



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

July 30, 2025

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

SUBJECT: BRUNSWICK STEAM ELECTRIC PLANT – INTEGRATED INSPECTION
REPORT 05000324/2025002 AND 05000325/2025002

Dear John A. Krakuszeski:

On June 30, 2025, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Brunswick Steam Electric Plant. On July 22, 2025, 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,

A handwritten signature in black ink, appearing to read "Matthew S. Fannon".

Signed by Fannon, Matthew
on 07/30/25

Matthew S. Fannon, Chief
Projects Branch 2
Division of Operating Reactor Safety

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

Enclosure:
As stated

cc w/ encl: Distribution via LISTSERV

SUBJECT: BRUNSWICK STEAM ELECTRIC PLANT – INTEGRATED INSPECTION
REPORT 05000324/2025002 AND 05000325/2025002 JULY 30, 2025

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DATE	07/29/2025	07/29/2025	07/30/2025		

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

Docket Numbers: 05000324 and 05000325

License Numbers: DPR-62 and DPR-71

Report Numbers: 05000324/2025002 and 05000325/2025002

Enterprise Identifier: I-2025-002-0016

Licensee: Duke Energy Progress, LLC

Facility: Brunswick Steam Electric Plant

Location: Southport, NC

Inspection Dates: April 01, 2025, to June 30, 2025

Inspectors: C. Curran, Senior Resident Inspector
J. Hickey, Senior Project Engineer
C. Smith, Reactor Operations Engineer
G. Smith, Senior Resident Inspector

Approved By: Matthew S. Fannon, Chief
Projects Branch 2
Division of Operating Reactor Safety

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 rated thermal power (RTP) and operated there until April 12, 2025, when power was reduced to 60 percent RTP to perform a control rod sequence exchange and turbine valve testing. Following the sequence exchange, valve testing and two follow on rod improvements the unit was restored to 100 percent RTP on April 16, 2025. On May 31, 2025, power was reduced to 67 percent RTP to perform a control rod sequence exchange and quarterly valve testing. Following the sequence exchange and valve testing the unit was restored to 100 percent RTP on June 2, 2025, where it continued to operate for the remainder of the inspection period.

Unit 2 began the period at 93 percent RTP following a refueling outage. Following power ascension and two follow on rod improvements the unit was restored to 100 percent RTP on April 4, 2025. The unit operated at 100 percent RTP until June 14, 2025, when power was reduced to 70 percent RTP to perform a control rod sequence exchange and quarterly valve testing. Following the sequence exchange and valve testing the unit was restored to 100 percent RTP on June 16, 2025, 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 and Unit 2 nuclear service water (NSW) and conventional service water (CSW) while the Unit 1 'B' NSW pump was out-of-service (OOS) due to strainer rebuild on April 24, 2025
- (2) Emergency diesel generator (EDG) 1, 3, and 4 while EDG-2 was OOS for a maintenance outage on April 28 and April 29, 2025
- (3) Unit 1 'A' train residual heat removal service water (RHRSW) while 'B' train RHRSW was OOS for maintenance on May 6 and May 7, 2025
- (4) Unit 1 reactor core isolation cooling while Unit 1 high pressure coolant injection (HPCI) was OOS for maintenance on May 20 and May 21, 2025

- (5) Unit 1 'B' train RHRSW while 'A' train RHRSW was OOS for maintenance on June 17 and June 18, 2025

71111.05 - Fire Protection

Fire Area Walkdown and Inspection Sample (IP Section 03.01) (9 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) Diesel generator cells 1-4 (fire zones: 1PFP-DG-05/04 and 2PFP-DG-03/02) and E5-E8 switchgear rooms (fire zones: 1PFP-DG-06/07 and 2PFP-DG-08/09) on June 9, 2025
- (2) Flex storage building (Fire zone: 0PFP-FSB) on June 10, 2025
- (3) E1 through E4 switchgear rooms (Fire zones: 1PFP-DG-11/12 and 2PFP-DG-13/14) on June 12, 2025
- (4) Diesel generator fuel oil tank cells 1-4 (fire zones: 0PFP-DG-19/20/21/22) and diesel generator basement (fire zone: 0PFP-DG-01) on June 12, 2025
- (5) Service water building pump area (fire zone: 0PFP-SW-01A) and service water valve area (fire zone: 0PFP-SW-01B) on June 13, 2025
- (6) Unit 1 southwest and northwest core spray, northeast and southeast residual heat removal, and HPCI rooms on June 27, 2025
- (7) Unit 2 reactor building 20' elevation general area on June 30, 2025
- (8) Unit 2 southwest and northwest core spray, northeast and southeast residual heat removal, and HPCI rooms on June 30, 2025
- (9) Unit 2 reactor building 50' elevation general area on June 30, 2025

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 June 11, 2025. The drill involved a simulated fire in the Unit 2 breezeway area.

71111.06 - Flood Protection Measures

Flooding Sample (IP Section 03.01) (1 Sample)

- (1) The inspectors evaluated external flooding mitigation protections in manhole/cable vault 2-MH-SE under work order (WO) 20609598-01.

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 2 down power and control rod improvement post refueling outage on April 1, 2025, and April 3, 2025.

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

- (1) The inspectors observed and evaluated an evaluated simulator scenario conducted for licensed operator continuing training on May 1, 2025. Scenario, LORX-019, consisted of a loss of turbine building closed cooling water followed by a loss of 4.16 kilovolt buses 2C and E4, and concluded with a loss of coolant accident (LOCA).

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) Unit 1 'A' recirculation pump variable frequency drive 'B' controller failure (nuclear condition report (NCR) 2538453)

71111.13 - Maintenance Risk Assessments and Emergent Work Control

Risk Assessment and Management Sample (IP Section 03.01) (6 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 during Unit 1 'B' NSW pump outage from April 23 through April 25, 2025
- (2) Elevated site risk during the EDG-2 maintenance outage on April 28 and April 29, 2025
- (3) Elevated risk due to emergent failure of the Unit 1 'B' CSW pump discharge strainer shear pin key on May 5, 2025
- (4) Elevated risk during Unit 1 'B' train RHRSW outage concurrent with maintenance on the Unit 1 'A' CSW pump on May 6 and May 7, 2025
- (5) Elevated risk during Unit 1 HPCI outage on May 20 and May 21, 2025
- (6) Elevated risk during Unit 1 'A' train RHRSW outage on June 17 and June 18, 2025

71111.15 - Operability Determinations and Functionality Assessments

Operability Determination or Functionality Assessment (IP Section 03.01) (7 Samples)

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

- (1) 10 CFR 50.46 Atrium 11 peak center line LOCA analysis impact for Brunswick (NCR 2540080)
- (2) EDG-2 high lube oil temperature switch does not meet acceptance criteria for reset only (NCR 2541812)
- (3) 1B CSW pump discharge strainer shear pin failure (NCR 2553080)
- (4) EVAL Engineering Change (EC) 425152 secondary containment operability evaluation as a result of NCR 2537559
- (5) EC 425052, "Evaluation of through wall flaw in line 1-SW-142-20-157," as a result of NCR 2537559, "Through wall leak downstream of 1-E11-PDV-F068A"

- (6) EC 425551, "Reevaluation of through wall flaw in line 1-SW-142-20-157 reducer due to flaw growing into the taper transition area" (NCR 2537559)
- (7) 1A RHRSW booster pump discharge line near 1-E11-V41 leak at welded fitting (NCR 02558546)

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) (5 Samples)

- (1) OPT-06.2.3 "Standby Liquid Control System Squib Test," Rev. 52 following squib valve replacement in accordance with (IAW) WO 20666674
- (2) 2MST-PCIS26Q, "PCIS High Main Steam Line Flow Trip Unit Channel B Calibration," Rev. 15 following replacement of failed trip unit, 2-B21-PDTM-N009B-1 IAW WO 20707204
- (3) OPT-46.5 "Control Room Air Conditioning Performance Test," Rev. 8 following replacement of control building air cooled condenser Unit 2D compressor 2A IAW WO 20724005
- (4) OPT-08.1.4B "RHR Service Water System Operability Test - Loop B," Rev. 082 following replacement of RHR heat exchanger discharge valve motor IAW WO 20712257
- (5) Post maintenance checks following annual inspection of the 2E main control air conditioning unit IAW WO 20664460, WO 20694355, and WO 20704114

Surveillance Testing (IP Section 03.01) (7 Samples)

- (1) OPT-12.2C, "No. 3 Diesel Generator Monthly Load Test," Rev. 126 completed on February 24, 2025
- (2) OPT-12.2B, "No. 2 Diesel Generator Monthly Load Test," Rev. 125 completed on February 24, 2025
- (3) OPT-12.2A, "No. 1 Diesel Generator Monthly Load Test," Rev. 128 completed on February 25, 2025
- (4) OPT-80.1, "Reactor Pressure Vessel ASME Section XI Pressure Test," Rev. 87 completed on March 24, 2025
- (5) 2MST-SCIS42R, "CAC PCIS Group 2/6 and SCIS Isolation Logic System Functional Test," Rev. 11 completed on December 12, 2024
- (6) OPT-12.1D, "No. 4 Diesel Generator LOOP/LOCA Loading Test," Rev. 011 completed on June 24, 2025
- (7) OPT-14.1, "Control Rod Operability Check," Rev. 072 on Unit 2 completed on June 26, 2025

Containment Isolation Valve (CIV) Testing (IP Section 03.01) (1 Sample)

- (1) OPT-20.3A.5, "MSIV Leak Test," Rev. 16 performed on March 1, 2025 (As-found) and March 17, 2025 (As-left)

71114.06 - Drill Evaluation

Additional Drill and/or Training Evolution (2 Samples)

The inspectors evaluated:

- (1) Mini-emergency drill scenario, BNP-EX-25-02, that included a tornado inside the protected area, a feedwater heater tube leak and a main steam line failure to close conducted on April 16, 2025
- (2) Control room simulator scenario drill scenario, LORX-020, that included a loss of a 230kV line, a dual unit loss of offsite power, and a recirculation suction line break in primary containment conducted on April 24, 2025

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, 2024, through March 31, 2025)
- (2) Unit 2 (April 1, 2024, through March 31, 2025)

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

- (1) Unit 1 (April 1, 2024, through March 31, 2025)
- (2) Unit 2 (April 1, 2024, through March 31, 2025)

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

- (1) Unit 1 (April 1, 2024, through March 31, 2025)
- (2) Unit 2 (April 1, 2024, through March 31, 2025)

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 performance that might be indicative of a more significant safety issue.

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 22, 2025, the inspectors presented the integrated inspection results to John A. Krakuszeski and other members of the licensee staff.