



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

October 29, 2010

Mr. Michael J. Annacone
Vice President
Brunswick Steam Electric Plant
P.O. Box 10429
Southport, NC 28461-0429

**SUBJECT: BRUNSWICK STEAM ELECTRIC PLANT - NRC INTEGRATED INSPECTION
REPORT NOS.: 05000325/2010004 AND 05000324/2010004**

Dear Mr. Annacone:

On September 30, 2010, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Brunswick Unit 1 and 2 facilities. The enclosed integrated inspection report documents the inspection findings, which were discussed on October 28, 2010, with you 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 of very low safety significance (Green). However, because of the very low safety significance and because this finding was entered into your corrective action program, the NRC is treating this finding as a non-cited violation (NCV) consistent with Section 2.3.2 of the NRC Enforcement Policy. Additionally, one licensee-identified violation, which was determined to be of very low safety significance, is listed in this report. If you contest any 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 assigned to 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, RII, and the NRC Senior Resident Inspector at the Brunswick Steam Electric Plant.

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, 324/2010004
w/Attachment: Supplemental Information

cc w/encl: (See page 3)

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cc w/encl:
(Vacant)
Vice President
Nuclear Operations
Carolina Power & Light Company
Electronic Mail Distribution

William Jefferson, Jr.
Director Site Operations
Brunswick Steam Electric Plant
Electronic Mail Distribution

Edward L. Wills, Jr.
Plant General Manager
Brunswick Steam Electric Plant
Progress Energy Carolinas, Inc.
Electronic Mail Distribution

Christos Kamilaris
Director
Fleet Support Services
Carolina Power & Light Company
Electronic Mail Distribution

Joseph W. Donahue
Vice President
Nuclear Oversight
Carolina Power and Light Company
Electronic Mail Distribution

Brian C. McCabe
Manager, Nuclear Regulatory Affairs
Progress Energy Carolinas, Inc.
Electronic Mail Distribution

Phyllis N. Mentel
Manager, Support Services
Brunswick Steam Electric Plant
Progress Energy Carolinas, Inc.
Electronic Mail Distribution

Michael S. Williams
Manager, Training
Brunswick Steam Electric Plant
Progress Energy Carolinas, Inc.
Electronic Mail Distribution

(Vacant)
Manager
License Renewal
Progress Energy
Electronic Mail Distribution

Annette H. Pope
Supervisor, Licensing/Regulatory Programs
Brunswick Steam Electric Plant
Progress Energy Carolinas, Inc.
Electronic Mail Distribution

John H. O'Neill, Jr.
Shaw, Pittman, Potts & Trowbridge
2300 N. Street, NW
Washington, DC 20037-1128

Peggy Force
Assistant Attorney General
State of North Carolina
P.O. Box 629
Raleigh, NC 27602

Chairman
North Carolina Utilities Commission
Electronic Mail Distribution

Robert P. Gruber
Executive Director
Public Staff - NCUC
4326 Mail Service Center
Raleigh, NC 27699-4326

Brunswick County Board of Commissioners
P.O. Box 249
Bolivia, NC 28422

James Ross
Nuclear Energy Institute
Electronic Mail Distribution

Public Service Commission
State of South Carolina
P.O. Box 11649
Columbia, SC 29211

(cc w/encl continued next page)

CP&L

4

(cc w/encl continued)

W. Lee Cox, III
Section Chief
Radiation Protection Section
N.C. Department of Environmental
Commerce & Natural Resources
Electronic Mail Distribution

Warren Lee
Emergency Management Director
New Hanover County Department of
Emergency Management
230 Government Center Drive
Suite 115
Wilmington, NC 28403

CP&L

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Letter to Michael J. Annacone from Randall A. Musser dated October 29, 2010

SUBJECT: BRUNSWICK STEAM ELECTRIC PLANT - NRC INTEGRATED INSPECTION
REPORT NOS.: 05000325/2010004 AND 05000324/2010004

Distribution w/encl:

C. Evans, RII

L. Slack, RII

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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.: 05000325/2010004, 05000324/2010004

Licensee: Carolina Power and Light (CP&L)

Facility: Brunswick Steam Electric Plant, Units 1 & 2

Location: 8470 River Road, SE
Southport, NC 28461

Dates: July 1, 2010 through September 30, 2010

Inspectors: P. O'Bryan, Senior Resident Inspector
G. Kolcum, Resident Inspector
A. Nielsen, Senior Health Physics Inspector (4OA6)

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

Enclosure

SUMMARY OF FINDINGS

IR 05000325/2010004, 05000324/2010004; 07/01/10 – 09/30/10; Brunswick Steam Electric Plant, Units 1 & 2; Maintenance Effectiveness.

This report covers a three-month period of inspection by resident inspectors and a review of the station's groundwater tritium plan by a regional inspector. This report contains one NRC-identified Green finding. 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 aspect was determined using IMC 0310, "Components Within the Cross-Cutting Areas", and 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. The inspectors identified a Green NCV of 10 CFR Part 50, Appendix B, Criterion XVI, Corrective Action, for failure to promptly correct a condition adverse to quality regarding moisture and corrosion buildup in carbon steel components used in the emergency diesel generator (EDG) starting/control air systems, leading to EDG starting/control air components experiencing ongoing failures due to moisture-related corrosion buildup. The licensee has initiated NCR 424932 and new corrective actions are currently being developed.

The inspectors determined that the licensee's failure to take adequate corrective actions for the corrosion buildup in the carbon steel components used in the EDG starting/control air system was a performance deficiency. The inspectors determined that the finding is more than minor because if left uncorrected, the issue would become a more significant safety concern in that the potential exists for an EDG failure. This issue is associated with the equipment performance attribute of the Mitigating Systems cornerstone and adversely affects 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 carbon steel components used in the EDG starting/control air system due to moisture has adversely affected the reliability of the EDGs. This finding was evaluated using Inspection Manual Chapter 0609, "Significance Determination Process," Phase 1 Worksheet for mitigating systems. The finding was determined to be of very low safety significance (Green) because the degraded condition did not actually result in the loss of the EDG system safety function or the loss of function of a single EDG. This finding has a cross-cutting aspect in the Corrective Action Program (CAP) component of the Problem Identification and Resolution area because the licensee did not take appropriate corrective action to address safety issues and adverse trends in a timely manner, commensurate with their safety significance and complexity, in that the licensee did not promptly correct the adverse condition of corrosion products in the EDG starting/control air system. (P.1(d)) (Section 1R12)

B. Licensee-Identified Violations

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 are listed in Section 4OA7 of this report.

REPORT DETAILS

Summary of Plant Status

Unit 1 began the inspection period at rated thermal power. Unit 1 was reduced to 65 percent on July 31, 2010, for main turbine and feed pump testing and returned to 100 percent on August 1, 2010. On August 2, 2010, there was a reduction to 80 percent for a control rod improvement and then returned to 100 percent the same day. Unit 1 operated at or near full power for the remainder of the inspection period.

Unit 2 began the inspection period at rated thermal power. On September 10, 2010, Unit 2 was reduced to 65 percent power for main turbine testing, feed pump testing, and feed pump low pressure trip switch modification. Unit 2 returned to 100 percent on September 13, 2010. Later that day power was reduced to 87 percent for a control rod improvement and then returned to 100 percent the same day. Unit 2 operated at or near full power for the remainder of the inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Protection

.1 Readiness for Impending Adverse Weather Condition

a. Inspection Scope

On August 31, 2010, as hurricane Earl approached the plant area, inspectors reviewed the licensee's overall preparations for 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 also toured the plant grounds to look for any loose debris that could become missiles during a tornado. The inspectors evaluated operator staffing and accessibility of controls and indications for those systems required to control the plant. 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 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 four partial system walkdowns of the following risk-significant systems:

- 2A loop of residual heat removal (RHR) with 2B loop of RHR out of service for maintenance on August 3, 2010;
- Unit 1 reactor core isolation cooling (RCIC) with high pressure coolant injection out of service for maintenance on August 10, 2010;
- Unit 1, 1B conventional service water pump with the 1A conventional service water pump out of service for maintenance on August 10, 2010; and
- Unit 2, 2A standby liquid control system with the 2B standby liquid control system out of service for maintenance on September 22, 2010.

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, Technical Specification (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 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.

1R05 Fire Protection

.1 Quarterly Resident Inspector Tours

a. Inspection Scope

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

- Diesel Generator Basement 2' Elevation (0PFP-DG-1);
- Diesel Generator Cell 3 23' Elevation (2PFP-DG-3);
- Diesel Generator Cell 4 23' Elevation (2PFP-DG-2);
- E1 Switchgear Room 50' Elevation (1PFP-DG-11); and
- Service Water Building 4' Elevation (0PFP-SW-1b).

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 implemented 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. Using the documents listed in the attachment, 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 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 September 17, 2010, 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 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 Annual Review of Cables Located in Underground Bunkers/Manholes

a. Inspection Scope

The inspectors conducted an inspection of underground bunkers/manholes subject to flooding that contain cables whose failure could disable risk-significant equipment. The inspectors performed walkdowns of risk-significant areas, including manhole 2-MH-1SW, 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. When applicable, the inspectors verified proper dewatering device (sump pump) operation and verified level alarm circuits were set appropriately to ensure that the cables will not be submerged. Where dewatering devices were not installed, the inspectors ensured that drainage was provided and functioning properly.

b. Findings

No findings were identified.

1R11 Licensed Operator Requalification Program

a. Inspection Scope

On August 23, 2010, 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;
- clarity and formality of communications;
- timely actions in the conservative direction;
- prioritization, interpretation, and verification of annunciator alarms;
- use and implementation of abnormal and emergency procedures;
- control board manipulations;

- oversight and direction from supervisors; and
- TS 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.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness

a. Inspection Scope

The inspectors evaluated degraded performance issues involving the following two risk-significant systems:

- Unit 2 reactor core isolation cooling (RCIC) barometric condenser condensate pump breaker failure (NCR 409710); and
- Emergency diesel generator (EDG) #2 right bank pressure reducing valve failure (NCR 413184)

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 action 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 that maintenance effectiveness issues were entered into the corrective action program with the appropriate significance characterization.

b. FindingsFailure to Correct a Condition Adverse to Quality Involving Corrosion-Related Failures in the Emergency Diesel Generator Starting/Control Air System

Introduction. The inspectors identified a Green NCV of 10 CFR Part 50, Appendix B, Criterion XVI, Corrective Action, for failure to promptly correct a condition adverse to quality regarding moisture and corrosion buildup in carbon steel components used in the EDG starting/control air systems, leading to EDG starting/control air components experiencing ongoing failures due to moisture-related corrosion buildup.

Description. On August 1, 2010, during the monthly surveillance run of EDG #2, the right bank air start header pressure controlled low out of specification at 150 pounds per square inch (psi) instead of the required 250 psi. This resulted in a slower than normal EDG starting time, although the EDG started in less than the 10-second technical specification limit. The EDG started successfully because the redundant left bank air start header pressure was in the normal band. Licensee inspection of the right bank air start header pressure reducing valve (PRV) revealed corrosion products in the pilot valve resulting in sluggish operation. Previous PRV failures have also occurred due to corrosion of the valve sleeve and seating surface leading to PRV seat leakage. The most recent occurrence of an EDG PRV failing to seat due to corrosion was on April 6, 2009 on the EDG #1 left bank air start header. Previous licensee investigations have identified other system vulnerabilities due to moisture resulting in the formation of corrosion products. On September 18, 2009, during a maintenance run of EDG #4, the control air PRV failed to provide adequate downstream pressure and the EDG failed to start. The licensee determined that the filter at the inlet to the control air PRV was fouled with corrosion products.

Corrective action to date includes replacing selected components on a two-year frequency, cleaning accessible portions of piping during inspections, and changing component material, when available, to stainless steel. However, the corrective action has been unsuccessful in preventing corrosion-related component failures. Also, examination of EDG #3 starting/control air system by the inspectors revealed that moisture in the system had collected at carbon steel reducers, small diameter fittings, and on the internal surfaces of the PRVs. These moisture collection points in the EDG air systems cause corrosion products to accumulate, which migrate to the close tolerance components in the PRVs and lead to high debris loading of the filters in the system. The licensee has planned long-term corrective action to install air dryers in the four EDG air systems, but the modifications are not scheduled to start until 2011. With long-term corrective action not scheduled until 2011, and with repeated corrosion-related component failures in the moisture-laden EDG air system environment, the EDGs are currently vulnerable to continued poor reliability.

Analysis. The inspectors determined that the licensee's failure to take adequate corrective action for the corrosion buildup in the carbon steel components used in the EDG starting/control air system was a performance deficiency. The inspectors determined that the finding is more than minor because if left uncorrected, the issue would become a more significant safety concern in that the potential exists for an EDG

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failure. This issue is associated with the equipment performance attribute of the Mitigating Systems cornerstone and adversely affects 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 carbon steel components used in the EDG starting/control air system due to moisture has adversely affected the reliability of the EDGs. This finding was evaluated using Inspection Manual Chapter 0609, "Significance Determination Process," Phase 1 Worksheet for mitigating systems. The finding was determined to be of very low safety significance (Green) because the degraded condition did not actually result in the loss of the EDG system safety function or the loss of function of a single EDG. This finding has a cross-cutting aspect in the CAP component of the Problem Identification and Resolution area because the licensee did not take appropriate corrective action to address safety issues and adverse trends in a timely manner, commensurate with safety significance and complexity, in that the licensee did not promptly correct the adverse condition of corrosion products in the EDG starting/control air system. (P.1(d))

Enforcement. 10 CFR Part 50, Appendix B, Criterion XVI, Corrective Action, requires, in part, that measures shall be established to assure that conditions adverse to quality are promptly corrected. Contrary to this, the licensee failed to take prompt and adequate corrective action for corrosion products forming in the EDG starting/control air system. Because this finding was of very low safety significance and has been entered into the licensee's corrective action program as NCR 424932, this violation is being treated as an NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy and is identified as: NCV 05000324/2010004-01, Failure to Correct a Condition Adverse To Quality Involving Corrosion Related Failures in the Emergency Diesel Generator Starting/Control Air System.

1R13 Maintenance Risk Assessments and Emergent Work Control

a. Inspection Scope

The inspectors reviewed the licensee's evaluation and management of plant risk for the five 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:

- Work on 2-SAMA-1 diesel generator during week of July 5, 2010
- Reduced reliability on the 1B reactor feed pump on July 13, 2010;
- Maintenance on 2B loop of RHR during week of August 2, 2010;
- Replacement of 1A 230kV insulator on August 13, 2010; and
- Failure of the 2C RHR service water booster pump bearing on August 26, 2010.

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

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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 that plant conditions were consistent with the risk assessment. The inspectors also reviewed technical specification (TS) requirements and walked down portions of redundant safety systems, when applicable, to verify that 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 six issues:

- Unit 2 reactor core isolation cooling (RCIC) barometric condenser condensate pump breaker failure (NCR 409710);
- Excessive charcoal buildup on 1A standby gas treatment (NCR 410873);
- Foreign material in the Unit 2 service water systems (NCR 417194);
- EDG #1 crankcase vacuum blower failure (NCR 417801);
- EDG #2 auto voltage regulator operating failure (NCR 419863); and
- EDG #3 exhaust bellows failure (NCR 399667).

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.

1R19 Post-Maintenance Testinga. 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:

- 0PT-12.22, Load Test For Severe Accident Mitigation Alternative (SAMA) Diesels on July 12, 2010, after maintenance;
- 2OP-16, RCIC System Operating Procedure on July 14, 2010, after barometric condenser condensate pump breaker maintenance;
- 0OP-39, Diesel Generator Operating Procedure on July 14, 2010, for EDG #3 after brush replacement;
- 2PT-24.1-2, Service Water Pump and Discharge Valve Operability Test on July 16, 2010, after maintenance on 2C conventional service water pump; and
- 0PT-09.2, HPCI System Operability Test on July 16, 2010, after maintenance.

These activities were selected based upon 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 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.

1R22 Surveillance Testing.1 Routine Surveillance Testinga. 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, in-service 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-BATT11NA, Batteries, 125VDC, Visual Inspection, for Unit 2 on September 7, 2010;
- 0MST-HPCI23Q, HPCI Turbine Exhaust Diaphragm High Pressure Instrument Channel Calibration for Unit 1 on September 8, 2010; and
- 2MST-RCIC22Q, RCIC Steam Line Low Pressure Instrument Channel Calibration, for Unit 2 on September 16, 2010.

b. Findings

No findings were identified.

.2 In-Service Testing (IST) Surveillance

a. Inspection Scope

The inspectors reviewed the performance of 0PT-08.2.2C, LPCI/RHR System Operability Test – Loop A for Unit 1 on July 8, 2010, 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, 1OI-03.1, Reactor Operator Daily Surveillance Report, and 2OI-03.2, Reactor Operator Daily Surveillance Report, on July 15, 2010. The inspectors observed in-plant activities and reviewed procedures and associated records to determine whether: Effects of the testing 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 TS, 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; and 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

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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.

1EP6 Emergency Planning Drill Evaluation

a. Inspection Scope

The inspectors observed a site emergency preparedness training drill/simulator scenario conducted on August 23, 2010. The inspectors reviewed the drill scenario narrative to identify the timing and location of classifications, notifications, and protective action recommendations development activities. During the drill, the inspectors assessed the adequacy of event classification and notification activities. The inspectors observed portions of the licensee's post-drill self-assessment. The inspectors verified that the licensee properly evaluated the drill's performance 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

The inspectors sampled licensee submittals for the Mitigating Systems Performance Index – Residual Heat Removal performance indicator for the period from the third quarter of 2009 through the second quarter of 2010. 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 Barrier Integrity Cornerstone

.a Inspection Scope

- Reactor Coolant System (RCS) Specific Activity

The inspectors reviewed licensee submittals for the Reactor Coolant System Specific Activity performance indicator for the period from the third quarter of 2009 through the second quarter of 2010. The inspectors reviewed the licensee's RCS chemistry samples, TS requirements, issue reports, and event reports for the period to validate the accuracy of the submittals. In addition to record reviews, the inspectors observed a chemistry technician obtain and analyze a reactor coolant system sample.

- Reactor Coolant System Leakage

The inspectors sampled licensee submittals for the Reactor Coolant System Leakage performance indicator for the period from the third quarter of 2009 through the second quarter of 2010. The inspectors reviewed the licensee's operator logs, RCS leakage tracking data, issue reports, and event reports for the period to validate the accuracy of the submittals.

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 review was accomplished by reviewing daily action request reports.

b. Findings

No findings were identified.

.2 Selected Issue Follow-up Inspection

a. Inspection Scope

The inspectors selected the following two issues for detailed review:

- NCR 403460, Halon Release in the EDG building. This NCR was associated with a fire protection system failure in the EDG building basement that released halon into

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the basement and caused a tornado damper to open between the basement and the EDG cells.

- NCR 417194, Rubber Liner Found in TBCCW Heat Exchanger.

The inspectors reviewed these reports to verify that the licensee identified the full extent of the issue, performed an appropriate evaluation, and specified and prioritized appropriate corrective action. The inspectors evaluated the reports 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.

b. Findings

No findings were identified.

40A3 Follow-up of Events

.1 (Closed) LER 05000325/2010-003, Automatic Reactor Scram Due to 1B Reactor Feed Pump Trip.

Inspectors reviewed LER 05000325/2010-003 which describes an event that occurred on May 5, 2010. Unit 1 experienced an automatic reactor scram after the 1B reactor feed pump tripped and the recirculation pumps did not runback as expected. The reactor scrambled when the reactor water level reached the low level scram setpoint. The recirculation pumps failed to runback due to improperly adjusted instrument line pressure pulsation dampeners in the reactor feed pump suction line instrument lines. The error in adjustment of the pressure pulsation dampeners was identified as a finding in NRC Inspection Report 05000325, 324/2010003 as finding number 05000325/2010003-01, Inadequate Design Change Results in an Automatic Reactor Scram. After the Unit 1 reactor scram, the licensee adjusted the instrument line snubbers so that they responded properly to changes in RFP flow and entered the issue into their corrective action program. No other findings or NRC violations were identified during the review of this LER. This LER is closed.

40A5 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. 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.

4OA6 Meetings, Including Exit

On September 23, 2010, the inspectors held a teleconference with licensee staff and State of North Carolina radiation protection representatives 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 surface and ground water sampling locations and discussed ongoing remediation efforts associated with the primary source of contamination - the onsite Storm Drain Stabilization Pond (SDSP). Although seasonal fluctuations can occur, the inspectors noted that onsite tritium concentrations have generally trended downward since 2007 when the contamination was discovered and corrective actions were initiated to stop releases of tritium to the SDSP. 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. Ongoing and planned corrective actions include a network of sub-surface pumps installed around the SDSP to limit offsite releases through groundwater and construction of a new, lined, pond to replace the SDSP. The meeting details are documented in NCR 402755. 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 2009 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 ML101380657).

On October 28, 2010 the inspectors presented the inspection results to Mr. Michael Annacone, and other members of the licensee staff. The inspectors confirmed that proprietary information was not provided or examined during the inspection period.

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 the NRC Enforcement Policy, for being dispositioned as an NCV.

10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," requires, in part, that measures shall be established to assure that conditions adverse to quality are promptly corrected. Contrary to this, the licensee failed to ensure adequate corrective actions were implemented to address degradation of the rubber liner in the 2A conventional service water (CSW) pump discharge elbow, resulting in its failure in August 2010. Several repairs have been performed on the 2A CSW pump elbow liner previously, including September 2005, March 2008, and November 2008. After the failure of the 2A CSW pump elbow liner in August 2010, the issue was entered into the licensee's corrective action program as NCR 417194. As corrective actions, the licensee removed the rubber liners from the service water pump discharge elbows, set up a foreign

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material recovery plan, and implemented engineering change 78094 to coat the elbow internal surfaces with an epoxy composite coating. The finding was determined to be of very low safety significance (Green) because the degraded condition did not result in the inoperability of TS equipment or the unavailability of non-TS risk significant equipment for greater than 24 hours. Also, the finding was not potentially risk significant due to a seismic, flooding, or severe weather initiating event.

ATTACHMENT: SUPPLEMENTAL INFORMATION

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
B. Davis, Manager – Engineering
P. Dubrouillet, Supervisor - Operations Support
L. Grzeck, Lead Engineer - Technical Support
R. Ivey, Manager – Nuclear Oversight Services
F. Jefferson, Superintendent – Systems Engineering
J. Johnson, Manager – Environmental and Radiological Controls
J. Magee, Hydrology Engineer, Silar Services
M. McGowan, Environmental Supervisor
P. Mentel, Manager - Support Services
M. Millinor, Senior Chemistry Specialist
R. Mosier, Communications Specialist
W. Murray, Licensing Specialist
D. Petrusic, Environmental and Chemistry Supervisor
A. Pope, Supervisor – Licensing and Regulatory Affairs
E. Rochelle, Supervisor - Radiological Controls Supervisor
T. Sherrill, Engineer - Technical Support
J. Titrington, Superintendent – Design Engineering
M. Turkal, Lead Engineer - Technical Support
J. Vincelli, Superintendent - Environmental and Radiological Controls
M. Williams, Manager - Training
E. Wills, Plant General Manager

North Carolina Department of Environmental and Natural Resources

P. Cox, Health Physicist
C. Fidalgo, Health Physicist

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

05000324/201004-01	NCV	Failure to Correct a Condition Adverse to Quality Involving Corrosion-Related Failures in the Emergency Diesel Generator Starting/Control Air System
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Closed

05000325/2010-003	LER	Automatic Reactor Scram due to 1B Reactor Feed Pump Trip
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LIST OF DOCUMENTS REVIEWED

Section 1R01: Adverse Weather Protection

0AOP-13.0, Operation during Hurricane, Flood Conditions, Tornado, or Earthquake
0AI-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
0PM-HT001, Preventative Maintenance on Plant Freeze Protection and Heat Tracing System

Section 1R04: Equipment Alignment

1OP-16, Reactor Core Isolation Cooling System Operating Procedure
2OP-16, Reactor Core Isolation Cooling System Operating Procedure
1OP-17, Residual Heat Removal System Operating Procedure
2OP-17, Residual Heat Removal System Operating Procedure
1OP-43, Service Water System Operating Procedure
2OP-43, Service Water System Operating Procedure

Section 1R05: Fire Protection

0PFP-DG, Diesel Generator Building Prefire Plans
0PFP-013, General Fire Plan
0OP-41, Fire Protection and Well Water System
0PFP-PBAA, Power Block Auxiliary Areas Prefire Plans (SW, RW, AOG, TY, EY, PDC)
0PFP-MBPA, Miscellaneous Buildings Pre-Fire Plans – Protected Area
0PT-34.11.2.0, Portable Fire Extinguisher Inspection

Section 1R06: Flood Protection

WO 1137982 Perform Manhole Inspections
 WO 770466 Perform Manhole Inspections
 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 Requalification

OTPP, Licensed Operator Continuing Training Program
 TRN-NGGC-0014, NRC Initial Licensed Operator Exam Development and Administration
 1EOP-01-LPC, Level/Power Control
 OPEP-2.1.1, Emergency Control – Notification of Unusual Event, Alert, Site Area Emergency, or General Emergency
 OPEP-02.1, Initial Emergency Actions

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
 OAP-022, BNP Outage Risk Management

Section 1R13: Maintenance Risk Assessment and Emergent Work Control

OAP-022, BNP Outage Risk Management
 ADM-NGCC-0104, Work Management Process
 OAI-144, Risk Management
 ADM-NGGC-0006, Online EOOS Model

Section 1R15: Operability Evaluations

OPS-NGGC-1305, Operability Determinations
 OPS-NGGC-1307, Operational Decision Making

Section 1R19: Post Maintenance Testing

OPLP-20, Post Maintenance Testing Program

Section 40A1: Performance Indicator Verification

Procedures

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

Records and Data

Monthly PI Reports, July 1, 2009 – June 30, 2010

Section 40A6: Meetings, Including Exit

NCR 402755