



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

July 27, 2011

Mr. Michael Annacone
Vice President
Carolina Power and Light Company
Brunswick Steam Electric Plant
P. O. Box 10429
Southport, North Carolina 28461

**SUBJECT: BRUNSWICK STEAM ELECTRIC PLANT - NRC INTEGRATED INSPECTION
REPORT NOS.: 05000325/2011003, 05000324/2011003, 05000325/2011501
AND 05000324/2011501**

Dear Mr. Annacone:

On June 30, 2011, 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 25, 2011, with Mr. Edward Wills and other members of your staff.

The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

The report documents one NRC-identified finding of very low safety significance (Green) which was determined to be a violation of NRC requirements. Additionally, a licensee-identified violation which was determined to be of very low safety significance is listed in this report. However, because of the very low safety significance and because it was entered into your corrective action program, the NRC is treating the finding as a non-cited violation (NCV) consistent with Section 2.3.2.a of the NRC Enforcement Policy. If you contest the NCV, 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. In addition, if you disagree with the cross-cutting aspect of any finding 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 Senior Resident Inspector at the Brunswick Steam Electric Plant. The information you provide will be considered in accordance with Inspection Manual Chapter 0305.

In accordance with 10 CFR 2.390 of the NRC's Rules of Practice, a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

/RA/

Randall A. Musser, Chief
Reactor Projects Branch 4
Division of Reactor Projects

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

Enclosure: Inspection Report 05000325/2011003, 05000324/2011003, 05000325/2011501,
05000324/2011501
w/Attachment: Supplemental Information

cc w/encl: (See page 3)

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Letter to Michael J. Annacone from Randall A. Musser dated July 27, 2011

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AND 05000324/2011501

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U. S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket Nos.: 50-325, 50-324

License Nos.: DPR-71, DPR-62

Report Nos.: 05000325/2011003, 05000324/2011003, 05000325/2011501,
05000324/2011501

Licensee: Carolina Power and Light (CP&L)

Facility: Brunswick Steam Electric Plant, Units 1 & 2

Location: 8470 River Road, SE
Southport, NC 28461

Dates: April 1, 2011 through June 30, 2011

Inspectors: P. O'Bryan, Senior Resident Inspector
G. Kolcum, Resident Inspector
A. Minarik, Reactor Inspector
A. Nielsen, Sr. Health Physicist (Section 40A6)
M. Speck, Sr. Emergency Preparedness Inspector (Section 1EP2, 1EP3,
1EP4 & 1EP5)

Approved by: Randall A. Musser, Chief
Reactor Projects Branch 4
Division of Reactor Projects

Enclosure

SUMMARY OF FINDINGS

IR 05000325/2011003, 05000324/2011003, 05000325/2011501, 05000324/2011501; 04/01/11 - 06/30/11; Brunswick Steam Electric Plant, Units 1 & 2; Other Activities

This report covers a three-month period of inspection by resident inspectors. One Green finding was identified by the inspectors. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP). The cross-cutting aspects were determined using IMC 0310, "Components within the Cross Cutting Areas". Findings for which the SDP does not apply may be Green or be assigned a severity level after NRC management review.

A. NRC-Identified and Self-Revealing Findings

Cornerstone: Mitigating Systems

- Green. A self revealing non-cited violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action" was identified for failure to promptly correct a condition adverse to quality regarding a manufacturing defect of a Barton Model 199 dual dampener differential pressure unit (DPU) used in the 1B residual heat removal (RHR) loop. Specifically, the licensee failed to replace the DPU after the vendor determined that the manufacturing process was incorrect and could lead to a slow response of the component in safety-related applications. This led to a failure of the RHR system 1B loop minimum flow bypass valve, 1-E11-F007B, to operate on February 18, 2011. The failure of the defective DPU was tracked as NCR 448471 in the corrective action program, and the licensee replaced the defective DPU.

The inspectors determined that the licensee's failure to promptly correct a condition adverse to quality regarding a manufacturing defect for Barton Model 199 dual dampener DPUs was a performance deficiency. The finding is more than minor because it is associated with the equipment performance attribute of the Mitigating Systems Cornerstone and adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e. core damage). Specifically, the corrosion buildup in the DPU used in the control of the position of the minimum flow bypass valve for the 1B RHR loop had degraded, such that the availability and reliability of the 1B RHR loop was adversely affected. This finding was evaluated using Inspection Manual Chapter 0609, "Significance Determination Process," Phase 1 Worksheet for mitigating systems. The finding required phase two and phase three SDP analyses by a regional Senior Reactor Analyst (SRA) because the 1B loop of RHR was assumed to be inoperable for longer than its Technical Specifications (TS) allowed outage time. The SRA performed a phase three analysis using the NRC's site-specific risk model. Common cause factors were not propagated to the other loop of RHR during the modeling because of the prior instrument changes in the other loop. Operator recovery for the impact of the failed instrument was deemed to be credible, because the valve's hand switch remained functional, and was

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evaluated using the SPAR-H methodology. The short duration of non-functionality since the last known proper functioning of the instrument, combined with the high likelihood of operator recovery, and the lack of an increase in common cause failures resulted in a finding that is characterized as Green. This finding does not have a cross-cutting aspect because the performance deficiency occurred greater than three years ago and does not reflect current licensee performance. (Section 4OA5.4)

B. Licensee-Identified Violation

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

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REPORT DETAILS

Summary of Plant Status

Unit 1 began the inspection period at rated thermal power (RTP). Due to increasing identified drywell leakage beginning in early April, Unit 1 shut down to repair the leakage on May 14, 2011. The outage was exited on May 17, 2011, when Unit 1 entered Mode 2. Unit 1 synchronized the main generator to the grid on May 18, 2011, reached RTP on May 20, 2011, and operated at or near full power for the remainder of the inspection period.

Unit 2 began the inspection period in Mode 5, cold shutdown, due to a scheduled refueling outage. On April 13, 2011, the plant commenced startup and synchronized the main generator to the grid and reached approximately 50 percent RTP on April 17, 2011. On April 18 the unit was shut down to evaluate leakage inside of the primary containment. After repairs, the unit started up on April 20, 2011, and reached RTP on April 24, 2011. On June 15, 2011, unit power was lowered to 50 percent due to a seal failure on the 2A condensate booster pump. Condensate booster pump 2C was unavailable for maintenance. After repairs were made to the condensate booster pumps power was raised to 70 percent on June 17 for feed pump valve testing. Power was raised to 90 percent on June 18, 2011, and then lowered to 70 percent for a control rod improvement. Power returned to 100 percent on June 19. The Unit operated 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 Readiness of Offsite and Alternate AC Power Systems

a. Inspection Scope

The inspectors verified that plant features and procedures for operation and continued availability of offsite and alternate alternating current (AC) power systems during adverse weather were appropriate. The inspectors reviewed the licensee's procedures affecting these areas and the communications protocols between the transmission system operator (TSO) and the plant to verify that the appropriate information was being exchanged when issues arose that could impact the offsite power system. Examples of aspects considered in the inspectors' review included:

- The coordination between the TSO and the plant during off-normal or emergency events;
- The explanations for the events;
- The estimates of when the offsite power system would be returned to a normal state; and

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- The notifications from the TSO to the plant when the offsite power system was returned to normal.

The inspectors also verified that plant procedures addressed measures to monitor and maintain availability and reliability of both the offsite AC power system and the onsite alternate AC power system prior to or during adverse weather conditions. Specifically, the inspectors verified that the procedures addressed the following:

- The actions to be taken when notified by the TSO that the post-trip voltage of the offsite power system at the plant would not be acceptable to assure the continued operation of the safety-related loads without transferring to the onsite power supply;
- The compensatory actions identified to be performed if it would not be possible to predict the post-trip voltage at the plant for the current grid conditions;
- A re-assessment of plant risk based on maintenance activities which could affect grid reliability, or the ability of the transmission system to provide offsite power; and
- The communications between the plant and the TSO when changes at the plant could impact the transmission system, or when the capability of the transmission system to provide adequate offsite power was challenged.

The inspectors also reviewed corrective action program items to verify that the licensee was identifying adverse weather issues at an appropriate threshold and entering them into its corrective action program in accordance with station corrective action procedures.

b. Findings

No findings were identified.

.2 Summer and Hurricane Seasonal Readiness Preparations

a. Inspection Scope

The inspectors performed a review of the licensee's preparations for summer weather for selected systems, including conditions that could lead to an extended drought as a result of high temperatures.

During the inspection, the inspectors focused on plant-specific design features and the licensee's procedures used to mitigate or respond to adverse weather conditions. Additionally, the inspectors reviewed the Updated Final Safety Analysis Report (UFSAR) and performance requirements for systems selected for inspection, and verified that operator actions were appropriate as specified by plant specific procedures. The inspectors also reviewed corrective action program items to verify that the licensee was identifying adverse weather issues at an appropriate threshold and entering them into its corrective action program in accordance with station corrective action procedures. The inspectors' reviews focused specifically on the following plant systems:

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- Emergency Diesel Generators; and
- Service Water.

b. Findings

No findings were identified.

.3 Readiness for Impending Adverse Weather Condition

a. Inspection Scope

On April 5, 2011, a tornado watch and severe thunderstorm warning was issued for the plant area. Also, on April 27, 2011, a tornado watch was issued for the plant area. On each occasion (two inspection samples), inspectors reviewed the licensee's overall preparations for the impending adverse weather conditions. The inspectors walked down areas of the plant susceptible to high winds, including the licensee's emergency alternating current (AC) power systems. The inspectors evaluated the licensee staff's preparations against the site's procedures and determined that the staff's actions were adequate. During the inspection, the inspectors focused on plant-specific design features and the licensee's procedures used to respond to specified adverse weather conditions. The inspectors toured the plant grounds to look for any loose debris that could become missiles during a tornado. The inspectors also evaluated operator staffing and accessibility of controls and indications for those systems required to control the plant. Additionally, the inspectors reviewed the UFSAR and performance requirements for systems selected for inspection, and verified that operator actions were appropriate as specified by plant specific procedures. The inspectors also reviewed a sample of corrective action program items to verify that the licensee identified adverse weather issues at an appropriate threshold and dispositioned them through the corrective action program in accordance with station corrective action procedures.

b. Findings

No findings were identified.

1R04 Equipment Alignment

.1 Quarterly Partial System Walkdowns

a. Inspection Scope

The inspectors performed three partial system walkdowns of the following risk-significant systems:

- Emergency diesel generators 1, 2, and 3; and switchgear E3 and E7 with switchgear E4 and E8 out of service on April 3, 2011;

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- Unit 1 High Pressure Coolant Injection (single train system) on April 25, 2011; and
- Unit 2 High Pressure Coolant Injection (single train system) on April 25, 2011.

The inspectors selected these systems based on their risk significance relative to the reactor safety cornerstones at the time they were inspected. The inspectors attempted to identify any discrepancies that could impact the function of the system, and, therefore, potentially increase risk. The inspectors reviewed applicable operating procedures, system diagrams, UFSAR, TS requirements, outstanding work orders, condition reports, and the impact of ongoing work activities on redundant trains of equipment in order to identify conditions that could have rendered the systems incapable of performing their intended functions. The inspectors also walked down accessible portions of the systems to verify that system components and support equipment were aligned correctly and were operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no obvious deficiencies. The inspectors also verified that the licensee had properly identified and resolved equipment alignment problems that could cause initiating events or impact the capability of mitigating systems or barriers and entered them into the corrective action program with the appropriate significance characterization.

b. Findings

No findings were identified.

.2 Semi-Annual Complete System Walkdown

a. Inspection Scope

On May 12, 2011, the inspectors performed a complete system alignment inspection of the Reactor Water Cleanup System to verify the functional capability of the system. This system was selected because it was considered both safety-significant and risk-significant in the licensee's probabilistic risk assessment. The inspectors walked down the system to review mechanical and electrical equipment line-ups, electrical power availability, system pressure and temperature indications, as appropriate, component labeling, component lubrication, component and equipment cooling, hangers and supports, operability of support systems, and to ensure that ancillary equipment or debris did not interfere with equipment operation. A review of a sample of past and outstanding work orders (WOs) was performed to determine whether any deficiencies significantly affected the system function. In addition, the inspectors reviewed the corrective action program database to ensure that system equipment alignment problems were being identified and appropriately resolved.

b. Findings

No findings were identified.

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1R05 Fire Protection

.1 Quarterly Resident Inspector Tours

a. Inspection Scope

The inspectors conducted fire protection walkdowns (six samples) which were focused on availability, accessibility, and the condition of firefighting equipment in the following risk-significant plant areas:

- Makeup Water Treatment/Emergency Fire Pump Building, 0PFP-MWT;
- Unit 2 Drywell, 2PFP-RB2-7;
- Unit 2 North Core Spray Room -17' Elevation 2PFP-RB2-1b;
- Unit 2 North RHR Room -17' Elevation 2PFP-RB2-1c;
- Unit 1 Reactor Building South 20' Elevation 2PFP-RB2-1g N; and
- Unit 2 HPCI Room, 2PFP-RB2-2.

The inspectors reviewed areas to assess if the licensee had implemented a fire protection program that adequately controlled combustibles and ignition sources within the plant, effectively maintained fire detection and suppression capability, maintained passive fire protection features in good material condition, and had implemented adequate compensatory measures for out of service, degraded or inoperable fire protection equipment, systems, or features in accordance with the licensee's fire plan. The inspectors selected fire areas based on their overall contribution to internal fire risk as documented in the plant's Individual Plant Examination of External Events with later additional insights, their potential to impact equipment which could initiate or mitigate a plant transient, or their impact on the plant's ability to respond to a security event. The inspectors verified that fire hoses and extinguishers were in their designated locations and available for immediate use; that fire detectors and sprinklers were unobstructed; that transient material loading was within the analyzed limits; and that fire doors, dampers, and penetration seals appeared to be in satisfactory condition. The inspectors also verified that minor issues identified during the inspection were entered into the licensee's corrective action program.

b. Findings

No findings were identified.

.2 Annual Fire Protection Drill Observation

a. Inspection Scope

On June 25, 2011, the inspectors observed fire brigade performance during an unannounced fire drill. The observation was used to determine the readiness of the plant fire brigade to fight fires. The inspectors verified that the licensee staff identified

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deficiencies; openly discussed them in a self-critical manner at the drill debrief, and took appropriate corrective actions. Specific attributes evaluated were: (1) proper wearing of turnout gear and self-contained breathing apparatus; (2) proper use and layout of fire hoses; (3) employment of appropriate fire fighting techniques; (4) sufficient firefighting equipment brought to the scene; (5) effectiveness of fire brigade leader communications, command, and control; (6) search for victims and propagation of the fire into other plant areas; (7) smoke removal operations; (8) utilization of pre planned strategies; (9) adherence to the pre planned drill scenario; and (10) drill objectives.

b. Findings

No findings were identified.

1R06 Flood Protection Measures

.1 Review of Areas Susceptible To Internal Flooding

a. Inspection Scope

The inspectors reviewed selected risk-important plant design features and licensee procedures intended to protect the plant and its safety-related equipment from internal flooding events. The inspectors reviewed flood analyses and design documents, including the UFSAR, engineering calculations, and AOPs for licensee commitments. In addition, the inspectors reviewed licensee drawings to identify areas and equipment that may be affected by internal flooding caused by the failure or misalignment of nearby sources of water, such as the fire suppression or the circulating water systems. The inspectors also reviewed the licensee's corrective action documents with respect to past flood-related items identified in the corrective action program to verify the adequacy of the corrective actions. The inspectors performed a walkdown of the following plant areas to assess the adequacy of watertight doors and verify drains and sumps were clear of debris and were operable, and that the licensee complied with its commitments. The following areas constitute two inspection samples:

- Unit 1 Reactor Building
- Unit 2 Reactor Building

b. Findings

No findings were identified.

.2 Annual Review of Cables Located in Underground Bunkers/Manholes

a. Inspection Scope

The inspectors conducted an inspection of an underground bunker/manhole subject to flooding that contains cables whose failure could disable risk-significant equipment. The inspectors performed an inspection of manhole MH-5 on April 10, 2011, to verify that the cables were not submerged in water, that cables and/or splices appear intact and to observe the condition of cable support structures. Since dewatering devices were not installed; the inspectors ensured that drainage was provided and was functioning properly.

b. Findings

No findings were identified.

1R11 Licensed Operator Regualification Program

a. Inspection Scope

On May 18, 2011, the inspectors observed a crew of licensed operators in the plant's simulator during licensed operator requalification examinations to verify that operator performance was adequate, evaluators were identifying and documenting crew performance problems and training was being conducted in accordance with licensee procedures. The inspectors evaluated the following areas:

- licensed operator performance;
- crew's clarity and formality of communications;
- ability to take timely actions in the conservative direction;
- prioritization, interpretation, and verification of annunciator alarms;
- correct use and implementation of abnormal and emergency procedures;
- control board manipulations;
- oversight and direction from supervisors; and
- ability to identify and implement appropriate TS actions and Emergency Plan actions and notifications.

The crew's performance in these areas was compared to pre-established operator action expectations and successful critical task completion requirements. A review of Operating Experience Smart Sample (OpESS) FY2010-02 "Sample Selections for Reviewing Licensed Operator Examinations and Training Conducted on the Plant-Referenced Simulator" was performed.

b. Findings

No findings were identified.

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1R12 Maintenance Effectiveness

a. Inspection Scope

The inspectors evaluated degraded performance issues involving the 2D Control building air conditioning unit compressor trip on May 2, 2011, NCR 462873 (one sample).

The inspectors reviewed events where ineffective equipment maintenance may have resulted in equipment failure or invalid automatic actuations of Engineered Safeguards Systems and independently verified the licensee's actions to address system performance or condition problems in terms of the following:

- implementing appropriate work practices;
- identifying and addressing common cause failures;
- scoping of systems in accordance with 10 CFR 50.65(b) of the maintenance rule;
- characterizing system reliability issues for performance;
- charging unavailability for performance;
- trending key parameters for condition monitoring;
- ensuring 10 CFR 50.65(a)(1) or (a)(2) classification or re-classification; and
- verifying appropriate performance criteria for structures, systems and components (SSCs)/functions classified as (a)(2) or appropriate and adequate goals and corrective actions for systems classified as (a)(1).

The inspectors assessed performance issues with respect to the reliability, availability, and condition monitoring of the system. In addition, the inspectors verified maintenance effectiveness issues were entered into the corrective action program with the appropriate significance characterization.

b. Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control

a. Inspection Scope

For the three samples listed below, the inspectors reviewed the licensee's evaluation and management of plant risk for the maintenance and emergent work activities affecting risk-significant equipment listed below to verify that the appropriate risk assessments were performed prior to removing equipment for work:

- Unit 1 and Unit 2 risk while electrical busses E4 and E8 were out of service on April 2, 2011;

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- Unit 2 reactor core isolation cooling system failure with emergency diesel generator (EDG) 1 out of service on May 28, 2011; and
- The Unit 2 risk when MSIV B21-F022D failed to slow close during OPT-40.2.8 testing and the plant running on 1 CBP.

These activities were selected based on their potential risk significance relative to the reactor safety cornerstones. As applicable for each activity, the inspectors verified that risk assessments were performed as required by 10 CFR 50.65(a)(4) and were accurate and complete. When emergent work was performed, the inspectors verified that the plant risk was promptly reassessed and managed. The inspectors reviewed the scope of maintenance work, discussed the results of the assessment with the licensee's probabilistic risk analyst or shift technical advisor, and verified plant conditions were consistent with the risk assessment. The inspectors also reviewed TS requirements and walked down portions of redundant safety systems, when applicable, to verify risk analysis assumptions were valid and applicable requirements were met.

b. Findings

No findings were identified.

1R15 Operability Evaluations

a. Inspection Scope

The inspectors reviewed the following five issues:

- Corroded anchor bolts in Unit 1 RCIC discharge piping pipe support, NCR 463916;
- Closing Coil for EDG-2 output breaker failed to meet voltage requirements, NCR 464340;
- Unit 1 rod worth monitor not enforcing, NCR 465768;
- 1B RHR differential pressure above acceptance range, NCR 462323; and
- EDG #1 voltage regulator potentiometer malfunction, NCR 468299.

The inspectors selected these potential operability issues based on the risk-significance of the associated components and systems. The inspectors evaluated the technical adequacy of the evaluations to ensure that TS operability was properly justified and the subject component or system remained available such that no unrecognized increase in risk occurred. The inspectors compared the operability and design criteria in the appropriate sections of the TS and UFSAR to the licensee's evaluations to determine whether the components or systems were operable. Where compensatory measures were required to maintain operability, the inspectors determined whether the measures in place would function as intended and were properly controlled. The inspectors determined, where appropriate, compliance with bounding limitations associated with the evaluations. Additionally, the inspectors also reviewed a sampling of corrective action

documents to verify that the licensee was identifying and correcting any deficiencies associated with operability evaluations.

b. Findings

No findings were identified.

1R18 Plant Modifications

a. Inspection Scope

The following engineering design package was reviewed and selected aspects were discussed with engineering personnel (one permanent modification sample):

- EC #79467, EDG Collector Ring Replacement.

This document and related documentation were reviewed for adequacy of the associated 10 CFR 50.59 safety evaluation screening, consideration of design parameters, implementation of the modification, post-modification testing, and relevant procedures, design, and licensing documents properly updated. The inspectors observed ongoing and completed work activities to verify that installation was consistent with the design control documents. The modification replaced the collector ring material on EDG 4, and governs the future replacement of the collector rings on the other three EDGs.

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing

a. Inspection Scope

The inspectors reviewed the following five post-maintenance activities to verify that procedures and test activities were adequate to ensure system operability and functional capability:

- OPT-08.10.L, LPCI/RHR System Valve Local and ASSD Control Operability Test on April 1, 2011 after maintenance on several 2A loop RHR valves during the Unit 2 refueling outage;
- OPIC-UC013, Calibration of Yokogawa Manual or Programmable Indicating Controller Models SMLD and SLPC after corrective maintenance on the Unit 2 RCIC system on April 7, 2011;
- OPT-12.14.L, Diesel Generator 4 Local Operability Test on April 9, 2011, after replacement of the LOCR relay;

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- OPT-10.16.L, Remote Shutdown Panel RCIC Flow Controller Local Control Operability Test after corrective maintenance on the Unit 2 RCIC system on April 15, 2011; and
- OPT-12.2D, EDG 4 Monthly Load Test after maintenance on May 27, 2011.

These activities were selected based on the structure, system, or component's ability to impact risk. The inspectors evaluated these activities for the following: the effect of testing on the plant had been adequately addressed; testing was adequate for the maintenance performed; acceptance criteria were clear and demonstrated operational readiness; test instrumentation was appropriate; tests were performed as written in accordance with properly reviewed and approved procedures; equipment was returned to its operational status following testing, and test documentation was properly evaluated. The inspectors evaluated the activities against TS and the UFSAR to ensure that the test results adequately ensured that the equipment met the licensing basis and design requirements. In addition, the inspectors reviewed corrective action documents associated with post-maintenance tests to determine whether the licensee was identifying problems and entering them in the corrective action program and that the problems were being corrected commensurate with their importance to safety.

b. Findings

No findings were identified.

1R20 Outage Activities

.1 Refueling Outage Activities

a. Inspection Scope

Unit 2 started the inspection period shut down for refueling and started up from the refueling outage on April 13, 2011. During the refueling outage, the inspectors monitored licensee controls over the outage activities listed below.

- Licensee configuration management, including maintenance of defense-in-depth for key safety functions and compliance with the applicable TS 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;

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- 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;
- Refueling activities, including fuel handling and sipping to detect fuel assembly leakage;
- 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; and
- Licensee identification and resolution of problems related to refueling outage activities.

b. Findings

No findings were identified.

.2 Other Outage Activities

a. Inspection Scope

The inspectors evaluated outage activities for two unscheduled maintenance outages. The first was for Unit 2, and was conducted from April 18, 2011, until April 20, 2011, and the second was for Unit 1, and was conducted from May 14, 2011, until May 17, 2011. Both outages were performed due to adverse drywell leakage trends. The inspectors reviewed activities to ensure that the licensee considered risk in developing, planning, and implementing the outage schedule.

The inspectors observed or reviewed the reactor shutdown and cooldown, outage equipment configuration and risk management, electrical lineups, selected clearances, control and monitoring of decay heat removal, control of containment activities, startup and heatup activities, and identification and resolution of problems associated with the outage.

b. Findings

No findings were identified.

1R22 Surveillance Testing

.1 Routine Surveillance Testing

a. Inspection Scope

The inspectors either observed surveillance tests or reviewed the test results for the following three activities to verify the tests met TS surveillance requirements, UFSAR commitments, inservice testing requirements, and licensee procedural requirements. The inspectors assessed the effectiveness of the tests in demonstrating that the SSCs were operationally capable of performing their intended safety functions.

- 0MST-DG13R, EDG #3 LOOP/LOCA test on April 7, 2011;
- OPT-09.3a, HPCI 150# test on April 14, 2011; and
- OPT-10.1.3, RCIC 150# test on April 14, 2011.

b. Findings

No findings were identified.

.2 In-Service Testing (IST) Surveillance

a. Inspection Scope

The inspectors reviewed the performance of OPT-8.2.2B, Unit 1 LPCI/RHR System Operability Test on May 22, 2011, to evaluate the effectiveness of the licensee's American Society of Mechanical Engineers (ASME) Section XI testing program for determining equipment availability and reliability. The inspectors evaluated selected portions of the following areas: 1) testing procedures, 2) acceptance criteria, 3) testing methods, 4) compliance with the licensee's IST program, TS, selected licensee commitments, and code requirements, 5) range and accuracy of test instruments, and 6) required corrective actions.

b. Findings

No findings were identified.

.3 Reactor Coolant System Leak Detection Inspection Surveillance

a. Inspection Scope

The inspectors observed and reviewed the test results for a reactor coolant system leak detection surveillance, OPT-80.1, Unit 1 Reactor Pressure Vessel ASME Section XI Pressure Test, on May 22, 2011. The inspectors observed in-plant activities and reviewed procedures and associated records to determine whether: effects of the testing

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were adequately addressed by control room personnel or engineers prior to the commencement of the testing; acceptance criteria were clearly stated, demonstrated operational readiness, and were consistent with the system design basis; plant equipment calibration was correct, accurate, and properly documented; and the calibration frequency were in accordance with TSs, the UFSAR, procedures, and applicable commitments; applicable prerequisites described in the test procedures were satisfied; test frequencies met TS requirements to demonstrate operability and reliability; tests were performed in accordance with the test procedures and other applicable procedures; test data and results were accurate, complete, within limits, and valid. Inspectors verified that test results not meeting acceptance criteria were addressed with an adequate operability evaluation or the system or component was declared inoperable; equipment was returned to a position or status required to support the performance of its safety functions; and all problems identified during the testing were appropriately documented and dispositioned in the corrective action program.

b. Findings

No findings were identified.

Cornerstone: Emergency Preparedness

1EP2 Alert and Notification System Testing

a. Inspection Scope

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

The inspector reviewed various documents that are listed in the Attachment to this report. This inspection activity satisfied one inspection sample for the ANS on a biennial basis.

b. Findings

No findings were identified.

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1EP3 Emergency Preparedness Organization Staffing and Augmentation System

a. Inspection Scope

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

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

The inspector reviewed various documents that are listed in the Attachment to this report. This inspection activity satisfied one inspection sample for the ERO staffing and augmentation system on a biennial basis.

b. Findings

No findings were identified.

1EP4 Emergency Action Level and Emergency Plan Changes

a. Inspection Scope

Since the last NRC inspection of this program area, revisions 75 through 79 of the Emergency Plan were implemented. The licensee determined that in accordance with 10 CFR 50.54(q), the changes resulted in no decrease in the effectiveness of the Plan, and that the revised Plan continued to meet the requirements of 10 CFR 50.47(b) and Appendix E to 10 CFR Part 50. The inspector conducted a review of the Emergency Action Level changes and a sampling of the implementing procedure changes made between August 1, 2010, and April 30, 2011, to evaluate for potential decreases in effectiveness of the Plan. However, this review was not documented in a Safety Evaluation Report and does not constitute formal NRC approval of the changes. Therefore, these changes remain subject to future NRC inspection in their entirety. The inspection was conducted in accordance with NRC Inspection Procedure 71114, Attachment 04, "Emergency Action Level and Emergency Plan Changes." The applicable planning standard, 10 CFR 50.47(b)(4), and its related requirements, 10 CFR 50, Appendix E, were used as reference criteria.

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

b. Findings

No findings were identified.

1EP5 Correction of Emergency Preparedness Weaknesses and Deficiencies

a. Inspection Scope

The inspector reviewed the corrective actions identified through the Emergency Preparedness program to determine the significance of the issues and to determine if repeat problems were occurring. The facility's self-assessments and audits were reviewed to assess the licensee's ability to be self-critical, thus avoiding complacency and degradation of their emergency preparedness program. In addition, the inspector reviewed licensee self-assessments and audits to assess the completeness and effectiveness of all emergency preparedness related corrective actions.

The inspection was conducted in accordance with NRC Inspection Procedure 71114, Attachment 05, Correction of Emergency Preparedness Weaknesses. The applicable planning standard, 10 CFR 50.47(b)(14) and its related 10 CFR 50, Appendix E requirements were used as reference criteria.

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

b. Findings

No findings were identified.

1EP6 Emergency Planning Drill Evaluation

a. Inspection Scope

The inspectors observed one emergency preparedness training drill and one simulator scenario. The simulator scenario was conducted on May 18, 2011, and the emergency preparedness drill was conducted on June 9, 2011. The inspectors reviewed the drill scenario narratives to identify the timing and location of classifications, notifications, and protective action recommendations development activities. During the exercises, the inspectors assessed the adequacy of event classification and notification activities. The inspectors observed portions of the licensee's post-drill critiques. The inspectors verified

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that the licensee properly evaluated the drill performances with respect to performance indicators and assessed drill performance with respect to drill objectives.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator (PI) Verification

.1 Mitigating Systems Cornerstone

a. Inspection Scope

To verify the accuracy of the PI data reported to the NRC, the inspectors compared the licensee's basis in reporting each data element listed below to the PI definitions and guidance contained in Nuclear Energy Institute (NEI) Document 99-02, Regulatory Assessment Indicator Guideline:

- Safety System Functional Failures;
- Mitigating Systems Performance Index, Emergency AC Power; and
- Mitigating Systems Performance Index, Cooling Water Systems.

The inspectors sampled licensee submittals for the performance indicators listed above for the period from the first quarter 2010 through the first quarter 2011. The inspectors reviewed the licensee's operator narrative logs, issue reports, MSPI derivation reports, event reports and NRC Integrated Inspection Reports for the period to validate the accuracy of the submittals. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the PI data collected or transmitted for this indicator and none were identified.

b. Findings

No findings were identified.

.2 Emergency Preparedness Cornerstone

a. Inspection Scope

The inspector sampled licensee submittals relative to the Performance Indicators (PIs) listed below for the period July 1, 2010, through March 31, 2011. To verify the accuracy of the PI data reported during that period, PI definitions and guidance contained in NEI 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6, was used to confirm the reporting basis for each data element.

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Emergency Preparedness Cornerstone

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

The inspection was conducted in accordance with NRC IP 71151, "Performance Indicator Verification." For the specified review period, the inspector examined data reported to the NRC, procedural guidance for reporting PI information, and records used by the licensee to identify potential PI occurrences. The inspector verified the accuracy of the PI for ERO drill and exercise performance through review of a sample of drill and event records. The inspector reviewed selected training records to verify the accuracy of the PI for ERO drill participation for personnel assigned to key positions in the ERO. The inspector verified the accuracy of the PI for alert and notification system reliability through review of a sample of the licensee's records of periodic system tests. The inspector also interviewed the licensee personnel who were responsible for collecting and evaluating the PI data. Licensee procedures, records, and other documents reviewed within this inspection area are listed in the Attachment to this report.

This inspection activity satisfied one inspection sample each for the Drill/Exercise Performance, ERO Drill Participation, and Alert and Notification System as defined in IP 71151-05.

b. Findings

No findings were identified.

4OA2 Identification and Resolution of Problems

.1 Routine Review of items Entered Into the Corrective Action Program

a. Inspection Scope

To aid in the identification of repetitive equipment failures or specific human performance issues for follow-up, the inspectors performed frequent screenings of items entered into the licensee's corrective action program. The screenings were accomplished by reviewing daily action request reports.

b. Findings

No findings were identified.

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.2 Semi-Annual Trend Review

a. Inspection Scope

The inspectors performed a review of 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' review was focused on repetitive equipment issues, but also considered the results of daily inspector corrective action program item screening discussed in Section 4OA2.1 above, licensee trending efforts, and licensee human performance results. The inspectors' review nominally considered the six-month period of January 1, 2011, through June 30, 2011, although some examples expanded beyond those dates where the scope of the trend warranted.

Inspectors also reviewed major equipment problem lists, repetitive and rework maintenance lists, departmental problem/challenges lists, system health reports, quality assurance audit/surveillance reports, self-assessment reports, and Maintenance Rule assessments. The inspectors compared and contrasted their results with the results contained in the licensee's corrective action program trending reports. Corrective actions associated with a sample of the issues identified in the licensee's trending reports were reviewed for adequacy.

b. Assessments and Observations

No findings were identified. Trends noted by the inspectors were previously identified by the licensee and addressed in the licensee's corrective action program.

.3 Selected Issues Follow-up Inspection:

a. Inspection Scope

The inspectors conducted follow-up inspections of the conditions listed below. The inspectors reviewed these conditions to verify that the licensee identified the full extent of the issues, performed appropriate evaluations, and specified and prioritized appropriate corrective actions. The inspectors evaluated the conditions against the requirements of the licensee's corrective action program as delineated in corporate procedure CAP-NGGC-0200, Corrective Action Program, and 10 CFR 50, Appendix B.

- Annual Follow-up Sample Utilizing Operating Experience Smart Sample (OpESS) FY 2010-01 "Recent Inspection Experience for Components Installed Beyond Vendor Recommended Service Life;" and
- NCR 460765 and NCR 472890, Intermediate Range Nuclear Instrument Failures.

b. Findings

No findings were identified.

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4OA3 Follow-up of Events

.1 Alert Declared Due to Halon Discharge in the EDG Building

a. Inspection Scope

The inspectors reviewed the plant's response to an alert declared on May 23, 2011, due to a halon discharge into the diesel generator basement. A maintenance activity related to a nitrogen freeze seal on the service water system caused the inadvertent discharge of halon. Inspectors discussed the response with operators, engineering, and licensee management personnel to gain an understanding of the event and assess follow-up actions. The inspectors reviewed operator actions taken in accordance with licensee procedures, and reviewed unit and system indications to verify that actions and system responses were as expected. The inspectors will perform a detailed review of the cause of the event during a subsequent review of the licensee's respective licensee event report. The inspectors also reviewed the initial licensee notifications to verify that the requirements specified in NUREG-1022, "Event Reporting Guidelines," Revision 2, were met.

b. Findings

No findings were identified.

.2 (Closed) LER 05000325/2011-001, Loss of Control Room Emergency Ventilation.

Inspectors reviewed LER 05000325/2011-001 which describes an event that occurred on April 7, 2011. The main control room experienced a safety system functional failure of the emergency ventilation system during a test of EDG 3. During the test, the main feeder breaker to electrical bus E7 unexpectedly tripped open. As a result, emergency ventilation makeup damper 2-VA-2J-D-CB closed on loss of power. This condition resulted in a loss of function for both control room emergency ventilation subsystems. After the loss of main control room emergency ventilation, the licensee replaced the main feeder breaker to bus E7, restored function to the control room ventilation system, and entered the issue into its corrective action program. No findings or NRC violations were identified during the review of this LER. This LER is closed.

4OA5 Other Activities

.1 Quarterly Resident Inspector Observations of Security Personnel and Activities

a. Inspection Scope

During the inspection period, the inspectors conducted observations of security force personnel and activities to ensure that the activities were consistent with licensee security procedures and regulatory requirements relating to nuclear plant security.

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These observations took place during both normal and off-normal plant working hours. These quarterly resident inspector observations of security force personnel and activities did not constitute any additional inspection samples. Rather, they were considered an integral part of the inspectors' normal plant status reviews and inspection activities.

b. Findings

No findings were identified.

.2 Independent Spent Fuel Storage Installation (ISFSI) Inspections

a. Inspection Scope

The inspectors performed a walkdown of the ISFSI on site. The inspectors reviewed reported changes made to the licensee's procedures and programs for the ISFSI to verify the changes made were consistent with the license and Certificate of Compliance (CoC), and did not reduce the effectiveness of the program. The inspectors also reviewed surveillance records to verify that daily surveillance requirements were performed as required by technical specifications. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

.3 (Closed) NRC Temporary Instruction 2515/183, "Follow-up to the Fukushima Daiichi Nuclear Station Fuel Damage Event"

a. Inspection Scope

The inspectors assessed the activities and actions taken by the licensee to assess its readiness to respond to an event similar to the Fukushima Daiichi nuclear plant fuel damage event. This included (1) an assessment of the licensee's capability to mitigate conditions that may result from beyond design basis events, with a particular emphasis on strategies related to the spent fuel pool, as required by NRC Security Order Section B.5.b issued February 25, 2002, as committed to in severe accident management guidelines, and as required by 10 CFR 50.54(hh); (2) an assessment of the licensee's capability to mitigate station blackout (SBO) conditions, as required by 10 CFR 50.63 and station design bases; (3) an assessment of the licensee's capability to mitigate internal and external flooding events, as required by station design bases; and (4) an assessment of the thoroughness of the walkdowns and inspections of important equipment needed to mitigate fire and flood events, which were performed by the licensee to identify any potential loss of function of this equipment during seismic events possible for the site.

b. Findings

Inspection Report 05000325/2011010 and 05000324/2011010 (ML111330094) documented detailed results of this inspection activity. Following issuance of the report, the inspectors conducted detailed follow-up on selected issues. No findings identified during this follow-up inspection.

.4 (Closed) NRC Temporary Instruction 2515/184, "Availability and Readiness Inspection of Severe Accident Management Guidelines (SAMGs)"

On May 27, 2011, the inspectors completed a review of the licensee's severe accident management guidelines (SAMGs), implemented as a voluntary industry initiative in the 1990s, to determine (1) whether the SAMGs were available and updated, (2) whether the licensee had procedures and processes in place to control and update its SAMGs, (3) the nature and extent of the licensee's training of personnel on the use of SAMGs, and (4) licensee personnel's familiarity with SAMG implementation.

The results of this review were provided to the NRC task force chartered by the Executive Director for Operations to conduct a near-term evaluation of the need for agency actions following the Fukushima Daiichi fuel damage event in Japan. Plant-specific results for the Brunswick station were provided as an enclosure to a memorandum to the Chief, Reactor Inspection Branch, Division of Inspection and Regional Support, dated June 02, 2011 (ML111530328).

.5 Failure to Adequately Evaluate and Correct a Condition Adverse to Quality Involving a Manufacturing Defect of Barton Model 199 Dual Dampener Differential Pressure

a. Inspection Scope

An apparent violation (AV) 05000325/2011002-01, Failure to Adequately Evaluate and Correct a Condition Adverse to Quality Involving a Manufacturing Defect of Barton Model 199 Dual Dampener Differential Pressure, was documented in NRC Integrated Inspection Report 05000325/2011002 and 05000324/2011002. An NRC regional senior risk analyst (SRA) completed the significance determination which allowed closure of the AV to an NCV discussed below.

Introduction: A self revealing non-cited violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," was identified for failure to promptly correct a condition adverse to quality regarding a manufacturing defect of a Barton Model 199 dual dampener differential pressure unit (DPU) used in the 1B RHR loop. Specifically, the licensee failed to replace the DPU after the vendor determined that the manufacturing process was incorrect and could lead to a slow response of the component in safety-related applications. This led to a failure of the RHR system 1B loop minimum flow bypass valve, 1-E11-F007B, to operate on February 18, 2011.

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Description: The licensee failed to promptly correct a condition adverse to quality regarding manufacturing defects of Barton Model 199 dual dampener differential pressure units. Barton Instrument Systems issued an advisory related to dual dampener DPUs in October 2001. The advisory informed the licensee that water-filled DPUs built prior to 1997 were susceptible to a manufacturing defect due to an additional dampener port drilled internal to the DPU. The additional drilled port was not re-passivated. Passivation is a chemical process to provide corrosion protection for stainless steels. As the small diameter port in the DPU corrodes over time, corrosion products may clog openings in the DPU, making it susceptible to slow operation and failure. The licensee received the Barton advisory in January 2002. The licensee's evaluation of the condition concluded that if the DPUs in stores and in operation had not failed yet, they were unlikely to fail in the future, and normal testing would be sufficient to detect impending failure.

The 1B RHR loop previously operated correctly on January 29, 2011, when the 1B RHR pump was used in accordance with 1OP-17, Section 8.7, to drain the suppression pool to radwaste. On February 15, 2011, during maintenance on the DPU for the 1B RHR loop minimum flow valve, 1-E11-F007B, the DPU failed calibration. The DPU was discovered stuck in one position, out of calibration, sluggish, and difficult to operate. Troubleshooting continued until the licensee was able to obtain a successful calibration on February 16, 2011. A post-maintenance test (PMT) was performed on February 18, 2011, for the 1B loop of RHR and approximately twenty-five minutes into the test, the minimum flow bypass valve failed to operate correctly. NCR 448471 was initiated. The minimum flow bypass valve has a safety-related function in the open direction to automatically open to permit bypass flow when the pump's flow is insufficient for pump cooling and in the closed direction to prevent diversion of flow from the pump during low pressure coolant injection and containment cooling modes. Additional failures occurred during system operation until March 7, 2011, when the licensee replaced the DPU with a non-susceptible, silicone-filled model that was not part of the 2001 advisory and installed a temporary modification to maintain the valve normally open. In addition, the licensee implemented compensatory actions to ensure that susceptible DPUs in other plant applications are not in a failed state until replacement DPUs can be procured and installed.

Analysis: The inspectors determined that the licensee's failure to promptly correct a condition adverse to quality regarding a manufacturing defect for Barton Model 199 dual dampener DPUs was a performance deficiency. The finding is more than minor because it is associated with the equipment performance attribute of the Mitigating Systems Cornerstone and adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Specifically, the corrosion buildup in the DPU used in the control of the position of the minimum flow bypass valve for the 1B RHR loop had degraded such that the availability and reliability of the 1B RHR loop was adversely affected.

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This finding was evaluated using Inspection Manual Chapter 0609, "Significance Determination Process," Phase 1 Worksheet for mitigating systems. The finding required phase two and phase three SDP analyses by a regional Senior Reactor Analyst (SRA) because the 1B loop of RHR was assumed to be inoperable for longer than its TS allowed outage time. The SRA performed a phase three analysis using the NRC's site-specific risk model. Common Cause factors were not propagated to the other loop of RHR during the modeling because of the prior instrument changes in the other loop. Operator recovery for the impact of the failed instrument was deemed to be credible, because the valve's hand switch remained functional, and was evaluated using the SPAR-H methodology. The short duration of non-functionality since the last known proper functioning of the instrument, combined with the high likelihood of operator recovery, and the lack of an increase in common cause failures, resulted in a finding that is characterized as Green. The dominant sequences each result in change in core damage probabilities of less than E-8. They generally involve loss of the condensate/feed systems (loss of secondary side heat removal) with a failure of RHR to provide containment heat removal or low pressure injection, leading eventually to core damage. This finding does not have a cross-cutting aspect because the performance deficiency occurred greater than three years ago and does not reflect current licensee performance.

Enforcement: 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," states, in part, that measures shall be established to assure that conditions adverse to quality are promptly identified and corrected. Contrary to this, the licensee failed to take prompt and adequate corrective action in response to an advisory issued by Barton Instrument Systems in October, 2001. The failure to take adequate corrective action in response to the advisory led to the failure of the minimum flow bypass valve in the 1B RHR loop. Because this violation is of very low significance and it was entered into the licensee's corrective action program as NCR 448471, this violation is being treated as a Green NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy: NCV 05000325/2011003-01, Failure to Adequately Evaluate and Correct a Condition Adverse to Quality Involving a Manufacturing Defect of Barton Model 199 Dual Dampener Differential Pressure Units.

.6 World Association of Nuclear Operators (WANO) Plant Assessment Report Review

The inspectors reviewed the final report for the WANO plant assessment conducted in February, 2011. The inspectors reviewed the report to ensure that issues identified were consistent with the NRC perspectives of licensee performance and to verify if any significant safety issues were identified that required further NRC follow-up.

.7 Status of BSEP'S Groundwater Monitoring Program

On June 16, 2011, Health Physics inspectors held a teleconference with licensee staff to discuss the status of BSEP'S groundwater monitoring program. The licensee provided an update on tritium concentrations in water collected from onsite and offsite

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groundwater and surface water sampling locations and discussed ongoing remediation efforts associated with the onsite Storm Drain Stabilization Pond (SDSP). Although seasonal fluctuations can occur, the inspectors noted that onsite tritium concentrations in and near the SDSP have generally trended downward since 2007, when the contamination was discovered and corrective actions were initiated. The inspectors also noted that although very low concentrations of tritium have been identified periodically in the offsite environs, e.g., Nancy's Creek immediately adjacent to the SDSP, all reported values for offsite samples have remained significantly below established regulatory limits. The licensee has completed a network of sub-surface pumping wells designed to remediate the groundwater in and around the SDSP and will soon begin construction of a new, double-lined pond to replace the SDSP. The licensee also provided an update on groundwater contamination levels due to a leak of tritiated water from underground piping associated with the Unit 1 Condensate Storage Tank (CST) in December 2010. The meeting details are documented in NCR 00402755. Publicly available information regarding onsite groundwater monitoring and radionuclide concentrations in the environment near BSEP can be found in the Annual Radiological Environmental Operating Report. The 2010 Annual Report is currently available through the Agencywide Documents Access and Management System (ADAMS) at <http://www.nrc.gov/reading-rm/adams.html> (accession number ML 11137A053). A 30-day report regarding the CST piping leak is also available through ADAMS (accession number ML110190210).

4OA6 Management Meetings

Exit Meeting Summary

On May 6, 2011, the Emergency Preparedness lead inspector presented the inspection results to Mr. J. Frisco and other members of licensee management. The inspector confirmed that proprietary information was not provided or examined during the inspection.

On July 25, 2011, the resident inspectors presented the inspection results to Mr. Edward Wills and other members of his staff. The inspectors confirmed that proprietary information was not provided or examined during the inspection.

4OA7 Licensee-Identified Violations

The following finding of very low significance (Green) was identified by the licensee and is a violation of NRC requirements which meets the criteria of Section VI of the NRC Enforcement Policy, NUREG-1600, for being dispositioned as an NCV.

- Technical Specification Section 5.4.1.a, Administrative Control (Procedures), states, in part, that written procedures shall be established, implemented, and maintained, covering applicable procedures recommended in Regulatory Guide 1.33, Appendix A, November 1972 (Safety Guide 33, November 1972). Appendix A, Section D.24.a

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of Safety Guide 33, November 1972 states, in part, that procedures shall be prepared for the energizing, shutdown, and changing modes of operation for electrical systems. Contrary to this, the licensee identified that on April 3, 2011, during execution of Step 8.7.2.13 in procedure 2OP-50, Plant Electric System Operating Procedure, they rendered the Site Auxiliary Transformer (SAT) inoperable, because this control circuit delivered power to the fast-transfer function of Bus 2D. The finding was determined to be of very low-safety significance per Appendix A of Inspection Manual Chapter 0609 Significance Determination Process, for Unit 1, because the SAT was inoperable for less than its allowed TS outage time. The finding was determined to be of very low safety significance for Unit 2 per Checklist 8 in Attachment 1 of Appendix G of IMC 0609 Significance Determination Process, because Unit 2 still had one qualified source of offsite power (The Unit Auxiliary Transformer). Upon discovery of the condition, the licensee took action to restore operability of the SAT. This finding was documented in the licensee's corrective action program as NCR 457424.

ATTACHMENT: SUPPLEMENTAL INFORMATION

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SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

M. Annacone, Site Vice President
L. Beller, Superintendent, Operations Training
W. Brewer, Manager – Maintenance
A. Brittain, Manager – Security
C. Burgwald, EP Specialist
J. Burke, Manager – Outage and Scheduling
K. Crocker, Supervisor Emergency Preparedness
P. Dubrouillet, Manager – Training
C. Dunsmore, Manager – Shift Operations
L. England, Lead Environmental Specialist
J. Frisco, Plant General Manager
C. George, Manager – Technical Support Engineering
K. Gerald, Superintendent – Mechanical Maintenance
S. Gordy, Manager – Operations
L. Grzeck, Lead Engineer – Technical Support
R. Ivey, Manager – Nuclear Oversight Services
F. Jefferson, Manager – Systems Engineering
J. Johnson, Manager – Environmental and Radiological Controls
J. Kessel, EP Specialist
M. Kinney, EP Specialist
M. McGowan, Supervisor - Environmental and Radiological Controls
M. McKoy, EP Specialist
M. Millinor, Senior Chemistry Specialist
P. Mentel, Manager – Support Services
R. Mullis, Supervisor – Operations Training
W. Murray, Licensing Specialist
D. Petrusic, Superintendent – Environmental and Chemistry
A. Pope, Supervisor – Licensing and Regulatory Affairs
T. Sherrill, Engineer – Technical Support
P. Smith, Superintendent – Electrical, Instrumentation, and Controls Maintenance
J. Stephenson, Corporate Emergency Preparedness
J. Titlington, Superintendent – Design Engineering
M. Turkal, Lead Engineer – Technical Support
J. Vincelli, Superintendent – Radiation Protection
E. White, EP Specialist
E. Wills, Director – Site Operations

NRC Personnel

Randall A. Musser, Chief, Reactor Projects Branch 4, Division of Reactor Projects Region II

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

05000325/2011003-01	NCV	Failure To Adequately Evaluate And Correct A Condition Adverse To Quality Involving A Manufacturing Defect Of Barton Model 199 Dual Dampener Differential Pressure Units (Section 4OA5.5)
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Closed

05000325/2011002-01	AV	Failure To Adequately Evaluate And Correct A Condition Adverse To Quality Involving A Manufacturing Defect Of Barton Model 199 Dual Dampener Differential Pressure Units (Section 4OA5.5)
05000325/2011-001	LER	Loss of Control Room Emergency Ventilation (Section 4OA3.2)
2515/183	TI	Follow-up to the Fukushima Daiichi Nuclear Station Fuel Damage Event (Section 4OA5.3)
2515/184	TI	Availability and Readiness Inspection of Severe Accident Management Guidelines (SAMGs) (Section 4OA5.4)

LIST OF DOCUMENTS REVIEWED

Section 1R01: Adverse Weather Protection

0AOP-13.0, Operation during Hurricane, Flood Conditions, Tornado, or Earthquake
0A1-68, Brunswick Nuclear Plant Response to Severe Weather Warnings
0PEP-02.1, Initial Emergency Actions
0PEP-02.6, Severe Weather
0O1-01.03, Non-Routine Activities
NGGM-IA-0003, Transmission Interface Agreement for Operations, Maintenance, and Engineering Activities at Nuclear Plants
0AP-025, BNP Integrated Scheduling

Section 1R04: Equipment Alignment

0OP-50.1, Diesel Generator Emergency Power System Operating Procedure
Drawing D-02265, sheets 1A and 1B, drawing D-02266, sheets 2A and 2B, Piping Diagram for Diesel Generators Starting Air System Units 1 and 2
Drawing D-02268, sheets 1A and 1B, drawing D-02269, sheets 2A and 2B, Piping Diagram for Diesel Generators Fuel Oil System Units 1 and 2
Drawing D-02270, sheets 1A and 1B, drawing D-02271, sheets 2A and 2B, Piping Diagram for Diesel Generators Lube Oil to Lube Oil System Units 1 and 2
Drawing D-02272, sheets 1A and 1B, drawing D-02273, sheets 2A and 2B, Piping Diagram for Diesel Generators Jacket Water System Units 1 and 2
Drawing D-02272, sheets 1A and 1B, drawing D-02273, sheets 2A and 2B, Piping Diagram for Diesel Generators Jacket Water System Units 1 and 2
Drawing D-02274, sheets 1 and 2, Piping Diagram for Diesel Generators Service and Demineralized Water System Units 1 and 2
1OP-19, High Pressure Cooling Injection System Operating Procedure
2OP-19, High Pressure Cooling Injection System Operating Procedure
1OP-14, Reactor Water Cleanup Operating Procedure
2OP-14, Reactor Water Cleanup Operating Procedure

Section 1R05: Fire Protection

0PFP-013, General Fire Plan
1PFP-RB, Reactor Building Prefire Plans Unit 1
2PFP-RB, Reactor Building Prefire Plans Unit 2
0OP-41, Fire Protection and Well Water System
0PFP-MBPA, Miscellaneous Buildings Pre-Fire Plans – Protected Area
0PT-34.11.2.0, Portable Fire Extinguisher Inspection

Section 1R06: Flood Protection

EGR-NGGC-0351 Condition Monitoring of Structures
EGR-NGGC-0507, Cable Aging Management Activities

EGR-NGGC-0512, Licensing Renewal Aging Management Activities
 EGR-NGGC-0156, Environmental Qualification of Electrical Equipment Important to Safety
 NRC Generic Letter 2007-01, "Inaccessible or Underground Power Cable Failures that Disable
 Accident Mitigation Systems or Cause Plant Transients."
 NRC Information Notice 2002-012, "Submerged Safety Related Electrical Cables"

Section 1R11: Licensed Operator Regualification

OTPP, Licensed Operator Continuing Training Program
 TRN-NGGC-0014, NRC Initial Licensed Operator Exam Development and Administration
 1EOP-01-LPC, Level/Power Control
 0EOP-02-PCCP, Primary Containment Control
 0PEP-2.1.1, Emergency Control – Notification of Unusual Event, Alert, Site Area Emergency, or
 General Emergency
 0PEP-02.1, Initial Emergency Actions
 LOT-AOP-201, Fire in Bus E4, Reactor Scram
 Training Presentation Slides, Operations Training: Breaker Control Power Training
 Quick Hit Self-Assessment Report, No. 410958-01, August 16 – August 23, 2010
 NGG Informational Slides, Robinson Event, March 28, 2010: Dissemination of Information

Section 1R12: Maintenance Effectiveness

ADM-NGGC-0101, Maintenance Rule Program
 NUMARC 93-01, Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear
 Power Plants
 ADM-NGGC-0203, Preventive Maintenance and Surveillance Testing
 Administration
 EGR-NGGC-0351, Condition Monitoring of Structures
 ADM-NGGC-0203, Preventive Maintenance and Surveillance test Administration
 0AP-022, BNP Outage Risk Management

Section 1R13: Maintenance Risk Assessment and Emergent Work Control

0AP-022, BNP Outage Risk Management
 ADM-NGCC-0104, Work Management Process
 0AI-144, Risk Management
 ADM-NGGC-0006, Online EOOS Model

Section 1R15: Operability Evaluations

OPS-NGGC-1305, Operability Determinations
 OPS-NGGC-1307, Operational Decision making
 SA-E51-535, Pipe Stress Analysis for Sheet 535 RCIC System
 EGR-NGGC-0320, Civil/Structural Operability Reviews
 UFSAR Section 3.8.4
 Unit 1 Technical Specifications
 BNP-E-6.120, Rev. 2, Volts DC System Battery Load Study
 BNP-E-6.062, Rev. 4D, VDC System Voltage Drop Calculation

Section 1R18: Plant Modifications

EGR-NGGC-0005, Engineering Change
 EGR-NGGC-0011, Engineering Product Quality
 OSMP-MO003, Soft Electrical Backseating of AC Motor Operated Valves Using the Motor Operator

Section 1R19: Post Maintenance Testing

0PLP-20, Post Maintenance Testing Program

Section 1R20: Outage Activities

1OP17, Residual Heat Removal System Operating Procedure
 0GP-01, Prestartup Checklist
 0GP-02, Approach to Criticality and Pressurization of the Reactor
 0GP-03, Unit Startup and Synchronization
 0GP-12, Power Changes
 OSMP-RPV502, Reactor Vessel Reassembly
 0MMM-015, Operation and Inspection of Cranes and Material Handling Equipment

Section 1EP2: Alert and Notification System Testing**Procedures and Manual**

0PEP-04.2, Emergency Facilities and Equipment, Rev. 36
 0EPM-600, Brunswick Siren System User Guide, Rev. 3
 Siren System FEMA Approval, February 28, 2008
 WPS-2900 Series High Power Voice & Siren System, Installation, Operating and Troubleshooting Manual, 2005

Records and Data

Equipment Repair Logs
 Weekly Silent Tests, January 1, 2008 to September 30, 2009
 Quarterly Growl Tests, January 2009 to March 2010
 2009, 2010 Annual Siren Full Volume Tests

Section 1EP3: Emergency Response Organization (ERO) Augmentation**Procedures**

EPQ-001, Emergency Response Organization Qualification Checklists, Rev.11
 EMG-NGGC-005, Activation of the Emergency Response Organization Notification System, Rev. 1
 EMG-NGGC-004, Maintenance of the Emergency Response Organization Notification System, Rev. 1
 EMG-NGGC-005, Activation of the Emergency Response Organization Notification System, Rev. 1

Records and Data

Quarterly Pager Tests, 4th Quarter 2009 – 1st Quarter 2011

Fifteen individual position qualifications were verified

Summary of Brunswick Event of February 19, 2010

Unannounced Augmentation Drill Critique Reports, June 4, 2010, July 9, 2010 and December 17, 2010

Emergency Response Organization - current list

AR 398082: BENS Telephone Line Inop

AR 409357: Everbridge Carbon Copy feature Did Not Activate

AR 320766: Validate ERO travel times

AR 323254: ENS Computer Inoperable

Section 1EP4: Emergency Action Level (EAL) and Emergency Plan Changes

REG-NGGC-0010, 10 CFR 50.59 and Selected Regulatory Reviews, Rev. 13

NRC letter to Brunswick Steam Electric Plant dated December 24, 2009 – Safety Evaluation of Changes to Emergency Planning Zones

December 24, 2009 – Safety Evaluation of Changes to Emergency Planning Zones

NRC letter to Brunswick Steam Electric Plant dated November 6, 2009 – Revision to Emergency Action Levels

Change Packages for Plans and Procedures

0ERP, Radiological Emergency Response Plan, Rev. 75, 76, 77, 78 and 79

0PEP-02.2.1, Emergency Action Level Technical Bases, Rev. 1, 2, and 3

0PEP-02.1, Initial Emergency Actions, Rev. 51 and 52

0PEP-02.1.1, Emergency Control – Notification of Unusual Event, Alert, Site Area Emergency, and General Emergency, Rev. 14, 15, and 16

0PEP-02.6.26, Activation and Operation of the Technical Support Center(TSC), Rev. 23 and 24

Section 1EP5: Correction of Emergency Preparedness Weaknesses and DeficienciesProcedures

NOS-NGGC-0100, Nuclear Oversight Assessment Process, Rev. 10

CAP-NGGC-0201, Self-Assessment/Benchmark Programs, Rev. 16

CAP-NGGC-0200, Condition Identification and Screening Process, Rev. 33

Records and Data

ERO Training Drill, January 13, 2011

ERO Training Drill, December 17, 2010

ERO Training Drill, September 7, 2010

ERO Training Drill, August 31, 2010

ERO Training Drill, July 22, 2010

ERO Training Drill, June 26, 2010

ERO Training Drill, June 1, 2010

ERO Training Drill, May 18, 2010

ERO Training Drill, September 15, 2009

Brunswick CAP Roll-up Reports/Emergency Preparedness/ 2009-2010

Audits and Self-Assessments

BNOS 09-067, Brunswick NOS Emergency Preparedness Mid-Cycle Review (B-EP-09-01),
BNOS 10-034, Assessment of Emergency Preparedness (B-EP-10-01)

Condition Reports (NCRs)

422118, Upgrade off-site dose projection
423677, Inoperable siren
433537, Conflicting guidance in ERO activation
442306, TSC Equipment Failures
443592, Dose Projection Timeliness

Section 40A1: Performance Indicator (PI) Verification

Procedures

REG-NGGC-0009, NRC Performance Indicators and Monthly Operating Report Data
0PT-8.1.4A(B), RHR Service Water System Operability Test- Loop A
0PT-8.16.L, Service Water Valve Local Control and Manual Operability Test
0PT-12.2B, No. 2 Diesel Generator Monthly Load Test
EMG-NGGC-1000, Fleet Conduct of Emergency Preparedness, Rev. 1
REG-NGGC-0009, NRC Performance Indicators and Monthly Operating Report Data, Rev. 10
0EPM-210, Emergency Preparedness Drill/Exercise Program, Rev. 17

Records and Data

Monthly PI Reports, April, 2010 – March, 2011
BNP-PAS-069, NRC Mitigating System Performance Index (MSPI) Basis Document
NCR 00432459, EDG Unavailability KPI Logging Error
NCR 00413184, Diesel Gen #2 Starting Air Low Press Alarm on Start
DEP opportunities documentation from 3rd Quarter 2010 through 1st Quarter 2011
Drill and exercise participation records of ERO personnel from 3rd Quarter 2010 through 1st Quarter 2011
Siren test data from 3rd Quarter 2010 through 1st Quarter 2011
Various ERO Personnel Qualification and Participation records

Section 40A3: Event Followup

0GP-01, Prestartup Checklist
0GP-02, Approach to Criticality and Pressurization of the Reactor
0GP-03, Unit Startup and Synchronization
0GP-12, Power Changes

Section 40A5: Other Activities

0AOP-41.0, Independent Spent Fuel Storage Installation Abnormal Events
IFS-NGGC-0003, Independent Spent Fuel Storage Installation (ISFSI) Program

IFS-NGGC-0010, Start-up or Accident Temperature Monitoring of the Horizontal Storage
Module

FP-86004, Transnuclear Dry Fuel Storage System

NGGM-PM-0028, Transnuclear NUHOMS Dry Fuel Storage Program Manual