



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION II  
SAM NUNN ATLANTA FEDERAL CENTER  
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ATLANTA, GEORGIA 30303-8931

January 22, 2001

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 INSPECTION REPORT  
50-325/00-05 AND 50-324/00-05

Dear Mr. Keenan:

On December 30, 2000, the Nuclear Regulatory Commission (NRC) completed an inspection at your Brunswick facility. The enclosed report presents the results of that inspection which were discussed on January 8, 2001 with Mr. J. Lyash and other members of your staff.

This 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.

No findings of significance were identified.

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/NRC/ADAMS/index.html> (the Public Electronic Reading Room).

Sincerely,

Brian R. Bonser, Chief  
Reactor Projects Branch 4  
Division of Reactor Projects

Docket Nos.: 50-325, 50-324  
License Nos.: DPR-71, DPR-62

Enclosure: Inspection Report 50-325/00-05 and 50-324/00-05  
cc w/encl: (See page 2)

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REGION II

Docket Nos: 50-325, 50-324  
License Nos: DPR-71, DPR-62

Report No: 50-325/00-05, 50-324/00-05

Licensee: Carolina Power and Light Company

Facility: Brunswick Steam Electric Plant, Units 1 & 2

Location: 8470 River Road SE  
Southport, NC 28461

Dates: October 1 - December 30, 2000

Inspectors: T. Easlick, Senior Resident Inspector  
E. Brown, Resident Inspector  
E. Guthrie, Resident Inspector  
R. Aiello, Senior Operations Engineer (1R11.1)  
J. Dodson, Region IV Health Physicist (2PS1,4OA1.5)  
J. Kreh, Emergency Preparedness Inspector (1EP1, 4OA1.2-.4)  
J. Lenahan, Senior Reactor Inspector (4OA5)  
K. O'Donohue, Operations Engineer (1R11.1)  
W. Sartor, Senior Emergency Preparedness Inspector (1EP1,  
4OA1.2-.4)  
D. Thompson, Physical Security Inspector (4OA1.6)

Approved by: B. Bonser, Chief  
Projects Branch 4  
Division of Reactor Projects

Enclosure

## SUMMARY OF FINDINGS

IR 05000325-00-05, IR 05000324-00-05, on 10/01-12/30/2000 Carolina Power and Light Company, Brunswick Steam Electric Plant, Units 1 & 2, Resident Inspection Report.

The inspection was conducted by resident inspectors, and regional operations engineers, reactor inspectors, emergency preparedness inspectors, a reactor inspector and a health physicist. No findings of significance were identified during this inspection. The significance of issues is indicated by their color (green, white, yellow, red) as determined by the Significance Determination Process in Inspection Manual Chapter 0609 (See Attachment).

## Report Details

Unit 1 began the report period operating at 100 percent rated thermal power (RTP). On October 7, power was reduced to 60 percent RTP for a special backwash of the 1A-North and 1A-South circulating water debris filters and other maintenance activities. The unit was returned to 100 percent RTP on October 9. On October 14, reactor power was reduced to 75 percent RTP for control rod improvements and returned to 100 percent RTP the following day. On November 18, the 1A reactor feedwater pump tripped due to problems with the main oil pump and power was reduced to 50 percent RTP. The 1A feedwater pump was restored to operation and the unit was returned to 100 percent RTP on November 20. The unit operated at or near full RTP for the remainder of the inspection period.

Unit 2 began the report period operating at 100 percent RTP. On December 8, reactor power was reduced to 55 percent RTP for a deep/shallow control rod exchange, and turbine valve and scram time testing. The unit was returned to 100 percent RTP the following day. On December 11, RTP was reduced to 85 percent for control rod improvement and returned to 100 percent RTP the following day. The unit operated at or near full RTP for the remainder of the inspection period.

### **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 0AI-68, Brunswick Nuclear Weather Plant Response to Severe Weather Warnings, Revision (Rev) 20 and Operating Instruction, 0OI-01-03, Non-Routine Activities, Rev 9, Section 5.4, Freeze Protection and Cold Weather Bill. The review verified that selected risk significant systems would remain functional when challenged by adverse weather; that the procedures would require system readiness and adequate staffing; and that the operator actions required for those systems selected could be accomplished during severe weather. The systems selected for this review were:

- Service Water (SW) System
- Condensate Storage and Transfer System

###### **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. 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 simple system alignments and reviewed the associated documents:

- Unit 1 Residual Heat Removal Loop 'A'
  - Operating Procedure 1OP-17, Residual Heat Removal System Operating Procedure, Rev 70
  - NEI 99-02, March 28, 2000, Regulatory Assessment Performance Indicator Guidelines, Rev 0,
  - Reactor Building Piping Diagram, Residual Heat Removal System, Unit No. 1, D-25025, Shts. 1A and 1B
- Unit 1 High Pressure Coolant Injection (HPCI)
  - 10P-19 High Pressure Coolant Injection System Operating Procedure, Rev 52
- Unit 1 Control Rod Drive Train 'B'
  - System Description SD-08, Control Rod Drive Hydraulic System, Rev 1
  - Operating Procedure 1OP-08, Control Rod Drive Hydraulic System Operating Procedure, Rev 47
  - Piping Diagram, Control Rod Drive Hydraulic System, Sht. 1A, Unit No. 1, D-25016

### b. Findings

No findings of significance were identified.

## 1R05 Fire Protection

### a. Inspection Scope

The inspectors reviewed current Action Requests (ARs), work orders, 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 protection 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:

- SW Building
  - Prefire Plan 0PFP-PBAA, Power Block Auxiliary Areas Prefire Plan, (SW, RW, AOG, TY, EY), Rev 2
- Unit 1 Reactor Building (20 foot, 50 foot elevations)
  - Prefire Plan 1PFP-RB, Reactor Building Prefire Plan, Rev 1
- Emergency Diesel Generator Rooms
  - Diesel Generator Building Prefire Plans, 0PFP-DG, Rev 4

In addition the inspectors observed a plant fire drill to assess fire brigade performance to ensure proper fire-fighting techniques for the type of fire encountered and reviewed associated documents:

- SW Building Evaluated Drill
  - Nuclear Assessment Section, Report File No. B-FP-99-1, Report Subject: Brunswick Fire Protection Annual Assessment
  - Training Program Procedure, 0TPP-219, Fire Protection Training Program, Rev 3,
  - Plant Program, 0PLP-01.1, Fire Protection Commitment Document, Rev 19
  - Recommendations for Organization, Training and Equipment, Private Fire Brigades, NFPA No. 27 - 1975

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification

.1 Biennial Review

a. Inspection Scope

The inspectors observed one of five operating crews during active simulator evaluations and selected operator job performance measures in the simulator and plant areas. During these observations the inspectors assessed licensee evaluator effectiveness in identifying operator performance deficiencies requiring supplemental training. The inspectors also evaluated and observed a portion of the walkthrough examination administered during the requalification segment.

The inspectors reviewed and evaluated the licensee's operator continuing training program which included: TPP-200, Licensed Operator Continuing Training, Rev 2; TAP-402, Student Performance Review and Remedial Training, Rev. 3; and TAP-409,



Conduct of Simulator Training and Evaluation, Rev 3 for this requalification cycle. The inspectors also reviewed a sample of on-shift licensed operator qualification records (medical and reactivation) to ensure compliance with 10 CFR 55.59, Requalification, and 10 CFR 55.53, Conditions of License, respectively.

b. Findings

No findings of significance were identified.

.2 Quarterly Review

a. Inspection Scope

The inspectors observed licensed operator performance during simulator training for cycle 2000-05 for two crews. This observation included emergency operating procedure and abnormal operating procedure scenarios. The inspectors verified that the licensee's requalification program for licensed operators 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 main condenser vacuum with a small break loss of coolant accident requiring an emergency depressurization; a fuel failure with a general emergency radiation release; a loss of off-site power with a large break loss of coolant accident; and a reactor feedwater line rupture with safety system actuation failures during a small break loss of coolant accident with other plant anomalies. The inspectors verified consistent clarity and formality of communication, conservative decision-making by the crew, appropriate use of procedures, 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 Technical Specification (TS) actions and regulatory reports and notifications, were observed. The following documents were reviewed:

- LOI and LOCT Core Simulator Scenario, LOT-EOP-011, Loss of Off-Site Power, Large Break LOCA, Transition to SAMG, Rev 1
- LOI and LOCT Core Simulator Scenario, LOT-EOP-044, Fuel Failure, Steam Leak In the Turbine Building, General Emergency Radiation Release, Rev 1
- LOI and LOCT Core Simulator Scenario, LOT -EOP-007, Vacuum Loss, BOP Bus Transfer Failure, Small Break LOCA Requiring Emergency Depressurization Failure of Recirc. Pumps to Trip, Rev 1
- Simulator Core Scenario - LOT-IPO-123 HCU Low Pressure, Feedwater Line Rupture, Group Isolation and ESF Actuation Failures During a Small Break LOCA: HPCI Logic Bus 'A' Auto Start Failure, HPCI Torus Level Transfer Defeated, Group 2 Isolation Logic Defeated, RCIC, CS 'A' and 'B', RHR 'A' and 'B' Auto Start Failures, G31-F001/F004, E41-F002/F003, E51-F007/F008 Auto Closures Disabled, RCIC Low Pressure Isolation Defeated, Rev 0

b. Findings

No findings of significance were identified.

1R12 Maintenance Rule Implementation

a. Inspection Scope

For the equipment issues described in work orders, condition reports, 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 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:

- Unit 2 Suppression Pool Level Instrumentation Channel Check Failures  
The following documents were reviewed:
  - Significant Adverse Condition Investigation 24837-01, Rev 2
  - Maintenance Rule Event Log Report for System 2070 Containment Atmospheric Control, 10/26/97-10/25/00
  - OPT-08.1.6 Suppression Pool Level Indicator Operability, Rev 27
- Unit 2 SW Valve SW-V111  
The following documents were reviewed:
  - Operations Log Entries, 10/5/00-10/13/00, RHR 2045, SW 4060
  - Reactor Building Piping Diagram, Service Water System, Unit No. 2, D-02537, Shts. 1 and 2
  - Reactor Building Piping Diagram, Service Water System, Unit No. 2, D-02537, Sht. 2
- Unit 1 2-DSA-V57 Failure  
The following documents were reviewed:
  - Piping Diagram, Starting Air For Diesel Generators, Sht. 1B, Units No. 1 & 2, D-02265 Sht. 1B
  - Maintenance Rule Event Log Report, 10/1/00-11/8/00, 11/14/97-11/13/00, Diesel Generator Starting Air
  - Periodic Test, OPT-12.3.2B, Rev 8, Nos. 2 Diesel Generator Starting Air Valve Operability Test
  - Work Request/Job Order, (WR/JO), ADRP 028, Procedure OPT-12.3.2B, Rev 8, No. 2 Diesel Generator Starting Air Valve Operability Test
  - Nuclear Generation Group Standard Procedure, ADM-NGGC-0101, Rev 11, Maintenance Rule Program
  - Maintenance Rule, Scoping and Performance Criteria, 5112, Diesel Generator Starting Air
- SW Differential Pressure Switches  
The following documents were reviewed:
  - Maintenance Rule Event Log Report, 12/13/99-12/12/00, 4060 Service Water
  - Maintenance Rule Scoping and Performance Criteria, 4060 Service Water
  - Action Report (AR) 00026401
  - Equipment Database, Quality Classification Analysis, Tag #1-SW-PDSH-117, Conv SW Pmp 1A Disch Str Diff Press HI
  - Equipment Database, Quality Classification Analysis, Tag #1-SW-PDSH-270,

SW Pmps Brg Strainer Diff Press Hi

- Equipment Database, Quality Classification Analysis, Tag #1-SW-PV-140, Nuc SW Pmp 1B Discharge Strainer PCV

- Control Rod Drive System

The following document was reviewed:

- Maintenance Rule Scoping and Performance Criteria, 1070 Control Rod Drive Hydraulic

b. Findings

No findings of significance were identified.

1R13 Maintenance Risk Assessments and Emergent Work Evaluation

a. Inspection Scope

For the following work weeks, work tickets, 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 SW Maintenance activities on the 1-SW-V117 and the 1-SW-V103  
The following document was reviewed:  
- Administrative Procedure, 0AP-025, BNP Integrated Scheduling, Rev 11
- Unit 1 HPCI 1-E51-F010  
The following documents were reviewed:  
- Equipment Control Form, 1-EC-99-123, Rev 7  
- Reactor Building Piping Diagram, Reactor Core Isolation Cooling System, Unit No. 1, D-25029 Sht. 1  
- Reactor Building Piping Diagram, Reactor Core Isolation Cooling System, Unit No. 1, D-25029 Sht. 2  
- Administrative Procedure, 0AP-025, BNP Integrated Scheduling, Rev 11
- Diesel Generator 1 Auxiliary Lubrication Pump Failure  
The following documents were reviewed:  
- 0AP-25, BNP Integrated Scheduling, Figure 3 for 2-LO-AUX-PMP-1 motor to pump coupling failure, Rev 11  
- System Description, SD-39, Emergency Diesel Generator, Rev 2
- Work Week 46  
The following documents were reviewed:  
- BNP Risk Profile - Week 46  
- BNP1-EOOS Schedule Rise Profile - Week 46  
- BNP2-EOOS Schedule Rise Profile - Week 46  
- Progress Status Report
- Work Week 49  
The following documents were reviewed:  
- BNP Risk Profile - Week 49  
- BNP1-EOOS Schedule Rise Profile - Week 49  
- BNP2-EOOS Schedule Rise Profile - Week 49

- Progress Status Report
- Unit 2 Reactor Recirculation Motor Generator Set 'A' Scoop Tube Failure to Respond  
The following document was reviewed:
  - Work Order Package - 00106511-01, The 2A Scoop Tube Positioner ER Failed

b. Findings

No findings of significance were identified.

1R14 Personnel Performance During Non-routine Plant Evolutions

.1 Unit 1 Reactor Feedwater Pump Trip

a. Inspection Scope

Personnel performance was evaluated by the inspectors following a November 18 event in which the Unit 1 1A Reactor Feedwater Pump Turbine (RFPT) tripped off resulting in a subsequent power reduction from 100 percent RTP. The cause of the RFPT to trip off was the loss of the main oil pump which was caused by a failure of a coil in the power supply breaker. Alarms in the unit control room, indicating a loss of lube oil to the 1A RFPT, allowed the operator sufficient time to lower reactor power within the capacity of the operating RFPT by lowering the reactor recirculating pump speed controllers.

The inspectors reviewed operator logs, plant computer data, and strip charts to determine what occurred and how the operators responded; to determine if operator responses were in accordance with the response required by procedures and training; and to evaluate the occurrence and subsequent personnel response using the significance determination process (SDP).

b. Findings

No findings of significance were identified.

.2 Unit 2 Downpower

a. Inspection Scope

On December 9, the inspectors reviewed the operating crew's performance during a scheduled Unit 2 downpower to 55 percent RTP. The inspectors observed briefings and reviewed the associated contingency actions. The downpower was scheduled to

perform a deep/shallow control rod exchange, and turbine valve and scram time testing. Additionally the inspectors observed plant restoration activities for the Unit 2 2A condenser waterbox after satisfactory completion of tube repairs.

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 warranted; (3) whether other existing degraded conditions were considered as compensating measures; (4) where compensatory measures were involved, whether the compensatory measures were in place, would work as intended, and were appropriately controlled; and (5) where continued operability was considered unjustified, the impact on TS limiting conditions for operations (LCOs) and the risk significance in accordance with the SDP. These reviews were performed for the following:

- Operability Assessments of corrective action ARs  
The following document was reviewed:  
- ESR 00-00282, Deluge Valve Supervisory Circuit, Rev 0
- Unit 1 'A' Control Rod Drive Pump Casing Leak  
The following documents were reviewed:  
- Plant Document - Assessment of 11/27/00 1A CRD Pump Casing Leak  
- Updated Final Safety Analysis Report Section 9.2.6.3, Safety Evaluation
- 480V Operability Determination for a grounded electrical cable in an Electrical Underground Manhole Feeding Safety Related Equipment on MCC-2PA, Resulted in Ground on Emergency Bus E7  
The following document was reviewed:  
- Engineering Disposition - ESR 00-00426, 480V Operability Determination, Rev 0
- SW Differential Pressure Switches  
The following documents were reviewed:  
- AR Number 00026401  
- Equipment Database, Quality Classification Analysis, Tag 1-SW-PDSH-117, Conventional SW Pump Discharge Strainer Differential Pressure High  
- Equipment Database, Quality Classification Analysis, Tag 1-SW-PDSH-270, Circulating Water Pumps Bearing Water Strainer Differential Pressure High  
- Equipment Database, Quality Classification Analysis, Tag 1-SW-PV-140, Nuclear Service Water (NSW) Pump 1B Discharge Strainer PCV

b. Findings

No findings of significance were identified.

1R17 Permanent Plant Modificationsa. Inspection Scope

The inspectors performed a design and implementation review for a change to the Unit 1 reactor recirculation pump number 2 runback limiter setpoint. The inspectors verified the permanent modification did not impair emergency/abnormal operating procedure actions or operator response to loss of key safety functions without acceptable risk-informed contingency and compensatory actions.

The following documents were reviewed:

- Work Order Package 00030174 01, Number 2 Limiter Setpoint Change
- Engineering Service Request 00-253, Revs 1 and 2, U1/2 Recirc Limiter Setpoint Change
- Process Instrument Calibration, 0PIC-CNV039, GE 562 Signal Limiter Calibration, Rev 3

b. Findings

No findings of significance were identified.

1R19 Post-Maintenance Testinga. Inspection Scope

For the post-maintenance tests and the associated documents 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:

- Unit 2 Nuclear SW 2B Strainer
  - AR 00024048, 2B NSW Strainer Thin Wall
  - Work Order (WO) Packages 00030698 06 and 00030698 04, Pump Strainer Thin Wall, Tag 2-SW-2B-Nuc-Pmp-Str
  - Preventive Maintenance, 0PM-STR500, R. P. Adams Self-Cleaning Strainers, Models VWS 10 through 40, Rev 8
  - Equipment Database PMTR Screen, 2-SW-2B-Nuc-Pmp-Str
- Unit 1 HPCI Main Pump Radial Sleeve Bearing Thermocouple Replacement
  - Work Order Package - 00029658 02, Thermocouple Reading Error
- Replacement of Transmitter 2-E41-PDT-N004, HPCI Steam Line Break High P/D Instrument Isolation Valve
  - Work Order Package - 00031654 01, Replace the 2-E41-PDT-N004 Isolation

- Valve
- Replacement of Relay on Electronic Level Sensor Circuit Board for Scram Discharge Volume, 2-C12-LS12-4516B
  - Verified Proper Operation by Performing 2MST-RPS27R, RPS Scram Disch Vol. Hr. Wtr. Lvl. Chan. Funct. Test and Chan. Cal., Rev 8
  - Work Request, WR/JO 99-AGPL1- 2-C12-LSH-4516B, Electronic LV Sensor-Scram Disch.
- Unit 1 Control Rod Drive Pump 'A'
  - WO Package 00030584 02, Leaking Casing Bolt on 1A CRD PMP

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing

a. Inspection Scope

The inspectors examined the test procedure and/or witnessed the testing, and reviewed test records against the Updated Final Safety Analysis Report (UFSAR) and TS to determine whether the scope of testing adequately demonstrated that the affected equipment was capable of performing its intended function and was operable in accordance with TS. The following tests and associated documents were reviewed:

- Maintenance Surveillance Test 1MST-PCIS25Q, PCIS High Main Steam Line Flow Trip Unit Chan A Cal, Rev 3
- Unit 1 Calibration of HPCI Discharge Flow Instrumentation, 1-E41-FSHL-N006
  - Work order Package - 0045890 01, Perform Calibration of 1-E41-FSHL-N006
  - 0PIC-PS004, ASCO Models SB12BKR, SB22BKR, SB32BKR, and SB42BKR, Fixed Deadband Pressure Switch Calibration, Rev 28
  - 0PIC-DPS001, Calibration of ITT Barton Model 581 A-O Differential Pressure Indicating Switch
- Unit 1 Rod Block Monitor 'B'
  - 0MST-RBM11Q, RBM Channel Functional Test, Rev 4
  - Work Order Package - 00048379 01, Perform 0MST-RMB11Q
- Anticipated Transient Without Scram (ATWS) Reactor High Pressure RPT and ARI Scram Inst. Chan. Cal. 1MST-ATWS22R
  - 1MST-ATWS22R, ATWS Reactor high Pressure RPT and ARI Scram Inst. Chan. Cal., Rev 5
  - Work Order - 00046584-01, perform 1MST-ATWS22R, Rev 5
  - Reactor Recirc. Pump M-G Set Elementary Wiring Diagram, 1-FP-05572, Sht. 9
  - Trip Calibration Cabinet "AQ5" ECCS Div I, CB-XU-63 Control Wiring Diagram, unit 1, F-39031, Sht. 2
  - Power Upated Steam Dome Pressure High (ATWS Rpt) Uncertainty and Scaling Calculation (ATWS B21-N045 Loops), Calculation OB21-0077, Rev 2
- Unit 2 Residual Heat Removal Inservice Testing (IST) Surveillance
  - Periodic Test 0P-08.2.2b, LPCI/RHR System Operability Test - Loop B, Rev 57
  - System Description SD-17, Residual Heat Removal System, Rev 2

b. Findings

No findings of significance were identified.

**Cornerstone: Emergency Preparedness**

1EP1 Exercise Evaluation

a. Inspection Scope

The inspectors reviewed the objectives and scenario for the Brunswick Nuclear Plant biennial, full-participation emergency preparedness exercise on November 14, 2000, to determine whether they were designed to suitably test major elements of the licensee's emergency plan. The criteria against which the exercise scenario, the licensee's performance, and the licensee's critique were evaluated are contained in Attachment 01 to Inspection Procedure 71114.

During the period November 13-16, 2000, the inspectors observed and evaluated the licensee's performance in the exercise, as well as selected activities related to the licensee's conduct and self-assessment of the exercise. The exercise was conducted on November 14, 2000, from 8:00 a.m. to 1:47 p.m. Licensee activities inspected during the exercise included those occurring in the Control Room Simulator, Technical Support Center, Operational Support Center, and Emergency Operations Facility. The NRC's evaluation focused on the risk-significant activities of event classification, notification of governmental authorities, onsite protective actions, offsite protective action recommendations (PARs), 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.

1EP6 Drill Evaluation

a. Inspection Scope

The inspectors observed an emergency response training drill conducted on October 10 to evaluate drill conduct and the adequacy of the licensee's post drill critique of performance utilizing the emergency plan and the plant emergency procedures. The drills were conducted using the plant simulator and emergency facilities. The inspectors evaluated the licensee's self-assessment of classification, notification, and protective action recommendation development.



b. Findings

No findings of significance were identified.

**2. RADIATION SAFETY**

**Cornerstone: Public Radiation Safety**

2PS1 Radioactive Gaseous and Liquid Effluent Treatment and Monitoring Systems

a. Inspection Scope

The inspector interviewed cognizant personnel and walked down the major components of the gaseous and liquid release systems to observe ongoing activities, equipment material condition, and the system configuration, as compared to the description in the Final Safety Analysis Report. The following items were reviewed and compared with regulatory requirements:

- 1999 Radiological Effluent Release Report
- Changes to the Offsite Dose Calculation Manual and the radioactive waste system design and operation.
- Anomalous results, if any, reported in the Radiological Effluent Release Report
- Sample collection and analysis of the plant stack gaseous effluent release point.
- Selected radioactive effluent release permits and associated projected doses to members of the public (2000-continuous gaseous releases for the stack, U2 Reactor Building, U1/2 Turbine Buildings, Batch Liquid Release Permits 00-0010,00-0018, 00-0026, 00-0027, 00-0028, 00-0029).
- Compensatory sampling and radiological analyses conducted when effluent monitors were declared out-of-service
- Monthly, quarterly, and annual dose calculations
- Air cleaning system surveillance test results (SBGT-1A, SBGT-2A, CBEFS-2A, CBEFS-2B)

- Records of instrument calibrations and surveillance tests performed since the last inspection for each point of discharge (liquid, stack, Unit ½ reactor building, and Unit ½ turbine building), effluent radiation monitors and flow measurement devices.
- Effluent radiation monitor alarm setpoint values
- Calibration and Quality Control records of counting room instrumentation associated with effluent monitoring and release activities
- Audits (Nuclear Assessment Report RR-ERC-00-01) and self assessments (AR-9822, AR-9913, B-SP-00-02, CESAR-10269) related to the radioactive effluent treatment and monitoring program
- Selected corrective action documentation related to the radioactive effluent treatment and monitoring program (Action Requests-00015808, 00017034, 00017070, 00017126, 00017200, 00017350, 00017674, 00017867, 00019389, 00020917, 00022156, 00022290, 00022757, 00022759, 00023540, 00024570, 00025492, 00026077, 00026454, 0026671)

b. Findings

No findings of significance were identified.

**4 OTHER ACTIVITIES**

40A1 Performance Indicator (PI) Verification

.1 Mitigating Systems: Barrier Integrity

a. Inspection Scope

The inspectors reviewed the past Performance Indicator (PI) data reported upon initiation of the Revised Reactor Oversight Program. A sample of ARs, engineering databases and operator's logs were reviewed to validate the previously reported events. The inspectors reviewed the following PIs for the period of fourth quarter 1999 through the third quarter of 2000 and the associated documents:

- Reactor Coolant System Activity
  - NEI 99-02, Regulatory Assessment Performance Indicator, Rev 0
  - REG-NGGC-0009, NRC Performance Indicator, Rev 0
  - TS 3.4.6, RCS Specific Activity
  - OE&RC-1000, Sampling and Analysis for Technical, ODCM and RM Specifications Chemistry, Rev 41
- Residual Heat Removal System Unavailability
  - Maintenance Rule Unavailability Report, Service Water
  - Maintenance Rule Unavailability Log Report, 10/3/97-10/2/00, 4060 Service Water
  - Maintenance Rule Unavailability Log Report, 10/25/97-10/24/00, 2045 Residual

- Heat Removal  
Safety System Functional Failures  
LER 1-00-001, Loss of Offsite Power During Refuel Outage

b. Findings

No findings of significance were identified.

.2 Emergency Response Organization (ERO) Drill/Exercise Performance PI

a. Inspection Scope

The inspectors assessed the accuracy of the PI for ERO Drill and Exercise Performance over the past eight quarters through review of documentation of drills and actual events. Detailed records of five Notification of Unusual Event declarations (on August 29 and September 14, 1999; and March 3, September 22, and October 14, 2000) and selected drills were reviewed to verify the licensee's reported data regarding successes in emergency classifications, notifications, and PARs.

b. Findings

No findings of significance were identified.

.3 ERO Drill Participation PI

a. Inspection Scope

The inspectors assessed the accuracy of the PI for ERO Drill Participation during the previous eight quarters by selective review of the training records for the 144 personnel (as of September 30, 2000) assigned to key positions in the ERO. Drill participation was verified by reviewing training attendance records for approximately 10 percent of key ERO personnel.

b. Findings

No findings of significance were identified.

.4 Alert and Notification System PI

a. Inspection Scope

The inspectors assessed the accuracy of the PI for the Alert and Notification System through review of the licensee's records of the siren tests for the previous 12 months.

b. Findings

No findings of significance were identified.

.5 Radiation Safety Performance Indicators

a. Inspection Scope

The inspectors assessed the accuracy of the Radiation Safety performance indicators, Occupational Exposure Control Effectiveness and Radiological Effluent Technical Specifications (RETS)/ Offsite Dose Calculation Manual (ODCM) Radiological Effluents. Information reviewed included corrective action program records for locked high radiation areas, very high radiation areas, and unplanned exposure occurrences for the past 12 months to confirm that these occurrences were properly recorded as performance indicator data. Radiologically controlled area exit transactions with exposures greater than 100 millirem for the past 12 months were reviewed, and selected examples were investigated to determine whether they remained within the dose projections of the governing radiation work permits. Additionally, radiological effluent release program corrective action records, licensee event reports, and annual effluent release reports documented during the past four quarters were reviewed to determine if any events exceeded the performance indicator thresholds.

b. Findings

No findings of significance were identified.

.6 Physical Protection PI

a. Inspection Scope

The inspectors reviewed licensee programs for gathering and submitting data for the following PIs: Fitness-for-Duty/Personnel Reliability Program, Personnel Screening Program, and Protected Area Equipment. The review included the plants tracking and trending reports and security event reports for the PI data submitted from the first quarter 2000 to the fourth quarter of 2000.

Findings

No findings of significance were identified.

4OA5 Other

(Closed) Inspector Followup Item (IFI) 50-325, 324/98-14-05

This issue concerned the operation of the high pressure coolant injection (HPCI) system and the reactor core isolation cooling (RCIC) system steam supply line drain pot valves. These valves are air-operated and close on loss of the non-safety related instrument air system. In cases when either HPCI or RCIC would be required to cycle on and off, the unavailability of instrument air would cause the drain pot valves to remain closed which

could result in an accumulation of condensed water in the drain pots/steam supply lines. The licensee initiated condition report CR 99-00271 to disposition this issue. The inspectors conducted an in-office review of the licensee's actions taken in response to this IFI.

For the RCIC system, licensee engineers concluded that this system would most likely be operated continuously for system design basis accident conditions. However, licensee engineers determined that the RCIC system can be cycled on and off, and restarted even if a loss of instrument air would occur which would cause the RCIC drain pot valves to remain closed. The licensee issued an operating procedure, RCIC Start Up with Loss of Air, to address this condition.

For the HPCI system, licensee engineers determined that the best solution to this issue was to replace the air operators on the HPCI drain pot valves with manual operators to ensure the valves remain open after loss of instrument air. The valves will normally be in the open position which will prevent accumulation of condensate in the HPCI steam supply lines. The licensee initiated Engineering Service Request (ESR) 9900405 to modify the Unit 1 HPCI drain pot valves and ESR 9900406 to modify the Unit 2 drain pot valves. The inspectors reviewed the ESRs and the 10 CFR 50.59 safety evaluations for the valve modifications. The licensee's 10 CFR 50.59 evaluation determined that the modification did not involve an unresolved safety question. The licensee's 10 CFR 50.59 evaluation considered the effect of the proposed modification on offsite dose rates and control room habitability, the effect on operation of the HPCI turbine with the drain pot valves open, and accident mitigation capability of the HPCI system. The inspectors concurred with the licensee's evaluation and conclusions. The inspectors determined that the modification does not increase the frequency or consequences of an accident previously evaluated in the UFSAR. No performance deficiencies or violations of NRC requirements were identified. The modifications were completed on November 15, 2000, for Unit 1 and on November 16, 2000, for Unit 2.

#### 4OA6 Meetings, including Exit

##### Exit Meeting Summary

The inspectors presented the inspection results to Mr. J. Lyash, Director of Site Operations, and other members of licensee management at the conclusion of the inspection on January 8, 2001. The licensee acknowledged the findings presented.

The inspectors asked the licensee whether any of the material examined during the inspection should be considered proprietary. No proprietary information was identified.

**PARTIAL LIST OF PERSONS CONTACTED**

Licensee

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

ITEMS OPENED, CLOSED, AND DISCUSSED

**Opened**

None

**Closed**

50-325(324)/98-14-05	IFI	HPCI/RCIC Steam Line Drain Valve Operation (Section 4OA5 Other).
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**Discussed**

None

# NRC's REVISED REACTOR OVERSIGHT PROCESS

The federal Nuclear Regulatory Commission (NRC) recently revamped its inspection, assessment, and enforcement programs for commercial nuclear power plants. The new process takes into account improvements in the performance of the nuclear industry over the past 25 years and improved approaches of inspecting and assessing safety performance at NRC licensed plants.

The new process monitors licensee performance in three broad areas (called strategic performance areas): reactor safety (avoiding accidents and reducing the consequences of accidents if they occur), radiation safety (protecting plant employees and the public during routine operations), and safeguards (protecting the plant against sabotage or other security threats). The process focuses on licensee performance within each of seven cornerstones of safety in the three areas:

## Reactor Safety

- Initiating Events
- Mitigating Systems
- Barrier Integrity
- Emergency Preparedness

## Radiation Safety

- Occupational
- Public

## Safeguards

- Physical Protection

To monitor these seven cornerstones of safety, the NRC uses two processes that generate information about the safety significance of plant operations: inspections and performance indicators. Inspection findings will be evaluated according to their potential significance for safety, using the Significance Determination Process, and assigned colors of GREEN, WHITE, YELLOW or RED. GREEN findings are indicative of issues that, while they may not be desirable, represent very low safety significance. WHITE findings indicate issues that are of low to moderate safety significance. YELLOW findings are issues that are of substantial safety significance. RED findings represent issues that are of high safety significance with a significant reduction in safety margin.

Performance indicator data will be compared to established criteria for measuring licensee performance in terms of potential safety. Based on prescribed thresholds, the indicators will be classified by color representing varying levels of performance and incremental degradation in safety: GREEN, WHITE, YELLOW, and RED. GREEN indicators represent performance at a level requiring no additional NRC oversight beyond the baseline inspections. WHITE corresponds to performance that may result in increased NRC oversight. YELLOW represents performance that minimally reduces safety margin and requires even more NRC oversight. And RED indicates performance that represents a significant reduction in safety margin but still provides adequate protection to public health and safety.

The assessment process integrates performance indicators and inspection so the agency can reach objective conclusions regarding overall plant performance. The agency will use an Action Matrix to determine in a systematic, predictable manner which regulatory actions should be taken based on a licensee's performance. The NRC's actions in response to the significance (as represented by the color) of issues will be the same for performance indicators as for inspection findings. As a licensee's safety performance degrades, the NRC will take more and increasingly significant action, which can include shutting down a plant, as described in the Action Matrix.

More information can be found at: <http://www.nrc.gov/NRR/OVERSIGHT/index.html>.