



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA ST., N.W., SUITE 3100
ATLANTA, GEORGIA 30303

Report Nos. 50-324/81-11 and 50-325/81-11

Licensee: Carolina Power and Light Company
411 Fayetteville Street
Raleigh, N.C. 27602

Facility Name: Brunswick

Docket Nos. 50-324 and 50-325

License Nos. DPR-62 and DPR-71

Inspection at: Brunswick site near Wilmington, N.C.

Inspector: C. Julian for
D. F. Johnson, Sr. Resident Inspector

6/3/81
Date Signed

Approved by: C. Julian
C. Julian, Acting Section Chief, Division
of Resident and Reactor Project Inspection

6/3/81
Date Signed

SUMMARY

Inspection on April 15 thru May 15, 1981

Areas Inspected

This routine inspection involved 167 resident inspector hours on site in the areas of plant operations; operational safety verification; observation of physical security; review of operational events; follow-up on licensee event reports; plant tours; licensee action on previous inspection findings; radiation protection; maintenance activities; and independent inspection efforts.

Results

Of the 10 areas inspected, one violation was identified (inadequate procedures that resulted in accidental initiation of ECCS, paragraph 5.d).

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DETAILS

1. Persons Contacted

Licensee Personnel

C. Dietz, General Manager, Brunswick
B. Furr, Vice President, Nuclear Operations
*D. Allen, QA Supervisor
A. Bishop, Engineering Supervisor
*G. Bishop, Project Engineer
*S. Bohanan, Prin. Specialist Reg. Comp.
J. Brown, Manager, Operations
G. Cameron, Lead Engineer
W. Hatcher, Security Specialist
M. Hill, Maintenance Manager
*R. Morgan, Plant Operations Manager
H. Nobles, Elect. Foreman
G. Oliver, E & RC Manager
A. Padgett, Assistant to General Manager
R. Poulk, Regulatory Specialist
W. Triplett, Administrative Supervisor
*W. Tucker, Technical and Administrative Manager
E. Utley, Executive Vice President, Engineering and Construction

Other licensee employees contacted included technicians, operators, security force members and administrative personnel.

Contractor Personnel

L. Mech. General Foreman, Yeargin N.P.C.D.
S. Gilchrist, Elect. General Foreman, Yeargin N.P.C.D.
F. James, Mech. Foreman, Yeargin N.P.C.D.
J. Jeffreys, Mech. Foreman, Yeargin N.P.C.D.
P. Nichols, Plant Engineer, Johnson Control B.S.E.P.
D. Yeilding, Construction Coordinator, United Engineers & Constructors N.P.C.D.

*Attended Exit Interview.

2. Exit Interview

The inspection scope and findings were summarized on May 15, 1981, with those persons indicated in paragraph 1 above. Meetings were held with senior facility management periodically during the course of this inspection to discuss the inspection findings.

3. Licensee Action on Previous Inspection Findings

(CLOSED) Violation (324/81-02-01) failure to adhere to Technical Specification Limiting Condition for Operation and the appropriate action statement. The licensee has received a change to the Technical Specifications with respect to the Service Water System Operability, which will allow work on any portion of either the conventional or nuclear header. In addition, the licensee has revised the use of Operating Work Permits to require a PNSC review prior to implementation. Also, all licensed operators received training on service water system specifications to better understand the basis.

(CLOSED) Violation (324/81-02-02) failure to submit a timely written report. The licensee conducted a detailed review of the reporting requirements and the mechanisms for that reporting in existing plant procedures. Following the review, a dedicated effort was made to combine, revise, and/or establish procedures to make reportability assessments more effective.

The inspector had no further questions in this area.

4. Unresolved Items

Unresolved items are matters about which more information is required to determine whether they are acceptable or may involve a violation. New Unresolved Items identified during this inspection are discussed in paragraph 6.

5. Reportable Occurrences

- a. 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.

Unit 1

- | | |
|---------|--|
| 1-81-26 | Radwaste liquid effluent discharge indicator/recorder malfunctioned. |
| 1-81-33 | Brushes on 1A Reactor Recirculation Pump Motor Generator arched causing field ground. |
| 1-81-35 | CAC Monitor Oxygen Analyzer, 1-CAC-ATH-1259-2, indicated upscale concentration while sampling. |
| 1-81-36 | Suppression pool-to-reactor building vacuum breaker 1-CAC-V17 malfunctioned. |
| 1-81-42 | Primary containment ball insolation valve inoperable. |
| 1-81-43 | Radwaste liquid effluent discharge monitor, No. PRMS/N6573360, log rate integrator and Unit 1 recorder out of calibration. |

The inspector had no further questions in this area.

- b. During a special inspection on April 19, 1981, of the 1B RHR heat exchanger, as committed to in LER 2-80-30, it was found that the baffle plate was displaced approximately 9 inches at the bottom, creating a service water flow path from the inlet to the outlet bypassing the tubes. This baffle plate is welded to the tube sheet at the top, welded to the channel assembly on both sides, and fits into a groove in the channel cover at the bottom. The pass rib is 1" thick x 44-3/4" high x 54-1/2" wide and is made of SB-402, alloy #715, (70-30 Cu Ni) material.

During the repair of the 1B RHR heat exchanger, a loss of cooling was experienced immediately following the starting of a second RHR service water pump on the 1A RHR heat exchanger. An alternate shutdown cooling path was established using the RHR System, the Fuel Pool Cooling System, and the Core Spray System. This lineup was later modified to delete the Core Spray System. Vessel temperature never reached or exceeded 212°F. To restore a normal shutdown cooling lineup as expeditiously as possible, temporary repairs were effected on the 1A heat exchanger and it was restored to service while permanent repairs were still in progress on the 1B heat exchanger.

The apparent cause of damage to the heat exchanger baffles is loadings in excess of their design capability. It is unclear at this time, as to whether the loadings resulted from a water hammer transient or other mechanism, as no water hammer event could be recalled. A review of the heat exchanger baffle design by General Electric, as a result of the Unit No. 2 failure reported in LER 2-80-30, identified no problems. While sea shells were found inside both heat exchangers, the amounts were not unusual compared to other inspections. Investigations are in progress into the necessary design requirements for the baffle, the operation and maintenance of the system, and the possible impact of the shells found.

A program is being pursued to monitor heat exchanger performance. It will consist of using available temperature, flow and differential pressure instrumentation to determine the heat transfer rates and the amount of flow that may be bypassing the tubes. This will help predict baffle plate degradation. Periodic Test 8.1.4 is currently being performed quarterly which verifies heat exchanger flow.

In researching an alternate shutdown cooling lineup, it was decided to reject from the vessel with the RHR System through the fuel pool coolers and to the condensate storage tank (CST). To return water to the vessel, the Core Spray System would take a suction from the CST and provide makeup to the vessel at a throttled flow of approximately 500

gpm for level control. Using the Control Rod Drive System for vessel return was considered, however, it was felt that the low flow rate of this system would not provide sufficient cooling and mixing to maintain reactor temperature below a desirable level.

An inspection of the sensitive portions of the core spray lines and their supports revealed no physical damage. Testing and/or inspections are being performed on the core spray pump and the valve used to throttle to ensure that they have not been degraded. Their full operability will be assured prior to returning Unit No. 1 to power.

The above is preliminary information. A more detailed report will be submitted as LER 1-81-32 that will contain subsequent findings and will address corrective actions to prevent recurrence.

The inspector had no further questions at this time.

- c. At 1:00 A.M., on May 6, the licensee initiated a shutdown of Unit 2 due to concern about the operability of the Residual Heat Removal (RHR) heat exchangers. The cause of the Unit 1 RHR heat exchanger failure that occurred on April 25, is attributed to an excessive differential pressure across the heat exchanger baffle plate. The excessive pressure across the baffle plate is apparently caused by an accumulation of various varieties of shell fish which restrict flow through the heat exchanger tubes. The shell fish enter the service water system as micro organisms and remain in the system while growing to maturity. Inspection of a Unit 2 RHR heat exchanger also revealed an accumulation of shell fish. The licensee reports that chlorination of the service water system was discontinued about six months ago, due to concerns expressed by the on-site environmentalists over fish kills.

Both units remain shut down for repairs of the heat exchangers and removal of the shell fish from the piping systems. Other safety related heat exchangers will also be inspected during the outage.

The inspector had no further questions at this time.

- d. At 14:10 hours on May 6, 1981, an accidental initiation of the Core Spray System and supporting engineered safety features, occurred on Unit 1. The inadvertent initiation of the ECCS's was caused by leakage past the root stop valves to level instruments B21-LS-NO31A and B21-LS-NO31C that were undergoing a hydrostatic test of newly installed instrument lines as part of a modification to replace mechanical switches with analog transmitters (Mod. Nos. 77-269D and 77-269F). QC hold points were not being observed for independent verification.

The lack of communications and coordination between the different crafts involved in the modification package combined with procedures that were not entirely clear, concise and appropriate for the circumstances, was the root cause of the event. The failure to have adequate procedures is a Violation (325/81-11-01).

6. Plant Tours

a. Radiation Surveys and Posting of Drywell

On May 4, 1981, the NRC inspector was preparing for an entry into the drywell and was checking the posted radiation levels at the breezeway check point. He noted that the latest survey data for the 20' level was dated April 23, 1981. Initial discussions with contract health physics personnel responsible for surveying and posting, revealed the frequency for obtaining update radiation surveys was weekly, not to exceed 10 days. Subsequent investigation revealed that the radiation surveys were taken on May 4, 1981, but not posted in the above area because there was not work scheduled in this area. Survey results were posted immediately in the area identified.

The inspector determined by review of Radiation Control and Test Procedures and by discussion with licensee representatives, that there are no requirements that state any frequency for surveys or posting for the drywell, other than in Procedure 0600 "Contract Health Physics Technician Orientation", that applies to methods for orientation of contract health physics technicians in RC & T practices, procedures and instrumentation.

The licensee stated that Procedure 0250 "Posting of Areas/Materials" Revision 0, dated December 4, 1979, would be revised to include mandatory requirements for frequency of surveys and posting of the drywell area by June 30, 1981.

This is an Unresolved Item pending licensee's action (324/81-11-01 and 325/81-11-02).

b. Housekeeping

During a tour of the control room on May 5, 1981, the inspector identified to the licensee a potential fire hazard in electrical panel JWG-XU49 that contained approximately 12 cigarette butts and several small pieces of paper. The panel houses relays for reactor isolation penetration valves.

The licensee committed to inspect all control room electrical panels for possible similar conditions and instruct personnel in the requirements of Administration Instructions A1-17 "Plant Housekeeping" and Administrative Procedure 4.1.18 "Control Room Housekeeping".

This is an Unresolved Item pending action by the licensee (325/81-11-03 and 324/81-11-02).

7. Radiological Controls

The inspector verified the following during routine tours of the facility:

- observed that workers were wearing TLD's that were placed between the neck and waist;
- proper frisking techniques were being employed, i.e., low background in areas frisker were located, equipment and tools were surveyed, etc.;
- all personnel exiting the plant properly monitored themselves and entered the portal monitors;
- personnel entering control areas were dressed properly in accordance with applicable RWP's;
- all anti-c's inspected were in good condition, i.e., no rips, tears, broken zippers, etc.;
- permanent radiation monitors were operable and reading normal for the particular area being monitored;
- portable continuous air monitors were operable including strip charts;
- RWP's clearly indicate entry requirements, proper clothing, radiation levels, etc.;
- posted information up to date (refer to details paragraph 6.a.);
- hot spots within control areas are clearly marked;
- high radiation areas were clearly posted and proper shielding installed.

No violations were identified.

8. Security

The inspector verified the following during routine tours of the facility:

- guards were stationed at required posts;
- guards were performing their required duties;
- protected area (PA) barriers were intact;
- isolation zones were clear;

- personnel entering site were identified and searched, as required;
- packages were searched;
- vehicles entering PA were searched, controlled and escorted;
- all vital areas observed were locked, alarmed or compensatory measures were employed;

No violations were identified.

9. Maintenance Activities

The inspector observed modifications 77-269F and 77-269D regarding replacement of reactor water level switches with analog transmitters, including hydrostatic tests.

The inspector verified the following:

- maintenance activities were not in violation of limiting conditions for operation;
- redundant components were operable;
- required administrative approvals and tagouts were obtained prior to initiating the work;
- approved procedures were being used or the activity was within the "Skills of the Trades".
- the procedures were not adequate to control the activity (refer to details, paragraph 5.d.)
- activities were being accomplished by qualified personnel;
- radiological controls were proper and being implemented;
- QC hold points were not being observed to provide independent verification (refer to details paragraph 5.d.).

One violation was identified relative to the activity observed. (Refer to details paragraph 5.d.).

10. I.E. Bulletin Followup

The following actions taken by the licensee were verified:

- written response was within the time period stated in the bulletin;
- written response included the information required to be reported;

- licensee management forwarded copies of the written response to appropriate on-site management representatives;
- information discussed in the licensee's written response was accurate.

(CLOSED) IFI (50-324/80-BU-21 and 50-325/80-BU-21) Valve Yokes Supplied by Malcolm Foundry Company, Inc.

11. Review of Plant Operations

- a. The inspector reviewed plant operations through direct inspections and observations throughout the reporting period. The following areas were inspected.

- (1) Control Room
- (2) Service Building
- (3) Reactor Buildings
- (4) Diesel Generator Rooms
- (5) Control Points
- (6) Site Perimeter

- b. The following determinations were made:

- Monitoring instrumentation: The inspector verified that selected instruments were functional and demonstrated parameters within Technical Specification limits.
- Valve positions. This inspector verified that selected valves were in the position or condition required by Technical Specifications for the applicable plant mode. This verification included control board indication and field observation of valve position (Safeguards Systems).
- Radiation Controls. See paragraph 6.a.
- Plant housekeeping conditions. See paragraph 6.b.
- 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.
- 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.
- By frequent observation through-out the inspection period, the inspector verified that 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.

-- Security. See paragraph 8.

No violations were identified in this area.