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

August 5, 2024

John A. Krakuszeski
Site Vice President
Duke Energy Progress, LLC
8470 River Road SE
M/C BNP04
Southport, NC 28461-0429

SUBJECT: BRUNSWICK STEAM ELECTRIC PLANT – INTEGRATED INSPECTION REPORT 05000324/2024002 AND 05000325/2024002 AND 07200006/2024001

Dear John A. Krakuszeski:

On June 30, 2024, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Brunswick Steam Electric Plant. On July 25, 2024, 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,

Signed by Fannon, Matthew
on 08/05/24

Matthew S. Fannon, Chief
Reactor Projects Branch 4
Division of Reactor Projects

Docket Nos. 05000324 and 05000325 and 07200006
License Nos. DPR-62 and DPR-71

Enclosure:
As stated

cc w/ encl: Distribution via LISTSERV

SUBJECT: BRUNSWICK STEAM ELECTRIC PLANT – INTEGRATED INSPECTION REPORT 05000324/2024002 AND 05000325/2024002 AND 07200006/2024001 DATED AUGUST 05, 2024

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DATE	08/01/24	08/02/24	08/05/24		

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U.S. NUCLEAR REGULATORY COMMISSION
Inspection Report

Docket Numbers:	05000324 and 05000325 and 07200006
License Numbers:	DPR-62 and DPR-71
Report Numbers:	05000324/2024002 and 05000325/2024002 and 07200006/2024001
Enterprise Identifier:	I-2024-002-0015 and I-2024-001-0042
Licensee:	Duke Energy Progress, LLC
Facility:	Brunswick Steam Electric Plant
Location:	Southport, NC
Inspection Dates:	April 01, 2024, to June 30, 2024
Inspectors:	P. Cooper, Senior Reactor Inspector C. Curran, Resident Inspector B. Kellner, Senior Health Physicist M. Magyar, Allegations/Enforcement Specialist A. Nielsen, Senior Health Physicist G. Smith, Senior Resident Inspector R. Smith, Reactor Systems Engineer
Approved By:	Matthew S. Fannon, 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 Brunswick Steam Electric 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 began the period at 100 percent (full) rated thermal power (RTP) and operated there until June 15, 2024, when power was reduced to 60 percent RTP to perform a control rod sequence exchange, turbine valve testing, common bus power supply swap, and transmission system work. Following the valve testing, sequence exchange, electrical maintenance, and one subsequent rod improvement, the unit was restored to full RTP on June 18, where it continued to operate for the remainder of the inspection period.

Unit 2 began the period at full RTP and operated there until May 31, 2024, when power was reduced to 70 percent RTP to perform a control rod sequence exchange and turbine valve testing. Following the valve testing, sequence exchange, and one subsequent control rod improvement, the unit was restored to full RTP on June 4, where it continued to operate for the remainder of the 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," 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) (5 Samples)

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

(1) Unit 1 nuclear service water (NSW) and conventional service water (CSW) while the Unit 1 'C' CSW pump was out-of-service (OOS) for strainer maintenance on April 16, 2024
(2) Unit 1 'A' standby gas treatment (SGBT) train while the 'B' SGBT train was OOS for testing on April 24
(3) Unit 1 'B' residual heat removal (RHR) train while the 'A' RHR train was OOS for a maintenance outage on May 21
(4) Unit 2 'A' RHR train on June 7 following a maintenance outage that was completed on June 5
(5) Emergency diesel generator (EDG)-2, 3, and 4 while EDG-1 was OOS due to a maintenance outage on June 24

71111.05 - Fire Protection

Fire Area Walkdown and Inspection Sample (IP Section 03.01) (4 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) Service water building 4' and 20' elevation on April 5, 2024
(2) Unit 2 reactor building 117’ elevation on April 20
(3) EDG building 23' and 5' elevation on June 25
(4) EDG building 45' elevation on June 26

Fire Brigade Drill Performance Sample (IP Section 03.02) (1 Sample)

(1) The inspectors evaluated the onsite fire brigade training and performance during an announced fire drill on April 25, 2023. The drill involved a simulated fire in the Unit 1 turbine building near the 480-volt electrical motor control center 1TG.

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 1 power reduction to 80 percent RTP, control rod improvement and subsequent power ascension to full power on June 18, 2024. This evolution involved reactivity management as well as management oversight.

Licensed Operator Requalification Training/Examinations (IP Section 03.02) (2 Samples)

(1) The inspectors observed and evaluated a simulator operator requalification activity involving simulator guide LOT-AOP-106 Rev 07 on May 21, 2024. This scenario involved a reactor feed pump trip and runback failure.
(2) The inspectors observed and evaluated a simulator operator requalification activity involving simulator guide LOT-AOP-120 Rev 13a on May 22, 2024. This scenario involved a turbine building closed loop cooling water pump trip and loss of DC power.

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) Spurious Group 6 isolation that occurred on January 2, 2024 (Nuclear Condition Report (NCR) 2499468)

71111.13 - Maintenance Risk Assessments and Emergent Work Control

Risk Assessment and Management Sample (IP Section 03.01) (4 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 risk due to maintenance on the Unit 1 ‘B’ CSW pump strainer from April 16 to April 19, 2024
(2) Unit 1 station auxiliary transformer (SAT) ground and subsequent emergent repairs on May 9, 2024
(3) Elevated risk due to Unit 1 ‘A’ train RHR outage conducted from May 21 to May 22, 2024
(4) EDG-1 maintenance outage from June 17 to June 26, 2024, that involved the implementation of a risk informed completion time

71111.15 - Operability Determinations and Functionality Assessments

Operability Determination or Functionality Assessment (IP Section 03.01) (4 Samples)

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

(1) Steam packing leak on the Unit 2 'B' heater drain pump (Work Request 20268800) and its effect on the alternate source term analysis regarding main control room dose during a design basis accident
(2) Main turbine bypass system valve failure (NCR 2512610)
(3) Unit 1 SAT ground (NCR 2515448)
(4) Elevated Unit 1 drywell air temperature (NCR 2514949)

71111.18 - Plant Modifications

Temporary Modifications and/or Permanent Modifications (IP Section 03.01 and/or 03.02) (1 Sample)

The inspectors evaluated the following temporary or permanent modifications:

(1) Unit 1 main steam isolation valve 1-B21-F028B and 1-B21-F028D bonnet and actuator replacement (Engineering Change 421864)

71111.24 - Testing and Maintenance of Equipment Important to Risk

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

Post-Maintenance Testing (PMT) (IP Section 03.01) (3 Samples)

(1) 0MST-SRM24R, "SRM D Channel Calibration - Online," Rev. 14 and 0MST-SRM28R, "SRM D Channel Calibration - Outage," Rev. 2 after replacement of the Unit 1 'D'

source range monitor preamplifier in accordance with (IAW) work order (WO) 20631001
(2) 1PT-24.1-1, “Service Water Pump and Discharge Valve Operability Test,” Rev. 99 following disassembly/inspection of the Unit 1 ‘B’ CSW discharge strainer IAW WO 20631955
(3) 0PT-12.2C “No.3 Diesel Generator Monthly Load Test,” Rev. 124 following EDG 3 overspeed relay replacement IAW WO 20631389

Surveillance Testing (IP Section 03.01) (1 Sample)

(1) 1MST-SGBT500B, “Standby Gas Treatment Train 1B Filter Test,” Rev. 2 performed IAW WO 20565192

Inservice Testing (IST) (IP Section 03.01) (1 Sample)

(1) 1PT-24.1-1, “Service Water Pump and Discharge Valve Operability Test,” Rev. 99 performed on April 19, 2024

71114.06 - Drill Evaluation

Additional Drill and/or Training Evolution (2 Samples)

The inspectors evaluated:

(1) A simulator-based licensed operator requalification examination scenario (0700 crew) on June 13, 2024
(2) A simulator-based licensed operator requalification examination scenario (0900 crew) on June 13, 2024

RADIATION SAFETY

71124.06 - Radioactive Gaseous and Liquid Effluent Treatment

Walkdowns and Observations (IP Section 03.01) (4 Samples)

The inspectors evaluated the following radioactive effluent systems during walkdowns:

(1) Unit 1, turbine building ventilation system
(2) Unit 2, turbine building ventilation system
(3) Unit 2, reactor building ventilation system discharge to the main stack
(4) Unit 1 and 2 radwaste processing systems

Sampling and Analysis (IP Section 03.02) (3 Samples)

Inspectors evaluated the following effluent samples, sampling processes and compensatory samples:

(1) Unit 1 turbine building ventilation particulate, iodine, and gas sample
(2) Unit 2 main stack particulate, iodine, and gas sample
(3) Unit 2 salt water release tank sample and release

Dose Calculations (IP Section 03.03) (2 Samples)

The inspectors evaluated the following dose calculations:

(1) Stack gaseous release permit G-2024-0145 (release from 5/14/2024 to 5/21/2024)
(2) Unit 2 salt water release tank release permit L-2024-0107 (5/22/2024)

71124.07 - Radiological Environmental Monitoring Program

Environmental Monitoring Equipment and Sampling (IP Section 03.01) (1 Sample)

(1) The inspectors evaluated environmental monitoring equipment and observed collection of environmental samples.

Radiological Environmental Monitoring Program (IP Section 03.02) (1 Sample)

(1) The inspectors evaluated the implementation of the licensee's radiological environmental monitoring program.

GPI Implementation (IP Section 03.03) (1 Sample)

(1) The inspectors evaluated the licensee's implementation of the Groundwater Protection Initiative (GPI) program to identify incomplete or discontinued program elements.

OTHER ACTIVITIES – BASELINE

71151 - Performance Indicator Verification

The inspectors verified licensee performance indicators submittals listed below:

MS05: Safety System Functional Failures (SSFFs) Sample (IP Section 02.04) (2 Samples)

(1) Unit 1 (April 1, 2023, through March 31, 2024)
(2) Unit 2 (April 1, 2023, through March 31, 2024)

MS06: Emergency AC Power Systems (IP Section 02.05) (2 Samples)

(1) Unit 1 (April 1, 2023, through March 31, 2024)
(2) Unit 2 (April 1, 2023, through March 31, 2024)

MS10: Cooling Water Support Systems (IP Section 02.09) (2 Samples)

(1) Unit 1 (April 1, 2023, through March 31, 2024)
(2) Unit 2 (April 1, 2023, through March 31, 2024)

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) Automatic starting of all four EDGs on December 28, 2023. The inspectors verified that corrective actions have been initiated and/or completed or will be completed as scheduled.

71152S - Semiannual Trend Problem Identification and Resolution

Semiannual Trend Review (Section 03.02) (1 Sample)

(1) The inspectors reviewed the licensee's corrective action program to identify potential trends in equipment and human performance that might be indicative of a more significant safety issue.

OTHER ACTIVITIES – TEMPORARY INSTRUCTIONS, INFREQUENT AND ABNORMAL

60855 - Operation Of An ISFSI

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) 2690, "Inspection Program for Storage of Spent Reactor Fuel and Reactor-Related Greater-than-Class C Waste at Independent Spent Fuel Storage Installations (ISFSI) and for 10 CFR Part 71 Transportation Packagings."

Operation Of An ISFSI (1 Sample)

(1) From June 10 to 13, 2024 the inspectors performed a review of the licensee's ISFSI activities to verify compliance with regulatory requirements. During the on-site inspection, the inspectors observed and reviewed licensee activities in each of the five safety focus areas including occupational exposure, public exposure, fuel damage, confinement, and impact to plant operations.

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. Additionally, the inspectors performed independent walkdowns of the heavy load lifting equipment and the ISFSI haul path. The inspectors also performed an independent radiation survey of the ISFSI pad.

INSPECTION RESULTS

No findings were identified.

EXIT MEETINGS AND DEBRIEFS

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

- On July 25, 2024, the inspectors presented the integrated inspection results to J. Krakuszeski, Site Vice President, and other members of the licensee staff.
- On May 23, 2024, the inspectors presented the public radiation safety inspection results to B. Wooten, Engineering General Manager, and other members of the licensee staff.

DOCUMENTS REVIEWED

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
71111.13	Miscellaneous	PRT-1-24-1A RHR/RHRSW-076	Protected Equipment For the 1A RHR/RHRSW OOS for Planned Maintenance	05/20/2024
71111.15	Calculations	BNP-RAD-10	Management Standard Limit (Total AST Leakage)	3.0
	Miscellaneous		Alternate Source Term Leakage Log	05/15/2024
		UFSAR 15.6.4.3.2	Fission Product Release to Secondary Containment	28
		UFSAR Section 6.4	HABITABILITY SYSTEM	28
	Procedures	AD-MN-ALL-0006	Fluid Leak Management	6.0
	Work Orders	Work Requests (WRs)	20268800	
71124.06	Corrective Action Documents		NCRs 02333576, 02337906, 02340880, 02359530, 02385621, 02391988, 02434416, 02441650, 02441801, 02450039, 02459139, 02492244, and 02509788	Various
	Miscellaneous		BNP Land Use Census Evaluation [Plant REMP centerline location]	11/17/2022
		Radiochemistry Laboratory Cross Checks	Brunswick Radiochemistry Laboratory Interlaboratory Cross Check Analysis Results - fourth Quarter 2023 and first Quarter 2024	Various
		Work Order 20381052-02	Unit 2 B Standby Gas Treatment Carbon Filter Laboratory Sample Results	05/11/2022
		Work Order 20432114-02	Unit 2 A Standby Gas Treatment Carbon Filter Laboratory Sample Results	05/06/2022
	Radiation Surveys		2020, 2021, 2022, and 2023 Brunswick Steam Electric Plant Annual Land Use Census	Various
	Self-Assessments	02410188-05	Self-Assessment Report 2022 Radioactive Effluents	10/17/2022
		2020-BNP-RPCH-01	Nuclear Oversight Audit - BNP Radiation Protection and Chemistry	06/04/2020
		2022-BNP-RPCH-01	Nuclear Oversight Audit - BNP Radiation Protection and Chemistry	09/22/2022
71124.07	Corrective Action Documents	02441863		

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
	Engineering Changes	EC 421625	MET Tower Site and Equipment Upgrades	
	Engineering Evaluations		Meteorological tower instrument data recovery evaluations 2020 - 2023	
	Work Orders	WO 20562016-01		
71151	Calculations		BNP Annual Regulatory Guide 1.21 Report for 2023 [activity released via gaseous and liquid effluent release points and associated dose to key offsite receptors]	04/01/2024
		Gaseous Radioactive Release Permit # G-2024-0135 (including year to data activity and dose total)	Unit 2 Turbine Building Ventilation (weekly particulate, iodine, and gas sample for the period 04/30/2024 to 05/07/2024)	05/08/2024
		Liquid Radioactive Release Permit # L-2024-0096 (including year to data activity and dose total)	Unit 2 Salt Water Release Tank (SWRT)	05/06/2024
	Corrective Action Documents		NCRs 02428007, and 02467842	Various
71152A	Corrective Action Documents	Action Requests (ARs)	02499358, 02500305, 02505184, 02512899	
		Nuclear Condition Reports (NCRs)	2499358-7	
	Drawings	F-30019	4160 Volt System Relaying & Metering Three Line Diagram	33.0
	Miscellaneous	BNP-MECH-MSPI	NRC MITIGATING SYSTEM PERFORMANCE INDEX PLANT BASIS DOCUMENT	3.0
		EQUP 2499358	Extent of Condition for Components Related to EQUP 2499358	
		MTG-2024-	Maintenance Rule Expert Panel (Meeting Details)	04/15/2024

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		00001435		
		UFSAR 8.3.1.1.6.5	Diesel Generator Automatic Starting and Loading Description	28
		Work Requests (WRs)	20261317	
	Procedures	0PM-SWG005	PREVENTIVE MAINTENANCE OF ITE AND ABB 4 KV SWITCHGEAR	34
		0PM-SWG006	PREVENTIVE MAINTENANCE FOR EATON 480VAC FLEX SWITCHBOARDS 0-FLEX-DGF1-SWB AND 0-FLEX-DGF2-SWB	0.0
	Work Orders	Work Orders (WOs)	20644628-01	