



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
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ATLANTA, GEORGIA 30303-1200

March 13, 2019

Mr. Joseph W. Shea
Vice President, Nuclear Regulatory Affairs
and Support Services
Tennessee Valley Authority
1101 Market Street, LP 4A
Chattanooga, TN 37402-2801

SUBJECT: WATTS BAR NUCLEAR PLANT - NRC PROBLEM IDENTIFICATION AND
RESOLUTION INSPECTION; NRC CONFIRMATORY ORDER; AND SAFETY
CONSCIOUS WORK ENVIRONMENT ISSUE OF CONCERN FOLLOW-UP
05000390/2019010 AND 05000391/2019010

Dear Mr. Shea:

On January 31, 2019, the U.S. Nuclear Regulatory Commission (NRC) completed a problem identification and resolution inspection at your Watts Bar Nuclear Plant Units 1 and 2. On January 31, 2019 and March 6, 2019, the inspectors discussed the results of this inspection with Mr. Tom Marshall, Mr. Tony Williams and other members of your staff. The results of this inspection are documented in the enclosed report.

The NRC inspection team reviewed the plant's corrective action program and the plant's implementation of the program to evaluate its effectiveness in identifying, prioritizing, evaluating, and correcting problems, and to confirm that the station was complying with NRC regulations and licensee standards for corrective action programs. Based on the samples reviewed, the team determined that your staff's performance in each of these areas adequately supported nuclear safety.

The team also evaluated the plant's processes for use of industry and NRC operating experience information and the effectiveness of the station's audits and self-assessments. Based on the samples reviewed, the team determined that your staff's performance in each of these areas adequately supported nuclear safety.

Finally the team reviewed the plant's programs to establish and maintain a safety conscious work environment (SCWE), and interviewed plant personnel to evaluate the effectiveness of these programs. This review was also a follow-up to the NRC Confirmatory Order (CO) EA-17-022, dated July 27, 2017 (ML 17208A647) and Chilling Effect Letter (CEL) entitled, "Chilled Work Environment for Raising and Addressing Safety Concerns at the Watts Bar Nuclear Plant," dated March 23, 2016 (ML16083A479). The staff evaluated the attributes of a SCWE as described in inspection procedure (IP) 93100, "Safety Conscious Work Environment Issue of Concern Follow-up." The team concluded that Watts Bar demonstrated a general positive trajectory in improving SCWE, but corrective actions had not been in place long enough to determine that SCWE issues were resolved and the corrective actions taken would prevent recurrence.

NRC inspectors documented two findings of very low safety significance (Green) in this report. These findings involved violations of NRC requirements. Additionally, NRC inspectors documented one Severity Level IV violation with no associated finding. The NRC is treating this violation as non-cited violation (NCV) consistent with Section 2.3.2.a of the Enforcement Policy.

If you contest the violations or significance or severity of the violations documented in this inspection report, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region II; the Director, Office of Enforcement; and the NRC resident inspector at Watts Bar.

If you disagree with a cross-cutting aspect assignment in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region II; and the NRC resident inspector at Watts Bar.

This letter, its enclosure, and your response (if any) will be made available for public inspection and copying at <http://www.nrc.gov/reading-rm/adams.html> and at the NRC Public Document Room in accordance with 10 CFR 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

/RA/

Omar Lopez-Santiago, Chief,
Reactor Projects Branch 5
Division of Reactor Projects

Docket Nos.: 05000390 and 05000391
License Nos.: NPF-90 and NPF-96

Enclosure:
Inspection Report 05000390/2019010 and 05000391/2019010

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Letter to Joseph Shea from Omar Lopez Santiago dated March 13, 2019.

SUBJECT: WATTS BAR NUCLEAR PLANT - NRC PROBLEM IDENTIFICATION AND RESOLUTION INSPECTION; NRC CONFIRMATORY ORDER; AND SAFETY CONSCIOUS WORK ENVIRONMENT ISSUE OF CONCERN FOLLOW-UP 05000390/2019010 AND 05000391/2019010

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**U.S. NUCLEAR REGULATORY COMMISSION
Inspection Report**

Docket Number(s): 05000390 and 05000391

License Number(s): NPF-90 and NPF-96

Report Number(s): 05000390/2019010 and 05000391/2019010

Enterprise Identifier: I-2019-010-0019

Licensee: Tennessee Valley Authority

Facility: Watts Bar, Units 1 and 2

Location: Spring City, TN 37381

Inspection Dates: January 14, 2019 to January 31, 2019

Inspectors: D. Hardage, Senior Resident Inspector
S. Morrow, Human Factors Engineer (Senior Safety Culture Assessor)
D. Seat, Project Engineer
R. Taylor, Senior Project Engineer
D. Terry-Ward, Construction Inspector
A. Thomas, Resident Inspector
J. Viera, Operations Engineer
A. DeFrancisco, Senior Safety Culture Assessor Trainee

Approved By: Omar Lopez-Santiago, Chief,
Reactor Projects Branch 5
Division of Reactor Projects

Enclosure

SUMMARY

The U.S. Nuclear Regulatory Commission (NRC) continued monitoring the licensee’s performance by conducting the biennial inspection of the Problem Identification and Resolution Program at Watts Bar Units 1 and 2 in accordance with the Reactor Oversight Process. The Reactor Oversight Process is the NRC’s program for overseeing the safe operation of commercial nuclear power reactors. Refer to <https://www.nrc.gov/reactors/operating/oversight.html> for more information. Findings and violations being considered in the NRC’s assessment are summarized in the table below.

List of Findings and Violations

Failure to Ensure the Auto Start Feature for the Standby Annulus Vacuum Fan Results in Inoperability of Shield Building.			
Cornerstone	Significance	Cross-cutting Aspect	Report Section
Barrier Integrity	Green NCV 05000390, 391/2019-010-01 Open/Closed	None	71152B
A self-revealed, Green, NCV of 10 CFR Part 50, Appendix B, Criterion V, “Instructions, Procedures, and Drawings,” was identified on May 11, 2018, when the licensee failed to provide procedural guidance to ensure the auto start feature for the standby annulus vacuum fan was enabled.			

Failure to Implement Annunciator Response Procedure Results in Inoperability of Containment Purge Valves			
Cornerstone	Significance	Cross-cutting Aspect	Report Section
Barrier Integrity	Green NCV 05000391/2019-010-02 Open/Closed	[H.13] - Consistent Process	71152B
A self-revealed, Green, NCV of Watts Bar Unit 2 Technical Specification 5.7.1, “Procedures,” was identified on July 27, 2018, when the licensee did not implement procedures to verify a main control room annunciator indicating a malfunction of a purge air exhaust radiation monitor.			

Failure to Adequately Implement Requirements of Confirmatory Order EA-17-022, Commitment V.1.b.3			
Cornerstone	Significance	Cross-cutting Aspect	Report Section
Not Applicable	Severity Level IV NCV 05000390, 391/2019-010-03 Open	Not Applicable	92702
The inspectors identified a Severity Level IV NCV for the licensee’s failure to adequately implement requirements of Confirmatory Order EA-17-022, commitment V.1.b.3. Specifically, the licensee failed to ensure that new supervisory employees completed safety conscious work environment (SCWE) training within three months of their hire or promotion effective date.			

INSPECTION SCOPES

Inspections were conducted using the appropriate portions of the inspection procedures (IPs) in effect at the beginning of the inspection unless otherwise noted. Currently approved IPs with their attached revision histories are located on the public website at <http://www.nrc.gov/reading-rm/doc-collections/insp-manual/inspection-procedure/index.html>. Samples were declared complete when the IP requirements most appropriate to the inspection activity were met consistent with Inspection Manual Chapter (IMC) 2515, "Light-Water Reactor Inspection Program - Operations Phase." The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel to assess licensee performance and compliance with Commission rules and regulations, license conditions, site procedures, and standards.

OTHER ACTIVITIES – BASELINE

71152B - Problem Identification and Resolution

02.04 Biennial Team Inspection (1 Sample)

The inspectors performed a biennial assessment of the licensee's corrective action program, use of operating experience, self-assessments and audits, and safety conscious work environment.

- Corrective Action Program Effectiveness – The inspectors assessed the corrective action program's effectiveness in identifying, prioritizing, evaluating, and correcting problems.
- Operating Experience, Self-Assessments and Audits – The inspectors assessed the effectiveness of the station's processes for use of operating experience, audits and self-assessments.
- Safety Conscious Work Environment – The inspectors assessed the effectiveness of the station's programs to establish and maintain a safety conscious work environment.

OTHER ACTIVITIES – TEMPORARY INSTRUCTIONS, INFREQUENT AND ABNORMAL

92702 - Followup on Corrective Actions for Violations and Deviations

Followup - Corrective Actions - Violations and Deviations (1 Sample)

The inspectors reviewed commitments associated with six items from Confirmatory Order EA-17-022, issued to TVA on July 27, 2017.

(1) Commitment V.1.b.1.c: This commitment and action required that training records be retained consistent with applicable TVA record retention policies and made available to the NRC upon request. The inspectors reviewed the training records for TVA employees and contractors to verify the records were retained consistent with TVA policies. The inspection was completed for Browns Ferry, Sequoyah, Watts Bar and TVA Corporate.

(2) Commitment V.1.b.2: This commitment and action required that training be provided within one year and on an annual basis thereafter to, at a minimum, all working status

nuclear business group supervisory employees, contractor supervisory employees involved in nuclear-related work activities, human resource staff involved in the adverse employment action process, employee concerns program staff, contract technical stewards for nuclear-related work activities, and the personnel in the TVA Office of General Counsel who are engaged in nuclear-related work activities. TVA identified 216 individuals at Watts Bar who were required to complete the training. The inspectors verified that the list of individuals included first line supervisors and above, contract technical stewards, human resources personnel, and employee concerns personnel. The inspection was only completed for Watts Bar.

(3) Commitment V.1.b.3: This commitment and action required that new supervisory employees complete initial training through in-person or computer-based training within three months of their hire or promotion effective date. The training also required, at a minimum, a discussion of the training material with personnel in the TVA Office of General Counsel who are engaged in nuclear-related work activities. This commitment applied to new supervisory employees who were not included in the initial training specified in Commitment V.1.b.2. The inspectors reviewed records of TVA Watts Bar employees and contractors who were hired or promoted into supervisory positions after July 28, 2018 to verify that personnel had completed the specified training within three months of their hire or promotion effective date. The inspection was only completed for Watts Bar.

(4) Commitment V.1.b.4: This commitment and action required that initial training be conducted in person by the independent third-party for personnel specified in V.1.b.2 who work at Watts Bar and personnel in the TVA Office of General Counsel who are engaged in nuclear-related work activities. Additionally, initial training for the other employees specified in V.1.b.2 and subsequent refresher training shall be conducted by personnel in the TVA Office of General Counsel who are engaged in nuclear-related work activities. The inspectors reviewed training records to verify that personnel specified in V.1.b.2 had completed initial training, and Watts Bar personnel had completed initial training conducted in person by the independent third-party. The inspection was completed for Browns Ferry, Sequoyah, Watts Bar and TVA Corporate.

(5) Commitment V.1.d.1: This commitment required an independent third-party to perform quarterly audits for the first year after the date of issuance of the CO, and semi-annually for the next two years, of the adverse employment action process. The inspectors reviewed the "Fourth Independent Auditor's Report of the TVA Adverse Employment Action Process for Quarter Ending 6/30/2018," dated 7/10/2018, and the "Fifth Independent Auditor's Report of the TVA Adverse Employment Action Process for Semester Ending 12/31/2018," dated 12/28/2018. The inspectors verified that the audits included a review of all adverse employment actions, periodical attendance at Executive Review Boards and a review of chilling effect mitigation plans (inclusive of recommendations as appropriate). The inspection of the audit was completed for Browns Ferry, Sequoyah, Watts Bar and TVA Corporate.

Inspectors also performed an independent review of recent Adverse Employment Action and Executive Review Board (ERB) packages at Watts Bar. Specific activities included review of the background information associated with recent ERBs, associated SCWE Mitigation Plan Screening, SCWE Mitigation Plans, and results of recent pulse surveys conducted as a result of adverse actions taken against employees.

(6) Commitment V.1.e.1: This commitment required TVA to conduct an independent nuclear safety culture assessment at Watts Bar in 2017, evaluate the results and develop,

implement, and track to completion corrective actions to address weaknesses identified through the assessment. The inspectors reviewed corrective actions and enhancements associated with the 2017 nuclear safety culture assessment at Watts Bar (CR 1346431) to verify that corrective actions were implemented and tracked to completion. The inspection was only completed for Watts Bar.

93100 - Safety Conscious Work Environment Issue of Concern Follow-up

Safety Conscious Work Environment (1 Sample)

Qualified safety culture assessors performed a limited assessment of the SCWE at Watts Bar in accordance with IP 93100, “Safety Conscious Work Environment Issue of Concern Follow-up,” and other IPs as referenced by IP 93100. The objectives of the assessment were to: (1) determine whether actions taken by TVA have improved the work environment in the Radiation Protection and Operations departments; (2) determine if employees are currently reluctant to raise safety or regulatory issues; and (3) determine if employees are currently being discouraged from raising safety or regulatory issues.

The assessors conducted semi-structured focus groups and interviews with 50 Watts Bar employees, contractors, and management. Individuals were randomly selected for the focus groups and interviews by the assessors. The following departments were sampled: Radiation Protection (RP), Operations, Chemistry, Maintenance, and Security.

The assessors also reviewed case files and assessments of the Employee Concerns Program (ECP), minutes from the Nuclear Safety Culture Monitoring Panel and Site Leadership Team meetings, and condition reports and corrective actions associated with safety culture and SCWE.

INSPECTION RESULTS

Observation	71152B
<p>1. Corrective Action Program Effectiveness</p> <p>Based on the samples reviewed, the team determined that the licensee’s corrective action program (CAP) complied with regulatory requirements and self-imposed standards. The licensee’s implementation of the CAP adequately supported nuclear safety.</p> <p>Problem Identification</p> <p>The team determined that most conditions that required generation of a condition report (CR) by licensee procedure, NPG-SPP-22.300, “Corrective Action Program,” had been appropriately entered into the CAP. The team observed supervisors at the Management Review Committee (MRC) meetings and Plant Screening Committee (PSC) meetings appropriately questioning and challenging condition reports to ensure clarification of issues and appropriate entry into the corrective action program. In response to several housekeeping and minor equipment observations identified by the team during plant walkdowns, licensee personnel initiated condition reports and/or took immediate action to address the issues. Based on the samples reviewed, the team determined that the licensee trended equipment and programmatic issues, and appropriately identified problems in condition reports. Additionally, the team concluded that personnel were identifying trends at</p>	

low levels. However, the team did identify multiple examples of issues that would not have been entered into the licensee's CAP without NRC involvement. Specifically, in the second half of 2016 and 2017 the team identified eleven instances where operators had failed to initiate a condition report for technical specification action statement entries or other conditions adverse to quality. The team did note that there were no similar examples in 2018 after licensee site wide communications conducted in December 2017. Overall, the team determined that the licensee is identifying problems at the proper threshold and entering them into the corrective action program.

Problem Prioritization and Evaluation

Based on the review of CRs sampled by the inspection team during the onsite period, the team concluded that problems were generally prioritized and evaluated in accordance with the licensee's CAP procedures as described in NPG-SPP-22.300, "Corrective Action Program." Operability and reportability determinations were performed when conditions warranted, and the evaluations generally supported the conclusions. The causal analyses reviewed appropriately considered the extent of condition or problem, generic issues, and previous occurrences of the issue. In general, the team determined the technical adequacy and depth of evaluations was appropriate.

The team did note the initial evaluation of the failure of the 1-3 reactor coolant pump and associated unit 1 reactor trip on May 2, 2017 did not identify the true cause of the failure. Following the second reactor trip on May 4, 2017, the licensee was able to identify the cause and appropriate corrective actions were taken.

The team also noted several examples where CAP procedural requirements were not performed or documented. Specifically, required MRC reviews for level 1 and 2 evaluations were not documented; several examples where required NRC violation checklists and department head approvals for evaluations addressing NRC violations were not performed; and several examples were noted where Gap analyses were not performed or were inadequate. Additionally, the team noted examples where condition reports lacked ties to Licensee Event Report (LER) corrective actions, objective evidence, and corrective action focus codes. The licensee initiated CRs on these issues. The team did not find evidence these issues impacted the quality of the evaluations reviewed and considered these issues as minor performance deficiencies.

Overall, the team determined that the licensee's process for evaluating and prioritizing issues once they had been entered into the corrective action program supported nuclear safety.

Effectiveness of Corrective Actions

For Significant Conditions Adverse to Quality (SCAQ), corrective actions directly addressed the cause and effectively prevented recurrence in that a review of performance indicators, CRs, and effectiveness reviews demonstrated that significant conditions adverse to quality had not recurred. Effectiveness reviews for corrective actions to prevent recurrence (CAPRs) were generally sufficient to ensure corrective actions were properly implemented and were effective. The team reviewed green findings since the last PI&R biennial inspection along with CR's written to document the findings. The team found that CRs had adequate corrective actions in place, completed actions were closed, and open actions had reasonable dates for completion. The team reviewed the actions for the CRs and noted that the majority of them were corrective actions not only for what happened, such as the performance deficiency, but

also included corrective actions for the reason why the performance deficiency happened. The team did note several examples where closed CRs lacked administrative procedural requirements for closures or where CR actions were closed to work orders (WOs) and the associated WO actions were not implemented correctly and where WOs lacked the administrative procedural requirements for closure. The licensee generated CRs on these issues and the team evaluated these as minor performance deficiencies. Based on review of corrective action documents, interviews with licensee staff, and verification of completed corrective actions, the team determined that overall, corrective actions were timely, commensurate with the safety significance of the issues, and effective, in that conditions adverse to quality were corrected and non-recurring.

2. Use of Operating Experience (OE)

Based on a review of selected documentation related to OE issues, the team determined that the licensee was generally effective in screening operating experience for applicability to the plant. Industry OE was evaluated at either the corporate or plant level depending on the source and type of document. Relevant information was then forwarded to the applicable department for further action or informational purposes. Operating Experience issues requiring action were entered into the CAP for tracking and closure. The team did note one example where a closed OE evaluation lacked a clear conclusion. The licensee generated a CR on this issue and the team evaluated this as a minor performance deficiency. The team evaluated the following licensee event reports which can be accessed at <https://lersearch.inl.gov/LERSearchCriteria.aspx>:

1. (Closed) Licensee Event Report (LER) 05000391/2018-002-00, Loss of Shield Building Vacuum due to Equipment Failure
2. (Closed) Licensee Event Report (LER) 05000391/2018-004-00, Failure to Implement Annunciator Response Process Results in a Condition Prohibited by Technical Specifications

The inspectors reviewed the licensee's LERs and Corrective Actions associated with the events and determined they were adequate.

3. Self-Assessments and Audits

The team determined that the scopes of assessments and audits were adequate. Self-assessments were generally detailed and critical. The team verified that CRs were created to document areas for improvement and findings resulting from self-assessments, and verified that actions had been completed consistent with those recommendations. Audits of the quality assurance program appropriately assessed performance and identified areas for improvement. Generally, the licensee performed evaluations that were technically accurate.

4. Safety Conscious Work Environment

Based on the inspection interviews, the team observed indications that the work environment in RP is improving and past improvements in the Operations department have been sustained. However, the team noted that the environment in RP is still fragile and in a state of flux due to recent personnel changes, the in-progress implementation of a work environment improvement plan (CR 1460021), and a planned revision to the root cause analysis of the RP chilled work environment that could include additional causes and corrective actions (CR 1452420). The corrective actions to improve the work environment in RP need more run time

to assess the sustainability of changes.

The team reviewed the Employee Issue Tracking Matrix (EITM) associated with CR 1452420. The EITM tool was developed to aggregate work environment data at both the station and department specific level. The team observed that the EITM tool provided improved visual trending of safety conscious work environment indicators at a department level, and opportunities to identify and take action when work environment challenges were at a lower threshold than a chilled work environment. However, the team noted that the tool lacked supporting documentation or guidance to ensure consistent use and continued proactive action at a low threshold. Watts Bar management indicated that the tool was still being tested and modified at the time of the inspection.

The team' review of ECP indicated that case files were complete and there was improved tracking of corrective actions from the last PI&R inspection. The team noted that ECP recently completed a self-assessment, dated November 20, 2018, and had an excellence plan in place to address feedback from the self-assessment. The team did not observe a difference in perceptions of ECP during the inspection interviews and focus groups as compared to previous inspections. However, most actions from the excellence plan were in progress at the time of the inspection.

The team did not identify other departments that met the criteria for a chilled work environment. However, the team noted some general work environment issues that may represent challenges to the free flow of information, and could produce a reluctance to raise nuclear safety concerns if not proactively addressed. These general work environment issues were most apparent among Chemistry staff, and to a lesser extent among Security and Auxiliary Operations staff. Watts Bar management demonstrated that they were aware of the general work environment issues and taking corrective actions to address the issues before they affected the environment for raising nuclear safety concerns. In particular, CR 1475636 was initiated to document actions to monitor and improve the Chemistry department work environment. Management's response demonstrated a more proactive approach to resolving general work environment issues than previous efforts.

The team concluded that Watts Bar demonstrated a general positive trajectory in improving SCWE, but corrective actions had not been in place long enough to determine that SCWE issues were resolved and the corrective actions taken would prevent recurrence.

Failure to Ensure the Auto Start Feature for the Standby Annulus Vacuum Fan results in Inoperability of Shield Building.			
Cornerstone	Significance	Cross-cutting Aspect	Report Section
Barrier Integrity	Green NCV 05000391/2019-010-01 Open/Closed	None	71152B
A self-revealed, Green, NCV of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," was identified on May 11, 2018, when the licensee failed to provide procedural guidance to ensure the auto start feature for the standby annulus vacuum fan was enabled.			

Description: At 1011 Eastern Daylight Time (EDT) on May 11, 2018, containment shield building annulus differential pressure exceeded the required limit. The Shield Building was declared inoperable requiring entry into Technical Specification (TS) Limiting Condition for Operation (LCO) 3.6.15 Conditions A and B. The event was initiated by failure of the operating annulus vacuum fan. Main control room operators manually started the stand-by annulus vacuum fan to recover pressure. The required shield building annulus differential pressure was restored and LCO 3.6.15 Conditions A and B were exited May 11, 2018 at 1016 EDT.

The shield building transient was caused by the failure of the fan belts associated with annulus vacuum fan 2A. In addition, the hand switch for the 2B annulus vacuum fan had not been reset after actuation during a previous surveillance to permit the fan to auto start on lowering annulus vacuum.

The inspectors reviewed the licensee's LER 2018-002-00 and corrective actions associated with the event and determined they were adequate.

Corrective Action(s): The licensee determined that during blackout testing in U2R1, after actuation of phase A for testing, there was no procedural guidance to reset the annulus exhaust fan start circuits, which are locked out by the phase A signal. The licensee identified the following corrective actions: (1) revise 1/2-SOI-65.1, "Annulus Vacuum System" to include direction to reset the standby vacuum fan circuit logic following a phase A containment isolation signal; (2) replace the belts on the 2A annulus vacuum fan; and (3) update the preventative maintenance frequency for inspection and replacement, as necessary, of the annulus vacuum fans belts.

Corrective Action Reference(s): CR 1413807

Performance Assessment:

Performance Deficiency: Failure to provide procedural guidance to ensure the auto start feature for the standby annulus vacuum fan was enabled was a performance deficiency (PD). Specifically, quality related procedure 2-SOI-65.1, "Annulus Vacuum System" did not provide direction to reset the standby vacuum fan circuit logic following a phase A containment isolation signal.

Screening: The inspectors determined the performance deficiency was more than minor because it was associated with the Procedure Quality attribute of the Barrier Integrity cornerstone. Specifically, failure to ensure the auto start feature for the vacuum fan was enabled led to the inoperability of the shield building.

Significance: The inspectors assessed the significance of the finding using Appendix A, "Significance Determination of Reactor Inspection Findings for At - Power Situations." Because in accordance with Exhibit 3, "Barrier Integrity Screening Questions," the performance deficiency only represented a degradation of the radiological barrier function provided for the control room, or auxiliary building, or spent fuel pool, the finding screened as Green.

Cross-cutting Aspect: Not Present Performance. No cross cutting aspect was assigned to this finding because the inspectors determined the finding did not reflect present licensee performance.

Enforcement:

Violation: 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," states, in part, that activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings.

Contrary to the above, prior to May 11, 2018, the licensee did not accomplish activities affecting quality in accordance with prescribed procedures appropriate to the circumstance. Specifically, 2-SOI-65.1, "Annulus Vacuum System" is a quality related procedure and was not appropriate to the circumstance in that it failed to ensure the auto start feature for the standby annulus vacuum fan was enabled. This led to the inoperability of the shield building following the trip of the running fan.

Enforcement Action: This violation is being treated as a Non-Cited Violation, consistent with Section 2.3.2 of the Enforcement Policy.

Failure to Implement Annunciator Response Procedure results in Inoperability of Containment Purge Valves

Cornerstone	Significance	Cross-cutting Aspect	Report Section
Barrier Integrity	Green NCV 05000391/2019-010-02 Open/Closed	[H.13] - Consistent Process	71152B

A self-revealed Green finding and associated NCV of Watts Bar Unit 2 Technical Specification 5.7.1, "Procedures," was identified on July 27, 2018, when the licensee did not implement procedures to verify a main control room annunciator indicating the malfunction of a purge air exhaust radiation monitor required by technical specifications.

Description: At 1040 on July 27, 2018, while preparing to place Unit 2 containment purge into service, notification was received locally by licensee staff that Train A containment purge air exhaust radiation monitor (RM) 2-RM-90-130 would not source check, and the green "operate" light was not illuminated. Subsequently, it was noted that instrument malfunction annunciator (ANN) 193-D, "CNTMT PURGE EXH, 2-RM-130/131, INSTR MALF" was illuminated. A review of plant data revealed that ANN 193-D had originally alarmed in the main control room (MCR) at 1007 on July 26, 2018. 2-RM-90-130 was inoperable at that point but was not recognized by licensed operators until 1040 on July 27, 2018. Procedure 2-PI-OPS-ANN, Annunciator Verification, requires verification of the status of all Unit 2 annunciators at least once per shift in Mode 1, however, the status of annunciator 193-D was not properly verified for two shifts. Entry into technical specifications (TS) Limiting Conditions for Operation (LCO) 3.3.6, Containment Vent Isolation, Condition B, and TS LCO 3.6.3, Containment Isolation Valves, Condition A, was required at 1007 on July 26, 2018, with 2-RM-90-130 and associated containment purge valves inoperable.

Corrective Action(s): Upon discovering 2-RM-90-130 was inoperable, the licensee immediately entered Unit 2 TS LCO 3.3.6 Condition B, and TS LCO 3.6.3 Condition A as required. Additionally, the licensee initiated procedure 2-PI-OPS-ANN, Annunciator Verification, to account for all annunciators.

Corrective Action Reference(s): CR 1434751

Performance Assessment:

Performance Deficiency: The licensee's failure to properly implement the annunciator response process described in 2-PI-OPS-ANN, Annunciator Verification, was a performance deficiency.

Screening: The inspectors determined the performance deficiency was more than minor because it was associated with the Human Performance attribute of the Barrier Integrity cornerstone. Specifically, the licensee's failure to properly verify the status of ANN 193-D resulted in the inoperability of containment purge valves for longer than its TS allowed outage time, reducing assurance that the containment function assumed in the safety analyses will be maintained.

Significance: The inspectors assessed the significance of the finding using Appendix A, "Significance Determination of Reactor Inspection Findings for At - Power Situations". Because both questions in Section B of Exhibit 3, "Barrier Integrity Screening Questions," were answered "no," the finding screened as Green.

Cross-cutting Aspect: H.13 - Consistent Process: Individuals use a consistent, systematic approach to make decisions. Risk insights are incorporated as appropriate. The inspectors determined that the finding has a cross-cutting aspect of "Consistent Process" in the human performance area because licensee personnel did not use a consistent, systematic approach to verifying annunciators.

Enforcement:

Violation: Watts Bar Unit 2 Technical Specification 5.7.1 requires, in part, that procedures shall be established, implemented, and maintained covering the applicable procedures recommended in Regulatory Guide 1.33, Revision 2, Appendix A, February 1978. Regulatory Guide 1.33, Appendix A, Section 5 requires, in part, procedures for abnormal, offnormal, and alarm conditions.

Contrary to the above, on July 27, 2018, the licensee did not implement procedures to assess an abnormal condition indicated by annunciator 193-D. The licensee restored compliance on July 28, 2018 by initiating procedure 2-PI-OPS-ANN, Annunciator Verification, and entering the appropriate TS LCO action statements.

Enforcement Action: This violation is being treated as a Non-Cited Violation, consistent with Section 2.3.2 of the Enforcement Policy.

Failure to Adequately Implement Requirements of Confirmatory Order EA-17-022, commitment V.1.b.3

Cornerstone	Severity	Cross-cutting Aspect	Report Section

Not Applicable	Severity Level IV NCV 05000390, 391/2019-010-03 Open	Not Applicable	92702
<p>The inspectors identified a Severity Level IV NCV for the licensee's failure to adequately implement requirements of Confirmatory Order EA-17-022, commitment V.1.b.3. Specifically, the licensee failed to ensure that new supervisory employees completed safety conscious work environment (SCWE) training within three months of their hire or promotion effective date.</p>			
<p><u>Description:</u> Confirmatory Order (CO) EA-17-022, issued to TVA on July 27, 2017, requires, in part, that certain personnel complete initial and recurring SCWE training. Specifically, commitment V.1.b.3 in CO EA-17-022 requires that: <i>“New supervisory employees shall complete initial training through in-person or computer based training within three months of their hire or promotion effective date. The training shall require, at a minimum, a discussion of the training material with personnel in the TVA Office of General Counsel who are engaged in nuclear related work activities.”</i></p>			
<p>On December 21, 2018, the licensee identified five out of 14 nuclear business group employees at Watts Bar who were hired into or promoted to supervisory positions after July 27, 2018, but who did not complete the specified SCWE training within three months of their hire or promotion effective date. The time period that the employees were overdue for completing the training ranged from 11 days to 53 days. The licensee also identified an additional nine nuclear business group supervisory employees who worked at TVA Corporate and had not completed the SCWE training within the three month time period.</p>			
<p>The licensee's review of the extent of the condition revealed an additional five contractor employees involved in nuclear related work activities who were new to supervisory positions and did not complete the training in the three month time period. Four of the contractor employees had not previously been assigned the SCWE training in the licensee's learning management system. The licensee determined that contractor employees were not included in the requirement for SCWE training within three months of their hire or promotion effective date. Contrary to the above, the inspectors determined that the licensee's characterization of the issue was inadequate because new contractor supervisory employees were required to complete the training within three months as specified in CO EA-17-022, item V.1.b.3.</p>			
<p>The personnel identified as required to complete the SCWE training are identified in commitment V.1.b.2 and include, at a minimum, <i>“all working status nuclear business group supervisory employees, contractor supervisory employees involved in nuclear related work activities, human resource staff involved in the adverse employment action process, employee concerns program staff, contract technical stewards for nuclear related work activities, and the personnel in the TVA Office of General Counsel who are engaged in nuclear related work activities.”</i></p>			
<p>Personnel who held supervisory positions during the first year of the CO, from July 27, 2017 to July 27, 2018, were required to complete the initial SCWE training as described in CO commitment V.1.b.2. New employees who were not subject to the initial SCWE training that occurred during the first year of the CO were required to complete SCWE training within three months of their hire or promotion effective date as described in CO commitment V.1.b.3. As a result, commitment V.1.b.3 essentially took effect after July 27, 2018.</p>			

Commitment V.1.b.2 specifies the personnel who are required to take the annual SCWE training, including two types of supervisory employees:

1. working status nuclear business group supervisory employees, and
2. contractor supervisory employees involved in nuclear related work activities.

Because both nuclear business group and contractors are referred to as “supervisory employees” in commitment V.1.b.2, the inspectors understand the term “new supervisory employees” in commitment V.1.b.3 to mean both nuclear business group and contractor supervisory employees involved in nuclear related work activities who are new to TVA.

Corrective Action(s): The licensee entered this issue into their corrective action program on December 21, 2018, and took immediate action to ensure all Watts Bar employees had completed the training by January 7, 2019, reestablished bi-weekly reporting of training due dates, and initiated condition reports (CRs) for new supervisory employees to track their requirement to complete training within 90 days. A CR was written on December 26, 2018, with actions to perform an apparent cause analysis of the incorrect due dates and track actions at the TVA Corporate level. The licensee initiated a CR on March 5, 2019 to document the missed SCWE training for new contractor supervisory employees.

Corrective Action Reference(s): CR 1477482, CR 1477964, CR 1478017, CR 1495957

Performance Assessment:

The licensee’s failure to ensure that new supervisory employees completed SCWE training within three months of their hire or promotion effective date was in violation of commitment V.1.b.3 in Confirmatory Order Modifying License (EA-17-022). The inspectors determined that this violation was associated with impeding the regulatory process and subject to traditional enforcement as described in the NRC Enforcement Policy, dated May 15, 2018.

Enforcement:

The ROP’s significance determination process does not specifically consider the regulatory process impact in its assessment of licensee performance. Therefore, it is necessary to address this violation which impedes the NRC’s ability to regulate using traditional enforcement to adequately deter non-compliance.

Severity: The inspectors determined this violation constituted a more than minor traditional enforcement violation associated with failure to implement the requirements of CO EA-17-022. The inspectors determined that the failure to ensure that current and future CO requirements continue to be met could potentially impact safety. Specifically in this example, failure to ensure new supervisory employees complete SCWE training in a timely manner could miss opportunities to identify and/or prevent an environment where individuals would be hesitant to raise nuclear safety concerns for fear of retaliation. The violation is more than minor because it was not isolated to one or two individuals. The inspectors determined that the licensee’s failure to implement the requirements of the Confirmatory Order is considered an SL IV violation, consistent with Section 2.2.2.d of the NRC Enforcement Policy, dated May 15, 2018.

Violation: Commitment V.1.b.3 in Confirmatory Order EA-17-022, issued to TVA on July 27, 2017, requires, in part, that: *“New supervisory employees shall complete initial training through in-person or computer based training within three months of their hire or promotion*

effective date. The training shall require, at a minimum, a discussion of the training material with personnel in the TVA Office of General Counsel who are engaged in nuclear related work activities.”

Contrary to the above, prior to January 31, 2019, the licensee failed to ensure that new supervisory employees completed safety conscious work environment (SCWE) training within three months of their hire or promotion effective date. Specifically, five new Watts Bar supervisory employees, nine new TVA Corporate supervisory employees, and five new contractor supervisory employees involved in nuclear related work activities did not complete the SCWE training within three months as required.

Enforcement Action: This violation is being treated as a Non-Cited Violation, consistent with Section 2.3.2 of the Enforcement Policy.

EXIT MEETINGS AND DEBRIEFS

The inspectors verified no proprietary information was retained or documented in this report.

- On January 31, 2019 and March 6, 2019, the inspectors presented the inspection results to Mr. Tom Marshall, Mr. Tony Williams and other members of the licensee staff.

LIST OF DOCUMENTS REVIEWED

Procedures

2-ARI-188-194, Unit 2 Radiation Detectors, Rev. 9
2-PI-OPS-ANN, Annunciator Verification, Rev. 2
OPDP-1, Conduct of Operations, Rev. 42
NPG-SPP-01.7, Nuclear Safety Culture Rev. 4
NPG-SPP-01.7.1, Employee Concerns Program Rev. 3
NPG-SPP-01.7.2, Nuclear Safety Culture Monitoring, Rev. 12
NPG-SPP-01.7.3, Conduct of Nuclear Safety Culture Assessments and Organizational Effectiveness Surveys, Rev. 4
NPG-SPP-01.7.4, Adverse Employment Action and the Executive Review Board, Rev. 2
NPG-SPP-01.16, Condition Report Initiation, Rev. 0002
NPG-SPP-03.4, Maintenance Rule Performance Indicator Monitoring, Trending and Reporting - 10CFR50.65, Rev. 0003
NPG-SPP-03.19, Conduct of Quality Assurance Internal Audits Rev. 9
NPG-SPP-04.003, Material Storage and Handling, Rev. 0000
NPG-SPP-06.1, Work Order Process, Rev. 0007
NPG-SPP-06.2, Preventative Maintenance, Rev. 0011
NPG-SPP-07.1, On Line Work Management, Rev. 0021
NPG-SPP-09.0.1.1, System Monitoring and Trending, Rev. 0002
NPG-SPP-09.5, Temporary Modifications Temporary Configuration Changes, Rev. 0013
NPG-SPP-09.18.13, Equipment Failure Trending, Rev. 0000
NPG-SPP-10.2, Clearance Procedure to Safely Control Energy, Rev. 0017
NPG-SPP-11.10, Adverse Employment Action, Rev. 8
NPG-SPP-22.000, Performance Improvement Program, Rev. 9
NPG-SPP-22.300, Corrective Action Program, Rev. 7
NPG-SPP-22.300, Corrective Action Program, Rev. 12
NPG-SPP-22.301, Condition Report Initiation, Rev. 0006
NPG-SPP-22.302, Corrective Action Program Screening, Rev. 0010
NPG-SPP-22.303 CR Actions, Closures and Approvals, Rev. 0009
NPG-SPP-22.304 CR Trending, Rev. 0004
NPG-SPP-22.305 Level 2 Evaluations, Rev. 0006
NPG-SPP-22.600, Issue Resolution, Rev. 0003
NSDP-38, Access Authorization – Reviewing Officials, Rev. 0009
MMDP-1, Maintenance Management System, Rev. 36
NPG-SPP-22.500, Operating Experience Program, Rev. 7
1-SOI-65.01, Annulus Vacuum System, Rev. 4 and 5
2 -SOI-65.01, Annulus Vacuum System, Rev. 5 and 6
1-E-1, Loss of Reactor or Secondary Coolant, Rev. 9, 10, and 11
2-E-1, Loss of Reactor or Secondary Coolant, Rev. 4
1-GO-6, Unit Shutdown From Hot Standby to Cold Shutdown, Rev. 8 and 9
2-GO-6, Unit Shutdown From Hot Standby to Cold Shutdown, Rev. 5, 6, and 7
0-GOI-7, General Equipment Operating Guidelines, Rev. 5
2-SI-68-86, 18 Month Channel Calibration of Remote Shutdown Monitoring Narrow Range Pressurizer Pressure Loop 2-LPP-68-337C, Rev. 4 and 5
0-SI-67-907-A, Valve Full Stroke Exercising During Plant Operation – Essential Raw Cooling Water (Train A), Rev. 0029
0-SI-67-914-A, ERCW Valve Position Indication Verification (Train A), Rev. 0023
0-MI-0.038, Maintenance Instruction, Maintenance and Rework of NAMCO Series EA740 Limit Switches, Rev. 0005

0-SOI-30.05, Auxiliary Bldg HVAC Systems, Rev. 17
0-SOI-78.01, Unit 0, Spent Fuel Pool Cooling and Cleaning System, Rev. 0023
0-SOI-78.01, Unit 0, Spent Fuel Pool Cooling and Cleaning System, Rev. 0025
0-TI-119, Technical Instruction, Maintenance Rule Performance Indicator Monitoring, Trending, and Reporting, Rev. 0009
1-CM-6.60, Unit 1, Chemistry Manual, Steam Generator Sampling in Hot Sample Room (Modes 2-6), Rev. 0003
2-CM-6.60, Unit 2, Chemistry Manual, Steam Generator Sampling in Hot Sample Room (Modes 2-6), Rev. 0006

Condition Reports

CR 1010176, CR 1025956, CR 1093085, CR 1094317, CR 1102231, CR 1110498, CR 1120553, CR 1123283, CR 1126041, CR 1129256, CR 1141394, CR 1142422, CR 1142712, CR 1148174, CR 1131468, CR 1151681, CR 1151960, CR 1152376, CR 1166176, CR 1168424, CR 1161780, CR 1156304, CR 1160910, CR 1165982, CR 1168449, CR 1199001, CR 1201749, CR 1206192, CR 1219984, CR 1224257, CR 1227494, CR 1230388, CR 1230503, CR 1233697, CR 1452420, CR 1477482, CR 1477964, CR 1478017, CR 1346431, CR 1363607, CR 1242754, CR 1248250, CR 1250715, CR 1253673, CR 1257669, CR 1261774, CR 1275060, CR 1276752, CR 1288446, CR 1263272, CR 1291140, CR 1291142, CR 1292305, CR 1293113, CR 1293605, CR 1307224, CR 1309040, CR 1323570, CR 1326397, CR 1331333, CR 1331043, CR 1331330, CR 1311705, CR 1336506, CR 1345593, CR 1358748, CR 1351955, CR 1354018, CR 1354479, CR 1354552, CR 1354626, CR 1356391, CR 1357258, CR 1235960, CR 1240560, CR 1240434, CR 1247701, CR 1248740, CR 1261560, CR 1271072, CR 1243927, CR 1397190, CR 1419654, CR 1300292, CR 1300298, CR 1307246, CR 1370877, CR 1480911, CR 1310230, CR 1326399, CR 1280644, CR 1268151, CR 1295834, CR 1357392, CR 1384339, CR 1387219, CR 1387242, CR 1390171, CR 1391745, CR 1393422, CR 1394789, CR 1399059, CR 1399082, CR 1402728, CR 1403761, CR 1403950, CR 1414850, CR 1417333, CR 1420900, CR 1421308, CR 1433017, CR 1433039, CR 1440339, CR 1442882, CR 1454882, CR 1458231, CR 1458959, CR 1462240, CR 1463200, CR 1466100, CR 1472043, CR 1477272, CR 1480188, CR 1482980, CR 1483243, CR 1483601, CR 1483615, CR 1214250, CR 1214580, CR 1482137, CR 1216892, CR 1237178, CR 1236767, CR 1245529, CR 1261774, CR 1261775, CR 1246167, CR 1258384, CR 1261780, CR 1247701, CR 1295836, CR 1295842, CR 1309345, CR 1318176, CR 1319469, CR 1331331, CR 1331422, CR 1437551, CR 1408573, CR 1413807, CR 1463201, CR 1432669, CR 1434572, CR 1435889, CR 1460021, CR 1475636, CR 1446428, CR 1383351, CR 1432846, CR 1452826, CR 1415478, CR 1415863, CR 1381054, CR 1418881, CR 1427980, CR 1433640, CR 1437721, CR 1440788, CR 1452420, CR 1260778, CR 1271299, CR 1255594, CR 1229767, CR 1248124, CR 1155393, CR 1254753, CR 1248578, CR 1019953, CR 1172243, CR 1172555, CR 1214990, CR 1232888, CR 1232891, CR 1284199, CR 1285545, CR 1287163, CR 1286314, CR 1286327, CR 1286391, CR 1294798, CR 1295542, CR 1295709, CR 1295710, CR 1302665, CR 1310096, CR 1331099, CR 1331335, CR 1463204, CR 1404737, CR 1407157, CR 1434751

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Self-Assessments & Trends

WBN-OPS-SSA-17-004, Snapshot Assessment Effectiveness Review of CR 1151960
WBN-PI-SA-18-002, Problem Identification & Resolution (PI&R) Preparation
WBN-PI-SA-18-005, Perform Effectiveness Review to determine CAP Effectiveness and Confidence in CAP
WBN-CEM-SSA-18-007, Self-Assessment Information, Chemistry Instrumentation Performance,
WBN-CEM-SSA-18-008, Self-Assessment Information, WBN Primary Chemistry Program Compliance
WBN-ENG-FSA-18-002, Self-Assessment Information, Maintenance Rule Implementation
WBN-ENG-SA-18-001, Self-Assessment Information for the Emergency Diesel Generator
WBN-ENG-SSA-16-004, Self-Assessment Information, Obsolescence Program
WBN-SEC-SA-18-003, Self-Assessment Information, Security Organization
WBN-RP-SA-18-007, Radiation Monitoring Instrumentation
WBN-EP-SA-18-002, Emergency Classification and Notification Accuracy and Timeliness

Calculations

WBN-CEB-WCG-1-327, SMSVR Blowout Hatches, roof elevation 752.0", Rev. 005
WBN-NTB-TI556, Pressure in the Main Steam Valve Vaults during a Main Steam Line Break, Rev. 006

Other Documents

WBN Unit 1 and Unit 2 Technical Specifications
WBN Unit 1 and Unit 2 Final Safety Analysis Report
LP ICT303.025 Foxboro Intelligent Automation Distributed Control System, Rev. 2
CDE 1592 Maintenance Rule FF evaluation for 2B MDAFW pump outboard pump bearing leakage
CDE 1595 Maintenance Rule FF evaluation for incorrect installation of MTE on Unit 1 TDAFW pump during surveillance testing
CDE 1531 Maintenance Rule FF evaluation for 1B MDAFW pump discharge pressure control valve failure
10CFR21-0115, Engine Systems, Inc., 10CFR21 Reporting of Defects and Non-compliance, EMD Fuel Injector, P/N 40084720, Rev. 0
Chemistry Department Monthly Performance Assessment, Watts Bar, Review of August through September 2018, dated 10/18/18
CR 1224257, Level 2 Evaluation, Rev. 1
Gap Analysis for CR 1331330 and related CR 1160910
L17 170331 800, Site Audit Report SSA1703 Security and Safeguards Information Watts Bar Nuclear Plant (WBN) February 27 - March 10, 2017, approved 4/5/2017
L17 1707060 800, Site Audit Report, SSA1707, Chemistry, Effluent, and Environmental Monitoring Watts Bar Nuclear Plant June 19 - 30, 2017, approved 7/26/17
L17 180206 800, Site Audit Report, SSA1802 Security and Safeguards Information (SGI) Watts Bar Nuclear Plant (WBN), February 12-23, 2018, approved 3/5/19
MRC meeting minutes for CR 1397190 and CR 1400179, dated 04/02/2018
NRC Finding/Violation Checklist for CR 1387219
QA-WB-17-013, U1R14 CTS Oversight – Chemistry and Radiation Protection, Watts Bar Nuclear Plant March 13, 2017, approved 3/13/17
WBN-SDD-N3-67-4002, Rev. 0035, "Essential Raw Cooling Water System, System 67"
1-TO-2016-0054, Section 1-30-0757-WW
3-OT-SPP-1002OE, TVA Clearance OE, rev 0
PM 610245001, Replace 152-Z2 Control Relay, MN XFMR PCB Aux Relay, rev 1

LER 390/2017-002-00, Incorrectly Hung Clearance Leads to a Condition Prohibited by the Technical Specifications, February 2017
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TVA Cause Evaluation Training Manual, rev 13
TVA Watts Bar Nuclear Plant Organizational Chart, dated 12/12/2018
Misc. ECP Case Files, January 2018 to January 2019
WBN ECP Pulsing Survey Summary Results, January 2018-December 2018.
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Nuclear Safety Culture Monitoring Panel and Site Leadership Team Minutes, 1/11/2018 to 11/29/2018
Fourth Independent Auditor's Report of the TVA Adverse Employment Action Process for Quarter Ending 6/30/2018, dated 7/10/2018
Fifth Independent Auditor's Report of the TVA Adverse Employment Action Process for Semester Ending 12/31/2018, dated 12/28/2018
Misc. ERB Packages, October 2018 to January 2019
Training Records associated with Management Actions to Promote a Safety Conscious Work Environment, HRD099.031
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