UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
SAM NUNN ATLANTA FEDERAL CENTER
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October 15, 2004

Carolina Power and Light Company
ATTN: Mr. C. J. Gannon
Vice President
Brunswick Steam Electric Plant
P. O. Box 10429
Southport, NC 28461-0429

SUBJECT: BRUNSWICK STEAM ELECTRIC PLANT - NRC INTEGRATED INSPECTION REPORT NOS. 05000325/2004004 AND 05000324/2004004

Dear Mr. Gannon:

On September 18, 2004, the Nuclear Regulatory Commission (NRC) completed an inspection at your Brunswick Units 1 and 2 facilities. The enclosed integrated inspection report documents the inspection findings, which were discussed on September 30, 2004, 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. Based on the results of this inspection, no findings of significance were identified.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and its enclosure 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/

Paul E. Fredrickson, 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, 324/2004004
w/Attachment: Supplemental Information

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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:	05000325/2004004 and 05000324/2004004
Licensee:	Carolina Power and Light (CP&L)
Facility:	Brunswick Steam Electric Plant, Units 1 & 2
Location:	8470 River Road SE Southport, NC 28461
Dates:	June 20, 2004 - September 18, 2004
Inspectors:	E. DiPaolo, Senior Resident Inspector J. Austin, Resident Inspector P. O'Bryan, Resident Inspector, Harris Nuclear Plant (Section 1R12)
Approved by:	Paul Fredrickson, Chief Reactor Projects Branch 4 Division of Reactor Projects

Enclosure

SUMMARY OF FINDINGS

IR 05000325/20040-04, 05000324/20040-04; 06/20/2004 - 09/18/2004; Brunswick Steam Electric Plant, Units 1 and 2; routine integrated report.

The report covered a three-month period of inspection by resident inspectors. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 3, dated July 2000. No findings of significance were identified.

Enclosure

REPORT DETAILS

Summary of Plant Status

Unit 1 began the report period operating at full power. The unit performed a planned downpower to approximately 62 percent on July 23 to perform fuel leak suppression testing and returned to full power on July 26. On August 13, due to the loss of an offsite power line as a result of damage sustained by a tornado, Unit 1 reduced power to approximately 67 percent at load dispatcher request. On August 14, operators manually scrammed the unit as a result of a loss of offsite power due to a failure of an offsite power line insulator while Hurricane Charley traversed the Cape Fear Region of North Carolina. Following recovery actions from the event, the unit entered Mode 2 (Startup) on August 17. Unit 1 reached full power on August 24, where it remained for the duration of the inspection period.

Unit 2 began the report period operating at full power. On June 24, the unit performed an unplanned downpower to approximately 53 percent power due to clogging of the B main condenser circulating water debris filter, which resulted in degraded main condenser performance. The unit returned to full power on June 26. On July 24, Unit 2 reduced power to approximately 77 percent due to corrosion of three control rod drive insert lines. The unit returned to full power on July 26. On July 29 the unit initiated a Technical Specification (TS) required shutdown to Mode 4 (Cold Shutdown) due to a drywell-to-suppression pool vacuum breaker not closing following surveillance testing. The unit reached full power on August 5. On August 27, the unit performed a planned downpower to approximately 53 percent to perform secondary plant maintenance and a control rod sequence exchange and returned to full power on August 29. An unplanned downpower to approximately 74 percent was performed on August 31, in response to lowering main condenser vacuum as a result of a circulating water intake pump tripping. The pump tripped as a result of high differential pressure across the associated traveling screen due to an apparent heavy flow of silt to the intake structure. The unit returned to full power on September 1, where it remained for the duration of the inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

1R01 Adverse Weather Protection

a. Inspection Scope

Hot Weather Preparations

The inspectors assessed the effectiveness of the licensee's hot weather protection program as it related to ensuring that emergency diesel generator (EDG) building and cable spreading room equipment would remain functional and available during hot weather conditions (1 adverse weather sample of 2 systems). In addition to reviewing the licensee's design basis documents and procedures addressing temperature affects on equipment, walkdowns were conducted of controlling equipment (e.g., ventilation fans, dampers, etc.) associated with the above areas. Licensee problem identification and resolution were also addressed. This included a review of Action Request (AR)

131023, which documented high temperature conditions in electrical board rooms in the EDG Building. Documents reviewed are listed in the Attachment.

Adverse Weather Conditions

During the approach of Hurricanes Charley and Frances (two actual adverse weather samples) to the Cape Fear Region of North Carolina, the inspectors attended hurricane preparation status meetings, reviewed site preparations for adverse weather, and reviewed preparations for plant damage assessment. The inspectors toured risk-significant and susceptible plant areas to verify the implementation of adverse weather preparation procedures and compensatory measures before the onset of adverse weather conditions. On August 14, 2004, the inspectors observed the licensee's emergency response facility staff's monitoring of storm conditions, damage assessment, and corrective actions as a result of Hurricane Charley. Documents reviewed are listed in the Attachment.

b. Findings

No findings of significance were identified.

1R04 Equipment Alignment

a. Inspection Scope

The inspectors performed three partial walkdowns of the below listed systems to verify that the systems were correctly aligned while the redundant train or system was inoperable or out-of-service (OOS) or, for single train risk significant systems, while the system was available in a standby condition. The inspectors assessed conditions such as equipment alignment (i.e., valve positions, damper positions, and breaker alignment) and system operational readiness (i.e., control power and permissive status) that could affect operability. The inspectors verified that the licensee identified and resolved equipment alignment problems that could cause initiating events or impact mitigating system availability. The inspectors reviewed Administrative Procedure ADM-NGGC-0106, Configuration Management Program Implementation, to verify that available structures, systems or components (SSCs) met the requirements of the licensee's configuration control program. Documents reviewed are listed in the Attachment.

- Unit 1 A and B trains of standby liquid control (SLC) after return-to-service following testing on July 18, 2004
- EDG #3 when EDG #4 was OOS due to planned maintenance on August 23-24, 2004
- Service water intake structure on August 31, 2004, during heavy flow of silt to intake structure

To assess the licensee's identification and resolution of problems associated with the system, the inspectors reviewed the following ARs:

- AR 132331, SLC tank left unattended while air sparging
- AR 131197, Broken and degraded EDG synchroscope switch handles

b. Findings

No findings of significance were identified.

1R05 Fire Protection

a. Inspection Scope

The inspectors toured the following ten areas important to reactor safety and reviewed the associated prefire plans to verify that the requirements for fire protection design features, fire area boundaries, and combustible loading were met. The inspectors reviewed current ARs and work orders (WOs) associated with the fire suppression system to confirm that their disposition was in accordance with Procedure OAP-033, Fire Protection Program Manual. The inspectors reviewed the status of ongoing surveillance activities to verify that they were current to support the operability of the fire protection system. In addition, the inspectors observed the fire suppression and detection equipment for any existing conditions or deficiencies which would impair the operability of that equipment. Documents reviewed are listed in the Attachment:

- EDG cells #3 and #4, 23' elevation (2 areas)
- Units 1 and 2 north and south core spray rooms, -17' elevation (4 areas)
- Units 1 and 2 north and south residual heat removal (RHR) Rooms, -17' elevation (4 areas)

To assess the licensee's ability to identify and correct adverse conditions the inspectors reviewed the licensee's action in response to AR 130109 which documented an inspector-identified issue when an EDG building fire impairment was maintained following completion of required tasks.

b. Findings

No findings of significance were identified.

1R06 Flood Protection Measures

a. Inspection Scope

Internal Flooding

The inspectors performed a walkdown of the Units 1 and 2 reactor buildings below elevation 20' (two areas) to verify that internal flood protection features were consistent with the licensee's internal flooding analysis as described in Updated Final Safety Analysis Report (UFSAR) Section 3.4.2, Protection From Internal Flooding. The inspectors reviewed the effects of postulated piping failures for these two areas to verify

that analysis assumptions and conclusions were based on the current plant configuration. The internal flooding design features and equipment for coping with internal flooding were also inspected. The walkdown included sources of flooding and drainage, sump pumps, level switches, watertight doors, curbs , pedestals, and equipment mounting. The inspectors reviewed the procedures for coping with internal flooding. Documents reviewed are listed in the Attachment.

External Flooding

The inspectors performed the annual review of flood protection barriers and reviewed procedures for coping with external flooding. This included a review of the licensee's external flooding analysis as described in UFSAR Section 3.4.1, Protection from External Flooding, to determine the external flood control design features. Walkdowns were conducted to inspect the external flood protection barriers including watertight doors, curbs, sealing of external building penetrations below floodline, and the sump pumps and level alarm circuits. Procedures for coping with external flooding were reviewed. Documents reviewed are listed in the Attachment.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification

a. Inspection Scope

The inspectors observed licensed operator performance on September 23 and 25, 2004, and reviewed the associated training documents during simulator examination and training sessions for training cycle 2003-04. The observed scenarios tested the operators' ability to respond to anticipated transients without scram and other safety and balance of plant equipment failures. The simulator observation and review included an evaluation of emergency operating procedure and abnormal operating procedure utilization. The inspectors reviewed Procedure OTPP-200, Licensed Operator Continuing Training (LOCT) Program, to verify that the program ensured safe power plant operation. The inspectors also reviewed the operators activities to verify consistent clarity and formality of communication, conservative decision-making by the crew, appropriate use of procedures, and proper alarm response. Group dynamics and supervisory oversight, including the ability to properly identify and implement appropriate TS actions, regulatory reports, and notifications, were observed. The inspectors assessed whether appropriate feedback was planned to be provided to the licensed operators.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness

a. Inspection Scope

For the equipment issues described in two issues listed below, the inspectors reviewed the licensee's implementation of the Maintenance Rule (10 CFR 50.65) with respect to the characterization of failures, the appropriateness of the associated Maintenance Rule a(1) or a(2) classification, and the appropriateness of the associated a(1) goals and corrective actions. The inspectors also reviewed operations logs and licensee event reports to verify unavailability times of components and systems, if applicable. Licensee performance was evaluated against the requirements of Procedure ADM-NGG-0101, Maintenance Rule Program. The inspectors also reviewed deficiencies related to the work activities listed below to verify that the licensee had identified and resolved deficiencies in accordance with Procedure CAP-NGGC-0200, Corrective Action. Documents reviewed are listed in the Attachment.

- AR 132962, EDG #4 starting air compressor #1 functional failure (motor and compressor failed bearings)
- AR 135119, Portions of the service water system discharge piping inappropriately downgraded from safety-related to non-safety-related

b. Findings

No findings of significance were identified.

1R13 Maintenance Risk Assessments and Emergent Work Evaluation

a. Inspection Scope

The inspectors reviewed the licensee's implementation of 10 CFR 50.65 (a)(4) requirements during scheduled and emergent maintenance activities, using Procedure OAP-025, BNP Integrated Scheduling and Technical Requirements Manual (TRM) 5.5.13, Configuration Risk Management Program. The inspectors reviewed the effectiveness of risk assessments performed prior to changes in plant configuration for maintenance activities (planned and emergent). The review was conducted to verify that, upon unforseen situations, the licensee had taken the necessary steps to plan and control the resultant emergent work activities. The inspectors reviewed the applicable plant risk profiles, work week schedules, and WOs for the maintenance activities on the following six OOS equipment or conditions:

- AR 132325, Diesel-driven fire pump OOS during the Unit 1 A RHR/RHR service water maintenance outage on July 14, 2004 (emergent)
- EDG #3 scheduled outage during work week 29 (July 17-23, 2004) concurrent with diesel-driven fire pump OOS (planned)
- Work Request (WR) 155405, Troubleshoot ground on 450 V substation transformer 2E on July 23, 2004 (emergent)

- AR 132939, Unit 2 control rod drive insert line through-wall leaks due to corrosion (emergent)
- AR 133336, Unit 2 forced outage (B216F2) risk plan due to drywell-to-suppression pool vacuum breaker (2-CAC-X18D) failing to close following testing (emergent)
- WO 353511, AX-2 motor control center supply breaker magnitude latch test

The inspectors reviewed the following ARs to assess the licensee's identification and resolution of emergent problems:

- AR 133444, Failure of second air compressor on EDG #4
- AR 133789, Control power fuse for residual heat removal heat exchanger 1A bypass valve (2-E11-F048A) failed during maintenance

b. Findings

No findings of significance were identified.

1R14 Operator Performance During Non-Routine Plant Evolutions and Events

a. Inspection Scope

The inspectors observed the following two transients and one reactor scram to assess operator performance during non-routine evolutions and events. Operator logs, plant computer data, and associated operator actions were reviewed as well as the procedures listed in the Attachment.

- Unit 2 power reduction and shutdown on July 29, 2004, due to drywell-to-suppression pool vacuum breaker (2-CAC-X18D) not closing following testing
- Unit 2 startup and heatup on August 1, 2004
- Unit 1 manual scram due in response to loss of both reactor recirculation pumps caused by a loss of offsite power to the startup auxiliary transformer on August 14, 2004

To assess the licensee's ability to identify and correct adverse conditions, the inspectors reviewed the licensee's actions in response to failing to meet required source range-to-intermediate range nuclear instrument monitor overlaps during Unit 2 startup activities as documented in AR 133572.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations

a. Inspection Scope

The inspectors reviewed the operability evaluations associated with the below listed seven issues, which affected risk significant systems or components, to assess, as appropriate: 1) the technical adequacy of the evaluations; 2) the justification of continued system operability; 3) any existing degraded conditions used as compensatory measures; 4) the adequacy of any compensatory measures in place, including their intended use and control; and 5) where continued operability was considered unjustified, the impact on TS limiting conditions for operations (LCOs) and the risk significance. In addition to the reviews, discussions were conducted with the assigned system engineers regarding the ability of the affected systems to perform their intended safety function.

- AR 137490, EDG #3 inoperability while installing test connections in automatic control circuitry
- AR 131023, EDG cell #4 recirculation damper was in recirculation position due to faulty pneumatic relay
- AR 132939, Degraded Unit 2 control rod drive insert piping for control rod hydraulic control units 30-43, 34-43, 38-43, and 26-43
- AR 131519, Unit 1 B SLC pump failed to meet surveillance test flow rate requirements
- AR 133336, Unit 2 drywell-to-suppression pool vacuum breaker (2-CAC-X18D) stuck open during surveillance testing (operability determination for Unit 1 and remaining Unit 2 vacuum breakers)
- AR 134802 Task 10, EDG #1 operability following improper bus load stripping and resultant load transient during loss of offsite power
- AR 134802 Task 16, Operability determination of emergency buses E1-E4 based on inspection of surface mounted hinged armature (HGA) relays

b. Findings

No findings of significance were identified.

1R16 Operator Work-Arounds (OWAs)

a. Inspection Scope

Selected OWAs

The inspectors reviewed the status of OWAs for Units 1 and 2 to verify that the functional capability of the system or operator reliability in responding to an initiating event was not affected. One OWA was reviewed associated with obtaining suppression pool level locally while remote indication was not functioning properly, as documented in AR 133582. The review was to evaluate the effect of the OWA on the operator's ability to implement abnormal or emergency operating procedures during transient or event

conditions. The inspectors compared licensee actions to the requirements of Procedure 0OI-01.08, Control of Equipment and System Status and held discussions with operations personnel related to the OWA reviewed.

b. Findings

No findings of significance were identified.

1R17 Permanent Plant Modifications

a. Inspection Scope

The inspectors reviewed one permanent plant modification documented in Engineering Change (EC) 54715, Residual Heat Removal 2 B Continuous Vent Loop. The modification installed a continuous adjustable vent of the Unit 2 B loop of trains injection piping to alleviate required periodic venting due to piping pressurization. The inspectors reviewed the design adequacy of the modification for material compatibility, operational impact, failure modes, pressure boundary integrity, and effect on licensing basis to verify that the modification met the design bases and the design assumptions. The inspectors verified that modification preparation, staging, and implementation did not impair emergency/abnormal operating procedure actions and key safety functions. Post-modification testing was reviewed to verify that the testing demonstrated that the modification acceptance criteria were met. Documents reviewed are listed in the Attachment.

b. Findings

No findings of significance were identified.

1R19 Post-Maintenance Testing

a. Inspection Scope

For the six post-maintenance tests and maintenance activities listed below, the inspectors reviewed the test procedure and witnessed the testing and/or reviewed test records to confirm that the scope of testing adequately verified that the work performed was correctly completed, and that the test demonstrated that the effected equipment was capable of performing its intended function and was operable in accordance with TS requirements. The inspectors reviewed the licensee's actions against the requirements in Procedure 0PLP-20, Post Maintenance Testing Program.

- WO 546235, Replace Dresser couplings on EDG #4 with new Style 90
- WO 555654, EDG #2 manual voltage regulator not functioning properly during scheduled test run
- AR 134477, RHR flow indicates 500 gpm when there is no actual flow
- WO 583106, Spent fuel railroad track repair

- WO 344470, Calibration verification of the high pressure core injection reactor water level transmitter
- WO 602261, 1B standby gas train failed to start during Unit 1 loss of offsite power (LOOP)

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing

a. Inspection Scope

Routine Surveillance Testing

The inspectors either observed surveillance tests or reviewed test data for the four risk significant SSC surveillances, listed below, to verify the tests met TS surveillance requirements, UFSAR commitments, in-service testing (IST), 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.

- 0PT-06.1, Standby Liquid Control Operability Test, Rev. 60, performed on Unit 1
- 0PT-50.10, Average Power Range Monitor Drive Flow Alignment, Rev. 5, performed on Unit 1
- WO 603632, Testing of EDG #1 emergency bus parallel load shed permissive relays (CL-A/B) following discovery of test method not meeting TS Surveillance Requirement 3.3.8.1.4
- 0PT-02.3.1, Suppression Chamber to Drywell Vacuum Breakers Operability Test, Rev. 28, performed on Unit 2

Inservice Surveillance Testing

The inspectors reviewed the performance of Periodic Test 0PT-09.2, High Pressure Coolant Injection (HPCI) System Operability Test (Rev. 114) performed on Unit 1. The inspectors evaluated the effectiveness of the licensee's American Society of Mechanical Engineers (ASME) Section XI testing program to determine 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. The inspectors also assessed any applicable corrective actions taken.

b. Findings

No findings of significance were identified.

1R23 Temporary Plant Modifications

a. Inspection Scope

The inspectors reviewed Plant Operating Manual 0PLP-22, Temporary Changes, to assess implementation of the below listed temporary modifications. The inspectors reviewed these temporary modifications to verify that the modifications were properly installed and whether they had any effect on system operability. The inspectors also assessed drawings and procedures for appropriate updating and post-modification testing. Documents reviewed are listed in the Attachment.

- EC 58282, Short-term Fix for 125 Ton Whiting Crane Load Sensing Structural Frame
- EC 58487, Temporary Modification for Unit 2 Degraded Control Rod Drive (CRD) Piping Leak Repair Clamp per ASME Code Case N-523-2

b. Findings

No findings of significance were identified.

Cornerstone: Emergency Preparedness

1EP6 Drill Evaluation

a. Inspection Scope

The inspectors observed two site emergency preparedness training drills/evolutions conducted on July 13 and July 20, 2004. The inspectors reviewed each drill scenario narrative to identify the timing and location of classification, notification, and protective action recommendation (PAR) development activities. The inspectors evaluated the conduct of each drill from the control room simulator, technical support center, and the emergency operations facility. During the drills, the inspectors assessed the adequacy of event classification and notification activities. The inspectors observed the licensee's post-drill critiques and evaluated the licensee's self assessments of classification, notification, and protective action recommendation development. The inspectors assessed the licensee's evaluation of each drill's performance with respect to performance indicators. To assess the ability of the licensee to identify and correct problems, the inspectors reviewed emergency response organization team training drill critique reports for the two drills/evaluations observed.

b. Findings

No findings of significance were identified.

4OA1 Performance Indicator Verification

a. Inspection Scope

The inspectors sampled licensee submittals for the Units 1 and 2 performance indicators (PIs) listed below for the period July 2003 through June 2004. To verify the accuracy of the PI data reported during that period, PI definitions and guidance contained in Nuclear Energy Institute (NEI) 99-02, "Regulatory Assessment Performance Indicator Guideline", Revision 2, were used to confirm the reporting basis for each data element.

Reactor Safety Cornerstone

- Safety System Unavailability, Residual Heat Removal System
- Safety System Functional Failures

A sample of plant records and data was reviewed and compared to the reported data to verify the accuracy of the PIs. The licensee's corrective action program records were also reviewed to determine if any problems with the collection of PI data had occurred.

b. Findings

No findings of significance were identified.

4OA2 Identification and Resolution of Problems

a. Inspection Scope

Routine Review of ARs

To aid in the identification of repetitive equipment failures or specific human performance issues for followup, the inspectors performed frequent screenings of items entered into the licensee's CAP. The review was accomplished by reviewing daily AR reports.

Annual Sample Review

The inspectors performed an in-depth annual sample review of selected ARs to verify that conditions adverse to quality were addressed in a manner that was commensurate with the safety significance of the issue. The inspectors reviewed the actions taken to verify that the licensee had adequately addressed the following attributes:

- Complete, accurate, and timely identification of the problem
- Evaluation and disposition of operability and reportability issues
- Consideration of previous failures, extent of condition, generic or common cause implications
- Prioritization and resolution of the issue commensurate with the safety significance

- Identification of the root cause and contributing causes of the problem
- Identification and implementation of corrective actions commensurate with the safety significance of the issue

The following issues and associated corrective actions were reviewed:

- AR 132939, Through-wall leak discovered on Unit 2 CRD insert piping
- AR 133336, drywell-to-suppression chamber vacuum breaker (2-CAC-X18D) for Unit 2 appears to have failed open

b. Findings and Observations

No findings of significance were identified associated with the two reviewed samples; however, the inspectors observed that the extent-of-condition reviews for the issues were not of sufficient detail to detect related adverse conditions on similar equipment.

On July 24, 2004, the licensee discovered through-wall leaks on three Unit 2 CRD insert lines. These lines were classified as ASME Code Class 2. The cause of the leaks for the stainless steel piping was found to be due to chloride induced transgranular stress corrosion cracking. The licensee found that overhead salt water drain line leakage was the source of the chloride contamination. Extent-of-condition inspections revealed that other Unit 1 and Unit 2 CRD piping was affected by salt water drain line leakage. However, no further through-wall leaks were discovered. Several weeks following the completion of the extent-of-condition review, on August 23, 2004, the licensee discovered additional saltwater corrosion and indication on two Unit 2 CRD hydraulic control unit exhaust lines (AR 135784). One exhaust line (for HCU 30-07) required a structural integrity evaluation due to the depth of the indication. The inspector questioned whether the original extent-of-condition review should have discovered the corrosion found on August 23. The licensee concluded that the original extent-of-condition walkdown missed these lines and initiated AR 135925, Insufficient Walkdown for CRD Corrosion. The inspector noted that the CRD exhaust lines were not required to meet ASME Code Class 2 requirements. However, the licensee conservatively treats the piping as such (Augmented Code Class 2) due to the piping's functioning as a pressure boundary during reactor scram conditions.

During surveillance testing on July 29, 2004, one Unit 2 drywell-to-suppression chamber vacuum breaker (2-CAC-X18D) would not close. In accordance with TS LCO 3.6.1.6, the unit was brought to Mode 4 (Cold Shutdown). At the time, the licensee determined the apparent causes of the stuck open vacuum breaker was due to open limit switch binding with the vacuum breaker hinge and vacuum breaker pneumatic test actuator binding. The test actuator binding was found to be due to a localized area of corrosion in the actuator cylinder creating an interference between the actuator piston and the cylinder. At the time only limited testing (i.e., stroke testing and limited visual observations) were completed on the remaining nine drywell-to-suppression chamber vacuum breaker pneumatic test actuators. Because the air actuators were not subject to any preventive maintenance, the inspectors questioned the basis of how the performed testing/observations would rule out similar conditions on the other nine test

actuators. Following more detailed visual inspections and stroke-time testing, the licensee discovered problems associated with two other vacuum breaker actuators. The test actuator associated with 2-CAC-X18F was found to stroke significantly slower than the other actuators (approximately 10 second versus 2-3 seconds) when retracting from the test position. The condition was found to be due to a degraded/clogging test actuator governor/control valve. Also, the test actuator associated with 2-CAC-X18H was found to have a cracked actuating cylinder and was leaking air. The licensee initiated AR 134015 and AR 133599 to address these conditions. The inspector noted that these conditions did not affect the operability of the associated vacuum breakers.

4OA3 Event Follow-up

.1 Unit 1 Loss of Offsite Power and Manual Scram

The inspectors observed plant parameters, equipment performance, and operator actions to a loss of offsite power and resultant manual scram of Unit 1 on August 14, 2004. Based on the circumstances during and following the event, the NRC established a Special Inspection Team to inspect and assess the circumstances and licensee operational activities associated with the event. The Special Inspection was performed August 23-27, 2004. Results of the inspection are documented in NRC Inspection Report 05000325/2004011, dated September 26, 2004.

.2 (Closed)Licensee Event Report (LER) 05000324/2004001: Inoperability of High Pressure Coolant Injection (HPCI) During Maintenance Activity.

During routine surveillance testing on June 21, 2004, the licensee found that a Unit 2 HPCI reactor high water level channel was out-of-calibration. Maintenance activities to restore the instrument channel were not completed within the TS completion time of 24 hours. In accordance with TS 3.3.5.1, Emergency Core Cooling System Instrumentation, the HPCI system was declared inoperable at 0900 on June 22, 2004. The instrument channel was subsequently repaired and the HPCI system was returned to an operable status later that day. The LER was reviewed by the inspectors and no findings of significance were identified. No violation of regulatory requirements occurred.

.3 (Closed)LER 05000325,324/2003-002: Oscillation Power Range Monitor (OPRM) Inoperability Due To Inadequate Confirmation Count Performance.

The LER reported a non-conservative condition affecting the Units 1 and 2 OPRM system identified in an October 5, 2003 10CFR21 report. The OPRM upscale trip function provides protection against exceeding the fuel minimum critical power ratio safety limit, should thermal-hydraulic power oscillations occur. The 10CFR21 report identified the potential for numerous, unexpected confirmation count resets in the event of an instability condition. The licensee established an alternate method to detect and suppress thermal-hydraulic instability oscillations as required. The licensee determined the cause was an incomplete analysis performed by the original vendor (GE) when establishing the OPRM period-based detection algorithm. The licensee completed

modifications on December 2, 2003 for Unit 1 and December 5, 2003 for Unit 2, and restored the systems back to operable status. The LER was reviewed by the inspectors and no findings of significance were identified.

4OA6 Meetings, Including Exit

On September 30, 2004, the resident inspectors presented the inspection results to Mr. C. J. Gannon and other members of his staff. The inspectors confirmed that proprietary information was not provided or examined during the inspection.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

G. Atkinson, Supervisor - Emergency Preparedness
L. Beller, Supervisor - Licensing/Regulatory Programs
A. Brittain, Manager - Security
T. Cleary, Director - Site Operations
E. Conway, Senior Nuclear Security Specialist
D. DiCello, Manager - Nuclear Assessment
C. Elberfeld, Lead Engineer - Technical Support
C. Gannon, Site Vice President
J. Gawron, Training Manager
D. Hinds, Plant General Manager
D. Makosky, Lead Nuclear Security Specialist
E. O'Neil, Manager - Site Support Services
E. Quidley, Manager - Outage and Scheduling
S. Tabor, Lead Engineer - Technical Support
H. Wall, Manager - Maintenance
M. Williams, Manager - Operations

NRC Personnel

P. Fredrickson, Chief, Reactor Projects Branch 4, Division of Reactor Projects Region II

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None

Opened and Closed

None

Closed

05000324/2004-001	LER	Inoperability of High Pressure Coolant Injection (HPCI) During Maintenance Activity (Section 4OA3.3)
0000325,324/2003-002	LER	Oscillation Power Range Monitor (OPRM) Inoperability Due To Inadequate Confirmation Count Performance (Section 4OA3.4)

Discussed

None

LIST OF DOCUMENTS REVIEWED

Section 1R01: Adverse Weather Protection

Plant Operating Manual (POM), Vol. I, Book 2, Administrative Instruction 0AI-68, Brunswick Nuclear Plant Response to Severe Weather Warnings, Rev. 23
POM, Vol. XIII, Plant Emergency Procedure 0PEP-02.1, Initial Emergency Actions, Rev. 48
POM, Vol. XIII, Plant Emergency Procedure 0PEP-02.6, Severe Weather, Rev. 9
POM, Vol. XXI, Abnormal Operating Procedure 0AOP-13.0, Operation During Hurricane, Flood Conditions, Tornado, or Earthquake, Rev. 32

Section 1R04: Equipment Alignment

POM, Vol. III, Operating Procedure 1OP-05, Standby Liquid Control System, Rev. 39
POM, Vol. X, Periodic Test 1SP-04-004, SLC Pump 1B Flow Test, Rev. 0
POM, Vol. X, Periodic Test 0PT-06.1, Standby Liquid Control System Operability Test, Rev. 60

Section 1R05: Fire Protection

POM, Vol. XIX, Prefire Plan 0PFP-DG, Diesel Generator Building Prefire Plans, Rev. 8
POM, Vol. XIX, Prefire Plan 1PFP-RB, Reactor Building Prefire Plans, Revision 6
POM, Vol. XIX, Prefire Plan 2PFP-RB, Reactor Building Prefire Plans, Revision 6

Section 1R06: Flood Protection Measures

Updated Final Safety Analysis Report (UFSAR), Chapter 3, Design of Structures, Components, Equipment, and Systems
POM, Vol. X, 0PT-34.2.2.1, Fire Door, ASSD Access/Egress Door, Severe Weather Door Inspections, Rev. 30
System Description (SD) SD-58, Structures and Cranes, Revision 3
POM, Vol. I, Book 2, Administrative Instruction 0AI-68, Brunswick
Nuclear Plant Response to Severe Weather Warnings, Rev. 23
POM , Vol. I, Administrative Instruction 0AI-68, Brunswick Nuclear Plant Response to Severe Weather Warnings, Rev. 23
Work Order (WO) 378199, Troubleshoot and repair service water intake structure building sump pump 2D-1
WO 378254, Replace service water intake structure building sump drain level switch

Section 1R12: Maintenance Effectiveness

POM, Vol. X, 0PT-12.2D, No. 4 Diesel Generator Monthly Load Test, Rev. 82
SD-39, System Description - Emergency Diesel Generators
UFSAR, Section 8.3, Onsite Power Systems
Maintenance Rule Database
IST Database

Section 1R14: Operator Performance During Non-Routine Evolutions and Events

POM, Vol. IV, 0GP-02, Approach to Criticality and Pressurization of the Reactor, Revision 77
POM, Vol. IV, 0GP-05, Unit Shutdown, Rev. 110
POM, Vol. IV, 0GP-10, Rod Sequence Checkoff Sheets, Rev. 31

Section 1R17: Permanent Plant Modifications

Design Basis Document 17, Residual Heat Removal System
POM, Vol. III, Operating Procedure 2-OP-17, Residual Heat Removal System Operating Procedure
UFSAR, Chapter 5, Reactor Coolant System and Connected Systems
UFSAR, Chapter 6, Engineered Safety Features
UFSAR, Chapter 15, Accident Analysis

Section 1R23: Temporary Plant Modifications

Action Request (AR) 130586, Whiting crane part 21 on reactor building bridge cranes
Nuclear Generation Group Standard Procedure, Vol. 99, Book/Part 99, EGR-NGGC-003, Design Review Requirements, Rev. 9