UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
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ATLANTA, GEORGIA 30303-8931

April 25, 2002

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. 50-325/01-05 AND 50-324/01-05

Dear Mr. Keenan:

On March 30, 2002, the Nuclear Regulatory Commission (NRC) completed an inspection at your Brunswick facility. The enclosed report documents the inspection findings, which were discussed on April 15, 2002, with you 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/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,
/RA/
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 50-325/01-05 and 50-324/01-05

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 Nos:	50-325/01-05, 50-324/01-05
Licensee:	Carolina Power and Light Company
Facility:	Brunswick Steam Electric Plant, Units 1 & 2
Location:	8470 River Road SE Southport, NC 28461
Dates:	December 30, 2001- March 30, 2002
Inspectors:	T. Easlick, Senior Resident Inspector E. Brown, Resident Inspector E. Guthrie, Resident Inspector K. Davis, Physical Security Inspector (Sections 3PP1, 3PP2, 4OA1) S. Vias, Senior Reactor Inspector (Sections 1R08, 1R17) J. Wallo, Lead Physical Security Inspector (Sections 3PP1, 3PP2, 4OA1)
Approved by:	B. Bonser, Chief Reactor Projects Branch 4 Division of Reactor Projects

Enclosure

SUMMARY OF FINDINGS

IR 05000325-01-05, IR 05000324-01-05, on 12/30/2001 - 3/30/2002, Carolina Power and Light Company, Brunswick Steam Electric Plant, Units 1 & 2. Baseline integrated resident inspection report.

The inspection was conducted by resident and regional inspectors. 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 Oversight Process website at http://www.nrc.gov/NRR/OVERSIGHT/ASSESS/index.html.

A. Inspector Identified Findings

None

B. Licensee Identified Violations

A violation of very low significance was identified by the licensee and has been reviewed by the inspectors. Corrective actions taken or planned by the licensee appear reasonable. This violation is listed in Section 4OA7 of this report.

Report Details

Summary of Plant Status

Unit 1 began the report period operating at 100 percent rated thermal power (RTP). On February 24, reactor power was reduced to 70 percent RTP to repair a leak on the 1B-South condenser outlet waterbox/debris filter. On March 2, the reactor was shut down to begin a refueling outage. On March 29, the reactor was started up and on the last day of the inspection period the reactor was at 40 percent RTP, in accordance with the startup test plan.

Unit 2 began the report period operating at 100 percent RTP. On January 18, reactor power was reduced to 25 percent RTP to add oil to the reactor recirculation pump motors. On February 22, reactor power was reduced to 65 percent RTP to repair the 2A reactor feed pump turbine torque arm bearing. 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, and Operating Instruction (OI), 0OI-01-03, Non-Routine Activities, Section 5.4, Freeze Protection and Cold Weather Bill. The licensee's activities were reviewed to verify 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 following document was reviewed:

- OI, 0OI-03.3, Auxiliary Operator Daily Surveillance Report

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 reviewed licensee

activities to verify that the licensee had properly identified and resolved equipment alignment problems that could cause initiating events or impact mitigating system availability. The inspectors reviewed licensee activities to verify the following system alignments and reviewed the associated documents:

- Unit 1 High Pressure Coolant Injection (HPCI), when Reactor Core Isolation Cooling (RCIC) was out of service for routine preventive maintenance.
  - Operating Procedure 1OP-19, High Pressure Coolant Injection System Operating Procedure
- Unit 2 Loop A Residual Heat Removal (RHR) System, when Loop B RHR was out of service for routine preventive maintenance.
  - Operating Procedure 2OP-17, Residual Heat Removal System Operating Procedure
- Unit 1 RCIC, when HPCI was out of service for repair of packing leak on steam supply valve 2-E41-F001
  - Operating Procedure 1OP-16, Reactor Core Isolation Cooling System Operating Procedure
- Unit 1 Loop A RHR System, when Loop B RHR was out of service for outage related activities
  -Reactor Building RHR System, Piping Diagram 1A&B, Sht D-25025

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 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 would impair the operability of that equipment. The inspectors toured the following areas important to reactor safety and reviewed the associated documents:

- Service Water Building (13 and 20 foot elevations, two areas)
  - Prefire Plan, 0PFP-PBAA, Power Block Auxiliary Areas Prefire Plans (SW, RW, AOG, TY, EY)
- Units 1 and 2, Reactor Buildings (20 foot elevation, four areas)
  - Prefire Plan, 1PFP-RM, Reactor Building Prefire Plans
  - Prefire Plan, 2PFP-RM, Reactor Building Prefire Plans
  - Periodic Test, 0PT-34.11.2.0, Portable Fire Extinquisher Inspection
  - Unit 2 Fire Protection Emergency DC Lighting, D-03412, Sht 8
- Emergency Diesel Generators (DG) 1-4 (four areas)

- Prefire Plan, 0PFP-DG, Diesel Generator Building Prefire Plans

b. Findings

No findings of significance were identified.

1R08 Inservice Inspection (ISI)

a. Inspection Scope

The inspectors observed in-process ISI work activities during the first outage of the second period, third ISI interval and reviewed selected ISI records. The observations and records were compared to the Technical Specifications (TS) and the applicable Code (ASME Boiler and Pressure Vessel Code, Section XI, 1989 Edition, with no Addenda) to verify compliance.

The following Unit 1 ISI examinations were observed and reviewed:

Ultrasonic (UT)	-	Main Steam System piping weld:1B21 PS2C5-24"-FWC5
Visual (VT)	-	Nuclear Boiler System Snubbers (8) (VT-3) Steam Dryer/Separator (VT-1)
Radiographic (RT)	-	Feedwater Heater B welds (5), Standby Liquid Control welds (2)

Qualification and certification records for examiners, equipment and consumables, and nondestructive examination (NDE) procedures for the above ISI examination activity were reviewed. In addition, the licensee's most recent Self-Assessment Audit No. 15549, dated November 2000, of the Inservice Inspection Program was reviewed for effectiveness. Also reviewed were Relief Requests (listed in the List of Documents Reviewed section of this report) that were recently approved for use by the plant.

The inspectors observed the licensee's quality control (QC) inspectors performing snubber visual inspections (VT-3) of recently replaced snubbers listed below:

-1B21-51SS106	-1B21-51SS113	-1B21-51SS115
-1B21-27SS267	-1B21-33SS335	-1B21-51SS105
-1B21-50SS109	-1B21-58SS276	

To verify that the radiographs showed the welds were free of rejectable indications, the inspectors reviewed the radiographs of five feedwater (FW) system welds and two standby liquid control system welds, to verify proper penetrameter type, size, placement, and sensitivity as well as film density, identification, quality, and weld coverage. The welds selected for this work effort were as follows:

-1-FW-S641-R1	24" CS th=1.8"
-1-FW-S640	24" CS th=1.8"
-1-FW-S642	24" CS th=1.8"

-1-FW-FJ-12	20” CS th=1.5"
-1-FW-FJ	20” CS th=1.5"
-1-C41-64	3.5" SS th=0.322"
-1-C41-65	3.5" SS th=0.322"

The inspection included a review of the following records: NDE Reports, consumables certifications, QC inspectors and NDE examiner certification and visual acuity documentation, and certification of visual acuity examiner's qualification. Records were reviewed for completeness, accuracy and technical adequacy. The radiographs were examined for both film quality and acceptability. The following records/documents were reviewed for the following personnel:

NDE Examiner/QC Inspector Qualification Certification and Visual Acuity Records Examined

Examiner	Method-Level
JM	UT-II
DP	UT-III
TDM	VT-II
SS	VT-II
EB	RT-III
GNN	RT-II

NDE Equipment and Consumables

Probes:	45° KBA, 2.25 mhz, .5" SN: 002MB6 60° KBA, 2.25 mhz, .5" SN: 007RV4 Model D798, SN:119817
Thermometer:	SN:199632
Scope:	Sonic 136, SN: 136P1200E021429 Panametrics Model 26DL Plus, SN: 95229301
Couplant:	Ultragel II - Batch 99325
Calibration Block:	- 316 SS, 19B, SN:A01143 (Per ASME XI, Appendix III, III-3400) - SW-12

The inspectors held discussions and reviewed various calculation packages to verify that the requirements for changing the ASME Section XI, Subsection IWB, Category B-A piping to a risk informed program were incorporated into the plants ISI Program Plan. The following calculation packages for the Risk Informed ISI Code Case N-578 Application to Brunswick Steam Electric Plants Units 1 & 2 were reviewed:

- **S** CPL-53Q-301, Degradation Mechanisms Evaluation for Brunswick Units 1 & 2
- **S** CPL-53Q-302, Risk Informed Inservice Inspection Consequence Evaluation of Class 1 Piping for Brunswick Nuclear Power Plant Units 1 & 2
- **S** CPL-53Q-304, Risk Ranking for Brunswick Units 1 & 2

The following documents were reviewed:

Procedures:

•	0ENP-16	Procedure for Administrative Control of Inservice Inspection Activities
•	0ENP-16.2	Administrative Control of ASME Section XI Non-Destructive Examination Program
•	0ENP-16.15	Administrative Procedure for Component Support and Snubber Program
•	0ENP-16.16	On-line Inspection Program
•	0PT-8.3c	ASME Section XI Pressure Test of the Class 2 RHR Shutdown Cooling Suction Piping
•	0PT-16.6	Retention and Control of ISI Ultrasonic Calibration Standards
•	0PT-19.6.0	Visual Inspection of Accessible Hydraulic Snubbers
•	0PT-90.1	Vessel Internal Component Remote Examinations
•	EGR-NGGC-0202	Flow Accelerated Corrosion Monitoring Program
•	ISI-PDI-UT-1	Ultrasonic Examination of Ferritic Pipe Welds
•	NDEP-0101	Radiographic Examination
•	NDEP-0107	Radiography for 1989 Edition Including All Addenda Through 1995 with 1996 Addenda ASME Code at Nuclear Power Plants
•	NDEP-0427	Digital Ultrasonic Thickness Measurement (Panametrics Model 26DL Plus and Model 3DL Plus)
•	NDEP-0612	VT-2 Visual Examination if Nuclear Power Plant Components
•	NDEP-0613	VT-3 Visual Examination if Nuclear Power Plant Components

Other Documents:

- Third Inspection Interval ISI Program Plan for Class 1, 2 & 3 Components and their Supports
- Risk Informed ISI Code Case N-578 Application to Brunswick Steam Electric Plants Units 1 & 2
- Self-Assessment Audit No. 15549, ISI Weld Inspection Program, November 21, 2000
- Relief Requests:

  - **S** N-532, Documentation Requirements for Inservice Inspection, Repair and Replacement Activities
  - **S** N-535, Inservice Inspection Interval Requirement
  - **S** N-547, Bolting for Control Rod Housing

- **S** N-498-1, Alternate Requirements for 10 Year System Hydrostatic Pressure Test
- **S** N-573, Transfer of Procedure Qualification Records
- **S** N-460, Examination Categories with less Than Three Items or Welds

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 2002-01 with one crew. This observation included emergency operating procedure and abnormal operating procedure scenarios. The inspectors observed the licensee's requalification program for licensed operators to verify that safe power plant operation was ensured by adequate evaluation of how well the individual operators and crews mastered the training objectives, including training on high-risk operator actions. The scenarios for this cycle were developed to test the operators' knowledge and understanding of the Unit 1, power up-rate modifications and the impact on plant operations. The inspectors also observed operator performance to verify 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 document was reviewed:

- Brunswick Unit 1 Power Up-rate Changes, LOR-SIM-LP-500-02-1

b. Findings

No findings of significance were identified.

1R12 Maintenance Rule (MR) Implementation

a. Inspection Scope

For the equipment issues described in WOs, and ARs listed below, the inspectors reviewed the licensee's implementation of the MR (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 MR a(2) performance criteria or the associated MR a(1) goals and corrective actions:

- Excess Flow Check Valve, 1B21-F049, Isolation

The following documents were reviewed:
- MR Scoping and Performance Criteria, System 1000, Primary Containment Isolation
- AR 54772, MR PMG Unavailability Monitoring Bases Needs Update
- AR 55268, Failure to Identify MR FF in AR Investigation
- AR 55266, MR FF on 1-B21-LT-N017D-1 & 2, EFCV Isolation

- Unit 2, 2A NSW Pump Discharge Check Valve Failure
  The following documents were reviewed:
  - MR Scoping Performance Criteria, 4060 Service Water
  - AR 55215, Failure of 2-SW-V24 to Close

- Unit 2, DG #4 Light Socket Shorting

  The following document was reviewed:
  - AR 55517, DG4 Light Socket Short

- Unit 2, Condenser Low Vacuum Transmitter Out of Tolerance

  The following document was reviewed:
  - AR 56176, MR 2-B21-PT-NO56A and NO56C, Transmitters Found Out of Tech Spec

- DG #2 Jacket Water Heater Breaker Failure

  The following document was reviewed:
  - AR 57196, DG #2 Jacket Water Heater Breaker Failure

- Units 1 and 2, Core Spray Systems Unavailability

  The following documents were reviewed:
  -AR 54920, LCO Time Frame Not Sufficient to Cover INOP Time
  - MR Scoping and Performance Criteria, 2035 Core Spray
  - MR Event Log Report, 2/21/02

b. Findings

No findings of significance were identified.

1R13 Maintenance Risk Assessments and Emergent Work Evaluation

a. Inspection Scope

For the following activities, the inspectors reviewed the effectiveness of risk assessments performed prior to changes in plant configuration for maintenance activities (planned and emergent), to verify that upon unforseen situations the licensee had taken the necessary steps to plan and control the resultant emergent work activities:

- Work Week 01 Activities

  The following documents were reviewed:
  - Integrated Scheduling for Units 1 and 2
  - BNP Risk Profile, Week 01

- Work Week 03 Activities

  The following documents were reviewed:
  - Integrated Scheduling Report for Units 1 and 2
  - BNP Risk Profile, Week 03

- DG #4 Inop Due to Local Control Indication Failure

  The following document was reviewed:
  - BNP Risk Profile, Week 06

- Unit 1, Final (FW) Temperature Reduction Implementation Needed to Maximize Power Generation.

  The following documents were reviewed:
  - BNP Risk Profile, Week 04
  - On-Line Schedule/Outage Scope Change Request, Number 5127, EL: Set U-1 APRM's to the Alternate (ATR) Setpoint Curve

- Unit 1 HPCI Unavailability to Repair Steam Supply Valve 2-E41-F001

  The following document was reviewed:
  - BNP Risk Profile, Week 05

- Work Week 11, Refueling Activities

  The following documents were reviewed:
  - BNP Risk Profile, Week 11
  -Operation Outage Turnover Reports
  -B114R1 Key Safety Function Status Reports

- Work Week 12, Refueling Activities, Outage to Online Risk Management Transition

  The following documents were reviewed:
  - BNP Risk Profile, Week 12
  -Operation Outage Turnover Reports
  -B114R1 Key Safety Function Status Reports

b. Findings

No findings of significance were identified.

1R14 Personnel Performance During Non-routine Plant Evolutions

.1 Unit 1: Use of Natural Circulation for Decay Heat Removal

a. Inspection Scope

On March 12, 2002, the inspectors observed the securing of the residual heat removal (RHR) system and the start of reactor vessel cooling using natural circulation during the Unit 1 refueling outage. The entry into natural circulation was performed to allow maintenance on both trains of RHR. The inspectors evaluated the availability and reliability of support systems tasked with assisting in natural circulation, reviewed the governing procedure Operating Procedure 1OP-17, Residual Heat Removal System Operating Procedure, Rev 75, the shutdown risk assessment, and examined the adequacy of the criteria established for determining whether reactor vessel cooling was maintained within expectations.

The inspectors attended the pre-evolution briefings, reviewed applicable procedures and acceptance criteria, monitored vessel cooling trends and performed walkdowns of credited support equipment as well as evaluated the compensatory measures established in the event natural circulation was not successful in maintaining reactor vessel temperature within limits.

b. Findings

No findings of significance were identified.

.2 Unit 1: Final Feedwater Temperature Reduction

a. Inspection Scope

Personnel performance was evaluated by the inspectors on January 14 during a Unit 1 final FW temperature reduction evolution. Reactor FW inlet temperature was reduced approximately 24 degrees F, while initially at 96 percent RTP, by opening the high pressure FW heater bypass valve. Reactor power was maintained less than 100 percent RTP by reducing reactor recirculation pump flow.

The inspectors attended the pre-evolution briefings, reviewed General Plant Operating Procedure GP-13, Increasing Unit Capacity At End Of Core Cycle, evaluated the compensatory measures established and considered by operations in the event problems occurred, and observed the evolution.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations

a. Inspection Scope

The inspectors reviewed selected operability evaluations affecting the 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; (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:

- Unit 1, Normally Closed Manually Operated Primary Containment Isolation Valves

  The following documents were reviewed:
  -Maintenance Surveillance Test (MST), MST-AMI26R, AMI Suppression Chamber Water Level Channel Calibration
  - Technical Requirements Manual, Appendix D, TRM Table 3.6.1.3-1
  - Operations Log Entries, 1/16/02-1/23/02, 9:34:26 AM
  - TS, 3.6.1.3 Primary Containment Isolation Valves

- Unit 2, DG #2 Lube Oil Temperature Switch

  The following documents were reviewed:
  - AR 55108, DG 2 Lube Oil Filter Heater temp Switch Failure
  - AR 55110, Operability Assessment for EDG Lube Oil Temperature
  - MR Scoping and Performance Criteria, 5095 Diesel Generator
  - Units 1 and 2, Piping Diagram, D-02270, Diesel Generator Lube Oil System, Shts 1A and 1B
  - Units 1 and 2, Piping Diagram, D-02271, Diesel Generator Lube Oil System, Shts 2A and 2B

- Unit 2, Level Transmitter 2-B21-LT-N036, Found Not Environmentally Qualified. This transmitter provides a reactor low level signal for the RHR system logic.

  The following documents were reviewed:
  - AR 54981 Operability Assessment
  - TS 3.3.5.1, Emergency Core Cooling System (ECCS) Instrumentation

- Units 1 and 2, Fire Protection Tank Found Below Administrative Limits

  The following documents were reviewed:
  - AR 00055231, Fire Protection Tank Below Minimum Level
  - Fire Protection Daily Check Sheet, 0FPP-046, Week Beginning February 2, 2002

- Unit 1,1A-2 Battery Testing with Cell Reversals

  The following documents were reviewed:
  - BNP NRC Resident Inspector Question Concerning 1A-2 Battery Testing White Paper
  - AR 58087, Assessment of Operability of 1A-2 Battery
  - USNRC Regulatory Guide 1.129, Maintenance, Testing, and Replacement of Large Lead Storage Batteries for Nuclear Power Plants
  - ANSI/IEEE Std 450-1987m IEEE Recommended Practice for Maintenance, Testing, and Replacement of Large Lead Storage Batteries for Generating Stations and Substations

- Unit 1, Loose Eyebolts on Drywell Personnel Access

  The following document was reviewed:
  - AR 56801, Loose Eyebolts Found at Personnel Lock to Drywell Liner Seat

b. Findings

No findings of significance were identified.

1R17 Permanent Plant Modifications

a. Inspection Scope

The inspectors evaluated portions of design change packages for two Engineering Service Requests (ESR) having to do with the Unit 1 Power Up-Rate, to verify that the modifications did not affect system availability, reliability, or functional capability. The inspectors verified that the nine limitations on the use of the BWR Owners Group (BWROG) report as outlined in a letter from USNRC to the BWROG, dated March 3, 1999, were addressed in the design basis for the Power Up-Rate modifications. The inspectors verified various attributes such as: energy requirements can be supplied by supporting systems; materials and replacement components were compatible with physical interfaces; replacement components were seismically qualified for application; Code and safety classification of replacement system, structures, and components were consistent with design bases; modification design assumptions were appropriate; failure modes introduced by the modification were bounded by existing analyses; and that appropriate procedures or procedure changes had been initiated. For selected modification packages, the inspectors verified that the as-built configuration accurately reflected the design documentation.

Documents reviewed included procedures, engineering calculations, modifications, site drawings, applicable sections of the UFSAR, supporting analyses, TSs, and design basis documentation.

List of Documents Reviewed

- Letter from USNRC to the BWR Owners Group Projects, dated March 3, 1999
- EPRI NP-6041-SL, A Methodology for Assessment of Nuclear Power Plant Seismic Margin
- Brunswick Nuclear Plant Unit 1 Alternate Source Term Technical Specification Change Alternate MSIV Leakage Path Seismic Evaluation Report (405019-R-001)
- 0COND-0004, Condenser Leakage Path Seismic Evaluation
- 0COND-0004, Attachment 1,
- EQE Calculation 50171-C001, BNP-1 Evaluation of MSIV Outliers
- EQE Calculation 50171-C002, Seismic Adequacy Verification of Main Steam Stop, Control, and Bypass Valves and Associated Support Anchorage
- EQE Calculation 50171-C003, Main Steam Drain Line Support Evaluations
- EQE Calculation 50171-C004, Seismic Adequacy Verification of Condenser and Condenser Anchorage Capacity
- EQE Calculation 50171-C005, Design Modifications for Selected MSIV Outliers
- 0COND-0004, Attachment 6, Condenser Weight Determination and Anchorage and Shell Evaluation
- ESR #01-00188, Seismic Qualification/mod for EPU & Alt Source Term
- ESR #01-00133, MS/FW Piping Vibration Monitoring
- BSEP Specification 005-011, Seismic Design Criteria

b. Findings

No findings of significance were identified.

1R19 Post-Maintenance Testing

a. 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 completed correctly; and whether the test demonstrated that the affected equipment was capable of performing it's intended function and was operable in accordance with TS:

- Unit 1, RCIC Governor Replacement

  The following document was reviewed:
  - Operating Procedure, 1OP-16, Reactor Core Isolation Cooling System Operating Procedure, Section 5.3

- Unit 1, DG #1, Cylinder Head Exhaust Valve Seat Replacement

The following documents were reviewed:
- WO 00199903 03, 2-DG1-Eng-Replace the No. 1-4 Right and 9-12 Cylinder Heads
- Periodic Test, 0PT-12.2A, No. 1 Diesel Generator Monthly Load Test

- Unit 2, Diesel Engine #4 Blown Fuse on Engine Control Panel

  The following document was reviewed:
  - WO 00215243 02, DG #4 Engine Cntrl Pnl Auto Start Light

- Unit 2, 2-E41-F001, HPCI Turbine Steam Supply Valve

  The following documents were reviewed:
  - Periodic Test, 0PT-09.7 HPCI System Valve Operability Test
  - HPCI System Log
  - WO 00192086 1, Steam Leak in HPCI Room on 2-E41-F001 Packing

- Unit 2, B21-LT-N036, Reactor Water Level Transmitter

  The following documents were reviewed:
  - MR, 2MST-RHR24R, RHR RX Vessel Shroud Level Instrument Chan Cal and Calibration for Low Level During Cold Shutdown
  - WO 00212291-01, 2-B21-LT-N036, Not EQ Qualified but Operable per EQ Org

- Unit 1, Diesel Engine #1 Jacket Water Coupling Leaks

  The following document was reviewed:
  - WO 00172473, 2-DG1-ENG, Jacket Water Couplings

- 2A Nuclear Service Water Discharge Check Valve Failure

  The following document was reviewed:
  - 2PT-24.1-2, Service Water Pump and Discharge Valve Operability Test

- 1A-2 Battery Cell Replacement

  The following document was reviewed:
  - WO 00234193, 1-1A-2-125 VDC-Bat, Cell Replacement

b. Findings

No findings of significance were identified.

1R20 Refueling and Outage Activities

a. Inspection Scope

The inspectors evaluated outage activities to ensure that the licensee considered risk in developing outage schedules; adhered to administrative risk reduction methodologies developed to control plant configuration; developed mitigation strategies to losses of key safety functions; and adhered to operating license and TS requirements that ensure defense-in-depth. The following specific areas were reviewed:

- Review of Outage Plan Prior to the outage, the inspectors reviewed the licensee's outage risk control plan, attended the risk briefings, to verify that the licensee appropriately considered risk, industry experience and previous site specific problems. The inspectors reviewed the licensee's contingency actions for losses of key safety functions and that the licensee maintained key safety function status and controls continuously throughout the outage. The inspectors reviewed the Unit 1 Outage Risk Assessment, Refueling Outage Safe Shutdown Risk Assessment. The following document was reviewed:

  - AR 55327, B114R1 Outage Risk Assessment

- Monitoring of Shutdown Activities The inspectors reviewed licensee activities to verify that TS cooldown restrictions were met. The following documents were reviewed:

  - General Procedure, 0GP-05, Warm Shutdown
  - Periodic Test, 1PT 01.7, Heatup/Cooldown Monitoring

- Licensee Control of Outage Activities The inspectors reviewed licensee activities to verify that the licensee maintained defense-in-depth commensurate with the outage risk control plan for key safety functions and applicable TS when risk significant equipment was removed from service. The inspectors reviewed licensee activities to verify that configuration changes due to emergent work and unexpected conditions were controlled in accordance with the outage risk control plan, and that control room operators were familiar with the plant configuration. The following document was reviewed:

  - Administrative Procedure, 0AP-022, BNP Outage Risk Management

- Clearance Activities The inspectors reviewed licensee activities to verify that clearance tags were properly hung and that associated equipment was appropriately configured to support clearance functions on a random sampling basis. The following documents were reviewed:

  - NSW Header Clearance, Checklist 00020110
  - Unit 1, Reactor Building Piping Diagram, D-25037, Service Water System, Shts 1 and 2

- Reactor Coolant System Instrumentation The inspectors reviewed licensee activities to verify that reactor coolant system pressure, level, and temperature instruments were installed and configured to provide accurate indication; and that appropriate instrumentation calibrations were performed as necessary based on plant conditions.

- Electrical Power The inspectors reviewed licensee activities to verify that the status and configurations of electrical systems met TS requirements and the licensee's outage risk control plan. The inspectors reviewed licensee activities to verify that switchyard activities were controlled commensurate with safety and were consistent with the licensee's outage risk control plan assumptions. The following document was reviewed:

  - Brunswick Nuclear Plant, Unit 1, B114R1 Refueling Outage, Safe Shutdown Risk Assessment, January 28, 2002, through January 30, 2002

- Decay Heat Removal (DHR) System Monitoring The inspectors observed DHR parameters to verify that the systems were functioning properly.

- Spent Fuel Pool Cooling System Operation The inspectors reviewed licensee activities to verify that outage work did not impact the ability of the operations staff to operate the spent fuel pool cooling system during and after core offload. The following document was reviewed:

  - Operating Procedure, 1OP-17, Residual Heat Removal System Operating Procedure

- Inventory Control The inspectors reviewed licensee activities to verify that flow paths, configurations, and alternative means for inventory addition were consistent and maintained with the outage risk plan, and that reactor vessel inventory controls were adequate to prevent inventory loss.

- Reactivity Control The inspectors reviewed licensee activities to verify that proper control of reactivity was maintained in accordance with the TS. Potential reactivity changes were identified in the outage risk plan and were verified to have proper controls.

- Refueling Activities The inspectors reviewed licensee activities to verify that fuel handling operations were performed in accordance with TS and fuel handling procedures. The inspectors reviewed licensee activities to verify the entire core fuel bundles were in the correct position and orientation. The inspectors observed several fuel handling moves in the vessel area and spent fuel pool area. The following documents were reviewed:

  - General Plant Operating Procedure, 0GP-05,Unit Shutdown
  - Fuel Handling Procedure, 0FH-11N, Control Rod Shuffle
  - Fuel Handling Procedure, 0FH-11, Refueling, Rev 71 and 72

- Engineering Procedure, 0ENP-24.13, Core Verification

- Monitoring of Startup Activities The inspectors reviewed licensee activities to verify that TS, license conditions, commitments, and administrative procedure prerequisites for mode changes were met and for changing plant configurations. The inspectors performed a walkdown of primary containment prior to reactor startup to verify that debris had not been left which could affect performance of the containment torus. The inspectors observed reactor startup, the approach to criticality, and major portions of the power ascension. The following documents were reviewed:

  - General Plant Operating Procedure, 0GP-02, Approach to Criticality and Pressurization of the Reactor
  - General Plant Operating Procedure, 0GP-03, Unit Startup and Synchronization
  - Administrative Instruction, 0AI-127, Primary Containment Inspection and Closeout
  - Special Procedure, 1SP-01-110, Unit 1 Intermediate Extended Power Uprate Startup Test Plan - Phase 1 (2558 MWT)
  -Plant Procedure, 0PLP-28, Startup and Power Ascension Management Plan for Unit Startup Following an Outage
  - Updated Final Safety Analysis Report (UFSAR), Section 9.1.3, Spent Fuel Pool Cooling and Cleanup System
  - UFSAR Section 9.1.3.3., Safety Evaluation
  - Units 1 & 2, 0G41-0019, Combined Pools Thermal Hydraulic Evaluation in Refueling Mode

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing

a. Inspection Scope

The inspectors examined surveillance 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 it's intended function and was operable in accordance with TS. The following surveillance tests and associated documents were reviewed:

- Unit 1, Reactor Vessel Division 1 Low Level Instrument Channel Calibration
  - Operator Log, 01/03/02
  - MST, 0MST-RHR23Q, RHR-LPCI ADS CS LL3, HPCI RCIC LL2 DIV 1 Trip Unit Chan Cal
  - Piping & Instrumentation Diagram (P&ID) D-2529, Shts 1and 2, Unit 2 Reactor Building, Reactor Core Isolation Cooling System Piping Diagram
- Unit 2, Reactor Vessel Pressure Instrument Channel Calibration

- WO Package 46516-01, 0MST-RHR26R, RHR CS Low RX Press Permissive Inst. Chan Cal
- P&ID, 2-FP-50017, Sht 6, RHR Sys, Elementary Diagram
- P&ID, 2-FP-05889, Shts 1 and 2, Core Spray System Elementary Diagram

- Unit 2, MST, 2MST-SW12Q, SW DG Cooling Water Supply Low Pressure INST Cal and Functional Test
- Unit 1, RCIC, 0PT-10.1.1
  - Periodic Test, 0PT-10.1.1, RCIC System Operability Test
- Unit 1, Primary Containment Isolation (CI) Valves, 1E11-F008 and 1E11-F009 (2 CI valves/refuel outage)
  - Engineering Procedure, 0ENP-16.4, Use of Leak Test Equipment
- Unit 1, Reactor Protection System Logic System Functional Test
  - MST, 1MST-APRM41R, Logic System Functional Test
- Unit 1, Batteries 1A-2 Service Capability Test
  - MST, 0MST-BATT11R, Batteries, 125 VDC, Service Capacity Test
  - WO 00234193 02, 1-1A-2-125VDC-BAT, Cell Replacement

b. Findings

No findings of significance were identified.

1R23 Temporary Plant Modifications

a. Inspection Scope

The inspectors reviewed a proposed temporary modification to the 1C main power transformer (MPT) bushing. The licensee identified an increase in temperature above average on the 1C MPT transformer bushing. The inspectors reviewed the 10 CFR 50.59 screening for the proposed temporary modification. ESR 98-222, MPT High Side Bushing Connector Replacement, Rev 0, was reviewed to assess the potential affects of the modification to transformer availability and operability. The following documents were reviewed:

- AR 20627, 1C Main Transformer Bushing
- AR 55073, Transformer Bushing Conductive Grease
- Nuclear Energy Institute (NEI), Guidelines for 10 CFR 50.59 Implementation, NEI 96-07
- ESR 01-000481, 1C MPT Connection Improvement
- Nuclear Generation Group (NGG) Standard Procedure, REG-NCCG-0002, 10 CFR 50.59 and Other Regulatory Evaluations
- NGG Standard Procedure, EGR-NGGC-0005, Engineering Change and Engineering Service Requests
- NGG Standard Procedure, EGR-NGGC-0204, Evaluation and Selection of Materials for Plant Components
- NGG Standard Procedure, REG-NGGC-0010, 10 CFR 50.59 Reviews

- NGG Interorganizational Agreement, NGGM-1A-0003, Transmission Interface Agreement for Operation, Maintenance, and Engineering Activities at Nuclear Plants

b. Findings

No findings of significance were identified.

3. SAFEGUARDS

Cornerstone: Physical Protection

3PP1 Access Authorization (Behavioral Observation Program)

a. Inspection Scope

The inspectors evaluated the licensee's Behavioral Observation Program to evaluate the effectiveness and proper implementation of the behavioral observation portion of the personnel screening and fitness for duty programs. Five representatives of licensee management and five representatives assigned escort duties were interviewed to determine their understanding of the program. The inspectors evaluated the effectiveness of each individual's training, including their ability to recognize aberrant behavioral traits, indications of narcotic and alcohol use, and knowledge of work call-out reporting procedures. The inspectors evaluated a sample of the licensee's ARs associated with the Access Authorization and Fitness For Duty Behavioral Observation Program issued from March 1, 2001, through January 2002, to evaluate the licensee's threshold for recommending for-cause testing for adverse events related to human performance.

The licensee's activities were evaluated against requirements in the Brunswick Nuclear Plant Physical Security Plan, associated plant procedures, and 10 CFR, Part 26, Fitness For Duty Program.

b. Findings

No findings of significance were identified.

3PP2 Access Control

a. Inspection Scope

The effectiveness of the licensee's access control procedures and associated equipment designed to detect and prevent the introduction of contraband into the protected area were evaluated. During the inspection the inspectors evaluated the adequacy of equipment testing procedures performed by a licensee security representative on access control equipment in use, and on in-service standby equipment at the site's Central Access Portal (CAP). The inspectors reviewed licensee activities to verify that the procedure that describes equipment testing is performance based and challenges the presently installed

and configured site equipment. The inspectors assessed the adequacy of the CAP card readers and biometric hand readers to prevent unauthorized entry into the protected area and to preclude multiple entries without logging out of the protected area. The adequacy of in-processing searches of personnel and packages at the CAP, and vehicle searches conducted at the protected area vehicle access portal were accessed. The licensee's Key and Lock Program and associated procedures for limiting and controlling vital area keys were examined. The inspectors reviewed a sample list of current plant workers with vital area access to evaluate the licensee's process for granting vital area access to authorized personnel identified as having a need for such access. An interview was conducted with the Site Security Manager and the Access Authorization Supervisor to evaluate if adequate safeguards were in place to protect against unauthorized access to the site security computers from outside the protected area.

The licensee's activity was evaluated against requirements in the Brunswick Nuclear Plant Physical Security Plan and associated procedures, and 10 CFR, Part 73.55, Requirements for Physical Protection of Licensed Activities in Nuclear Power Reactors Against Radiological Sabotage, and Part 73.56, Personnel Access Authorization Requirements for Nuclear Power Plants.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator (PI) Verification

.1 Mitigating Systems and Barrier Integrity PIs

a. Inspection Scope

The inspectors reviewed the PI data submitted in January 2002 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 to check for the accuracy of the performance indicators. 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 December 2000 to December 2001.

- Reactor Coolant System Leakage
- Unplanned Scrams per 7,000 Critical Hours
- Scrams with Loss of Normal Heat Removal

The following documents were reviewed:

- 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
- NEI 99-02 Regulatory Assessment Performance Indicator Guideline

b. Findings

No findings of significance were identified.

.2 Physical Protection PIs

a. Inspection Scope

The inspectors evaluated the licensee's PI data associated with the Intrusion Detection System and Closed Circuit Television to determine if the licensee provided accurate reporting for compensatory time relative to equipment degradation. The evaluation included a review of tracking and trending reports and security event reports for the fourth quarter of 2001. The following PIs were verified using NEI 99-02 Regulatory Assessment Performance Indicator Guideline:

- Protected Area Equipment
- Personnel Screening Program
- Fitness For Duty/Personnel Reliability Program

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 April 15, 2002. 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 Meeting Summary

On April 10 the NRC Region II, Division of Reactor Projects, Branch Chief, and the Senior Resident Inspector assigned to Brunswick Steam Electric Plant, met with representatives of the Carolina Power and Light Company, to discuss the NRC's Reactor Oversight Process (ROP) and the Brunswick Plant annual assessment of safety performance for the period of April 1, 2001 - December 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 Brunswick site management, members of site staff, two local officials, one member of the public, and three news media personnel.

This meeting was open to the public. Information used for the discussions of the ROP is available from the NRC's document system (ADAMS) as accession number ML020600179. ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm.html (the Public Electronic Reading Room). The information presented by the licensee at the meeting is included as Attachment 1.

4OA7 Licensee Identified Violations

The following finding of very low significance 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 a Non-Cited Violation (NCV).

If you deny this NCV, you should provide a response with the basis for your denial, within 30 days of the date of this inspection report, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington DC 20555-0001; with copies to the Regional Administrator, Region II; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the Brunswick facility.

NCV Tracking Number	Requirement Licensee Failed to Meet
50-325/01-05-01	TS 5.7.2 prescribes licensee requirements for personnel entering high radiation areas with dose rates greater than 1.0 rem/hour (at 30 centimeters from the radiation source or from any surface penetrated by the radiation), but less than 500 rads/hour (at 1 meter from the radiation source or from any surface penetrated by the radiation). Section TS 5.7.2.d prescribes acceptable monitoring requirements for personnel entering such an area. The licensee failed to meet these requirements on March 2 when an individual entered the Unit 1 drywell without a dosimeter and remained in the area for approximately 10 minutes. The inspectors noted that the licensee had met part of the monitoring requirements of TS 5.7.2.d.3 during the drywell entry, in that a health physics technicians accompanied the individual and monitored radiation levels as they worked. This item is described in licensee corrective action program AR 56719, Individual Entered LHRA Without Electronic Dosimeter (Green).

PARTIAL LIST OF PERSONS CONTACTED

Licensee

A. Brittain, Manager Security
D. DiCello, Manager Regulatory Affairs
R. Clemmons, Senior Security Analyst
M. Clemmons, Shift Supervisor, Security
C. Elberfeld, Senior Engineering & Technical Support Specialist
C. Gannon, Director Site Operations
J. Gawron, Training Manager
W. Dorman, Manager Nuclear Assessment
J. Keenan, Site Vice President
C. Miller, Senior Security Analyst
E. O'Neil, Manager Site Support Services
J. Franke, Manager Brunswick Engineering Support Section
W. Noll, Plant General Manager
E. Quidley, Manager Maintenance
H. Wall, Manager Outage and Scheduling
M. Williams, Interim Manager Operations
S. Wright, Access Authorization Supervisor

NRC

B. Bonser, Chief, Reactor Projects Branch 4

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None

Opened and Closed During This Inspection

50-325/01-05-01	NCV	Failure to meet TS Personnel Radiological Monitoring Requirements (Section 4OA7)

Closed

None

Discussed

None

List of Documents Reviewed

3PP1 And 3PP2

Various Licensee Event Reports and Trending Reports

Key and Lock Daily and Annual Inventory Logs for months July, 2001 and March, 2002

Semi-Annual Fitness for Duty Report, July - December, 2001

Brunswick Nuclear Plant/Carolina Power & Light Company:

Brunswick Physical Security Plan

Plant Access and Radiation Worker Training, GET SSG

Key and Lock Procedure, 0SI-01-02

Maintenance and Testing of Security Systems, 0SI-12

Vehicular Traffic And Material Access Control, 0SI-10

Access Control, Personnel Identification and Badging Procedure, 0SI-09

Progress Energy/Carolina Power & Light Company:

Continual Behavior Observation Program, SEC-NGGC-2130

Fitness For Duty Unscheduled Work Call Outs, SEC-NGGC-2141