



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

March 8, 2024

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 – AGE-RELATED DEGRADATION  
INSPECTION REPORT 05000390/2024010 AND 05000391/2024010

Dear James Barstow:

On February 8, 2024, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Watts Bar Nuclear Plant and discussed the results of this inspection with Mr. Anthony Williams, Site Vice President, and other members of your staff. The results of this inspection are documented in the enclosed report.

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,

A handwritten signature in black ink, appearing to read "JB", written over a horizontal line.

Signed by Baptist, James  
on 03/08/24

James B. Baptist, Chief  
Engineering Branch 1  
Division of Reactor Safety

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

Enclosure:  
As stated

cc w/ encl: Distribution via LISTSERV

SUBJECT: WATTS BAR NUCLEAR PLANT – AGE-RELATED DEGRADATION  
INSPECTION REPORT 05000390/2024010 AND 05000391/2024010  
DATED MARCH 8, 2024

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OFFICE	RII/DRP	RII/DRS	RII/DRS	RII/DRS	
NAME	J. Copeland	C. Even	J. Lizardi-Barreto	J. Baptist	
DATE	3/7/2024	3/7/2024	3/7/2024	3/8/2024	

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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: 05000390/2024010 and 05000391/2024010

Enterprise Identifier: I-2024-010-0021

Licensee: Tennessee Valley Authority

Facility: Watts Bar Nuclear Plant

Location: Spring City, TN

Inspection Dates: January 22, 2024 to February 08, 2024

Inspectors: P. Carman, Senior Reactor Inspector  
J. Copeland, Reactor Inspector  
C. Even, Sr. Reactor Inspector  
J. Lizardi-Barreto, Reactor Inspector

Approved By: James B. Baptist, Chief  
Engineering Branch 1  
Division of Reactor Safety

Enclosure

## **SUMMARY**

The U.S. Nuclear Regulatory Commission (NRC) continued monitoring the licensee's performance by conducting an age-related degradation 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**

None.

## **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.

## **REACTOR SAFETY**

### 71111.21N.04 - Age-Related Degradation

#### Age-Related Degradation (8 Samples)

For each sample listed below, inspectors reviewed licensee activities credited to address age-related degradation to assess whether they were being performed using appropriate standards and procedures, assessed against appropriate acceptance criteria, and that maintenance was being performed at an appropriate interval. Inspectors assessed whether issues identified during licensee activities were being appropriately entered into and addressed by the station corrective action program, and whether periodic assessments of maintenance effectiveness and operating experience were being completed.

- (1) 480 VAC shutdown board breaker (0-BKR-548-131-S)
- (2) A-A main control room heating ventilation and air conditioning air handling unit motor (0-MTR-31-12-A)
- (3) Auxiliary building gas treatment system containment purge air isolation dampers (1,2-FCO-30-294/295)
- (4) Control rod drive mechanism (CRDM) thermal sleeves
- (5) Essential raw cooling water (ERCW) discharge piping (C-A)
- (6) ERCW motor cooler (pumps A-A, B-A, C-A, D-A, E-B, F-B, G-B, H-B)
- (7) Unit 1 and 2 hydrogen igniters
- (8) Unit 2 motor driven auxiliary feedwater (MDAFW) pump 2B-B motor oil and bearings

## **INSPECTION RESULTS**

No findings were identified.

## **EXIT MEETINGS AND DEBRIEFS**

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

- On February 8, 2024, the inspectors presented the age-related degradation inspection results to Mr. Anthony Williams, Site Vice President, and other members of the licensee staff.

**DOCUMENTS REVIEWED**

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
71111.21N.04	Calculations	0-TI-31.02	Plant Equipment Vibration Monitoring & Vibration Diagnostics Program	Revision 0003
71111.21N.04	Calculations	2-TSD-268-1	Permanent Hydrogen Mitigation System	Rev. 0
71111.21N.04	Calculations	EPMRD102092	Design Basis for the Hydrogen Mitigation System	Rev. 3
71111.21N.04	Calculations	P.S.4.M.1.5	CLASSIFICATION, PROCUREMENT, RECEIPT AND USE OF LUBRICANTS	Revision 0008
71111.21N.04	Calculations	SDD-N3-3B-4002	AUXILIARY FEEDWATER SYSTEM	Rev. 0034
71111.21N.04	Calculations	SDD-N3-83-4001	COMBUSTIBLE GAS CONTROL SYSTEM Unit 1 & 2	Rev. 0013
71111.21N.04	Calculations	TVA Specification 1547	Steam-Turbine-Driven and Electric-Motor-Driven Auxiliary Feedwater Pumping Units	Rev. 2
71111.21N.04	Calculations	WB-DC-40-64	DESIGN BASIS EVENTS DESIGN CRITERIA	Rev. 23
71111.21N.04	Calculations	WBN-DCD-30-7	POST ACCIDENT MONITORING INSTRUMENTATION	Rev. 0031
71111.21N.04	Calculations	WBN-VTD-P076-0030	OPERATING AND MAINTENANCE INSTRUCTIONS FOR PARSON-PEEBLES INDUCTION MOTORS. (PUB. # GCM/254924)	Rev. 7
71111.21N.04	Calculations	WBNP-DS-1925-1547-01	Steam-Turbine-Driven and Electric-Motor-Driven Auxiliary Feedwater Pumping Units	07/18/1975
71111.21N.04	Corrective Action Documents	CRs 1417696, 1606564, 1673882, 1740577, 1759092, 1829252, 1859824, 1859917, 1859918, 1884979, 1899866		
71111.21N.04	Corrective Action Documents Resulting from Inspection	CR 1905083	2024 ARD NRC Inspection- PNL 2-L-413 Corrosion	01/23/2024
71111.21N.04	Corrective Action Documents Resulting from	CR 1905100	2024 ARD NRC Inspection - Insulation around 0-VTV-67-501F Deteriorating	01/23/2024

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
	Inspection			
71111.21N.04	Corrective Action Documents Resulting from Inspection	CR 1905139	2024 ARD NRC Inspection - 1A-A TWS Gearbox Bolting Engagement	01/23/2024
71111.21N.04	Corrective Action Documents Resulting from Inspection	CR 1905150	2024 ARD NRC Inspection - Loose bolt on 1-RFV-67-1042A Flange	01/23/2024
71111.21N.04	Corrective Action Documents Resulting from Inspection	CR 1905229	2024 ARD NRC Inspection - B-Train ERCW Pump Discharge Insulation Missing	01/24/2024
71111.21N.04	Corrective Action Documents Resulting from Inspection	CR 1905233	2024 ARD NRC Inspection - Insulation issues around 2-FCV-67-9A	01/24/2024
71111.21N.04	Corrective Action Documents Resulting from Inspection	CR 1905235	2024 ARD NRC Inspection - Scaffold Debris Around C-A ERCW Motor Base	01/24/2024
71111.21N.04	Corrective Action Documents Resulting from Inspection	CR 1905325	2024 ARD NRC Inspection - Spring Unseated on E-B ERCW Pump Pre-Lube Line	01/24/2024
71111.21N.04	Corrective Action Documents Resulting from Inspection	CR 1906420	2024 ARD NRC Inspection - Unclear Instructions on TVA Form NPG-SPP-09.7-8	01/29/2024
71111.21N.04	Corrective Action Documents Resulting from Inspection	CR 1908053	2024 ARD NRC Inspection- Chemical label on sodium hypochlorite bulk tank needs to be replaced	02/05/2024
71111.21N.04	Corrective Action	CR 1908061	2024 ARD NRC Inspection - CT1300 secondary	02/05/2024

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
	Documents Resulting from Inspection		containment collecting rainwater	
71111.21N.04	Corrective Action Documents Resulting from Inspection	CR 1908148	2024 ARD NRC Inspection - hypochlorite residual around offgassing valves on the injection skid	02/06/2024
71111.21N.04	Corrective Action Documents Resulting from Inspection	CR 1908184	2024 ARD NRC Inspection - Unclear Instructions on TVA Form NPG-SPP-09.7-8	02/06/2024
71111.21N.04	Corrective Action Documents Resulting from Inspection	CR 1908261	2024 ARD NRC Inspection - Cracks on the Chemistry Weather Shielding Structure	02/06/2024
71111.21N.04	Corrective Action Documents Resulting from Inspection	CR 1908491	2024 ARD Inspection – System Peer Team to Evaluate for Enhancement to NPG-SPP-09.0.1.1	02/07/2024
71111.21N.04	Corrective Action Documents Resulting from Inspection	CR 1908826	2024 NRD ARD Inspection Minor Violation: failure to document anomaly during maintenance	02/08/2024
71111.21N.04	Drawings	1-45W760-268-1	Wiring Diagram Permanent Hydrogen Mitigation Sys Schematic Diagrams	Rev. 3
71111.21N.04	Drawings	1-47W866-2	Flow Diagram Heating, Cooling & Ventilation Air Flow	Rev. 28
71111.21N.04	Drawings	193-3442-15	Final Assembly Hydrogen Ignitor	Rev. NC
71111.21N.04	Drawings	2-45W2772-7	Wiring Diagrams 480V Cont & Aux BLDG Vent BD 2B1-B Connection Diagrams	Rev. 2
71111.21N.04	Drawings	2-45W2772-7	Wiring Diagrams 480V Cont & Aux BLDG Vent BD 2A1-A Connection Diagrams	Rev. 0
71111.21N.04	Drawings	2-45W760-268-1	Wiring Diagram Permanent Hyd Mitigation Sys Schematic Diagrams	Rev. 4



Inspection Procedure	Type	Designation	Description or Title	Revision or Date
71111.21N.04	Drawings	6947D02	480V DS Switchgear	Rev. 901
71111.21N.04	Drawings	RB122225	Outline of Induction Motor M/C Size – T4007J – (Special) 2 Pole	Rev. 901
71111.21N.04	Drawings	RB12225	Outline of Induction Motor	Rev. G
71111.21N.04	Drawings	SDD-N3-30AB-4001	Auxiliary Building Heating, Ventilation, Air Conditioning System (30, 31, 44) Unit 1 / Unit 2	Rev. 45
71111.21N.04	Engineering Evaluations	DG-M6.3.3	Raw Water Systems: General Design of Essential Raw Cooling Water Systems	Rev. 3
71111.21N.04	Engineering Evaluations	WO 121342816	Evaluation of Watts Bar Unit 2 Thermal Sleeve ID and OD Wear Condition and Recommendations	Rev. 0
71111.21N.04	Engineering Evaluations	WO 124103289	Evaluation of Watts Bar Unit 2 Thermal Sleeve ID and OD Wear Condition and Recommendations	Rev. 0
71111.21N.04	Miscellaneous	067 System Walkdown Q1 2023	Quarter 1 System Walkdown Checklist for ERCW	03/16/2023
71111.21N.04	Miscellaneous	067 System Walkdown Q2 2023	Quarter 2 System Walkdown Checklist for ERCW	06/28/2023
71111.21N.04	Miscellaneous	067 System Walkdown Q3 2023	Quarter 3 System Walkdown Checklist for ERCW	09/25/2023
71111.21N.04	Miscellaneous	067 System Walkdown Q4 2023	Quarter 4 System Walkdown Checklist for ERCW	12/19/2023
71111.21N.04	Miscellaneous	7043291	TVA Receiving Report PO Number: 7043291-1	10/01/2021
71111.21N.04	Miscellaneous	Final Report FMRC J.I. 0J1R5. RU 070 (A)	Hydrogen Combustion Initiated By A Tayco Igniter in a Spray Environment Part 1: Test Program Description	08/1/1984
71111.21N.04	Miscellaneous	Lab Unit ID 2-MTR-3-128	Oil Sampling Report P1 - AUX FEED WATER PUMP MOTOR 2B	8/8/2022
71111.21N.04	Miscellaneous	LTR-NRC-18-34	Notification of the Potential Existence of Defects Pursuant to 10 CFR Part 21	05/28/2018
71111.21N.04	Miscellaneous	Tayco Qualification Summary Report # QAR-2375	TAYCO ENGINEERING, INC. HYDROGEN IGNITER ASSEMBLY Tayco P/N: 193-3442-15, Dated	3/7/2002
71111.21N.04	Miscellaneous	WBN-VTD-P014-0030	Pacific Air Products Instructions for the installations of Dampers	Rev. 3
71111.21N.04	Miscellaneous	WBN-VTD-P076-0030	OPERATING AND MAINTENANCE	Rev. 7

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
			INSTRUCTIONS FOR PARSON-PEEBLES INDUCTION MOTORS. (PUB. # GCM/254924)	
71111.21N.04	Miscellaneous	WBN-VTD-R165-0030	Reliance Installation and Maintenance Instructions for Life-Line T Motors, Type S, Type T, and Type N	Rev. 7
71111.21N.04	Miscellaneous	WBN-VTD-W120-3022	Westinghouse Nuclear Safety-Related Low Voltage Power Circuit Breakers and Cell Parts Types DS and DLS	Rev. 5
71111.21N.04	Miscellaneous	WBN-VTD-W120-3023	Westinghouse MPM-DS Breaker Maintenance Program Manual for Safety-Related Type DS Low Voltage Metal Enclosed Switchgear	Rev. 18
71111.21N.04	Operability Evaluations	CDE-1396	Operability Determination Document for 1-HTR-268-0002	10-15-2015
71111.21N.04	Operability Evaluations	CDE-1570	Operability Determination Document for 2-HTR-268-0022	4-13-2017
71111.21N.04	Operability Evaluations	CDE-1625	Operability Determination Document for 2-HTR-268-0048	3-27-2019
71111.21N.04	Operability Evaluations	CDE-1635	Operability Determination Document for 2-HTR-268-0047	5-7-2019
71111.21N.04	Operability Evaluations	CDE-1678	Operability Determination Document for 1-BKR-268-0002/16B	6-9-2020
71111.21N.04	Operability Evaluations	CDE-1712	Operability Determination Document for 2-HTR-268-0029	5-7-2019
71111.21N.04	Operability Evaluations	CDE-1713	Operability Determination Document for 2-HTR-268-0003	11-12-2020
71111.21N.04	Operability Evaluations	CDE-1714	Operability Determination Document for 2-HTR-268-0031	11-12-2020
71111.21N.04	Procedures	0-CM-1.08	Raw Water Strategic Plan	Rev. 0005
71111.21N.04	Procedures	0-MI-57.002	Westinghouse DS Circuit Breaker Routine Maintenance, Inspection, and Testing	Rev. 16
71111.21N.04	Procedures	0-MI-57.108	Insulation Resistance and Continuity Tests for Rotating Machinery, Valves, Cables, Buses and Transformers	Rev. 13
71111.21N.04	Procedures	0-MI-67.001	Removal, Inspection, and Repair of Essential Raw Cooling Water Pumps	Rev. 0000

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
71111.21N.04	Procedures	0-SI-31-31-A	Control Room Emergency Air Temperature Control System (CREATCS) Train A Operability Test	Rev. 14
71111.21N.04	Procedures	0-TI-109	Breaker Testing and Maintenance Program	Rev. 7
71111.21N.04	Procedures	0-TI-31.02	Plant Equipment Vibration Monitoring & Vibration Diagnostics Program	Revision 0003
71111.21N.04	Procedures	1-SI-268-1-A	PERMANENT HYDROGEN MITIGATION SYSTEM TRAIN A IGNITER AVAILABILITY TEST	Revision 0008
71111.21N.04	Procedures	1-SI-268-1-B	PERMANENT HYDROGEN MITIGATION SYSTEM TRAIN B IGNITER AVAILABILITY TEST	Revision 0008
71111.21N.04	Procedures	1-SI-268-2-A	Permanent Hydrogen Mitigation System Train A Operability Test	Revision 0008
71111.21N.04	Procedures	1-SI-268-2-B	Permanent Hydrogen Mitigation System Train B Operability Test	Revision 0008
71111.21N.04	Procedures	1-TRI-0-10.3	Unit 1 ASME Section XI ISI/NDE Program Third Interval	Rev. 12
71111.21N.04	Procedures	16-PAR-WBN	Maintenance Rule Program	Rev. o
71111.21N.04	Procedures	2-SI-268-1-A	PERMANENT HYDROGEN MITIGATION SYSTEM TRAIN A IGNITER AVAILABILITY TEST	Revision 0004
71111.21N.04	Procedures	2-SI-268-1-B	PERMANENT HYDROGEN MITIGATION SYSTEM TRAIN B IGNITER AVAILABILITY TEST	Revision 0005
71111.21N.04	Procedures	2-SI-268-2-A	Permanent Hydrogen Mitigation System Train A Operability Test	Revision 0005
71111.21N.04	Procedures	2-SI-268-2-B	Permanent Hydrogen Mitigation System Train B Operability Test	Revision 0006
71111.21N.04	Procedures	2-SI-3-901-B	Motor Driven Auxiliary Feedwater Pump 2B-B Quarterly Performance Test	Revision 0018
71111.21N.04	Procedures	2-SI-3-901-B	Motor Driven Auxiliary Feedwater Pump 2B-B Quarterly Performance Test	Revision 0018
71111.21N.04	Procedures	2-SI-3-923-B	Auxiliary Feedwater Pump 2B-B Comprehensive Pump Test	Revision 0019
71111.21N.04	Procedures	2-SOI-268.01	Permanent Hydrogen Mitigation System	Revision 0002
71111.21N.04	Procedures	2-TRI-0-10.1	ASME Section XI ISI/NDE Program	Rev. 9
71111.21N.04	Procedures	2-TRI-0-2	Periodic Testing of Penetration Overcurrent	Rev. 4

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
			Protection 480V Circuit Breakers	
71111.21N.04	Procedures	CM 11.91	Total Residual Oxidant and Free Available Oxidant By Hach Pocket Colorimeter II	Rev. 0001
71111.21N.04	Procedures	CM-3.01	System Chemistry Specifications	Rev. 0137
71111.21N.04	Procedures	CM-6.12	ERCW, RCW, and CCW Sampling	Rev. 0003
71111.21N.04	Procedures	FMS-Motor-2	Fleet Maintenance Strategy Motor-Low Voltage	Rev. 1
71111.21N.04	Procedures	MI-56.007	Westinghouse Safety-Related DS Circuit Breaker Overhaul Maintenance, Inspection, and Testing	Rev. 1
71111.21N.04	Procedures	NPG-SPP-09.0.1	Conduct of Systems Engineering and Equipment Reliability	Rev. 0013
71111.21N.04	Procedures	NPG-SPP-09.0.1.1	System Monitoring and Trending	Rev. 0010
71111.21N.04	Procedures	NPG-SPP-09.14	Generic Letter (GL) 89-13 Implementation	Rev. 0006
71111.21N.04	Procedures	NPG-SPP-09.7	Corrosion Control Program	Rev. 0009
71111.21N.04	Procedures	NPG-SPP-09.7.1	Corrosion Control - General, Localized and Galvanic, and Stress Corrosion Control Cracking Program	Rev. 0006
71111.21N.04	Procedures	NPG-SPP-09.7.3	Raw Water Corrosion Program	Rev. 0005
71111.21N.04	Procedures	PM #: M6771V	Lube Oil Sampling Of Motor Driven Auxiliary Feed Water Pump Motors	Rev. 11
71111.21N.04	Procedures	PM 610031003	Bridge and Meggering for 480V Class 1E Motors and Cable Condition Monitoring	Rev. 2
71111.21N.04	Procedures	PM M6318V	Lubrication, Cleaning and Inspection of Westinghouse Medium AC Motors	Rev. 3
71111.21N.04	Procedures	SDD-N3-3B-4002	AUXILIARY FEEDWATER SYSTEM	Rev. 0034
71111.21N.04	Procedures	SDD-N3-83-4001	COMBUSTIBLE GAS CONTROL SYSTEM	Rev. 0013
71111.21N.04	Procedures	TVA-NQA-PLN89-A	Nuclear Quality Assurance Plan	Rev. 0042
71111.21N.04	Procedures	WBN IPP PLAN (ECM-8)	Watts Bar Nuclear Plant: Integrated Pollution Prevention (IPP) Plan and Spill Response Plan	Rev. 37
71111.21N.04	Shipping Records	7456673	Batch-LL13A19721	05/04/2022
71111.21N.04	Shipping Records	G9150-2-065EQ	LUBRICANT, OIL, QA 2, DRUM, FAMILY, TURBINE OIL 46 INDUSTRY GRADE ISO VG-46, TURBINE OIL, TVA CODE STO-2 / HTO-2	10/7/2021
71111.21N.04	Work Orders	WO 111412275, 111984041, 112604458,		

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		116002096, 119467471, 119623179, 121467934, 121491782, 121491783, 121775913, 121878090, 121878091, 121951060, 122220778, 122610257, 122744165, 122744186, 122875135, 122875181, 122942239, 122942360, 123179448, 123187912, 123188000, 123220607, 123220875, 123304942, 124047203, 124131946		