



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

APR 22 1986

Report Nos. 50-325/86-11 and 50-324/86-12

Licensee: Carolina Power and Light Company
 P. O. Box 1551
 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: March 1-31, 1986

Inspectors: <u>PS. Melh</u>	<u>4/21</u>
FOR <u>W. H. Ruland</u>	Date Signed
<u>PS. Melh</u>	<u>4/21</u>
FOR <u>L. W. Garner</u>	Date Signed
Approved By: <u>P. E. Fredrickson</u>	<u>4/21/86</u>
for <u>P. E. Fredrickson, Section Chief</u>	Date Signed
<u>Division of Reactor Projects</u>	

SUMMARY

Scope: This routine safety inspection involved 154 inspector-hours on site in the areas of maintenance observation, surveillance observation, operational safety verification, engineered safety features system walkdown, information meetings with local officials, followup on unresolved item, and plant modifications.

Results: Three violations - Inadequate acceptance test after core spray valve motor-operator replacement; Failure to follow procedure when recording test tank level and inadequate procedure for a Standby Liquid Control (SLC) system surveillance test; Failure to have a procedure to verify SLC system discharge is flooded after installation of relief valves per FSAR commitment.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

P. Howe, Vice President - Brunswick Nuclear Project
C. Dietz, General Manager - Brunswick Nuclear Project
T. Wyllie, Manager - Engineering and Construction
E. Bishop, Manager - Operations
L. Jones, Director - Quality Assurance (QA)/Quality Control (QC)
R. Helme, Director - Onsite Nuclear Safety - BSEP
J. Chase, Assistant to General Manager
J. O'Sullivan, Manager - Maintenance
G. Cheatham, Manager - Environmental & Radiation Control
B. Hinkley, Manager - Technical Support
A. Hegler, Superintendent - Operations
W. Hogle, Engineering Supervisor
W. Tucker, Engineering Supervisor
B. Wilson, Engineering Supervisor
K. Enzor, Director - Regulatory Compliance
R. Creech, I&C/Electrical Maintenance Supervisor (Unit 2)
R. Warden, I&C/Electrical Maintenance Supervisor (Unit 1)
W. Dorman, Supervisor - QA
W. Hatcher, Supervisor - Security
R. Kitchen, Mechanical Maintenance Supervisor (Unit 2)
C. Treubel, Mechanical Maintenance Supervisor (Unit 1)
R. Poulk, Senior NRC Regulatory Specialist
D. Novotny, Senior Regulatory Specialist
W. Murray, Senior Engineer - Nuclear Licensing Unit

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

2. Exit Interview (30703)

The inspection scope and findings were summarized on March 28, 1986, with the general manager. The following findings were discussed in detail: Violation for an inadequate acceptance test after core spray valve motor-operator replacement (paragraph 9); Violation for failure to follow procedure when recording test tank level during a Standby Liquid Control (SLC) system surveillance test (paragraph 5); and a violation for failure to have a procedure to verify SLC system discharge is flooded after installation of relief valves per FSAR commitment (paragraph 7). The licensee acknowledged the above findings without exception.

The licensee agreed to provide additional information regarding the testing of the SLC system during a surveillance test (paragraph 5). On April 2, 1986, the licensee stated, via telecon with the inspectors, that PT-06.2.3 was an adequate procedure since the SLC relief valve was tested every outage and that postulating a check valve failure would be a double failure, exceeding the design basis. The licensee reported that they ran a test with the discharge valve of the non-running pump open to verify that no significant back leakage occurred through the discharge check valve. After considering the licensee's additional information, Region II finds that PT-06.2.3 was inadequate to completely test the SLC flowpath and flowrate per Technical Specifications 4.1.5.c.1 and .2 (paragraph 5). The inspectors notified the assistant to the general manager on April 9, 1986, that the procedural inadequacy of PT-06.2.3 would be listed as an additional example of a Technical Specification 6.8.1.a violation.

The inspectors and the licensee discussed several items listed in the report that may require additional management action to improve attention to detail at Brunswick. The licensee did not identify as proprietary any of the materials provided to or reviewed by the inspectors during the inspection.

3. Followup on Previous Enforcement Matters (92702)

Not inspected.

4. Maintenance Observation (62703)

The inspectors observed maintenance activities 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 and Authorizations (WR&A) were reviewed to ensure that the licensee gave priority to safety-related maintenance.

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

86-AMSF1	Safety Relief Valve Accoustic Monitor (F013A) Functional Verification
86-ALKS1	Reactor Water Cleanup Outboard Isolation Valve Repair
86-AEKX1	Diesel Generator Starting Air Receiver High Pressure Alarm Sensor (DG-PS-6523-2) Calibration

MI-03-3W3 Allen Bradley Model 836 Pressure Switch Calibration

MI-16-588 Lonergan Relief Valves - Series D and DB, Rev. 1 Performed Under 85-AMCJ1, Work on SLC Valve 2-C41-F029B

85-AFMQ1 Functional Test of Snubber 2-E41-2SS104

86-AIET1 Functional Test of Snubber 2-E11-21SS297

86-ALKS3 Breaker Maintenance for Reactor Water Cleanup Motor Operator for 2-G31-F004

On March 18, 1986, the inspector witnessed calibration of the diesel generator starting air pressure high alarm switch DG-PS-6523-2. Work request 86-AEKX1 and MI-03-3W3 were being utilized. The following items concerning MI-03-3W3 were discussed with maintenance supervision.

Step VII A. states: observe the general cleanliness conditions listed below: wipe off instrument line connections with a clean cloth prior to disconnecting and/or reconnecting the test equipment. The technician did not perform this step.

Step D. requires that pressure is applied at the setpoint and the switch is then adjusted until it actuates. The technician substituted an equivalent method. The technician adjusted the switch and increased test pressure to determine the actuation point. This was repeated until the switch was properly set.

Step E. does not provide for removal of water from the instrument line after calibration with a hydraulic dead weight tester. The technician blew down the instrument line, removing the water, even though not required by procedure.

The technician verified the as left setting although not required by the procedure.

The licensee performed MI-03-3W3 at least six times since revision 1 was issued in November 1984. The original revision, issued January 1984, and revision 1 have been processed by the Regulatory Related Instrument List (RRIL) procedure project. In the inspectors' opinion, MI-03-3W3 was a poor quality procedure. The licensee had not identified the procedure problems during rewrite, revision, or performance of the MI. The inspector will review procedures which are important to safety to determine if they are also of poor quality. This is an Inspector Followup Item: Poor Quality RRIL Procedures (325/86-11-04 and 324/86-12-04).

No violations or deviations were identified.

5. Surveillance Observation (61726)

The inspectors observed surveillance testing required by Technical Specifications. Through observation 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.

The inspectors witnessed/reviewed portions of the following test activities:

PT-11.1.8A	Safety Relief Valve Primary Position Indication Functional Test
PT-06.1, Rev. 23	Standby Liquid Control (SLC) System Operability Test
PT-06.2.1, Rev. 8	SLC Relief Valve Test
PT-06.2.3, Rev. 16	SLC System Injection Test
OI-03.1	Periodic Testing and Control Operator Daily Surveillance Report - Unit 1
OI-03.2	Periodic Testing and Control Operator Daily Surveillance Report - Unit 2

The inspector questioned the adequacy of PT-06.2.3. In accordance with this procedure, prior to testing the SLC A(B) pump, the discharge valve for the B(A) pump, F003 B(A) was shut. With F003 B(A) shut, the flow path boundaries for the SLC A(B) pump are changed from what would be seen during an injection. If SLC was required during an accident, the control room operator would start the pump using the control room keylock switch. The discharge valve for the idle pump would remain open. Technical Specification surveillance requirement 4.1.5.c.1 requires that the Standby Liquid Control system shall be demonstrated OPERABLE by initiating one of the Standby Liquid Control system loops and verifying that a flow path from the pumps to the reactor pressure vessel is available by pumping demineralized water into the reactor vessel. Technical Specification surveillance requirement 4.1.5.c.2 also requires that the minimum flow requirement of 41.2 gpm at a pressure of greater than or equal to 1190 psig is met. By performing PT-06.2.3 with the idle pump discharge valve closed, a potential bypass flow path was not tested; specifically through the discharge check valve and then through either the non-running pump or a stuck open relief valve. The discharge check valve, as described in FSAR section 9.3.4.2, prevents bypass flow from one pump in case of a relief valve failure in the idle pump's discharge line. The licensee has run tests, after the inspector raised his concerns, that have verified that no significant bypass flow existed on Unit 2.

While the licensee has shown that no appreciable bypass flow existed, this was shown after the fact. SLC is a manually actuated system and the licensee can take action to prevent bypass flow during an accident with little impact on plant safety. The inspectors concluded, however, that PT-06.2.3 was inadequate in that the flow path from the pumps to the reactor vessel was not adequately verified. This is a Violation (325/86-11-02 and (324/86-12-02).

The inspector also found a problem while observing the licensee conduct PT-06.2.3. On March 20, 1986, the inspector observed an Auxiliary Operator (AO) record 34 inches as the level in the SLC test tank. The AO performed step 7.2.12, which required the recording of the test tank level. This measurement was used as the initial value for the two minute flowrate check of the SLC pump as required by Technical Specification 4.1.5.c.2. The inspector questioned the AO regarding how he had obtained the reading. The AO indicated that he obtained the level in the tank by estimating the one foot and two feet levels and further estimating the actual level. The inspectors concluded that estimation of the test tank level was a failure to follow a Technical Specification required procedure. This is an additional example of the violation already listed in this paragraph.

The inspectors also questioned the adequacy of the ASME, Section XI testing of the SLC pump discharge check valves (F033 A & B). The licensee tests F033 A & B in the forward flow direction only. ENP-16, Procedure for Administrative Control of Inservice Inspection Activities, does not specify the normal position of the valve. Section IWV-3522 of the 1977 edition of Section XI states that, "check valves shall be exercised to the position required to fulfill their function." The FSAR, section 9.3.4.2, states that, "To prevent bypass flow from one pump, in case of relief valve failure in the line from the other pump, a check valve is installed downstream of each relief valve line in the pump discharge pipe." Section XI further specifies the testing requirements of normally open and normally closed check valves which does not apply here since the licensee has not specified a normal position. The licensee has taken no exception to Section XI with regard to check valves F033 A & B. The inspectors concluded that the F033 A & B valves should be tested in both directions or the licensee should have an NRC approved exception. This is an Unresolved Item: Section XI Testing of SLC Pump Discharge Check Valves (325/86-11-06 and 324/86-12-06). This item will remain unresolved pending development and review of the licensee position on this matter.

One violation and no deviations were identified.

6. Operational Safety Verification (71707)

The inspectors verified conformance with 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 room, shift supervisor, clearance 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 Specifications Limiting Conditions for 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 Specification limits. The inspectors observed shift turnovers to verify that continuity of system status was maintained. The inspectors verified the status of selected control room annunciators.

Operability of a selected Engineered Safety Feature (ESF) train 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 Technical Specifications, was completed; there was no leakage of major components; there was proper lubrication and cooling water available; and a condition did not exist which might 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.

During a plant tour on March 20, 1986, at 10:28 a.m., the inspector found the breaker for Valve 2-SW-V255 open on switch gear DGD in the diesel generator building. V255 is a normally open motor-operated valve that is remotely operated from the control room. The valve is in the flow path for the primary service water supply to the Unit 2 diesel generators and the alternate supply to the Unit 1 diesel generators. The breaker for V255 is normally closed. The valve receives no automatic operating signals. The shift foreman immediately verified that the valve was open when the inspector informed him of the open breaker. No equipment was rendered inoperable from the open breaker. The inspectors will review this event and the licensee's corrective action for possible enforcement action during future inspections. This is an Unresolved Item: Unit 2 Diesel Generator Service Water Supply Valve Breaker Open (324/86-12-05).

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

The inspectors verified 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 protected area (PA); vehicles were properly authorized, searched and escorted within the PA; personnel in vital areas were authorized and effective compensatory measures were employed when required. On February 21, 1986, at approximately 10:00 a.m., the inspector found security badge 450 on the top of a

coat rack in the maintenance office area within the protected area. The inspector returned the badge to the individual who was in a nearby office. The licensee reported that the individual had left his badge on the rack for about one minute. The inspectors discussed this issue with plant management. Based on the inspector's observations of all employees on site during the inspection period, this was an isolated incident. The inspector will continue to observe licensee performance in this area.

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

On March 26, 1986, Unit 1 scrambled from 100% power due to two high reactor water level signals that tripped both feedpump turbines and the main turbine. The inspectors will document their review of the scram in the LER follow-up. The licensee entered a six day outage after the scram to replace the 1A Recirc. Pump seal. The licensee stated that no work would be performed on the Unit 1 Safety Relief Valves since the outage was too short. Problems with Unit 2 SRVs are documented in LER 2-86-01.

No violations or deviations were identified.

7. Engineered Safety Features System Walkdown (71710)

The inspectors performed a complete walkdown of the Unit 1 and Unit 2 Standby Liquid Control (SLC) systems to verify system operability. The inspectors reviewed FSAR section 9.3.4, Technical Specification 3/4.1.5, System Description SD-5, SLC System, Rev. 4, dated July 14, 1984, and Operating Procedure OP-5, Rev. 7, February 6, 1986, to ensure that the system was still being operated per the design basis. The inspector verified that the valve line-up checklist agrees with the system P&ID, D-2547, Rev. 15 for Unit 2 and D-25047, Rev. 17, for Unit 1. The position of selected instrument valves was also verified.

The inspector identified several questions during his review:

- a. Questions on surveillance and Section XI testing (see paragraph 5).
- b. Reinstallation of relief valves. Each SLC pump has a relief valve (F029A & B) on the pump discharge that relieves to the suction of its pump. The relief valves are removed every 18 months to check the setpoint per Technical Specification 4.1.5.c.3. FSAR section 9.3.4.2 states that, "The relief valves are installed with the discharge flooded to prevent evaporation and precipitation within the valve." The licensee tested and reinstalled the relief valves this outage using procedure MI-16-588, Lonergan Relief Valves - Series D and DB, Rev. 1, October 11, 1981. MI-16-588, step I.E.8 states to, "Reinstall valve in the appropriate area of intended use." The licensee could not provide

the inspector with any other documentation to show that the discharge piping was verified as being flooded at any time during or after the valves were reinstalled. The piping attached to the relief valve is heat traced, preventing any precipitation in the piping. The relief valves are not heat traced but should remain warm due to conduction. The inspector believes that clogging of the relief valve two inch discharge port would be unlikely because of the small amount of air trapped in the port. However, the licensee has no procedures in place to assure that the FSAR commitment has been met. The verification that the discharge piping is flooded when the relief valves are removed and reinstalled is an activity affecting quality and, as such, failure to have appropriate procedures to accomplish this activity is a violation of 10 CFR 50, Appendix B, Criterion V: Failure to Verify Discharge Flooded When SLC Relief Valves Are Installed (325/86-11-03 and 324/86-12-03).

One violation was identified.

8. Information Meetings With Local Officials (94600)

The Senior Resident Inspector and Projects Section Chief met with local officials from Brunswick County, New Hanover County and the City of Southport. The meetings, held on March 17, 1986, were to familiarize local officials with the mission of NRC and to improve communications between local officials and NRC. The inspector and section chief: met with two county commissioners and an emergency planner for New Hanover County; met with the city manager and police chief for Southport; and attended the regular public board meeting of the Brunswick County commissioners. Several topics were discussed including waste shipment and storage, notification during emergencies, information availability, and overall performance at Brunswick.

9. Follow-up on Unresolved Item (92701)

(CLOSED) 325/86-05-01 and 324/86-06-01, Post Modification Testing of Valve Operators. In the above inspection report, the inspector determined that the acceptance test for modifications involving MOV actuator changeout for the core spray and low pressure cooling injection system injection valves had failed to adequately consider the Technical Specification system response times. The item had been listed as unresolved pending completion of licensee's review of the effect on operable systems and the inspector's evaluation of whether corrective actions associated with a similar violation in inspection report 325, 324/84-31 should have prevented the current problem. Preliminary results from the licensee indicated that even though the response time was inadequately addressed by the modifications, the allowable response times had not been exceeded. Comparison of the problem with that described in report 325, 324/84-31 indicates that the root causes were different. In the present case, a communication problem coupled with the design engineer relinquishing part of his responsibility for specifying the acceptance test to the inservice inspection group, was a major contributor to the problem. This was not a factor in the earlier violation.

10 CFR 50, Appendix B, Criterion V, as implemented by the FSAR and ENP-03, requires that acceptance tests verify performance requirements to the extent necessary to determine operability. Modification package 81-309 did not adequately address the core spray response time test in that the 2-E21-F005A valve was timed to its closed position instead of the open position. Also, the Technical Specification system response time of 27 seconds was specified for the valve only, in lieu of verifying that the valve in conjunction with other active components would meet the 27 second response time. The licensee failed to adequately specify quantitative acceptance criteria for the core spray valve F005A acceptance test in PM-81-309. This is a Violation: Inadequate Acceptance Test in Valve Operator Plant Modification (324/86-12-01).

One violation and no deviations were identified.

10. Plant Modifications (37700)

The inspector reviewed plant modification PM-84-361, Containment Atmosphere Control (CAC) Butterfly Valve Replacement. The inspector reviewed the modification after the licensee discovered on March 11, 1986, that the containment vacuum breaker butterfly valve 1-CAC-V17 was inoperable. V17 failed a Technical Specification surveillance test because the valve-shaft-to-actuator key was missing. The inspectors verified that an adequate acceptance test was performed as part of the plant modification. The licensee did not complete their review of IEN 85-67, Valve-Shaft-to-Actuator Key May Fall Out of Place When Mounted Below Horizontal Axis, until March 26, 1986. The inspectors will review the licensee's IEN 85-67 during future inspections.

No violations or deviations were identified.