



UNITED STATES
NUCLEAR REGULATORY COMMISSION

REGION II
101 MARIETTA STREET, N.W.
ATLANTA, GEORGIA 30303

Report Nos.: 50-325/84-30 and 50-324/84-30

Licensee: Carolina Power and Light Company
411 Fayetteville Street
Raleigh, NC 27602

Docket Nos.: 50-325 and 50-324

License Nos.: DPR-71 and DPR-62

Facility Name: Brunswick 1 and 2

Inspection Conducted: September 15 - October 15, 1984

Inspectors:	<u>P. O. Myers</u>	<u>10/31/84</u>
	D. O. Myers, Senior Resident Inspector	Date Signed
	<u>L. W. Garner</u>	<u>10/31/84</u>
	L. W. Garner, Resident Inspector	Date Signed
	<u>T. E. Hicks</u>	<u>10/31/84</u>
	T. E. Hicks, Resident Inspector	Date Signed
Approved by:	<u>P. Bemis</u>	<u>10/31/84</u>
	P. Bemis, Section Chief	Date Signed
	Division of Reactor Projects	

SUMMARY

Scope: This routine, unannounced inspection involved 178 inspector-hours on site in the areas of surveillance, maintenance, operational safety verification, ESF system walkdown, in-office Licensee Event Reports review, independent inspection, plant transients, and plant startup from refueling.

Results: Of the areas inspected, two violations were identified (Failure to follow an operations procedure - paragraph 8; and inadequate surveillance procedures - paragraph 6).

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REPORT DETAILS

1. Licensee Employees Contacted

- J. Boone, Engineering Supervisor
- *L. Boyer, Director - Administrative Support
- *J. Chase, Manager - Operations
- *G. Cheatham, Manager - Environmental and Radiation Control
- J. Cook, Senior Specialist - Environmental and Radiation Control
- R. Creech, Senior Specialist - Environmental and Radiation Control
- *C. Dietz, General Manager - Brunswick Nuclear Project
- W. Dorman, QA - Supervisor
- K. Enzor, Director - Regulatory Compliance
- W. Hatcher, Security Specialist
- *A. Hegler, Superintendent - Operations
- *R. Helme, Director - Onsite Nuclear Safety - BSEP
- *M. Hill, Manager - Administrative and Technical Support
- B. Hinkley, Engineering Supervisor
- J. Holder, Manager - Outages
- P. Hopkins, Director - Training
- P. Howe, Vice President - Brunswick Nuclear Project
- *L. Jones, Director - QA/QC
- R. Kitchen, Mechanical Maintenance Supervisor (Unit 2)
- J. Moyer, I&C Electrical Maintenance Supervisor (Unit 1)
- *D. Novotny, Senior Regulatory Specialist
- G. Oliver, Manager - Site Planning and Control
- *J. O'Sullivan, Manager - Maintenance (Acting)
- *B. Parks, Manager - Technical Support (Acting)
- R. Poulk, Senior NRC Regulatory Specialist
- C. Truebel, Mechanical Maintenance Supervisor (Unit 1)
- L. Tripp, Radiation Control Supervisor
- V. Wagoner, Director - IPBS/Long Range Planning
- J. Wilcox, Principle Engineer - Operations
- B. Wilson, Engineering Supervisor

Other licensee employees contacted included technicians, operators, and engineering staff personnel.

*Attended exit interview

2. Exit Interview

The inspection scope and findings were summarized on October 18, 1984, with those persons indicated in paragraph 1 above. Meetings were also held with senior facility management periodically during the course of this inspection to discuss the inspection scope and findings.

3. Licensee Action on Previous Enforcement Matters

Not inspected.

4. Unresolved Items

Unresolved items were not identified during this inspection.

5. Operational Safety Verification (71707 and 71710)

The inspector verified conformance with regulatory requirements throughout the reporting period by direct observations of activities, tours of facilities, discussions with personnel, reviewing of records and independent verification of safety systems status. The following determinations were made.

- Control Room Observations - The inspectors verified that control room manning requirements of 10 CFR 50.54 and the Technical Specifications were being met. Control room, shift supervisor, clearance and jumper/bypass logs were reviewed to obtain information concerning operating trends and out of service safety systems to insure that there were no conflicts with Technical Specifications Limiting Conditions of Operations. Direct observations were conducted of control room panels, instrumentation, and recorder traces important to safety to verify operability and that parameters were within Technical Specifications limits. In addition, the inspectors observed shift turnovers to verify that continuity of system status was maintained and also questioned shift personnel relative to their awareness of plant conditions. The inspectors verified the status of selected control room annunciators and were assured that the control room operators understood the reasons why important annunciators were lit. In addition, periodic verifications were conducted to insure that corrective actions, if appropriate, were initiated and completed in a timely manner.
- ESF Train Operability - Operability of selected ESF trains was verified by insuring that: each accessible valve in the flow path was in its correct position; each power supply and breaker, including control room fuses, were aligned for components that must activate upon initiation signal; removal of power from those ESF motor-operated valves so identified by TS was completed; there was no leakage of major components; there was proper lubrication and cooling water available; a condition did not exist which might prevent fulfillment of the train's functional requirements. In addition, instrumentation essential to system actuation or performance was verified operable by observing onscale indication and proper instrument valve lineup, if accessible.
- Radiation Protection Controls - The inspectors verified that the licensee's health physics policies/procedures are being followed, including area surveys, RWPs, posting and calibration of selected radiation protection instruments in use.
- Physical Security Plan - The inspectors verified that the security organization is properly manned and that security personnel are capable of performing their assigned functions, that persons and packages are checked prior to entry into PA, vehicles are properly authorized,

searched, and escorted within the PA, persons within the PA display photo identification badges, personnel in vital areas are authorized, that effective compensatory measures are employed when required, and that security's response to threats or alarms appears adequate.

- Plant Housekeeping - Observations relative to plant housekeeping identified no unsatisfactory conditions.
- Containment Isolation - Selected containment isolation valves were verified to be in their correct positions.
- Radioactive Releases - The inspectors verified that selected liquid and gaseous releases were made in conformance with 10 CFR 20 Appendix B and Technical Specifications.

No violations or deviations were identified.

6. Surveillance Testing (61726)

The surveillance tests were analyzed and/or witnessed by the inspector to ascertain procedural and performance adequacy.

The completed test procedures examined were analyzed for embodiment of the necessary test prerequisites, preparations, instructions, acceptance criteria and sufficiency of technical content.

The selected tests witnessed were examined to ascertain that current written approved procedures were available and in use, that test equipment in use was calibrated, that test prerequisites were met, system restoration was completed and test results were adequate.

The selected procedures attested conformance with applicable Technical Specifications, they appeared to have received the required administrative review and they apparently were performed within the surveillance frequency prescribed.

The inspector employed one or more of the following acceptance criteria for evaluating surveillance tests.

10 CFR
ANSI N18.7
Technical Specifications

Of the areas inspected, one violation was identified.

On October 2 and 3, 1984, the resident inspectors discovered that Technical Specifications 4.5.3.2.c for Units 1 and 2, which requires that each LPCI subsystem be demonstrated operable at least once per 18 months by performing a system functional test which includes simulated automatic actuation of the system throughout its emergency operating sequence and verifying that each automatic valve in the flow path actuates to its correct position, was not

being completely performed due to an inadequate surveillance procedure, PT 8.1.2. This procedure neglected to verify that both reactor coolant recirculating pump discharge and discharge bypass valves would automatically close after being given a simulated automatic actuation of the LPCI system. The valves are assigned to close when LOCA signal, combined with a low reactor pressure signal of 310 psi is present. This prevents diverting a large portion of the LPCI flow through the recirculation piping and out of a postulated break in the line. This inadequate procedure constitutes a violation of Technical Specifications 6.8.1.a (325,324/84-30-02).

The licensee has taken the following corrective actions for Unit 1 recirculation pump discharge and discharge bypass valve (which is operating at 100% power).

- a. Previously verified using PT 3.1.21, that the logic from the power source through the manual control switch and closing relay is operable.
- b. Previously verified using PT 8.1.2, that the logic contacts in the automatic sequence are operable.
- c. Verified using special procedure 84-153, that the wiring from the power source to the logic contacts in the automatic sequence, in between the contacts and from the contacts to the closing relay, is intact and operable.

For Unit 2, prior to startup, the licensee will rewrite PT 8.1.2 and perform those additional steps which were not written into the procedure and not performed at the last performance of the PT, such that Technical Specification 4.5.3.2.c will be satisfied.

The resident inspectors with concurrence from the Region, determined that this corrective action was satisfactory and the resident office will followup on the PT 8.1.2 rewrite and tests of the aforementioned surveillance requirement.

In a separate but similar example of an inadequate procedure, a Unit 1 trip was caused by an I&C technician using a maintenance instruction (see paragraph 10 for the details of the scram). On September 18, 1984, while performing MI-03-4U1, which is a calibration instruction for GE multipoint recorders in the steam/flow feed recorder (GE MAC Recorder Model 531 Inst. # 1-C32-FR-607), an I&C technician caused a feedwater transient when actions specified in the instruction were actually done out of sequence. Upon review of the procedure, the inspector observed that the actions which caused the feedflow increase were actually contained in a note in the procedure, but not a numbered stop. This ambiguity contributed to the technician error. After the plant was restored to a stable condition, maintenance personnel determined the deficiency and proposed corrective action to correct the procedure and inform the remaining staff of the details surrounding the issue. It remains, however, that the procedure was recently changed (Revision 5 dated 4/4/84) to its currently deficient condition and reviewed and does not appear to have had an engineering input,

either from maintenance or plant support engineering. The change was initiated to allow the option of "in-field" or "in-shop" instrument calibrations but was later found not to be adequate for all applications of the recorders to which the procedure was specified. In the case of the 1-C32-FR-607 recorder, the instrument is located in a current loop such that when the specified lead was lifted, the feedflow input to the feed pump controller was lost, thereby causing the feed pumps to "see" a decreased flow. Speed automatically increased to compensate and the overfeed of the reactor resulted. The resident office will continue to assess the apparent lack of engineering interface and interdisciplinary review of maintenance instruction as an Inspector Followup Item (325,325/84-30-01).

7. Maintenance Observations (62703)

Maintenance activities were observed and reviewed throughout the inspection period to verify that activities were accomplished using approved procedures or the activity was within the skill of the trade and that the work was done by qualified personnel. Where appropriate, limiting conditions for operation were examined to ensure that while equipment was removed from service, the Technical Specification requirements were satisfied. Also, work activities, procedures, and work requests were reviewed to ensure adequate fire cleanliness and radiation protection precautions were observed, and that equipment was tested and properly returned to service. Acceptance criteria used for this review were as follows:

Maintenance Procedure Technical Specifications

Outstanding work requests that were initiated by the operations group for Units 1 and 2 were reviewed to determine that the licensee is giving priority to safety-related maintenance and not allowing a backlog of work items to permit a degradation of system performance.

The licensee found that during maintenance on the HPCI main pump, that the installed pump seal was different from vendor manual recommendations. The maintenance instruction that guided work activities (MI-16-534), was not specific in delineating replacement part numbers, but did reference the correct vendor manual. Upon review, the vendor manual was found to be ambiguous in its description of replacement parts. Specifically, the problem found by maintenance personnel was that a "standard" speed seal was installed on the HPCI main pump instead of a "high speed" seal, as shown in one vendor manual drawing; other drawings showed the standard seal.

Maintenance contacted engineering for assistance and determined, after consulting with the pump and seal manufacturer, that the installed seal would be satisfactory for service remaining until the next Unit 1 outage when seal replacement could take place. This analysis was based on possible seal failure modes and resulting leakage and lost flow rates of HPCI to the vessel.

MI-16-534 was changed on 10/3/84 to reference the correct seal unit. A higher interaction between system engineers and ongoing maintenance work should enable the increased engineering overview of maintenance efforts and procedures to take place to correct other such deficiencies.

No violations or deviations were identified.

8. Inadvertent Level Decrease While Shutdown

On September 24, 1984, Unit 2 reactor water level was inadvertently lowered by personnel error from 177 inches above the top of the core to 165 inches above the top of the core. Prior to the event, the containment integrated leak rate test (CILRT) was being completed, i.e., containment pressure was 55 psig, the reactor was being cooled by shutdown cooling mode of RHR, one loop of core spray was operable and all other systems were isolated from the reactor and containment. As part of recovery from the CILRT, containment pressure had been lowered from 49 psig. This apparently caused suppression pool instrument LT-2601 to drift upward. The control operator observed this increase and informed the shift foreman that he was going to pump down the suppression pool. A discussion followed concerning valving in a tygon tube to observe suppression pool level. This is normal station practice. However, because the containment was pressurized, it was decided that this could be hazardous and thus was not advisable. Upon completion of this conversation with the shift foreman, the control operator proceeded to the control panel, verified that an RHR pump was running and opened the RHR valves from the pump discharge to radwaste. Within the next minute, reactor low level setpoint was reached. At the setpoint, a reactor scram occurred and isolation of the discharge valves to radwaste occurred. The reduction in reactor water level resulting from the RHR system being in shutdown cooling mode instead of suppression pool cooling mode, as assumed by the operator. The root cause of the event was failure of the operator to follow good work practices, i.e., he used a single item, pump running, versus verification of full correct system alignment for system status and failed to use a procedure for an evolution for which a procedure had been written. Compounding this is the fact the operator was standing his first watch in months on the shutdown unit. His normal duty was on Unit 1, which has been at power for most of the year. If the RHR system is in service on an operating unit, it is in the suppression pool cooling mode.

Failure to use procedure OP-17, Residual Heat Removal System Operating Procedure, for draining the suppression pool to radwaste, is a violation of Technical Specification 6.8.1.a, which requires procedures to be implemented (324/84-30-03).

9. Plant Startup from Refueling (71711)

The resident office conducted various inspections on Unit 2 to ascertain whether systems disturbed or tested during the refueling outage were returned to an operable status before plant startup. These included:

- Performing walkdowns on appropriate portions of emergency core cooling systems and reactivity control systems both inside and outside of primary containment.
- A review of licensee procedures and administrative controls for returning to an operable status various safety-related systems and components which underwent maintenance or were disturbed during the refueling outage.
- A review of licensee's administrative controls and startup procedures.

Unit 2 is completing a 32-week refueling outage and will be commencing startup in the next report period.

No violations or deviations were identified.

10. Followup of Plant Transients

During the period of this report, a followup on plant transients and safety system challenges was conducted to determine the cause; ensure that safety systems and components functioned as required; corrective actions were adequate; and the plant was maintained in a safe shutdown condition.

On September 18, 1984, at 1039 hours, Unit 1 reactor experienced a turbine stop valve trip from 89% of full power. Per emergency operating procedure, reactor level was controlled by manual initiation of the High Pressure Coolant Injection (HPCI) system and reactor pressure was controlled by manual actuation of one relief valve. Reactor pressure did not exceed 1060 psid.

Investigation into the cause of the trip revealed that, as a result of an inadequate maintenance instruction (see paragraph 6), an I&C technician working with leads to the feedwater chart recorder caused a loss of feedwater signal to the feedwater controller. Feedwater flow increased to 208 inches, at which point a main turbine trip and feedwater pump trip occurred. All engineered safety systems responded as expected.

The unit resumed operation on September 19, 1984.

No violations or deviations were identified.

11. Onsite Review Committees (40700)

The inspectors attended the regular monthly Plant Nuclear Safety Committee (PNSC) meeting and several special PNSC meetings conducted during the inspection period.

The inspectors verified the following items:

- Meetings were conducted in accordance with Technical Specification requirements regarding quorum membership, review process, frequency and personnel qualifications; and
- Meeting minutes were reviewed to confirm that decisions/recommendations were reflected and followup of corrective actions were completed.

No violations or deviations were identified.