



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**  
REGION II  
245 PEACHTREE CENTER AVENUE NE, SUITE 1200  
ATLANTA, GEORGIA 30303-1257

March 12, 2018

William R. Gideon  
Site Vice President  
Brunswick Steam Electric Plant  
8470 River Rd. SE (M/C BNP001)  
Southport, NC 28461

SUBJECT: BRUNSWICK STEAM ELECTRIC PLANT – NRC TEAM INSPECTION REPORT  
05000325/2018010 AND 05000324/2018010

Dear Mr. Gideon:

On February 1, 2018, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Brunswick Steam Electric Plant, Units 1 and 2 facilities. 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.

The inspection examined activities conducted under your license as they relate to the implementation of mitigation strategies and spent fuel pool instrumentation orders (EA-12-049 and EA-12-051) and Emergency Preparedness Communication/Staffing/Multi-Unit Dose Assessment Plans, your compliance with the Commission's rules and regulations, and with the conditions of your operating license. Within these areas, the inspection involved examination of selected procedures and records, observation of activities, and interviews with station personnel.

The NRC inspectors did not identify any finding or violation of more than minor significance.

W. Gideon

2

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 10 CFR 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

*/RA/*

Shane Sandal, Chief  
Reactor Projects Branch 6  
Division of Reactor Projects

Docket Nos.: 50-325, 50-324  
License Nos.: DPR-71, DPR-62

Enclosure:  
IR 05000325, 324/2018010

cc Distribution via ListServ

W. Gideon

3

SUBJECT: BRUNSWICK STEAM ELECTRIC PLANT - NRC TEAM INSPECTION  
REPORT 05000325/2018010 AND 05000324/2018010 March 12, 2018

**DISTRIBUTION:**

M. Kowal, RII  
S. Price, RII  
OE Mail  
RIDSNNRRDIRS  
PUBLIC  
RidsNrrPMBrunswick Resource

**ADAMS Accession No. ML 18071A151**

OFFICE	RII/DRP	RI/DRP	NRR	RII/DRP	RII/DRP	
NAME	SFreeman	MCatts	KRoche	RRodriguez	SSandal	
DATE	2/28/2018	2/28/2018	2/28/2018	3/1/2018	3/1/2018	

**OFFICIAL RECORD COPY**

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

Docket Numbers: 50-325, 50-324

License Numbers: DPR-71, DPR-62

Report Numbers: 05000325/2018010, 05000324/2018010

Enterprise Identifier: I-2018-010-0046

Licensee: Duke Energy Progress, LLC

Facility: Brunswick Steam Electric Plant, Units 1 and 2

Location: Southport, NC

Inspection Dates: January 29 – February 1, 2018

Inspectors: R. Rodriguez, Senior Project Engineer (Team Leader)  
M. Catts, Senior Project Engineer, Region I  
S. Freeman, Senior Reactor Analyst  
K. Roche, Reactor System Engineer, NRR

Approved By: S. Sandal, Chief  
Reactor Projects Branch 6  
Division of Reactor Projects

Enclosure

## SUMMARY

The NRC continued monitoring licensee's performance by conducting a Temporary Instruction 2515/191, "Implementation of Mitigation Strategies and Spent Fuel Pool (SFP) Instrumentation Orders and Emergency Preparedness Communication/Staffing/Multi-Unit Dose Assessment Plans," inspection (Agencywide Documents Access and Management System (ADAMS) Accession No. ML15257A188) at Brunswick Steam Electric Plant, Units 1 and 2, 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 were identified.

### Additional Tracking Items

Type	Issue number	Title	Report Section	Status
TI	TI 2515/191	Inspection of the Implementation of Mitigation Strategies and Spent Fuel Pool Instrumentation Orders and Emergency Preparedness Communication/Staffing/Multi-Unit Dose Assessment Plans	Other Activities	Closed

## TABLE OF CONTENTS

<b>INSPECTION SCOPES .....</b>	<b>4</b>
<b>OTHER ACTIVITIES – TEMPORARY INSTRUCTIONS, INFREQUENT AND ABNORMAL ..</b>	<b>4</b>
<b>INSPECTION RESULTS .....</b>	<b>6</b>
<b>EXIT MEETINGS AND DEBRIEFS .....</b>	<b>6</b>
<b>DOCUMENTS REVIEWED.....</b>	<b>7</b>

## INSPECTION SCOPES

Inspections were conducted using the appropriate portions of the inspection procedure (IP) 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>. Documents reviewed by inspectors are listed in the documents reviewed section of this report. 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.

## OTHER ACTIVITIES – TEMPORARY INSTRUCTIONS, INFREQUENT AND ABNORMAL

### TI 2515/191 - Inspection of the Implementation of Mitigation Strategies and Spent Fuel Pool Instrumentation Orders and Emergency Preparedness Communication/Staffing/Multi-Unit Dose Assessment Plans

Inspectors verified plans for complying with NRC Orders EA-12-049, "Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events," (Agencywide Documents Access and Management System (ADAMS) Accession No. ML12056A045) and EA-12-051, "Order Modifying Licenses With Regard to Reliable Spent Fuel Pool Instrumentation," (ML12054A679) were in place and were being implemented by the licensee. Additionally, the inspection verified implementation of staffing and communications information provided in response to the March 12, 2012, request for information letter (ML12053A340) and multiunit dose assessment information provided per COMSECY-13-0010, "Schedule and Plans for Tier 2 Order on Emergency Preparedness for Japan Lessons Learned," dated March 27, 2013 (ML12339A262).

- (1) Based on samples selected for review, the inspectors verified that the licensee satisfactorily implemented appropriate elements of the Diverse and Flexible Coping Strategies (FLEX) as described in the plant specific submittals and the associated safety evaluation (ML16335A031) and determined that the licensee is in compliance with NRC Order EA-12-049, "Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events" (ADAMS Accession No. ML12056A045). The inspectors verified the licensee satisfactorily:
  - a) developed and issued FLEX Support Guidelines (FSGs) to implement the FLEX strategies for postulated external events;
  - b) integrated their FSGs into their existing plant procedures such that entry into and departure from the FSGs were clear when using existing plant procedures;
  - c) protected FLEX equipment from site-specific hazards;
  - d) developed and implemented adequate testing and maintenance of FLEX equipment to ensure their availability and capability;
  - e) trained their staff to assure personnel proficiency in the mitigation of beyond-design basis events; and

- f) developed the means to ensure the necessary off-site FLEX equipment would be available from off-site locations.
- (2) Based on samples selected for review, the inspectors verified that the licensee satisfactorily implemented appropriate elements of the FLEX strategy as described in the plant specific submittals and the associated safety evaluation (ML16335A031) and determined that the licensee was in compliance with NRC Order NRC Order EA-12-051, "Order Modifying Licenses With Regard to Reliable Spent Fuel Pool Instrumentation" (ADAMS Accession No. ML12054A679). The inspectors verified the licensee satisfactorily:
- a) installed the SFP instrumentation sensors, cabling and power supplies to provide physical and electrical separation as described in the plant specific submittals and safety evaluation;
  - b) installed the SFP instrumentation display in the location, environmental conditions and accessibility as described in the plant specific submittals;
  - c) trained their staff to assure personnel proficiency with the maintenance, testing, and use of the SFP instrumentation; and
  - d) developed and issued procedures for maintenance, testing and use of the reliable SFP instrumentation.
- (3) The inspectors reviewed information provided in the licensee's multi-unit dose submittal and in response to the NRC's March 12, 2012, request for information letter (ML12053A340), and verified that the licensee satisfactorily implemented enhancements pertaining to Near-Term Task Force (NTTF) Recommendation 9.3 response to a large scale natural emergency event that results in an extended loss of all alternating current (ac) power (ELAP) to all site units and impedes access to the site. The inspectors verified the following:
- a) the licensee satisfactorily implemented required staffing changes to support a multi-unit ELAP scenario;
  - b) EP communications equipment and facilities are sufficient for dealing with a multi-unit ELAP scenario; and
  - c) the licensee implemented multi-unit dose assessment capabilities (including releases from SFPs) using the licensee's site-specific dose assessment software and approach.

The inspectors verified that noncompliances with requirements, and standards identified during the inspection were entered into the licensee's corrective action program as appropriate.



## **INSPECTION RESULTS**

No findings were identified.

## **EXIT MEETINGS AND DEBRIEFS**

No proprietary information was retained by the inspectors or documented in this report.

- On February 1, 2018, the inspectors presented the inspection results to Mr. R. Gideon and other members of the licensee's staff.
- On February 28, 2018, the lead inspector presented the final inspection results to Mr. L. Grzeck and Mr. T. Sherrill.

## DOCUMENTS REVIEWED

### Condition Reports Initiated as a Result of the Inspection

CR 2181612, Door blocks  
CR 2181431, Flex during hurricane  
CR 2181297, Temporary External Flood Barrier Control Labeling  
AR 2181247, CR block doors open PRR  
CR 2181255, KRRK key control  
CR 2181006, low fuel level  
AR 2180830, Batt Indication

### Procedures

0EOP-01-SEP-01, "Primary Containment Venting," Rev. 27  
0EOP-01-FSG-02, Portable Pump RPV Injection, Rev. 2  
0EOP-01-FSG-04, FLEX Diesel Generator Alignment, Rev. 2  
0EOP-01-FSG-05, FLEX Pneumatic Alignment, Rev. 3  
0EOP-01-FSG-06, Flex Fuel Oil Transfer, Rev. 1  
0EOP-01-FSG-07, Portable Pump Setup and Operation, Rev. 2  
0EOP-01-FSG-09, FLEX NSRC Generator Operation, Rev. 2  
0EOP-01-SEP-12, Fuel Pool Level Control, Rev. 3  
0EOP-01-SEP-14, Fuel Pool Spray, Rev. 2  
AD-WC-ALL-0420, Shutdown Risk Management, Rev. 1  
0AP-022, BNP Outage Risk Management, Rev. 57  
0LP-LT008, VEGAPULS 62 ER Level Transmitter Calibration, Rev. 4  
0E&RC-1010, Diesel Fuel Oil Testing Program, Rev. 53  
0PLP-01.4, Fukushima Flex System Availability, Action, and Surveillance Requirements, Rev. 5  
0AI-68, Brunswick Nuclear Plant Response to Severe Weather Warnings, Rev. 52  
0OI-02.3, Drywell Leakage Control, Rev. 7  
0EOP-01-UG, Attachment 33, Emergency Operating Procedures Toolbox Inventory Checklists, Rev. 69  
0EOP-01-UG, Attachment 34, FLEX Building Inventory, Rev. 70  
2EOP-01-RSP, Station Blackout, Rev. 16  
2EOP-01-RVCP, Reactor Vessel Level Control, Rev. 10  
AOP-14, Abnormal Primary Containment Condition, Rev. 30  
0EOP-01-SBO-02, Attachment 1, "Control Room Alternate Ventilation," Rev 6  
0EOP-01-FSG-04, "FLEX Diesel Generator Alignment," Rev 3. – Battery Room ventilation.  
0PEP-04.2, "Emergency Facilities and Equipment," Rev. 45  
AD-EP-ALL-0202, "Emergency Response Offsite Dose Assessment," Rev 6

### Drawings

D-25027, Sheet 1A, Reactor Building Reactor Water Cleanup System Piping Diagram, Rev. 27  
D-25027, Sheet 1B, Reactor Building Reactor Water Cleanup System Piping Diagram, Rev. 41  
LL-09341, Sheet 5, Emergency Power System 120/208 Volts AC, 3Ph, 4W Distribution Panel 2B, Rev. 38  
LL-09341, Sheet 4, Emergency Power System 120/208 Volts AC, 3Ph, 4W Distribution Panel 2A, Rev. 31  
LL-93041, Sheet 4, Emergency Power System 120/208 Volts AC, 3Ph, 4W Distribution Panel 1B, Rev. 44

SK-89578-Z-7012, Sheet 1, Spent Fuel Pool Level Indication Channel A & B Conduit Routing Block Diagram, Rev. C  
SK-89577-Z-7009, Unit 1 Spent Fuel Pool Elevation View with Levels Indicated, Rev. A  
F-02508, Reactor Building Arrangement and Details Fuel Pool, Rev. 9  
DE-02515, Sheet 1A and 1D, "Reactor Building Containment Atmospheric Control Piping Diagram," Rev. 68

Calculations

14-4019.010 Finite Element Analysis of Condensate Storage Tanks for Units 1 & 2, Rev. 0  
31116-CALC-C-001, Flex Diesel Generator Hardened Enclosure Design, Rev. 7

Work Orders

WO 20143258-01, Monthly Flex Equipment Inspections, dated 12/20/2017  
WO 20127524-01, Quarterly Flex Equipment Inspections, dated 10/9/2017  
WO 20102559-01, Annual Flex Equipment Inspections, dated 7/25/2017  
WO 20138817-01, Biennial Flex Equipment Inspections, dated 7/18/2017  
WO 13540928-01, SFP Level Transmitters Calibration 0LP-LT008, dated 3/9/2017  
OPEP-04.2, Attachment 1, "BNP Monthly Communications Test," Rev 45, Completed 1/11/2018  
OPEP-04.2, Attachment 11, "Emergency Preparedness Beyond Design Basis External Event Response Equipment," Rev 45, Completed 12/30/2018

Design Changes

EC 95856R3, BNP Condensate Storage Tank Natural Phenomena Hazards Evaluation, Rev. 3

Corrective Action Documents

1956980	1962602	2017949	2162307	2162314	2162063
2145577	2137711	2120314	2105006	2088489	2093431
1964263	2085580	2167571			

Others

Areva Test Plan 51-9225570-001, Through Air Radar Spent Fuel Pool Level Instrument (SFPLI) Site Acceptance Test (SAT) Plan for Duke Energy, Revision 1  
Specification NCP-G-0001, Common Diesel Fuel Oil (Grade 2D) Testing Specification, Rev. 6  
CSD-EG-BNP-8888, Mitigating Beyond Design Basis Events (MBDBE) Program Document, Rev. 3  
Vendor Tech Manual for FLEX Diesel Generator  
Vendor Tech Manual for FLEX Pump  
Vendor Tech Manual for FLEX Air Compressor  
TAP-418, Non-Licensed Operator Training Program, Rev. 18  
Brunswick Non-Licensed Operator Continuing Training Program, Rev. 1  
EPQ-001, Att. 9, Brunswick Nuclear Plant FLEX qualification Checklist, Rev. 21  
UFSAR Section 2.4.5, Probable Maximum Surge and Seiche Flooding, Rev. 25  
SAFER Response Plan for Brunswick Steam Electric Plant, Rev. 2

“Memorandum of Agreement Between Duke Energy Progress (Brunswick) and North Carolina  
Emergency Management,” dated June 15, 2017  
NEI 12-01 Phase 1 Extended Loss of AC (ELAP) ERO Staffing Analysis Report,” Rev. 0  
Letter, “CAROLINA POWER & LIGHT COMPANY'S AND FLORIDA POWER  
CORPORATION'S RESPONSE TO FOLLOW-UP LETTER ON TECHNICAL ISSUES  
FOR RESOLUTION REGARDING LICENSEE COMMUNICATION SUBMITTALS  
ASSOCIATED WITH NEAR-TERM TASK FORCE RECOMMENDATION 9.3 (TAC NO.  
ME7951),” dated Feb 22, 2013