



UNITED STATES  
NUCLEAR REGULATORY COMMISSION

REGION II  
SAM NUNN ATLANTA FEDERAL CENTER  
61 FORSYTH STREET, SW, SUITE 23T85  
ATLANTA, GEORGIA 30303-8931

January 28, 2005

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

SUBJECT: BRUNSWICK STEAM ELECTRIC PLANT - NRC INTEGRATED INSPECTION  
REPORT NOS. 05000325/2004005 AND 05000324/2004005

Dear Mr. Gannon:

On December 31, 2004, the US 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 January 5, 2005, with Mr. D.H. Hinds 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, one self-revealing finding of very low safety significance (Green) was identified. This finding was determined to involve a violation of NRC requirements. However, because of the very low safety significance and because it is entered into your corrective action program, the NRC is treating this finding as a non-cited violation (NCV) consistent with Section VI.A.1 of the NRC Enforcement Policy. If you contest this 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 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, 324/2004005  
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: 05000325/2004005 and 05000324/2004005

Licensee: Carolina Power and Light (CP&L)

Facility: Brunswick Steam Electric Plant, Units 1 & 2

Location: 8470 River Road SE  
Southport, NC 28461

Dates: September 19, 2004 - December 31, 2004

Inspectors: E. DiPaolo, Senior Resident Inspector  
J. Austin, Resident Inspector  
M. Maymi, Reactor Inspector (1R07)  
E. Lea, Senior Operations Engineer (1R11)  
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Approved by: Paul Fredrickson, Chief  
Reactor Projects Branch 4  
Division of Reactor Projects

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## SUMMARY OF FINDINGS

IR 05000325/2004-005, 05000324/2004-005; 09/19/2004 - 12/31/2004; Brunswick Steam Electric Plant, Units 1 and 2; Problem Identification and Resolution.

The report covered a three-month period of inspection by resident inspectors and three announced inspections by regional based inspectors. One Green non-cited violation (NCV) was identified. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 609, "Significance Determination Process" (SDP). Findings for which the SDP does not apply may be Green or be assigned a severity level after NRC management review. 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.

### A. NRC-Identified and Self-Revealing Findings

#### Cornerstone: Mitigating Systems

Green. A self-revealing finding and non-cited violation of 10CFR50, Appendix B, Criterion XIII, was identified for failure to store Unit 1 standby liquid control system (SLC) nitrogen accumulator repair kits in a condition which did not prevent deterioration. The licensee's material evaluation of the commercially dedicated part did not include special storage requirements and, therefore, the parts were stored, from at least 1999 until March 2004, in a condition which made them susceptible to developing leaks along folds in the nitrogen accumulator bladders. This resulted in accumulator nitrogen leakage into the Unit 1 standby liquid control system and was determined to be the cause of the 1 B standby liquid control pump being discovered in an inoperable condition on July 8, 2004.

This finding is more than minor because it is associated with equipment performance and affected the functional capability of the system to respond to initiating events. This finding was evaluated using MC 0609 Appendix A. A Phase 3 Significance Determination Process analysis determined this finding to be of very low safety significance (Green) because the redundant train of the Unit 1 SLC system remained operable. The licensee's corrective actions included replacing all of the affected nitrogen accumulator bladders (Section 4OA2).

### B. Licensee Identified Violations

None

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## REPORT DETAILS

### Summary of Plant Status

Unit 1 began the report period operating at approximately 100 percent power. On October 7, 2004, Unit 1 experienced an unplanned downpower to 67 percent power. This was the result of a 230 kv switchyard breaker (Weatherspoon PCB 24B) faulting, generating a lockout on 230 kv Bus 1B, which in turn caused the 1A recirculation pump to run back due to the resultant voltage transient. The unit returned to 100 percent power on October 9, 2004. On October 29, 2004, a planned downpower to 53 percent was performed for valve testing, secondary plant maintenance and control rod pattern adjustment. The unit returned to 100 percent power on October 31, 2004. On December 17, 2004, a planned downpower was performed to approximately 53 percent to facilitate fuel leak suppression testing, control rod scram time testing, valve testing and secondary plant maintenance. The unit returned to 100 percent power on December 22, 2004. Unit 1 remained at approximately 100 percent power for the remainder of the report period.

Unit 2 began the report period operating at full power. The unit performed a planned down power to 85 percent on September 25, 2004, for control rod improvement and returned to full power on September 26, 2004. On September 29, 2004, the unit performed a dispatcher directed downpower to approximately 74 percent power due to loss of the Delco West 230 kv offsite power line. The unit returned to full power on September 30, 2004. On November 5, 2004, a planned downpower was performed to facilitate a control rod pattern adjustment and secondary plant maintenance. Unit 2 returned to full power on November 7, 2004. The unit performed and completed a planned downpower to approximately 85 percent power for a control rod pattern adjustment on November 21, 2004. On December 10, 2004, the unit downpowered to 53 percent (again planned) for valve testing, control rod pattern adjustment and secondary plant maintenance, and was back to full power on December 11, 2004.

### 1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

#### 1R01 Adverse Weather Protection

##### a. Inspection Scope

The inspectors assessed the effectiveness of the licensee's cold weather protection program as it related to ensuring that the facility's diesel-driven fire pump, emergency diesel generators, and condensate storage tank low-level switches would remain functional and available in cold weather conditions. In addition to reviewing the licensee's program-related documents and procedures, walkdowns were conducted of the freeze protection equipment (e.g., heat tracing, area space heaters, etc.) associated with the above systems/components. Licensee problem identification and resolution were also assessed. This included review of Action Request (AR) 146036, which documented a need to review the heat trace program and implement procedures for improvements. Documents reviewed are listed in the Attachment.

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b. Findings

No findings of significance were identified.

1R04 Equipment Alignmenta. Inspection ScopePartial System Walkdowns

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). 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. Additional documents reviewed are listed in the Attachment.

- Unit 2 high pressure injection system (HPCI) alignment when reactor core isolation cooling (RCIC) system was OOS on September 29, 2004
- Emergency diesel generator (EDG) #4 alignment when EDG #3 was OOS on November 10, 2004
- Unit 1 RCIC alignment when HPCI system was OOS on December 30, 2004

Complete System Walkdown

The inspectors conducted a detailed review of the alignment and condition of the Unit 1 and 2 reactor protection systems (RPS). The inspectors reviewed the Updated Final Safety Analysis Report (UFSAR), Operating Procedures 1OP-03, Reactor Protection Operating Procedure, and 1OP-01, Nuclear Boiler System, and the system flow diagrams (drawing numbers FP-55109 and FP-55046).

b. Findings

No findings of significance were identified.



## 1R05 Fire Protection

### a. Inspection Scope

#### Fire Area Walkdowns

The inspectors reviewed current ARs and work orders (WOs) associated with the fire suppression system to confirm that their disposition was in accordance with Administrative Procedure OAP-033, Fire Protection Program Manual. Documents reviewed are listed in the Attachment. 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 to determine whether any conditions or deficiencies existed which would impair the operability of that equipment. The inspectors toured the following 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:

- Radioactive Material - Container Storage Building (1 area)
- E7 Switchgear Room 23' Elevation (1 area)
- Unit 1 Refueling Floor (1 area)
- Unit 1 Reactor Building 20' Elevation (2 areas)
- EDG Rooms 1 through 4 (4 areas)
- Service Water Building (2 areas)

#### Fire Drill

On November 23, 2004, the inspectors observed a plant fire drill in the radioactive material - container storage building, to assess the fire brigade performance and to verify that proper firefighting techniques for the type of fire encountered were utilized. The inspectors monitored the fire brigade's use of protective equipment and firefighting equipment to verify that preplanned firefighting procedures and appropriate firefighting techniques were used, and to verify that the directions of the fire brigade leader were thorough, clear, and effective. The inspectors attended the critique to confirm that appropriate feedback on performance was provided to brigade members and to ensure that areas for improvement were properly identified for licensee follow-up. In preparing for and evaluating the drill the inspectors reviewed the preplanned drill scenario, Brunswick Nuclear Plant Drill Scenario Guide, 04-F-RMCSB-01, and the fire plan for the area. Documents reviewed are listed in the Attachment.

### b. Findings

No findings of significance were identified.

## 1R06 Flood Protection Measures

### Internal Flooding

#### a. Inspection Scope

The inspectors performed a walkdown of the Unit 1 and 2 reactor buildings above elevation 20' (two areas) to verify that internal flood protection features were consistent with the licensee's internal flooding analysis as described in 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 the analysis assumptions and conclusions were based on the current plant configuration. The internal flooding design features and equipment for coping with internal flooding was inspected. The walkdown included sources of flooding and drainage, curbs, pedestals, and equipment mounting. The inspectors reviewed the procedures for coping with internal flooding. Documents reviewed are listed in the Attachment.

#### b. Findings

No findings of significance were identified.

## 1R07 Heat Sink Performance

#### a. Inspection Scope

##### Annual Review

The inspectors reviewed the licensee's execution and on-line monitoring of biofouling controls for the service water systems on a continuing basis. The inspectors verified that nuclear service water intake structure inspection and water treatment with biocides were performed in accordance with licensee commitments made in response to NRC Generic Letter 89-13, Service Water Systems-Problems Affecting Safety-Related Equipment.

The inspectors reviewed activities associated with abnormal low flow conditions experienced on the Unit 1 B and D residual heat removal (RHR) pump seal coolers during the inspection period. The inspectors reviewed the design basis for the seal coolers, maintenance history, and flow performance monitoring, to verify that controls were in place to detect degradation prior to loss of heat removal capability below design-basis values. Licensee actions to correct the low flow condition were also reviewed. Documents reviewed are listed in the Attachment.

##### Biennial Heat Sink Performance

The inspectors reviewed inspection records, test results, maintenance work orders, and other documentation to ensure that heat exchanger (HX) deficiencies that could mask or degrade performance were identified and corrected. The test procedures and records

were also reviewed to verify that these were consistent with Generic Letter (GL) 89-13 licensee commitments, and EPRI Heat Exchanger Performance Monitoring Guidelines. Risk significant heat exchangers reviewed included the RHR and Containment Spray (CS) pump room coolers, the RHR Service Water (SW) booster pump motor coolers, and the EDG jacket water HXs.

The inspectors reviewed the GL 89-13 program procedure, inspection and cleaning procedures, completed inspection records, and design specification sheets for all the safety related HXs selected. In addition, the inspectors reviewed the thermal performance test procedure that was planned to be used for the EDG jacket water and RHR HXs. These documents were reviewed to verify that test methods were consistent with industry standards, and to verify inspection methods and performance of the HXs under the current maintenance frequency were adequate. To verify minimum flow requirements and HX design basis were being maintained, the inspectors reviewed SW system hydraulic performance test records, acceptance criteria, and HX minimum required flow calculations.

The inspectors also reviewed general health of the SW system via review of design basis documents, system health reports, system microbiologically influenced corrosion (MIC) studies, self assessments, SW system data trending such as SW pump motor temperatures and chlorination sampling, and discussions with the SW system engineer. Additionally, SW intake inspection and cleaning work orders, SW pipe crawl through inspection results, and testing records for the emergency reactor core flooding SW backup valves were reviewed. These documents were reviewed to verify design bases were being maintained and to verify adequate SW system performance under current preventive maintenance, chemical treatments, inspections and frequencies.

ARs were reviewed for potential common cause problems and problems which could affect system performance to confirm that the licensee was entering problems into the corrective action program (CAP) and initiating appropriate corrective actions. These ARs included actions regarding RHR pump seal cooler degraded flow conditions, SW pump strainer clogging, and reports regarding SW pipe through-wall leaks and related piping support modifications. In addition, the inspectors conducted a walkdown of all selected HXs and major components for the SW system to assess general material condition and to identify any degraded conditions of selected components. Documents reviewed are listed in the Attachment.

b. Findings

No findings of significance were identified.

## 1R11 Licensed Operator Requalification

### a. Inspection Scope

#### Biennial Review

During the week of November 29, 2004, the inspectors reviewed documentation, interviewed licensee personnel, and observed the administration of simulator operating tests and job performance measures (JPMs) associated with the licensee's operator requalification program. Each of the activities performed by the inspectors was done to assess the effectiveness of the licensee in implementing requalification requirements identified in 10 CFR 55, "Operators' Licenses." The evaluations were performed to verify that the licensee effectively implemented operator requalification guidelines established in NUREG-1021, "Operator Licensing Examination Standards for Power Reactors," and Inspection Procedure 71111.11, "Licensed Operator Requalification Program." The inspectors reviewed and evaluated the licensee's simulation facility for adequacy of use in operator licensing examinations. The inspectors observed three operator crews and one staff crew during the performance of the operating tests. Documentation reviewed included written examinations, JPMs, simulator scenarios, licensee procedures, on-shift records, licensed operator qualification records, selected watchstanding and medical records, the feedback process, and remediation plans. The inspectors also reviewed a sample of simulator performance test records (transient tests, malfunction tests, steady state test, and procedure tests), simulator modification request records, and the process for ensuring continued assurance of simulator fidelity to ensure compliance with 10CFR 55.46, "Simulation Facilities." Licensee documents reviewed during the inspection are listed in the Attachment.

Following the completion of the operating examination testing cycle which ended on December 17, 2004, the inspectors reviewed the overall pass/fail results of the individual JPM operating tests, and the simulator operating tests administered by the licensee during the operator licensing requalification cycle. These results were compared, and found to be satisfactory, to the thresholds established in NRC Inspection Manual Chapter 0609 Appendix I, Operator Requalification Human Performance Significance Determination Process (SDP).

#### Quarterly Review

The inspectors observed licensed operator performance and reviewed the associated training documents during simulator training sessions for training cycle 2003-04. 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 ensures safe power plant operation. The inspectors observed licensed operator simulator examinations on November 17, 2004. The scenarios tested the operators' ability to respond to a loss of offsite power, a loss of coolant accident, an anticipated transient without scram, and a loss of normal heat sink. The inspectors reviewed the operators' activities to verify consistent clarity and formality of

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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 Technical Specification (TS) actions, regulatory reports, and notifications, were observed. The inspectors assessed whether appropriate feedback was planned to be provided to the licensed operators. The inspectors reviewed documents listed in the Attachment.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness

a. Inspection Scope

For the equipment issues described in work documents 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.

- AR 143044, E7-E8 former crosstie breaker functional failure
- AR 146005, 24 volt DC battery charger Maintenance Rule scoping deficiency

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 six 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 unforeseen 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 following OOS equipment or conditions:

- WO 338361, Unit 2 RCIC OOS concurrent with EDG #1 outage on September 29, 2004 (planned)
- AR 143512, Unit 2 RCIC inoperable due to torus suction valve (2-E51-F031) failure on November 12, 2004 (emergent)
- AR 143328, EDG #3 inoperable due to failed relay (2-DG3-ASCR-A) in engine control circuitry on November 10, 2004 (emergent)
- AR 144352, Standby liquid control pumps 1A and 2B declared inoperable due to discharge piping voiding on November 22, 2004 (emergent)
- AR 145757, Failure of 24VDC battery charger 22B-1 and subsequent battery bus voltage drop causing an invalid Group 6 containment isolation on December 1, 2004 (emergent)
- WO 642836, Repack HPCI steam supply valve 1-E41-F001 due to increase in valve packing leak on December 30, 2004 (emergent)

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 operating crew's performance during an unplanned abnormal condition caused by a chlorine leak on the tank car liquid supply valve on November 5, 2004. The inspectors reviewed operator event response to verify the response to the event was in accordance with procedures and training. Operator logs, plant computer data, associated operator actions, and Abnormal Operating Procedure 0AOP-34.0, Chlorine Emergencies were reviewed. The inspectors reviewed AR 142943, which documented the event, to verify that the licensee properly identified and resolved operational events in the CAP.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations

a. Inspection Scope

The inspectors reviewed the five operability evaluations associated with the following five issues, listed below, 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,

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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 applicable system engineer regarding the ability of the system to perform its intended safety function.

- AR 144352, Standby liquid control pumps 1A and 2B return to operation.
- AR 146164, Switchyard pneumatic circuit breaker (PCB) gas leaks including main generator output breaker PCB 22A
- AR 142013, Load limits for 4kv buses 2C and 2D were exceeded
- AR 141989, SLC system engineer notified control room of potential air in leakage from accumulator bladder
- AR 140022, EDGs inoperable when manually loaded to respective bus due to relay interaction issues

b. Findings

No findings of significance were identified.

1R16 Operator Work-Arounds (OWAs) Cumulative Effects

a. Inspection Scope

The inspectors reviewed the OWA database to determine their cumulative effects and reviewed operator turnover sheets to verify that no unidentified OWAs existed. The effect of the OWAs on reliability, availability, and potential misoperations of the systems involved were reviewed. The inspectors reviewed the OWAs on Unit 1 and Unit 2 to verify that no increase in initiating event frequency occurred and that the OWA could not affect multiple mitigating systems. The cumulative effects of OWAs on operators' correct and timely response to plant transients and accidents were also reviewed by the inspectors.

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 affected 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 OPLP-20, Post Maintenance Testing Program.

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- WO 636712, Repair Unit 2 RCIC torus suction isolation valve
- WO 143328, Repair failed relay on EDG #3 control circuitry
- WO 552916, Replace Unit 1 HPCI auxiliary oil pump
- WO 642731, Repair SLC pump nitrogen accumulator bladder
- WO 628300, Repair EDG #4 jacket water head tank sight glass
- WO 654575, Repair 1-CAC-AT-1260-1, Unit 1 containment air particulate radiation monitor

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 three 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.

- 2MST-HPCI127Q, HPCI and RCIC Condensate Storage Tank (CST) Low Water Level Instrument Channel Calibration, Revision 7
- Plant Operating Manual (POM), Vol. VIII, 0E&RC-1010, Fuel Oil Sampling, Rev. 24
- 1OI-03.1, Control Operator Daily Surveillance Report, Revision 79 (reactor coolant system leakage detection surveillance)

Inservice Surveillance Testing

The inspectors reviewed the performance of Periodic Test OPT-06.1, Standby Liquid Control System Operability Test, Revision 60 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 OPLP-22, Temporary Changes, to assess implementation of temporary modification OSMP-SFPC500 Installation of Supplemental Spent Fuel Pool Cooling. The inspectors reviewed the temporary modification to verify that the modification was properly installed and whether it had any adverse effect on system operability. The inspectors also assessed drawings and procedures for appropriate updating and post-modification testing.

### b. Findings

No findings of significance were identified.

Cornerstone: Emergency Preparedness

## 1EP1 Exercise Evaluation

### a. Inspection Scope

The inspectors reviewed the emergency exercise and scenario for the November 16, 2004, biennial emergency response exercise, which was required by Section IV.F.2.c of Appendix E to 10 CFR Part 50. The purpose of the review was to verify that the licensee had created a scenario suitable to test the major emergency plan elements in accordance with Appendix E to 10 CFR Part 50 and that the exercise was a satisfactory test of the Emergency Plan and whether the licensee's response to the simulated emergency conditions met the requirements of 10 CFR Part 50.47(b).

Licensee activities inspected during the exercise included independent observations in the control room simulator, emergency operations facility, technical support center, and operations support center. The inspectors reviewed a sample of prior corrective actions and determined whether performance trends represented a failure to: correct weaknesses; meet planning standards; or meet other regulatory requirements. The inspectors' evaluation focused on the risk-significant activities of event classification, notification of governmental authorities, onsite protective actions, offsite protective action recommendations, and accident mitigation. The inspectors also evaluated command and control, the transfer of emergency responsibilities between facilities, communications, adherence to procedures, and the overall implementation of the emergency plan. The inspectors attended the post-exercise critique to evaluate the licensee's self-assessment process, as well as the presentation of critique results to plant management.

### b. Findings

No findings of significance were identified.

#### 1EP4 Emergency Action Level and Emergency Plan Changes

##### a. Inspection Scope

The inspectors reviewed all emergency action level changes against the requirements of 10 CFR 50.54(q) to determine whether they had decreased the effectiveness of the Radiological Emergency Plan. The licensee had implemented Radiological Emergency Plan Revisions 63, 64, and 65 since the last inspection of this area, conducted in December 2003. The inspectors reviewed documentation of the licensee's 10 CFR 50.54(q) screening evaluations for the referenced revisions.

##### b. Findings

No findings of significance were identified.

#### 1EP6 Drill Evaluation

##### a. Inspection Scope

The inspectors observed a simulator-based training evolution conducted on November 17, 2004. The inspectors reviewed the evolution scenario's narrative to identify the timing and location of emergency classifications and notifications. The inspectors evaluated the training evolution conduct from the control room simulator. During the evolution, the inspectors assessed the adequacy of event classification and notification activities. The inspectors observed the evaluators' post-evolution critique. The inspectors assessed the licensee's evaluation of the evolution's performance with respect to performance indicators.

##### b. Findings

No findings of significance were identified.

#### 4OA1 Performance Indicator Verification

##### a. Inspection Scope

The inspectors sampled licensee submittals for the Unit 1 and 2 performance indicators (PIs) listed below for the periods indicated. 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, Heat Removal System (RCIC)-July 2003 through September 2004
- Reactor Coolant System Activity-September 2003 through September 2004

- Reactor Coolant System Leakage-September 2003 through September 2004

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 CAP records were also reviewed to determine if any problems with the collection of PI data had occurred. Documents reviewed are listed in the Attachment.

#### Emergency Preparedness Cornerstone

- Emergency Response Organization (ERO) Drill/Exercise Performance-October 2003 through September 2004
- ERO Drill Participation-October 2003 through September 2004
- Alert and Notification System Reliability-October 2003 through September 2004

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

#### b. Findings

No findings of significance were identified.

### 4OA2 Problem Identification and Resolution

#### .1 Routine Review of ARs

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 CAP. The review was accomplished by reviewing daily AR reports.

#### .2 Annual Sample Review

##### a. Inspection Scope

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:

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- 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 inspectors reviewed the associated corrective actions for AR 144352, Gas Voids Cause SLC Pump 1A and Pump 2B to be Inoperable.

b. Findings and Observations

Introduction

A self-revealing Green non-cited (NCV) was identified for failure to adequately store the Unit 1 standby liquid control system nitrogen accumulator bladders to prevent their deterioration.

Description

During the Spring 2004 Unit 1 refueling outage (B115R1) the licensee replaced the 1A and 1B standby liquid control (SLC) system nitrogen accumulator bladders as required by periodic maintenance. The accumulator's function is to reduce discharge pressure pulsations during pump (3 cylinder positive displacement) operation. The licensee also implemented a modification to the system which changed the pump test flow lineup from test tank-to-test tank to storage tank-to-storage tank via the tank sparger line. The lineup change resulted in higher pump discharge pressure [90 psig vs. approximately atmospheric] on pump startup for testing, because of the restrictions to flow through the sparger line. On July 8, 2004, SLC pump 1B failed quarterly surveillance testing due to only delivering approximately 2/3 of design flow. The issue was documented in AR 131159. Initial investigation efforts included pump disassembly inspection but the cause of failure was inconclusive. The pump was declared operable with weekly pump testing instituted as a compensatory measure while other possible causes of the failure were planned to be investigated. The inspectors questioned the basis for ruling out gas binding as a cause and noted two potential sources (nitrogen contained in the accumulator bladder and air used for storage tank sparging). Although the licensee's fault tree analysis identified gas binding as a potential cause for reduced flow, no troubleshooting was performed at the time of the failure. Testing later ruled out gas intrusion due to tank sparging (mixing). Pump discharge piping ultrasonic testing was later instituted to detect gas accumulation.

On October 27, 2004, ultrasonic testing detected significant gas voiding in the SLC Pump 1B discharge piping. The SLC pump 1B nitrogen accumulator bladder was replaced due to bladder leakage being the only credible source of the leak. On

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November 22, 2004, ultrasonic testing found voiding in the discharge piping of the 1A SLC pump. The gas void on the 1A pump was sampled and determined to be nitrogen. Following replacement of the SLC pump 1A accumulator bladder, the licensee declared the pump operable. The licensee initiated AR 144352 to investigate the cause of the bladder failure.

The licensee found that the installed commercial-grade SLC system nitrogen accumulator bladders were evaluated for safety-related use by Material Evaluation (ME) 3472, dated February 4, 1999. ME 3472 did not contain any special storage requirements. However, as documented in a technical bulletin (Greer Technical Bulletin 81-10, dated 6/1/81), the manufacturer stated that the bladders could be stored up to three years in the as-shipped configuration (i.e., deflated and folded) without deterioration. Longer-term storage was allowed provided that special storage requirements were met (e.g., inflated, stored away from light, etc.). The requirements were specified to minimize the chance of leaks developing along the folds of the bladders. A licensee material evaluation documented in 1985 (EER 85-0024) referenced the bulletin, however, the information was omitted from subsequent evaluations. Additionally, the licensee was unaware of information that further revised the storage recommendations to one year as-shipped or two years inflated. This information was documented in a manufacturer internal memorandum in April 2000, however, the information was not forwarded to the licensee. As a result of ME 3472 not containing the special storage requirements, the licensee failed to store the nitrogen accumulator bladder repair kits in a condition which would prevent deterioration from 1999 until March 2004 when they were installed in the Unit 1 SLC system. This resulted in accumulator bladder nitrogen leakage into the Unit 1 SLC system and was determined to be the cause of the 1B SLC pump being discovered in an inoperable condition during testing on July 8, 2004. The licensee promptly replaced the installed bladders with newly obtained bladders. The licensee's investigation determined that the bladders installed in the Unit 2 SLC system were not stored long enough to be adversely effected.

### Analysis

The failure to adequately store the Unit 1 SLC system nitrogen accumulator bladders to prevent their deterioration is greater than minor because it is associated with equipment performance and affected the functional capability of the system to respond to initiating events (Mitigating System Cornerstone). This resulted in accumulator nitrogen leakage into the system and was determined to be the cause of the 1 B SLC pump being discovered in an inoperable condition and not capable of performing its design function on July 8, 2004. A Phase 2 SDP analysis determined this finding to initially be of low safety significance (White). Because the actual time of inception of the condition was unknown, an exposure time equal to ½ of the exposure time from the last known successful operation of the pump (April 15, 2004) was applied. During this time period, the 1A train of the SLC system remained operable. A Phase 3 SDP analysis was performed for the finding because the SDP sheets did not represent the as-built condition of the plant. During the performance of the analysis, the full mitigating capability of the SLC (Reactivity Control function) was changed from 2 of 2 to 1 of 2

pumps on SDP Worksheet Anticipated Transients Without Scram (Table 3.8) located in the Risk-Informed Inspection Notebook for Brunswick Steam Electric Plant, Units 1 and 2, Revision 1. This was based on the improved system performance due to a modification the licensee implemented on the system during Refueling Outage B115R1 (March 2004). This modification replaced the SLC storage tank contents with an enriched sodium pentaborate solution as a neutron absorber. The modified Phase 2 sheets resulted in a Green finding, a finding of very low safety significance. In addition, a SPAR model run was made using the NRC's Sapphire risk program, which confirmed the issue to be Green.

### Enforcement

10CFR50, Appendix B, Criterion XIII, requires, in part, that measures shall be established to control the handling and storage of material and equipment in accordance with work and inspection instructions to prevent damage or deterioration. Contrary to Criterion XIII, Nitrogen Accumulator Repair Kits (CP&L Part Number 733-135-46) were stored in a condition which did not prevent deterioration. This condition existed since at least 1999 until March 2004 when the kits were installed in the Unit 1 A and 1B SLC subsystems. As a result, accumulator nitrogen leaked into the Unit 1 SLC system and was determined to be the cause of the 1B SLC pump being discovered in an inoperable condition on July 8, 2004. Because this issue is of very low safety significance and has been entered into the licensee's CAP (AR 144352), this violation is being treated as an NCV, consistent with Section VI.A of the NRC Enforcement Policy: NCV 05000325/2004005-01, Inadequate Storage of Standby Liquid Control System Nitrogen Accumulator Repair Kits.

### .3 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 review was focused on repetitive equipment issues but also considered the results of frequent inspector CAP item screening (discussed above), licensee trending efforts, and licensee human performance results. The review nominally considered the period of July through December 2004, although some examples expanded beyond these dates as warranted by the scope of the trend. The review further included issues documented outside the normal CAP in major equipment lists, repetitive and/or rework maintenance lists, equipment and "hit" lists, quality assurance audit/surveillance reports, key performance indicators, self-assessment reports, and maintenance rule assessments. The specific items reviewed are listed in the Attachment. The inspectors compared and contrasted their results with the results contained in the licensee's latest quarterly trend reports. Corrective actions associated with a sample of the issues identified in the licensee's trend reports were reviewed for adequacy. The inspectors also evaluated the reports against the requirements of the licensee's CAP as specified in Nuclear Generation Group Standard Procedure CAP-NGGC-0200, Corrective Action Program, and 10 CFR 50, Appendix B. The inspectors performed a review of licensee actions to

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address site human performance trends which were previously identified in the last semi-annual trend review documented in NRC Inspection Report 05000325, 324/2004003, dated July 19, 2004. Additional documents reviewed are listed in the Attachment.

b. Findings and Observations

No findings of significance were identified. The inspectors evaluated the licensee's trending methodology and observed that the licensee had performed a detailed review for trends. The licensee routinely reviewed cause codes, involved organizations, key words, and equipment reliability data to identify potential trends in its CAP data. The inspectors compared the licensee's process results with the results of the inspectors' CAP item screening and did not identify any discrepancies or potential trends that the licensee had failed to identify.

The inspector observed that the licensee had taken several actions to address previously identified trends in the area of site human performance. Performance in this area was previously identified as an adverse trend in the last semi-annual trend review documented in NRC Inspection Report 05000325, 324/2004003, dated July 19, 2004. Licensee actions to address the trend included developing living human performance improvement plans at the site section level. To address the identified adverse trend in human performance in the maintenance organization, the licensee established a comprehensive behavior based human performance strategic plan. The inspectors noted that the licensee has raised site awareness of human performance by establishing a Human Performance Error Site Clock and routinely discussed human performance at site meetings. Additionally, the licensee has received industry site assist visits in the area of human performance. The inspector's observations indicated that the trend in human performance events had improved somewhat since the last review based on less frequent and consequential errors. However, recent errors have occurred as documented in AR 145898 (24 VDC bus 22B-1 voltage drop due to operator error) and AR 146727 (fuel management guideline exceeded during rod movement). The inspector concluded that further review of this trend was warranted based on the licensee's ongoing actions.

The inspectors noted two instances, during the period under review, where licensee extent-of-condition reviews of issues were not of sufficient detail to detect related adverse conditions on similar equipment. These observations were related to control rod drive hydraulic line corrosion issues and drywell-to-suppression chamber vacuum breaker binding. Both issues were documented in NRC Inspection Report 05000325, 324/2004004 (Section 4OA2), dated October 15, 2004. Additionally, observations related to the extent-of-condition review of an adverse condition associated with an emergency bus relay cover were documented in NRC Special Inspection Report 05000325/2004011 (Section 4OA3.2.2), dated September 26, 2004. The inspectors noted that extent-of-condition reviews of adverse conditions had been an area of management emphasis during AR reviews. Although there were three observations associated with the quality of the extent-of-condition reviews during the inspection period, a performance trend in this area had not yet been clearly established.

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4OA3 Event Follow-up

- .1 (Closed) Licensee Event Report (LER) 05000324/2004002: Reactor Shutdown Required by Technical Specifications Due to Containment Vacuum Breaker Not Closed.

During routine surveillance testing on July 29, 2004, one Unit 2 suppression chamber-to-drywell vacuum breaker (2-CAC-X18D), opened for testing, would not close with the unit operating at approximately 88 percent power. In accordance with TS LCO 3.6.1.6, the unit entered Mode 4 (cold shutdown) at 0025 on July 30, 2004. The licensee determined the cause of the vacuum breaker sticking open was due to mechanical interference (binding) between a portion of the hinge assembly and an "opened" limit switch fit up bushing. The interference which caused the binding was determined to be introduced by vacuum breaker maintenance activities during the previous refueling outage. The licensee completed repairs and restored the vacuum breakers to operable status prior to plant startup.

The inspectors reviewed the causes of the event. The licensee determined the root cause of the vacuum breaker binding was due to insufficient maintenance procedure detail and guidance. The procedures used for maintenance and testing of the vacuum breakers did not contain guidance to address potential binding which could be introduced during maintenance activities. The inspectors reviewed the vendor manual (FP-6663, Vacuum Breakers-GPE Controls) and found that it did not contain any information or cautions for the potential interference between the vacuum breaker hinge and limit switch fit up bushing. Due to the lack of guidance in the vendor manual and industry operating experience with respect to the potential interference, no licensee performance deficiency was identified and no violation of regulatory requirements occurred. This LER is closed.

- .2 (Closed) LER 05000324/2004003: Unanalyzed Condition due to Missing One-Hour Rated Fire Barrier-480 Volt Switchgear Room.

On October 29, 2004, it was determined that two conduits located in a Unit 2 480-volt switchgear room were not properly protected as required by 10CFR50, Appendix R, Section III.G.2. This issue was identified during an NRC Triennial Fire Protection inspection and resulted in a Green finding and NCV of regulatory requirements. This issue is discussed in detail in NRC Triennial Fire Protection Inspection Report 05000325, 05000324/ 2004010 (Section 1R05.09). No new information was identified in the LER. This LER is closed.

- .3 (Closed) LER 05000325/2004001-00, Emergency Diesel Generator No. 3 Condition Prohibited by Technical Specifications.

This dual unit LER applied to both Brunswick Units 1 and 2. The LER was reviewed and closed in NRC Inspection Report 05000324/2004009. The corrective actions were applicable to both Brunswick Units 1 and 2. However, the LER for Unit 1 could not be closed in report 05000324/2004009 as this was a Unit 2 inspection report. Therefore, the Unit 1 LER required a separate but only administrative closure in a subsequent

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report. As described in NRC IR 05000324/2004009, the inspectors reviewed the licensee's corrective actions delineated in the LER and determined that the actions were adequate. The corrective actions were completed within and in accordance with the licensee's CAP. No findings of significance were identified by the inspector's review of this LER. This LER is closed.

#### 40A6 Meetings, Including Exit

On January 5, 2005, the resident inspectors presented the inspection results to Mr. D.H. Hinds and other members of the Brunswick Management Staff. The inspectors confirmed that proprietary information was not provided or examined during the inspection.

On December 14, 2004, the Division of Reactor Projects, Chief of Branch 4 conducted a Regulatory Performance Meeting with Mr. C.J. Gannon and other members of his staff. The meeting was conducted in accordance with NRC Inspection Manual, Manual Chapter 0305, Operating Reactor Assessment Program, and was associated with a White finding involving a No. 3 EDG jacket cooling water system leak. A Supplemental Inspection of the finding was completed on December 10, 2004 and documented in NRC Inspection Report 05000324/2004009, dated January 7, 2005. The performance deficiencies and corrective actions associated with the finding were discussed at the meeting.

ATTACHMENT: SUPPLEMENTAL INFORMATION

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## 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  
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  
S. Kaseman - Engineering Supervisor  
R. Kitchen - Engineering Manager  
J. Leviner - Operations Training  
E. O'Neil - Site Support Services Manager  
A. Pope - Maintenance Manager  
E. Quidley - Outage and Scheduling Manager  
C. Robert - Operations Training  
T. Sherrill - Service Water System Engineer  
S. Tabor - Technical Support Lead Engineer  
M. Williams - Operations Manager

#### 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

05000325/2004005-01	NCV	Inadequate Storage of Standby Liquid Control System Nitrogen Accumulator Repair Kits (Section 4OA2)
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#### Closed

05000324/2004002-00	LER	Reactor Shutdown Required by Technical Specifications Due to Containment Vacuum Breaker Not Closed (Section 4OA3.1)
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05000324/2004003-00	LER	Unanalyzed Condition due to Missing One-Hour Rated Fire Barrier - 480 Volt Switchgear Room (Section 4OA3.2)
05000325/2004001-00	LER	Emergency Diesel Generator No. 3 Condition Prohibited by Technical Specifications (Section 4OA3.3)

Discussed

NONE

## LIST OF DOCUMENTS REVIEWED

### **Section 1R01: Adverse Weather Protection**

OPM-HT001, Preventive Maintenance on Plant Freeze Protection and Heat Tracing System, Rev. 7  
 0OI-01.03, Non-Routine Activities, Rev. 21  
 System Description 53, Freeze Protection and Heat Tracing  
 AR 113573, Review adequacy of heat trace program  
 AR 115083, Unit 2 CST heat trace setpoint

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

Plant Operating Manual (POM), Vol. III, 2OP-19, High Pressure Coolant Injection System Operating Procedure, Rev. 102  
 POM, Vol. III, 1OP-16, Reactor Core Isolation Cooling System Operating Procedure, Rev. 57

### **Section 1R05: Fire Protection**

POM, Vol. XIX, 0PFP-013, General Fire Plan, Rev. 22  
 POM, Vol. XIX, 0PFP-MBPA, Miscellaneous Buildings Prefire Plans - Protected Area, Rev. 5  
 POM, Vol. XIX, 0PFP-DG, Diesel Generator Building Prefire Plans, Rev. 8  
 POM, Vol. XIX, 1PFP-RB, Reactor Building Prefire Plans, Rev. 6  
 POM, Vol. XIX, 0PFP-PBAA, Power Block Auxiliary Areas Prefire Plans (SW, RW, AOG, TY, EY), Rev. 8  
 Brunswick Nuclear Plant Drill Scenario Guide, 04-F-RMCSB-01, Fire in RMCSB, Rev. 0

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

Updated Final Safety Analysis Report (UFSAR), Chapter 3, Design of Structures, Components, Equipment and Systems  
 System Description (SD) SD-58, Structures and Cranes, Rev. 3  
 POM, Vol. I, Book 2, Administrative Instruction 0AI-68, Brunswick Nuclear Plant Response to Severe Weather Warnings, Rev. 23  
 AR 145529

### **Section 1R07: Heat Sink Performance**

#### Calculations

G0050A-10, BNP Unit No. 1 Service Water System Hydraulic Analysis, Rev. 7

#### Procedures

0ENP-2704, Administrative Control of NRC Generic Letter 89-13 Requirements, Rev. 8  
 0ENP-2705, Service Water Heat Exchanger Thermal Performance Testing, Rev. 2  
 0PM-ACU500, Inspection and Cleaning of the RHR/Core Spray Room Aerofin Cooler Air Filters and Coolers, Rev. 7  
 0PM-HX503, RHR Service Water Booster Pump Motor Heat Exchanger Inspection, Rev. 7

OPM-STU500, Service Water Intake Structure Inspection and Cleaning, Rev. 11  
 POM, Vol. XX, 0ENP-2704, Administrative Control of NRC Generic Letter 89-13 Requirements,  
 Rev. 8  
 POM, Vol. XVI, 1APP-A-02, Annunciator Procedure for Panel A-02, Rev. 32

### Drawings

D-02041, Unit 2 Service Water System Piping Diagram, Sh. 2, Rev. 61  
 D-02274, Piping Diagram Diesel Generator Service Water & Demineralized Water Systems,  
 Sh. 1 & 2, Rev. 23 & 22  
 D-02537, Reactor Building Piping Diagram Service Water System Unit 2, Sh. 1 & 2, Rev. 82 &  
 81  
 D-20041, Piping Diagram Service Water System Unit 1, Sh. 2, Rev. 52  
 D-25037, Unit 1 Reactor Building Service Water System, Sh. 1 & 2, Rev. 85 & 78

### Engineering Changes

55455, Rubber Lining Service Water V104/V105 Piping Spool Piece, Rev. 1  
 59781, Replace Unit 1 RHR Pump Seal Cooler Discharge Line Flow Orifices, Rev. 0

### Action Requests

AR 74020, Clogged SW Strainers Due to Accumulation of Oyster Shells, 10/10/02  
 AR8439, Self Assessment Report for Cooling Water Reliability (GL 89-13) Program, 09/24/03  
 AR 88981, RHR Pump Seal Cooler Low Flow, 03/28/03  
 AR 94989, Through Wall Leak on Nuclear Service Water Supply to B-Loop RHRSW, 06/01/03  
 AR 106070, GL 89-13 Program Does Not Meet the Requirements of EGR-NGGC-008, 10/01/03  
 AR 106128, GL 89-13 Program Needs to be Able to Demonstrate that Safety Related Heat  
 Exchangers can Remove DBA Heat Loads and Include EPRI 7552 Criteria, 10/01/03  
 AR 106130, The Bases for Changing Safety Related Heat Exchanger Inspection Frequencies  
 Were Not Included in the Scope of the GL 89-13 Program, 10/01/03  
 AR 106132, There Is No Assurance that SW Cooled Safety Related Heat Exchangers and  
 Other Components Will be Laid Up with Only Chlorinated Water, 10/01/03  
 AR 142673, 1D RHR Pump Seal Cooler Reduced Flow, 11/03/04  
 AR 144045, Unit 1B RHR pump low seal cooling water flow alarm sealed in  
 AR 142673, Unit 1D RHR pump low seal cooling water flow alarm sealed in

### Completed Procedures

0ENP-2704, Attachment 2, Service Water Safety Related Heat Exchanger Cleaning/Inspection  
 Data Sheet, 1A & 1B RHR Room Cooler, completed 03/15/02  
 0ENP-2704, Attachment 2, Service Water Safety Related Heat Exchanger Cleaning/Inspection  
 Data Sheet, 1A & 1B Core Spray Room Cooler, completed 05/13/02  
 0ENP-2704, Attachment 2, Service Water Safety Related Heat Exchanger Cleaning/Inspection  
 Data Sheet, No. 1 & 2 Diesel Generator Jacket Water Cooler, completed 06/16/02, 07/18/00  
 0ENP-2704, Attachment 2, Service Water Safety Related Heat Exchanger Cleaning/Inspection  
 Data Sheet, 1A, 1B, 1C & 1D RHR SW Pump Motor Cooler, completed 08/13/03, 07/19/01,  
 06/23/99, 07/17/03, 06/21/01, 08/19/99, 12/06/01  
 0PT-08.1.5, RHRSW Cross-Tie Valves Operability Test, completed 03/16/01, 03/12/00  
 1PT-24.6.4, Service Water System Hydraulic Performance Test, completed 03/27/02, 05/16/98

Completed Work Orders

WO 378427-01, Unit 1 SW and SCW Pump Bay Silt and Biofouling Cleaning and Inspection, 11/30/03

WO 388555-01, Unit 2 SW and SCW Pump Bay Silt and Biofouling Cleaning and Inspection, 10/17/03

Miscellaneous Documents

10510B6L/4060, Review of BNP Service Water System for MIC Potential, 04/06/92  
 System Health Report, System 4060 Service Water  
 PI System Health Trend Template, System 4060 Service Water  
 Engineering PNSC Startup Topic, B114R1 & B216R1 Service Water Inspection Results  
 NGG Program Health Report, Cooling Water Reliability (89-13), 12/09/04  
 BNP System Description, SD-43, Service Water System, Rev. 8  
 UFSAR, Chapter 7.4, System Required for Safe Shutdown  
 UFSAR, Chapter 9, Auxiliary Systems  
 Tech. Spec. 3.7.2, Service Water System and Ultimate Heat Sink (UHS)

**Section 1R11: Licensed Operator Requalification**

OTPP-206, Simulator Program, Revision 1  
 PRO-NGGC-0200, Procedure Use and Adherence, Revision 6  
 TAP - 100, Analysis Phase, Revision 6  
 TAP - 403, Conduct of Examinations, Revision 6  
 TAP-409, Conduct of Simulator Training and Evaluation, Revision 7  
 TAP - 411, Initial Licensing and Continuing Training Annual/Biennial Exam Development and Security, Revision 3  
 TAP-412, Simulator Operation and Maintenance, Revision 0  
 Licensed Operator Medical Records (10)  
 JPMs  
 Simulator Scenarios  
 Scenario Based Testing for scenarios LORX-006 and  
 Simulator Steady-State Tests for 50%, 75%, and 100% power levels  
 Simulator Transient Tests:  
     Transient Test #3, Simultaneous Closure of all Main Steam Isolation Valves  
     Transient Test #5, Single Recirculation Pump Trip  
     Transient Test #10, Simultaneous Closure of all Main Steam Isolation Valves combined with a single stuck open safety or relief valve  
 Written Examinations  
 Simulator Hardware Differences List  
 Open Simulator Service Requests  
 Closed Simulator Service Requests (1 year)

**Section 1R22: Surveillance Testing**

POM, Vol. XII, 0PDM-MO005C, Teledyne Smart Stem and Quick Stem Sensor Testing, Rev. 8  
 POM, Vol. X, 0PT-06.1, Standby Liquid Control System Operability Test, Rev. 60

## **Section 1EP: Emergency Preparedness Cornerstone**

### Corrective Action Documents

Telecommunications Trouble Ticket 380068, dated 05/24/04. Repair of Siren 23, following the failure of a silent test.

Telecommunications Trouble Ticket 396839, dated 07/12/04. Repair of Siren 03 following failure of a Chopper motor, blown control fuse and tripped thermal breaker.

Action Request (AR) 131754, dated 07/12/04. Repair of Siren 03 following failure of a Chopper motor, blown control fuse and tripped thermal breaker.

Telecommunications Trouble Ticket 404034, dated 07/27/04. Repair of Siren 20 following blown a starting capacitor.

Telecommunications Trouble Ticket 330702, dated 01/06/04. Repair of Siren 17 following a thermal breaker trip.

AR 124085 dated, 03/16/04. Repair of Siren 32 following discovery of a control switch found left in the off position.

Telecommunications Trouble Ticket 420295, dated 09/14/04. Repair of Siren 13 repair of siren 13 following a rotation belt found off the drive pulley.

Telecommunications Trouble Ticket 424885, dated 09/28/04. Repair of Siren 13 replacement of rotation sensor following failure with no apparent cause.

Telecommunications Trouble Ticket 365323, dated 04/13/04. Repair of Siren 27 replacement of rotation sensor following failure.

Telecommunications Trouble Ticket 362659, dated 04/12/04. Repair of Siren 08 following failure of the air supply header to Horn.

Telecommunications Trouble Ticket 370037, dated 04/27/04. Repair of Siren 03 repair of horn assembly following discovery of loose clutch bands on horn assembly.

### Procedures and Plans

OPEP-02.6.12, Activation and Operation of the Operational Support Center, Rev. 27

OPEP-03.7.7, Onsite Radiological Controls, Rev. 2

OAI-122, Pre-Job Briefings and Post-Job Critiques, Rev. 10

Procedure REG-NGGC-0009, Performance Indicators, Revision 3, Attachment 8, Drill/Exercise Performance (October 2003 - October 2004)

Procedure REG-NGGC-0009, Performance Indicators, Revision 3, Attachment 9, Emergency Response Organization Drill Participation (October 2003 - October 2004)

Radiological Emergency Response Plan (ERP), Revisions 63, 64, and 65

### Other Program Documents

CP&L Brunswick Steam Electric Plant Siren System Test Reports (October 2003 - October 2004)

ERO Performance Indicator Tracking Forms (October 2003 - October 2004)

Drill Critique Reports (October 2003 - October 2004)

EPM-210, Emergency Preparedness Drill/Exercise Performance, Revision 3 and 4, Attachment 19, BNP Emergency Preparedness Participation Rosters (October 2003 - October 2004)

**Section 40A1: Performance Indicator Verification**

Nuclear Generation Group Standard Procedure, REG-NGGC-0009, NRC Performance Indicators, Revision 3  
NEI 99-02, Regulatory Assessment Performance Indicator Guidelines  
Unit Operator Logs  
System engineer notebooks  
Chemistry Logs

**Section 40A2: Problem Identification and Resolution**

Nuclear Generation Group Standard Procedure, Volume 99, Book/Part 99, CAP-NGGC-0200, Corrective Action Program, Rev. 14  
AR 1278455, Potential adverse trend in sitewide human performance  
AR 129173, Maintenance adverse trend in human performance  
AR 121925, Outage human performance error trend  
Brunswick Plant CAP Data Evaluation Report for second and third quarters of 2003