



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

July 31, 2015

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

**SUBJECT: BRUNSWICK STEAM ELECTRIC PLANT - NRC INTEGRATED INSPECTION  
REPORT NOS.: 05000325/2015002 AND 05000324/2015002**

Dear Mr. Gideon:

On June 30, 2015, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Brunswick Steam Electric Plant, Units 1 and 2. The enclosed integrated inspection report documents the inspection findings, which were discussed on July 16, 2015, with you and other members of your staff.

Three NRC-identified findings of very low safety significance (Green) were identified during this inspection. Two of these findings were determined to involve a violation of NRC requirements. The NRC is treating these findings as non-cited violations (NCVs) consistent with Section 2.3.2.a of the Enforcement Policy.

If you contest the violations or the significance of the violations, 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, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the Brunswick Steam Electric Plant.

If you disagree with the cross-cutting aspect assignment in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region II, and the NRC Resident Inspector at the Brunswick Steam Electric Plant.

In accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) 2.390 of the NRC's "Agency Rules of Practice and Procedure," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's Agencywide Document Access and Management System (ADAMS). ADAMS is accessible from the NRC Website 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, 324/2015002  
w/Attachment: Supplementary Information

cc: Distribution via ListServ

W. Gideon

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Letter to William R. Gideon from George Hopper dated July 31, 2015.

SUBJECT: BRUNSWICK STEAM ELECTRIC PLANT - NRC INTEGRATED INSPECTION  
REPORT NUMBERS: 05000325/2015002 AND 05000324/2015002

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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.: 05000325/2015002, 05000324/2015002

Licensee: Duke Energy Progress, Inc.

Facility: Brunswick Steam Electric Plant, Units 1 & 2

Location: Southport, NC

Dates: April 1, 2015 through June 30, 2015

Inspectors: M. Catts, Senior Resident Inspector  
M. Schwieg, Resident Inspector  
M. Orr, Resident Inspector (Acting)  
M. Riches, Resident Inspector, Harris

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

Enclosure

## SUMMARY OF FINDINGS

IR 05000325/2015002, 05000324/2015002; April 1, 2015, through June 30, 2015; Duke Energy Progress, Inc., Brunswick Steam Electric Plant, Units 1 and 2, Fire Protection, Operability Determinations and Functionality Assessments, and Post-Maintenance Testing.

The report covered a three-month period of inspection by resident inspectors. There were two NRC-identified violations and one NRC-identified finding 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.

### Cornerstone: Mitigating Systems

- Green. An NRC-identified Green non-cited violation (NCV) of License Condition 2.B.(6), Fire Protection Program, was identified for the licensee's failure to maintain the 3-hour fire seals in the Unit 2 cable access way. Specifically, three cables in the Unit 2 cable access way were not within continuously enclosed conduits, which failed to preserve the integrity of the 3-hour rated barrier. As corrective action, the licensee sealed all three penetrations with a qualified 3-hour seal. This issue was entered into the licensee's corrective action program (CAP) as nuclear condition report (NCR) 740606.

The inspectors determined that the licensee's failure to maintain the 3-hour penetration fire barrier conduits in the Unit 2 cable access way, as required by licensee specification 118-003, Selection and Installation of Fire Barrier and Pressure Boundary Penetration Seals, was a performance deficiency. The finding was more than minor because it was associated with the external factors attribute (i.e. fire) of the Mitigating Systems Cornerstone and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, this resulted in the failure of the three conduits to perform their function. The finding was screened using NRC IMC 0609, Appendix F, "Fire Protection Significance Determination Process," dated September 20, 2013, because the finding affected the ability to confine a fire. Using IMC 0609, Appendix F, Attachment 1, "Fire Protection SDP Phase 1 Worksheet," dated September 20, 2013, the finding was assigned to the Fire Confinement category because the degraded penetrations were located in a fire barrier that separated two fire areas. Proceeding to Task 1.3.1 of IMC 0609, Appendix F, Attachment 1, the inspectors determined the finding was of very low safety significance (Green) because safety significant equipment was located a sufficient distance from the degraded penetrations and the reactor's ability to reach and maintain a safe shutdown condition was not

impacted. The finding does not have a cross-cutting aspect since the performance deficiency is not indicative of current plant performance. (Section 1R05)

- Green. An NRC-identified Green NCV of 10 CFR Part 50, Appendix B, Criterion V, Instructions, Procedures, and Drawings, was identified for the licensee's failure to have an adequate procedure to perform maintenance on the 1B conventional service water (CSW) pump strainer. Specifically, between August 28, 2009, and May 11, 2015, licensee procedure MNT-NGGC-0009, Application of Protective Coatings, was not adequate to perform repairs on the 1B CSW pump strainer, which resulted in through-wall leaks on three occasions. As corrective actions, the licensee repaired the weld, recoated the inside of the affected strainer area with Belzona coating using qualified individuals, and updated procedure MNT-NGGC-0009. The licensee entered this issue into the CAP as NCR 747712.

The inspectors determined that the licensee's failure to have an adequate procedure to perform maintenance on the 1B CSW pump strainer was a performance deficiency. The finding was more than minor because if left uncorrected, it had the potential to lead to a more significant safety concern. Specifically, it could have led to a more significant failure of the 1B CSW pump strainer and the service water system. Using IMC 0609, Appendix A, issued June 19, 2012, the SDP for Findings At-Power, the inspectors determined the finding was of very low safety significance (Green) because the finding did not affect the design or qualification of a mitigating SSC, the finding did not represent a loss of system and/or function, the finding did not represent an actual loss of a function of a single train for greater than the TS allowed outage time, the finding did not represent an actual loss of a function of one or more non-TS trains of equipment, and did not screen as potentially risk-significant due to a seismic, flooding, or severe weather initiating event. The finding has a cross-cutting aspect in the area human performance associated with the documentation attribute because the licensee failed to create and maintain complete, accurate and up-to-date documentation to correct the 1B CSW pump strainer through-wall leak issue on three occasions. [H.7] (Section1R15)

- Green. An NRC-identified Green finding of licensee procedure CAP-NGGC-0205, Condition Evaluation and Corrective Action Process, was identified for the licensee's failure to perform an adequate extent of condition review for the 1C CSW pump strainer stop collar clearance issue. Specifically, between February 21, 2014, and April 8, 2015, the licensee failed to perform an adequate extent of condition to identify the 2C CSW pump strainer stop collar was also installed without being securely positioned. This resulted in the failure of the shear pin and inoperability of the 2C CSW strainer and pump. As corrective actions, the licensee replaced the shear pin securely and scheduled the replacement of the other CSW pump strainer shear pins at the earliest available work window. The licensee entered this issue into the CAP as NCR 742444.

The inspectors determined that the licensee's failure to perform an adequate extent of condition review for the 1C CSW pump strainer stop collar clearance issue, as required by licensee procedure CAP-NGGC-0205 was a performance deficiency. The finding was more than minor because it was associated with the equipment performance attribute of the Mitigating Systems Cornerstone and adversely affected the cornerstone objective to ensure the availability of systems that respond to initiating events to prevent

undesirable consequences. Specifically, this resulted in the failure of 2C CSW pump strainer shear pin, and inoperability of the 2C CSW strainer and pump. Using IMC 0609, Appendix A, issued June 19, 2012, the SDP for Findings At-Power, the inspectors determined the finding was of very low safety significance (Green) because the finding did not affect the design or qualification of a mitigating SSC, the finding did not represent a loss of system and/or function, the finding did not represent an actual loss of a function of a single train for greater than the TS allowed outage time, the finding did not represent an actual loss of a function of one or more non-TS trains of equipment, and did not screen as potentially risk-significant due to a seismic, flooding, or severe weather initiating event. The finding has a cross-cutting aspect in the area of problem identification and resolution associated with the evaluation attribute because the licensee failed to thoroughly evaluate issues to ensure that resolutions address causes and extent of conditions commensurate with their safety significance. Specifically, the licensee failed to evaluate the applicability of the stop collar clearance issue to the other strainers after the failure of the 1C CSW pump strainer shear pin. [P.2] (Section1R19)



## REPORT DETAILS

### Summary of Plant Status

Unit 1 began the inspection period at 100 percent rated thermal power (RTP). On May 29, 2015, the unit was down-powered to 70 percent for a scheduled control rod sequence exchange and returned to 100 percent RTP on May 31, 2015. On June 1, 2015, the unit was down-powered to 83 percent for a scheduled control rod pattern adjustment and returned to 100 percent RTP on June 2, 2015. On June 2, 2015, the unit was down-powered to 88 percent for a scheduled control rod pattern adjustment and returned to 100 percent RTP on June 3, 2015. 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 B222R1. On April 4, 2015, the unit was started up and returned to 100 percent RTP on April 18, 2015. On June 5, 2015, the unit was down-powered to 70 percent for a scheduled control rod sequence exchange and returned to 100 percent RTP on June 8, 2015. On June 8, 2015, the unit was down-powered to 71 percent for a scheduled control rod improvement and returned to 100 percent RTP on June 9, 2015. The unit 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

##### .1 Impending Adverse Weather Conditions (71111.01 – 1 sample)

###### a. Inspection Scope

The inspectors reviewed the licensee's preparations to protect risk-significant systems from Tropical Storm Ana from May 8 - 10, 2015. The inspectors evaluated the licensee's implementation of adverse weather preparation procedures and compensatory measures, including operator staffing, before the onset of and during the tropical storm conditions. The inspectors reviewed the licensee's plans to address the ramifications of potential sustained high winds, continual rainfall or flash flooding conditions. The inspectors verified that operator actions specified in the licensee's adverse weather procedure maintain readiness of essential systems. The inspectors verified that required surveillances were current, or were scheduled and completed, if practical, before the onset of anticipated adverse weather conditions. The inspectors also verified that the licensee implemented periodic equipment walkdowns or other measures to ensure that the condition of plant equipment met operability requirements. Lastly, the inspectors toured the switchyard and walked down other outside protected areas to verify the licensee removed or properly secured any potential tornado missile hazards. Documents reviewed are listed in the Attachment.

###### b. Findings

No findings were identified.

.2 (Grid Reliability) Readiness of Offsite and Alternate Alternating Current (AC) Power Systems (71111.01 – 1 sample)

a. Inspection Scope

The licensee did not implement equipment or procedure changes that potentially affect operation or reliability of offsite and alternate AC power systems since the last time the inspectors assessed grid reliability. The inspectors reviewed the material condition of offsite and onsite alternate AC power systems (including switchyard and transformers) by performing a walkdown of the switchyard. The inspectors reviewed outstanding work orders (WOs) and assessed corrective actions for degraded conditions that impacted plant risk or required compensatory actions. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

.3 Seasonal Extreme Weather Conditions (71111.01 – 1 sample)

a. Inspection Scope

The inspectors conducted a detailed review of the station's adverse weather procedures written for extreme high temperatures and extended hot weather concerns. 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 and during seasonal hot weather conditions. Documents reviewed are listed in the Attachment.

The inspectors evaluated the following risk-significant systems:

- EDG ventilation and air conditioning
- Service water (SW)
- Technical Support Center and Emergency Operations Facility ventilation and air conditioning

b. Findings

No findings were identified.

## 1R04 Equipment Alignment

### .1 Partial 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, 1B residual heat removal service water (RHRSW) pump with the 1A RHRSW pump out of service on June 3, 2015
- Units 1 and 2, 125/250 V direct current system on June 10, 2015
- Units 1 and 2, EDG 1 with EDG 2 out of service on June 10, 2015
- Unit 2, Reactor core isolation cooling with high pressure coolant injection out of service on June 16, 2015

#### b. Findings

No findings were identified.

### .2 Complete Walkdown (71111.04S – 1 sample)

#### a. Inspection Scope

The inspectors verified the alignment of the Unit 2 standby liquid control (SLC) System. The inspectors selected this system for assessment because it is a risk-significant mitigating system. The inspectors determined the correct system lineup by reviewing plant procedures, drawings, the updated final safety analysis report, and other documents. The inspectors reviewed records related to the system's outstanding design issues, maintenance work requests, and deficiencies. The inspectors verified that the selected system was correctly aligned by performing a complete walkdown of accessible components.

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.

To verify the licensee was identifying and resolving equipment alignment discrepancies, the inspectors reviewed corrective action documents, including condition reports and outstanding WOs. The inspectors also reviewed periodic reports containing information on the status of risk-significant systems, including maintenance rule reports and system health reports. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

1R05 Fire Protection

.1 Quarterly 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.

- 0PFP-CB-2, 6, 9, and 10, Control Building, 23-foot Elevation
- 0PFP-DG-01, Diesel Generator Building Basement, 2-foot Elevation
- 0PFP-DG-2, 3, 4, and 5, Diesel Generator Cells, 23-foot Elevation
- 2PFP-RB2-1h, Unit 2, Reactor Building, 50-foot Elevation
- 2PFP-RB-2-1j and 1k, Unit 2 Reactor Building, 80-foot Elevation

b. Findings

Degraded Fire Barrier Seals in the Unit 2 Cable Access Way

Introduction: An NRC-identified Green NCV of License Condition 2.B.(6), Fire Protection Program, was identified for the licensee's failure to maintain the 3-hour fire seals in the Unit 2 cable access way. Specifically, three cables in the Unit 2 cable access way were

not within continuously enclosed conduits, which failed to preserve the integrity of the 3-hour rated barrier.

Description: On March 27, 2015, the inspectors performed a walkdown of the Unit 2 cable access way in the 23-foot elevation of the control building. The inspectors identified the cable associated with floor penetration 0-FP-CB-1-314-1 did not have a 3-hour fire barrier conduit or a penetration seal. The cables associated with floor penetrations 0-FP-CB-1-314-2 and 0-FP-CB-1-314-3 did not have a 3-hour fire barrier conduit and the penetration seals were degraded.

The inspectors reviewed Calculation 85-125-0-26-F, Control Building Cable Access Way Penetration Evaluation, which evaluated cables in conduit runs that begin in the turbine building cable tunnel, pass through the 23-foot elevation of the control building cable access way and exit into the cable spreading rooms or, continue to the 49-foot elevation of the cable access way and exit into the control room area. The calculation assumed that all cables in the cable access way are located within continuously enclosed conduits to preserve the integrity of the 3-hour rated fire barrier.

The inspectors reviewed licensee specification 118-003, Selection and Installation of Fire Barrier and Pressure Boundary Penetration Seals, Section 5.3, which discusses the requirements for internal conduit seals. The specification allowed either an open-ended conduit with a 3-hour fire seal or a continuously enclosed conduit. Section 5.3.4.1 states, "An open ended conduit which extends 5 feet or less from the face of the barrier is required to be sealed with a 3-hour rated fire seal." Section 5.3.6.1 states, in part, "Continuous, enclosed conduits do not require a 3-hour fire seal at the barrier." The inspectors determined that the three cables were not installed in continuously enclosed conduits, nor had 3-hour fire seals. After the inspectors' questions, the licensee wrote NCR 746606 and took action to seal all three penetrations with a qualified 3-hour fire seal per WO 13506878.

Analysis: The inspectors determined that the licensee's failure to maintain the 3-hour penetration fire barrier conduits in the Unit 2 cable access way, as required by licensee specification 118-003, was a performance deficiency. The finding was more than minor because it was associated with the external factors attribute (i.e., fire) of the Mitigating Systems Cornerstone and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, this resulted in the failure of the three conduits to perform their function. Using Inspection Manual Chapter 0609.04, "Phase 1-Initial Screening and Characterization of Findings," the finding was determined to require additional evaluation under Inspection Manual Chapter 0609, Appendix F, "Fire Protection Significance Determination Process," dated September 20, 2013, because the finding affected the ability to confine a fire. Using IMC 0609, Appendix F, Attachment 1, "Fire Protection SDP Phase 1 Worksheet," dated September 20, 2013, the finding was assigned to the Fire Confinement category because the degraded penetrations were located in a fire barrier that separated two fire areas. Proceeding to Task 1.3.1 of IMC 0609, Appendix F, Attachment 1, the inspectors determined the finding was of very low safety significance (Green) because safety- significant equipment was located a sufficient distance from the degraded penetrations and the reactor's ability

to reach and maintain a safe shutdown condition was not impacted. The finding does not have a cross-cutting aspect since the performance deficiency is not indicative of current plant performance.

Enforcement: License Condition 2.B.(6), Fire Protection Program, requires, in part, that the licensee shall implement and maintain in effect all provisions of the approved fire protection program. Calculation 85-125-0-26-F assumes that all of the cables in the cable access way are located within continuously enclosed conduits to preserve the integrity of the 3-hour rated barrier. Licensee specification 118-003, Selection and Installation of Fire Barrier and Pressure Boundary Penetration Seals, Section 5.3, allowed either an open-ended conduit with a 3-hour fire seal or a continuously enclosed conduit. Contrary to the above, from plant startup to April 6, 2015, the licensee failed to implement and maintain in effect all provisions of the approved fire protection program. Specifically, three cables in the Unit 2 cable access way were not installed in continuously enclosed conduits, nor had 3-hour fire seals, which failed to preserve the integrity of the 3-hour rated barrier. Because this finding is of very low safety significance and was entered into the licensee's CAP as NCR 740606, consistent with Section 2.3.2.a of the NRC's Enforcement Policy, this violation is being treated as a NCV: NCV 05000324/2015002-01, Degraded Fire Barrier Seals in the Unit 2 Cable Access Way.

.2 Annual Inspection (71111.05A – 1 sample)

a. Inspection Scope

The inspectors evaluated the licensee's fire brigade performance during a drill on May 8, 2015, and assessed the brigade's capability to meet fire protection licensing basis requirements. The inspectors observed the following aspects of fire brigade performance:

- capability of fire brigade members
- leadership ability of the brigade leader
- use of turnout gear and fire-fighting equipment
- team effectiveness
- compliance with site procedures

The inspectors also assessed the ability of control room operators to combat potential fires, including identifying the location of the fire, dispatching the fire brigade, and sounding alarms. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

## 1R06 Flood Protection Measures

### .1 Internal Flooding (71111.06 – 1 sample)

#### a. Inspection Scope

The inspectors reviewed related flood analysis documents and walked down the area listed below containing risk-significant structures, systems, and components susceptible to flooding. The inspectors verified that plant design features and plant procedures for flood mitigation were consistent with design requirements and internal flooding analysis assumptions. The inspectors also assessed the condition of flood protection barriers and drain systems. 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, South Residual Heat Removal Room

#### b. Findings

No findings were identified.

### .2 Underground Cables (71111.06 – 1 sample)

#### a. Inspection Scope

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
- Unit 2, Manhole 2-MH-2SE

#### b. Findings

No findings were identified.

1R11 Licensed Operator Requalification Program and Licensed Operator Performance

.1 Resident Inspector Quarterly Review of Licensed Operator Requalification (71111.11 - 1 sample)

a. Inspection Scope

On April 16, 2015, the inspectors observed a simulator scenario for the loss of offsite power conducted for training of an operating crew. 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 April 14, 2015, during a down-power of Unit 1 from 95 percent to 90.8 percent to perform a restart of 1B circulating water intake pump following a trip on low lube water flow. On April 4, 2015, the inspectors observed licensed operator performance in the main control room during the startup from the Unit 2 B222R1 refueling outage.

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 – 2 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.

- NRC Event Notification 49230, Part 21 Report, Deviation of ABB HK Circuit Breaker Close Latch Spring
- Reactor Protection System Limit Switches for the Main Steam Isolation Valves (MSIVs)

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 RMAs. 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 8, 2015, elevated risk condition for 2C CSW pump outage
- Unit 1, May 7, 2015, elevated risk condition for 1B CSW pump strainer leak and pump outage
- Units 1 and 2, May 8, 2015, elevated risk condition for Tropical Storm Ana
- Unit 1, May 27, 2015, elevated risk condition for 1A electrohydraulic control (EHC) pressure regulator failure

- Unit 1, June 1, 2015, 1A SLC pump out of service

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessments

.1 Operability 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 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 the 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.

- Units 1 and 2, EDG Incorrect Relay Model Installed in Governor Control Panel, April 16, 2015
- Unit 1, Core Spray North Sump Pump Non-Functional, April 22, 2015
- Unit 1, 1B CSW Pump Strainer Through-Wall Leak, May 7, 2015
- Units 1 and 2, EDG Basement Water Leaks, May 18, 2015
- Units 1 and 2, EDG Allen Bradley 700-RTC Relays for undeclared complex programmable logic devices for EDGs 1, 2 and 4, May 29, 2015
- Units 1 and 2, EDG 3 Exhaust Crack, June 23, 2015

b. Findings

Inadequate Procedure for the 1B Conventional Service Water Pump Strainer Repair

Introduction: An NRC-identified Green NCV of 10 CFR Part 50, Appendix B, Criterion V, Instructions, Procedures, and Drawings, was identified for the licensee's failure to have an adequate procedure to perform maintenance on the 1B CSW pump strainer. Specifically, between August 28, 2009, and May 11, 2015, licensee procedure MNT-NGGC-0009, Application of Protective Coatings, was not adequate to perform repairs on the 1B CSW pump strainer, which resulted in through-wall leaks on three occasions.

Description: On October 28, 2008, during ultrasonic testing of the 1B CSW pump strainer, two areas of localized wall thinning were identified in the area of the weld for instrument line 1-SW-V54. The licensee initiated NCR 303817, and determined the strainer was operable but degraded. On August 28, 2009, the licensee performed weld repairs to the outside of the strainer and installed Belzona coatings to the inside of the strainer under WO 1439816-01.

On June 23, 2010, the 1B CSW pump strainer developed a through-wall leak on the weld for instrument line 1-SW-V54. The licensee initiated NCR 406525. The cause of the through-wall leak was determined to be a lack of proper prepping of the surface area and application of the Belzona coating on August 28, 2009, due to relying on skill of the craft. This allowed water to get underneath the rubber Belzona coating and contact the carbon steel surface. The through-wall leak was a result of localized corrosion within the weld area from inside the strainer vessel. As corrective actions, the licensee performed a structural integrity evaluation and determined the area was structurally acceptable, repaired the through-wall leak under WO 1776265-01 on July 15, 2010, and conducted a training needs analysis for maintenance personnel on Belzona coating applications and application techniques. The licensee determined that no additional training was required. In 2011, a qualification guide (MEQ0062N) was created for Belzona coatings, and licensee procedure MNT-NGGC-0009, Application of Protective Coatings, was updated to include all the new coating qualification guides.

On October 5, 2014, the 1B CSW pump strainer again developed a pin hole through-wall leak on the weld for instrument line 1-SW-V54. The pump was stopped and subsequently restarted the next day. When the pump was restarted, the leakage worsened and a spray developed from the leak location. The pump was secured, declared inoperable due to the increased leakage, the licensee entered TS 3.7.2, Service Water System and Ultimate Heat Sink, to repair the strainer and initiated NCR 711625. The licensee determined the cause of the through-wall leak was the Belzona coating was not applied correctly in 2010. No training or qualification existed in 2010 when the 1B CSW pump strainer was last repaired and coated with Belzona. As corrective actions, the licensee performed a weld repair for the through-wall leak and recoated the area with Belzona coating under WO 13442338 on October 9, 2014. The licensee also created a qualification guide, and updated licensee procedure MNT-NGGC-0009 to ensure Belzona coatings were applied correctly on service water equipment, by qualified individuals.

On May 7, 2015, the 1B CSW pump strainer developed a through-wall weep on the weld for instrument line 1-SW-V54. During preparation for the ultrasonic test, a pin hole leak developed. The licensee declared the pump inoperable, entered TS 3.7.2, to repair the strainer, and initiated NCR 747712. As the area was cleaned and prepped for a weld repair, through-wall leaks were identified in three different areas. The exterior paint provided the only barrier against water leakage. The licensee performed a correct only evaluation, repaired the weld, and recoated the inside of the affected strainer area with Belzona coating under WO 13519970 on May 11, 2015.

The inspectors identified that the licensee did not perform a cause evaluation on the May 7, 2015, strainer failure to determine why the strainer had a through-wall leak in the same location for a third time, and therefore, no corrective actions were identified.

Due to the inspectors' questions, the licensee concluded that procedure MNT-NGGC-0009 did not have adequate directions for application of the Belzona coating, and there was no acceptance or inspection criteria defined to determine if the coating was applied appropriately. The licensee generated EC 99149, Service Level III, Non-Safety Related, Augmented Quality Process Requirements for Coatings Applied to Service Water Systems, to add this documentation to procedure MNT-NGGC-0009 via procedure revision request 756034. The licensee also provided to maintenance personnel additional communications to emphasize the importance of using procedure MNT-NGGC-0009 in Belzona applications and provided additional training on the process and procedure requirements. The licensee plans to replace this strainer shell with a new strainer shell that will be rubber lined at the manufacturer under reoccurring preventative maintenance task 726808 in August 2015.

Analysis: The inspectors determined that the licensee's failure to have an adequate procedure to perform maintenance on the 1B CSW pump strainer was a performance deficiency. The finding was more than minor because if left uncorrected, it had the potential to lead to a more significant safety concern. Specifically, it could have led to a more significant failure of the 1B CSW pump strainer and the service water system. Using IMC 0609, Appendix A, issued June 19, 2012, the SDP for Findings At-Power, the inspectors determined the finding was of very low safety significance (Green) because the finding did not affect the design or qualification of a mitigating SSC, the finding did not represent a loss of system and/or function, the finding did not represent an actual loss of a function of a single train for greater than the TS allowed outage time, the finding did not represent an actual loss of a function of one or more non-TS trains of equipment, and did not screen as potentially risk-significant due to a seismic, flooding, or severe weather initiating event. The finding has a cross-cutting aspect in the area human performance associated with the documentation attribute because the licensee failed to create and maintain complete, accurate and up-to-date documentation to correct the 1B CSW pump strainer through-wall leak issue on three occasions. [H.7]

Enforcement: Appendix B to 10 CFR Part 50, Criterion V, Instructions, Procedures, and Drawings, states, in part, activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings. Contrary to the above, between August 28, 2009, and May 11, 2015, licensee procedure MNT-NGGC-0009, Application of Protective Coatings, was not appropriate to the circumstances to perform repairs on the 1B CSW pump strainer, which resulted in through-wall leaks on three occasions. As corrective actions, the licensee repaired the weld, recoated the inside of the affected strainer area with Belzona coating using qualified individuals, and updated procedure MNT-NGGC-0009. Because this finding is of very low safety significance and was entered into the licensee's CAP as NCR 747712, consistent with Section 2.3.2.a of the NRC's Enforcement Policy, this violation is being treated as an NCV: NCV 05000325/2015002-02, Inadequate Procedure for the 1B Conventional Service Water Pump Strainer Repair.

.2 Operator Work-Around Review (71111.15 – 1 sample)

a. Inspection Scope

The inspectors performed a detailed review of the licensee's operator work-around, operator burden, and control room deficiency lists for the station in effect on June 29, 2015, to verify that the licensee identified operator workarounds at an appropriate threshold and entered them in the CAP. The inspectors verified that the licensee identified the full extent of issues, performed appropriate evaluations, and planned appropriate corrective actions. The inspectors also reviewed compensatory actions and their cumulative effects on plant operation. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

1R18 Plant Modifications (71111.18 – 2 samples)

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.

- EC 89578, Fukushima Response Project - Spent Fuel Pool Wide Range Level Indication – Unit 2
- EC 99915, Install Relay Surge Suppression [On EDG 2]

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 six 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.

- Units 1 and 2, WO 13501131, March 22, 2015, Main Stack Radiation Monitor Sample Pump Loss of Flow
- Units 1 and 2, WO 13502384, March 23, 2015, EDG 3 RCR Relay Suppressive Diode Installation
- Unit 2, WO 13503239, April 3, 2015, Division II Pressure Regulator 2-RNA-PCV-5247 Replacement
- Unit 2, WO 13509326, April 8, 2015, 2C CSW Pump Strainer Shear Pin Failure
- Unit 2, WO 2299262, April 8, 2015, HPCI Steam Admission Valve 2-E41-F001 Replacement
- Unit 2, WO 13509700, April 10, 2015, 2C RHRSW Booster Pump Motor Oil Leak

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

.1 Failure to Perform an Adequate Extent of Condition Review for the 1C Conventional Service Water Pump Strainer

Introduction: An NRC-identified Green finding of licensee procedure CAP-NGGC-0205, Condition Evaluation and Corrective Action Process, was identified for the licensee's failure to perform an adequate extent of condition review for the 1C CSW pump strainer stop collar clearance issue. Specifically, between February 21, 2014, and April 8, 2015, the licensee failed to perform an adequate extent of condition to identify the 2C CSW pump strainer stop collar was also installed without being securely positioned. This resulted in the failure of the shear pin and inoperability of the 2C CSW strainer and pump.

Description: On April 8, 2015, the 2C CSW pump strainer shear pin failed, which resulted in the strainer not rotating, and entry into TS 3.7.2 for the 2C CSW pump being inoperable. The licensee repaired the strainer using licensee procedure OPM-STR500, R.P. Adams Self-Cleaning Strainers, Models VWS 10 Through 40.

The inspectors determined a similar failure occurred on February 13, 2014, when the 1C CSW pump strainer shear pin failed, as documented in NCR 668564. The licensee performed a quick cause evaluation and determined the cause of the February 2014 strainer shear pin failure was the inadequate dimpling process, which allowed a gap to exist between the collar and the motor. This allowed the collar to come loose from the shaft and slide down, which resulted in an immediate failure. This was due to inadequate procedural guidance in procedure OPM-STR500, which allowed the stop collar to be installed with a 1/8-inch clearance between the stop collar and the gear motor housing. However, Vendor Instruction Manual FP-20234, R.P. Adams CO., INC., Strainers, Poro-Edge Automatic, Maintenance Section, states, ensure that the stop collar is securely positioned against the underside of the gear motor. The corrective actions were to revise procedure OPM-STR500 in accordance with the vendor manual and to reinstall the stop collar securely in accordance with the vendor manual.

The licensee performed an extent of condition review for the quick cause evaluation in NCR 668564, which stated, the as-found condition is only applicable to the 1C CSW pump strainer; however, by design, the potential exists for each of the service water strainer shear pins to fail. All of the service water strainers were inspected at time of discovery with no additional shear pin issues identified. The inspectors determined the licensee only performed a visual inspection of the shear pins to determine if any were currently failed. The licensee identified no corrective actions for the other strainers in NCR 668564.

The inspectors reviewed licensee procedure CAP-NGGC-0205, section 3.0, Definitions, Definition 21, which defines quick cause evaluation, in part, as an evaluation conducted to understand the extent of condition, likely cause, and develop appropriate corrective actions. Since the condition was determined to be a gap between the stop collar and gear motor housing, the inspectors determined that the extent of condition inspection should have determined if this gap also existed on the other strainers, and not just if the shear pins were intact. The inspectors determined the licensee did not perform an adequate extent of condition inspection and did not identify and correct the shear pin gap issue on the 2C CSW pump, which resulted in the failure of the shear pin.

After the inspectors' questions, the licensee performed a quick cause evaluation for the 2C CSW pump shear pin failure. The licensee determined the cause of the strainer shear pin failure was that the strainer stop collar was not installed securely, which allowed vertical movement in the strainer motor shaft and abnormal wear on the pin. This issue was documented in NCR 742444. The licensee corrective actions included expediting maintenance to fix the stop collar gap on the remaining strainers, including the 1A CSW pump, 2A CSW pump, 1B nuclear SW pump, and the 2A nuclear SW pump.

Analysis: The inspectors determined that the licensee's failure to perform an adequate extent of condition review for the 1C CSW pump strainer stop collar clearance issue, as required by licensee procedure CAP-NGGC-0205 was a performance deficiency. The finding was more than minor because it was associated with the equipment performance attribute of the Mitigating Systems Cornerstone and adversely affected the cornerstone objective to ensure the availability of systems that respond to initiating events to prevent

undesirable consequences. Specifically, this resulted in the failure of 2C CSW pump strainer shear pin, and inoperability of the 2C CSW strainer and pump. Using IMC 0609, Appendix A, issued June 19, 2012, the SDP for Findings At-Power, the inspectors determined the finding was of very low safety significance (Green) because the finding did not affect the design or qualification of a mitigating SSC, the finding did not represent a loss of system and/or function, the finding did not represent an actual loss of a function of a single train for greater than the TS allowed outage time, the finding did not represent an actual loss of a function of one or more non-TS trains of equipment, and did not screen as potentially risk-significant due to a seismic, flooding, or severe weather initiating event. The finding has a cross-cutting aspect in the area of problem identification and resolution associated with the evaluation attribute because the licensee failed to thoroughly evaluate issues to ensure that resolutions address causes and extent of conditions commensurate with their safety significance. Specifically, the licensee failed to evaluate the applicability of the stop collar clearance issue to the other strainers after the failure of the 1C CSW pump strainer shear pin. [P.2]

Enforcement: This finding does not involve enforcement action because no violation of a regulatory requirement was identified since the licensee failed to follow their procedure CAP-NGGC-0205, Condition Evaluation and Corrective Action Process. The licensee entered this issue into the CAP as NCR 742444. Because this finding does not involve a violation and is of very low safety or security significance, it is identified as FIN: FIN 05000324/2015002-03, Failure to Perform an Adequate Extent of Condition Review for the 1C Conventional Service Water Pump Strainer.

.2 (Opened) Unresolved Item (URI) 05000324/2015002-05, 2C Residual Heat Removal Service Water Pump Oil Leak

Introduction: The inspectors opened a URI to review the licensee's evaluation of the motor oil leak on the 2C RHRSW pump and determine if there is a performance deficiency.

Description: On April 8, 2015, the licensee identified an oil leak on the motor for the 2C RHRSW pump in excess of the amount that would be acceptable for the pump to meet the 30-day mission time, and the pump was declared inoperable. The licensee's immediate corrective actions were to apply sealant to the mechanical joints of the bearing housings. The licensee entered this issue in the CAP as NCR 742643. This issue is being tracked as a URI: URI 05000324/2015002-04, 2C Residual Heat Removal Service Water Pump Oil Leak.

1R20 Refueling and Other Outage Activities (71111.20 – 1 sample)

a. Inspection Scope

Unit 2 began the inspection period in refueling outage B222R1. The inspectors reviewed outage plans and contingency plans for the Unit 2 refueling outage 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 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.

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 – 4 samples)

- Unit 1, 1OP-19, High Pressure Coolant Injection System Operating Procedure, February 20, 2015
- Unit 2, 2MST-RPS22HR, Reactor Protection System Outboard Main Steam Line Isolation Valve B21-F028D Closure Channel Calibration, February 26, 2015
- Unit 2, 0PT-08.1.4a, RHRSW System Operability Test – Loop A, March 15, 2015
- Units 1 and 2, 0PT-12.2A, No. 1 Diesel Generator Monthly Load Test, April 3, 2015

Containment Isolation Valve (71111.22 – 1 sample)

- Unit 2, 0PT-20.3A.5, MSIV Leak Test, March 10, 2015

In-Service Tests (IST) (71111.22 – 1 sample)

- Unit 1, 0ENP-16.1, Inservice Test Pump and Valve Data, June 8, 2015

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

- Unit 1, 1OI-03.1, Reactor Operator Daily Surveillance Report, June 15, 2015

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 April 16, 2015. The inspectors observed licensee activities in the simulator and/or 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 – 6 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 April 1, 2014, through March 31, 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

- Safety System Functional Failures
- Emergency AC Power Systems
- Cooling Water Systems

###### 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 condition reports, attended screening meetings, or accessed the licensee's computerized corrective action database.

###### .2 Semi-Annual Trend Review (71152 – 1 sample)

###### a. Inspection Scope

The inspectors reviewed issues entered in the licensee's CAP and associated documents to identify trends that could indicate the existence of a more significant safety issue. The inspectors focused their review on repetitive equipment issues, extent of condition evaluations, and cause evaluations, 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, 2015, through June 30, 2015, 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 and Observations

No findings were identified.

The inspectors evaluated a sample of condition reports generated over the course of the past two quarters by departments that provide input to the quarterly trend reports. The inspectors determined that, in most cases, the issues were appropriately evaluated by licensee staff for potential trends and resolved within the scope of the corrective action program. However, the inspectors noted on the following three occasions that operations personnel did not follow procedures due to an issue being of short duration, even though this is not allowed by the procedure:

- Failure to classify the following two examples as operator workarounds:
  - Unit 2 SLC tank level indicator clogged as discussed in FIN 05000324; 05000325/2014004-04, Failure to Correct SLC Tank Level Indication Degradation.
  - Drywell air temperature resistance temperature detector 2-CAC-TE-1258-17 failed low as described in NCR 747336.
- Failure to protect the 1B SLC subsystem during the 1A SLC subsystem outage as described in NCR 752032.

The inspectors considered that, while not a violation of regulatory requirements, this was an opportunity to identify a trend in the use of procedures by operations personnel. The licensee entered this issue into the CAP as NCR 758709.

4OA6 Meetings, Including Exit

On July 16, 2015, the resident inspectors presented the inspection results to Mr. William R. 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.

ATTACHMENT: SUPPLEMENTARY INFORMATION

## **SUPPLEMENTARY INFORMATION**

### **KEY POINTS OF CONTACT**

#### Licensee Personnel

W. Gideon	Vice President
J. Krakuszeski	Plant Manager
K. Allen	Director, Design Engineering
A. Brittain	Director, Nuclear Plant Security
J. Bryant	Senior Nuclear Engineer
K. Crocker	Manager, Nuclear Emergency Preparedness
M. Goddard	Program Manager, Fire Protection
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
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
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### LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

<u>Opened and Closed</u>		
05000324/2015002-01	NCV	Degraded Fire Barrier Seals in the Unit 2 Cable Access Way (Section 1R05.1)
05000325/2015002-02	NCV	Inadequate Procedure for the 1B Conventional Service Water Pump Strainer Repair (Section 1R15.1)
05000324/2015002-03	FIN	Failure to Perform an Adequate Extent of Condition Review for the 1C Conventional Service Water Pump Strainer (Section 1R19.1)
<u>Opened</u>		
05000324/2015002-04	URI	2C Residual Heat Removal Service Water (RHRSW) Pump Oil Leak (Section 1R19.2)

## 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**

0A1-68, Brunswick Nuclear Plant Response to Severe Weather Warnings, Rev. 47  
0AOP-13.0, Operation During Hurricane, Flood Conditions, Tornado, or Earthquake, Rev. 62  
0AOP-22.0, Grid Stability, Rev. 26  
0AOP-36.1, Loss of Any 4160V Buses or 480V E-Buses, Rev. 67  
0AP-062, Seasonal Preparations, Rev. 3  
0O1-01.03, Non-Routine Activities, Rev. 60  
0PEP-02.6, Severe Weather, Rev. 19  
0PEP-02.6.26, Activation and Operation of the Technical Support Center (TSC), Rev. 36  
0PEP-02.6.27, Activation and Operation of the Emergency Operations Facility (EOF), Rev. 37  
0PEP-02.6.30, Alternate Emergency Facility Operation, Rev. 9  
0PLP-37, Equipment Important to Emergency Preparedness and Emergency Response Organization Response, Rev. 7  
1OP-43, Service Water System Operating Procedure, Rev. 121  
2OP-43, Service Water System Operating Procedure, Rev. 156  
AD-WC-ALL-0230, Seasonal Readiness, Rev. 0  
SORMC-NUC-050, Brunswick Plant Voltage Support & Coordination, Rev. 22

#### **Condition Reports**

725308	734113	742610	745170	745389	746651
747424	747580	749177	754299	754300	754301
755924					

#### **Drawings**

D-04101, Unit 1 and 2 Ventilation System Diesel Generator Building Air Flow Diagram, Rev. 13  
D-02537, Reactor Building Service Water System Piping Diagram, Sht. 1, Rev. 96  
D-20041, Service Water System Piping Diagram, Sht. 2, Rev. 56

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

#### **Procedures**

0OP-39, Diesel Generator Operating Procedure, Rev. 164  
1OP-43, Service Water System Operating Procedure, Rev. 121  
2OP-05, Standby Liquid Control, Rev. 66  
2OP-16, Reactor Core Isolation Cooling System Operating Procedure, Rev. 119  
2OP-51, DC Electrical System Operating Procedure, Rev. 79

Drawings

D-02265, Starting Air for Diesel Generators Piping Diagram, Rev. 25  
 D-02268, Fuel Oil to Diesel Generators Piping Diagram, Rev. 30  
 D-02270, Piping Diagram Diesel Generator Lube Oil System, Rev. 23  
 D-02272, Diesel Generator Jacket Water System Piping Diagram, Rev. 15  
 D-02274, Diesel Generator Service Water and Demineralized Water Systems Piping Diagram, Sht. 1 and Sht. 2, Rev. 25  
 D-02529, Reactor Building Reactor Core Isolation Cooling System Piping Diagram, Sht. 1, Rev. 60  
 D-02529, Reactor Building Reactor Core Isolation Cooling System Piping Diagram, Sht. 2, Rev. 44  
 D-02547, Reactor Building Standby Liquid Control System Piping Diagram, Rev. 31  
 F-03006, 125/250 VDC Switchboard 2A and 2B Single Line Unit 2

**Section 1R05: Fire Protection**Procedures

0FPP-60, Fire Drill Program, Rev. 0  
 0PFP-013, General Fire Plan, Rev. 45  
 0PFP-CB, Control Building Prefire Plan, Rev. 11  
 0PFP-DG, Diesel Generator Building Prefire Plans, Rev. 15  
 0PFP-MBPA, Miscellaneous Buildings Prefire Plans – Protected Area, Rev. 24  
 0PT-34.6.7.8, Fire Barrier Penetration Seals Control Building, Rev. 22  
 2PFP-RB, Reactor Building Prefire Plans, Rev. 16  
 AD-EG-ALL-1520, Transient Combustible Control, Rev. 3

Condition Reports

740606

Work Orders

2118878

Miscellaneous

Calculation 85-125-0-26-F, Control Building Cable Access way Penetration Evaluation, Rev. 6  
 Specification 118-003, Selection and Installation of Fire Barrier and Pressure Boundary Penetration Seals, Rev. 9  
 Engineering Change 100104, Control Building Penetration Seals for Cable Access way Penetrations Missing Internal Conduit Seals, Rev. 0  
 Fire Drill Scenario Guide Template for 15-F-MW-01, Fire in 4L Switchgear

**Section 1R06: Flood Protection Measures**Procedures

EGR-NGGC-0351, Condition Monitoring of Structures, Rev. 22  
 0-AOP-13.0, Operation during Hurricane, Flood Conditions, Tornado, or Earthquake, Rev. 62  
 BNP VOL-VI, 0EOP-03-SCCP, Secondary Containment Control, Rev. 9



Condition Reports

746183	740594	740487	755421
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Work Orders

37248
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Drawings

F-03343, East Yard Area – Units No. 1&2 Electrical Underground Duct Runs Plan, Sheet 1,  
Rev. 30

D-02780, Reactor Building Floor and Wall Sleeves Plan, Rev. 17

Miscellaneous

Calculation 7163-M-8, BSEP RB Flooding Assessment dated 1/14/86

Calculation 500M-M-03, BSEP RB Flooding Assessment due to a HELB, Rev. 3

DBD-144, External and Internal Flooding Topical Design Basis Document, Rev. 0

**Section 1R11: Licensed Operator Regualification**Procedures

0AOP-37.0, Loss of Condenser Vacuum, Rev. 38

1OP-29, Circulating Water System, Rev. 143

0GP-02, Approach to Criticality and Pressurization of the Reactor, Rev. 109

0GP-10, Rod Sequence Check-off Sheets, Rev. 43

Condition Reports

743543	743554
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Procedure Change Evaluation 100278, Rev. 0

Engineering Change 100278, 1B Circulating Water Intake Pump Trip on Low Lubricating Water  
Flow, Rev. 0

EP Training Drill Scenario, April 16, 2015

**Section 1R12: Maintenance Effectiveness**Procedures

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AD-PI-ALL-0100, Corrective Action Program, Rev. 2

AD-EG-ALL-1210, Maintenance Rule Program, Rev. 0

Condition Reports

621011	743010	647947	690815	735077
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Work Orders

13413628	13413627	13320156	13413626	13413625	13413624
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13413623	13361181	2216244	1776491	13413293	13413292
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1909368	13413291	13413290	13413289
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Miscellaneous

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

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Condition Reports

736639            752032

Work Orders

13495706

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 0AOP-36.1, Loss of Any 4160V Buses or 480V E-Buses, Rev. 68  
 0SP-EC79468, Integrated Testing of EDG3 Following Governor Replacement, Rev. 4  
 MNT-NGGC-0009, Application of Protective Coatings, Rev. 7

Condition Reports

747336	739129	746970	693645	744972	749527
750197	441801	545199	399667	738270	713742
748309	738272	751256	751262	751248	749702
750073	738272	743915	747712	711625	406525
747712	711625	303817	711625	747712	722633
726808	505704	406525			

Work Orders

2155527	13462141	13461988	1898252	13472346	13432946
13519047	1842184	11649704	11671207	13502387	13502385
13502386	1117548	13499886	13502313	1776265	13519970
13442338	438918	11645029	11670705	1842952	1439816

Drawings

F-09347, Diesel Generator No. 3 Circuits Control Wiring Diagrams, Sheets 1–2, Rev. 41 and 40  
 LL-09113, 4160 Volt Switchgear E3 Compartment AI5 Emergency Diesel Generator No. 3  
 Breaker Control Wiring Diagram, Sheet 12, Rev. 12  
 LL-09113, 4160 Volt Switchgear E3 Compartment AI5 Emergency Diesel Generator No. 3  
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 Engineering Change 99915, Install Relay Surge Suppression, Rev. 2  
 Event Notification 51030, Part 21, Potentially Unqualified Component in Certain Allen Bradley  
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EGR-NGGC-0005, Engineering Change, Rev. 40

REG-NGGC-0010, 10 CFR 50.59 and Selected Regulatory Reviews, Rev. 22

**Condition Reports**

702952	710272	725967	727839	735283	748309
738272	751256	751262	751248	749702	750073
738272					

**Work Orders**

13502387	13502385	13502386	1117548	13499886	13502313
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**Drawings**

F-09347, Diesel Generator No. 3 Circuits Control Wiring Diagrams, Sheets 1–2, Rev. 41 and 40

LL-09113, 4160 Volt Switchgear E3 Compartment AI5 Emergency Diesel Generator No. 3  
Breaker Control Wiring Diagram, Sheet 12, Rev. 12

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Breaker Control Wiring Diagram, Sheet 12A, Rev. 15

LL-09113, 4160 Volt Switchgear E3 Compartment AI5 Emergency Diesel Generator No. 3  
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Indication – BNP2

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Engineering Change 99915, Install Relay Surge Suppression, Rev. 2

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2PT-24.1-2, Service Water Pump and Discharge Valve Operability Test, Rev. 76

0PT-09.2, High Pressure Coolant Injection System Operability Test, Rev. 145

0PT-09.7, High Pressure Coolant Injection System Valve Operability Test, Rev. 32

0PT-20.8, Nitrogen Backup System Operability Test, Rev. 32

0PT-02.3.2, Reactor Building to Suppression Chamber Vacuum Breaker and Valve Operability  
Test, Rev. 32

Condition Reports

742444	742999	752230	739260	739260	668564
291690	748309	738272	751256	751262	751248
749702	750073	738272	680499	740063	742643
749109	742999				

Work Orders

13509326	13509700	2299262	378305	13501131	13307898
13401365	2274769	13400350	13502387	13502385	13502386
1117548	13499886	13502313	13503239	2233780	11664694
2226830	13502387				

Drawings

F-09347, Diesel Generator No. 3 Circuits Control Wiring Diagrams, Sheets 1 – 2, Rev. 41 and 40

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LL-09113, 4160 Volt Switchgear E3 Compartment AI5 Emergency Diesel Generator No. 3 Breaker Control Wiring Diagram, Sheet 12A, Rev. 15

LL-09113, 4160 Volt Switchgear E3 Compartment AI5 Emergency Diesel Generator No. 3 Breaker Control Wiring Diagram, Sheet 13B, Rev. 17

D-73068, Reactor Building Instrument Air Supply Nitrogen Backup Piping Diagram, Rev. 14

D-70007, Reactor Building Instrument Air Supply System Piping Diagram, Rev. 29

D-70029, Reactor Building Instrument Air Supply System Piping Diagram, Rev. 38

Miscellaneous

0PM-STR500, R.P. Adams Self-Cleaning Strainers, Models VWS 10 Through 40, Rev. 30

FP-20234, R.P. Adams CO., INC, Strainers, Poro-Edge Automatic, Rev. N

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Engineering Change 99915, Install Relay Surge Suppression, Rev. 2

Event Notification 57095, Allen Bradley 700RTC Relay Configuration, May 26, 2015

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**Section 1R20: Refueling or Forced Outage**Procedures

0GP-01, Prestartup Checklist, Rev. 188

0GP-02, Approach to Criticality and Pressurization of the Reactor, Rev. 109

0GP-03, Unit Startup and Synchronization, Rev. 83

0GP-10, Rod Sequence Check-off Sheets, Rev. 43

0GP-12, Power Changes, Rev. 78

0MMM-015, Operation and Inspection of Cranes and Material Handling Equipment, Rev. 62

0PM-CRN002, Overhead Crane Checkout, Rev. 14

0SMP-RPV502, Reactor Vessel Reassembly, Rev. 34

0PT-80.1, Reactor Pressure Vessel ASME Section XI Pressure Test, Rev. 69

OPT-14.1A, Control Rod Coupling Check and CRD Testing, Rev. 45  
 OPT-14.2.1, Single Rod Scram Insertion Times Test, Rev. 73  
 AI-127, Primary Containment Inspection and Closeout, Rev. 39  
 1PT-01.7, Heatup/Cooldown monitoring, Rev. 9  
 2SP-15-101, Unit 2 EGM 11-03 OPDRV Activities, Rev. 0  
 OOI-01.01, BNP Conduct of Operations Supplement, Rev. 73  
 0ENP-24.0, Reactor Engineering Guidelines, Rev. 61

#### Condition Reports

735945	736034	736638	735497	735667	735400
735349	735291	734963	735047	735082	735086
735133	735124	734292	734222	733934	733866
730272	7239800				

#### Work Orders

2233959	2233799	1742557	2233816
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#### Miscellaneous

Unit 2 B222R1 System Outage Windows, February – April 2015  
 Fatigue Management Exceptions, January –April, 2015  
 B222R1 Outage Report, April 2015  
 Key Safety Function Plan, February – April 2015  
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### **Section 1R22: Surveillance Testing**

#### Procedures

0CM-VCK512, Anchor Darling Swing Check Valves, Rev. 24  
 0CM-VGB501, Rebuild of the R.A. Hiller SA-A075 Actuator on the Rockwell Figure 1612 Globe Stop Valve, Rev. 18  
 0ENP-16.1, Inservice Test Pump and Valve Data, Rev. 32  
 0ENP-16.4, Use of Leak Test Equipment, Rev. 23  
 0OP-47, Floor and Equipment Drain System Operating Procedure, Rev. 27  
 0PDM-VCK513, Check Valve Predictive Maintenance, Rev. 13  
 0PT-08.1.4a, RHRSW System Operability Test – Loop A, Rev. 82  
 0PT-12.2A, No. 1 Diesel Generator Monthly Load Test, Rev. 109  
 0PT-20.3A.5, Main Steam Isolation Valve Leak Test, Rev. 10  
 0PT-40.2.7, Testing of Main Steam Isolation Valves after Maintenance, Rev. 13  
 1OI-03.1, Reactor Operator Daily Surveillance Report, Rev. 124  
 1OP-19, High Pressure Coolant Injection System Operating Procedure, Rev. 93  
 1OP-21, Reactor Building Closed Cooling Water System Operating Procedure, Rev. 70  
 2MST-RPS22HR, Reactor Protection System Outboard Main Steam Line Isolation Valve B21-F028D Closure Channel Calibration, Rev. 7

Condition Reports

647947	690815	735077	738146	530489	732624
748749	707742	735322	456421	713276	592035
582572	713387				

Work Orders

13413628	13413627	13320156	13413626	13413625	13413624
13413623	13361181	2216244	1776491	13413293	13413292
1909368	13413291	13413290	13413289	13491853	1949840
859297	1582864				

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FP-50554, Valves, Main Steam Isolation, Rev. AA

1-FP-55013, Flite Flow, Balance Stop Valve, (B21-F002) Jimmy, Sheet 1, Rev. G

2-FP-55013, Rockwell International Mainsteam Isolation Valve, Sheet 2, Rev. C

0-FP-83460, 12" – 300# Flanged Ends Stainless Steel Swing Check Valve, Rev. A

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Inoperable due to Auxiliary Oil Pump Failure, April 10, 2015

System Description-43, Service Water System, Rev. 26

FP-61761, Valves and Operators, Rev. AC

Engineering Change 96785, Basis for OCM-VCK512 Revision to Seal Weld Disc Nut Pin, Rev. 0

**Section 1EP6: Drill Evaluation**Miscellaneous

EP Training Drill Scenario, April 16, 2015

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REG-NGGC-0009, NRC Performance Indicators and Monthly Operating Report Data, Rev. 14

Condition Reports

731656	717634	711994	754504
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MiscellaneousOperator Logs

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Brunswick Unit 2 PI Summary, April 2014 – March 2015

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

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AD-PI-ALL-0103, Quick Cause Evaluation, Revision 1

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**Condition Reports**

680499	740063	735540	740606	752032	747712
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742444	735322	747336	746970
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**Work Orders**

11670241

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