



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

January 27, 2012

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

SUBJECT: BRUNSWICK STEAM ELECTRIC PLANT - NRC INTEGRATED INSPECTION
REPORT NOS.: 05000325/2011005, 05000324/2011005, 05000325/2011502
AND 05000324/2011502

Dear Mr. Annacone:

On December 31, 2011, 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 January 18, 2012, 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.

One self-revealing finding of very low safety significance (Green) was identified during this inspection. This finding was determined to involve a violation of NRC requirements. The NRC is treating this violation as non-cited violation (NCV) consistent with Section 2.3.2 of the Enforcement Policy.

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

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

In accordance with 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, 324/2011005, 05000325/2011502,
05000324/2011502
w/Attachment: Supplemental Information

cc w/encl: (See page 3)

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cc w/encl: (See page 3)

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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.: 05000325/2011005, 05000324/2011005, 05000325/2011502,
05000324/2011502

Licensee: Carolina Power and Light (CP&L)

Facility: Brunswick Steam Electric Plant, Units 1 & 2

Location: 8470 River Road, SE
Southport, NC 28461

Dates: October 1, 2011 through December 31, 2011

Inspectors: P. O'Bryan, Senior Resident Inspector
M. Schwieg, Resident Inspector
C. Stancil, Resident Inspector, Browns Ferry
D. Hardage, Resident Inspector, Hatch
M. Bates, Operator Licensing Inspector

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

Enclosure

SUMMARY OF FINDINGS

IR 05000325/2011005, 05000324/2011005, 05000325/2011502, 05000324/2011502; 10/01/11 - 12/31/11; Brunswick Steam Electric Plant, Units 1 & 2; Maintenance Effectiveness.

This report covers a three-month period of inspection by resident inspectors and announced baseline inspections by regional 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 Green non-cited violation of TS 5.4.1, Procedures, was identified for failure to implement procedural requirements for verifying lubrication levels on the 2B RHRSW Booster pump. This finding resulted in failure of the 2B RHRSW Booster pump. The condition was entered into the licensee's corrective action program as AR #489386 and the licensee investigated the failure and repaired the pump.

The failure to follow procedural requirements for verifying lubrication levels was a performance deficiency. The performance deficiency was more than minor because it was associated with the Mitigating Systems cornerstone attribute of Equipment Performance – Availability, and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the performance deficiency resulted in the failure of the 2B RHRSW booster pump which is credited for decay heat removal and service water injection. Using Inspection Manual Chapter 0609, Significance Determination Process, Attachment 0609.04, Phase 1 Screening Worksheet, the finding screened as potentially greater than green because it represented an actual loss of a single train of equipment for more than its Technical Specifications (TS) allowed outage time. Therefore, a phase 2 significance determination evaluation was required. Inspectors with assistance from a regional Senior Reactor Analyst (SRA) determined the significance of this finding to be very low safety significance (Green) using Phase 2 pre-solved tables. The cause of the finding was directly related to the training cross-cutting aspect in the Resources component of the Human Performance area because the licensee failed to ensure that workers had adequate knowledge of the RHRSW pump oilers to execute procedures for verifying lubrication levels which caused a failure of a safety-related pump. [H.2(b)] (Section 1R12)

B. Licensee-Identified Violations

None

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REPORT DETAILS

Summary of Plant Status

Unit 1 began the inspection period at rated thermal power (RTP). On December 22, 2011, power was reduced to approximately 16 percent due to high unidentified leakage inside the primary containment. After repairs, power was returned to RTP on December 23, 2011, and remained at or near RTP for the remainder of the inspection period.

Unit 2 began the inspection period at RTP. On October 28, 2011, power was reduced to approximately 44 percent due to an inadvertent trip of the 2B recirculation pump. The unit was returned to RTP on November 2, 2011. On November 4, 2011, the unit was shut down for a planned maintenance outage. The unit began a reactor startup on November 16, 2011, but operators scrambled the reactor due to high unidentified leakage inside of the primary containment and remained shut down until December 1, 2011. The details of the NRC review of this issue are contained in NRC inspection report 05000324/2011013. Unit returned to RTP on December 9, 2011, and remained at or near RTP for the remainder of the inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R04 Equipment Alignment

.1 Quarterly Partial System Walkdowns

a. Inspection Scope

The inspectors performed three (3) partial system walkdowns of the following risk-significant systems:

- Emergency Diesel Generator (EDG) #4 with EDG #3 out of service for planned maintenance on October 19, 2011;
- EDG #2 following planned maintenance on November 8, 2011; and
- Unit 2 High Pressure Injection Cooling (HPIC) following planned maintenance on November 15, 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, Updated Final Safety Analysis Report (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

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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.

1R05 Fire Protection

.1 Quarterly Resident Inspector Tours

a. Inspection Scope

The inspectors conducted four (4) fire protection walkdowns which were focused on availability, accessibility, and the condition of firefighting equipment in the following risk-significant plant areas:

- Unit 2 Reactor Building East 50' Elevation 2PFP-RB2-1h E;
- Diesel Generator 23' Elevation 1-PFP-DG-5;
- Unit 2 HPCI Room -17' Elevation 2PFP-RB2-2; and
- Unit 1 Battery Room 1B 23' Elevation 1PFP-CB-8.

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. 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.

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b. Findings

No findings were identified.

1R11 Licensed Operator Regualification Program

.1 Quarterly Licensed Operator Continuing Training

a. Inspection Scope

On October 25, 2011, the inspectors observed a crew of licensed operators in the plant's simulator during licensed operator regualification examinations to verify that operator performance was adequate, evaluators were identifying and documenting crew performance problems, and to ensure that 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
- the 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.

b. Findings

No findings were identified.

.2 Licensed Operator Regualification

a. Inspection Scope

Annual Review of Licensee Regualification Examination Results. The licensee completed the comprehensive biennial regualification written examinations and annual regualification operating tests required to be administered to all licensed operators in accordance with 10 CFR 55.59(a)(2). The inspectors performed an in-office review of the overall pass/fail results of the written examinations, individual operating tests and the crew simulator operating tests. These results were compared to the thresholds established in Manual Chapter 609 Appendix I, Operator Regualification Human Performance Significance Determination Process.

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b. Findings

No findings were identified.

1R12 Maintenance Effectiveness

a. Inspection Scope

The inspectors evaluated one (1) degraded performance issue involving the following risk-significant system:

- Unit 2 2B residual heat removal service water (RHRSW) booster pump bearing failure on September 21, 2011.

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; and
- 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

Introduction: A self-revealing Green non-cited violation of TS 5.4.1, Procedures, was identified for failure to implement procedural requirements for verifying lubrication levels on the 2B RHRSW booster pump. This finding resulted in a failure of the 2B RHRSW booster pump.

Description: On September 21, 2011, the 2B RHRSW booster pump was started for suppression pool cooling. After several hours of operation, a security officer performing rounds in the unit 2 reactor building observed a smoky odor in the vicinity of 2B RHRSW

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booster pump. The Reactor Building Auxiliary Operator investigated and observed sparks coming from the pump thrust bearing. The pump was secured and it was determined that the thrust bearing had overheated due to lack of lubrication. The condition was entered into the licensee's corrective action program as AR #489386 and the licensee repaired the pump.

The insufficient lubrication of the 2B RHRSW booster pump thrust bearing was caused by a low oil level in the thrust bearing casing. The oil level in the thrust bearing casing was low due to a failure of the licensee to verify the oil level on two different occasions. The first occurrence was on April 3, 2011, during reinstallation of the 2B RHRSW booster pump following modification of the pump's bed plate. During the modification of the bed plate, the pump was moved several times and the oiler level adjustment mechanism was removed. Upon reinstallation of the pump, the oiler level adjustment mechanism was not reinstalled. Without the leveling mechanism, the oil level could not be aligned properly to the pump tab mark in accordance with procedure 0MMM-053, Equipment Lubrication Application Guidance and Lubrication Listing. The work order for the pump reinstallation (WO #1037629) had specific instructions to verify and adjust lubricant levels in accordance with procedure 0MMM-053. This procedure provides specific guidance for Trico oilers (step 5.1.4) that states "level should be at or just below pump tab (1/16")." Failure to properly verify thrust bearing oil level following reinstallation of the pump left the oil level in the bearing casing below the normal operating level. Although this level was sufficient to lubricate the bearing at the time of the pump's reinstallation, it was not sufficient to ensure an adequate amount of oil existed in the bearing casing to make up for any additional losses of oil.

The second occurrence was on July 13, 2011, when a routine oil sample was taken from the 2B RHRSW booster pump thrust bearing. A significant quantity of oil was removed from the bearing, and oil was added back by refilling the oil bubbler. The work order (WO #1820326) contained specific instructions to perform oil samples in accordance with procedure 0MMM-053. This procedure provides specific guidance for taking samples for Trico oilers (step 5.1.4) to "measure exact amount removed to ensure exact amount is replaced" and "level should be at or just below pump tab (1/16")." The licensee failed to measure the oil removed or check that level was at or just below tab (1/16") prior to returning the pump to service. It is probable after July 13, 2011, that oil level in the thrust bearing casing was insufficient for the 2B RHRSW booster pump to satisfy its safety function. This condition resulted in the pump bearing failure on September 21, 2011.

Analysis: The failure to follow procedural requirements for verifying lubrication levels was a performance deficiency. The performance deficiency was more than minor because it was associated with the Mitigating Systems cornerstone attribute of Equipment Performance – Availability, and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the performance deficiency resulted in the failure of the 2B RHRSW booster pump which is credited for decay heat

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removal and emergency service water injection. Using Inspection Manual Chapter 0609, Significance Determination Process, Attachment 0609.04, Phase 1 Screening Worksheet, the finding screened as potentially greater than green because it represented an actual loss of a single train of equipment for more than its TS allowed outage time. Therefore, a Phase 2 significance determination evaluation was required. Inspectors with assistance from a regional Senior Reactor Analyst (SRA) determined the significance of this finding to be very low safety significance (Green) using Phase 2 pre-solved tables. The cause of the finding was directly related to the training cross-cutting aspect in the Resources component of the Human Performance area because the licensee failed to ensure that workers had adequate knowledge of the RHRSW pump oilers to execute procedures for verifying lubrication levels which caused a failure of a safety-related pump. [H.2(b)].

Enforcement: TS 5.4.1, Procedures, requires, in part, that written procedures shall be implemented covering applicable procedures recommended in Regulatory Guide 1.33, Appendix A, November 1972 (Safety Guide 33, November 1972). Regulatory Guide 1.33, Appendix A, November 1972 (Safety Guide 33, November 1972), Section I, requires written procedures for maintenance which can affect performance of safety related equipment. Plant procedure 0MMM-053, Equipment Lubrication Application Guidance and Lubrication Listing, is the licensee's procedure for lubrication maintenance on safety-related pumps and describes requirements for verifying the proper oil level for Trico oilers. Contrary to the above, on April 13, 2011, and July 13, 2011, the licensee failed to properly implement procedure 0MMM-053. Specifically, oil levels were not properly verified on the 2B RHRSW booster pump. This resulted in a failure of the pump thrust bearing. Upon discovery of this condition, the licensee reinstalled oil level control mechanism, held special training sessions with maintenance personnel, and repaired the pump. Because this finding is of very low safety significance and has been entered into the licensee's corrective action program as AR #489386, it is being treated as a non-cited violation, consistent with Section 2.3.2 of the NRC Enforcement Policy: NCV 05000324/2011005-01, Failure to Verify Bearing Oil Level Resulted in Residual Heat Removal Service Water Pump Failure.

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 four (4) 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:

- Emergent work on the EDG #2 Voltage Regulator on November 8, 2011;
- Increased shutdown risk for the decay heat removal key safety function during work on the A loop of the unit 2 residual heat removal (RHR) system on November 18, 2011;

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- Planned work on the unit 2, A loop of the RHR system with the 1B reactor building closed cooling water system heat exchanger out of service (increased risk for unit 2) on December 15, 2011; and
- Planned work on the unit 1 high pressure coolant injection (HPCI) pump with the 2C conventional service water pump out of service (increased risk for unit 1) on December 20, 2011.

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 that 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 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 four (4) issues:

- EDG #2 voltage regulator preset potentiometer limit switch failure (AR #498277);
- Relay 2-E4-AK0-27E1, E4 Undervoltage Relay, out of calibration (AR #497761);
- Evaluated unit 2 HPCI injection line temperature (AR #497443); and
- 2A RHR heat exchanger drain line leak (AR #500128).

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

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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 Testing

a. Inspection Scope

The inspectors reviewed the following six (6) post-maintenance activities to verify that procedures and test activities were adequate to ensure system operability and functional capability:

- 2OP-43, Service Water Operation on October 4, 2011 after 2B CSW pump planned maintenance outage;
- OPT-12.2C, No. 3 Diesel Generator Monthly Load Test on October 20, 2011 after corrective maintenance on the collector rings and other planned maintenance;
- OPT-12.2A, No. 1 Diesel Generator Monthly Load Test on November 2, 2011 after corrective maintenance on the collector rings and other planned maintenance;
- OPT-12.2B No. 2 Diesel Generator Monthly Load Test on November 19, 2011 after corrective maintenance on the automatic voltage regulator;
- OPT-80.1, Reactor Pressure Vessel Test on November 29, 2011 after the unit 2 reactor head reassembly; and
- OPT-12.2D, No. 4 Diesel Generator Monthly Load Test on December 28, 2011 after a planned diesel maintenance outage.

These activities were selected based upon the structure, system, or component's ability to impact risk. The inspectors evaluated these activities for the following (as applicable): 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.

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1R20 Outage Activities

a. Inspection Scope

The inspectors evaluated outage activities for a scheduled unit 2 maintenance outage, conducted from November 5, 2011, to December 2, 2011. The inspectors reviewed activities to ensure that the licensee considered risk in developing, planning, and implementing the outage schedule.

During the outage, the inspectors observed portions of the shutdown and cooldown processes and 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;
- Monitoring of decay heat removal processes, systems, and components;
- Controls to ensure that outage work was not impacting the ability of the operators to operate the spent fuel pool cooling system;
- Reactor water inventory controls including flow paths, configurations, and alternative means for inventory addition, and controls to prevent inventory loss;
- Controls over activities that could affect reactivity;
- Maintenance of secondary containment as required by TS;
- Refueling activities, including fuel handling and sipping to detect fuel assembly leakage;
- Startup and ascension to full power operation; and
- Licensee identification and resolution of problems related to outage activities.

b. Findings

No findings were identified.

1R22 Surveillance Testing

.1 Routine Surveillance Testing

a. Inspection Scope

The inspectors either observed three (3) surveillance tests or reviewed the test results for the following activities to verify the tests met TS surveillance requirements, UFSAR commitments, in-service testing requirements, and licensee procedural requirements.

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The inspectors assessed the effectiveness of the tests in demonstrating that the SSCs were operationally capable of performing their intended safety functions.

- 0MST-RGE15Q RGE, Unit 1 Reactor Building Ventilation Monitoring Channel Functional Test on October 5, 2011;
- 1MST-HPC127Q, Unit 1 HPCI and reactor core isolation cooling (RCIC) Low Water Level Instrument Channel Calibration on October 13, 2011; and
- 1OI-03.2, Unit 1 Reactor Operator Daily Surveillance Report for DW leakage on November 17, 2011;

b. Findings

No findings were identified.

.2 In-Service Testing (IST) Surveillance

a. Inspection Scope

The inspectors reviewed the performance of 0PT-10.1.1, RCIC System Operability Test on December 13, 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.

1EP6 Emergency Planning Drill Evaluation

a. Inspection Scope

The inspectors observed a site emergency preparedness training drill conducted on October 18, 2011. 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. 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.

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b. Findings

No findings were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator (PI) Verification.1 Mitigating Systems Cornerstonea. Inspection Scope

The inspectors sampled licensee submittals for the Mitigating Systems Performance Index performance indicators listed below for the period from the 3rd quarter 2010 through the 3rd quarter 2011. The inspectors reviewed the licensee's operator narrative logs, issue reports, Mitigating System Performance Index (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.

- Mitigating Systems Performance Index, High Pressure Coolant Injection System
- Mitigating Systems Performance Index, Heat Removal System (Reactor Core Isolation Cooling System)

b. Findings

No findings were identified.

4OA2 Identification and Resolution of Problems.1 Routine Review of Items Entered Into the Corrective Action Programa. 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.

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.2 Semi-Annual Trend Review

a. Inspection Scope

The inspectors performed a review of the licensee's CAP 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 CAP 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 July 1, 2011, through December 31, 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 CAP trending reports. Corrective actions associated with a sample of the issues identified in the licensee's trending reports were reviewed for adequacy.

b. Findings and Observations

Inspectors, concurrent with the licensee, noted an ongoing adverse trend in human performance, as exemplified by the following events: 1) AOP-20, Pneumatic System Failures on November, 24, 2011, due to operator error, 2) failure of the 2B RHRSW booster pump on September 21, 2011, (see section 1R12 of this report), and 3) multiple human errors associated with the inadequate tensioning of the unit 2 reactor vessel head studs and declaration of an Unusual Event on November 16, 2011. Details of the inadequate tensioning of the unit 2 reactor vessel head studs are contained in NRC inspection report 05000324/2011013. The licensee has entered the issues into their corrective action program.

.3 Assessments and Observations

Annual Sample: Review of Operator Workarounds (OWAs)

a. Inspection Scope

The inspectors evaluated the licensee's implementation of their process used to identify, document, track, and resolve operational challenges. Inspection activities included, but were not limited to, a review of the cumulative effects of the OWAs on system availability and the potential for improper operation of the system, for potential impacts on multiple systems, and on the ability of operators to respond to plant transients or accidents. The inspectors performed a review of the cumulative effects of OWAs. The inspectors

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reviewed both current and historical operational challenge records to determine whether the licensee was identifying operator challenges at an appropriate threshold, had entered them into their corrective action program and proposed or implemented appropriate and timely corrective actions which addressed each issue. Reviews were conducted to determine if any operator challenge could increase the possibility of an Initiating Event, if the challenge was contrary to training, required a change from long-standing operational practices, or created the potential for inappropriate compensatory actions. Daily plant and equipment status logs, degraded instrument logs, and operator aids or tools being used to compensate for material deficiencies were also assessed to identify any potential sources of unidentified operator workaround.

b. Findings

No findings were identified.

4OA3 Follow-up of Events

Unusual Event Declaration for Excessive Unit 2 Unidentified Leakage

a. Inspection Scope

The inspectors reviewed the plant's response to an Unusual Event declared for unit 2 unidentified leakage inside of primary containment exceeding 10 gallons per minute on November 16, 2011. The leakage developed shortly after reactor startup and pressurization and was due to an improperly installed reactor vessel head. Details of the event are included in NRC Special Inspection Report 05000324/2011013.

b. Findings

Results associated with this event are in NRC Special Inspection Report 05000324/2011013.

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. 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.

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b. Findings

No findings were identified.

.2 Operation of an Independent Spent Fuel Storage Installation (ISFSI)

a. Inspection Scope

During the inspection period the inspectors conducted observations of selected activities and independent evaluation, that the licensee has maintained fuel stored in the ISFSI in a safe manner and in compliance with approved procedures. Inspectors also reviewed selected records that the licensee has identified each fuel assembly placed in the ISFSI, has recorded the parameters and characteristics of each fuel assembly, and has maintained a record of each fuel assembly as a controlled document.

b. Findings

No findings were identified.

4OA6 Management Meetings

Exit Meeting Summary

On January 18, 2011, the inspectors presented the inspection results to Mr. Edward Wills, and other members of the licensee staff. The inspectors confirmed that proprietary information was not provided or examined during the inspection period.

ATTACHMENT: SUPPLEMENTAL INFORMATION

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SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

M. Annacone, Site Vice President
S. Bostic, Supervisor – Major Projects
A. Brittain, Manager – Security
J. Burke, Director – Engineering
C. Dunsmore, Manager – Shift Operations
P. Dubrouillet, Manager - Training
J. Frisco, Plant General Manager
C. George, Manager – Technical Support Engineering
K. Gerald, Acting Manager – 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
P. Mentel, Manager - Support Services
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
M. Turkal, Lead Engineer - Technical Support
J. Vincelli, Superintendent – Radiation Protection
H. Willets, Manager– Design Engineering
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

05000324/2011005-01	NCV	Failure to Verify Bearing Oil Level Resulted in Residual Heat Removal Service Water Pump Failure (Section 1R12)
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LIST OF DOCUMENTS REVIEWED

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
OPT-12.2B, No. 2 Diesel Generator Monthly Load Test
OPT-12.2D, No. 4 Diesel Generator Monthly Load Test
0OP-39, Diesel Generator Operating Procedure
SD-39, Emergency Diesel Generators
0OP-19, High Pressure Coolant Injection System Operating Procedure
SD-19, High Pressure Coolant Injection System Description

Section 1R05: Fire Protection

0PFP-CB, Control Building Prefire Plans
0PFP-DG, Diesel Generator Building Prefire Plans
0PFP-013, General Fire Plan
2PFP-RB, Reactor Building Prefire Plans Unit 2
0PFP-MBPA, Miscellaneous Buildings Pre-Fire Plans – Protected Area

Section 1R11: Licensed Operator Regualification

0TPP, Licensed Operator Continuing Training Program
TRN-NGGC-0014, NRC Initial Licensed Operator Exam Development and Administration
1EOP-01-LPC, Level/Power Control
0PEP-2.1.1, Emergency Control – Notification of Unusual Event, Alert, Site Area Emergency, or General Emergency
0PEP-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
 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

Section 1R19: Post Maintenance Testing

0PLP-20, Post Maintenance Testing Program
 2OP-43 Service Water Operation
 0PT-12.2A No. 1 Diesel Generator Monthly Load Test
 0PT-12.2B No. 2 Diesel Generator Monthly Load Test
 0PT-12.2C No. 3 Diesel Generator Monthly Load Test
 0PT-12.2D No. 4 Diesel Generator Monthly Load Test
 SD-39, Emergency Diesel Generators
 SD-43, Service Water System
 0PT-80.1, Reactor Pressure Vessel ASME Section XI Pressure Test

Section 1R20: Outage Activities

2OP17, 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-05, Unit Shutdown
 0GP-12, Power Changes
 0SMP-RPV502, Reactor Vessel Reassembly
 0MMM-015, Operation and Inspection of Cranes and Material Handling Equipment

Section 1R22: Surveillance Testing

0MST-RGE15Q RGE Reactor Bldg Vent Monitoring Channel Functional
 1MST-HPC127Q HPCI and RCIC Low Water Level Instrument Channel Cal
 1OP-03.2 RODSR Attachment 1 Drywell Leakage Rate Calculation
 0PT-10.1.1, RCIC System Operability Test
 SD-16, Reactor Core Isolation Cooling (RCIC) System

Section 4OA1: Performance Indicator Verification

Procedures

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

Records and Data

Monthly PI Reports, October 2010 – September 2011

Section 4OA3: Event Followup

1OP17, Residual Heat Removal System Operating Procedure

2OP17, 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-05, Unit Shutdown

0GP-12, Power Changes