



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

May 4, 2022

Ms. Kim Maza
Site Vice President
Duke Energy Progress, LLC
5413 Shearon Harris Road
Mail Code HNP01
New Hill, NC 27562-9300

SUBJECT: SHEARON HARRIS NUCLEAR POWER PLANT – INTEGRATED INSPECTION
REPORT 05000400/2022001

Dear Ms. Maza:

On March 31, 2022, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Shearon Harris Nuclear Power Plant. On April 21, 2022, the NRC inspectors discussed the results of this inspection with you 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,

Matthew Endress

Matthew F. Endress, Branch Chief
Reactor Projects Branch 4
Division of Reactor Projects

Docket No. 05000400
License No. NPF-63

Enclosure:
As stated

cc w/ encl: Distribution via LISTSERV®

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

Docket Number: 05000400

License Number: NPF-63

Report Number: 05000400/2022001

Enterprise Identifier: I-2022-001-0033

Licensee: Duke Energy Progress, LLC

Facility: Shearon Harris Nuclear Power Plant

Location: New Hill, NC 27562

Inspection Dates: January 1, 2022 to March 31, 2022

Inspectors: C. Smith, Resident Inspector
J. Zeiler, Senior Resident Inspector

Approved By: Matthew F. Endress, Branch Chief
Reactor Projects Branch 4
Division of Reactor Projects

Enclosure

SUMMARY

The U.S. Nuclear Regulatory Commission (NRC) continued monitoring the licensee's performance by conducting an integrated inspection at Shearon Harris Nuclear Power 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.

PLANT STATUS

Unit 1 operated at or near rated thermal power for the entire inspection period.

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 performed activities described in IMC 2515, Appendix D, "Plant Status," conducted routine reviews using IP 71152, "Problem Identification and Resolution," observed risk significant activities, and completed on-site portions of IPs. 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

71111.04 - Equipment Alignment

Partial Walkdown Sample (IP Section 03.01) (4 Samples)

The inspectors evaluated system configurations during partial walkdowns of the following systems/trains:

- (1) 'B' essential services chilled water (ESCW) system while 'A' ESCW was out of service for emergent issue with pre-rotation vane alignment on January 11, 2022
- (2) 'B' emergency diesel generator (EDG) while 'A' EDG was out of service for scheduled maintenance on January 12, 2022
- (3) 'B' residual heat removal (RHR) pump and associated flowpath while 'A' RHR pump was out of service for scheduled maintenance on January 19, 2022
- (4) 'B' and 'C' charging and safety injection pumps (CSIPs) while 'A' CSIP was out of service for scheduled maintenance on February 8, 2022

71111.05 - Fire Protection

Fire Area Walkdown and Inspection Sample (IP Section 03.01) (5 Samples)

The inspectors evaluated the implementation of the fire protection program by conducting a walkdown and performing a review to verify program compliance, equipment functionality, material condition, and operational readiness of the following fire areas:

- (1) 'B' EDG and fuel oil day tank rooms (fire zones 1-D-1-DGB-RM, 1-D-3-DGB-ES, 1-D-DTB, 1-D-1-DGB-ASU, and 1-D-1-DGB-ER) on January 12, 2022
- (2) Reactor auxiliary building (RAB) 236' elevation 'A,' 'B,' and 'C' CSIP rooms (fire zones 1C-CSIP-SAB, 1-A-BAL-G, 1-A-BAL-H, and 1-A-3-PB) on February 8, 2022
- (3) RAB 236' elevation corridor for component cooling water pumps (fire zone 1-A-3-PB/1-A-3-TA) on March 17, 2022

- (4) RAB 261' elevation for 'A' and 'B' ESCW chiller areas (fire zone 1-A-4-CHLR) on March 25, 2022
- (5) Fuel handling building (FHB) 286' elevation for spent fuel pool operating floor (fire zones 5-F-23-NFP1, 5-F-23-FTC1, 5-F-23-SFP1, 5-F-4-BAL, 5-F-23-SFP2, 5-F-23-NFP2, and 5-F-23-NF) on March 29, 2022

71111.06 - Flood Protection Measures

Inspection Activities - Internal Flooding (IP Section 03.01) (1 Sample)

The inspectors evaluated internal flooding mitigation protections in the:

- (1) Cable vaults M71C and M71D that contain 'B' train safety-related cables associated with the emergency service water (ESW) system on January 4 and 5, 2022

71111.11Q - Licensed Operator Requalification Program and Licensed Operator Performance

Licensed Operator Performance in the Actual Plant/Main Control Room (IP Section 03.01) (1 Sample)

- (1) The inspectors observed and evaluated licensed operator performance in the Control Room during a unit downpower to 88 percent power to conduct scheduled turbine generator valve testing on February 4, 2022

Licensed Operator Requalification Training/Examinations (IP Section 03.02) (1 Sample)

- (1) The inspectors observed and evaluated a simulator scenario for operator training involving an anticipated transient without scram (ATWS) followed by a complete loss of heat sink on February 9, 2022

71111.12 - Maintenance Effectiveness

Maintenance Effectiveness (IP Section 03.01) (1 Sample)

The inspectors evaluated the effectiveness of maintenance to ensure the following structures, systems, and components (SSCs) remain capable of performing their intended function:

- (1) 'A' CSIP speed increaser oil piping issue (Nuclear Condition Report (NCR) 02412354) on March 31, 2022

Quality Control (IP Section 03.02) (1 Sample)

The inspectors evaluated the effectiveness of maintenance and quality control activities to ensure the following SSC remains capable of performing its intended function:

- (1) Review of commercial grade dedication of the current sensing input adjustable (CSIA) resistor under engineering change (EC) 401153 which prematurely actuated and caused abnormal operation of the 'B' ESCW chiller on December 13, 2021

71111.13 - Maintenance Risk Assessments and Emergent Work Control

Risk Assessment and Management Sample (IP Section 03.01) (5 Samples)

The inspectors evaluated the accuracy and completeness of risk assessments for the following planned and emergent work activities to ensure configuration changes and appropriate work controls were addressed:

- (1) Elevated (Green) risk during emergent repairs to 'A' ESCW chiller on January 10-11, 2022
- (2) Elevated (Green) risk during scheduled motor preventive maintenance of 'B' motor driven auxiliary feedwater (MDAFW) pump on January 24, 2022
- (3) Elevated (Green) risk during scheduled motor operated valve calibration/testing of 1SW-130, ESW service water supply to the 'B' MDAFW pump, on February 3, 2022
- (4) Elevated (Green) risk during scheduled reactor downpower to 88 percent power to conduct turbine generator valve testing on February 4, 2022
- (5) Elevated (Green) risk during scheduled operational testing of the alternate seal injection (ASI) pump on March 14, 2022

71111.15 - Operability Determinations and Functionality Assessments

Operability Determination or Functionality Assessment (IP Section 03.01) (5 Samples)

The inspectors evaluated the licensee's justifications and actions associated with the following operability determinations and functionality assessments:

- (1) Pressurizer level channel 3 (level transmitter LT-461) excessive deviation from other two channels LT-459 and LT-460 (NCR 02405450) on January 3, 2022
- (2) 'A' ESCW chiller compressor pre-rotation vane misposition due to linkage slippage (NCR 02411360) on January 10, 2022
- (3) Loose fan motor belts on 'A' train RHR and containment spray pump room air handling fan AH-5A (NCR 02413884) on January 29, 2022
- (4) 'B' train core exit thermocouple indications reading incorrectly (NCR 02414373) on February 1, 2022
- (5) Failure of main control board AC power supply to control room annunciators (NCR 02415836) on February 13, 2022

71111.19 - Post-Maintenance Testing

Post-Maintenance Test Sample (IP Section 03.01) (6 Samples)

The inspectors evaluated the following post-maintenance testing activities to verify system operability and/or functionality:

- (1) Operations surveillance test (OST)-1020, Remote Shutdown Monitoring and Accident Monitoring Instrumentation Channel Check Monthly Interval Modes 1-3, following replacement of pressurizer level transmitter LT-461 on January 5, 2022
- (2) Operations periodic test (OPT)-1512, Essential Chilled Water Turbopak Units Quarterly Inspection/Checks Modes 1-6, following emergent troubleshooting and repairs to 'A' ESCW chiller for pre-rotational vane malfunction on January 11, 2022

- (3) Partial OST-1076, Auxiliary Feedwater Pump 1B-SB Operability Test Quarterly Interval Modes 1-4, following scheduled pump motor preventive maintenance on 'B' MDAFW pump on January 24, 2022
- (4) Partial OST-1215, Emergency Service Water System Operability Train B Quarterly Interval Modes 1 2 3 4 5 6 Defueled, following scheduled motor operated valve preventive maintenance of valve 1SW-130 on February 3, 2022
- (5) Partial OST-1007, CVCS/SI System Operability Train A Quarterly Interval Modes 1-4, following scheduled preventive maintenance on the 'A' CSIP on February 8, 2022
- (6) OPT-1512, Essential Chilled Water Turbopak Units Quarterly Inspection/Checks Modes 1-6, following emergent repair of the 'A' ESCW following unexpected chiller trip on low refrigerant pressure on March 29, 2022

71111.22 - Surveillance Testing

The inspectors evaluated the following surveillance testing activities to verify system operability and/or functionality:

Surveillance Tests (other) (IP Section 03.01) (3 Samples)

- (1) OST-1086, 1B-SB Diesel Generator Operability Test Semiannual Interval Modes 1-6, on January 26, 2022
- (2) OPT-1014, Turbine Valve Test Modes 1-5, on February 4, 2022
- (3) OST-1124, Train B 6.9 KV Emergency Bus Undervoltage Trip Actuating Device Operational Test and Contact Check Modes 1-6, on March 11, 2022

Inservice Testing (IP Section 03.01) (1 Sample)

- (1) OST-1007, CVCS/SI System Operability Train A Quarterly Interval Modes 1-4, on March 21-22, 2022

71114.06 - Drill Evaluation

Select Emergency Preparedness Drills and/or Training for Observation (IP Section 03.01) (1 Sample)

- (1) On February 24, 2022, the inspectors observed and evaluated a licensee quarterly emergency preparedness drill involving an ATWS followed by a faulted steam generator

OTHER ACTIVITIES – BASELINE

71151 - Performance Indicator Verification

The inspectors verified licensee performance indicators submittals listed below:

IE01: Unplanned Scrams per 7000 Critical Hours Sample (IP Section 02.01) (1 Sample)

- (1) Unit 1 (January 1, 2021 - December 31, 2021)

IE03: Unplanned Power Changes per 7000 Critical Hours Sample (IP Section 02.02) (1 Sample)

(1) Unit 1 (January 1, 2021 - December 31, 2021)

IE04: Unplanned Scrams with Complications (USwC) Sample (IP Section 02.03) (1 Sample)

(1) Unit 1 (January 1, 2021 - December 31, 2021)

71152A - Annual Follow-up Problem Identification and Resolution

Annual Follow-up of Selected Issues (Section 03.03) (1 Sample)

The inspectors reviewed the licensee's implementation of its corrective action program related to the following issues:

- (1) 'B' ESCW chiller discovered with high refrigerant pressure and chill water outlet temperature due to malfunction of the current sensing input adjustable resistor on December 13, 2021 (NCR 02408989)

INSPECTION RESULTS

No findings were identified.

EXIT MEETINGS AND DEBRIEFS

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

- On April 21, 2022, the inspectors presented the integrated inspection results to Kim Maza and other members of the licensee staff.

DOCUMENTS REVIEWED

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
71111.04	Drawings	5-S-1310	Simplified Flow Diagram Safety Injection System	Rev 12
	Procedures	OP-107	Chemical and Volume Control System	Rev. 120
		OP-111	Residual Heat Removal System	Rev. 63
		OP-148	Essential Services Chilled Water System	Rev. 84
		OP-155	Diesel Generator Emergency Power System	Rev. 92
71111.05	Fire Plans	CSD-HNP-PFP-FHB	Fuel Handling Building Pre-Fire Plan	Rev. 1
		CSD-HNP-PFP-RAB-236	Reactor Auxiliary Bldg. Elevation 236 Pre-Fire Plan	Rev. 2
		CSD-HNP-PFP-RAB-261	Reactor Auxiliary Building Elevation 261 Pre-Fire Plan	Rev. 2
	Procedures	AD-EG-ALL-1520	Transient Combustible Control	Rev. 14
		FPP-001	Fire Protection Program Manual	Rev. 45
		FPP-013	Fire Protection - Minimum Requirements, Mitigating Actions and Surveillance Requirements	Rev. 111
	71111.06	Procedures	AD-EG-ALL-1615	Cable Aging Management Program - Implementation
Work Orders		WO 20367677	Inspect manhole and associated cables for M71C and M71D	1/4-5/2021
71111.11Q	Miscellaneous	Reactivity Manipulation Plan	HNP1 02/2022 Turbine Valve Test	Rev. 0
	Procedures	AD-OP-ALL-1000	Conduct of Operations	Rev. 18
		AD-OP-HNP-0205	HNP Time Critical Actions/Time Sensitive Actions	Rev. 0
		AD-OP-HNP-1001	HNP Conduct of Abnormal Operations	Rev. 1
		AOP-001	Malfunction of Rod Control and Indication System	Rev. 57
		AOP-033	Chemistry Out of Tolerance	Rev. 34
		EOP-FR-H.1	Response to Loss of Secondary Heat Sink	Rev. 6
		EOP-FR-S.1	Response to Nuclear Power Generation/ATWS	Rev. 7
		GP-006	Normal Plant Shutdown from Power Operation to Hot Standby (Mode 1 to Mode 3)	Rev. 97
OPT-1014	Turbine Valve Test Modes 1-5	Rev. 33		

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
71111.12	Corrective Action Documents	02412354	A CSIP speed increaser oil piping	01/18/2022
		NCR 02408989	'B' ESCW chiller operation with abnormally high refrigerant evaporator pressure and chilled water outlet temperature	12/13/2021
	Engineering Changes	EC 401153	Commercial grade dedication of replacement safety-related current sensing input adjustable resistor for the ESCW chillers	1/7/2016
	Procedures	AD-EG-ALL-1011	Procurement Engineering Products	Revs. 0-6
AD-EG-ALL-1210		Maintenance Rule Program	Rev. 3	
71111.13	Procedures	AD-NF-ALL-0501	Electronic Risk Assessment Tool (ERAT)	Rev. 6
		AD-WC-ALL-0200	On-Line Risk Management	Rev. 20
		AD-WC-ALL-0240	On-Line Risk Management Process	Rev. 3
		AD-WC-ALL-0410	Work Activity Integrated Risk Management	Rev. 12
	Work Orders	WO 20392120	'B' MDAFW pump motor preventive maintenance	1/24/2022
		WO 20403356	MOV calibration and testing of valve 1SW-130	2/3/2022
		WO 20512433	Troubleshoot/repair pre-rotational vanes associated with 'A' ESCW chiller	1/12/2022
71111.15	Procedures	AD-OP-ALL-0105	Operability Determinations	Rev. 6
71111.19	Procedures	PLP-400	Post Maintenance Testing	Rev. 64
	Work Orders	WO 20392120	'B' MDAFW pump motor preventive maintenance	1/24/2022
		WO 20403356	Motor operated valve calibration and testing of valve 1SW-130	2/3/2022
		WO 20505482	Replace pressurizer level transmitter LT-461 with excessive drift	1/5/2022
		WO 20512433	Troubleshoot/repair 'A' ESCW chiller pre-rotational vane malfunction	1/11/2022
		WO 20527985	'A' ESCW chiller trip due to low refrigerant pressure	3/29/2022
WOs 20265472, 20357958, 20405906, 20489737, and 20491760	Pump, motor, and gear drive preventive maintenance activities associated with the 'A' CSIP	2/8/2022		

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
71111.22	Corrective Action Documents	NCR 02419285	RWCU inlet isolation valve failed LLRT	3/9/2022
	Work Orders	WO 20525711	Troubleshooting RWCU inlet containment isolation valve 1-G31-F001 following LLRT failure	3/9/2022
71114.06	Miscellaneous	22-02 HNP Quarterly ERO Drill	Harris Quarterly ERO Drill package	Rev. 1 and 2
	Procedures	AD-EP-ALL-0002	NRC Regulator Assessment Performance Indicator Guidance EP Cornerstone	Rev. 6
		AD-EP-ALL-0100	Emergency Response Organization (ERO)	Rev. 6
		AD-EP-ALL-0101	Emergency Classification	Rev. 3
		AD-EP-ALL-0103	Activation and Operation of the Emergency Operations Facility	Rev. 5
		AD-EP-ALL-0105	Activation and Operation of the Technical Support Center	Rev. 7
		AD-EP-ALL-0111	Control Room Activation of the ERO	Rev. 4
		AD-EP-ALL-0304	State and County Notification	Rev. 6
		EOP-E-0	Reactor Trip or Safety Injection	Rev. 15
		EOP-E-2	Faulted Steam Generator Isolation	Rev. 3
		EOP-E-3	Steam Generator Tube Rupture	Rev. 7
		EOP-FR-S.1	Response to Nuclear Power Generation/ATWS	Rev. 7
		EP-ALL-EPLAN	Duke Energy Common Emergency Plan	Rev. 1
PLP-201	Emergency Plan	Rev. 76		
71151	Miscellaneous		Operator Log Entries between January 2021 - December 2021	
	Procedures	AD-PI-ALL-0700	Performance Indicators	Rev. 5
71152A	Corrective Action Documents	NCR 024006385	'B' ESCW chiller insufficient maximum ampere during surveillance testing using OST-1512	11/19/2021
	Procedures	AD-PI-ALL-0100	Corrective Action Program	Rev. 26
		AD-PI-ALL-0106	Cause Investigation Checklists	Rev. 7
	Work Orders	WO 20508170	Replace CSIA resistor and hot gas bypass valve actuator on 'B' ESCW chiller	12/17/2021