



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

Report Nos. 50-324/82-39 and 50-325/82-39

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

Facility Name: Brunswick

Docket Nos. 50-324 and 50-325

License Nos. DPR-62 and DPR-71

Inspection at Brunswick site near Wilmington, North Carolina

Inspectors: *D. O. Myers* 10/29/82
 D. O. Myers Date Signed

L. W. Garner 10/29/82
 L. W. Garner Date Signed

P. Holmes-Ray
 P. Holmes-Ray Date Signed

Approved by: C. Burger, Section Chief, Division of Project and Resident Programs
 C. Burger, Section Chief, Division of Project and Resident Programs Date Signed

SUMMARY

Inspection on September 15 - October 15, 1982

Areas Inspected

This inspection involved 298 inspector hours on site in the areas of review of licensee event reports, followup of significant events, review and audit of surveillance activities, operational safety verification, followup of plant transients, and safety system challenges, review and audit of maintenance activities, independent inspections, and special pre-startup inspections.

Results

Of the eight areas inspected, no violations were identified in seven areas and three violations and one unresolved item were identified in one area (Followup of plant transients paragraph 8; Technical Specification violations - failure to follow procedures and inadequate procedures.) The violations apply to Unit 2.

DETAILS

1. Persons Contacted

Licensee Employees

- *A. Bishop, Technical and Administrative Manager
- J. Boone, Engineering Supervisor
- L. Boyer, Administrative Supervisor
- G. Campbell, Mechanical Maintenance Supervisor (Unit 2)
- R. Coburn, Director QA/QC
- J. Cook, E&RC Foreman
- R. Creech, I&C/Electrical Maintenance Supervisor (Unit 2)
- *C. Dietz, General Manager, Brunswick
- J. Dimmette, Mechanical Maintenance Supervisor
- W. Dorman, QA Supervisor
- *E. Enzor, I&C Electrical Maintenance Supervisor
- *J. Harness, Plant Operations Manager
- W. Hatcher, Security Specialist
- J. Jefferson, I&C/Electrical Maintenance Supervisor (Unit 1)
- W. Martin, Principle Engineer/Operations
- G. Milligan, Principle Engineer/Onsite Nuclear Safety Section
- D. Novotny, Regulatory Specialist
- G. Oliver, E&RC Manager
- *R. Poulk, Regulatory Specialist
- C. Treubel, Mechanical Maintenance Supervisor (Unit 1)
- L. Tripp, RC Supervisor
- W. Tucker, Operations Manager
- V. Wagner, Director, Planning and Scheduling

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 15, 1982, 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. Review of Licensee Event Reports

Not inspected.

4. Unresolved Items

Unresolved Items are matters about which more information is required to determine they are acceptable or may involve noncompliances or deviations.

New unresolved items identified during this inspection are discussed in paragraph 8.

5. Review of Licensee Event Reports

The below listed Licensee Event Reports (LERs) 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.

Unit 1

- 1-82-69 (3L) During a RCIC turbine start, the turbine tripped on high exhaust pressure.
- A common ground has been provided between the Woodward Governor and the turbine speed control ramp generator in both the high pressure coolant injection (HPCI) system and the reactor core isolation coolant (RCIC) system, per plant modifications 82-144 and 82-145. Applicable instrumentation drawings will be updated before the modification packages are officially closed out.
- 1-82-85 (3L) Plant procedures did not provide for channel functional test of both Unit's APRMs for fixed neutron flux-high within 24 hours of reactor startup, if not performed within the previous 7 days.
- PT 1.1.7P, revision 30, was issued August 15, 1982, to require that a APRM neutron flux-high trip functional test be performed within 24 hours prior to startup, if not performed within the previous seven days. Startup procedure, GP-1, approved September 23, 1982, contains a sign-off to verify completion prior to startup.
- 1-82-89 (3L) Test procedure did not provide for a once per 18 months calibration of ATWS-RPT time delay relays.
- PT-03.2.1, revision 6, was issued September 23, 1982 to include calibration of recirculation pump trip time delay relays. The relays were calibrated in August 1982.
- 1-82-95 (3L) RHR valves F008/F009 (shutdown cooling suction valves) and valves F022/F023 (vessel head spray valves), were not being tested per ISI requirement on a quarterly periodicity.

Revision 4 to ENP-16, updates the ISI testing requirements of specified valves. The revision states that ASME, Section XI, code exceptions have been taken for these valves. The exceptions were reviewed by the PNSC and NRC inspectors.

1-82-96 (3L)

Procedures did not provide for the required once per 31 days surveillance of the suppression pool and drywell nitrogen supply inlet isolation valves CAC-V47 and V48 respectively.

Procedure Unit 0, PT-16.1, has been revised (Rev. 7), to include V47 and V48. Procedure was approved September 9, 1982.

1-82-93 (3L)

Procedure did not provide for electrical continuity testing for RPS logic circuitry, K-14/15 relays.

Procedure PT-01.1.10 was revised on September 22, 1982, to include the K-14/15 relays.

1-82-72 (3L)

Failure to have adequate procedures for Technical Specification required surveillances.

The inspector has reviewed revision 6 to periodic test PT-02.2.4, Primary Containment Isolation Valve Verification, which was updated to include hatches and valves as specified in Technical Specification (TS) 4.6.1.1.a.1 and T.S. 4.6.1.1.a.2.

Revision 9 to PT-06.2.3, SLC Injection Test, was reviewed satisfactorily. This test implements the surveillance of the RWCU outboard isolation valve G31-F004 closure on SLC initiation for T.S. Table 4.3.2-1(3.d) and T.S. 4.6.3.3. The test was performed satisfactorily on 9-16-82 for both units.

Periodic test PT 12.7.4 PC, 4KV Emergency Bus Loss of Voltage Channel Calibration, was developed by the licensee to meet the requirements of T.S. Table 4.3.3-1, item 5.a. The subject relays were tested in the interim by temporary revision log #48 to MI 11-7, GE Over and Undervoltage Relay Model 12IAV53K (device 27/59E). The temporary change afforded the proper method and calibration settings for adequate testing of the relays.

1-82-84 (3L)

Exceeding surveillance frequency for T.S. 4.3.2.1, items 1.c.3 and 1.c.4

The inspector has reviewed the completed periodic tests for the overdue surveillances. The results were satisfactory. Also reviewed were revisions to PT 20.1 (Rev. 1), Steam Line High Flow Channel Calibration and Functional Test, and PT 21.1 (Rev. 1), Main Steam Line Low Pressure Channel Calibration and Functional Test, which updated the surveillance frequency requirements.

Unit 2

2-82-77 (1T)

Baseplate on support brace for hydraulic snubber 2-B21-59SS320, was missing nuts on 3 of its 4 wedge anchors and the fourth wedge anchor was missing.

Plant modification PM 82-073, Rev. 1, was initiated to correct improper installation of the baseplate on the support brace for the indicated hydraulic snubber. A document review by inspectors indicate that corrections were specified, installed, inspected and declared operable on July 27, 1982.

2-82-82 (3L)

Periodic test failed to reflect surveillance frequency while in operational mode 5.

Revision 10 to periodic test PT-1.10, has been reviewed and does include reference to the subject surveillance frequency.

2-82-104 (3L)

Procedures did not reflect surveillance frequency for specified plant electrical systems and offsite-onsite class 1E distribution electrical systems.

Revision 7 to periodic test PT-12.6, Breaker Alignment Surveillance, was reviewed and found satisfactory by the inspector. The revision included the required verifications as specified in Technical Specifications. The test was rerun and completed on September 24, 1982.

2-82-96 (3L)

Requirement to have low condenser vacuum switches B21-PS-N056 (A-D) in service when vessel pressure ≥ 500 psig, not reflected in system logic.

A license amendment to delete the ≥ 500 psig requirement (whose logic was deleted per SIL-107 in 1976) was submitted September 7, 1982.

2-82-87 (3L)

Diesel generator #4 fuel oil inventory on the engine mounted fuel tank was less than required.

Inspectors had no questions regarding licensee repair of level instrumentation.

2-82-100 (3L)

Untested ECCS initiation Logic circuit

Core Spray is initiated by 1) a combination of high drywell pressure and reactor low pressure or 2) reactor low level. The reactor low level signal is checked under response time PT-45.3.2. The high drywell pressure is checked under response time PT-45.3.1. The reactor low pressure was not checked by either of these PT's. As it is required to be coincident with high drywell pressure to initiate core spray the reactor low pressure response must be tested and compared to that time of the high pressure signal. The greater of the two must then be used in the calculation of total system response time. PT-A3.2 was developed to measure the pressure signal response time and was performed on 8-21-82 Unit 1 and 8-20-82 on Unit 2. PT-45.3.3 was revised to include measurement of the response time of the reactor low pressure signal, the PT was subsequently performed on 8-21-82. PT-45.3.5 LPCI initiation was revised also to include the reactor low pressure response time. The licensee performed an analysis of data from previous tests to determine full compliance to required response time using the newly acquired signal time of the reactor pressure signal. Response time were found to be satisfactory.

2-82-101

Inadequate surveillance procedure leads to missed surveillance

Inspectors reviewed revision 6 to periodic test PT-12.6, Breaker Alignment Surveillance, and verified it incorporated the subject surveillances.

6. Operational Safety Verification

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 Specification 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 position. The inspector verified that selected valve 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. On September 27, 1982 the inspectors toured the Unit 2 reactor water cleanup system RWCU pump and heat exchanger rooms. The inspectors observed that Technical Specification listed area ventilation differential temperature sensor, 2-G31-TS-N602B, was suspended in mid-air with bailing wire and was not in its proper location. The instrument was not required to be operable in the then existing cold shutdown mode. The inspectors noted that three pipe supports and numerous instrument line clamps on non-safety related equipment were not attached. The general area had paper, paint stencils, rags, cans, sections of pipe and other miscellaneous debris on the floor. These conditions were reported to the licensee.
- 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.

7. Onsite Review Committees

The inspectors attended several Plant Nuclear Safety Committee meetings conducted during the period September 15 through October 15, 1982.

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 follow-up of corrective actions were completed.

No violations were identified.

8. Followup of Plant Transients and Safety System Challenges

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.

1. On 9-30-82, Unit 2 experienced a reactor scram from 6.5% power. The scram occurred on neutron monitoring system high flux resulting from a group 1 isolation. No ECCS actuation occurred and the ensuing cooldown was normal.

Licensee event investigation revealed that the group 1 isolation occurred with the plant at approximately 548 psig, when a control operator placed the condenser vacuum - low pressure switches B21-PS-N056 C and D into service by use of the control room keylock switches. Prior to placing the pressure switches in service, condenser vacuum had been verified at 28". Further investigation revealed the pressure switches were isolated from sensing the actual condenser vacuum by a closed isolation valve that was not identified in the applicable valve line-up. The licensee initiated a check of all valve lineups for safety-related instruments, comparing valve line-up sheets to actual plant configuration. Additional procedural valve line-up deficiencies were determined to exist with the drywell pressure switches, RWCU high flow isolation, main steam line low pressure switches, main steam line high flow switches.

Failure of procedure OP-30 to have an adequate valve line-up sheet to ensure the proper operation of containment isolation instrumentation switches B21-PS-N056 C and D is a violation of Technical Specification

6.8.1.2 which requires such procedures to be established. (324/82-39-01)

The licensee subsequently determined that the subject isolation valve for B21-PS-N056 C and D was added by plant modification (PM 78-017, 78-018) in 1980.

The inability of auxiliary operators to identify the subject isolation valve during previous evolutions as not having been on the valve line-up sheet, raises the question of the adequacy of training of these personnel. The issue of auxiliary operation on-the-job training is considered an unresolved item (82-39-01).

At the time that the unit tripped, reactor pressure was 548 psig. Technical Specification (TS) 3.3.2, Table 3.3.2-1 item 1.E, requires that the condenser vacuum switches be in operation at a reactor pressure of greater than 500 psig. The controlling procedure GP-1 had been changed to remove this requirement. A T.S. change request to delete the 500 psig requirement had been submitted on September 7, 1982, but had not been acted upon by the NRC. An on shift decision was made to place the switches into service. Failure to have condenser vacuum switches B21-PS-N056 C and D in service prior to reaching 500 psig reactor pressure is a violation of T.S. 3.3.2, Table 3.3.2-1 item 1.e. (324/82-39-02).

2. On 10-10-82, Unit 2 experienced a reactor scram from 25% on a reactor protection system low water level trip. The unit was in a controlled shutdown due to a significant unisolatable leak in the heater drain system. Operators were attempting to transfer station loads from normal to alternate power supplies when complications arose with the associated 4160V breakers. Efforts to transfer loads resulted in a loss of power to the 4160V balance of plant bus 2D and emergency bus E-3. Diesel Generator #3 had been started in control room manual in anticipation of potential electric feed problems, but did not close onto bus E-3 when called upon. The resulting loss of power to bus E-3 led to a loss of feedwater, inducing the low level trip. A group 1 isolation was also initiated by a combination loss of power and a spurious spike in the main steam line high radiation monitors. HPCI was initiated manually to recover reactor water level and a safety relief valve was eventually used as pressure control. HPCI and RCIC were then utilized to perform the reactor cooldown to facilitate repairs on the heater drain system.

During the recovery from this transient, the inspector noted a lack of attention to plant procedures which lead to the following problem. Operators failed to lock the reactor mode switch in the shutdown position within one hour of the loss of the source range monitors (SRM) per EI-13, SRM and IRM Neutron Monitoring System Failure. This action was required by Technical Specification 3.3.5.4.b. This failure to follow a procedure is a violation of T.S. 6.8.1.a (324/82-39-03). The SRM's were technically inoperable because each read <3 cps and was

unable to be inserted into the core because drive power was not available from bus E-3. This condition existed for 1 hour and 45 minutes. Subsequent licensee investigation determined that the bus 2D alternate source 4160V breaker from the startup auxiliary transformer (SAT) had a failure in the closing spring charging motor function. The breaker was replaced.

The reason for the DG #3 failure to energize the E-3 bus has been traced to relay timing associated with the control room manual position of the D.G. control switch. Administrative procedures have been changed to preclude the recurrence of this condition. The heater drain system leak was found to have been due to cracking of a weld in the heater drain pump discharge piping. After satisfactory weld repairs, the unit was restarted on 10-16-82 and is currently at 36% power and increasing.

3. On October 9, 1982, Unit 1 experienced a manual scram in response to a relief valve that failed to reseal after testing. The reactor was at 200 psig and the licensee was performing routine post-maintenance testing on the safety relief valve B21-F013J. The valve had a flange leak repaired during the preceding extended shutdown. The ensuing cooldown to mode 4 occurred per procedure.

Licensee investigation revealed the cause of failure to have been a relaxed spring on the air solenoid of the valve actuator. These two - stage target-rock relief valves had been identified by the vendor as being in a family of valves that contained solenoid valve springs weakened due to known materials problems. Replacement springs are to be installed. After replacement of the valve solenoid, the unit returned to power on October 14 and all relief valves were to be tested to verify operability. This testing resulted in two additional discoveries. B21-F013D and B21-F013E failed to open when called upon. The licensee replaced these valves, restarted and satisfactorily tested the new valves. The investigation into the failure of the relief valve continues as per direction of IE Bulletin 80-25. The unit remains at power at the close of the report period.

9. Special Pre-startup Inspection of Surveillance Testing and Maintenance Activities

Previously issued inspection reports, 324/82-32, 35, 37 and 38 documented inspection or partial inspection of 13 areas of the pre-startup inspection plan. The remainder of the pre-startup inspection plan is discussed below.

1. Preliminary review of licensee pre-startup efforts: The scope of the licensee effort to identify areas of regulatory concern was reviewed with the Director of Regulatory Compliance section on August 13, 1982. The inspectors agreed that satisfactory completion of the reviews in progress and resolution of their findings should ensure that Technical Specification surveillance requirements are properly incorporated into

plant procedures and that these procedures are satisfactorily performed prior to resuming power operation.

2. Review of surveillance system: The licensee has committed to complete reorganization and development of a Technical Specification surveillance scheduling and audit system including a cross reference between each requirement and its implementing procedure by November 30, 1982. The interim scheduling system was reviewed by the licensee to verify that all periodic requirements are specified on a tracking system at the required frequency and reactor modes. The inspector independently verified approximately 75% of the Technical Specification surveillances are scheduled correctly.
3. Verify missed surveillances have been performed: The inspectors verified that the licensee satisfactorily performed the following surveillances which had been missed, improperly performed or lacked adequate documentation: PT A3.2, PT A5.2, PT A20.1, PT A21-1, PT A 22.2, PT A25.3, PT 1.1.7P, PT 1.1.10, PT 1.3.2P-2, PT 2.1.1P, PT 2.1.12P, PT 2.1.23PC, PT 2.2.1a, PT 2.2.4, PT 2.2.4a, PT 2.3.1, PT 2.3.2, PT 3.1.21, PT 3.1.22, PT 4.1.8, PT 6.1, PT 6.2.3, PT 7.1.1a, PT 7.1.1b, PT 7.2.4a, PT 7.2.4b, PT 8.0, PT 8.0a, PT 8.0b, PT 8.1.2, PT 8.1.4a, PT 8.1.4b, PT 8.2.2b, PT 8.2.2c, PT 9.0, PT 11.0, PT 11.3, PT 12.2a, PT 12.2b, PT 12.2c, PT 12.2d, PT 12.6, PT 12.7.3P, PT 12.7.4 PC, PT 14.0, PT 14.6, PT 15.7, PT 15.8, PT 16.0, PT 16.1.1, PT 17.6, PT 20.0, PT 20.3, PT 20.3a, PT 20.3b, PT 22.2, PT 24.1, PT 24.2, PT 25.1, PT 31.1, PT 35.4.6, PT 35.10, PT 35.11.2, PT 35.22, PT 35.18.2, PT 35.18.3, PT 45.3.5, PT 46.1, and ER&C 1010.
4. Verify licensee identified procedural inadequacies have been resolved: The inspectors verified that procedural inadequacies identified by the onsite nuclear safety subgroup and by operations personnel which were designated as pre-startup items had the associated procedures revised or were otherwise satisfactorily resolved.
5. Review Technical Specification change submittals: The inspectors reviewed the licensee proposed Technical Specification changes and verified that Region II management and the office of Nuclear Reactor Regulation were cognizant of the content of the submittals.
6. Verify completion of licensee identified pre-startup items and evaluate PNSC review of item: On September 25, 1982, the inspector attended the special Plant Nuclear Safety Committee meeting convened by the licensee to review the pre-startup item list. Of the 209 items, 186 had been completed, 5 were being completed that day and 18 were transferred to the PNSC action item list to be completed after resumption of power operation. The twenty-three not totally completed items were reviewed by the committee to verify that power operation within license conditions was possible without those items being closed out. The inspector concurred with this assessment.

The Director of Regulatory Compliance section certified that all 186 closed out items had been processed by the PNSC. The PNSC choose three out of the 186 items at random to re-review. This re-review yielded no concerns. The inspector considered this methodology and the review process as satisfactory.

Prior to this meeting, the inspectors had attended several other PNSC meetings which had addressed specific items such as post-maintenance testing, Technical Specification amendment control, plant modification controls and containment isolation valve identification and testing. The 186 items closed by the licensee were individually reviewed by the inspectors. The inspectors noted no concerns which required resolution prior to re-start.

7. Evaluate program for recognition and implementation of surveillance requirements resulting from Technical Specification changes and plant modification: Administrative procedures AI 9.1 and ENP-3 address the subject concerns. These procedures appear adequate. Proper recognition and implementation of recently issued Unit 2 Technical Specification amendments 71, 72 and 73 was verified by the inspector. The quality assurance organization is in the process of establishing a program to audit implementation of Technical Specification amendments and all surveillances periodically, completion of this task is anticipated by late 1982.
8. Review program for documentation of post-maintenance testing: The inspectors reviewed maintenance procedures MP-10 and MP-14 which establish the administrative controls for and documentation of post-maintenance testing. The procedures were verified to be in accordance with the requirements of 10 CFR 50, ANSI 18.7 (1971) and Technical Specifications. In addition the inspector reviewed the syllabus used to train personnel in the revised maintenance control system. The training outline appears to adequately address the changes in the program as well as providing practice in using new and revised forms.
9. Review modifications which enable containment isolation valves to be tested: The inspector verified that modifications have been completed and that the valves were successfully tested.
10. Review additions and deletions to snubber program: The inspector verified that the licensee has submitted a Technical Specification change incorporating current plant snubber status.

The special pre-startup inspection is considered complete.

10. Confirmation of Action Letters Dated July 2 and July 20, 1982

On September 29, 1982 the licensee verbally notified the NRC that the licensee actions required by the conformation of action letters of July 2 and July 20, 1982 had been satisfactorily completed. This was followed up

by written notification on October 3, 1982. The inspectors verified that the actions delineated on the subject letters had been completed as required. These letters are considered closed.

11. NRC Regional Office Notice No. 0551

All inspection requirements contained in the NRC Regional Office Notice No. 0551 were addressed as part of the special pre-startup inspection plan for Brunswick. Therefore this notice is considered closed.