



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

July 31, 2017

EA-17-123

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 INTEGRATED INSPECTION
REPORT NOS.: 05000325/2017002 AND 05000324/2017002 AND EXERCISE OF
ENFORCEMENT DISCRETION**

Dear Mr. Gideon:

On June 30, 2017, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Brunswick Steam Electric Plant, Units 1 and 2. On July 12, 2017, 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.

A violation of Technical Specification 3.6.4.1, Secondary Containment, was identified. Because the violation was identified during the discretion period described in Enforcement Guidance Memorandum 11-003, Revision 3, the NRC is exercising enforcement discretion 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 the license amendment request which was submitted on June 29, 2017.

Further, 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.

If you contest the violation or the significance of the violation, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN.: Document Control Desk, Washington DC 20555-0001; with copies to the Regional Administrator Region II; the Director, Office of Enforcement, and the NRC Resident Inspector at the Brunswick Steam Electric Plant.

W. Gideon

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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/

Steven D. Rose, Chief
Reactor Projects Branch 4
Division of Reactor Projects

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

Enclosure:
IR 05000325, 324/2017002
w/Attachment: Supplementary Information

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SUBJECT: BRUNSWICK STEAM ELECTRIC PLANT – NRC INTEGRATED INSPECTION
REPORT NUMBERS: 05000325/2017002 AND 05000324/2017002 July 31, 2017

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U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket Nos.: 50-325, 50-324

License Nos.: DPR-71, DPR-62

Report No.: 05000325/2017002, 05000324/2017002

Licensee: Duke Energy Progress, Inc.

Facility: Brunswick Steam Electric Plant, Units 1 & 2

Location: Southport, NC

Dates: April 1, 2017 through June 30, 2017

Inspectors: M. Catts, Senior Resident Inspector
M. Schwieg, Resident Inspector
D. Jackson, RII Project Engineer

Approved by: Steven D. Rose, Chief
Reactor Projects Branch 4
Division of Reactor Projects

Enclosure

SUMMARY

Integrated Inspection Report 05000325/2017002, 05000324/2017002; April 1, 2017, through June 30, 2017; Brunswick Steam Electric Plant, Units 1 and 2.

The report covered a 3-month period of inspection by resident inspectors and regional inspectors. There were no NRC-identified or self-revealing 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. All violations of NRC requirements are dispositioned in accordance with the NRC's Enforcement Policy dated November 1, 2016. The NRC's program for overseeing the safe operations of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 6.

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

REPORT DETAILS

Summary of Plant Status

Unit 1 began the inspection period at 100 percent rated thermal power (RTP). On April 25, 2017, the unit was shut down for a forced outage to repair the 1B recirculation pump seal. On April 28, 2017, the unit was restarted and power was returned to 100 percent on May 1, 2017. On May 2, 2017, power was reduced to 66 percent for a control rod improvement and power was returned to 100 percent on May 4, 2017. On May 6, 2017, power was reduced to 80 percent for a control rod improvement and power was returned to 100 percent on May 8, 2017. On May 31, 2017, power was reduced to 98 percent due to a loss of the 1B variable frequency device controller for the 1B recirculation pump. Power was returned to 100 percent after restoration of the 1B variable frequency device controller on May 31, 2017. On June 9, 2017, power was reduced to 70 percent for a control rod improvement and power was returned to 100 percent on June 11, 2017. The unit remained at or near 100 percent RTP for the remainder of the inspection period.

Unit 2 began the inspection period shutdown for refueling outage B223R1. On April 14, 2017, the unit was restarted and power was returned to 100 percent on April 22, 2017. On May 22, 2017, power was reduced to 70 percent to repair a steam leak on 2-MD-V16 and power was returned to 100 percent on May 22, 2017. On June 3, 2017, power was reduced to 70 percent for a control rod sequence exchange and valve testing. Power was returned to 100 percent on June 3, 2017. On June 5, 2017, power was reduced to 70 percent for a control rod sequence exchange. Power was returned to 100 percent on June 5, 2017. The unit remained at or near 100 percent 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)

a. Inspection Scope

Seasonal Extreme Weather Conditions

The inspectors conducted a detailed review of the station's adverse weather procedures written for extreme high temperatures. The inspectors verified that weather-related equipment deficiencies identified during the previous year had been placed into the work control process and/or corrected before the onset of seasonal extremes. The inspectors evaluated the licensee's implementation of adverse weather preparation procedures and compensatory measures before the onset of seasonal extreme weather conditions. Documents reviewed are listed in the Attachment.

The inspectors evaluated the following risk-significant systems:

- service water system
- transformer yard

b. Findings

No findings were identified.

1R04 Equipment Alignment

a. Inspection Scope

Partial Walkdown (71111.04 – 4 samples)

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. Documents reviewed are listed in the Attachment.

The inspectors selected the following systems or trains to inspect:

- Unit 1, core spray (CS) train B
- Unit 2, reactor core isolation cooling (RCIC)
- Unit 1, nuclear service water (NSW)
- Unit 2, CS train B

b. Findings

No findings were identified.

1R05 Fire Protection

a. Inspection Scope

Quarterly Inspection (71111.05Q – 5 samples)

The inspectors evaluated the adequacy of selected pre-fire plans 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-TB2-01A, Unit 2 Turbine Building Breezeway, North 20 foot elevation
- 2PFP-RB2-07, Unit 2 Drywell, 20 foot elevation
- 1PFP-DG-05/04, Unit 1 Diesel Generator Cells 1-2, 23 foot elevation

- 2PFP-TB2-01M, Unit 2 Turbine Building Laydown Area, 70 foot elevation
- 2PFP-RB2-01T, Unit 2 Reactor Building Torus, 0 foot elevation

b. Findings

No findings were identified.

1R06 Flood Protection Measures (71111.06 – 1 sample)

a. Inspection Scope

Underground Cables

The inspectors reviewed related flood analysis documents and inspected the areas listed below containing cables whose failure could disable risk-significant equipment. The inspectors directly observed the condition of cables and cable support structures and, as applicable, verified that dewatering devices and drainage systems were functioning properly. In addition, the inspectors verified the licensee was identifying and properly addressing issues using the CAP. Documents reviewed are listed in the Attachment.

- Unit 2, manhole 2-MH-6NW, 2-MH-6SW

b. Findings

No findings were identified.

1R11 Licensed Operator Regualification Program and Licensed Operator Performance (71111.11 – 2 samples)

a. Inspection Scope

.1 Resident Inspector Quarterly Review of Licensed Operator Regualification

On June 1, 2017 the inspectors observed an evaluated simulator scenario, involving a NSW header leak and RCIC steam line break with failure to isolate, administered to an operating crew as part of the annual regualification operating test required by 10 CFR 55.59, "Regualification".

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.

.2 Resident Inspector Quarterly Review of Licensed Operator Performance in the Actual Plant/Main Control Room

The inspectors observed licensed operator performance in the main control room on April 14, 2017, during plant startup from Unit 2 refueling outage B223R1.

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 – 1 sample)

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. Documents reviewed are listed in the Attachment.

- WO 20132630, Unit 1 high pressure coolant injection (HPCI) auxiliary oil pump motor overload relay replacement

b. Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13 – 4 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 management actions. 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.

- Unit 2, April 3, 2017, elevated risk during refueling outage B223R1 fuel movement
- Unit 2, April 6, 2017, elevated risk during refueling outage B223R1 electrical work window

- Unit 2, April 10, 2017, elevated risk during refueling outage B223R1 vessel draindown
- Unit 2, May 15, 2017, elevated risk with 2-CAC-V17, reactor building to torus vacuum breaker, unplanned inoperability

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessments (71111.15 – 5 samples)

a. Inspection Scope

Operability and Functionality Review

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 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, residual heat removal (RHR) valve F047B, heat exchanger 2B inlet valve, ground alarm, NCR 2113446
- Unit 2, emergency diesel generators (EDG) 2 overspeed relay failure, NCR 2120738
- Unit 2, RCIC high moisture content in turbine oil, NCR 2126899
- Unit 2, RCIC steam leak, NCR 2127691
- Unit 2, primary containment inoperable during startup, NCR 2116753

b. Findings

One licensee-identified violation was documented in Section 4OA7.

1R18 Plant Modifications (71111.18 – 2 samples)

a. Inspection Scope

The inspectors verified that the plant modifications 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 SSCs. 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.

- NCR 2124497, Carabiners installed for barring gear locking pins on EDGs 1, 2 and 3
- EC408181, Unit 2 RHR F047B, heat exchanger 2B inlet valve, motor replacement

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.

- WO 20156990, Unit 2, EDG 4 starting air pin failure, March 30, 2017
- WO 20096176, Unit 2, 2-CAC-V17 reactor building to torus vacuum breaker inoperable, May 15, 2017
- WO 20153997, Unit 1, service water backdraft damper lubrication, May 25, 2017
- WO 20157390, Unit 2, RHR F047B, heat exchanger 2B inlet valve, motor replacement, May 30, 2017
- WO 20156298, Unit 2, HPCI planned maintenance outage, June 14, 2017
- WO 13538781, Units 1, EDG 2 planned maintenance outage, June 8, 2017

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.

1R20 Refueling and Other Outage Activities (71111.20 – 2 samples)

a. Inspection Scope

.1 Unit 2 Refueling Outage B223R1 (71111.20 – 1 sample)

Unit 2 began the inspection period in refueling outage B223R1. The inspectors reviewed outage plans and contingency plans for the Unit 2 refueling outage, which ended with the generator synchronization to the grid on April 15, 2017, to confirm that the licensee had appropriately considered risk, industry experience, and previous site-specific problems in developing and implementing a plan that assured maintenance of defense-in-depth of key safety functions.

During the refueling outage, the inspectors monitored licensee controls over the following outage activities:

- Licensee configuration management, including maintenance of defense-in-depth for key safety functions and compliance with the applicable Technical Specifications (TSs) when taking equipment out of service
- Implementation of clearance activities and confirmation that tags were properly hung and equipment appropriately configured to safely support the work or testing
- Installation and configuration of reactor coolant pressure, level, and temperature instruments to provide accurate indication, accounting for instrument error
- Controls over the status and configuration of electrical systems to ensure that TS and outage safety plan requirements were met, and controls over switchyard activities
- Monitoring of decay heat removal processes, systems, and components
- Controls to ensure that outage work was not impacting the ability of the operators to operate the spent fuel pool cooling system
- Reactor water inventory controls including flow paths, configurations, and alternative means for inventory addition, and controls to prevent inventory loss
- Controls over activities that could affect reactivity
- Maintenance of secondary containment as required by TS
- Startup and ascension to full power operation, tracking of startup prerequisites, walkdown of the drywell (primary containment) to verify that debris had not been left which could block emergency core cooling system suction strainers, and reactor physics testing
- Licensee identification and resolution of problems related to refueling outage activities

Documents reviewed are listed in the Attachment.

.2 Unit 1 Maintenance Outage B120F1 (71111.20 – 1 sample)

For the Unit 1 maintenance outage to replace the 1B recirculation pump seal, from April 25, 2017, through April 28, 2017, the inspectors evaluated the following outage activities:

- shutdown, cooldown, heatup, and startup
- reactor coolant system instrumentation and electrical power configuration
- reactivity and inventory control
- decay heat removal and spent fuel pool cooling system operation

The inspectors verified that the licensee:

- controlled plant configuration in accordance with administrative risk reduction methodologies
- developed work schedules to manage fatigue
- developed mitigation strategies for loss of key safety functions
- adhered to operating license and TS requirements

Inspectors verified that safety-related and risk-significant SSCs not accessible during power operations were maintained in an operable condition. The inspectors also reviewed a sample of related corrective action documents to verify the licensee was identifying and correcting any deficiencies associated with outage activities. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22 – 4 samples)

a. Inspection Scope

The inspectors reviewed the surveillance tests listed below and either observed the test or reviewed test results to verify testing activities adequately demonstrated that the affected SSCs remained capable of performing the intended safety functions (under conditions as close as practical to design bases conditions or as required by TS) and maintained their operational readiness.

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

- Procedure 2MST-RPS41R, RPS Logic System Functional Test, April 6, 2017
- Procedure 0PT-80.1, Reactor Pressure Vessel ASME Section XI Pressure Test, May 11, 2017

In-Service Tests (IST)

- Procedure 0PT-09.2, HPCI System Operability Test, May 10, 2017

Reactor Coolant System Leak Detection

- Procedure 0OI-02.3, Unit 1 Drywell Leakage Control, April 25, 2017

b. Findings

No findings were identified.

Cornerstone: Emergency Preparedness

1EP6 Drill Evaluation (71114.06 – 1 sample)

a. Inspection Scope

The inspectors observed the emergency preparedness drill conducted on June 1, 2017, involving a NSW header leak and RCIC steam line break with failure to isolate. 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 (PI) Verification (71151 – 6 samples)

a. Inspection Scope

The inspectors reviewed a sample of the performance indicator data, submitted by the licensee, for the Unit 1 and Unit 2 PIs listed below. The inspectors reviewed plant records compiled between April 1, 2016, through March 31, 2017, 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

- Units 1 and 2, safety system functional failures
- Units 1 and 2, emergency AC power system
- Units 1 and 2, cooling water system

b. Findings

No findings were identified.

4OA2 Problem Identification and Resolution (71152 – 2 samples)

.1 Routine Review

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

.2 Semi-Annual Trend Review

a. Inspection Scope

The inspectors reviewed issues entered in the licensee's corrective action program and associated documents to identify trends that could indicate the existence of a more significant safety issue. The inspectors focused their review on human performance trends during Unit 2 refueling outage B223R1, but also considered the results of inspector daily condition report screenings, licensee trending efforts, and licensee human performance results. The review nominally considered the 6-month period of January 1, 2017, through June 30, 2017, although some examples extended beyond those dates when the scope of the trend warranted. The inspectors compared their results with the licensee's analysis of trends. Additionally, the inspectors reviewed the adequacy of corrective actions associated with a sample of the issues identified in the licensee's trend reports. The inspectors also reviewed corrective action documents that were processed by the licensee to identify potential adverse trends in the condition of structures, systems, and/or components as evidenced by acceptance of long-standing non-conforming or degraded conditions. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

.3 Annual Follow-Up of Selected Issues

a. Inspection Scope

The inspectors conducted a detailed review of the following condition report:

- NCR 2120423, rising trend in Unit 2 suppression pool temperature, April 30, 2017

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 condition reports
- completion of corrective actions in a timely manner

Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

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

.1 (Closed) Licensee Event Report (LER) 05000324/2017-001-00, Implementation of Enforcement Guidance Memorandum (EGM) 11-003, Revision 3

a. Inspection Scope

On March 22, 2017, Unit 2 implemented the guidance of EGM 11-003, Revision 3, 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 activities. The EGM guidance was implemented from March 22, 2017, at 1209 to March 28, 2017, at 1230. 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 has submitted a license amendment request to adopt TS Task Force traveler associated with generic resolution of this issue. The licensee entered this issue into the CAP as NCR 2110409. Documents reviewed are listed in the Attachment.

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 05000324/2017-002-00, Plant Mode Change with Primary Containment Inoperable

a. Inspection Scope

On April 13, 2017, Unit 2 was in Mode 4 preparing to exit refueling outage B223R1. The primary containment was being vented to ensure habitability during maintenance in the drywell. At 2347, the reactor was taken to Mode 2 with the primary containment still aligned for venting. In this condition, the drywell ventilation makes the primary containment inoperable due to the drywell and the suppression chamber being in communication to each other. With primary containment inoperable during startup, the plant violated Limiting Condition for Operation (LCO) 3.0.4, which requires all LCOs to be met for the plant condition prior to entry into the applicable mode.

The licensee reported this event in accordance with 10 CFR 50.72(b)(3)(v)(D), a non-emergency 8-hour report. The licensee also reported this event in accordance with 10 CFR 50.73(a)(2)(i)(B), for entering a condition prohibited by TSs, and 10 CFR 50.73(a)(2)(v)(D), for a loss of safety function. The cause of the event was the failure of operations personnel to initiate a tracking LCO for primary containment being inoperable in accordance with licensee procedure 0OI-01.01, BNP Conduct of Operations Supplement. The licensee determined a tracking LCO should have been initiated to ensure the primary containment was restored to operable prior to entering Mode 2. As immediate corrective actions, the licensee restored containment to operable on April 14, 2017, at 0030, and the Shift Manager and Control Room Supervisor were

removed from shift. Further, a remediation plan was developed and implemented to assess the Shift Manager and Control Room Supervisor for watch standing and reinstatement. The licensee entered this issue into CAP as NCR 2116753. Documents reviewed are listed in the Attachment.

b. Findings

The enforcement actions associated with this LER are documented in Section 40A7. No findings were identified during the review of this LER. This LER is closed.

.3 (Closed) LER 05000325;324/2016-006-01, Control Room AC Units Inoperable Due to Corroded Supports

a. Inspection Scope

On December 14, 2016, the 2D control room AC unit was declared inoperable due to corrosion on the support channels, and Units 1 and 2 entered TS 3.7.4, Condition A. On January 30, 2017, the 1D control room AC unit was declared inoperable for corrosion on the support channels. The corrosion was due to trapped moisture in contact with steel supports exposed to a local marine environment. The corrosion degraded the supports to the point that the safety function of the AC unit would be lost during a seismic event. Since the degradation was due to corrosion, both units were determined to be inoperable at the same time. The conditions were determined to have existed longer than the TS 3.7.4 allowed outage time. The licensee entered this issue into the CAP as NCRs 2113799 and 2113800. As corrective actions, the licensee replaced both AC units' supports, declared the units operable, and inspected the 2E control room AC unit for corrosion.

b. Findings

The inspectors identified the licensee failed to recognize the 1D AC unit was inoperable on December 1, 2016, during the periodic inspection. The inspectors documented an NRC-identified Green NCV in Inspection Report 05000325;324/2017001, Section 40A2. No additional findings were identified during the review of this LER. This LER is closed.

.4 (Closed) LER 05000325;324/2017-002, Foreign Material in Switch Results in Unplanned Automatic Start of Emergency Diesel Generators

a. Inspection Scope

On April 17, 2017, Unit 2 was in Mode 1 at approximately 22 percent of rated power and was starting up from a refueling outage. Operators manually tripped the Unit 2 main turbine to halt increasing bearing vibration. The power circuit breakers for the Unit 2 main generator did not open as expected on the turbine trip, but subsequently opened when main generator reverse power relays actuated. This resulted in the automatic start of all four EDGs. The EDGs did not tie to emergency busses because offsite power was still available. This event was caused by a turbine stop valve limit switch failing to open due to foreign material intrusion. There was no safety impact of the failed limit switch. The licensee entered this issue into the CAP as NCR 2117033. As corrective actions, the licensee will inspect similar switches during the next scheduled refueling outage on each unit (i.e., spring 2018 for Unit 1 and spring 2019 for Unit 2).

b. Findings

No findings were identified.

4OA5 Other Activities

.1 Implementation of EGM 11-003, Revision 3, 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 3, during Unit 2 maintenance activities for operations with a potential for draining the reactor vessel (OPDRVs), during the Unit 2 refueling outage. Inspectors verified that for all dates, all other TS requirements were met during OPDRVs with secondary containment inoperable. Documents reviewed are listed in the Attachment.

b. Findings

Description. During the Unit 2 refueling outage, the OPDRVs activities are listed below:

- March 21, 2017: 6 gallons per minute leakage for maintenance associated with the 2B recirculation pump seal rebuild
- March 23, 2017: 48 gallons per minute leakage for hydraulic control unit draining to support rod maintenance
- March 24, 2017: 65 gallons per minute leakage to close the excess flow check valve and cap the drain line
- March 27, 2017: 71.2 gallons per minute leakage to replace the low power range monitors and intermediate power range monitors

These activities took place without secondary containment being operable.

Enforcement. 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 March 21, 2017, March 23, 2017, March 24, 2017, and March 27, 2017, 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 3, and the licensee met the criteria established in the EGM prior to and during these activities, the NRC exercised enforcement discretion (Enforcement Action-17-123) for the dates of March 21, 2017, March 23, 2017, March 24, 2017, and March 27, 2017, 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. The inspectors observed that Brunswick has already submitted a license amendment request (BSEP 17-0060) on June 29, 2017 which was accepted for review by the NRC on July 18, 2017. The licensee entered this issue into the CAP as NCR 2110409.

4OA6 Meetings, Including Exit

On July 12, 2017, the resident inspectors presented the inspection results to Mr. Gideon and other members of the licensee's staff. The inspectors verified that no proprietary information was retained by the inspectors or documented in this report.

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 meet the criteria of the NRC Enforcement Policy, for being dispositioned as a non-cited violation.

- LCO 3.0.4 states, in part, when an LCO is not met, entry into a MODE or other specified condition in the applicability shall only be made when the associated ACTIONS to be entered permit continued operation in the MODE for an unlimited period of time.

Contrary to the above, on April 13, 2017, at 2347, the licensee changed modes on Unit 2 from Mode 4 to Mode 2 with the primary containment inoperable. Specifically, TS 3.6.1.1, Primary Containment, requires primary containment to be operable in Modes 1, 2, and 3, however, the reactor was taken to Mode 2 with the primary containment still aligned for venting. In this condition, the drywell ventilation makes the primary containment inoperable due to the drywell and the suppression chamber being in communication to each other. This condition is allowed for two hours before the required action to shutdown to Mode 4 is required. Since the required action is not permitted for continued operation, a violation of LCO 3.0.4 occurred. The cause of the event was the failure of operations personnel to initiate a tracking LCO for primary containment being inoperable in accordance with licensee procedure 00I-01.01, BNP Conduct of Operations Supplement. The licensee determined a tracking LCO should have been initiated to ensure the primary containment was restored to operable prior to entering Mode 2. As immediate corrective actions, the licensee restored containment to operable on April 14, 2017, at 0030, and the Shift Manager and Control Room Supervisor were removed from shift. Further, a remediation plan was developed and implemented to assess the Shift Manager and Control Room Supervisor for watch standing and reinstatement.

This finding is associated with the Barrier Integrity Cornerstone. Using IMC 0609, Appendix G, Shutdown Operations Significance Determination Process, Attachment 1, Exhibit 4, Barrier Integrity Screening Questions, the finding screened to Green because it did not degrade the ability to close or isolate the containment, it did not degrade the physical integrity of reactor containment, and it did not involve an actual reduction in function of hydrogen control. This issue was documented in the licensee's CAP as NCR 2116753.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

K. Allen	Director, Design Engineering
B. Bagwell	Environmental & Chemistry
A. Baker	Supervisor, Environmental & Chemistry
J. Berry	Supervisor, LOCT Training
A. Brittain	Director, Nuclear Plant Security
P. Brown	Manager, Nuclear Performance Improvement
B. Bryant	Manager, Nuclear Oversight
J. Bryant	Regulatory Affairs
R. Carpenter	Radiation Monitor Engineer
P. Dubrouillet	Director, Nuclear Engineering, Mechanical Systems
C. Dunsmore	Manager, Nuclear Outage
W. Gideon	Vice President
L. Grzeck	Manager, Nuclear Regulatory Affairs
J. Hicks	Manager, Nuclear Training
B. Houston	Manager, Nuclear Maintenance
J. Johnson	Manager, Nuclear Chemistry
K. Krueger	Manager, Nuclear Operations
J. McAdoo	Manager, Nuclear Rad Protection
K. Moser	Plant Manager
B. Murray	Licensing
J. Nolin	General Manager, Nuclear Engineering
W. Orlando	Superintendent, E/I&C
O. Paladiy	Welding Engineer/Repair & Replacement Engineer
A. Padleckas	Assistant Ops Manager, Training
D. Petrusic	Superintendent, Environmental & Chemistry
J. Pierce	Manager, Nuclear Work Management
E. Rau	Operations Training
M. Regan	Project Manager, Major Projects
L. Rohrbaugh	Operator Training
M. Smiley	Manager, Nuclear Ops Training
L. Spencer	Operator Training
R. Wiemann	Director, Nuclear Engineering, Electrical Reactor Systems
E. Williams	Operations Manager
S. Williams	BWRVIP Program Engineer
C. Winslow	ISI Program Engineer
B. Wonton	Director, Nuclear Organizational Effectiveness

State of North Carolina

P. Cox	Department of Health and Human Services
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NRC Personnel

S. Rose	Chief, Reactor Projects Branch 4
P. Niebaum	Acting Chief, Reactor Projects Branch 4

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

05000324/2017-001-00	LER	Implementation of Enforcement Guidance Memorandum (EGM) 11-003, Revision 3 (Section 4OA3.1)
05000324/2017-002-00	LER	Plant Mode Change with Primary Containment Inoperable (Section 4OA3.2)
05000325;324/2016-006-01	LER	Control Room AC Units Inoperable Due to Corroded Supports (Section 4OA3.3)
05000325;324/2017-002	LER	Foreign Material in Switch Results in Unplanned Automatic Start of Emergency Diesel Generators (Section 4OA3.4)

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

0AP-062, Seasonal Preparations, Rev. 6
AD-WC-ALL-0230, Seasonal Readiness, Rev. 0

Condition Report

2122700

Work Order

20147068

Section 1R04: Equipment Alignment

Procedures

2OP-18, Core Spray System Operating Procedure, Rev. 73
1OP-18, Core Spray System Operating Procedure, Rev. 61
AD-EG-ALL-1615, Cable Aging Management Program, Rev. 0
1OP-43, Service Water Operating Procedure, Rev. 128

Condition Report

2133573

Work Order

20010900

Drawings

D-02524, Reactor Building Core Spray System Piping Diagram Sheet 1, Rev. 43
D-25024, Reactor Building Core Spray System Piping Diagram Sheet 2, Rev. 39
D-20041, Service Water System Piping Diagram, Rev. 56

Section 1R05: Fire Protection

Procedures

2PFP-TB, Turbine Building Pre-Fire Plans, Rev. 31
2PFP-RB, Reactor Building PreFire Plans, Rev. 21
0PFP-DG, Diesel Generator Building PreFire Plan, Rev. 26

Section 1R06: Flood Protection

Procedure

EGR-NGGC-0512, Licensee Renewal Aging Management Activities, Rev. 8

Condition Report

2123053

Work Orders

20030212 20030213

Section 1R11: Licensed Operator Requalification Program and Licensed Operator PerformanceProcedures

LORX-037, NSW Header leak, RCIC steam line break with failure to isolate, Rev. 2
 0GP-01, Pre-startup Checklist, Rev. 192
 0GP-02, Approach to Criticality and Pressurization of the Reactor, Rev. 110
 0GP-03, Unit Startup and Synchronization, Rev. 84
 0GP-07, Preparations for Core Alterations, Rev. 63
 0GP-12, Power Changes, Rev. 78
 1PT-01.7, Heatup/Cooldown monitoring, Rev. 10
 0OI-01.01, BNP Conduct of Operations Supplement, Rev. 82
 0ENP-24.0, Reactor Engineering Guidelines, Rev. 67
 0AP-022, BNP Outage Risk Management, Rev. 56
 0ENP-24.13, Core Verification, Rev. 22

Section 1R12: Maintenance EffectivenessCondition Reports

2123476 2043067

Work Orders

20132630

Section 1R13: Maintenance Risk Assessment and Emergent Work ControlProcedures

AD-OP-ALL-0201, Protected Equipment, Rev. 04
 0AP-022, BNP Outage Risk Management, Rev. 56
 AD-WC-ALL-0250, Work Implementation and Completion, Rev. 04
 AD-WC-ALL-0410, Work Activity Integrated Risk Management, Rev. 03
 AD-WC-ALL-0200, Online Work Management, Rev. 08
 AD-OP-ALL-0201, Protected Equipment, Rev. 04
 AD-WC-ALL-0430, Outage Risk Review, Rev. 02
 0AP-025, BNP Integrated Scheduling, Rev. 56

Condition Report

2124169

Work Order

20072392

Miscellaneous

BNP Outage Risk Assessment
 BNP U2 Key Safety Function Daily Risk Assessment
 EOOS Risk Assessments
 BNP-PSA-041, BNP On-Line Equipment Out of Service Probabilistic Safety Assessment Model

Section 1R15: Operability Determinations and Functionality AssessmentsProcedures

AD-OP-ALL-0105, Operability Determinations and Functionality Assessments, Rev. 3

Condition Reports

2116753	2120738	2121027	2126899	2113446	2127691
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Work Orders

20163781	12086324
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Miscellaneous

PDO CR2120738

Section 1R18: Plant ModificationsProcedures

AD-EG-ALL-1137, Engineering Change Product Selection, Rev. 3

AD-EG-ALL-1138, Standard Design Process, Rev. 0

AD-EG-ALL-1132, Preparation and Control of Design Change Engineering Changes, Rev. 6

AD-EG-ALL-1117, Design Analyses and Calculations, Rev. 4

Condition Reports

2113446	2124497
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Miscellaneous

EC408181, RHR F047B motor replacement

Section 1R19: Post Maintenance TestingProcedures

OPT-02.3.2, Reactor Building to Suppression Chamber Vacuum Breaker and Valve Operability Test, Rev. 33

OPT-12.2B, No. 2 Diesel Generator Monthly Load Test, Rev. 109

Condition Reports

2124169	2116038	2113066	2113446	2131762	2130937
2131688					

Work Orders

20072392	20156990	20156298	20153997	20096176	13538781
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Miscellaneous

Calculation 0SWB-006 Rev 0

Apparent Cause Evaluation 211038

EC 296474, EDG Governor Replacement Modification

Section 1R20: Refueling and Other Outage ActivitiesProcedures

0GP-01, Pre-startup Checklist, Rev. 192

0GP-02, Approach to Criticality and Pressurization of the Reactor, Rev. 110

0GP-03, Unit Startup and Synchronization, Rev. 84

0GP-05, Unit Shutdown, Rev. 182

0GP-07, Preparations for Core Alterations, Rev. 63

0GP-12, Power Changes, Rev. 78

1PT-01.7, Heatup/Cooldown monitoring, Rev. 10

0OI-01.01, BNP Conduct of Operations Supplement, Rev. 82

0OI-01.06, Post Trip Review, Rev. 46

0MMM-015, Operation and Inspection of Cranes and Material Handling Equipment, Rev. 67

0ENP-24.0, Reactor Engineering Guidelines, Rev. 67
 0AP-022, BNP Outage Risk Management, Rev. 56
 0ENP-24.13, Core Verification, Rev. 22
 2SP-15-101, Unit 2 EGM 11-003 OPDRV Activities, Rev. 1

Condition Reports

2109110	2109091	2108800	2108718	2111148	2111542
2111474	2115107	2115089	2115088	2115035	2114985
2114833	2105377	2099005			

Work Orders

20074532	11904847	2158321
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Miscellaneous

Daily Outage Reports
 Daily Key Safety Function Status Sheets
 Daily Risk Profiles
 Crew Turnover Reports
 Fatigue Rule Management
 List of Operations with the Potential for Draining the Reactor Vessel (OPDRVs)
 Mode Change Checklists
 Progress Reporter Schedule
 Outage Risk Assessment
 NRC EGM 11-003, Rev. 3, Dispositioning Boiling Water Reactor Licensee Noncompliance with
 Technical Specification Containment Requirements during OPDRVs
 Operator Logs
 List of Outage Modifications
 Core Verification Videos

Section 1R22: Surveillance Testing

Procedures

OPT-80.1, Reactor Pressure Vessel ASME Section XI Pressure Test, Rev. 70
 0OI-02.3, Drywell Leakage Control, Rev.7
 2MST-RPS41R, RPS Logic System Functional Test, Rev. 24
 OPT-09.2, HPCI System Operability Test, Rev. 148

Section 1EP6: Drill Evaluation

Procedures

0OI-01.07, Notifications, Rev. 38
 2EOP-01-RSP, Reactor Scram Procedure, Rev. 16
 0PEP-02.1, Initial Emergency Actions, Rev. 53
 0PEP-02.1.1, Emergency Control – Notification of Unusual Event, Alert, Site Area Emergency,
 and General Emergency, Rev. 29
 LORX-037, NSW Header leak and RCIC steam line break with failure to isolate, Rev. 2

Section 4OA1: Performance Indicator Verification

Procedures

AD-LS-ALL-0004. Performance Indicators and Monthly Operating Report, Rev. 01

Miscellaneous

Operator Logs

NEI 99-02, Regulatory Assessment Performance Indicator Guideline, Rev. 7
 Brunswick Unit 1 PI Summary, April 1, 2016, through March 31, 2017
 Brunswick Unit 2 PI Summary, April 1, 2016, through March 31, 2017
 Monthly PI Reports, April 1, 2016, through March 31, 2017
 System Health Reports, April 1, 2016, through March 31, 2017
 Licensee Event Reports, April 1, 2016, through March 31, 2017

Section 40A2: Problem Identification and ResolutionProcedures

AD-HU-ALL-0001, Human Performance Program, Rev. 11
 AD-PI-ALL-0100, Corrective Action Program, Rev. 7
 AD-SY-ALL-0401, Fitness for Duty Program, Rev. 1
 AD-SY-ALL-0460, Managing Fatigue and Work Hour Limits, Rev. 1
 AD-SY-ALL-1000, Conduct of Security, Rev. 2
 AD-SY-ALL-0520, Security Training, Rev. 1
 SEC-NGGC-2141, Fitness for Duty Unscheduled Work Call Outs, Rev.11
 SEC-NGGC-2166, Security Access Controls, Rev. 15
 AD-PI-ALL-0101, Root Cause Evaluation, Rev. 4
 AD-PI-ALL-0102, Apparent Cause Evaluation, Rev. 4
 AD-PI-ALL-0103, Quick Cause Evaluation, Rev. 4
 AD-PI-ALL-0400, Operating Experience Program, Rev. 4

Condition Reports

2118029	2111095	2113981	2114013	2114985
2115269	2115331	2115577	2115822	2116631
2116753	2120423			

Miscellaneous

EC 266023
 Unit 2 Suppression Temperature Rising Trend

Section 40A3: Follow-up of EventsProcedures

AD-WC-ALL-0210, Work Request Initiation, Screening, Prioritization, and Classification, Rev. 7
 2SP-15-101, Unit 2 EGM 11-003 OPDRV Activities, Rev. 1
 00I-01.07, Notifications, Rev. 38

Condition Reports

2113799	2113800	2095663	2116753	2110409	2117033
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Work Orders

20132955	20068598	20160330
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Miscellaneous

LER 05000324/2017-001-00, Implementation of Enforcement Guidance Memorandum (EGM) 11-003, Revision 3
 LER 05000324/2017-002-00, Plant Mode Change with Primary Containment Inoperable
 LER 05000325;324/2016-006-01, Control Room AC Units Inoperable Due to Corroded Supports

Section 40A5: Other Activities

Procedures

2SP-15-10R, Unit 2 EGM 11-003 OPDRV Activities, Rev. 1

Condition Reports

2110409

Work Orders

Miscellaneous

LER 05000324/2017-001-00, Implementation of Enforcement Guidance Memorandum (EGM)
11-003, Revision 3

Section 40A7: Licensee Identified Violations

Procedures

Procedure 0OI-01.01, BNP Conduct of Operations Supplement, Rev. 82

Condition Reports

2116753

Miscellaneous Records

LER 05000324/2017-002-00, Plant Mode Change with Primary Containment