



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

July 27, 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
50-325/01-02 AND 50-324/01-02

Dear Mr. Keenan:

On June 30, 2001, the Nuclear Regulatory Commission (NRC) completed an inspection at your Brunswick Steam Electric Plant, Units 1 and 2. The enclosed report presents the results of that inspection which were discussed on July 16, 2001, with you and 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,

/RA/

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

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

Enclosure: (See page 2)

Enclosure: NRC Integrated Inspection Report 50-325/01-02 and 50-324/01-02
w/Attachment:

cc w/encl:

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

C. J. Gannon
Plant Manager
Brunswick Steam Electric Plant
Carolina Power & Light Company
Electronic Mail Distribution

Terry C. Morton, Manager
Performance Evaluation and
Regulatory Affairs CPB 7
Carolina Power & Light Company
Electronic Mail Distribution

David C. DiCello, Manager
Regulatory Affairs
Carolina Power & Light Company
Brunswick Steam Electric Plant
Electronic Mail Distribution

Leonard Beller
Licensing Supervisor
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

Mel Fry, 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
P. O. Box 29520
Raleigh, NC 27626-0520

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 3)

Distribution w/encl:
 D. Ashley, NRR
 PUBLIC

PUBLIC DOCUMENT (circle one): YES NO

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U. S. NUCLEAR REGULATORY COMMISSION

REGION II

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

Report No: 50-325/01-02, 50-324/01-02

Licensee: Carolina Power and Light Company

Facility: Brunswick Steam Electric Plant, Units 1 & 2

Location: 8470 River Road SE
Southport, NC 28461

Dates: April 1 to June 30, 2001

Inspectors: T. Easlick, Senior Resident Inspector
E. Brown, Resident Inspector
E. Guthrie, Resident Inspector
F. Wright, Senior Health Physicist (Sections 2OS1, 2OS2, 2PS2)

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

SUMMARY OF FINDINGS

IR 05000325-01-02, IR 05000324-01-02, on 03/31/2001- 06/30/2001, Carolina Power and Light Company, Brunswick Steam Electric Plant, Units 1 & 2, resident integrated baseline report.

The inspection was conducted by resident inspectors and a regional radiation specialist. No findings of significance were identified during this inspection. 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 are indicated by "No Color" or by the severity level of the applicable violation. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described at its Reactor website at <http://www.nrc.gov/NRR/OVERSIGHT/index.html>.

Report Details

Unit 1 began the report period operating at 100 percent rated thermal power (RTP). On May 18, power was reduced to 60 percent RTP to perform valve and scram time testing as well as control rod pattern improvements. The unit was returned to 100 percent RTP the following day. 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 May 20, power was reduced to 58 percent of RTP for power suppression testing to locate and troubleshoot a suspected fuel leak. Power was restored to 100 percent RTP on May 22. On June 11, unit power was reduced to approximately 55 percent RTP due to the condensate heater drain pumps tripping, as a result of problems with heater drain tank level control. Following repairs the unit was returned to 100 percent RTP the next day. On June 22, power was reduced to 60 percent RTP to perform valve and scram time testing as well as control rod pattern improvements. Power was restored to 100 percent RTP on June 24. 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

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 partial system alignments and reviewed the associated documents:

- Unit 1 Reactor Core Isolation Coolant (RCIC)
-Operating Procedure 1OP-16, Reactor Core Isolation System Operating Procedure, Rev 48
- Diesel Generators Nos. 2, 3 and 4
- Operating Procedure OP-39, Diesel Generator Operating Procedure, Rev 88
- Unit 2 Residual Heat Removal and Residual Heat Removal Service Water Train
- Drawing No. D-02525, Sht. 1B, Reactor Building Residual Heat Removal System, Unit No. 2
- Unit 1 RCIC
-Operating Procedure 1OP-16, Reactor Core Isolation System Operating Procedure, Rev 48

In addition, the inspectors performed a detailed inspection of the Unit 1 Standby Liquid

Control (SLC) system to verify that the system was correctly aligned and labeled. The power sources and support system were verified to be available. Outstanding design issues, maintenance work requests, and temporary modifications were also reviewed including the following documents:

- Operating Procedure 1OP-05, Standby Liquid Control System, Rev 34
- Technical Specifications (TS) 3.1.7, Standby Liquid Control System
- FSAR 9.3.4, Standby Liquid Control System
- Reactor Building Piping Diagram Standby Liquid Control System Unit No. 1, D-25047

b. Findings

No findings of significance were identified.

1R05 Fire Protection

a. Inspection Scope

The inspectors reviewed current Action Requests (AR), Work Orders (WO), and impairments associated with the fire suppression system. The inspectors reviewed the status of on-going 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 could impair the operability of that equipment. The inspectors toured the following areas important to reactor safety and reviewed the associated documents:

- Emergency Diesel Generator Rooms (four areas)
 - Diesel Generator Building Prefire Plan 0PFP-DG, Rev 4
 - Fire Impairment, IMPA2-01-622 for door 213
- Service Water Building (two areas)
 - Prefire Plan 0PFP-PBAA, Power Block auxiliary areas Prefire Plans (SW, RW, AOG, TY, EY), Rev 3
- Units 1 and 2 Battery Rooms (23 foot elevation, two areas)
 - Prefire Plan, 0PFP-CB, Control Building Prefire Plans, Rev 1
- Units 1 and 2 Cable Spreading Rooms (CB-5 and CB-6, two areas)
 - Prefire Plan, 0PFP-CB, Control Building Prefire Plans, Rev 1

b. Findings

No findings of significance were identified.

1R07 Heat Sink Performance

a. Inspection Scope

The inspectors observed activities associated with the inspection of the 1B Reactor Building Closed Cooling Water (RBCCW) heat exchanger (HX). The service water tube side inspection of the HX was reviewed by the inspectors consistent with the licensee requirements in Preventive Maintenance Procedure OPM-HX501, Reactor Building Closed Cooling Water Heat Exchangers Preventive Maintenance Procedure, Rev 7. The inspectors reviewed the licensee's results to determine whether the inspection frequency was adequate to detect degradation prior to loss of heat removal capability below design-basis values. Additionally the inspectors reviewed those activities taken by the licensee to address a small amount of debris identified in the tube side of the HX. The following documents were reviewed:

- WO 47949-01, 1-RCC-1B-HX, Perform Inspection Heat Exchanger
- Preventive Maintenance, OPM-HX501, Reactor Building Closed Cooling water Heat Exchangers Preventive Maintenance Procedure, Rev 7
- AR 00032088, 1B RBCCW Heat Exchanger Leak

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 2001-02 with one crew. 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 loss of off-site power; small break loss-of-coolant accident (LOCA) requiring emergency depressurization; and a high suppression pool level with a recirculation line break and feedwater injection available. 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 TS actions and regulatory reports and notifications, were observed. The following documents were reviewed:

- LOCT Simulator Scenario, LOT-EOP-021, High Suppression Pool Level, Recirc Line Break With Feedwater Injection Available, Rev 1

- Simulator Examination Scenario, LORX-039, Unit Startup, ECCS Instrument Failure, Loss of Off-Site Power, Small Break LOCA Requiring Emergency Depressurization, Rev 2
- Simulator Crew Evaluation Summaries for Crews C1, C2, and C3, following LORX-039 examination on the simulator

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 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:

- 1A Conventional Service Water pump strainer replacement

The following documents were reviewed:

- Maintenance Rule Event Log Report, 4060 Service Water, June 21, 1998 - June 21, 2001
- Maintenance Rule Scoping and Performance Criteria, 4060 Service Water

- Unit 2 High Pressure Coolant Injection (HPCI) system condensate storage tank low level switch, 2-E41-LSL-N002, failed to actuate

The following documents were reviewed:

- Maintenance Rule Event Log Report, 2095 HPCI system, June 25, 2000 - June 25, 2001
- Maintenance Rule Scoping and Performance Criteria, 2095 HPCI system.

- Uninterruptible Power Supply 2B-2 power supply swapping

The following documents were reviewed:

- Online Scope Change Request Form, Work Package 140924-03, 01, 05, Battery Cell #1 on 1B-2 Cell Changeout & Followup 0MST-BATT 11G
- Online Scope Change Request Form, Work Package 45509-01, PM 1-UPS-2B Inverter to Assist Troubleshooting with 138797-01
- Updated Final Safety Analysis Report (UFSAR), Section 8.3.2.1, 125/250 Volt DC Power Supply and Distribution System, Rev 16

- Repetitive functional failures of the Main Steam Isolation Valves (MSIV) providing Reactor Protection System (RPS) input - limit switch on inboard (MSIV) 2-B21-F022B found beyond its TS allowable limit

The following documents were reviewed:

- Significant Root Cause Investigation, 00029967, Repetitive functional failures of MSIV limit switches
- Maintenance Rule Event Log Report, System 1005, Nuclear Boiler, June 7, 1998 - June 6, 2001.
- NRC Inspection Manual, Part 9900 Technical Guidance, Maintenance-Preconditioning of Structures, Systems, and Components Before Determining Operability
- AR 00043129, Proper Documentation of As Found Surveillance Data.

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 2 2B Nuclear Service Water Pump strainer replacement

The following documents were reviewed:

- Administrative Procedure 0AP-25, BNP Integrated Scheduling, Rev 12, Attachment 4
- BNP Risk Profile, Week 22 and Week 23.
- Unit 2 Schedule Evaluation June 11-14

- Unit 2 Auxiliary Boiler outage with degraded drywell to torus vacuum breaker

The following documents were reviewed:

- BNP Risk Profile, Week 21
- Auxiliary Boiler outage schedule

- Unit 1 and 2 SLC with emergent Nuclear Service Water Pump maintenance activity

The following documents were reviewed:

- Online Scope Change Request Form, Work Package 140959-01, Replace Control Switch 1-SW-2S-V101 Verify Operability
- Drawing No. D-20041, Shts 1, 2, & 3, Piping Diagram, Service Water System,

Unit 1

- Operator's Risk Report

- Unit 1 High Pressure Coolant Injection (HPCI) Emergent Work to replace temperature detector card
The following documents were reviewed:
 - Administrative Procedure, 0AP-025, BNP Integrated Scheduling, Rev 12
 - Schedule Change Approval Form, Work Package 00139010-01, A1-01-0658 and A1-01-0659, Emergent Failure of NUMAC Drawer - Card A3 Thermocouple Input Card

- Unit 2 2A Recirculation Pump speed changes

The following documents were reviewed:

- Administrative Procedure 0AP-25, BNP Integrated Scheduling, Rev 12, Figure 3 and Attachment 4, for Work Package 133754-01
- Administrative Instruction 0AI-117, Guidance for Troubleshooting Safety Related Equipment, Rev 7, Attachment 1, Brunswick Nuclear Plant Troubleshooting Control Form, for Work Package 133754-01
- WO Package, 00133754, 2-B32-S001A-POS, Speed Auto Adjustment
- Safety Evaluation Screening, 01-0585 for AI-117 TCF # 01-013
- BNP Risk Profile Week 14

- Unit 2 Nuclear Service Water Pump 2B and Diesel Generator 4 scheduled maintenance

The following documents were reviewed:

- Administrative Procedure 0AP-025, BNP Integrated Scheduling, Rev 13
- Online Scope Change Request Form, 0AP-025, Figure 3, Rev 13, Replace 2-E41-LSL-N002
- Risk Assessment Worksheet, 0AP-025, Attachment 4, Rev 13
- Operator's Risk Report
- Archived Operator Log, 6/4-8/01, Unit 2
- Detailed Date Range Report with Predecessors & Successors, DG4 Avail, FS, 0 DG4 Availability Milestone, (A) 06/04/01 04:00, (A) 06/05/01 14:00
- Detailed Date Range Report with Predecessors & Successors, Perform 0PT-12.3.2D, DG #4 Air Receiver Check Valve Operability, (A) 06/06/01 00:00, (A) 06/06/01 02:00
- Detailed Date Range Report with Predecessors & Successors, Perform 0PT-12.4D, DG #4 Fuel Oil Pump Test
- Detailed Date Range Report with Predecessors & Successors, PMT-0PT-12.3.2D For V118 and V130, Perform 0PT-12.3.2D, DG #4 Air Receiver Check Valve Operability, Cancel DG4 LCO's and Declare DG Operable
- Detailed Date Range Report with Predecessors & Successors, FS 0 DG4 outage is over (A) 06/06/01 06:00, (A) 06/06/01 03:00

- Unit 2 down power reduction and work week 25 activities

The following documents were reviewed:

- Administrative Procedure, 0AP-025, BNP Integrated Scheduling, Rev 12
- BNP Risk Profile Week 25

b. Findings

No findings of significance were identified.

1R14 Personnel Performance During Non-routine Plant Evolutions

.1 Unit 1 and 2 Generator Oscillations

a. Inspection Scope

During the period from April 26 to May 11, Brunswick Units 1 and 2 experienced generator output megawatt (MW) oscillations ranging from 20-60 MW. These oscillations had a frequency of about 1 hertz and lasted until operator action was taken to terminate the oscillations. The MW oscillations were also accompanied by similar oscillations in the Unit 1 and 2 generator field voltage and voltage regulator differential voltage meter (nulling meter between auto and manual voltage regulator controls). The inspectors observed the first oscillation event from the main control room and attended subsequent site investigation team briefings and conference calls, as well as monitored transient troubleshooting.

Following the first event, guidance was provided to the System Operators by Carolina Power and Light Company's Energy Control Center to assist them in managing any subsequent events. Compensatory measures have also been put in place such as limiting the duration of the oscillations with operator intervention and minimizing transmission grid maintenance (line outages). The inspectors noted that when CP&L's Robinson Plant was returned to service following a refueling outage, and the Sutton-Castle Hayne 230KV line was restored following maintenance, the generator oscillations at Brunswick were significantly reduced. The licensee is continuing to review this issue and to date has concluded that the oscillations on the Brunswick units would not be expected to adversely impact the availability, reliability, or adequacy of the Brunswick offsite power sources. Additionally, no damage to the generator or turbine is expected as a result of the MW oscillations. The following documents were reviewed:

- Operating Procedure, 10P-27, Generator and Exciter Systems Operating Procedure, Rev 30
- Plant Computer Data
- Control Room Operator Log entries
- AR 00031110, Unstable Voltage Regulation Was Observed on Both U-1 & 2
- AR 00031236, U1 & U2 Generator Voltage and MW Output Oscillations

b. Findings

No findings of significance were identified.

.2 Unit 2 Fuel Leak

a. Inspection Scope

On May 16, the Unit 2 operators observed that the condenser off-gas radiation monitoring instruments indicated a change in reactor chemistry. The analysis of reactor coolant samples indicated that the unit experienced a small pinhole fuel leak based on the time required to release the pressurized gas within the fuel pin and the chemistry results. Reactor engineering developed a plan using power suppression techniques to identify which of the fuel bundles in the core were leaking. Power was reduced to 65 percent of RTP and a series of control rod movements were performed while monitoring the effects on the off-gas radiation levels. Subsequently, the leaking bundle was identified and the nearest control rods were inserted to suppress the power level near the fuel defect. The licensee, having successfully suppressed the leak, is evaluating the best time to shutdown and recover the leaking fuel bundle.

The inspectors reviewed operator logs, plant computer data and strip charts to determine how the operators responded to the event and to determine if operator responses were in accordance with the required procedure. Additionally, the inspectors observed the corrective action planning meeting and briefing. The following documents were reviewed:

- Plant Computer Data
- Control Room Operating Logs
- Operating Instructions 0OI-01.08, Control of Equipment and System Status, Rev 34
- TS 3.7.5 Main Condenser Off-gas

b. Findings

No findings of significance were identified.

.3 Unit 2 Heater Drain Pump (HDP) Trips

a. Inspection Scope

On June 11, Unit 2 was operating at 100 percent RTP when the two operating HDPs tripped. The HDP trips were attributed to an erroneous low-level signal for the heater drain deaerator. The licensee entered Abnormal Operating Procedure 0AOP-23, Condensate/Feedwater System Failure, Rev 4, and, as a result of concerns over feedwater system pressure, the licensee reduced power to approximately 67 percent power.

The inspectors were present in the control room during the recovery from this abnormal occurrence. The inspectors verified that operator actions were performed in accordance with the applicable procedures including 0AOP-23 and General Procedure GP-12, Rev 16. Meetings concerning recovery actions were attended. The inspectors monitored corrective maintenance activities on the failed level transmitter and subsequent recovery actions in returning the unit from 57 to 100 percent RTP.

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 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 and the risk significance in accordance with the SDP. These reviews were performed for the following:

- Low Pressure Coolant Injection (LPCI) test configurations may cause inoperability of the system

The following document was reviewed:

- LPCI Test Configuration-Operability Determination

- Unit 2 2A-2 Battery specific gravity and 2A-1 Battery erroneous voltage indication

The following documents were reviewed:

- System Description SD-51, DC Distribution System, Rev 2

- Operating Instruction, OOP-50, 125/250 Vdc Electrical Load List, Rev 20

- Unit 2 TS, 3.8 Electrical Power Systems, 3.8.6 Battery Cell Parameters

- WO Package, 00133451-02, 2-2A-2-125VDC-BAT Specific Gravity

- AR 00026970, EBOP / Low Battery Bus Voltage

- AR 00030368, Battery 2A-2 Fails Level B Criteria on Average SG

- WO Package, 00115954 01, Unit 2, 0MST-BATT11Q, Batteries, 125 VDC, Quarterly Operability

- Maintenance Surveillance Test, 0MST-BATT11FY, Batteries, 125 VDC, Performance Capacity Test, Rev 3

- Unit 2 Suppression Chamber-to-Drywell vacuum breaker 2-CAC-X18C loss of closed indication

The following documents were reviewed:

- Periodic Test OPT-02.3.1, Suppression Chamber to Drywell Vacuum Breaker Operability Test, Rev 23
- Periodic Test -PT-02.3.1a, Suppression Pool to Drywell Vacuum Breaker Position Check (Alternate Method), Rev 14

- Unit 2 Condensate Storage Tank low level switch, 2-E41-LSL-N002

The following documents were reviewed:

- Maintenance Surveillance Test 2MST-HPCI27QI, HPCI and RCIC CST Low Water Level Instrument Channel CAL, Rev 4, Date Completed 6-7-00
- WO Package 00108117 02, 2MST-HPCI27Q, HPCI and RCIC Low
- WR / JO 00-ADSE1, Inadvertent Partial Cust Swap
- AR 00020268, HPCI Suction Auto Transfer
- AR 00032180, 2-E41-LSL-N002 Switch Would Not Actuate During 2MST-HPCI27Q
- Elementary Wiring Diagram - HPCI System, Unit 2, 2-FP-50039, Sht. 3 and 7
- Online Scope Change Request Form, 0AP-025, Figure 3, Rev 13, Replace 2-E41-LSL-N002
- Risk Assessment Worksheet, 0AP-025, Attachment 4, Rev 13
- Operator's Risk Report

- Fire Header operability evaluation

The following documents were reviewed:

- AR 00043536, Fire Main Operability Determination
- Periodic Test OPT-34.7.1.0, Fire Suppression Water System Flow Test, Rev 9
- National Fire Protection Association (NFPA) Fire Protection Handbook, Chapter 16, Fifteenth Edition
- Engineering Service Request (ESR) 01-00249, Operability Evaluation Fire Main C-Factors
- NFPA 25, Standard for Inspection Testing, and Maintenance of Water-Based Fire Protection System, 1998 Edition

- Unit 1 RHR Service Water System Non-Q parts installation

The following documents were reviewed:

- AR 00044221, 1D RHR-SW Sample Valves Installed Non-Q
- ESR 01-00268, Operability Determination for Oil Sample Valve

b. Findings

No findings of significance were identified.

1R16 Operator Work-Aroundsa. Inspection Scope

The inspectors reviewed the work-arounds on reliability, availability, and potential mis-operations of the systems involved. The inspectors reviewed whether the operator work-arounds could increase an initiating event frequency or could affect multiple mitigating systems. The inspectors also reviewed the effects of operator work-arounds on operator correct and timely response to plant transients and accidents. The following item was reviewed:

- Core Spray (CS) & RHR System Venting

The following documents were reviewed:

- Reactor Building Residual Heat Removal System, Unit 2, D-02525, Sht. 1B
- Reactor Building Core Spray, Unit 2, D-02524, Sht. 1 and 2

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 1 125 VDC Battery cell replacement

The following documents were reviewed:

- WO Package 00140924 01, 1-1B-2-125VDC-BAT, Cell Replacement
- WO Package 00140924 05, 1-1B-2-125VDC-BAT, Cell Replacement Post Maintenance Testing
- Maintenance Surveillance Test 0MST-BATT11Q, Batteries, 125VDC, Quarterly Operability Test, Rev 4
- Preventive Maintenance 0PM-BAT004A, 125VDC Plant Battery Link Cleaning, Rev 7
- AR 00026970, EBOP / Low Battery Bus Voltage
- AR 00030368, Battery 2A-2 Fails Level B Criteria on Average SG
- WO Package, 00115954 01, Unit 2, 0MST-BATT11Q, Batteries, 125VDC, Quarterly Operability
- Maintenance Surveillance Test 0MST-BATT11FY, Batteries, 125VDC, Performance Capacity Test, Rev 3

- Unit 1 RCIC Turbine Exhaust vacuum breaker valve maintenance

The following documents were reviewed:

- WO Package 0045386-02, Perform OPT-10.14L for 1-E51-F062
- Periodic Test OPT-10.14L, RCIC Turbine Exhaust Vacuum Breaker Valve Local and ASSD Probability Test, Rev 3

- Unit 2 HPCI Condensate Storage Tank Water level instrument replacement

The following documents were reviewed:

- WO Package 00150081 01, 2-E41-LSL-N002, Condensate Storage Tank Low Water Level
- Maintenance Surveillance Test 2MST-HPCI17Q, HPCI and RCIC CST Low Water Level Instrument Channel CAL, Rev 4

- Unit 2, MSIV limit switch replacement, 2-B21-F022B-LS-1 and 2-B21-F022D-LS-1

The following document was reviewed:

- WO Package 00029870, Modify Air Supply Line As Necessary

- Unit 2, RHR, Core Spray low reactor pressure transmitter slave trip unit replacement, 2-B21-PTS-N021B-2

The following documents were reviewed:

- WO Package 00080050, 2-B21-PTS-N021B-2 - replace, CA
- Maintenance Surveillance Test 0MST-RHR26Q, RHR CS LO Reactor Press Permissive Trip Unit Chan Cal, Rev 3

- Unit 1A Control Rod Drive Pump

The following documents were reviewed:

- AR 00043392, CRD Pump Leak
- WO Package 00045710, CRD PMP 1A Perform PM on Relay 1-E1-AP3-50GS
- Calendar Week: 23, Unit 1 POD, Week of: 6/9/01
- Archived Operator Log, 6/11-12/01
- Operating Procedure 1OP-08, Control Rod Drive Hydraulic System Operating Procedure, Rev 47
- Plant Program Procedure 0PLP-20, Post-Maintenance Testing Program, Rev 25

- Unit 2 2A-2 Battery specific gravity and 2A-1 Battery erroneous voltage indication

The following documents were reviewed:

- System Description SD-51, DC Distribution System, Rev 2
- Operating Instruction, OOP-50, 125/250 Vdc Electrical Load List, Rev 20
- TS Unit 2, 3.8 Electrical Power Systems, 3.8.6 Battery Cell Parameters
- WO Package, 00133451-02, 2-2A-2-125VDC-BAT Specific Gravity
- AR 00026970, EBOP / Low Battery Bus Voltage

- AR 00030368, Battery 2A-2 Fails Level B Criteria on Average SG
- WO Package, 00115954 01, Unit 2, 0MST-BATT11Q, Batteries, 125 VDC, Quarterly Operability
- Maintenance Surveillance Test, 0MST-BATT11FY, Batteries, 125 VDC, Performance Capacity Test, Rev 3

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing

a. Inspection Scope

The inspectors examined test procedures and/or witnessed testing, and reviewed test records against the 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 requirements. The following tests and associated documents were reviewed:

- Periodic Test 0PT-9.7, HPCI System Valve Operability Test, Rev 8
 - Piping and Instrumentation Diagram, D-02523, Unit 2 Reactor Building High Pressure Coolant Injection System, Sht. 1 & 2
- Unit 2 Maintenance Surveillance Test 0MST-HPCI26Q, HPCI Suppression Pool High Level Instrument Chem Cal, Rev 3
 - TS 3.3.5.1, Emergency Core Cooling System (ECCS) Instrumentation
 - TS SR 3.3.5.1.2
 - TS SR 3.3.5.1.4
 - TS SR 3.3.5.1.5
- Unit 1 0MST-ATWS21Q, ATWS Reactor Water LL2 Trip Unit Chan Cal, Rev 2
 - Improved TS
 - System Description OSD-01, Nuclear Boiler System
 - System Description OSD-03, Reactor Recirculation System
 - System Description OSD-03, Reactor Protection System
- Unit 1 Low Pressure Coolant Injection Operability Test
 - Periodic Test 0PT-08.2.2.B, LPCI/RHR System Operability Test-Loop B, Rev 59.
 - Updated Final Safety Analysis Report, Section 6.3
 - System Description OSD-17, RHR System Description

- ANSI/ASME, O.M.-1987, "Operation and Maintenance of Nuclear Power Plants," w/OCA-1988 addenda, Part 6 and Part 10.

- Unit 2 Low Pressure Coolant Injection Operability Test
 - Periodic Test OPT-08.2.2.B, LPCI/RHR System Operability Test-Loop B, Rev 59.
 - Updated Final Safety Analysis Report, Section 6.3
 - System Description OSD-17, RHR System Description
 - ANSI/ASME, O.M.-1987, "Operation and Maintenance of Nuclear Power Plants," w/OCA-1988 addenda, Part 6 and Part 10
- Unit 1 High Pressure Coolant Injection Operational Inspection
 - Preventative Maintenance OPM-TRB507, High Pressure Coolant Injection Operational Inspection, Rev 6
 - AR 00031313, HPCI Oil Sample
 - WO 125171, 1E41-C002, Unit 1 HPCI oil pressure

b. Findings

No findings of significance were identified.

Cornerstone: Emergency Preparedness

1EP6 Drill Evaluation

a. Inspection Scope

The inspectors observed an emergency response training drill conducted on May 17, to evaluate drill conduct and the licensee's post-drill critique. The drill was conducted using the plant simulator and both onsite and offsite emergency facilities. The inspectors evaluated event classification, notification, protective action recommendation (PAR) development, and licensee self assessment against the requirements provided in drill program documents, plant procedures, NUREG-1022, Rev 2, and NEI 99-02.

The following documents were reviewed:

- 5/17/2001 Drill Critique Report
- AR 00032161, Improve Conduct of EP Drills
- AR 00032081, Emer. Notif Form From the EOF
- AR 00032084, OSC Medical Emergency Response
- Training Program Procedure OTHP-216, Emergency Preparedness Training Program, Rev 5
- NEI 99-02, 28 March 2000, 2.4 Emergency Preparedness Cornerstone, Rev 0
- Plant Emergency Procedure OPEP-04.3, Performance of Training Exercises, and Drills, Rev 15

b. Findings

No findings of significance were identified.

2. RADIATION SAFETY

Cornerstone: Occupational Radiation Safety

2OS1 Access Control To Radiologically Significant Areas

a. Inspection Scope

Licensee radiation protection activities for occupational radiation workers were evaluated against licensee procedures, UFSAR, TS, and 10 Code of Federal Regulations (CFR)

Part 20 requirements. To evaluate the licensee's control of access to radiologically-significant areas, the inspectors reviewed radiation work permits (RWPs), radiation surveys, and the licensee's controls of locked and very high radiation areas. The inspectors observed postings and control of access to radiological control areas, high radiation areas, locked high radiation areas and very high radiation areas during inspections of the Radiologically Controlled Areas (RCAs). Adherence to access control procedures and RWP specified access controls by radiation workers and Health Physics (HP) technicians providing job coverage were observed during job site inspections. The inspectors independently measured radiation dose rates at selected locations of the reactor and radioactive waste building. Licensee surveillances of high radiation area key controls and locked high radiation area doors were reviewed.

The following licensee procedures and documents were evaluated and reviewed during the inspection:

- 0E&RC-0040, "Administrative Controls for High Radiation Areas, Locked High Radiation Areas, and Very High Radiation Areas;" Rev. 20
- HPS-NGGC-0003, "Radiological Posting, Labeling, and Surveys;"
- HPS-NGGC-0008, "Performing Work in Radiation Control Areas;"
- RWP B01-1006, Rev 4, "Corrective and Preventive Maintenance Activities for the Reactor Water Clean Up (RWCU) Areas, Includes all Support Work (Unit 1);"
- RWP B01-1023, Rev 3, "Corrective and Preventive Maintenance Activities for the RWCU Areas, Includes all Support Work (Unit 2);"
- RWP B00-1011, Rev1, "RWCU Activities (Units 1 and 2);" and
- RWP B01-1008, Rev 2, "TIP Room Entries, Includes TIP Drive Box Work (Units 1 and 2)."

b. Findings

No findings of significance were identified.

2OS2 As Low As Reasonably Achievable (ALARA) Planning and Controls

a. Inspection Scope

Licensee activities were reviewed against UFSAR, TS, 10 CFR Part 20 requirements, and licensee procedures. The inspectors evaluated the licensee's performance establishing and implementing occupational radiation exposure goals and estimates for the recently completed Unit 2 Re-fueling Outage (RFO) activities. The outage job ALARA Work Plan dose estimates and man-hour revisions were evaluated. The inspectors attended an ALARA Committee Meeting in which the site's performance in maintaining exposures ALARA during the RFO were critically reviewed. The inspectors observed plant management, supervisors, and health physics personnel providing input for the Brunswick ALARA work plan. Radiological work plans and exposure estimates for the five jobs anticipated to incur the highest exposures were evaluated by the inspectors for consistency with previous plant performance. Actual exposures for those jobs were compared to the exposure estimates. Licensee procedure 0E&RC-4100, "ALARA Program," Rev. 8, was examined during the inspection.

b. Findings

No findings of significance were identified.

Cornerstone: Public Radiation Safety (PS)

2PS2 Radioactive Material Processing and Transportation

.1 Radioactive Material Processing

a. Inspection Scope

Licensee activities were reviewed against UFSAR, TS, 10 CFR Part 20 requirements, and licensee procedures. Radiation protection program activities for characterization, temporary storage, and preparation of radioactive waste (radwaste) for subsequent transport to licensed processing or burial facilities were reviewed. During the inspection, the inspectors toured solid radioactive waste processing and on-site storage facilities. The material condition and housekeeping were also observed.

The licensee's facilities with the assistance of vendor waste processing equipment were utilized to prepare solid radwaste. The inspectors verified the licensee's procedures had been approved by site management and engineering.

Procedures evaluated and reviewed during the inspection included:

- STD-P-03-020, "RADLOK Inspection Procedure," 10/26/00;
- STD-P-03-006, "Inspection of Allied Technology Group (ATG) Steel Liners," 09/09/99

- CL01-P-06-001, "Transfer and De-Watering Ion-Exchange Resin And/Or Activated Charcoal Filter Media Using the Rapid De-Watering System," 08/31/00
- CL01-P-06-002, "Transfer and De-Watering Bead Resin And/Or Activated Charcoal Filter Media in Steel Liners With A Single Layer or Rapid De-Watering Under Drain Assembly to Less Than 0.5% Drainable Liquid," 04/11/00
- 0E&RC-0521, "Use of the Low Level Radwaste Processing Facility," 11/20/98
- 0E&RC-0541, "De-watering Process Filter Liners," 12/17/98
- OPT-45.1, "Loading Dock Transfer Lines Leak Test," 05/23/00

b. Findings

No findings of significance were identified.

.2 Transportation Activities

a. Inspection Scope

Transportation activities were reviewed against 10 CFR Parts 20 and 71, and 49 CFR Parts 170 -189 requirements; and approved licensee and vendor procedures. Radiation protection program activities associated with packaging, and transportation of radioactive waste/materials were evaluated. Shipping paper details and supporting documentation were reviewed and examined for accuracy and completeness. Quality assurance program activities and selected quality control records associated with use of Type B containers as required by 10 CFR 71, Subpart H, were reviewed and discussed. The inspector made independent radiation surveys of radioactive packages and shipping transport vehicles and gamma and neutron surveys of loaded spent fuel shipping cask.

Records of the following radwaste or radioactive material shipment documents and licensee shipping procedures were evaluated and reviewed by the inspector for regulatory requirements:

- 01-091, Radioactive Material, Low Specific Activity (LSA), Not Otherwise Specified (n.o.s.), 7, UN2912, Fissile Excepted, Reportable Quantity (RQ), Radionuclides Powdered De-watered Resin, 05/14/01
- 01-86, Radioactive Material, LSA, n.o.s., 7, UN2912, Solidified Air Filters, 05/15/01
- MWS01-014, Waste, Radioactive Material, LSA, n.o.s., UN2912 Lead DAW (ALDTEAW-01)
- HPS-NGGC-0001, Radioactive Material Receipt and Shipping Procedure, Rev 10
- HPS-NGGC-0002, Vendor Cask Utilization Procedure," Rev 7
- 0E&RC-584, Advanced Notification for Spent Fuel Shipments, Rev 18

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator (PI) Verification

a. Inspection Scope

The inspectors reviewed the PI data reported to the NRC since the last verification inspection was performed. A sample of the plant records and data was reviewed and compared to the reported data. The licensee's corrective action program records were also reviewed to determine if any problems with the collection of PI data had occurred. The inspectors reviewed the following PIs for the period from April 2000 to March 2001:

- Unplanned Scrams per 7,000 Critical Hours
- Scrams with Loss of Normal Heat Removal
- Unplanned Power Changes per 7,000 Critical Hours

The following documents were reviewed:

- Control room operator logs
- Licensee Event Report (LER) 50-324/2001-001-00, EHC System Malfunction Results in Specified System Actuations
- LER 50-324/2000-002-00, Main Transformer Fault Results in Reactor Scram
- NRC Inspection Reports issued during the review period
- Licensee's Monthly Operating Reports issued during the review period
- Licensee's PI data bases for the PIs listed above
- NEI 99-02 Regulatory Assessment Performance Indicator Guideline, March 2000, Rev 0

b. Findings

No findings of significance were identified.

4OA6 Meetings, including Exit

.1 Exit Meeting Summary

The inspectors presented the inspection results to Mr. J. Keenan, Site Vice President, and other members of licensee management at the conclusion of the inspection on July 16. 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.

.2 Annual Assessment Public Meeting

The NRC Senior Resident Inspector and the Division of Reactor Projects Branch Chief assigned to Brunswick Steam Electric Plant met on June 26, with Carolina Power and Light (CP&L) to discuss the NRC's Reactor Oversight Process (ROP) annual assessment of safety performance for Brunswick Steam Electric Plant for the period of

April 2, 2000 through March 31, 2001. The major topics addressed were: the NRC's assessment program, the results of the Brunswick assessment, and the NRC's Agency Action Matrix. Attendees included CP&L site management, members of plant staff, several local officials, and news media personnel.

Following the annual assessment meeting, a brief meeting was held with local officials to discuss the ROP and NRC activities involving the plant.

Both of the meetings were open to the public. Information used for the discussions of the ROP is available from the NRC's document system (ADAMS) as accession number ML 011980088. ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/NRC/ADAMS/index.html> (the Public Electronic Reading Room). Copies of the slides presented by CP&L at the annual assessment meeting are attached to this inspection report.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

- A. Brittain, Manager Security
- K. Crocker, Superintendent Environmental and Radiation Controls (E&RC) ALARA
- D. DiCello, Manager Regulatory Affairs
- W. Dorman, Manager Nuclear Assessment
- J. Franke, Manager Brunswick Engineering Support Section
- N. Gannon, Plant General Manager
- J. Gawron, Training Manager
- S. Hamilton, Radiation Protection Manager
- D. Holder, Superintendent E&RC Programs
- J. Keenan, Site Vice President
- J. Lyash, Director of Site Operations
- W. Noll, Manager Operations
- E. O'Neil, Manager Site Support Services
- E. Quidley, Manager Maintenance
- H. Wall, Manager Outage and Scheduling

NRC

- B. Bonser, Chief, Reactor Projects Branch 4

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None

Closed

None

Discussed

None