



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION II  
SAM NUNN ATLANTA FEDERAL CENTER  
61 FORSYTH STREET SW SUITE 23T85  
ATLANTA, GEORGIA 30303-8931**

January 27, 2003

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

**SUBJECT: BRUNSWICK STEAM ELECTRIC PLANT - NRC INTEGRATED INSPECTION  
REPORT NOS. 50-325/02-04 AND 50-324/02-04**

Dear Mr. Keenan:

On December 28, 2002, 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 January 7, 2003, with Mr. C. J. Gannon 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, the inspectors identified two issues of very low safety significance (Green). The issues were determined to involve violations of NRC requirements. However, because of the very low safety significance and because they are entered into your corrective action program, the NRC is treating these two findings as non-cited violations (NCVs), consistent with Section VI.A of the NRC Enforcement Policy. Additionally, a licensee identified violation is listed in Section 4OA7 of this report. If you contest any NCV in this report, 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 (USNRC), Washington, DC 20555-0001; and the NRC Resident Inspector at the Brunswick facility.

Since the terrorist attacks on September 11, 2001, the USNRC has issued two Orders (dated February 25, 2002, and January 7, 2003) and several threat advisories to licensees of commercial power reactors to strengthen licensee capabilities, improve security force readiness, and enhance access authorization. The USNRC also issued Temporary Instruction 2515/148 on August 28, 2002, that provided guidance to inspectors to audit and inspect licensee implementation of the interim compensatory measures (ICMs) required by the February 25 Order.

Phase 1 of TI 2515/148 was completed at all commercial nuclear power plants during calendar year (CY) 2002, and the remaining inspections are scheduled for completion in CY 2003. Additionally, table-top security drills were conducted at several licensees to evaluate the impact of expanded adversary characteristics and the ICMs on licensee protection and mitigative strategies. Information gained and discrepancies identified during the audits and drills were reviewed and dispositioned by the Office of Nuclear Security and Incident Response. For CY 2003, the USNRC will continue to monitor overall safeguards and security controls, conduct inspections, and resume force-on-force exercises at selected power plants. Should threat conditions change, the USNRC may issue additional Orders, advisories, and temporary instructions to ensure adequate safety is being maintained at all commercial power reactors.

In accordance with 10CFR 2.790 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 50-325, 324/02-04  
w/Attachment: Supplemental Information

cc w/encl: (See page 3)

cc w/encl:

C. J. Gannon, Director  
Site Operations  
Brunswick Steam Electric Plant  
Carolina Power & Light  
Electronic Mail Distribution

W. C. Noll  
Plant Manager  
Brunswick Steam Electric Plant  
Carolina Power & Light Company  
Electronic Mail Distribution

James W. Holt, Manager  
Performance Evaluation and  
Regulatory Affairs CPB 7  
Carolina Power & Light Company  
Electronic Mail Distribution

Edward T. O'Neil, Manager  
Site Support Services  
Carolina Power & Light Company  
Brunswick Steam Electric Plant  
Electronic Mail Distribution

Leonard Beller, Supervisor  
Licensing/Regulatory Programs  
Carolina Power and Light Company  
Electronic Mail Distribution

William D. Johnson  
Vice President & Corporate Secretary  
Carolina Power and Light Company  
Electronic Mail Distribution

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

Beverly Hall, Acting Director  
Division of Radiation Protection  
N. C. Department of Environment  
and Natural Resources  
Electronic Mail Distribution

Peggy Force  
Assistant Attorney General  
State of North Carolina  
Electronic Mail Distribution

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

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

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

Dan E. Summers  
Emergency Management Coordinator  
New Hanover County Department of  
Emergency Management  
P. O. Box 1525  
Wilmington, NC 28402

Distribution w/encl: (See page 4)

Distribution w/encl:  
 B. Mozafari, NRR  
 RIDSNRRDIPMLIPB  
 PUBLIC

OFFICE	DRP/RII	DRP/RII	DRP/RII	DRS/RII	DRS/RII	DRS/RII	DRS/RII
SIGNATURE	GM	GM for	GM for	KD	DF	FW	JK
NAME	GMacdonald:aw	TEaslick	EGuthrie	KDavis	DForbes	FWright	JKreh
DATE	01/27/2003	01/27/2003	01/27/2003	01/23/2003	01/23/2003	01/23/2003	01/24/2003
E-MAIL COPY?	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
PUBLIC DOCUMENT	YES NO						
OFFICE	DRS/RII	DRS/RII	DRS/RII	DRS/RII			
SIGNATURE	LM	KVD for	KVD	KVD			
NAME	LMellen	MScott	KVanDorn	RMaxey			
DATE	01/24/2003	01/23/2003	01/23/2003	01/23/2003	1/ /2003	1/ /2003	1/ /2003
E-MAIL COPY?	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
PUBLIC DOCUMENT	YES NO						

**U. S. NUCLEAR REGULATORY COMMISSION**

**REGION II**

Docket Nos: 50-325, 50-324

License Nos: DPR-71, DPR-62

Report No: 50-325/02-04 and 50-324/02-04

Licensee: Carolina Power and Light

Facility: Brunswick Steam Electric Plant, Units 1 & 2

Location: 8470 River Road SE  
Southport, NC 28461

Dates: September 29 - December 28, 2002

Inspectors: T. Easlick, Senior Resident Inspector  
E. Guthrie, Resident Inspector  
K. Davis, Physical Security Inspector (4OA5)  
D. Forbes, Physical Security Inspector (4OA5)  
F. Wright, Senior Radiation Specialist (2OS1, 4OA1, 4OA7 )  
L. Mellen, Senior Emergency Preparedness Inspector (1EP1,  
1EP4, 4OA1)  
J. Kreh, Emergency Preparedness Inspector (1EP1, 1EP4, 4OA1)  
M. Scott, Senior Reactor Inspector (1R02, 1R17)  
P. VanDoorn, Senior Reactor Inspector (1R02, 1R17)  
R. Maxey, Reactor Inspector (1R02, 1R17)

Approved by: Paul Fredrickson, Chief,  
Reactor Projects Branch 4  
Division of Reactor Projects

Enclosure

## SUMMARY OF FINDINGS

IR 05000325/2002-004, 05000324/200-004; Carolina Power and Light; on 09/29/02 - 12/28/02; Brunswick Steam Electric Plant, Units 1 and 2; Operability Evaluations, Radiation Safety.

The report covered a three month period of inspection by resident inspectors, a regional radiation specialist, regional emergency preparedness inspectors, regional reactor inspectors, and regional physical security inspectors. Two Green non-cited violations (NCVs) were identified. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using IMC 0609, "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. Inspector Identified and Self-Revealing Findings

#### Cornerstone: Barrier Integrity

- Green. An inadequate implementation of Procedure 0ENP-54, Building Ventilation Pressure Control, resulted in a breach of the control room habitability envelope that exceeded the allowable leakage criteria to maintain both units' control room emergency ventilation (CREV) systems operable.

A non-cited violation of Technical Specification (TS) 5.4.1a was identified. This issue was considered to be more than minor because it affected a cornerstone attribute and an associated cornerstone objective. The barrier integrity objective and containment functionality attribute of configuration control and human performance in post-accident and event performance were affected. Additionally, if this issue was left uncorrected, it would have been a more significant safety concern. The finding involved the barrier integrity cornerstone in which the control room barrier was degraded and represented a degradation of the barrier function of the control room against smoke and a toxic atmosphere. This issue was evaluated to be very low safety significant. The impact of chlorine gas intrusion (toxic atmosphere) into the control room during the period the door was blocked open was limited to the human factors concern of control room response while wearing breathing apparatus. Also, the CREV systems for both units were returned to operable status within the TS allowed time frame. Operator actions of interest were those required to respond to an initiating event that happened during the short time of vulnerability. (Section 1R15.1)

#### Cornerstone: Mitigating Systems

- Green. An inadequate implementation of Preventive Maintenance Procedure 0PM-STU500, Service Water Intake Structure Inspection and Cleaning, resulted in the 1A Nuclear Service Water (NSW) pump becoming inoperable, with a loss of function, due to the pump's discharge strainer becoming clogged with oyster shells during a diving evolution.

A non-cited violation of TS 5.4.1a was identified. This issue was considered to be more than minor because it affected a cornerstone attribute and an

associated cornerstone objective. The mitigating systems cornerstone objective to ensure reliability, availability, and capability of systems that respond to initiating events was affected by equipment performance and human error. The finding was determined to be of very low safety significant because the risk was mitigated by the availability of the conventional service water pumps which were utilized in accordance with the abnormal operating procedures to restore service water flow. (Section 1R15.2)

B. Licensee Identified Violations

A violation of very low significance, which was identified by the licensee, has been reviewed by the inspectors. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program. The violation and corrective action tracking number are listed in Section 4OA7.

## REPORT DETAILS

### Summary of Plant Status

Unit 1 began the report period in startup at 15 percent power. Power was increased to 35 percent on September 30 and later decreased to 22 percent to remove the turbine from service and complete repairs on a minor steam leak in the turbine building. The unit was returned to full power on October 4, and continued full power operation for the entire report period with the following exceptions. On December 13 power was reduced to 53 percent for valve testing and main condenser water box manway seal repairs.

Unit 2 began the report period operating at full power. The unit operated at full power for the entire report period with the following exceptions. On November 17 power was reduced to 65 percent for valve testing. On December 21 power was reduced to 70 percent for main condenser water box manway seal repairs.

#### 1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

##### 1R01 Adverse Weather Protection

###### a. Inspection Scope

The inspectors reviewed the licensee's preparations for severe weather as described in Administrative Instruction (AI) 0AI-68, Brunswick Nuclear Plant Response to Severe Weather Warnings. The review verified that selected risk significant systems including the service water system and the emergency diesel generating system, would remain functional when challenged by adverse weather; that AI 0AI-68 would require system readiness and adequate staffing; and that the operators' actions required for those systems selected could be accomplished during severe weather. The reviews were performed in December 2002, for cold weather preparations on the service water and emergency diesel generating systems.

###### b. Findings

No findings of significance were identified.

##### 1R02 Evaluations of Changes, Tests or Experiments

###### a. Inspection Scope

The inspectors reviewed selected samples of evaluations to confirm that the licensee had appropriately considered the conditions under which changes to the facility or procedures may be made, and tests conducted, without prior NRC approval. The inspectors reviewed evaluations for seven changes.



The inspectors confirmed, through review of additional information, such as calculations, supporting analyses, the Updated Final Safety Analysis Report (UFSAR), and drawings that the licensee had appropriately concluded that the changes could be accomplished without obtaining a license amendment. The seven evaluations reviewed are listed in the Attachment.

The inspectors also reviewed samples of design/engineering packages and procedure changes for which the licensee had determined that evaluations were not required, to confirm that the licensee's conclusions to screen-out these changes were correct and consistent with 10 CFR 50.59. The 22 screened-out changes reviewed are listed in the Attachment.

The inspectors also reviewed the results of the licensee's recent self-assessments and audits related to the 10 CFR 50.59 process to confirm the licensee was identifying problems at an appropriate threshold, entering these into the corrective action process, and initiating appropriate corrective action.

b. Findings

No findings of significance were identified.

1R04 Equipment Alignment

a. Inspection Scope

The inspectors reviewed plant documents to determine correct system lineup, and observed equipment to verify that the systems were correctly aligned while the other train or system was inoperable or out-of-service (OOS). The inspectors verified that the licensee had properly identified and resolved equipment alignment problems that could cause initiating events or impact mitigating system availability. The inspectors verified the following system alignments:

- Emergency Diesel Generator (EDG) 1, when EDG 2 was OOS for maintenance
- Unit 1, high pressure coolant injection (HPCI), when reactor core isolation cooling (RCIC) was OOS for surveillance testing

In addition, the inspectors performed a detailed walkdown, of the 2A core spray system, to verify that the system was correctly aligned, and labeled. The power sources and support systems were also verified to be available. The review of this system included a review of outstanding design issues, maintenance work requests and temporary modifications.

The inspectors used the procedures and other documents listed below to verify system alignments:

- 1OP-39, Diesel Generator Operating Procedure
- 1OP-19, High Pressure Coolant Injection System Operating Procedure
- 2OP-18, Core Spray System Operating Procedure
- UFSAR Section 6.3, Emergency Core Cooling Systems (ECCS)

- Technical Specifications (TS) 3.5, ECCS and RCIC
- Reactor Building Piping Diagram Core Spray System Unit No. 2, D-02524

b. Findings

No findings of significance were identified.

1R05 Fire Protection

a. Inspection Scope

The inspectors reviewed current action requests (ARs), work orders (WOs), and impairments associated with the fire suppression system. The inspectors reviewed the status of ongoing surveillance activities to determine whether 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 documents:

- Unit 2 reactor building, 20 foot elevation, (three areas)
  - Prefire Plan 2PFP-RB, Reactor Building Prefire Plans
- Diesel generator building (four areas)
  - Prefire Plan 0PFP-DG, Diesel Generator Building Prefire Plans

b. Findings

No findings of significance were identified.

1R06 Flood Protection Measures

a. Inspection Scope

The inspectors reviewed the internal flooding analysis described in UFSAR, Section 3.4.2, Protection From Internal Flooding. The inspectors reviewed the preventive and periodic maintenance on every level switch and alarm described in UFSAR Section 3.4.2. This review included the frequency, last performance, correct setpoints, and results of each instrument check. The level alarms reviewed were installed in the radwaste building -3 foot elevation; service water intake structure level alarms installed in the lower levels of the -13 ft. 4 inch elevation; diesel generator building level switches installed in the tank compartments, deluge pit, and piping trenches; and the turbine building level alarms installed in the circulating water condenser pits that included a set of three level alarms installed 9 feet above the pit floor that would, when activated, automatically shut off the circulating water pumps. Additionally, the inspectors reviewed the seismic qualification of the control building condensate supply and return lines passing through the cable spread rooms in the control building. The inspectors observed accessible switches for abnormal or degraded conditions. The following documents were reviewed:

- Design Basis Document, DBD-58, Structures System
- Calculation ID: SA-COD-G003 : Pipe Stress Analysis for 24" diam. Condensate line in the Control Building

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification

a. Inspection Scope

The inspectors observed licensed operator performance during simulator training for cycle 2002-05 with one crew. This observation included emergency operating procedure and abnormal operating procedure scenarios. The inspectors reviewed the licensee's requalification program for licensed operators to verify that the program ensures safe power plant operation by adequately evaluating how well the individual operators and crews have mastered the training objectives, including training on high-risk operator actions. The scenarios tested the operators' ability to respond to a loss of coolant accident (LOCA), steam line breaks, and an emergency depressurization. The inspectors evaluated consistency, clarity, and formality of communication, crew decision-making, appropriateness of procedure utilization, proper alarm response, and high-risk reactor turbine gauge board manipulations. Group dynamics and supervisory oversight, including the ability to properly identify and implement appropriate TS actions and regulatory reports and notifications, were observed. The following documents were reviewed:

- LOI and LOCT Core Simulator Scenario, LOT-EOP-044, Fuel Failure, Steam Leak in the Turbine Building, General Emergency-Rad Release
- LOI and LOCT Core Simulator Scenario, LOT-EOP-007, Vacuum Loss, Small Break LOCA, Required Emergency Depressurization
- LOI and LOCT Core Simulator Scenario, LOT-EOP-018, Loss of E7 Buss, Total Loss of Closed Loop Cooling Water, Small Steam Line Break

b. Findings

No findings of significance were identified.

1R12 Maintenance Rule Implementation

a. Inspection Scope

For the equipment issues described in WOs and ARs 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 MR a(1) or a(2) classification, and the appropriateness of either the associated a(2) performance criteria or the associated a(1) goals and corrective actions:

- SW pump strainer clogging repetitive functional failures on the 1A nuclear service water (NSW), 1B NSW, and 1A conventional service water pump strainers  
- AR 00075058
- Motor driven fire pump failed to start. This constituted the second functional failure of this component in the last 36 months.  
-Significant Adverse Condition Investigation AR 00076948

b. Findings

No findings of significance were identified.

1R13 Maintenance Risk Assessments and Emergent Work Evaluation

a. Inspection Scope

For the following system work weeks, WO packages and/or procedures, the inspectors reviewed the effectiveness of risk assessments performed prior to changes in plant configuration for maintenance activities (planned and emergent), and verified that upon unforeseen situations the licensee had taken the necessary steps to plan and control the resultant emergent work activities:

- Unit 1, 1A-2 reactor protective system inverter replacement  
BNP Risk Profile Week 44
- EDG 3, maintenance outage  
BNP Risk Profile Week 45
- EDG 1, service water line freeze seal maintenance work  
BNP Risk Profile Week 47

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations

a. Inspection Scope

The inspectors reviewed selected operability evaluations affecting risk significant mitigating systems, listed below, to assess, as appropriate: (1) the technical adequacy of the evaluations; (2) whether continued system operability was justified; (3) whether other existing degraded conditions were considered as compensatory measures; (4) where compensatory measures were involved, whether the compensatory measures were in place, would work as intended, and were appropriately controlled; (5) where continued operability was considered unjustified, the impact on TS limiting conditions for operations (LCOs) and the risk significance. These reviews were performed for the following issues using the associated documentation listed:

- Through wall leak identified in a blind flange installed on piping line number 2-SW-29-6-046 (diesel jacket water supply)
  - Licensee operability evaluation concerning this issue
- EDG 4, erratic voltage
  - Licensee operability evaluation concerning this issue
- Unit 1, main turbine pressure regulator step increase
  - Special Process Procedure, 0SPP-EHC001, Electro Hydraulic Controls (EHC) System
  - EHC Pressure Regulator Action Plan
  - GE Nuclear Service Information Letters (SIL) No. 614, Backup Pressure Regulator
- Pressure seal work on control, EOF/TSC, and simulator buildings
- Nuclear service water system preventive maintenance

b. Findings

. 1 Control Room Emergency Ventilation System

Introduction: A Green non-cited violation (NCV) was identified for inadequate implementation of Procedure 0ENP-54, Building Ventilation Pressure Control. This failure resulted in a breach in the control room habitability envelope that exceeded the allowable leakage criteria to maintain both units' control room emergency ventilation (CREV) systems operable.

Description: The inspectors found a maintenance activity in progress on door 218 at the 49 foot elevation of the control building during which the door was tied in the full-open position. The inspector reviewed the posted work permit entitled Pressure Seal Work Permit for Control, EOF/TSC, and Simulator Building. The permit as posted required that the door remain less than nine inches open at all times. The seal work permit was an engineering evaluation performed to ensure that the operability of the control room habitability pressure boundary was maintained. The inspectors notified the operators of the condition. The licensee concluded that this condition caused the CREV systems for both units to be inoperable. The door was closed following operator response within 15 minutes of the start of the work activity. Both Unit 1 and Unit 2 CREV systems were inoperable for 15 minutes. TS 3.7.3, Control Room Emergency Ventilation Systems, requires that both units be in mode 3 of operation in 12 hours with both CREV systems inoperable.

The CREV systems provide automatic system isolation and control room pressurization upon detecting high radiation levels in the intake plenum of the control room. The CREV systems provide automatic system isolation and control room pressurization upon detecting smoke in the control room. The systems provided automatic system isolation upon detecting chlorine in the control building air intake plenum.

Analysis: This issue was considered to be more than minor because it affected a cornerstone attribute and an associated cornerstone objective. The barrier integrity objective and containment functionality attribute of configuration control and human performance in post-accident and event performance were affected.

Additionally, if this issue was left uncorrected, it would have been a more significant safety concern. The finding involved the barrier integrity cornerstone in which the control room barrier was degraded and represented a degradation of the barrier function of the control room against smoke and a toxic atmosphere. This issue was evaluated to be very low safety significant (Green). The impact of Chlorine gas intrusion (toxic atmosphere) into the control room during the period the door was blocked open was limited to the human factors concern of control room response while wearing breathing apparatus. Also, the CREV systems for both units were returned to operable status within the TS allowed time frame. Operator actions of interest were those required to respond to an initiating event that happened during the short time of vulnerability.

Enforcement: TS 5.4.1.a, Procedures, requires that written procedures be implemented covering the activities in Regulatory Guide 1.33, Appendix A, November 1972, which includes procedures for bypassing safety functions. Engineering Procedure, 0ENP-54, Building Ventilation Pressure Control Program, established the methodology for controlling the removal, repair, installation, visual inspection, and breaches of pressure boundary seals for ventilation pressure control of the control room. This methodology included a posted work permit entitled Pressure Seal Work Permit for Control, EOF/TSC, and Simulator Building, which required that control building door 218 remain less than nine inches open at all times. Contrary to the above, on September 30 Procedure 0ENP-54, Building Ventilation Pressure Control Program, was not adequately implemented when control building door 218 was blocked open in excess of the allowable nine inch opening which caused the control building habitability boundary and both Units' CREV systems to be inoperable. Because the failure to adequately implement Procedure 0ENP-054 is of very low safety significance and has been entered into the corrective action program (AR 00072981), this violation is being treated as an NCV, consistent with Section VI.A of the NRC Enforcement Policy: NCV 50-325,324/02-04-01, Failure to implement Procedure 0ENP-54.

## .2 Nuclear Service Water System

Introduction: A Green NCV was identified for inadequate implementation of Preventive Maintenance Procedure 0PM-STU500, Service Water Intake Structure Inspection and Cleaning. This failure resulted in the 1A NSW pump becoming inoperable with a loss of function due to the pump's discharge strainer becoming clogged with oyster shells during a diving evolution.

Description: On October 10 the licensee was performing a diving evolution to inspect and clean the service water intake structure. During the evolution the diver attempted to install a pump suction guard around the suction end bell of the 1A NSW pump, while the pump was running. While attempting to install the device, oyster shells were drawn into the pump suction from the disturbance created by the divers' activities. The 1A NSW pump discharge strainer became clogged resulting in a loss of SW flow from the pump. The 1B NSW pump had previously been removed from service for maintenance, therefore a SW loss-of-flow alarm was received in the control room. The operators restored flow to the SW header by aligning a conventional service water pump to restore flow in accordance with the abnormal operating procedures (AOPs). The inspectors reviewed Preventive Maintenance Procedure 0PM-STU500, Service Water Intake Structure Inspection and Cleaning, and found that the procedure specifically stated that

the SW pump was to be shut down prior to installing the pump end bell suction guard. This was to prevent silt and debris from being drawn into the pump and provide a safe environment for the diver. The failure to follow the procedure was a performance issue that directly resulted in the loss of the safety-related NSW pump function.

Analysis: This issue was considered to be more than minor because it affected a cornerstone attribute and an associated cornerstone objective. The mitigating systems cornerstone objective to ensure reliability, availability, and capability of systems that respond to initiating events was affected by equipment performance and human error. The finding was determined to be very low safety significant (Green) because the risk was mitigated by the availability of the conventional service water pumps which were utilized in accordance with the AOPs to restore SW flow.

Enforcement: TS 5.4.1.a, Procedures requires that written procedures be implemented covering activities applicable to procedures recommended in Regulatory Guide 1.33, Appendix A, November 1972, which includes procedures for performing maintenance. Preventive Maintenance Procedure OPM-STU500, Service Water Intake Structure Inspection and Cleaning, established the methodology for performing maintenance to reduce flow blockage as a result of biofouling in the SW intake structure. Contrary to the above, on October 10, Procedure OPM-STU500, Service Water Intake Structure Inspection and Cleaning, was not adequately implemented when 1A NSW pump was not shut down prior to installing the pump end bell suction guard resulting in a loss of pump function due to the pump's discharge strainer becoming clogged with oyster shells. Because the failure to adequately implement Procedure OPM-STU500 is of very low safety significance and has been entered into the corrective action program (AR 00075073), this violation is being treated as an NCV, consistent with Section VI.A of the NRC Enforcement Policy: NCV 50-325,324/02-04-02, Failure to Implement Procedure OPM-STU500.

## 1R16 Operator Work-Arounds

### a. Inspection Scope

A licensee identified operator workaround (OWA) was evaluated to determine if the mitigating system function or the operator's ability to implement abnormal and emergency operating procedures was affected, as a result of the 2B low pressure coolant injection line being pressurized from leakage of reactor coolant through an isolation valve. The workaround was also evaluated for an increase in potential human error as a result of the change from longstanding operational practices.

The inspectors held discussions with the OWA coordinator and reviewed the OWA database to determine their cumulative effects. The effect of the workarounds on reliability, availability, and potential misoperations of the systems involved were reviewed. The inspectors reviewed whether the OWA's on Unit 1 and Unit 2 could increase an initiating event frequency or could 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.

1R17 Permanent Plant Modifications

a. Inspection Scope

The inspectors evaluated design change packages for 9 modifications, in all three cornerstone areas, to evaluate the modifications for adverse effects on system availability, reliability, and functional capability. The modifications and the associated attributes reviewed are as follows:

ESR 99 00405, High Pressure Coolant Injection (HPCI) Pump Drains (Mitigating Systems)

- Functional requirements in accordance with design bases
- Heat removal requirements met
- Testing and preventive maintenance requirements included acceptance criteria
- Implementation actions including normal and emergency procedures
- Modified safety system component structural integrity acceptable
- Revised flow paths serve functional requirements

ESR 00 00442, Unit 1 Power Range Neutron Monitoring System Replacement (Mitigating Systems and Initiating Events )

- Energy needs (voltages and currents)
- Functional requirements in accordance with design bases (both response time testing and operational characteristics)
- Environmental and seismic qualification of the new equipment
- Heat removal (heat generated in equipment cabinets)
- Control signals will be appropriate under accident conditions

ESR 98-00552, High Pressure Coolant Injection High Steam Flow Transmitter Card Replacement (Mitigating Systems)

- Functional requirements in accordance with design bases
- Replacement component compatible with physical interface
- Replacement component environmentally qualified
- Response time sufficient for accident conditions
- Failure modes were bounded by the existing analysis



ESR 00-00283, Primary Containment Isolation Valve Boundary Reclassification (Barrier Integrity)

- Pressure boundary (conformance with design basis for containment boundary)
- Failure modes bounded
- Field implementation sample observation
- Documents updated (surveillance procedures, operations procedures, Technical Requirements Manual, UFSAR)

ESR 00-00427, 2-E11-F029 Valve Replacement (Mitigating Systems)

- Functional equivalency
- Seismic loading considerations
- Material replacement compatibility with environment
- Documents updated (test procedures, drawings, equipment data base, calculation)

ESR 99 00242, Pressure Locking Valve Modification (Mitigating Systems)

- Functionality in accordance with design basis
- Seismic loading considerations
- Failure considerations (no new significant failure modes introduced, evaluation of temporary boot seal required for installation)
- Post modification valve testing
- Documents updated (test procedures, system descriptions, equipment data basis)

05267R00, Material Replacement for Diesel Generator Timer (Mitigating Systems)

- Functional equivalency (open circuit, short circuit, mounting, size, insulation integrity)
- Testing (contact resistance, insulation integrity, dimensional, timing functionality)

05255R00, Material Replacement for Overload Heater (Mitigating Systems)

- Correct component configuration and size
- Functional testing adequacy

05236R01, Material Replacement for Service Water Strainer Thrust Bearing (Mitigating Systems)

- Correct component configuration and size
- Functional testing adequacy

For selected modification packages, the inspectors observed the as-built configuration. Documents reviewed included procedures, engineering calculations, modifications, work orders, site drawings, corrective action documents, applicable sections of the UFSAR, supporting analyses, the TS, and design basis information.

The inspectors also reviewed 25 corrective action program reports to verify that the licensee was identifying problems at an appropriate threshold and entering them into the corrective action process, that modifications did not exhibit post-installation problems, and that appropriate corrective actions had been initiated.

b. Findings

No findings of significance were identified.

1R19 Post Maintenance Testing

a. Inspection Scope

For the maintenance activities and post maintenance tests listed below, the inspectors reviewed the test procedure and witnessed the testing and/or reviewed test records to determine whether the scope of testing adequately verified that the work performed was correctly completed; and whether the test demonstrated that the affected equipment was capable of performing its intended function and was operable in accordance with TS.

- 2B conventional service water pump strainer repair  
-Periodic Test 2PT-24.1-2 Service Water Pump And Discharge Valve Operability Test
- Unit 1, 1A-2 RPS inverter failure  
- WO 33412203, 1-C71-NVT-1-A2, RPS Cab., XU-66 Inverter
- EDG 1, service water line freeze seal maintenance work  
-Periodic Test 0PT-12.2A, No.1 Diesel Generator Monthly Load Test
- EDG 3, cylinder head installation  
-Periodic Test 0PT-12.2C, No.3 Diesel Generator Monthly Load Test

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing

a. Inspection Scope

For the following tests, the inspectors examined procedures and/or witnessed testing, and reviewed test records against the UFSAR and TS. The purpose of the review was to verify that the scope of testing adequately demonstrated that the equipment were capable of performing their intended function and were operable in accordance with the TS.

- Unit 1, Periodic Test 0PT-10.1.1, RCIC System Operability Test (IST)
- Unit 2, Maintenance Surveillance Test, 2MST-DG22R DG-4, Trip Bypass Logic Test
- Unit 2, Periodic Test 0PT-09.2, HPCI System Operability Test
- Unit 2, Periodic Test 0PT-08.2.2c, LPCI/RHR System Operability Test - Loop A
- Unit 2, Periodic Test 0PT-12.2D, No.4 Diesel Generator Monthly Load Test

- Units 1 and 2, Periodic Test OPT-08.13a, LPCI/RHR System Component Test-Loop A

The inspectors reviewed the following documents:

- OENP-17, Pump and Valve Inservice Testing (IST)
- ASME/ANSI OM-1987, Operation and Maintenance of Nuclear Power Plants with OMa-1988 Addenda, Part 10

b. Findings

No findings of significance were identified.

Cornerstone: Emergency Preparedness

1EP1 Exercise Evaluation

a. Inspection Scope

The inspectors reviewed the site emergency exercise and scenario for the biennial, full-participation 2002 emergency response exercise. The review covered the verification that the licensee had created a scenario suitable to test the major elements of the emergency plan, in accordance with 10 CFR Part 50, Appendix E.

Licensee activities inspected during the exercise included observations in the control room simulator (CRS), emergency operations facility (EOF), technical support center (TSC), and operational support center (OSC). The exercise was conducted on November 19, with the ingestion pathway exercise performed on November 20. The inspectors reviewed a sample of corrective actions identified during previous exercises, and developed a list of areas to be observed in this exercise. Areas reviewed for corrective action were event classification, notification, protective action recommendation development, and assessment activities. The inspectors attended the post-exercise licensee critique and the presentation of results to management to evaluate the licensee's self-assessment of the emergency drill.

b. Findings

No findings of significance were identified.

1EP4 Emergency Action Level and Emergency Plan Changes

a. Inspection Scope

On November 21, 2002, the inspector reviewed changes made to the Radiological Emergency Response Plan (RERP) since the last inspection (conducted in October 2001) against the requirements of 10 CFR 50.54(q) to determine whether any of the changes decreased RERP effectiveness. Revision 59 contained numerous modifications to the EALs as well as other substantive and editorial changes.

The inspection purpose was also to verify that the EAL modifications were reviewed with, and agreed upon by, State and local officials prior to implementation, as required by Section IV.B of Appendix E to 10 CFR Part 50.

b. Findings

No findings of significance were identified.

2. RADIATION SAFETY

2OS1 Access Control To Radiologically Significant Areas

.1 Access Controls

a. Inspection Scope

Licensee program activities for monitoring workers and controlling their access to radiologically significant areas and tasks were evaluated. The inspectors evaluated procedural guidance, directly observed implementation of administrative and physical controls, and assessed resultant worker exposures.

The inspectors observed the planning, preparation, and dose reduction techniques for activities in the radioactive waste building pipe tunnel. The pre-job briefing was attended and the adequacy of the radiological controls and conditions communicated between the participants was evaluated.

Radiation worker and radiation protection technician performance with respect to radiation protection requirements, radiation monitoring, and access control were also evaluated. Radiological barriers, radiological postings, and surveys were appraised. The inspectors reviewed five additional radiation work permits (RWPs) for the adequacy of radiological controls. In addition, while touring the radiological control area (RCA), the inspectors interviewed workers regarding their RWP, their dosimeter setpoints, and their response in the event of a dosimeter alarm.

The inspectors reviewed the licensee's collective dose data for the March 2002 Unit 1 Cycle 14 refueling outage (RFO), the two maintenance outages conducted due to leaking fuel bundles, the fuel bundle replacement projects, and the site in calendar year 2002. The inspectors assessed the accrued doses against licensee exposure estimates for the activities.

The controls and procedures for high radiation areas (HRAs), locked high radiation areas (LHRAs), and very high radiation areas (VHRAs) were discussed with the radiation protection staff. The inspectors toured selected LHRAs and evaluated established controls and postings. The key controls for these areas were also reviewed against licensee procedure requirements, and the keys were inventoried.

The inspectors observed radiologically significant work areas with radiation areas and HRAs as well as the spent fuel storage pools. The inspectors discussed the licensee's efforts to remove highly activated materials being stored in the spent fuel pools and

evaluated the licensee's inventory and radiological controls for materials stored in the pools.

Airborne radiological hazards and associated controls were reviewed. Airborne radiological areas and resulting internal exposures since the last radiation protection inspection in this area were reviewed with the licensee's technical staff. The inspectors evaluated the licensee's follow-up on the intakes and assignment of doses to the individuals' occupational exposure records. During plant observations, the use of engineering controls to minimize airborne radioactivity was evaluated.

The inspectors discussed with the Radiation Protection Manager (RPM) recent changes in the licensee's radiation control program and implementing procedures. Potential changes to the program were evaluated with emphasis in the area of the control of low level byproduct materials and the contaminated tool control program.

Radiation Protection (RP) program activities and their implementation were evaluated against 10 CFR 19.12; 10 CFR Part 20; details in UFSAR Section 12, Radiation Protection; TS 5.7; and approved procedures. Licensee documents, records, and data reviewed within this inspection area are listed in the Attachment.

b. Findings

No findings of significance were identified.

.2 Problem Identification and Resolution

a. Inspection Scope

Issues identified through a radiological protection program audit, RP departmental and self-assessments, and corrective action program documents associated with radiological controls, personnel monitoring, and exposure assessments were reviewed and discussed with cognizant licensee representatives. The inspectors assessed the licensee's ability to resolve the issues identified in this RP program area. Documents reviewed within this inspection area are listed in the Attachment.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES [OA]

4OA1 Performance Indicator Verification

a. Inspection Scope

The inspectors sampled licensee submittals for the performance indicators (PIs) listed below to verify the accuracy of reported PI data. PI definitions and guidance contained in Nuclear Energy Institute (NEI) 99-02, Regulatory Assessment Performance Indicator Guideline, Revision 2 were utilized.

### Reactor Safety Cornerstone

- Reactor Coolant System Activity
- Reactor Coolant System Leakage

The inspectors reviewed a sample of plant records and data to verify the accuracy of the above-listed PIs for the period of September 2001 to September 2002. The following documents were reviewed:

- Environmental & Radiation Control Procedure OE&RC-1000, Sample and Analysis For Technical, ODCM and TRM Specifications Chemistry
- Operating Instruction, 2OI-03.2, Control Operator Daily Surveillance Report
- Control room operating logs
- NRC inspection reports issued during the review period
- Licensee's data bases for the PIs listed above
- Nuclear Generating Group Standard Procedure REG-NGGC-0009, NRC Performance Indicator

### Emergency Preparedness Cornerstone

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

The inspectors evaluated the accuracy of the above-listed PIs through the third quarter of 2002. The inspectors reviewed documentation for ERO drills conducted on July 16, August 13, and August 27, 2002, and licensed operator continuing training conducted during July-August 2002 to verify the licensee's reported data regarding successes in emergency classifications, notifications, and protective action recommendations. In addition, through direct observation, the inspectors assessed the accuracy of the licensee's determinations with respect to the 11 DEP PI opportunities during the exercise on November 20, 2002 (see Section 1EP1). The inspectors reviewed the training records (particularly drill and exercise rosters) for 9 of the 83 individuals assigned to key positions in the ERO as of the end of the third quarter of 2002. The inspectors assessed the accuracy of the PI for the ANS reliability through review of a sample of the licensee's records of siren tests conducted October-December 2001 and April-June 2002.

### Occupational Radiation Safety and Public Radiation Safety Cornerstones

- Occupational Exposure Control Effectiveness
- Radiological Effluent Technical Specifications/Offsite Dose Calculation Manual (RETS/ODCM) Radiological Effluent

The inspectors reviewed the above-listed PIs for accuracy. To verify data submitted for the PIs, the inspectors interviewed various individuals for indications of PI related occurrences and reviewed licensee data including radiation protection log records and the effluent release program records for the period of January 1 through December 2002. Documents reviewed within this inspection area are listed in the Attachment.

b. Findings

No findings of significance were identified.

40A5 Temporary Instruction (TI) 2515/148, Appendix A, Pre-inspection Audit for Interim Compensatory Measures (ICMs) at Nuclear Power Plants

The inspectors conducted an audit of the licensee's actions in response to a February 25, 2002 Order, which required the licensee to implement certain interim security compensatory measures. The audit consisted of a broad-scope review of the licensee's actions in response to the Order in the areas of operations, security, emergency preparedness, and information technology. The inspectors selectively reviewed relevant documentation and procedures; directly observed equipment, personnel, and activities in progress; and discussed licensee actions with personnel responsible for development and implementation of the ICM actions.

The licensee's activities were reviewed against the requirements of the February 25, 2002, Order; the licensee's response to the Order; and the provisions of the NRC-endorsed NEI Implementation Guidance, dated July 24, 2002.

No findings of significance were identified. A more in-depth review of the licensee's implementation of the February 25, 2002 Order, will be conducted in the near future.

40A6 Meetings, including Exit

Exit Meeting Summary

On January 7, 2003, 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.

40A7 Licensee-Identified Violations

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

Contrary to the requirements of 10 CFR 20.1501 and 10 CFR 20.1801, the licensee failed to perform adequate surveys to ensure that licensed materials which were stored in controlled or unrestricted areas were secured from unauthorized removal or access. Specific examples were the following: (1) on March 12, 2001, a torque wrench was found outside the RCA at the exit portals having contamination levels of approximately 4,000 disintegrations per minute (dpm) per probe area; (2) on March 20, 2001, a sling was found outside the RCA in the power stores warehouse having contamination levels of approximately 26,000 dpm/per probe area; (3) on March 20, 2001, a fire extinguisher was found outside the RCA in the power stores warehouse having contamination levels sufficient to alarm the small article monitor (SAM) 9, with approximately 3,500 dpm contamination; (4) on August 22, 2001, a welding lead was found outside the RCA at the stack filter pit having contamination sufficient to alarm the licensee's SAM 9, with an effective alarm value in the range of 2,900-3,300 dpm; (5) on March 14, 2002, a pair of

gloves was found outside the RCA in the control room having contamination levels sufficient to alarm the licensee's SAM 9, with approximately 6,000 to 8,000 dpm; (6) on April 15, 2002, paperwork was found outside the RCA at the control room exit having sufficient contamination to alarm a licensee's SAM 9, with approximately 7,700 dpm contamination; and (7) on May 14, 2002, a flashlight was found outside the RCA at the 49' elevation control room exit having sufficient contamination to alarm the licensee's SAM 9, with an effective alarm value in the range of 2,900-3,000 dpm.

Although each example involved the failure to maintain radioactive material inside the RCA, all occurred within the protected area and the potential exposure to a member of the public was less than five mrem, therefore each example was determined to be very low safety significant. These issues are in the licensee's corrective action program as ARs 00029430, 00029769, 00046957, 00057449, 00059470 and 00060760, respectively.



## **SUPPLEMENTAL INFORMATION**

### **KEY POINTS OF CONTACT**

#### Licensee Personnel:

A. Brittain, Manager Security  
W. Dorman, Manager Nuclear Assessment  
N. Gannon, Director of Site Operations  
J. Gawron, Training Manager  
D. Hinds, Manager Brunswick Engineering Support Section  
J. Keenan, Site Vice President  
E. O'Neil, Manager Site Support Services  
W. Noll, Plant General Manager  
E. Quidley, Manager Maintenance  
H. Wall, Manager Outage and Scheduling  
M. Williams, Manager Operations

#### NRC Personnel:

P. Fredrickson, Branch Chief, Division of Reactor Projects (DRP), Region II (RII)  
G. MacDonald, Acting Branch Chief, DRP, RII

### **LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED**

#### Opened

None

#### Opened and Closed

50-325, 324/02-04-01	NCV	Failure to Implement Procedure 0ENP-54, Building Ventilation Pressure Control Program (Section 1R15.1)
50-325, 324/02-04-02	NCV	Failure to Implement Procedure 0PM-STU500, Service Water Intake Structure Inspection and Cleaning (Section 1R15.2)

#### Closed

None

#### Discussed

None

## LIST OF DOCUMENTS REVIEWED

### **Sections 1R02 and 1R17: Evaluation of Changes, Tests, or Experiments and Permanent Plant Modifications**

#### Evaluations [1R02]

ESR 99-00405, HPCI drains  
 ESR 00-00283, Primary Containment Isolation Valve Boundary Reclassification  
 ESR 00-00350, Service Water Operability  
 ESR 00-00474, EDG Loading Evaluation  
 ESR 97-00582, High Energy Line Break Flood Assessment  
 ESR 00-00442, Unit 1 Power Range Neutron Monitoring System Replacement  
 ESR 98-00552, HPCI High Steam Flow Transmitter Card Replacement

#### Screened Out Items [1R02]

00-1887 (ESR 00-00427), 2-E11-F029 valve replacement  
 00-882 (ESR 99-00242), Pressure locking valve modification  
 ESR 97-00686, Station blackout bases and procedure changes  
 00-1290, Water in reactor coolant injection cooling (RCIC) turbine lubrication oil  
 00-1393 and 1394, RCIC turbine high exhaust trip  
 00-1504, Remove power supply from HPCI drain valve  
 02-0103, Power range neutron monitoring system logic change  
 02-0105 and 0113, Increase traveling screen speed  
 02-0126, Procedure OGP-05  
 02-0133 and 1186, 1 and 2 SW-V3 SW turbine building isolation valves  
 02-0150, Nitrogen supply as backup to air for drywell cooler dampers  
 02-0174, EDG KW load rate increase  
 02-0649 and 0651, Discharge canal level  
 02-0547, HPCI steam supply valve motor operator cable splice  
 02-0686 and 0701, Tagout screens for 1EC-01-122 and 1-EC-02-038  
 02-0692, Circulating water ocean discharge isolation valves  
 02-0703, Turbine stop valve channel calibration  
 02-0776, Bypass valve pressure setpoint changes  
 02-0812, Procedure OSAMG-04  
 02-0845, Procedure OPT-10.16L, AST Implementation  
 01-1598 (ESR 01-00209), Install Power System Stabilizer on Unit 1 Main Generator  
 00-1813 (ESR 00-00324), SIL 630 - Physical Separation of Circuits for ECCS

#### References

REG-NGGC-0002, 10 CFR 50.59 and Other Regulatory Evaluations  
 REG-NGGC-0010, 10 CFR 50.59 reviews  
 MCP-NGGC-0401, Material Acquisition  
 EGR-NGGC-0005, Engineering Change

Self Assessment Documents [1R02 & 1R17]

AR 46089 Configuration Control Assessment 6/24 - 6/27/02  
 AR 50953 BESS Design Support Assessment 5/14-15/02  
 Report Number B-SP-01-03 Extended Power Uprate Project Assessment 11/28/01  
 Report Number RR-ES-00-01 Round-Robin Engineering Functional Area  
 Assessment at Brunswick and Robinson Nuclear Plants, November 1, 2000  
 Report Number B-SP-01-01 BNP 10 CFR 50.59 Reviews Assessment, October 11, 2001

**Sections 1EP1 and 1EP4: Emergency Preparedness**Emergency Plan, Implementing Procedures, and Exercise-Related Documents

Radiological Emergency Response Plan, Revision 59, effective August 1, 2002  
 Minutes of Monthly PNSC Meeting 02-22 (10/29/02)  
 Plant Emergency Procedure (OPEP) -02.1, Initial Emergency Actions  
 OPEP-02.1.1, Emergency Control - Notification of Unusual Event, Alert, Site Area Emergency,  
 and General Emergency  
 OPEP-02.6.21, Emergency Communicator  
 OPEP-02.6.28, Off-Site Protective Action Recommendations  
 Scenario for Brunswick Steam Electric Plant 2002 Emergency Preparedness Biennial Exercise,  
 submitted 10/04/2002  
 Drill Messages to Press with plant classifications/status. Releases 1 through 9.

Action Requests

AR 00077765, Regulatory basis review for protective action recommendations, 11/20/02  
 AR 00077816, PI data reporting error, 11/21/02

**Section 2OS1: Access Control To Radiologically Significant Areas**Radiation Work Permits (RWPs)

RWP 00000001, Rev. 01, E&RC Activities, Radiation Control, Chemistry, Instrumentation and  
 ALARA, Task 01 - Locked High Radiation Area HP Activities  
 RWP 00000001, Rev. 01, Task 06 - Shipment Preparations  
 RWP 00000334, Rev. 01, Mechanical Preventative Maintenance, Task 05 - Radioactive Waste  
 Miscellaneous  
 RWP 000000341, Rev. 00, Refuel Floor Activities Unit 1, Task 01 - Unit I Reactor Building and  
 Outside Areas  
 RWP0000000354, Rev. 03, Turbine Building Hot Side Work Unit 1, Task 01 - Unit I Turbine  
 Building Hot Side Walk-down

Procedures

DOS-NGGC-0004, Administrative Dose Limits  
 DOS-NGGC-0007, Internal Dose Calculations  
 DOS-NGGC-0008, In-Vitro Bioassay

HPS-NGGC-0003, Radiological Posting, Labeling, And Surveys  
 HPS-NGGC-0008, Performing Work in Radiation Control Areas  
 HPS-NGGC-0009, Operation of Radiation/Contamination Survey Instruments  
 HPS-NGGC-0013, Personnel Contamination Monitoring, Decontamination, and Reporting  
 OAI-112, Control of Materials In Spent Fuel Pool  
 OAI-122, Pre-Job Briefings & Post-Job Critiques  
 OAI-131, Conduct of Diving Operations  
 OE&RC- 0040, Administrative Controls For High Radiation Areas, Locked High Radiation Areas, and Very High Radiation Areas  
 OE&RC-0100, Radiation Survey Methods  
 OE&RC-0111, Survey Methods For Removable Surface Contamination  
 OE&RC-0120 Routine/Special Airborne Radioactivity Survey  
 OE&RC-0112, Hot Particle Control  
 OE&RC-0175, Radiological Controls for Diving Operations  
 OE&RC-0215, Removal of Materials From the Radiological Controls Area  
 OE&RC-0230, Issue and Use of Radiation Work Permit

#### Records

Initial Intake Assessment, 03/18/02  
 Initial Intake assessment, 03/22/02  
 Radiological ALARA Pre-Job Briefing Radioactive Waste Building Pipe-Chase, 12/17/02

#### Audits and Self-Assessments

BNP E&RC Self-Evaluation Roll-up Monthly Meeting, 12/10/02  
 Brunswick Nuclear Assessment Section (BNAS) Periodic Observations Roll-up For Period Ending December 12, 2002  
 BNAS Periodic Observations Roll-up For Period Ending October 11, 2002  
 BNAS Periodic Observations Roll-up For Period Ending September 11, 2002  
 BNAS Periodic Observations Roll-up For Period Ending May 16, 2002  
 B-ERC-02-01, Environmental and Radiation Control Assessment, June 5, 2002  
 Self Assessment Report 530007, Control of Radioactive Material, 11 /18/02 -11/22/02

#### Action Requests

00056089, Incorrect bar coding allowed access to wrong RWP, 02/19/02  
 00056694, Contractor alarmed exit portal monitor at protected area security building, 03/01/02  
 0056835, Spread of contamination outside boundary in -17, south RHR, 03/04/02  
 00056931, Several intakes of radioactive material resulted from insulation work on the "B" Main Steam Isolation Valve (MSIV), 03/06/02  
 00057106, A MSIV bonnet was moved within the RCA having a 100 mr/hr contact dose rate without Health Physics (HP) knowledge or escort, 03/08/02  
 00057166, Components, vendor tools and equipment were being unconditionally released by technicians working in the clean material processing facility without HP approval as required by OE&C procedure 0215, 03/09/02  
 00057349, Several personnel contamination events were not properly coded to cause a Condition Report, 03/12/02

- 00057433, A source greater than 100 mCi was used in the Unit I Drywell without being properly signed out in accordance with licensee procedure OE&RC-500, 03/13/02
- 00057449, Purple tools for use in RCA only and contaminated gloves were found outside the RCA in the Control Room, 03/14/02.
- 00057614, Purple tools were being used in the Unit I condenser water boxes, 03/16/02
- 00058068, Individual contaminated while transporting the cattle chute and removing guide rod extensions on the refuel floor, 03/22/02
- 00058070, Elevated airborne activity in the unit 1 reactor cavity, 03/22/02
- 00058106, Purple tool found outside the RCA in back of golf cart, 03/24/02
- 00058305, Shielding crew removed shielding and grating from under vessel, 03/27/02
- 00058401, Instrumentation and Control (I&C) personnel demonstrated poor radiation worker practices which resulted in personnel contaminations, 03/28/02
- 00059457, Door posted as a Locked High Radiation Area, 2A Reactor Feed Pump Room was found unlocked; however, actual general area dose rates in the room were less than 1,000 mrem/hr, 04/18/02
- 00059470, Contaminated document found outside the RCA in the Control Room, 04/15/02
- 00059650, A 20,000 ncpm hot particle was found on a workers scrubs as he exited the RCA, 04/22/02
- 00059849, Vacuum cleaner creating a radiation area in an area not posted as radiation area, 04/25/02
- 00059896, Contaminated liquid samples removed from the RCA into the Main Control Room, 04/25/02
- 00060015, Employee wearing contaminated (4,000 cpm) scrubs attempted to depart the protected area, 04/29/02
- 00060760, Purple flashlight found outside the RCA in the Control room, 05/14/02
- 00061183, I&C personnel exceed dose goal for work on a pressure switch in the Unit 2 RHR room, 05/23/02
- 00061184, NAS E&RC assessment identified inconsistencies in the labeling of radioactive material storage areas, 5/21/02
- 00066793, High Radiation Levels from IRM lift temporarily created on refueling floor from Unit 2 Spent Fuel Pool during pool cleanup activities, 07/18/02
- 00068949, During investigation of AR 64656, Rad material outside the RCA, the licensee determined that 21 separate purple tools discoveries had been identified since 1999. Only 7 of the purple tools were contaminated, 08/14/02
- 00069278, Purple shackle found on slings being released from RCA, 08/19/02
- 00070938, Incorrect estimation of staffing for repair of valve resulted in the dose goal for the job being exceeded, 09/07/02
- 00071198, Security guard finds purple tool in protected area outside the RCA, tool was not contaminated, 09/11/02
- 00072331, Individual received facial contamination of 20,000 ncpm while working in Unit 1 Cavity during mini outage to identify and replace leaking refueling bundles, 09/23/02
- 00075075, Leaking valve catch container overflows during rain, 10/18/04
- 0078189, During quarterly radiological survey of hot tool room several tools were found above the administrative limits of 5,000 cpm fixed contamination and less than 1,000 dpm/100 cm<sup>2</sup>, 11/25/02
- 00078723, Several purple tools found outside clean trash facility, 11/22/02
- 000760-1, There was a 20 percent failure rate among radiation workers questioned on their RWP numbers and electronic dosimeter alarm set-points, 11/01/02

**Section 40A1: Performance Indicator Verification**

Control room operating logs

NRC Inspection Reports issued during the review period

Licensee PI data bases

Nuclear Generating Group Standard Procedure REG-NGGC-0009, NRC Performance Indicator