recommend the Senior Vice President, Nuclear Engineering and Operations Support, provide:

- · Additional training to reinforce the distinctions between CAP, non-CAP, and WM processes.
- Employees with all CAP boot camp guides to use as a reference.

Nuclear agrees with this recommendation and will implement it as written by July 29, 2018.

<u>Recommendation</u>: We recommend the Senior Vice President, Nuclear Engineering and Operations Support, require documentation to be maintained that verifies anonymous CRs are routed to the appropriate personnel.

Nuclear agrees with this recommendation and implemented it in NPG-SPP-01.16 Revision 1, effective January 11, 2018 .

Let me know if you have any questions.

DCz