



UNITED STATES
NUCLEAR REGULATORY COMMISSION

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

Report Nos.: 50-325/84-27 and 50-324/84-27

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: August 15 - September 15, 1984

Inspectors:

[Signature]
D. O. Myers, Senior Resident Inspector

10/10/84
Date Signed

[Signature]
L. W. Garner, Resident Inspector

10/10/84
Date Signed

[Signature]
T. E. Hicks, Resident Inspector

10/10/84
Date Signed

Approved by:

[Signature]
Paul R. Bemis, Section Chief
Division of Reactor Projects

10/10/84
Date Signed

SUMMARY

Scope: This routine safety inspection involved 187 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, closeout of previous inspection findings, followup of significant events.

Results: Of the areas inspected one violation was identified in one area (inadequate 10 CFR 50.59 review described in paragraph 3.)

REPORT DETAILS

1. Licensee Employees Contacted

J. Boone, Engineering Supervisor
L. Boyer, Director - Administrative Support
*J. Chase, Manager - Operations
G. Cheatham, Manager - Environmental & Radiation Control
J. Cook, Senior Specialist - Environmental & Radiation Control
R. Creech, I&C/Electrical Maintenance Supervisor (Unit 2)
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 & 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 & Control
J. O'Sullivan, Manager - Maintenance (Acting)
B. Parks, Manager - Technical Support (Acting)
*R. Poulk, Senior NRC Regulatory Specialist
C. Treubel, 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 September 7 and 14, 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

(Closed) Unresolved Item (325/84-15-03) Review of core spray pump operability with the minimum flow valves de-energized closed. Licensee Event Report No. 1-84-9 contains the analysis results concerning pump operation without minimum flow capability. In summary, the analysis shows that the pumps remained fully operable for mitigating the consequences of a large pressure boundary break; however, the pumps could have possibly experienced degradation and loss of function if they had been called upon to mitigate the consequences of a small leak in which the automatic depressurization system (ADS) had activated. For break sizes greater than 0.2 Ft², a large break, flow would be established through the injection pathway prior to damage to a core spray pump, i.e., the minimum flow pathway is not necessary because the pump starts and injects quickly. For certain small break scenarios (less than a 0.2 Ft² break), the core spray pump could start and run at no flow conditions long enough for some pump degradation to occur. This statement is based on the pump vendors position that at about 3 minutes of no flow conditions pump seal damage may begin. Therefore since the core spray pumps could not be assured of remaining functional for all their intended safety functions during the period their minimum flow valves were closed and de-energized. They must be considered technically inoperable.

The inspector determined that the root cause of unknowingly having both core spray systems inoperable was the failure to perform an adequate 50.59 evaluation. Page 6.3.2-4 of the updated Final Safety Analysis Report (FSAR) states "a low flow bypass line runs from the pump discharge..to the suppression pool. The bypass flow is required to prevent the pump from overheating when pumping occurs against a closed discharge valve." Closure and de-energization of the bypass line valves when perform for other than maintenance reasons, i.e., to repair a broken component, constitutes a facility modification in that a change was made to the facility which made it different from the description in the FSAR. During the decision making process which resulted in the valve closures, core spray pump operability was discussed; however, the pump vendor was not contacted and thus based on their knowledge and experience, the licensee believed that if the pumps started and ran dead headed sufficient time would exist for operator action prior to pump damage and therefore did not declare the core spray system inoperable. Subsequent discussions with the pump vendor indicates that sufficient time could not have been guaranteed. Hence the original evaluation was later determined to be erroneous. Thus a change to the facility was made which increased the probability of malfunction of equipment important to safety. Failure to perform an adequate safety review is a violation of 10 CFR 50.59(b) which among other requirements, requires a safety evaluation that a change does not increase the probability of a malfunction of equipment important to safety.

(Closed) Violation 50-325/84-13-01, 50-324/84-13-01; Failure to Implement Administrative AI-09.1 and identify new surveillance requirements.

The inspector reviewed the licensee's response dated August 21, 1984, and found that the corrective actions taken and the results received were satisfactory. Increased management attention resulting from this action should ensure detailed implementation reviews of program effectiveness to preclude recurrence.

(Closed) Violation 50-325/84-13-02, 50-324/84-13-02; Failure to meet 10 CFR 50, Appendix B, Criterion V for accomplishing activities in accordance with adequate procedures in that QAP-302 requirements were not met.

The inspector reviewed the licensee's response dated August 21, 1984, and found that the corrective actions taken and the results received were satisfactory and had been implemented.

4. Unresolved Items

Unresolved items were not identified during this inspection.

5. Operational Safety Verification (71707, 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 system status. The following determinations were made:

- Technical Specifications. Through log review and direct observation during tours, the inspector verified compliance with selected Technical Specifications Limiting Conditions for Operation.
- By observation during the inspection period, the inspector verified the control room manning requirements of 10 CFR 50.54(k) and the Technical Specifications were being met. In addition, the inspector observed shift turnovers to verify that continuity of system status was maintained. The inspector periodically questioned shift personnel relative to their awareness of plant conditions.
- Control room annunciators. Selected lit annunciators were discussed with control room operators to verify that the reasons for them were understood and corrective action, if required, was being taken.
- Monitoring instrumentation. The inspector verified that selected instruments were functional and demonstrated parameters within Technical Specification limits.
- Safeguard system maintenance and surveillance. The inspector verified by direct observation and review of records that selected maintenance and surveillance activities on Safeguard Systems were conducted by qualified personnel with approved procedures, acceptance criteria were

met and redundant components were available for service as required by Technical Specifications.

- Major components. The inspector verified through visual inspection of selected major components that no general condition exists which might prevent fulfillment of their functional requirements.
- Valve and breaker positions. The inspector verified that selected valves and breakers were in the position or condition required by Technical Specifications for the applicable plant mode. This verification included control board indication and field observation (Safeguard Systems).
- Fluid leaks. No fluid leaks were observed which had not been identified by station personnel and for which corrective action had not been initiated, as necessary.
- Plant housekeeping conditions. Observations relative to plant housekeeping identified no unsatisfactory conditions.
- Radioactive releases. The inspector verified that selected liquid and gaseous releases were made in conformance with 10 CFR 20, Appendix B, and Technical Specification requirements.
- Radiation Controls. The inspector verified by observation that control point procedures and posting requirements were being followed. The inspector identified no failure to properly post radiation and high radiation areas.
- Security. During the course of these inspections, observations relative to protected and vital area security were made, including access controls, boundary integrity, search, escort, and badging.

No violations or deviations were identified.

6. Review of Licensee Event Reports (92700)

The below listed Licensee Event Reports (LER's) were reviewed to determine if the information provided met NRC reporting requirements. The determination included adequacy of event description and corrective action taken or planned, existence of potential generic problems and the relative safety significance of each event. Additional in-plant reviews and discussions with plant personnel, as appropriate, were conducted for those reports indicated by an asterisk. These reports are considered closed.

LER	1-84-11	Actuation of Control Building Emergency Air Filtration Train A.
	1-84-12	Automatic Actuation of Control Building Emergency Air Filtration Train A

1-84-13	Automatic Actuation of Control Building Emergency Air Filtration Train B
1-83-002	Safety relief valves setpoints were found higher than specified.
2-84-008	RPS actuation during Unit 2 refueling outage from IRM work.
2-84-009	RPS actuation during Unit 2 refueling outage during IRM work.
2-84-010	RPS actuation during Unit 2 refueling outage work.
2-83-45	Reactor vessel level instrument discrepancy.

7. 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, no violations or deviations were identified.

8. 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 Procedures
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.

Of the areas inspected, no violations or deviations were identified.

9. Followup of Plant Transients and Safety System Challenges (93702)

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 condition.

No violations or deviations were identified.

On September 10, 1984, at 0910 hours Unit 1 reactor experienced a spurious main steam line radiation high scram from 99.3% of full power. The spurious high radiation signals also closed the main steam line isolation valves (MSIVs). Reactor pressure increased to just above the 1105 psig setpoint for safety relief valve (SRV) F013G which resulted in the valve auto-lifting. The operator later opened SRV F013A and F013E in accordance with emergency operating procedures to control pressure. The main steam lines valves were opened at 0930 at which time the reactor feedpump B and the main condenser were placed into service. The unit was taken to cold shutdown because of the close proximity of hurricane Diana. The cause of the spurious signals was attributed to a lightning strike of the heater bay crane on top of the turbine building roof. No property damage occurred. Unit 2 reactor is in a refueling at the time. Spurious signals were also generated on Unit 2 instrumentation during the same time frame.

All Unit 1 engineered safety features (ESF) responded as expected with the following two exceptions. Diesel generator number 2 which started as a result of the turbine trip would not electronically shutdown and had to be mechanically tripped on overspeed. The problem was traced to a dirty air filter on a solenoid time delay relay which caused a slower than normal air bleed-off through the vent hole, i.e., a relatively large time delay resulted. Because the operator was familiar with little or no time delay occurring with the trip circuitry, he failed to hold the trip button in for sufficient time. Hence no electronic trip occurred. The source of dirt in the instrument air supply is being investigated by engineering.

The other ESF problem involved failure of the acoustical monitors to activate when the SRV's lifted. This resulted in the valve position indicator lights in the control room to maintain a close indication. See report 84-20 for description of a similar problem. The sensing threshold for the detector was set lower. During the subsequent Unit 1 restart on September 15, 1984, a relief valve was manually lifted at low reactor pressure to verify that the acoustical monitor would perform correctly. The test was successful.

Also during the event, MSIV outboard valves B and C provided both open and close indication simultaneously. The cause was found to be loose position switch bracket bolts which allowed the brackets to slip out of place. These were repositioned and tightened prior to return to service. The switches which provide input into the reactor protection system for the main steam closure scram remained functional.

No violations or deviations were identified.

10. 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;
- Meeting minutes were reviewed to confirm that decisions/recommendations were reflected and followup of corrective actions were completed.

No violations or deviations were identified.

11. Followup of Significant Events (93701)

During the report period the site experienced hurricane conditions for several days with insignificant damage. A brief sequence of events and description of conditions follow. Information is based on the resident inspectors logs taken during the event.

September 10, 1984 (Monday)

Unit 1 scrambled from full power on a main steam line high radiation monitor spike induced by a lightning strike in the vicinity of the turbine building. (See para. 9 for details)

0930 An unusual event was declared based on the anticipated path of hurricane Diana. Site preparation for hurricane conditions are underway per procedures.

September 11, 1984 The licensee decides not to restart Unit 1 until the hurricane passes.

The NRC high frequency radio is connected and operating through the efforts of a region based inspector dispatched to the site.

1430 The site technical support center is activated.

~ 1800 Unit 1 is at cold shutdown conditions, Unit 2 in refueling conditions.

2100 The National Weather Service classifies the hurricane as F-4 with winds in excess of 135 mph.

September 12, 1984 Maximum winds onsite, estimated using the Oak Island Coast Guard Station, are 115 mph. Met. Tower High wind indication inoperable.

Minor damage reported to some trailers and temporary structures onsite. No damage to safety related structures or equipment. No personnel injuries.

0617 TSC secured based on information that Diana has passed and is heading out to sea in a NE direction. The unusual event condition maintained.

2200 Re-established the TSC based on new storm path predictions.

2347 The storm center is 22 miles East of the plant, maximum sustained winds are 110 mph.

2358 Communicators established with NRC headquarters.

September 13, 1984

0030	Communicators established with NRC Regional Office.
0100	Weatherspoon line lost U-1
0146	Eye ~ 10 miles from Cape Fear
0210	Lost Jacksonville Line U-1
0228	Lost Delco East U-1
0238	HF radio communication established with Region II
0240	Switchyard reported to have arcing and sparking.
0543	Common A&B Busses switched to U-2
0740	Lost Wallace Line U-2
0941	Grounds reported at Caswell Beach Transformer. No longer have remote control of ocean discharge pumps.
0947	Lost Delco West line - U-2
1200	Maximum sustained winds now ~ 75 mph. storm continuing on westerly course at 5 mph.
1238	Red phones is in reduced status. Much static, constant flashing, difficult to hear.
1706	Jacksonville line restored (U-1)
1715	TSC deactivated
~ 1800	Storm downgraded to tropical storm, unusual event secured.

Subsequent followup activities on site revealed that the plant sustained very little damage as a result of the hurricane. Reactor building integrity was verified thru the performance of P.T.15.4. The ocean discharge pump control was regained. The problem was found to have been water intrusion into the radio transmitter at the site. Three of four sources of offsite power were lost due to trees and debris on transmission lines in the grid

service area. (T.S. 3.8.1.2 requires only 1 offsite source per unit). All 4 Diesel Generators remained operable but were not used.

One of 3 Access roads to the site was blocked due to wind downed trees, the access road was reopened on Saturday, September 15, 1984.

High winds prevented licensee personnel from acquiring grab samples on the main stack as part of T/S surveillance requirement 3.3.5.9.b. Sampling was resumed as winds subsided. A red phone report was made at 0836 on September 13, 1984 notifying the NRC of the invoking of the 10 CFR 50.54x authorization to deviate from TS requirements.

No flooding or unusual water levels was experienced. U-1 was restarted on 9.

No violations or deviations were identified.