



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA STREET, N.W.
ATLANTA, GEORGIA 30323

Report No. 50-325/90-45 and 50-324/90-45

Licensee: Carolina Power and Light Company
P. O. Box 1551
Raleigh, NC 27602

Docket Nos. 50-325 and 50-324 License No. DPR-71 and DPR-62

Facility Name: Brunswick 1 and 2

Inspection Conducted: November 5 - 30, 1990

Lead Inspector:

R. L. Prevatte
R. L. Prevatte

12/10/90
Date Signed

Other Inspectors:

W. Levis
D. J. Nelson

Approved By:

D. Verretti
D. Verretti, Branch Chief
Division of Reactor Projects

12/10/90
Date Signed

SUMMARY

Scope:

This routine safety inspection by the resident inspectors involved the areas of maintenance observation, surveillance observation, and operational safety verification.

Results:

In the areas inspected, no programmatic weaknesses, significant safety matters, violations, or deviations were identified.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

- *K. Altman, Manager - Regulatory Compliance
- F. Blackmon, Manager - Radwaste/Fire Protection
- *S. Callis, On-Site Licensing Engineer
- T. Canterbury, Manager - Unit 1 Mechanical Maintenance
- *G. Cheatham, Manager - Environmental & Radiation Control
- R. Creech, Manager - Unit 2 I&C Maintenance
- J. Cribb, Manager - Quality Control (QC)
- W. Dorman, Manager - Quality Assurance (QA)/(QC)
- *M. Foss, Supervisor, Regulatory Compliance
- *J. Gee, Nuclear Engineering Department
- *J. Harness, General Manager - Brunswick Steam Electric Plant
- W. Hatcher, Supervisor - Security
- *R. Helme, Manager - Technical Support
- J. Holder, Manager - Outage Management & Modifications (OM&M)
- *M. Jones, Manager - On-Site Nuclear Safety - BSEP
- R. Kitchen, Manager - Unit 2 Mechanical Maintenance
- B. Leonard, Manager - Training
- J. Leviner, Manager - Engineering Projects
- J. McKee, Manager - QA
- *J. Moyer, Technical Assistant to Plant General Manager
- B. Poteat, Administrative Assistant to Plant General Manager
- R. Poulk, Manager - License Training
- J. Simon, Manager - Operations Unit 1
- W. Simpson, Manager - Site Planning and Control
- S. Smith, Manager - Unit 1 I&C Maintenance
- R. Starkey, Vice President - Brunswick Nuclear Project
- *R. Tart, Manager - Operations Unit 2
- J. Titrington, Manager - Operations Staff
- *R. Warden, Manager - Maintenance
- B. Wilson, Manager - Nuclear Systems Engineering

Other licensee employees contacted included construction craftsmen, engineers, technicians, operators, office personnel, and security force members.

*Attended the exit interview

Acronyms and initialisms used in the report are listed in the last paragraph.

2. Maintenance Observation (62703)

The inspectors observed maintenance activities, interviewed personnel, and reviewed records to verify that work was conducted in accordance with approved procedures, Technical Specifications, and applicable industry codes and standards. The inspectors also verified that: redundant components were operable; administrative controls were followed; tagouts were adequate; personnel were qualified; correct replacement parts were used; radiological controls were proper; fire protection was adequate; quality control hold points were adequate and observed; adequate post-maintenance testing was performed; and independent verification requirements were implemented. The inspectors independently verified that selected equipment was properly returned to service.

Outstanding work requests were reviewed to ensure that the licensee gave priority to safety-related maintenance.

The inspectors observed/reviewed portions of the following maintenance activities:

PM89-107	Rewire Motor Control Center for RHR Valve E11-F008
PM90-003	Miscellaneous Service Water System Maintenance/Upgrades
90-ALIG1 90-ALIII1	Swap cables between LPRM 20-21A and LPRM 20-05C
90-AUXS1	Replace HPCI Area Leak Detection Power Failure Relay
90-APFK1	Rebuild 2A SLC Pump

Violations and deviations were not identified.

3. Surveillance Observation (61726)

The inspectors observed surveillance testing required by Technical Specifications. Through observation, interviews, and record review, the inspectors verified that: tests conformed to Technical Specification requirements; administrative controls were followed; personnel were qualified; instrumentation was calibrated; and data was accurate and complete. The inspectors independently verified selected test results and proper return to service of equipment.

Portions of the following test activities were witnessed/reviewed:

2-MST-APRM12W	APRM Channel Functional Test
2-MST-RPS23M	RPS High Reactor Pressure Trip Unit Channel Calibration

2-MST-RPS24M RPS Reactor Vessel Low Water Level (LL 1) Trip Unit
Channel Calibration

0-PT-12.2B EDG 2 Monthly Load Test

Violations and deviations were not identified.

4. Operational Safety Verification (71707)

The inspectors verified that Unit 1 and Unit 2 were operated in compliance with Technical Specifications and other regulatory requirements by direct observations of activities, facility tours, discussions with personnel, reviewing of records and independent verification of safety system status.

The inspectors verified that control room manning requirements of 10 CFR 50.54 and the Technical Specifications were met. Control operator, shift supervisor, clearance, STA, daily and standing instructions, and jumper/bypass logs were reviewed to obtain information concerning operating trends and out of service safety systems to ensure that there were no conflicts with Technical Specification Limiting Conditions for Operations. Direct observations of control room panels and instrumentation and recorder traces important to safety were conducted to verify operability and that operating parameters were within Technical Specification limits. The inspectors observed shift turnovers to verify that system status continuity was maintained. The inspectors verified the status of selected control room annunciators.

Operability of a selected Engineered Safety Feature division was verified weekly by ensuring that: each accessible valve in the flow path was in its correct position; each power supply and breaker was closed for components that must activate upon initiation signal; the RHR subsystem cross-tie valve for each unit was closed with the power removed from the valve operator; there was no leakage of major components; there was proper lubrication and cooling water available; and conditions did not exist which could prevent fulfillment of the system's functional requirements. Instrumentation essential to system actuation or performance was verified operable by observing on-scale indication and proper instrument valve lineup, if accessible.

The inspectors verified that the licensee's health physics policies/procedures were followed. This included observation of HP practices and a review of area surveys, radiation work permits, postings, and instrument calibration.

The inspectors verified by general observations that: the security organization was properly manned and security personnel were capable of performing their assigned functions; persons and packages were checked prior to entry into the PA; vehicles were properly authorized, searched, and escorted within the PA; persons within the PA displayed photo identification badges; personnel in vital areas were authorized; effective compensatory measures were employed when required; and security's response to threats or alarms was adequate.

The inspectors also observed plant housekeeping controls, verified position of certain containment isolation valves, checked clearances, and verified the operability of onsite and offsite emergency power sources.

- a. The current Unit 1 outage scope necessitated that the core be off-loaded to the spent fuel pool. Full core off-loading is common practice at both BWRs and PWRs. Technical Specifications have limited applicability when no fuel is in the reactor vessel (i.e., there is no "operational condition" defined for this situation). Decay heat removal is accomplished using the shutdown cooling mode of RHR prior to off-load and by using the non-safety spent fuel pool cooling system after off-load. RHR can be configured to a "spent fuel pool cooling assist" mode, if necessary, but no TS requirements exist once the core is off-loaded. The licensee desired to remove both trains of RHR from service following the Unit 1 core off-load. Prior to the second train being disabled, Technical Support personnel recognized a conflict with the FSAR safety evaluation for a loss of spent fuel pool cooling. FSAR Section 9.1.2.3.2.3 analyzes two cases for a loss of the spent fuel pool cooling system: one is the partial off-load "refueling case" and the second is the "core unload case" for full core off-load.

The analysis for both cases assumes that the RHR system is available as a backup decay heat removal method. In addition, the analysis for the radiological impact of elevated spent fuel pool temperature assumes that the SBT system and, thus, secondary containment, are available. These assumptions had not been translated into operational requirements previously. Technical Support conducted a detailed analysis for the specific Unit 1 conditions and concluded that upon loss of spent fuel pool cooling without RHR, sufficient time margin existed to take mitigating actions prior to excessive fuel pool temperatures being reached. This was documented in EER 90-285 dated October 27, 1990. The conclusion was based upon the actual decay heat being within the bounds of the FSAR worst case fuel pool heat load and that SBT and secondary containment could be made functional to mitigate radiological impacts. Although the SBT and secondary containment conditions were not initially met, these conditions could be met in less time than the spent fuel pool would take to heat up to 150 degrees F after loss of all spent fuel pool cooling. Operational restrictions were imposed to ensure that no outage activities were allowed that would prevent immediate manual operation of one SBT train or manual operation of the second SBT train and establishment of functional secondary containment within eight hours.

The inspector reviewed the licensee's analysis as compared to the FSAR and concluded that absent specific TS requirements, the licensee's analysis was conservative and resulting actions were

prudent. Technical Support personnel demonstrated the proper safety sensitivity and questioning attitude that led to discovery of the previously unrecognized situation.

Violations and deviations were not identified.

5. Exit Interview (30703)

The inspection scope and findings were summarized on November 30, 1990, with those persons indicated in paragraph 1. The inspectors described the areas inspected. Proprietary information is not contained in this report.

6. Acronyms and Initialisms

AO	Auxiliary Operator
APRM	Average Power Range Monitor
BSEP	Brunswick Steam Electric Plant
BWR	Boiling Water Reactor
EDG	Emergency Diesel Generator
EER	Engineering Evaluation Report
ESF	Engineered Safety Feature
F	Degrees Fahrenheit
FSAR	Final Safety Analysis Report
HP	Health Physics
I&C	Instrumentation and Control
IE	NRC Office of Inspection and Enforcement
IFI	Inspector Followup Item
IPBS	Integrated Planning, Budgeting and Scheduling
LER	Licensee Event Report
LPRM	Local Power Range Monitor
MST	Maintenance Surveillance Test
NRC	Nuclear Regulatory Commission
NRR	Nuclear Reactor Regulation
PA	Protected Area
PM	Plant Modification
PNSC	Plant Nuclear Safety Committee
PT	Periodic Test
PWR	Pressurized Water Reactor
QA	Quality Assurance
QC	Quality Control
RHR	Residual Heat Removal
RPS	Reactor Protection System
SBGT	Standby Gas Treatment
SLC	Standby Liquid Control
STA	Shift Technical Advisor
TS	Technical Specification
URI	Unresolved Item