



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**
REGION II
245 PEACHTREE CENTER AVENUE N.E., SUITE 1200
ATLANTA, GEORGIA 30303-1200

July 1, 2021

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

SUBJECT: WATTS BAR NUCLEAR PLANT – BIENNIAL PROBLEM IDENTIFICATION AND
RESOLUTION INSPECTION REPORT 05000390/2021012 AND
05000391/2021012

Dear Mr. Barstow:

On May 21, 2021, the U.S. Nuclear Regulatory Commission (NRC) completed a problem identification and resolution inspection at your Watts Bar Nuclear Plant. On May 20, 2021 the NRC inspectors discussed the results of this inspection with 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 station's corrective action program and the station'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 station'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 station's programs to establish and maintain a safety-conscious work environment and interviewed station personnel to evaluate the effectiveness of these programs. Based on the team's observations and the results of these interviews the team found no evidence of challenges to your organization's safety-conscious work environment. Your employees appeared willing to raise nuclear safety concerns through at least one of the several means available.

No findings or violations of more than minor significance were identified during this inspection.

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 Title 10 of the *Code of Federal Regulations* 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

/RA/

Thomas A. Stephen, Chief
Reactor Projects Branch #5
Division of Reactor Projects

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

Enclosure:
As stated

SUBJECT: WATTS BAR NUCLEAR PLANT – BIENNIAL PROBLEM IDENTIFICATION AND RESOLUTION INSPECTION REPORT 05000390/2021012 AND 05000391/2021012 dated July 1, 2021

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OFFICE	RII/DRP	RII/DRP	RII/DRP	RII/DRP	RII/DRP
NAME	S. Ninh	R. Taylor	K. Miller	N. Childs	T. Stephen
DATE	6/29/2021	6/29/2021	6/29/2021	6/30/2021	7/1/2021

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

Docket Numbers: 05000390 and 05000391

License Numbers: NPF-90 and NPF-96

Report Numbers: 05000390/2021012 and 05000391/2021012

Enterprise Identifier: I-2021-012-0017

Licensee: Tennessee Valley Authority

Facility: Watts Bar Nuclear Plant

Location: Spring City, TN

Inspection Dates: May 03, 2021 to May 21, 2021

Inspectors: N. Childs, Resident Inspector
K. Miller, Resident Inspector
S. Ninh, Senior Project Engineer
R. Taylor, Senior Project Engineer

Approved By: Thomas A. Stephen, 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 a biennial problem identification and resolution inspection at Watts Bar Nuclear Plant, 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.

List of Findings and Violations

No findings or violations of more than minor significance were identified.

Additional Tracking Items

Type	Issue Number	Title	Report Section	Status
URI	05000391/2021012-01	2A-A CCS Pump Seal Bolting Failure	71152B	Open

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. Starting on March 20, 2020, in response to the National Emergency declared by the President of the United States on the public health risks of the coronavirus (COVID-19), inspectors were directed to begin telework. In addition, regional baseline inspections were evaluated to determine if all or a portion of the objectives and requirements stated in the IP could be performed remotely. If the inspections could be performed remotely, they were conducted per the applicable IP. In some cases, portions of an IP were completed remotely and on site. The inspections documented below met the objectives and requirements for completion of the IP.

OTHER ACTIVITIES – BASELINE

71152B - Problem Identification and Resolution

Biennial Team Inspection (IP Section 02.04) (1 Sample)

- (1) 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. The inspectors also conducted an in-depth CAP review of the component cooling system (CCS), residual heat removal (RHR) system, and control room emergency ventilation system (CREVS).
 - **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.

INSPECTION RESULTS

Assessment	71152B
<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>1. Corrective Action Program Effectiveness</p> <p><u>Problem Identification:</u> The team determined that the licensee was generally effective in identifying problems and entering them into the CAP at the appropriate threshold. This conclusion was based on a review of the requirements for initiating condition reports (CRs) as described in licensee procedure NPG-SPP-22.300, "Corrective Action Program," and the site's management expectation that employees were encouraged to initiate condition reports. Additionally, site management was actively involved in the corrective action program and focused appropriate attention on significant plant issues.</p> <p><u>Problem Prioritization and Evaluation:</u> Based on the review of CRs sampled by the inspection team during the onsite period, the inspectors concluded that problems were prioritized and evaluated in accordance with the CAP requirements described in procedure NPG-SPP-22.300. The inspectors determined that adequate consideration was given to system or component operability and associated plant risk. The inspectors determined that plant personnel had generally conducted cause evaluations in compliance with the licensee's CAP procedures, including appropriate cause determinations, and performed adequate levels of analysis based on the significance of the issues being evaluated.</p> <p><u>Effectiveness of Corrective Actions:</u> Based on a review of corrective action documents, interviews with licensee staff, and verification of completed corrective actions, the inspectors determined that corrective actions were effective, timely, and commensurate with the safety significance of the issues. For significant conditions adverse to quality, the corrective actions directly addressed the cause and effectively prevented recurrence. The inspectors reviewed performance indicators, CRs, and effectiveness reviews, as applicable, to verify that the significant conditions adverse to quality had not recurred. Effectiveness reviews for corrective actions to preclude repetition (CAPRs) were sufficient to ensure corrective actions were properly implemented and were effective.</p> <p>2. Use of Operating Experience (OE)</p> <p>Based on a review of selected documentation related to OE issues, the team determined that the licensee was 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 determined that the licensee's use of industry and NRC OE was effective, and the program adequately supported nuclear safety.</p>	

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 (SCWE)

Based on interviews with plant staff and reviews of the employee concerns program, CRs, and the latest safety culture survey results, the inspectors found no evidence of challenges to the safety conscious work environment. It should be noted that this was the first biennial Problem Identification and Resolution (PI&R) inspection at Watts Bar since closure of the Chilling Effect Letter and the SCWE cross cutting issue. The safety culture appeared to be improved since the last PI&R and employees appeared willing to raise nuclear safety concerns through at least one of the several means available.

Unresolved Item (Open)	2A-A CCS Pump Seal Bolting Failure URI 05000391/2021012-01	71152B
<p><u>Description:</u> On May 5, 2021, during the CCS walkdown with the system engineer for the PI&R inspection, the inspector identified abnormal leakage coming from the 2A-A CCS pump inboard mechanical seal. Upon further investigation, the licensee identified that one of two inboard seal bolts was sheared/missing from the seal housing. The bolt was observed to be lying in the seal leak off catch basin. As a result of this observation, the licensee declared the 2A-A CCS pump inoperable at 5:10 p.m. on May 5, 2021 and entered technical specification (TS) limiting condition for operation (LCO) 3.7.7 which requires restoration of the pump within 72 hours. An unresolved item (URI) is opened for additional review to determine if appropriate regulatory requirements or self-imposed standards were followed for the maintenance of the 2A-A CCS pump (i.e., to determine the performance deficiency).</p> <p>Planned Closure Actions: The Watts Bar resident inspectors will review the licensee's evaluation of the issue and document the results in the quarterly integrated inspection report.</p> <p>Licensee Actions: Work Order (WO) 122102466 replaced the sheared inboard seal bolt and the 2A-A CCS pump was declared operable at 1844 on May 6 after the work was completed. The licensee is currently evaluating the issue and extent of condition via CR 1701046.</p> <p>Corrective Action References: CRs 1692049, 1692589, 1695509, 1701046</p>		

EXIT MEETINGS AND DEBRIEFS

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

- On May 20, 2021, the inspectors presented the biennial problem identification and resolution inspection results to Mr. Tony Williams and other members of the licensee staff.

DOCUMENTS REVIEWED

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
71152B	Corrective Action Documents		1233275; 1244275; 1244348; 1244398; 1245056; 1332863; 1353102; 1413807; 1434751; 1446383; 1450336; 1450338; 1454882; 1474341; 1476614; 1482137; 1483352; 1486878; 1486882; 1487830; 1488848; 1488684; 1492565; 1498928; 1498934; 1499812; 1501943; 1501994; 1501945; 1507301; 1508964; 1510237; 1501946; 1502448; 1502633; 1502915; 1504014; 1504499; 1504520; 1506037; 1506341; 1510056; 1513326; 1515204; 1515390; 1516431; 1516485; 1516492; 1516494; 1516841; 1517359; 1520769; 1521049; 1521069; 1521317; 1521319; 1521497; 1525654; 1525982; 1526540; 1527359; 1527618; 1548617; 1549553; 1549554; 1529382; 1531046; 1534909; 1540594; 1540598; 1540601; 1540603; 1542419; 1548549; 1555701; 1557359; 1558324; 1563492; 1566193; 1579238; 1571100; 1579250; 1585826; 1595410; 1597523; 1594403; 1602934; 1607003; 1608135; 1608980; 1609457; 1610611; 1612542; 1615444; 1616077; 1616698; 1618074; 1618544; 1620816; 1622991; 1624008; 1636072; 1629687; 1631948; 1634062; 1634387; 1637007; 1640749; 1640903; 1641030; 1642981; 1643336; 1634387; 1644412; 1644413; 1647007; 1647416; 1653024; 1653032; 1654084; 1654091; 1660933; 1660938; 1661691; 1667128; 1667314; 1668321; 1669936; 1670127; 1670136; 1670795; 1670878; 1670960; 1670969; 1672352; 1672356; 1672357; 1672359; 1672462; 1672644; 1672655; 1673877; 1675314; 1677763; 1677999; 1679707; 1681286; 1688163; 1690437; 1690827; 1691621; 1691824; 1692049; 1693132; 1693260; 1693651; 1695509;	

Inspection Procedure	Type	Designation	Description or Title	Revision or Date	
	Corrective Action Documents Resulting from Inspection	1692049	WBN PI&R inspection - 2A CCS pump inboard mechanical seal leakage	05/05/2021	
		1693132	WBN PI&R Inspection - P&IR Walkdown CREVs - Loose Door Seal C50	05/11/2021	
		1693260	WBN P&IR Walkdown CREVs - Loose Door Seal C36	05/11/2021	
		1693624	WBN PI&R Inspection - Issues with CR summaries in CRs 1540603 and 1540601	05/12/2021	
		1695079	WBN PI&R Inspection - Page numbering issue with WBN-VTD-D088-0020	05/19/2021	
		1695509	WBN PI&R Inspection - Legacy error in calculation EPMDWP070594 for CCS Pump Seal Bolts	05/20/2021	
		1695529	WBN PI&R Inspection - URI on 2A CCS pump issues	05/20/2021	
		1695591	WBN PI&R Inspection – NRC Observation regarding EWR associated with CR 292049	05/20/2021	
	Miscellaneous			Equipment Failure Investigation Checklist for CR 1597523, Turbine Driven Auxiliary Feedwater Level Control Valve Failed Quarterly Stroke Time Test	05/14/2020
				Watts Bar Nuclear (WBN) Nuclear Safety Culture Evaluation	09/01/2019
				2021 WBN Problem Identification and Resolution Self-Assessment	Rev. 2
				Organizational Effectiveness and Programmatic Checklist, Potential non-compliance with NERC Standard VAR-002 – 4.1 Requirements	06/28/2019
				Organizational Effectiveness and Programmatic Checklist, Streaming Analysis of 2019 WBN Performance Based Evaluation (PBE)	03/26/2020
				Root Cause Analysis Report, Risk Management of the 2C Unit Board Loss	Rev. 0
				Root Cause Analysis Report, Unit 2 Turbine Generator Exciter Failure	Rev. 0
		Equipment Failure Investigation Checklist for CR 1669936, Water in Upper Bearing Oil of ERCW Pump Motor	05/17/2020		
	Audit Report		Chemistry, Effluent, and Environmental Monitoring Watts		

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		SSA1906	Bar (WBN), June 03 - June 13, 2019	
		Engineering Work Request no. EWR18MEC030278	Evaluation for Loss of CRE Safety Function Due to MCR Doors Open,	6/18/2018
		Health Report Scorecard	Air Conditioning/CREVS, Reporting Period: October 2018 - March 2019	
		Health Report Scorecard	Air Conditioning/CREVS, Reporting Period: Reporting Period: April 2019 - September 2019	
		Health Report Scorecard	Air Conditioning/CREVS, Reporting Period: Oct 1, 2019 to March 31, 2020)	
		Health Report Scorecard	Air Conditioning/CREVS, Reporting Period: April 1, 2020 to Sept 30, 2020	
		Health Report Scorecards	Component Cooling Water System (CCS): Fall 2019 - Spring 2021	
		Pressure Boundary Door Smoke Test	Door C036 Data Sheet	5/11/2021
		Pressure Boundary Door Smoke Test	Door C0350 Data Sheet	5/11/2021
		SDD-N3-30CB-4002	Control Building Heating, Ventilating, Air Conditioning, and Air Cleanup System Unit 1/Unit 2	Rev. 21
		Site Audit Report, SSA1907	Radiation Protection and Radwaste Watts Bar Nuclear Plant (WBN), July 15 - 25, 2019	
		SSA2101	Audit Report - Emergency Preparedness Watts Bar Nuclear Plant (WBN)	02/18/2021
		Procedures	0-TI-119	Maintenance Rule Performance Indicator Monitoring, Trending, and Reporting - 10CFR50.65
	1-FOR-304-1		Visual Inspection of Fire-Rated Assemblies Located in Unit 1 Reactor Building	Rev. 19
	2-FOR-304-1		Visual Inspection of Fire-Rated Assemblies Located in Unit 2 Reactor Building	Rev. 5
0-FOR-304-1	Fire Barrier/Mechanical, Conduit, Cable Tray, and Fire Damper (External) Penetration Visual Inspection- Auxiliary, Control Diesel		Rev. 20	
Fire Protection	Fire Protection Fire Barrier/Mechanical, Conduit, and Cable		Rev. 3	

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		Training Procedure – FPT 358.304.000	Tray Penetration Seals and Radiant Energy Shields Qualification Card	
		NEDP-22	Operability Determinations and Functional Evaluations	Rev. 21
		NEDP-27	Past Operability Evaluations	Rev. 5
		OPDP-8	Operability Determination Process and Limiting Conditions for Operation Tracking	Rev. 27
		NPG-SPP-18.4.6	Control of Fire Protection Impairments	Rev. 18
		NPG-SPP-22.300	Corrective Action Program	Rev. 20
		NPG-SPP-01.7.1	Employee Concerns Program	Rev. 5
		NPG-SPP-03.19	Conduct of Quality Assurance Internal Audits	Rev. 13
		NPG-SPP-03.28	Conduct of the Quality Assurance Organization	Rev. 0
		NPG-SPP-22.000	Performance Improvement Program	Rev. 12
		NPG-SPP-22.000	NPG Self-Assessment and Benchmarking Programs	Rev. 11
		NPG-SPP-22.300	Corrective Action Program	Rev. 21
		NPG-SPP-22.500	Operating Experience Program	Rev. 13
		NPG-SPP-22.600	Issue Resolution	Rev. 12
		NPG-SPP-22.600	Issue Resolution	Rev. 11
		OPDP-8	Operability Determination Process and Limiting Conditions for Operation Tracking	Rev. 8
		Technical Instruction (TI)-64	Breaching Hazard Barriers	Rev. 14
		TI-65	Breaching the Containment Annulus, ABSCE, or MCRHZ Pressure Boundaries	Rev. 9
		TVA-NQA-PLN89-A	Nuclear Quality Assurance Plan (NQAP) (Quality Assurance Program Description)	Rev. 9
		WBN-RP-SA-19-001	Self-Assessment Report, Occupational Exposure Control Effectiveness	
		WBN-RP-SA-19-005	Self-Assessment Report, Radiation Monitoring Instrumentation	
		Self-Assessments	SA/BM Report	Control Room Envelope(CRE) Habitability Program Self-Assessment
		SA/BM Report	Gamma spectroscopy report review	9/16/2019
	SA/BM Report	Closed cooling water	8/31/2020	

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		WBN-CEM-SA-18-002	Self-Assessment Report, Pre-NRC Public Radiation Safety/Effluents & REMP & GW	
		WBN-CEM-SA-19-001	Self-Assessment Report, QA/QC Crosscheck Program	
		WBN-CEM-SA-19-003	Self-Assessment Report, Chemistry Level B Technician Class 1604 improvement opportunities	
		WBN-RP-SA-19-002	Self-Assessment Report, Radiological Hazard Assessment and Exposure Controls	
		WBN-RP-SA-19-003	Self-Assessment Report, Pre-NRC Inspection Occupational ALARA Planning and Controls	
		WBN-RP-SA-19-004	Self-Assessment Report, Occupational Dose Assessment	
		WBN-RP-SA-19-006	Self-Assessment Report, In Plant Airborne Radioactivity Control and Mitigation	
	Work Orders		115628962; 119335861; 119348959; 119585026; 119585030; 119637745; 119638587; 119700865; 119723972; 119891929; 119891939; 119965129; 120016807; 120031097; 120308867; 120346965; 120371218; 120410551; 120449610; 120524675; 120537041; 120550272; 120550341; 120550342; 120593488; 120774110; 120860846; 120918377; 120967368; 120967370; 120967384; 120968563; 121056541; 121056931; 121102181; 121121004; 121264623; 121292587; 121344438; 121377748; 121399972; 121399973; 121424581; 121443542; 121469082; 121509038; 121590361; 121590359; 121597109; 121590361; 121544716; 121658780; 121663792; 121752447; 121752449; 121799971; 121834547; 121834548; 121892180; 121912949; 121922757; 122000228; 122014474; 122102466; 122102469;	