



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

EA-15-234

November 6, 2015

Mr. William R. Gideon  
Vice President  
Duke Energy Progress, Inc.  
Brunswick Steam Electric Plant  
P.O. Box 10429  
Southport, NC 28461

**SUBJECT: BRUNSWICK STEAM ELECTRIC PLANT - NRC INTEGRATED INSPECTION  
REPORT NOS.: 05000325/2015003 AND 05000324/2015003 AND EXERCISE OF  
ENFORCEMENT DISCRETION**

Dear Mr. Gideon:

On September 30, 2015, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Brunswick Unit 1 and 2 facilities. The enclosed integrated inspection report documents the inspection findings, which were discussed on October 20, 2015, with you and other members of your staff.

No NRC-identified or self-revealing findings were identified during this inspection. However, inspectors documented a licensee-identified violation which was determined to be of very low safety significance in this report. The NRC is treating this violation as non-cited violation NCV consistent with Section 2.3.2.a of the Enforcement Policy.

In accordance with Title 10 of the *Code of Federal Regulations* 2.390, "Public Inspections, Exemptions, Requests for Withholding," of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC's Public Document Room or from the Publicly Available Records (PARS) component of the

W. Gideon

2

NRC's Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

*/RA/*

George T. Hopper, Chief  
Reactor Projects Branch 4  
Division of Reactor Projects

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

Enclosure:  
IR 05000325, 324/2015003  
w/Attachment: Supplementary Information

cc Distribution via ListServ

W. Gideon

2

NRC's Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

*/RA/*

George T. Hopper, Chief  
Reactor Projects Branch 4  
Division of Reactor Projects

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

Enclosure:  
Inspection Report 05000325, 324/2015003  
w/Attachment: Supplementary Information

cc Distribution via ListServ

PUBLICLY AVAILABLE       NON-PUBLICLY AVAILABLE       SENSITIVE       NON-SENSITIVE  
ADAMS:  Yes      ACCESSION NUMBER: ML15310A162       SUNSI REVIEW COMPLETE       FORM 665 ATTACHED

OFFICE	RII:DRP	RII:DRP	RII:EICS	RII:DRP	RII:DRP	RII:DRP	RII:DRS
SIGNATURE	MPS4 via email	LFP1 via email	DLG2 via email	MXO via email	MES1 via email	JDA via email	AMR4
NAME	MCatts	LPressley	DGamberoni	MOrr	MSchwieg	JAustin	ARuh
DATE	11/5/2015	11/5/2015	11/4/2015	11/5/2015	11/5/2015	11/5/2015	11/5/2015
E-MAIL COPY?	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
OFFICE	RII:DRS	RII:DRS	RII:DRP	RII:DRP	RII:DRP		
SIGNATURE	AXS2 via email	SPS via email	CAF2 via email	JSD	GTH		
NAME	ASengupta	SSanchez	CFontana	JDodson	GHopper		
DATE	11/4/2015	11/5/2015	11/5/2015	11/5/2015	11/6/2015		
E-MAIL COPY?	YES NO	YES NO	YES NO	YES NO	YES NO		

OFFICIAL RECORD COPY DOCUMENT NAME: G:\DRPI\RPB4\BRUNSWICK\REPORTS\2015 REPORTS\15-03\BRU IR 2015003.DOCX

W. Gideon

3

Letter to William R. Gideon from George T. Hopper dated November 6, 2015.

SUBJECT: BRUNSWICK STEAM ELECTRIC PLANT - NRC INTEGRATED INSPECTION  
REPORT NUMBERS: 05000325/2015003 AND 05000324/2015003 AND  
EXERCISE OF ENFORCEMENT DISCRETION

**DISTRIBUTION:**

D. Gamberoni, RII

S. Price, RII

L. Gibson, RII

OE Mail

RIDSNNRRDIRS

PUBLIC

R. Pascarelli, NRR

RidsNrrPMBrunswick Resource

**U.S. NUCLEAR REGULATORY COMMISSION**

**REGION II**

Docket Nos.: 50-325, 50-324

License Nos.: DPR-71, DPR-62

Report No.: 05000325/2015003, 05000324/2015003

Licensee: Duke Energy Progress, Inc.

Facility: Brunswick Steam Electric Plant, Units 1 & 2

Location: Southport, NC

Dates: July 1, 2015 through September 30, 2015

Inspectors: M. Catts, Senior Resident Inspector  
L. Pressley, Acting Senior Resident Inspector  
M. Orr, Acting Resident Inspector  
M. Schwieg, Resident Inspector  
J. Austin, Senior Resident Inspector (1R18)  
A. Ruh, Resident Inspector (1R04/1R05)  
A. Sengupta, RII Reactor Inspector (1R07)  
S. Sanchez, Senior Emergency Preparedness Inspector (1EP2,  
1EP3, 1EP4, 1EP5, 4OA1, 4OA6)  
C. Fontana, Emergency Preparedness Inspector (1EP2, 1EP3,  
1EP4, IEP5, 4OA1, 4OA6)

Approved by: George T. Hopper, Chief  
Reactor Projects Branch 4  
Division of Reactor Projects

Enclosure

## SUMMARY

IR 05000325/2015003, 05000324/2015003; 07/01/15 – 09/30/15; Duke Energy Progress, Inc., Brunswick Steam Electric Plant, Units 1 and 2.

This report covers a three-month period of inspection by resident and regional inspectors. There are no NRC-identified violations documented in this report. The significance of inspection findings are indicated by their color (i.e., greater than Green, or Green, White, Yellow, Red) and determined using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP) dated April 29, 2015. The cross-cutting aspects are determined using IMC 0310, "Aspects within the Cross-Cutting Areas," dated December 4, 2014. All violations of NRC requirements are dispositioned in accordance with the NRC's Enforcement Policy dated February 4, 2015. The NRC's program for overseeing the safe operations of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 5, dated February 2014.

### Licensee-Identified Violation

One violation of very low safety significance that was identified by the licensee has been reviewed by the inspectors. Corrective actions planned or taken by the licensee have been entered into the corrective action program (CAP). This violation is listed in Section 4OA7 of this report.

## REPORT DETAILS

### Summary of Plant Status

Unit 1 began the inspection period at rated thermal power (RTP). On August 29, 2015, the unit was down powered to 70 percent for a scheduled control rod sequence exchange. The unit was returned to RTP on August 30, 2015. On September 1, 2015, the unit was down powered to 83 percent for a scheduled control rod pattern adjustment. The unit was returned to RTP on September 2, 2015 and remained at or near RTP for the remainder of the inspection period.

Unit 2 began the inspection period at RTP. On September 18, 2015, the unit was down powered to 70 percent for a scheduled control rod sequence exchange. The unit was returned to RTP on September 19, 2015. On September 21, 2015, the unit was down powered to 70 percent for a scheduled control rod improvement. The unit was returned to RTP on September 22, 2015. On September 23, 2015, the unit was down powered to 75 percent for a scheduled control rod improvement. The unit was returned to RTP on September 24, 2015 and remained at or near RTP for the remainder of the inspection period.

#### 1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

#### 1R01 Adverse Weather Protection (71111.01 – 1 sample)

##### Readiness to Cope with External Flooding

##### a. Inspection Scope

The inspectors evaluated the licensee's implementation of flood protection procedures and compensatory measures during impending conditions of flooding or heavy rains. The inspectors reviewed the updated final safety analysis report and related flood analysis documents to identify those areas containing safety related equipment that could be affected by external flooding and their design flood levels. The inspectors walked down flood protection barriers, reviewed procedures for coping with external flooding, and reviewed corrective actions for past flooding events. The inspectors verified that the procedures for coping with flooding could reasonably be used to achieve the desired results. For those areas where operator actions are credited, the inspectors assessed whether the flooding event could limit or preclude the required actions. Documents reviewed are listed in the attachment.

The inspectors conducted walkdowns of the following plant areas containing risk-significant structures, systems, and components that are below flood levels or otherwise susceptible to flooding:

- Service Water Building
- Emergency Diesel Generator (EDG) Building

b. Findings

No findings were identified.

1R04 Equipment AlignmentPartial Walkdown (71111.04 – 4 samples)a. Inspection Scope

The inspectors verified that critical portions of the selected systems were correctly aligned by performing partial walkdowns. The inspectors selected systems for assessment because they were a redundant or backup system or train, were important for mitigating risk for the current plant conditions, had been recently realigned, or were a single-train system. The inspectors determined the correct system lineup by reviewing plant procedures and drawings. The inspectors observed whether there was indication of degradation, and if so, verified degradation was being appropriately managed in accordance with an aging management program, if applicable, and it had been entered into the licensee's CAP at the appropriate threshold. Documents reviewed are listed in the Attachment.

The inspectors selected the following four systems or trains to inspect:

- Unit 1 reactor core isolation cooling (RCIC) system with high pressure coolant injection (HPCI) inoperable on August 18, 2015
- Unit 1 and Unit 2 nuclear service water (NSW) pumps and Unit 2 conventional service water (CSW) pumps with 2B NSW pump out of service due to planned maintenance on August 19, 2015
- Unit 1 residual heat removal (RHR) loop A system with RHR loop B inoperable on August 27, 2015
- Unit 1 HPCI during increased activity associated with the dehydration skid on September 3, 2015

b. Findings

No findings were identified.

1R05 Fire ProtectionQuarterly Inspection (71111.05Q – 5 samples)a. Inspection Scope

The inspectors evaluated the adequacy of selected pre-fire plans and fire protection procedures by comparing the pre-fire plans to the defined hazards and defense-in-depth features specified in the fire protection program. In evaluating the pre-fire plans, the inspectors assessed the following items:



- control of transient combustibles and ignition sources
- fire detection systems
- water-based fire suppression systems
- gaseous fire suppression systems
- manual firefighting equipment and capability
- passive fire protection features
- compensatory measures and fire watches
- issues related to fire protection contained in the licensee's CAP

The inspectors toured the following fire areas to assess material condition and operational status of fire protection equipment. Documents reviewed are listed in the Attachment.

- 2PFP-RB2-1g, Unit 2, Reactor Building, 20 foot elevation North and South
- 2PFP-RB2-2, 2PFP-RB2-1c and 2PFP-RB2-1d, Unit 2 Reactor Building, -17 foot elevation
- 0PFP-SW-1A. Service Water Building Pump Area, 20 foot elevation
- 1PFP-TB1-01A/B and 1PFP-TB1-10, Unit 1 Turbine Building Breezeway 20 foot elevation and Exhaust Fan Room 45 foot elevation
- 1PFP-RB, Unit 1, Reactor Building, -17 foot elevation, HPCI Room

b. Findings

No findings were identified.

1R07 Heat Sink Performance (71111.07T – 5 samples)

Triennial Review of Heat Sink Performance

a. Inspection Scope

The inspectors reviewed, where applicable, vendor manual information, associated calculations, performance test results, and inspection results for the RHR heat exchanger 1A and 2B, EDG jacket water cooler-1 heat exchanger, 1C reactor building component cooling water (RBCCW) heat exchanger, and 2B control rod drive pump lube oil cooler heat exchanger.

These heat exchangers were chosen based on their risk significance in the licensee's probabilistic safety analysis, and their important safety-related mitigating system support functions.

The inspectors determined, where applicable, whether the testing, inspection, maintenance, and monitoring of biotic fouling and macrofouling programs for the selected heat exchangers were adequate, to ensure proper heat transfer. This was accomplished by determining whether the test method used was consistent with accepted industry practices, or equivalent; the test conditions were consistent with the selected methodology; the test acceptance criteria were consistent with the design basis

values; and reviewing results of heat exchanger performance testing. The inspectors also determined whether the test results appropriately considered differences between testing conditions and design conditions; the frequency of testing based on trending of test results was sufficient to detect degradation prior to loss of heat removal capabilities below design basis values; and the test results considered test instrument inaccuracies and differences.

For the heat exchangers selected, the inspectors reviewed the methods and results of heat exchanger performance inspections. The inspectors determined whether the methods used to inspect and clean heat exchangers were consistent with the as-found conditions identified, expected degradation trends, and industry standards. The inspectors also verified that the licensee's inspection and cleaning activities had established acceptance criteria consistent with industry standards, and the as-found results were recorded, evaluated, and appropriately dispositioned so that the as-left condition was acceptable.

In addition, the inspectors determined whether the condition and operation of the heat exchangers selected were consistent with design assumptions in heat transfer calculations, and as described in the Final Safety Analysis Report. This included determining whether the number of plugged tubes were within pre-established limits based on capacity and heat transfer assumptions. In addition, eddy current test reports and visual inspection records were reviewed for the RHR heat exchanger 1A and 2B, EDG jacket water cooler-1, and the 1C RBCCW to determine the structural integrity of the heat exchangers.

The inspectors determined whether the performance of ultimate heat sinks (UHS), and their subcomponents such as piping, intake screens, pumps, valves, etc., were appropriately evaluated by tests or other equivalent methods, to ensure availability and accessibility to the in-plant cooling water systems.

The inspectors determined whether the licensee's inspection of the UHS was thorough, and of sufficient depth to identify degradation of the shoreline protection, or loss of structural integrity. This included determination whether vegetation present along the slopes were trimmed, maintained, and were not adversely impacted by the embankment. In addition, the inspectors determined whether the licensee ensured sufficient reservoir capacity by trending, and removing debris or sediment buildup, in the UHS.

The inspectors reviewed the licensee's operation of the service water (SW) system and UHS. This included a review of licensee's procedures for a loss of the SW system or UHS, and the verification that instrumentation, which is relied upon for decision-making, was available and functional. In addition, the inspectors determined whether macrofouling was adequately monitored, trended, and controlled by the licensee to prevent clogging. The inspectors determined whether the licensee's biocide treatments for biotic control were adequately conducted, and whether the results were adequately monitored, trended, and evaluated. The inspectors also reviewed strong pump-weak pump interaction, and design changes, to the SW system and the UHS.

The inspector performed a system walkdown of the SW intake structure to determine whether the licensee's assessment of structural integrity, and component functionality, was adequate, and that the licensee ensured proper functioning of traveling screens and strainers, and structural integrity of component mounts. In addition, the inspectors determined whether SW pump bay silt accumulation was monitored, trended, and maintained at an acceptable level by the licensee, and that water level instruments were functional and routinely monitored. The inspectors also determined whether the licensee's ability to ensure functionality during adverse weather conditions was adequate.

In addition, the inspectors reviewed condition reports (CRs) related to the heat exchangers, and heat sink performance issues, to determine whether the licensee had an appropriate threshold for identifying issues, and to evaluate the effectiveness of the corrective actions. Documents reviewed are listed in the Attachment.

These inspection activities constituted five heat sink inspection samples as defined in inspection procedure 71111.07-05.

b. Findings

No findings were identified.

1R11 Licensed Operator Regualification Program and Licensed Operator Performance

.1 Resident Inspector Quarterly Review of Licensed Operator Regualification (71111.11 – 1 sample)

a. Inspection Scope

On August 11, 2015, the inspectors observed simulator scenario LORX-202 conducted for training of an operating crew. The scenario included a loss of offsite power and a small break loss of coolant accident.

The inspectors assessed the following:

- licensed operator performance
- the ability of the licensee to administer the scenario and evaluate the operators
- the quality of the post-scenario critique
- simulator performance

Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

.2 Resident Inspector Quarterly Review of Licensed Operator Performance in the Actual Plant/Main Control Room (71111.11 – 1 sample)

a. Inspection Scope

The inspectors observed licensed operator performance in the main control room on August 29, 2015 during a Unit 1 downpower reactivity manipulation to 70% rated thermal power to support a control rod sequence exchange and various testing activities.

The inspectors assessed the following:

- use of plant procedures
- control board manipulations
- communications between crew members
- use and interpretation of instruments, indications, and alarms
- use of human error prevention techniques
- documentation of activities
- management and supervision

Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12 – 3 samples)

a. Inspection Scope

The inspectors assessed the licensee's treatment of the issues listed below to verify the licensee appropriately addressed equipment problems within the scope of the maintenance rule (10 CFR 50.65, "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants"). The inspectors reviewed procedures and records to evaluate the licensee's identification, assessment, and characterization of the problems as well as their corrective actions for returning the equipment to a satisfactory condition. The inspectors also interviewed system engineers to assess the accuracy of performance deficiencies and extent of condition. Documents reviewed are listed in the Attachment.

- Elevated moisture content in Unit 1 HPCI oil system
- Automatic Depressurization System (ADS) / Safety Relief Valve (SRV) maintenance rule (a)(1) transition corrective action plan
- Service water strainer shear pin failure maintenance rule evaluation

b. Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13 – 5 samples)a. Inspection Scope

The inspectors reviewed the maintenance activities listed below to verify that the licensee assessed and managed plant risk as required by 10 CFR 50.65(a)(4) and licensee procedures. The inspectors assessed the adequacy of the licensee's risk assessments and implementation of risk mitigation assessments. The inspectors also verified that the licensee was identifying and resolving problems with assessing and managing maintenance-related risk using the CAP. Additionally, for maintenance resulting from unforeseen situations, the inspectors assessed the effectiveness of the licensee's planning and control of emergent work activities. Documents reviewed are listed in the Attachment.

- Yellow risk condition due to Unit 2 RHR and RHR service water (RHRSW) outage on B Loop
- Yellow risk condition due to Unit 1 RHR time delay relay channel calibration on B Loop, 1MST-RHR28BR
- Yellow risk condition due to Unit 1 RHR and RHRSW outage on B Loop
- Orange risk condition due to unplanned trip of Unit 1 480 V feeder breaker to motor control center 1CB
- Elevated risk condition due to Unit 1 1B CSW and RCIC outage

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality AssessmentsOperability and Functionality Review (71111.15 – 6 samples)a. Inspection Scope

The inspectors selected the operability determinations or functionality evaluations listed below for review based on the risk-significance of the associated components and systems. The inspectors reviewed the technical adequacy of the determinations to ensure that Technical Specification (TS) operability was properly justified and the components or systems remained capable of performing their design functions. To verify whether components or systems were operable, the inspectors compared the operability and design criteria in the appropriate sections of the TS and updated final safety analysis report to the licensee's evaluations. Where compensatory measures were required to maintain operability, the inspectors determined whether the measures in place would function as intended and were properly controlled. Additionally, the

inspectors reviewed a sample of corrective action documents to verify the licensee was identifying and correcting any deficiencies associated with operability evaluations. Documents reviewed are listed in the Attachment.

- Unit 2, secondary containment operable with roof drain through wall leak, July 1, 2015
- Unit 1, HPCI operable with pump casing leaking, August 12, 2015
- Unit 1, nitrogen backup pressure drop, August 20, 2015
- Unit 2, 2A-2 station battery cell 6 low voltage, August 25, 2015
- Unit 1, 1C RHRSW booster pump oil condition, August 25, 2015
- Unit 1, reactor water clean-up (RWCU) inlet inboard isolation valve, (1-G31-F001) containment isolation function given dual indication and over thrust event, September 9, 2015

b. Findings

No findings were identified.

1R18 Plant Modifications (71111.18 – 1 sample)

a. Inspection Scope

The inspectors verified that the plant modification listed below did not affect the safety functions of important safety systems. The inspectors confirmed the modifications did not degrade the design bases, licensing bases, and performance capability of risk significant structures, systems and components. The inspectors also verified modifications performed during plant configurations involving increased risk did not place the plant in an unsafe condition. Additionally, the inspectors evaluated whether system operability and availability, configuration control, post-installation test activities, and changes to documents, such as drawings, procedures, and operator training materials, complied with licensee standards and NRC requirements. In addition, the inspectors reviewed a sample of related corrective action documents to verify the licensee was identifying and correcting any deficiencies associated with modifications. Documents reviewed are listed in the Attachment.

- Unit 2 FLEX Modifications and Strategies (EC 288932)

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19 – 6 samples)

a. Inspection Scope

The inspectors either observed post-maintenance testing or reviewed the test results for the maintenance activities listed below to verify the work performed was completed

correctly and the test activities were adequate to verify system operability and functional capability.

- Unit 1, Work Order ( WO) 13432010, July 16, 2015, HPCI maintenance outage
- Unit 2, WO 13316882, July 24, 2015, No. 4 diesel generator maintenance outage
- Unit 2, WO 20012340, August 22, 2015, RCIC following failure of steam trip and throttle valve to close during overspeed test
- Unit 1, WO 13537636, August 27, 2015, RHR service water loop B maintenance outage
- Unit 1, WO 11842952, September 24, 2015, 1B CSW pump strainer replacement
- Unit 1, WO 12287726, September 28, 2015, RCIC actuator inspection

The inspectors evaluated these activities for the following:

- acceptance criteria were clear and demonstrated operational readiness
- effects of testing on the plant were adequately addressed
- test instrumentation was appropriate
- tests were performed in accordance with approved procedures
- equipment was returned to its operational status following testing
- test documentation was properly evaluated

Additionally, the inspectors reviewed a sample of corrective action documents to verify the licensee was identifying and correcting any deficiencies associated with post-maintenance testing. Documents reviewed are listed in the attachment.

b. Findings

No findings were identified.

1R22 Surveillance Testing

a. Inspection Scope

The inspectors reviewed the surveillance tests listed below and either observed the test or reviewed test results to verify testing adequately demonstrated equipment operability and met TS and licensee procedural requirements. The inspectors evaluated the test activities to assess for preconditioning of equipment, procedure adherence, and equipment alignment following completion of the surveillance. Additionally, the inspectors reviewed a sample of related corrective action documents to verify the licensee was identifying and correcting any deficiencies associated with surveillance testing. Documents reviewed are listed in the attachment.

Routine Surveillance Tests (71111.22 – 2 samples)

- 1MST-RHR28BR, RHR B Loop Time Delay Relay Channel Calibration, August 4, 2015
- OPT-12.2C, No. 3 Diesel Generator Monthly Load Test, August 9, 2015

In-Service Tests (71111.22 – 1 sample)

- 2PT-24.1-2, Service Water Pump and Discharge Valve Operability Test, August 18, 2015

Reactor Coolant System (RCS) Leak Surveillance (71111.22 – 1 sample)

- 2OI-03.2, Reactor Operator Daily Surveillance Report, Attachment 1, Drywell Leakage Calculation

b. Findings

No findings were identified.

Cornerstone: Emergency Preparedness1EP2 Alert and Notification System Evaluationa. Inspection Scope

The inspectors evaluated the adequacy of the licensee's methods for testing and maintaining the alert and notification system in accordance with NRC Inspection Procedure 71114, Attachment 02, Alert and Notification System Evaluation. The applicable planning standard, 10 CFR Part 50.47(b)(5) and its related 10 CFR Part 50, Appendix E, Section IV.D requirements were used as reference criteria. The criteria contained in NUREG-0654, Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants, Revision 1, were also used as a reference.

The inspectors reviewed various documents which are listed in the Attachment, interviewed personnel responsible for system performance, and observed aspects of periodic siren maintenance and testing. This inspection activity satisfied one inspection sample for the alert and notification system on a biennial basis.

b. Findings

No findings were identified.

1EP3 Emergency Response Organization Staffing and Augmentation Systema. Inspection Scope

The inspectors reviewed the licensee's Emergency Response Organization (ERO) augmentation staffing requirements and process for notifying the ERO to ensure the readiness of key staff for responding to an event and timely facility activation. The qualification records of key position ERO personnel were reviewed to ensure all ERO qualifications were current. A sample of problems identified from augmentation drills or system tests performed since the last inspection was reviewed to assess the



effectiveness of corrective actions.

The inspection was conducted in accordance with NRC Inspection Procedure 71114, Attachment 03, Emergency Response Organization Staffing and Augmentation System. The applicable planning standard, 10 CFR 50.47(b)(2), and its related 10 CFR 50, Appendix E requirements were used as reference criteria.

The inspectors reviewed various documents which are listed in the Attachment. This inspection activity satisfied one inspection sample for the ERO staffing and augmentation system on a biennial basis.

b. Findings

No findings were identified.

1EP4 Emergency Action Level and Emergency Plan Changes

a. Inspection Scope

Since the last NRC inspection of this program area, several changes were made to the Radiological Emergency Plan, along with changes to several implementing procedures. The licensee determined that, in accordance with 10 CFR 50.54(q), the Plan continued to meet the requirements of 10 CFR 50.47(b) and Appendix E to 10 CFR Part 50. The inspectors reviewed these changes to evaluate for potential reductions in the effectiveness of the Plan. However, this review was not documented in a Safety Evaluation Report and does not constitute formal NRC approval of the changes. Therefore, these changes remain subject to future NRC inspection in their entirety.

The inspection was conducted in accordance with NRC Inspection Procedure 71114, Attachment 04, Emergency Action Level and Emergency Plan Changes. The applicable planning standards of 10 CFR 50.47(b), and its related requirements in 10 CFR 50, Appendix E, were used as reference criteria.

The inspectors reviewed various documents that are listed in the Attachment to this report. This inspection activity satisfied one inspection sample for the emergency action level and emergency plan changes on an annual basis.

b. Findings

No findings were identified.

1EP5 Maintenance of Emergency Preparedness

a. Inspection Scope

The inspectors reviewed the corrective actions identified through the Emergency Preparedness program to determine the significance of the issues, the completeness and effectiveness of corrective actions, and to determine if issues were recurring. The

licensee's post-event after action reports, self-assessments, and audits were reviewed to assess the licensee's ability to be self-critical, thus avoiding complacency and degradation of their emergency preparedness program. Inspectors reviewed the licensee's 10 CFR 50.54(q) change process, personnel training, and selected screenings and evaluations to assess adequacy. The inspectors toured facilities and reviewed equipment and facility maintenance records to assess licensee's adequacy in maintaining them. The inspectors evaluated the capabilities of selected radiation monitoring instrumentation to adequately support Emergency Action Level (EAL) declarations.

The inspection was conducted in accordance with NRC Inspection Procedure 71114, Attachment 05, Maintenance of Emergency Preparedness. The applicable planning standards, related 10 CFR 50, Appendix E requirements, and 10 CFR 50.54(q) and (t) were used as reference criteria.

The inspectors reviewed various documents which are listed in the Attachment. This inspection activity satisfied one inspection sample for the maintenance of emergency preparedness on a biennial basis.

b. Findings

No findings were identified.

1EP6 Drill Evaluation (71114.06 – 1 sample)

a. Inspection Scope

The inspectors observed the emergency preparedness drill conducted on September 9, 2015. The inspectors observed licensee activities in the simulator and technical support center to evaluate implementation of the emergency plan, including event classification, notification, and protective action recommendations. The inspectors evaluated the licensee's performance against criteria established in the licensee's procedures. Additionally, the inspectors attended the post-exercise critique to assess the licensee's effectiveness in identifying emergency preparedness weaknesses and verified the identified weaknesses were entered in the CAP. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151 – 9 samples)

a. Inspection Scope

The inspectors reviewed a sample of the performance indicator (PI) data, submitted by the licensee, for the Unit 1 and Unit 2 PIs listed below. The inspectors reviewed plant records compiled between July 1, 2014, through June 30, 2015, to verify the accuracy and completeness of the data reported for the station. The inspectors verified that the PI data complied with guidance contained in Nuclear Energy Institute 99-02, "Regulatory Assessment Performance Indicator Guideline," and licensee procedures. The inspectors verified the accuracy of reported data that were used to calculate the value of each PI. In addition, the inspectors reviewed a sample of related corrective action documents to verify the licensee was identifying and correcting any deficiencies associated with PI data. Documents reviewed are listed in the Attachment.

Cornerstone: Mitigating Systems

- MSPI RHR

Cornerstone: Barrier Integrity

- RCS leak rate
- RCS specific activity

Cornerstone: Emergency Preparedness

- Drill/Exercise Performance (DEP)
- Emergency Response Organization Drill Participation (ERO)
- Alert and Notification System Reliability (ANS)

b. Findings

No findings were identified.

4OA2 Problem Identification and Resolution

.1 Routine Review

The inspectors screened items entered into the licensee's CAP to identify repetitive equipment failures or specific human performance issues for follow-up. The inspectors reviewed CRs, attended screening meetings, or accessed the licensee's computerized corrective action database.

.2 Annual Follow-up of Selected Issues (71152 – 3 annual samples)

a. Inspection Scope

The inspectors conducted a detailed review of the following three CRs:

- CR 737292, Unit 2 Cycle 21 SRVs did not meet TS 3.4.3.1
- CR 758254, Unplanned TS entry for 2A CSW high strainer differential pressure

- CR 752720, Unit1 1A RHRSW booster pump maintenance causing secondary containment inoperability

The inspectors evaluated the following attributes of the licensee's actions:

- complete and accurate identification of the problem in a timely manner
- evaluation and disposition of operability and reportability issues
- consideration of extent of condition, generic implications, common cause, and previous occurrences
- classification and prioritization of the problem
- identification of root and contributing causes of the problem
- identification of any additional CRs
- completion of corrective actions in a timely manner

Documents reviewed are listed in the Attachment.

b. Findings

A licensee identified violation was identified on the 1A RHRSW booster pump maintenance. This violation is documented in Section 4OA7.

4OA3 Follow-up of Events (71153 – 2 samples)

.1 (Closed) Licensee Event Report (LER) 05000324/2015-001-00, Implementation of Enforcement Guidance Memorandum (EGM) 11-003, Revision 2

a. Inspection Scope

On February 26, 2015, Unit 2 implemented the guidance of EGM 11-003, Revision 2, Enforcement Guidance Memorandum on Dispositioning Boiling Water Reactor Licensee Noncompliance with TS Containment Requirements During Operations with a Potential for Draining the Reactor Vessel. Consistent with this EGM, secondary containment operability was not maintained during operations with the potential for draining the reactor vessel (OPDRV) activities. The EGM guidance was implemented four additional times during the Unit 2 refueling outage. The activities are discussed in Section 4OA5. Inspectors verified compliance with the guidelines of EGM 11-003 prior to and during these activities. The licensee plans to submit a license amendment request to adopt Technical Specification Task Force traveler associated with generic resolution of this issue within 12 months after the issuance of the Notice of Availability. The licensee entered this issue into the CAP as CR 734902.

b. Findings

The enforcement actions associated with this LER are documented in Sections 4OA5. No findings were identified during the review of this LER. This LER is closed.

.2 (Closed) LER 05000324/2015-002-00 and LER 05000324/2015-002-01, Setpoint Drift in Main Steam Line Safety/Relief Valves Results in Three Valves Inoperable

a. Inspection Scope

On March 10, 2015, the licensee received the results of testing of eleven main steam line SRVs removed from Unit 1 during the spring refueling outage. Three of the eleven SRVs were found to have as-found lift setpoints outside the +/- 3% tolerance required by TS 3.4.3. One SRV was 3.2% high; one SRV was 3.6% high, and one SRV was 4% low. The root cause for the high setpoints was determined to be micro-cracking on the pilot disc surface which allowed localized loss of the platinum coating, resulting in corrosion bonding and raising the breakaway force. The low setpoint cause was not determined. Although the SRV setpoints limits were exceeded, the plant condition was bounded by the Brunswick Unit 1 Cycle 21 Reload Safety Analysis, demonstrating that the SRVs could have performed their safety function of limiting reactor vessel overpressure. The inspectors determined the root cause was different from previous SRV failures and, therefore, the issue was not within the licensee's ability to foresee and correct.. The licensee entered this issue into the CAP as NCR 737292 and is taking corrective actions to reduce micro-cracking in future SRV pilot rebuilds.

b. Findings

No findings were identified during the review of these LERs. These LERs are closed.

4OA5 Other Activities

.1 Implementation of EGM 11-003, Revision 2, Enforcement Guidance Memorandum on Dispositioning Boiling Water Reactor Licensee Noncompliance with Technical Specification Containment Requirements During Operations with a Potential for Draining the Reactor Vessel

a. Inspection Scope

The inspectors reviewed the plant's implementation of NRC EGM 11-003, Revision 2, during Unit 2 maintenance activities which had the potential to drain the reactor vessel during the Unit 2 refueling outage. The activities included:

- February 26, 2015: 398 gallons per minute leakage for establishing a clearance for RWCU vent and drain valve maintenance
- March 14, 2015: 85 gallons per minute leakage for RWCU maintenance activities and excess flow check valve testing through test valve 2-B32-V85
- March 17, 2015, 0411: 1 gallon per minute leakage for RWCU isolation valve leak
- March 17, 2015, 1300: 1 gallon per minute leakage for RWCU isolation valve leak
- March 18, 2015: 1 gallon per minute leakage for RWCU isolation valve leak, leak stopped when the 2A RWCU pump was put under clearance

These activities took place without secondary containment being operable. Inspectors verified compliance with the guidelines of EGM 11-003 prior to and during these activities. Additionally, inspectors verified that, for all dates, all other TSs were met during OPDRVs with secondary containment inoperable.

b. Findings

TS 3.6.4.1, Secondary Containment requires that secondary containment be operable and is applicable during OPDRVs. The required action if secondary containment is inoperable in this condition is to initiate actions to suspend OPDRVs immediately. Contrary to the above, on February 26, 2015, March 14, 2015, twice on March 17, 2015, and March 18, 2015, the licensee failed to maintain secondary containment operable while performing OPDRVs.

However, because the violations were identified during the discretion period described in EGM 11-003, Revision 2, the NRC is exercising enforcement discretion for the dates of February 26, 2015, March 14, 2015, twice on March 17, 2015, and March 18, 2015, in accordance with Section 3.5, "Violations Involving Special Circumstances," of the NRC Enforcement Policy and, therefore, will not issue enforcement action for this violation, subject to a timely license amendment request being submitted.

2. Temporary Instruction 2515/190 – Inspection of the Proposed Interim Actions Associated with Near-Term Task Force Recommendation 2.1 Flooding Hazard Evaluations

a. Inspection Scope

The inspectors independently verified that the licensee's proposed interim actions would perform their intended function for flooding mitigation.

- Visual inspection of the flood protection feature was performed if the flood protection feature was relevant. External visual inspection for indications of degradation that would prevent its credited function from being performed was performed.
- Flood protection feature functionality was determined using either visual observation or by review of other documents.

The inspectors verified that issues identified were entered into the licensee's CAP.

b. Findings

No findings were identified.

The inspectors identified the following minor issues and observations:

- The inspectors performed a walk down of the flooding cliff edge barriers. During the walk down, the inspectors identified that the beyond design basis cliff edge barriers for the Unit 1 and Unit 2 Control Building double doors, doors 1-CTB-DR-EL023-104A/B and 2-CTB-DR-EL023-101A/B, could not be found. The licensee entered this issue in the CAP as NCR 758759. The licensee fabricated new cliff edge barriers for these doors. This is an observation since these cliff edge barriers are for beyond design basis events.
- During the walk down of the EDG building North door, door 114, the inspectors identified a gap in the watertight door seal of approximately 2 inches by 1 inch, 2 inches off of the ground. The identified gap is below the design basis still water flood level of 22 feet. The licensee entered this issue in the CAP as NCR 758454. This is a minor issue since a second watertight door with no gaps exists inside of door 114.
- During the walk down of the EDG building fuel oil transfer chamber South door, the inspectors identified the watertight door would not fully close. The licensee determined the door hinges were misaligned which prevented the watertight door from closing fully. This allowed a gap the entire length of the left side of the door. The licensee entered this issue into the CAP as NCR 756971 and performed an evaluation of water intrusion during the probable maximum hurricane. This is a minor issue since inleakage due to the gap would not have exceeded the allowed design basis of 5 gallons per minute.
- The inspectors reviewed Procedure 0AI-68, Brunswick Nuclear Plant Response to Severe Weather Warnings, Attachment 21, which requires the cliff edge barriers to be installed at least 12 hours prior to the predicted storm surge of 20 feet or greater on site. Attachment 22 requires the use of a mobile crane to move the EDG rollup door platform to install the flood barrier. The inspectors identified that Procedure 0AI-68 did not include a step to receive notification of the storm surge 12 hours prior the storm surge being onsite so that the cliff edge barriers could be installed. The licensee entered this issue in the CAP as procedure revision request 758399 and NCR 758338. This is a minor issue since the licensee would be monitoring the path and severity of the storm in the emergency operations facilities.

#### 4OA6 Meetings, Including Exit

On October 20, 2015, the inspectors presented the inspection results of the Integrated Inspection to Mr. Randy Gideon, Brunswick Nuclear Plant Site Vice President, and other members of the licensee staff. The inspectors confirmed that none of the potential report input discussed was considered proprietary.

On August 20, 2015, the inspectors presented the inspection results of the Emergency Preparedness Baseline Inspection to Mr. Randy Gideon, Brunswick Nuclear Plant Site Vice President, and other members of the staff. The inspectors confirmed that proprietary information was not provided or reviewed during the inspection.

On July 23, 2015, the inspectors presented the inspection results of the Triennial Heat Sink Inspection to Mr. Randy Gideon, Brunswick Nuclear Plant Site President, and other members of the licensee staff. The inspectors confirmed that none of the potential report input discussed was considered proprietary.

#### 4OA7 Licensee-Identified Violations

The following violation of very low safety significance (Green) was identified by the licensee and is a violation of NRC requirements which meets the criteria of the NRC Enforcement Policy, for being dispositioned as a Non-Cited Violation.

- Technical Specification 5.4.1.a requires written procedures to be established as recommended by Safety Guide 1.33, November 3, 1972. Section I.1 recommends procedures for performing maintenance of safety related equipment should be properly pre-planned and performed in accordance with documented instructions appropriate to the circumstances.

Contrary to the above, on June 3, 2015, the licensee failed to establish appropriate work instructions to properly pre-plan and perform maintenance that affected the performance of Unit 1 secondary containment. Specifically, WOs 13304512 and 13304513 failed to ensure that secondary containment was declared inoperable prior to work on the RHRSW motor coolers. The performance deficiency is more than minor, because it adversely affected the procedure quality attribute of the barrier integrity cornerstone to provide reasonable assurance that physical design barriers protect the public from radionuclide releases caused by accidents or events. Using Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," and Inspection Manual Chapter 0609, Appendix A, Exhibit 3, "Barrier Integrity, the inspectors determined that the finding was of very low safety significance (Green) because it only represented a degradation of the radiological barrier function provided for the SBGT system. The licensee entered this issue into their CAP as NCR 752720 and took actions to make a late LCO entry and change the WO instruction.

ATTACHMENT: SUPPLEMENTARY INFORMATION



## **SUPPLEMENTARY INFORMATION**

### **KEY POINTS OF CONTACT**

#### **Licensee Personnel**

W. Gideon	Vice President
C. Moser	Plant Manager
K. Allen	Director, Design Engineering
A. Brittain	Director, Nuclear Plant Security
J. Bryant	Senior Nuclear Engineer
J. Cobb	Chem Control, Essential Raw Cooling Water System Engineer
K. Crocker	Manager, Nuclear Emergency Preparedness
R. Davis	Service Water System Engineer
M. Goddard	Program Manager, Fire Protection
J. Goelz	Design Engineer
L. Grzeck	Manager, Nuclear Regulatory Affairs
R. Heiber	Superintendent, Nuclear Maintenance
J. Hicks	Manager, Nuclear Training
B. Houston	Manager, Maintenance
F. Jefferson	Director, Nuclear Engineering
J. Johnson	Manager, Nuclear Chemistry
J. Kalamaja	Manager, Nuclear Operations
T. King	Manager, Outage and Scheduling
W. Murray	Lead Nuclear Engineer
E. Neal	Acting Manager, Nuclear Rad Protection
J. Nolin	General Manager, Nuclear Engineering
W. Orlando	Superintendent, E/I&C
A. Padleckas	Assistant Ops Manager, Shift
F. Payne	Manager, Nuclear Work Management
A. Pope	Director, Nuclear Operating Experience
M. Schultheis	Manager, Nuclear Performance Improvement
T. Sherrill	Licensing
M. Smiley	Manager, Nuclear Ops Training
R. Wiemann	Director, Electrical/Rx Systems
E. Williams	Superintendent, Nuclear Maintenance

#### **NRC Personnel**

G. Hopper	Chief, Reactor Projects Branch 4
J. Dodson	Senior Project Engineer

## LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

### Closed

<u>Temporary Instruction 2515/190</u>	TI	<u>Inspection of the Proposed Interim Actions Associated with Near-Term Task Force Recommendation 2.1 Flooding Hazard Evaluations (Section 4OA5.2)</u>
05000324/2015-001-00	LER	Implementation of Enforcement Guidance Memorandum 11-003, Revision 2 (Section 4OA3.1)
05000324/2015-002-00	LER	Setpoint Drift in Main Steam Line Safety/Relief Valves Results in Three Valves Inoperable (Section 4OA3.2)
05000324/2015-002-01	LER	Setpoint Drift in Main Steam Line Safety/Relief Valves Results in Three Valves Inoperable (Section 4OA3.2)

## LIST OF DOCUMENTS REVIEWED

### **Common Documents Reviewed**

Updated Final Safety Analysis Report  
Individual Plant Examination  
Individual Plant Examination of External Events  
Technical Specifications and Bases  
Technical Requirements Manual  
Control Room Narrative Logs  
Plan of the Day

### **Section 1R01: Adverse Weather Protection**

#### Procedures

AD-PI-ALL-0100, Corrective Action Program, Rev. 2  
0AI-68, Brunswick Nuclear Plant Response to Severe Weather Warnings, Rev. 48  
0AOP-13.0, Operation During Hurricane, Flood Conditions, Tornado, or Earthquake, Rev. 62  
0BNP-TR-019, External Event Protection Features, Rev. 5  
0ENP-66, External Events Protection Program, Rev. 0  
0AP-100, External Events Protection Features Equipment Inspection, Rev. 0  
EGR-NGGC-0351, Condition Monitoring of Structures, Rev. 22

#### Condition Reports

466253	431541	756971	758454	758338	758873
758891					

#### Work Orders

2232931

#### Miscellaneous

Specification 024-001, Special Doors, Rev. 8  
BSEP 15-0025, Brunswick Steam Electric Plant, 10 CFR 50.54(f) Flood Hazard Reevaluation Report, Response to NRC 10 CFR 50.54(f) Request for Information Pursuant to Title 10 of the Code of Federal Regulations 50.54(f) Regarding Recommendations 2.1, 2.3 and 9.3 of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident, dated March 12, 2012  
Calculation BNP-MECH-FHR-009, Combined Effects Flood Evaluation, Rev. 0

### **Section 1R04: Equipment Alignment**

#### Procedures

1OP-16, Reactor Core Isolation Cooling System Operating Procedure, Rev. 84  
1OP-17, Residual Heat Removal System Operating Procedure, Rev. 126  
1OP-19, High Pressure Coolant Injection System Operating Procedure, Rev 93  
1OP-43, Service Water System Operating Procedure, Rev. 121  
2OP-43, Service Water System Operating Procedure, Rev. 156

Drawings

D-25029, Reactor Building Piping Diagram RCIC Sheets 1 & 2, Rev. 63/43  
 D-25025, Reactor Building Piping Diagram RHR Unit 1 Sheets 1A & 1B, Rev. 57/73  
 D-25023, Reactor Building High Pressure Coolant Injection Piping Diagram Sheet 1, Rev 62  
 D-25023, Reactor Building High Pressure Coolant Injection Piping Diagram Sheet 2, Rev 54

Miscellaneous

UFSAR, Section 6.3, Emergency Core Cooling Systems, Rev 18C  
 BN-16.0.1, Reactor Core Isolation Cooling System, Rev. 04  
 BN-17.0.1, Residual Heat Removal System, Rev. 04  
 AD-OP-ALL-0201, Protected Equipment, Rev. 1  
 0AP-025, BNP Integrated Scheduling, Rev. 52  
 BNP Operations Unit 2 Log Entries dated August 19, 2015  
 Protected Equipment Walk-down Sheet, Unit 2, 2B NSW

**Section 1R05: Fire Protection**Procedures

2PFP-RB, Unit 2, Reactor Building Prefire Plans, Rev. 16  
 0PFP-PBAA, Unit 0 Power Block Auxiliary Areas Prefire Plan, Rev. 26  
 MNT-NGGC-0004, Scaffolding Control, Rev. 18  
 1PFP-TB, Turbine Building Prefire Plans, Rev. 24  
 AD-EG-ALL-1520, Transient Combustible Control, Rev. 3  
 1PFP-RB, Reactor Building Prefire Plans, Att. 5, HPCI Room -17 Foot Elevation, Rev 17

**Section 1R07: Heat Sink Performance**Procedures

1-OI-03.4.2, Unit 1 Reactor Building Auxiliary Operator Daily Check Sheets, Rev. 54  
 1-PT-24.1-1, Service Water Pump and Discharge Valve Operability Test, Rev. 79  
 1-PM-MEC502, Conventional Service Water Header Temperature Inspection, Unit 1, Rev. 18  
 1-PM-MEC506, Nuclear Service Water Header Temperature Inspection, Unit 1, Rev. 9  
 1-OP-17, Residual Heat Removal System Operating Procedure, Unit 1, Rev. 126  
 1-OP-43, Service Water System Operating Procedure, Unit 1, Rev. 121  
 2-OP-17, Residual Heat Removal System Operating Procedure, Unit 2, Rev. 156  
 2-OP-43, Service Water System Operating Procedure, Unit 2, Rev. 171  
 2PM-MEC501, Nuclear Service Water Header Inspection, Unit 2, Rev. 17  
 2PM-MEC505, Conventional Service Water Header Inspection, Unit 2, Rev. 7  
 AD-EG-ALL-1213, System Walkdown, Rev. 2  
 AD-EG-ALL-1613, Buried Piping Integrity Program Implementation, Rev. 1  
 AD-PI-ALL-0100, Corrosion Action Program, Rev. 2  
 AD-PI-ALL-0103, Quick Cause Evaluation, Rev. 1  
 NDEP-0507, Eddy Current Examination of Tubing in Balance of Plant Components, Rev. 1  
 OAI-82, Closed Cooling Water Chemistry Guidelines, Rev. 11  
 OENP-2701, Administrative Control of NRC generic Letter 89-13 Requirements, Rev. 24  
 OMST-DG500R, Emergency Diesel Generators 24-Month Inspection, Rev. 43  
 OPM-HX501, Reactor Building Closed Cooling Water Heat Exchanger Preventive Maintenance Program, Rev. 18

Condition Reports

760238	760243	219334	497136	262601	140541
106128	106130	546346	547585	549178	562558
568911	579672	592035	609844	610544	613526
652836	712513	727873	731276	731387	747712

Work Orders

2234867-01	1939727-09	1842961-01	2041914-01
2060531-01	1834210-01	2041913-01	1945732-01
2116645-01	1975061-01	1944656-01	2123121-01
1897932-01	1944393-01	13316872	2142730-01
2233959-50	13310383-01	13310383-02	859297-08
2116642-01	13316872	2234867	1939727
2076096-08	13340532-01	2257751-01	19613387-01
2040722-01, 2	13395422-02	2268295-01	

Drawings

D-20041/25037, Service Water System, Rev. 2

F-02010, Service Water Intake Structure General Arrangement, Rev. 12

Miscellaneous

1-PT-24.1-1, Service Water Pump and Discharge Valve Operability Test, dated 7/31/2014

2-PM-MEC505, Conventional Service Water Header Inspection, dated 2/26/2015

BSEP-258-03, Spec. for Closed Cooling Water System Heat Exchanger, dated 3/23/84

EC72379, Replace SW Pump Strainer Blowdown Valves

EC93577, Evaluation of Corrosion on 2-SW-103-30-157

NLS-90-005, GL 89-13 Response, dated 1/1990

NLS-91-074, GL 89-13 Supplemental Response, dated 03/1991

Periodic Walkdown by Systems Engineer Service Water, dated 6/23/2015-4/1/2014

PSEC-57, Reactor Building Closed Cooling Heat Exchanger-1C, Eddy Current Inspection Report, dated 2/28/2013

Record#5724848, Buried Piping Inspection, dated 3/3/2015

Report#2-E11-B002B, Eddy Current Testing on RHR 2B, dated 3/15/2009

Report#1-E11-B001A, Eddy Current Testing on RHR 1A, dated 3/12/2010

Report#EDG-1-JWC2012, Eddy Current Testing on EDG-1 Jacket Water Cooler, dated 5/29/2014

SD29.1, Screen Wash Water System, Rev. 7

SD17, Residual Heat Exchanger System, Rev. 19

SD43, System Description of Service Water System, Rev. 26

System Health Report, RBCCW, dated 1/1-3/31/2015

System Health Report, SW, dated 1/1-3/31/2015

System Health Report, RHR, dated 1/1-3/31/2015

System Health Report, DG, dated 1/1-3/31/2015

G0050A-16, BOP Units 1 and 2 Service Water Single Failure Analysis, Rev. 1

G-0050C-04, Design Basis Heat Loads from Vital Heat Exchangers for BSEP Units 1 and 2,  
Rev. 1  
SW-0096, Tube Plugging and Fouling of Service Water Safety Related Heat Exchangers,  
Rev. 0

### **Section 1R11: Licensed Operator Requalification**

#### Procedures

TRN-NGGC-0420, Conduct of Simulator Training and Evaluation, Rev. 4

#### Miscellaneous

LORX-202, Recirculation Loop A Flow Transmitter Failure, RBCCW High Radiation, Loss of Off-Site Power, Small Break LOCA, Rev. 7  
Reactivity Manipulation Plan, Unit 1 Sequence Exchange, Rev. 0  
ODMI 1A RCR Second Stage Seal Pressure Oscillations, CR 1945691

### **Section 1R12: Maintenance Effectiveness**

#### Procedures

1OP-19, High Pressure Coolant Injection System Operating Procedure, Rev. 93

#### Condition Reports

607846	733798	737292	1941105	758254
--------	--------	--------	---------	--------

#### Work Orders

13540443

#### Miscellaneous

TS Bases 3.4.3 Safety/Relief Valves  
SRV/ADS Maintenance Rule (a)(1) Evaluation and supporting documents  
LTAM BNP-15-0085, SRV Rebuild Improvement  
AR 291690, Adverse Condition on SW

### **Section 1R13: Maintenance Risk Assessment and Emergent Work Control**

#### Procedures

AD-NF-ALL-0501, Electronic Risk Assessment Tool (ERAT), Rev. 0  
AD-OP-ALL-0201, Protected Equipment, Rev. 1  
0AP-025, BNP Integrated Scheduling, Rev. 52  
BNP Operations Unit 2 Log Entries dated July 7, 2015  
Protected Equipment Walk-down Sheet, Unit 1, 1B RHR / RHRSW Outage  
BNP Operations Unit 1 Log Entries dated September 9-13, 2015  
BNP Operational Focus Meeting Packages dated September 9-10, 2015  
BNP Operational Focus Meeting Packages dated September 21, 2015

#### Condition Reports

1955853

**Section 1R15: Operability Evaluations**Procedures

AD-OP-ALL-0105, Operability Determinations and Functionality Assessment, Rev. 0  
 1OI-03.1, Reactor Operator Daily Surveillance Report, Rev. 124  
 2MST-BAT11CQ, 125 VDC Battery 2A-2 Quarterly Operability Test, Rev. 4

Condition Reports

757106	1941154	1941157	1942315	1941323	1943442
1944175	1944178	952454			

Work Orders

2004341

Miscellaneous

Certificate of Laboratory Analysis BSP125 and BSP134  
 PDO for NCR 1952454  
 BNP-MECH-G31-F001, Mechanical Analysis and Calculations for 1/2-G31-F001 RWCU Inboard Isolation Valves

**Section 1R18: Plant Modifications**Miscellaneous

EC (2)88932, Flex Strategies And Implementation Plan  
 EC (2)90388 (NT000104 BSEP Position Paper) – Position paper for pre-staging both Flex DG's  
 EC (2)90400, BNP Permanent Flex Storage Building  
 EC (2)90412 Hydraulic Analysis for Flex flow path and pumps  
 EC (2)95521, Unit 2 Condensate Storage Tank Flex Pump Connection  
 EC (2)99559, Implementing ECs for FLEX  
 EC (2)95856, BNP Condensate Storage Tank Natural Phenomena Hazards Evaluation

**Section 1R19: Post Maintenance Testing**Procedures

OPT-09.2, HPCI System Operability Test, Rev. 146  
 OPT-12.2D, No. 4 Diesel Generator Monthly Load Test, Rev. 113  
 OPT-10.1.1, RCIC System Operability Test, Rev. 104  
 OPT-08.1.4b, RHR Service Water System Operability Test – Loop B, Rev. 70  
 1PT-24.1-1, Service Water Pump and Discharge Valve Operability Test, Rev. 86

Condition Reports

759733	759061	759012	759011	759187	759543
760001	759747	759523	1945760		

Work Orders

13432010	13452139	13316882	20012340	13444382	13537636
11842952	12287726				

Miscellaneous

OPM-MO504, Mechanical Inspection and Lubrication of Limitorque Operators, Rev. 41

**Section 1R22: Surveillance Testing**Procedures

1MST-RHR28BR, RHR B Loop Time Delay Relay Chan Cal, Rev. 3  
 0PT-12.2C, No. 3 Diesel Generator Monthly Load Test, Rev. 106  
 0OP-39, Diesel Generator Operating Procedure, Rev. 165  
 0PT-12.8.1, Breaker Alignment Operability Test, Rev. 13  
 2PT-24.1-2, Service Water Pump And Discharge Valve Operability Test, Rev. 77  
 1OI-03.1, Reactor Operator Daily Surveillance Report, Rev. 125  
 2OI-03.2, Reactor Operator Daily Surveillance Report, Rev. 135

Condition Reports

1940334    1944638

Work Orders

13344682    13351049    11610231    1332057

**Section 1EP2: Alert and Notification System Evaluation**Procedures and Reports

0PEP-04.2, Emergency Facilities and Equipment, Rev. 42  
 0EPM-600, Brunswick Siren System User Guide, Rev. 4  
 Siren System FEMA Annual Siren Report for 2013  
 WPS-2900 Series High Power Voice & Siren System, Installation, Operating and Troubleshooting Manual, 2005  
 BNP Public Warning System (Siren Control System) Operator Guide, 2007  
 WPS-2900, Whelen High Power Voice and Siren System Instruction and Troubleshooting Manual, 2005

Records and Data

Equipment Repair Logs  
 Weekly Silent Tests, 2013 - June 2015  
 Quarterly Growl Tests, 2013 - June 2015  
 2014 Annual Siren Full Volume Test

Condition Reports

CR 705775, Siren B18 failed to activate during weekly test  
 AR 1943703, Telecon 2014 siren PM paperwork missing for sirens B09 to B12 (NRC)

**Section 1EP3: Emergency Response Organization Staffing and Augmentation System**Procedures

0PEP-02.1.1, Emergency Control – Notification of Unusual Event, Alert, Site Area Emergency, and General Emergency, Rev. 22

0PEP-02.6.12, Activation and Operation of the OSC, Rev. 43  
 0PEP-04.03, Performance of Training, Exercises, and Drills, Rev. 27

Records and Data

Evacuation Time Estimate analysis, KLD Engineering, November 2012, Rev. 1  
 Brunswick Nuclear Plant 2014 Population Update Analysis, KLD Engineering, November 17, 2014, Rev. 0



Monthly ERO Notification drills, 2013-2015  
 Summary of Brunswick NOUE of January 10, 2014  
 Summary of Brunswick NOUE on January 20, 2014  
 Summary of Brunswick NOUE on August 12, 2014  
 Emergency Response Organization - current list  
 Organizational Charts/Access list report, 6/22/2015  
 Emergency Response Organization on call roster, 6/4/2015

#### Condition Reports

AR 733895, 10CFR50.54(q)(3) Attachment 2, Evaluation sheet  
 AR 733896, 10CFR50.54(q)(3) Attachment 2, Evaluation screening  
 CR 612047, ERO vacancies increase  
 CR 617845, ERO Drill Critique items, notification devices  
 CR 631983, ERO Drill, September 30, 2013  
 CR 649961, BNP ERO staffing depth not meeting expectations  
 CR 703387, Halon gas discharge in EOF/TSC simulator  
 CR 728951, Security DG building NOVEC discharge  
 CR 736953, BNP ERO vacancies is yellow priority

#### **Section 1EP4: Emergency Action Level and Emergency Plan Changes**

##### Procedures

EMG-NGGC-0010, Emergency Plan Change Screening & Evaluation 10CFR50.54(q)(3), Rev. 4  
 REG-NGGC-0010, 10CFR50.59 & Selected Regulatory Reviews, Rev. 22  
 OPEP-02.6.29, Activation and Operation of the JIC, Rev. 27  
 OPEP-02.6.30, Alternate Emergency Facility Operations, Rev. 9

##### Change Packages

EREG #713107, 50.54(q)(3) Evaluation Sheet for OERP Brunswick Nuclear Plant (BNP) Radiological Emergency Response Plan (EREP) Rev. 86, dated 12/5/14  
 EREG #713107, 50.54(q)(3) Screening Sheet for OERP BNP EREP Rev. 86, dated 12/5/14  
 EREG #756555, 50.54(q)(3) Screening Sheet for OERP BNP EREP Rev. 87, dated 7/16/15  
 EREG #756555, 50.54(q)(3) Evaluation Sheet for OERP BNP EREP Rev. 87, dated 7/16/15  
 EREG #728552, 50.54(q)(3) Screening Sheet for OPEP-02.1.1 Emergency Control – Notification of Unusual Event, Alert, Site Area Emergency, General Emergency Rev. 27, dated 3/10/15  
 EREG #728552, 50.54(q)(3) Evaluation Sheet for OPEP-02.1.1 Emergency Control – NOUE, Alert, Site Area Emergency, General Emergency Rev. 27, dated 3/10/15  
 EREG #718072, 50.54(q)(3) Screening Sheet for OPEP-02.2.1 Emergency Action Level Technical Basis Rev. 7, dated 4/10/15  
 EREG #713107, 50.54(q)(3) Evaluation Sheet for OPEP-02.2.1 Emergency Action Level Technical Basis Rev. 7, dated 4/10/15

#### **Section 1EP5: Maintenance of Emergency Preparedness**

##### Procedures

OERP, Radiological Emergency Response Plan, Rev. 87  
 AD-PI-ALL-0100, Corrective Action Program, Rev. 2  
 AD-PI-ALL-0300, Self-Assessment & Benchmarking Programs, Rev. 1

Records and Data

B-EP-13-01, Assessment of Emergency Preparedness (EP) Program, dated 9/17/13  
 2014-BNP-EP-PR-01, Performance Review of EP Program, dated 10/27/14  
 NOUE Explosion Within the Protected Area January 10, 2014, dated 1/20/14  
 NOUE Due to Toxic, Corrosive, Asphyxiant, or Flammable Gases February 3, 2014, dated 6/23/14  
 Prompt Investigative Response Team (PIRT) Report for NOUE on August 12, 2014, for Halon Discharge in EOF/TSC Simulator Building  
 Security Diesel Generator Building NOVEC Discharge January 20, 2015, dated 1/30/15  
 Evacuation Time Estimate analysis, KLD Engineering, November 2012, Rev. 1  
 Brunswick Nuclear Plant 2014 Population Update Analysis, KLD Engineering, 11/17/14, Rev. 0  
 Employee Qualification Report, dated 6/17/15  
 10CFR50.54(q) Training Slides, dated 4/23/13  
 OPT-93.0, EOF/TSC Building Emergency System Test, Rev. 9, dated 1/15/15

Condition Reports

AR 655082, Minimum staff ERO worker responded late for UE  
 AR 665375, EAL classification for fire in H1 area  
 AR 666246, Radio condition impeding fire brigade response  
 AR 666356, Fire brigade advisor left command post  
 AR 666414, Conduct a common cause analysis of NOUEs for the past 2 years  
 AR 666642, MET tower reporting erratic barometric pressure data  
 AR 666886, EAL basis guidance  
 AR 691035, 5/28/14 EP Drill: EOF notification to offsite agencies  
 AR 693590, Procedural requirement places personnel in challenging task  
 AR 695859, Plant access & egress delayed  
 AR 700197, EAL 99-01 Revision 6  
 AR 728953, 2-SEC-UPS-001 smoke alarm & suppression system actuation  
 AR 728966, Equipment missing from fire trailer  
 AR 1944992, Current emergency kit inventory not with the kit per procedure (NRC)  
 AR 1945065, Refrigerant container had no chemical control label (NRC)  
 AR 1945192, Small nitrogen cylinder improperly tied off (NRC)  
 AR 1945589, AD-PI-ALL procedures do not provide direction on action closure for actions completed prior to evaluation (NRC)  
 AR 1945663, EP definition deficiency in EP drill critique reports (NRC)

**Section 1EP6: Drill Evaluation**Miscellaneous

Brunswick Nuclear Plant September 9, 2015 EP Training Drill Master Scenario and Controller Drill Package  
 Nuclear Power Plant Emergency Notification Forms dated 9/9/2015  
 Event Notification Worksheets dated 9/9/2015

**Section 40A1: Performance Indicators**Procedures

REG-NGGC-0009, NRC Performance Indicators and Monthly Operating Report Data, Rev. 14  
 1OI-03.1, Reactor Operator Daily Surveillance Report, Rev. 125  
 2OI-03.2, Reactor Operator Daily Surveillance Report, Rev. 135

AD-EP-ALL-002, NRC Regulatory Assessment Performance Indicator Guideline Emergency Preparedness Cornerstone, Rev. 1  
 AD-EP-ALL-0803, Evaluation & Critique of Drills & Exercises, Rev. 0

#### Records and Data

Documentation of Performance Indicator data from July 1, 2014 through June 30, 2015 for DEP, ANS, and ERO

#### Condition Reports

AR1944498, Revise AD-EP-ALL-002 to improve instructions for DEP evaluations (NRC)  
 AR 1944520, Revise AD-EP-ALL-803 to improve references/attachments (NRC)

#### Miscellaneous

BNP-PSA-069, NRC Mitigating System Performance Index Basis Document, Rev. 13  
 Daily Operator Logs during the inspection period  
 Brunswick Operation Focus Meeting Chemistry Daily Status Report  
 NEI 99-02, Regulatory Assessment Performance Indicator Guideline, Rev. 7 Brunswick Unit 1 PI Summary, July 2014 – June 2015  
 Brunswick Unit 2 PI Summary, July 2014 – June 2015  
 Monthly PI Reports, July 2014 – June 2015

### **Section 40A2: Identification and Resolution of Problems**

#### Procedures

0CM-VSR509, Main Steam Relief Valves Target Rock Model 7567 Assembly Disassembly, Inspection, And Reassembly, Rev. 20  
 0PM-HX503, RHR Service Water Booster Pump Motor Heat Exchanger Inspection, Rev. 15  
 0ENP-54, Building Ventilation Pressure Control Program, Rev. 33

#### Condition Reports

1957895	1956157	1955849	1952576	1949371	1952454
1956157	1943598	1943599	1942956	1941319	1941409
1941638	1940247	1941154	1938653	1938435	1939765
0759546	0759514	0759992	0759777	0737292	0607846
752720					

#### Work Orders

13304512    13304513

#### Miscellaneous

Patent 6,090,655  
 Nuclear Engineering BNP Unit 2 SRV Pilot Discs report, April 7, 2015  
 Nuclear Engineering BNP Unit 2 SRV Pilot Discs report, May 4, 2015  
 QCE 758254, Unplanned Tech Spec Entry

### **Section 40A3: Follow-up of Events**

#### Procedures

2SP-15-101, Unit 2 EGM 11-003 OPDRV Activities Expires 12-31-15, Rev. 0  
 0ENP-54, Building Ventilation Pressure Control Program, Rev. 32

Condition Reports

737292      734902

Miscellaneous

LER 2015-001

LER 2015-002-01

LER 2-2015-001-00, Implementation of EGM 11-003, Rev. 2

**Section 40A5: Other Activities**Procedures

0ISFS-102, ISFSI DSC Loading and Storage, Rev. 0

0FH-11A, Refueling Platform Operations, Rev. 75

TE-NF-NGO-0601, Selection of Fuel for Storage in the NUHOMS Dry Fuel Storage System, Rev. 0

AD-PI-ALL-0100, Corrective Action Program, Revision 2

0AI-68, Brunswick Nuclear Plant Response to Severe Weather Warnings

0AOP-13.0, Operation During Hurricane, Flood Conditions, Tornado, or Earthquake, Rev. 62

0BNP-TR-019, External Event Protection Features, Rev. 5

0ENP-66, External Events Protection Program, Rev. 0

0AP-100, External Events Protection Features Equipment Inspection, Rev. 0

EGR-NGGC-0351, Condition Monitoring of Structures, Rev. 22

2SP-15-101, Unit 2 EGM 11-003 OPDRV Activities Expires 12-31-15, Rev. 0

0ENP-54, Building Ventilation Pressure Control Program, Rev. 32

Condition Reports

1943598	1944564	1943053	1943160	1943642	758891
466253	431541	756971	758454	758338	758873
734902					

Work Order

2232931

Miscellaneous

Specification 024-001, Special Doors, Rev. 8

BSEP 15-0025, Brunswick Steam Electric Plant, 10 CFR 50.54(f) Flood Hazard Reevaluation Report, Response to NRC 10 CFR 50.54(f) Request for Information Pursuant to Title 10 of the Code of Federal Regulations 50.54(f) Regarding Recommendations 2.1, 2.3 and 9.3 of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident, dated March 12, 2012

Calculation BNP-MECH-FHR-009, Combined Effects Flood Evaluation, Rev. 0

LER 2-2015-001-00, Implementation of EGM 11-003, Rev. 2