



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

Report Nos.: 50-325/88-24 and 50-324/88-24

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: July 7 - August 7, 1988

Inspector:

W. H. Ruland

8/31/88

Date Signed

W. Levis

8/31/88

Date Signed

Accompanying Personnel: M. Branch
C. Casto
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Approved by:

P. E. Fredrickson
P. E. Fredrickson, Section Chief
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9/1/88

Date Signed

SUMMARY

Scope: This routine safety inspection by the resident inspectors involved the areas of followup on previous enforcement matters, maintenance observation, surveillance observation, operational safety verification, followup on inspector identified and unresolved items, onsite Licensee Event Report (LER) review (Unit 1), in office LER review (Unit 1), Unusual Event/Fire Unit 2, fire on diesel generator building roof, HPCI auxiliary oil pump splice, Residual Heat Removal (RHR) service water (SW) gasket rupture, Automatic Switch Company (ASCO) pressure switch failure, RHR SW temperature limit exceeded, and sustained control room and plant observation.

Results: Four violations were identified: failure to properly control work approval, resulting in a fire underneath a diesel generator silencer; inadequate corrective action and design control leading to inoperable DC motor operated valves in the High Pressure Coolant Injection (HPCI) system; inadequate corrective action regarding resolution of silicon bronze bolt cracking; and failure to maintain RHR SW piping temperature (considered licensee identified). No deviations were identified.

Continuous onsite NRC coverage (July 18 - August 1, 1988) found no significant safety issues regarding operator performance.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

- *K. Altman, Acting Manager - Maintenance
- W. Biggs, Engineering Supervisor
- *F. Blackmon, Manager - Operations
- *J. Brown, Res. Engineer - Engineering
- T. Canterbury, Mechanical Maintenance Supervisor (Unit 1)
- *G. Cheatham, Manager - Environmental & Radiation Control
- R. Creech, I&C/Electrical Maintenance Supervisor (Unit 2)
- *W. Dorman, Supervisor - QA
- *K. Enzor, Director - Regulatory Compliance
- R. Groover, Manager - Project Construction
- *J. Harness, General Manager - Brunswick Nuclear Project
- W. Hatcher, Supervisor - Security
- A. Hegler, Superintendent - Operations
- R. Helme, Manager - Technical Support
- J. Holder, Manager - Outages
- *P. Howe, Vice President - Brunswick Nuclear Project
- L. Jones, Director - Quality Assurance (QA)/Quality Control (QC)
- *M. Jones, Director - On-Site Nuclear Safety - BSEP
- R. Kitchen, Mechanical Maintenance Supervisor (Unit 2)
- J. Moyer, Manager - Training
- G. Oliver, Manager - Site Planning and Control
- *J. O'Sullivan, Project Manager Valves - Projects
- B. Parks, Engineering Supervisor
- *R. Poulk, Senior NRC Regulatory Specialist
- *J. Smith, Director - Administrative Support
- R. Starkey, Manager - Nuclear Safety and Environmental Services
- V. Wagoner, Director - IPBS/Long Range Planning
- R. Warden, I&C/Electrical Maintenance Supervisor (Unit 1)
- B. Wilson, Engineering Supervisor
- *A. Worth, Engineering Supervisor
- T. Wyllie, Manager - Engineering and Construction

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

*Attended the exit interview

Note: Acronyms and abbreviations used in the report are listed in paragraph 17.

2. Followup on Previous Enforcement Matters (92702)

(CLOSED) Violation 324/86-16-01, Failure to Declare a Support Inoperable When Required by Procedure. The inspector reviewed the licensee's response to the violation dated August 14, 1986. This incident revealed a programmatic deficiency in that the previous test data sheets for visual examinations were used only for recording examination results. The decision on whether a deficiency requires an LCO was made solely by the ISI support coordinator with no independent review. Corrective actions included immediate review of outstanding WR/JOs issued by the ISI group. No other improper determinations of LCO requirements were found. The inspector verified, through record review, that the corrective actions implemented by the licensee were completed in accordance with the response.

(CLOSED) Violation 325/87-02-02 and 324/87-02-02, Failure to Adequately Establish Chlorine Monitor Annunciator Procedure. The inspector reviewed the corrective actions taken in the licensee's response dated April 2, 1987, and found them implemented adequately. The inspector also reviewed OER 2-87-02, Chlorine Detector Failure Requiring Isolation of Control Building Ventilation. The OER gave an in-depth analysis of the correction of the chlorine detector drip rate problem, revisions to annunciator procedures, and other procedure related problems. The inspector concurs with the evaluation results and corrective actions taken.

No significant safety matters, violations or deviations were identified.

3. Maintenance Observation (62703)

The inspectors observed maintenance activities, interviewed personnel, 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 were reviewed to ensure that the licensee gave priority to safety-related maintenance. Numerous maintenance items were reviewed throughout the reporting period. The inspectors observed/reviewed, in detail, those portions of the following maintenance activities:

88-AUDP1 Unit 1 HPCI Auxiliary Oil Pump Motor Lead Repair

88-AULU1 HPCI Auxiliary Oil Pump Oil Changeout Due to High Moisture

88-AUNH1 Replace Directional Control Valve for CRD 30-15

88-ATWP3 Replaced the 2B Heater Drain Pump Motor

No significant safety matters, violations, or deviations were identified.

4. Surveillance Observation (61726)

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

1-MST-RBM11M	Rod Block Monitor Channel Functional Test
2-MST-APRM11M	APRM Rod Block Functional Test
2-MST-APRM21W	APRM 15% Trip and Inoperable Channel Functional Test Calibration
2-MST-APRM27Q	APRM 12% Rod Block Channel Functional Test
2-MST-IRM11W	IRM Channels A, C, E & G Functional Test
2-MST-SRM11W	SRM Channel Functional Test (Setpoint Calibration)
PT-01.6.1	RSCS Operability Functional Test

No significant safety matters, violations, or deviations were identified.

5. Operational Safety Verification (71707)

The inspectors verified that Unit 1 and Unit 2 were operated in compliance with Technical Specifications and other 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 operator, shift supervisor, clearance, STA, daily and standing instructions, 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 operating 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 division was verified weekly by ensuring that: each accessible valve in the flow path was in its correct position; each power supply and breaker was closed for components that must activate upon initiation signal; the RHR subsystem cross-tie valve for each unit was closed with the power removed from the valve operator; 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.

The inspectors verified that the licensee's health physics policies/procedures were followed. This included observation of HP practices and 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; vehicles were properly authorized, searched and escorted within the PA; persons within the PA displayed photo identification badges; personnel in vital areas were authorized; and effective compensatory measures were employed when required.

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

No significant safety matters, violations, or deviations were identified.

6. Followup on Inspector Followup and Unresolved Items (92701)

(OPEN) Inspector Followup Item 325/86-11-04 and 324/86-12-04, Poor Quality RRIL Procedures. The inspector reviewed the licensee's current program for upgrading maintenance instructions and procedures which includes the RRIL procedure project. The priority for upgrading has been those procedures utilized in current plant modifications. Due to the ongoing decrease in plant modification work and consequently the number of maintenance procedures which are being reviewed and upgraded, the licensee is planning on continuing upgrades on a more scheduled and prioritized basis. This changeover is due to occur in the mid 1989 time frame pending budget limitations. A considerable amount of maintenance procedures still

require review and upgrade. The current staffing levels involved appear to be adequate to properly review procedures which are utilized in plant modification.

The inspector reviewed MP-52, Standards for Preparing and Maintaining Maintenance Procedures, Revision 003, dated April 14, 1988, for accuracy and scope as compared to recommended criteria expressed in NUREG/CR-1369, Revision 1, Procedures Evaluation Checklist for Maintenance, Test and Calibration Procedures Used in Nuclear Power Plants. No discrepancies were noted. MP-52 now incorporates Procedures Administration Manual philosophy for format and content and has been regularly upgraded. The inspector also interviewed both licensee and contract personnel in regards to the current maintenance procedure upgrade process and future expectations. This item should remain open pending the development of a more discernible upgrade schedule and prioritization program for the remaining maintenance procedure upgrades.

(CLOSED) Inspector Followup Item 325/86-17-03 and 324/86-18-03, Review of Unauthorized Control Room Pressure Boundary Extension. The inspector reviewed OER 2-86-025, approved on August 14, 1986, which adequately detailed the breakdown in communications and work controls which lead to the event. The licensee performed a smoke test on July 10, 1986, which demonstrated that a positive pressure still existed with both fire doors left open. The inspector concurs that, in terms of control room habitability, the presence of a security guard to close the wired open door in case there had been any in-leakage, further mitigates the potential for loss of habitability. However, the guard was not stationed at the door for control room habitability concerns. The licensee's actions to prevent recurrence included operations shift personnel training, a new plant security open door policy, and the posting of all doors and hatches into the control room with information regarding the consequences of leaving doors open and who can authorize this action. The inspector has no further questions.

(OPEN) Inspector Followup Item, 325/86-24-03 and 324/86-25-03, Review of Lonegren Relief Valve Test Program. The inspector reviewed the licensee's assessment of the Lonegren Model LCT-11 Emergency Core Cooling System relief valve failures dated October 7, 1987. The functional testing included bench testing and disassembly examination. The results found that nine out of the ten valves tested exhibited unsatisfactory results. The problems, which were generic to all the valves, included severe corrosion of springs, stems, guides, and steps. In addition, cutting and pitting were noted on discs and seating surfaces. The licensee also reviewed the consequence of these relief valve failures on plant operating procedures and concluded that frequent cycling of the valves via routine bypassing of ECCS keepfill station PCVs may be contributing to many premature failures. Certain ECCS keepfill PCV setpoints have been reset in order to avoid needless cycling of both primary system and keepfill relief valves.

Currently, planned corrective actions include either rebuilding of the LCT-11 model or, if necessary, replacement of the entire valve with Model LCT-14. This item will remain open pending completion of the valve upgrade which is scheduled for late 1988.

(CLOSED) Inspector Followup Item 325/87-31-02 and 324/87-35-02, Work Controls for Fasteners Loosened on Operable Equipment. The inspector reviewed various licensee inter-office memorandums concerning the resolution of the continued instances of non-conformances involving work controls for loosening fasteners. The subject has received appropriate management attention and involvement in the issue resolution. The inspector also reviewed Q-List Evaluation No. 88-10, approved on March 22, 1988, along with the associated work package documentation. The analysis provided appears to be adequate in determining that cable tray covers are not seismic or fire protection related, and are not required from a structural integrity standpoint. Based on these conclusions, the licensee's intention is to downgrade the cable tray cover, as a component part, to non Q-List classification and replace the damaged or missing covers in the course of normal modification activity as they are discovered. The inspector had no further questions.

(OPEN) Inspector Followup Item 325/88-21-05, Review of HPCI Door OER. On July 11, 1988, an additional event occurred regarding a HPCI door. At approximately 5:00 p.m., an inspector accompanied the Unit 2 shift foreman on tour of the Unit 2 reactor building. The inspector and shift foreman found the north door of the HPCI room wide open, with a large 4' square fan in the doorway. No maintenance personnel were in the area. The Maintenance staff had been performing MAC testing in the area. At the time the door was found open, the CO₂ system had been rendered inoperable for personnel safety. The shift foreman stated that maintenance personnel were given permission to open the door for ventilation, provided an individual is present to close the door in case of fire. Both events will be reviewed when the original OER is issued.

(CLOSED) Unresolved Item 325/88-18-07 and 324/88-18-07, Adequacy of Actions to Identify and Correct Silicon Bronze Bolt Problem. Upon further NRC review of LER 1-88-006 and its supplement, this matter is considered a violation. Violation: Inadequate Corrective Actions Taken to Identify and Correct Silicon Bronze Bolt Failures (325/88-24-03 and 324/88-24-03).

(CLOSED) Unresolved Item 325/88-21-07 and 324/88-21-07, Valve Operability With Respect to Starting Resistors in DC Motor Control Centers. This issue and related issues regarding DC motors were identified as a violation in AIT report 325,324/88-27. The violation will be administratively tracked using this report. Violation: Inadequate Corrective Action for Problems Identified in DC Motor Operated Valves (325/88-24-04 and 324/88-24-04).

Two violations and no deviations were identified.

7. Onsite Review of Licensee Event Reports (92700)

The below listed LERs were reviewed to verify that the information provided met NRC reporting requirements. The verification included adequacy of event description and corrective action taken or planned, existence of potential generic problems and the relative safety significance of the event. Onsite inspections were performed and concluded that necessary corrective actions have been taken in accordance with existing requirements, license conditions and commitments.

(CLOSED) LER 1-85-59, Reactor Scram Due to Primary Containment Group 1 Isolation Along with Trip of Reactor Core Isolation Cooling System and Trip/Lockout of Diesel Generator No. 4. This event was previously inspected in inspection report 50-325/87-31. The licensee has submitted a supplemental response, dated June 27, 1988, to the subject LER. The revision exhibited a more clearly defined scope of event investigation, corrective actions, and reportability concerns. Resolutions to various technical concerns which may or may not have been related to the root cause of the event were analyzed and improvements were made as part of the corrective actions taken. The inspector reviewed the completed work package and verified the associated procedural changes.

No significant safety matters, violations, or deviations were identified.

8. In Office Licensee Event Report Review (90712)

The below listed LER was reviewed to verify that the information provided met NRC reporting requirements. The verification included adequacy of event description and corrective action taken or planned, existence of potential generic problems and the relative safety significance of the event.

(CLOSED) LER 1-88-15, Automatic Isolation of Units 1 and 2 Common Control Building Heating, Ventilating, Air Conditioning System and Emergency Air Filtration System.

No significant safety matters, violations, or deviations were identified.

9. Unusual Event/Fire Unit 2 (93702)

The licensee declared an Unusual Event at 11:30 p.m., due to a fire in Unit 2 from the 2B Water Drain Pump motor. The fire existed for greater than 10 minutes from initial detection. At 11:15 p.m., the Unit 2 breezeway 20' south fire alarm was received in the control room followed shortly by the bus 2C motor overload alarm. Personnel were dispatched to the breezeway and the 2C switchboard to investigate. A fire was confirmed at 11:20 p.m. due to the presence of smoke in the breezeway area and the fire alarm sounding. Motor amperage for HDP 2B was reading 200 amps (140 normal value). HDP 2C was started at 11:20 p.m. and HDP 2B was secured. The fire brigade assembled and entered the 2B HDP room at 11:28 p.m. and

extinguished the fire in the motor. The fire was reported out at 11:48 p.m. and the Unusual Event terminated at 11:49 p.m. An NRC inspector was in the control room at the time of the event and reported that operator actions were prudent and in accordance with procedures. The fire was confined to the HDP motor and no release of radioactive materials from the plant occurred. The inspectors will review the post fire investigation report during future routine inspections.

No significant safety matters, violations, or deviations were identified.

10. Fire on Diesel Generator Building Roof (93702)

The licensee declared an unusual event at 7:54 a.m. on July 24, 1988, due to a fire on the DG building roof near the No. 1 DG exhaust silencer. At 7:42 a.m. the fire was reported to the control room. At 7:44 a.m. the fire alarm was sounded. The fire brigade mustered at the assembly point at 7:50 a.m. Fire extinguishers were raised to the roof and the fire was reported out at 7:59 a.m., at which time the unusual event was terminated. NRC inspectors were present in the control room and at the assembly point, and noted that the licensee's response to the event was controlled, well executed, and in accordance with established procedures.

The fire occurred in some 8 X 8 timbers used to support the west end of the DG No. 1 exhaust silencer. The timbers ignited due to the performance of PT-12.2A, the monthly DG load test, which had been performed for the No. 1 DG earlier that morning. The timbers were placed to support removal and replacement of the exhaust silencers, which is scheduled for the week of September 17. Installation of the wood support structure, which was installed on all four diesel generators, was completed on July 22, 1988. The work was authorized by a Plant Services Authorization form, which is Appendix H to MP-14A, Corrective Maintenance. Included with this form was a Fire Protection Engineering Review form, Attachment 2 to FPP-014. This form, completed on July 8, 1988, stipulated that fire retardant sheeting be placed over the cribbing and that a fire extinguisher be present at the work site. This stipulation was made since non-fire retardant wood was used in this application due to the unavailability of treated wood in the 8 X 8 size. Attachment 2 of FPP-014 has provisions for a fire inspector's signature to ensure that the appropriate stipulations were satisfied. This block was not signed.

The licensee's initial review of the event determined the following:

- ° The timbers should not have been in place unless the diesels were under clearance. In fact, it was the understanding of the individual completing Attachment 2 that the structure would not be put in place until the diesels were tagged out. The operating state of the diesel, however, was not specified as a prerequisite to putting the structure in place.

- The lack of independent review/controls to ensure that personnel complied with the stipulated conditions for use of the wood contributed to the event.
- The magnitude and impact of the fire were within the limits previously analyzed by fire protection engineering.

This event in itself does not appear to be safety significant. However, the lack of controls in performing maintenance on safety related structures and components is a weakness that must be addressed. The use of a Plant Services Authorization form as the controlling document for this work is not appropriate. Appendix I to MP-14A defines plant services work for that which control by WR/JO is not required. In addition, Appendix I provides examples of work items which do not require review by the shift foreman. The installation of non-fire retardant wood support structures in direct contact with Q structures is not exempted from WR/JO control or SF approval as specified in Appendix I and J. Therefore, a WR/JO should have been used and SF approval obtained prior to performing this work. Criterion V to Appendix B of 10 CFR 50 requires that activities affecting quality shall be prescribed by documented instructions or procedures of a type appropriate to the circumstances. The lack of controls in place during the installation of the wood support structure is in violation of this requirement. Violation: Fire on Diesel Generator Building Roof (325/88-24-01 and 324/88-24-01).

No significant safety matters, one violation and no deviations were identified.

11. HPCI Auxiliary Oil Pump Splice (25576)

As the result of a previous EQ violation (325,324/88-21-02) dealing with SBTG SCR controllers, the licensee began to re-evaluate the qualification status of their skid mounted equipment; HPCI and SBTG in particular. This review, which was performed by BESU and completed on June 6, 1988, identified several possible EQ concerns. One item in particular was that the HPCI auxiliary oil pump motor splice connection may not be qualified. As a result of this deficiency, NCR A-88-016 was issued and the splices were examined on July 15, 1988, and July 24, 1988, for Unit 1 and Unit 2, respectively. The inspection results are documented in EER 88-0349 and EER 88-0371. The licensee concluded that the splices in Unit 1, which consisted of one in line tape splice, five parallel tape splices, and one three wire tape splice were acceptable based on the quality of splice construction, the observable characteristics of the splices in relation to those qualified in existing qualification data packages, and the environment in which it must function (ie., harsh for radiation only). The licensee, however, replaced these splices on July 30, 1988, with a type covered by their present qualification data packages.

The results of the inspection of the Unit 2 splice revealed that the splices were unacceptable. These splices also consisted of one in line, five parallel, and one three wire tape splice. However, due to the poor workmanship noted, lack of outer jacketing tape and three cases where holes were observed through the insulating tape, the licensee concluded that qualification was indeterminate for these splices. Operations was informed of the situation and HPCI was declared inoperable although it was not required to be operable at that time since the reactor was in mode 3 with pressure less than 113 psig. The splices were replaced with qualified splices prior to Unit 2 resuming power operations.

The lack of a qualified splice on the HPCI Unit 2 auxiliary oil pump is a violation of 10 CFR 50.49 requirements. However, since the violation was identified as a result of licensee corrective actions to a previous violation (325, 324/88-21-07), no Notice of Violation will be issued.

No significant safety matters, one violation and no deviations were identified.

12. RHR Service Water Gasket Rupture (63702)

On July 17, 1988, with Unit 1 in mode 3 and shutdown cooling established on the A RHR loop, the licensee experienced a gasket failure on the RHR service water line. The failure occurred at a 4" cleanout connection upstream of flow control valve E11-F068A. The failure occurred at a copper nickel raised face blind flange. The gasket used was an unreinforced EPDM gasket. When the leak was reported, shutdown cooling was secured and damage from spraying water assessed. Water accumulated in the north core spray room and had wetted down several components, including a lighting distribution panel, MCC 1XJ, and valve 1-E21-F015A. Affected components were examined, necessary repairs made, and items restored to operable status. The failed gasket was replaced with a reinforced type. To verify that other gaskets in the RHR service water system were operable, the licensee performed a pressure test on the system. Flow was reduced in accordance with OP-17 such that system discharge pressure was approximately 400 lbs. Other gaskets were walked down and no other leaks were found.

The licensee has experienced other gasket failures on the Unit 2 service water piping on April 30, 1986, and December 24, 1987. The failures were evaluated and determined to be attributable to three factors. These factors were unreinforced EPDM gaskets, raised face flange joint, and carbon steel piping materials. As a result of these failures, the licensee compiled a list of such high risk joints in both units. During the last refueling outage of Unit 2, 22 of the 55 joints on the discharge side of the RHR SW pumps were replaced. Prior to the latest failure on Unit 1, 20 of the 51 high risk joints were scheduled for replacement during the next refueling outage. Since the latest failure was a joint not previously considered to be high risk, the licensee is re-evaluating their position to determine if other gaskets should be replaced.

This item will undergo further review along with the previous unresolved item (324/87-43-06) which was written after the December 24, 1987 failure.

One potentially significant issue involving ruptured gaskets was identified; no violations, or deviations were identified.

13. ASCO Pressure Switch Failure (62703)

On July 25, 1988, while attempting to establish shutdown cooling on Unit 2, the control room operator was unable to open valve 2-E11-F009 from the control room. This valve is the inboard isolation valve on the common RHR shutdown cooling suction line. It is off recirculation loop A and it is not paralleled by a redundant line. Therefore, the opening of this valve is essential in the removal of core decay heat from the reactor during the shutdown cooling mode of operation. However, at the time of this event, the condenser was available and the reactor had sufficient steam pressure to remove decay heat through that path. Additionally, the drywell was accessible and the F009 valve could have been manually opened.

Trouble shooting under WR/J0-88-AUFA1 determined that a related interlock pressure switch (2-B32-PS-N018A-1) contacts were open, not allowing the control switch to open the F009 valve from the control room. This particular switch is designed as part of the control logic to allow the valve to open only when reactor pressure is less than 140 psig to protect the low pressure RHR system. The particular switch was equipped with a dual set of microswitch controls. The licensee wrote an engineering evaluation (EER 88-0369) to allow a temporary repair of the problem by using the spare switch.

As a result of this failure, combined with other recent setpoint drift problems associated with ASCO tripoint pressure switches being used in high pressure applications where a low setpoint is required, the NRC requested the licensee to review all other applications of this type of pressure switch. To address these concerns, EER 88-0376 was developed by engineering and reviewed by the PNSC. This evaluation provided the following information:

- ° Review of procurement specification BSEP 252-091 indicated that correct pressure and setpoint range were specified.
- ° Review of purchase order B26127 indicated that ASCO certified compliance to the above specification.
- ° Field verification of all installed ASCO tripoint pressure switches indicated that label plate data showed that rated over-range pressure was within system design pressure.
- ° The failure of pressure switch 2-B32-PS-N018A-1 was a random failure and not indicative of a generic problem.

- ° A failure analysis of pressure switch 2-B32-PS-N018A-1 would be performed as soon as the switch can be removed (presently scheduled for early September).

Based on the above, the pressure switches appear correct for this application. However, to improve reliability the licensee is working with ASCO on the instrument drift problem. The licensee indicates that their current calibration frequency of once per month is sufficient to ensure operability. During a plant safety meeting where this issue was discussed, a member indicated that Yankee Rowe had recently issued a 10 CFR Part 21 report on problems similar to those being experienced at BSEP. A review of the Part 21 report and followup of the licensee failure analysis is identified as an Inspector Followup Item: ASCO Pressure Switch Failure (325, 324/88-24-02).

No significant safety matters, violations or deviations were identified.

14. RHR SW Temperature Limit Exceeded (71707)

During review of the data associated with the performance of the 1A RHR heat exchanger performance test conducted on July 17, 1988, and pressure testing of gaskets subsequent to the repair of a failed gasket, the licensee determined that they had exceeded a design limit of 120 degrees F on the RHR SW piping downstream of the RHR heat exchanger. The chart recorder which monitors this parameter showed that before stabilizing, the RHR service water temperature downstream of the heat exchanger peaked at 215 degrees F when initially putting the heat exchanger in service. The 120 degrees F limit was based on the current stress analysis for the RHR SW piping downstream of the RHR heat exchanger. To determine if this piping was still operable, the licensee prepared EER 88-0365 and re-evaluated the stress model for this piping assuming a temperature of 215 degrees F. The analysis considered thermal and dead weight loads and showed that system design stresses had not been exceeded. Further analysis will be done to determine if the piping would have remained operable at 215 degrees F during design basis earthquake conditions to determine reportability of the event. This item is due by October 1, 1988.

To allow for continued operation, the licensee justified short term seismic qualification of the RHR SW piping downstream of the RHR heat exchanger with a limit of 186 degrees F. The operating procedure for RHR, OP-17, was revised for Unit 2 in Revision 27 (dated July 27, 1988) to reflect the 186 degrees F limit and imposed an operating limit of 170 degrees F. The temperature limit for long term qualification is due for completion by November 1, 1988.

Failure to maintain temperature below 120 degrees F on RHR SW piping is a violation of 10 CFR 50, Appendix B, Criterion V. The operating procedure was inadequate to keep the temperature from exceeding 120 degrees F. However, since all the requirements of 10 CFR 2, Appendix C, were

satisfied. the violation is considered licensee identified and no notice of violation is being issued. LIV: Failure to maintain RHR SW piping temperature below 120 degrees F. The inspectors will follow the licensee's corrective actions during future routine inspections (325/88-24-05 and 324/88-24-05).

No significant safety matters, one licensee identified violation, and no deviations were identified.

15. Sustained Control Room and Plant Observation (71715)

NRC began 24 hour coverage of the licensee's activities on July 18, 1988. Region II initiated the additional oversight because the licensee's continued problems with failure of plant equipment and questions concerning the supporting management systems. Continuous coverage ended on August 1, 1988, when Unit 2 reached 100% power. NRC performed additional inspections during this time as part of the AIT, report No. 325,324/88-27.

Major events and procedures reviewed by the inspectors are included throughout this report. No major findings resulted from the continuous coverage. The coverage included extended control room observation, attendance at licensee management turnover meetings, and observation of surveillance tests and maintenance activities.

No significant safety matters, violations or deviations were identified.

16. Exit Interview (30703)

The inspection scope and findings were summarized on August 5, 1988, with those persons indicated in paragraph 1. The inspectors described the areas inspected and discussed in detail the inspection findings listed below. Dissenting comments were not received from the licensee. Proprietary information is not contained in this report.

<u>Item Number</u>	<u>Description/Reference Paragraph</u>
325, 324/88-24-01	VIOLATION - Fire on Diesel Generator Building Roof (paragraph 10).
325, 324/88-24-03	VIOLATION - Inadequate Corrective Actions Taken to Identify and Correct Silicon Bronze Bolt Failures (paragraph 6).
325, 324/88-24-04	Inadequate Corrective Action for Problems Identified in DC Motor Operated Valves (paragraph 6).
325, 324/88-24-02	IFI - ASCO Pressure Switch Failure (paragraph 13).
325, 324/88-24-05	LIV - Failure to Maintain RHR SW Piping Temperature Below 120 Degrees F (paragraph 14).

17. List of Abbreviations for Unit 1 and 2

AIT	Augmented Inspection Team
AO	Auxiliary Operator
APRM	Average Power Range Monitor
ASCO	Automatic Switch Company
BESU	Brunswick Engineering Sub Unit
BSEP	Brunswick Steam Electric Plant
CO ₂	Carbon Dioxide
CP&L	Carolina Power & Light Company
CRD	Control Rod Drive
CWIP	Circulating Water Intake Pump
DC	Direct Current
DG	Diesel Generator
EER	Engineering Evaluation Report
EPDM	Ethylene Propylene Dipolymer
EQ	Environmental Qualification
ESF	Engineered Safety Feature
F	Degrees Fahrenheit
HDP	Header Drain Pump
HP	Health Physics
HPCI	High Pressure Coolant Injection
HSD	Hot Shutdown
I&C	Instrumentation and Control
IE	NRC Office of Inspection and Enforcement
IFI	Inspector Followup Item
IPBS	Integrated Planning Budget System
IRM	Intermediate Range Monitor
ISI	Inservice Inspection
JCO	Justification for Continued Operation
LCO	Limiting Condition for Operation
LER	Licensee Event Report
LIV	Licensee Identified Violation
MAC	Motor Actuator Characterizer
MCC	Motor Control Center
MP	Maintenance Procedure
NCR	Non-Conformance Report
NOUE	Notice of Unusual Event
NRC	Nuclear Regulatory Commission
NUREG	Nuclear Regulation
OER	Operating Experience Report
OP	Operating Procedure
PA	Protected Area
PAM	Procedures Administration Manual
PCV	Pressure Control Valve
PNSC	Plant Nuclear Safety Committee
PT	Periodic Test
Q	Quality
QA	Quality Assurance
QC	Quality Control

RCIC	Reactor Core Isolation Cooling
RHR	Residual Heat Removal
RRIL	Regulatory Related Instrument List
RSCS	Rod Sequence Control System
RWM	Rod Worth Minimizer
SBGT	Standby Gas Treatment
SCR	Silicon Controlled Rectifier
S/D	Shutdown
SF	Shift Foreman
SRM	Source Range Monitor
STA	Shift Technical Advisor
SW	Service Water
TS	Technical Specification
URI	Unresolved Item
WR	Work Request
WR/JO	Work Request/Job Order