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

Report No.: 50-325/91-02 and 50-324/91-02

Licensee: Carolina Power and Light Company
P. O. Box 1551
Raleigh, NC 27602

Docket Nos. 50-325 and 50-324 License No. DPR-71 and DPR-62

Facility Name: Brunswick 1 and 2

Inspection Conducted: February 1 - 28, 1991

Lead Inspector: R. L. Prevatte 3/12/91
Date Signed

Other Inspectors: W. Levis
D. J. Nelson

Approved By: H. O. Christensen, Section Chief 3/12/91
Date Signed
Reactor Projects Branch 1
Division of Reactor Projects

SUMMARY

Scope:

This routine safety inspection by the resident inspector involved the areas of maintenance observation, surveillance observation, operational safety verification, onsite review committee, onsite followup of events, installation and testing of modifications, restart from refueling, and action on previous inspection findings.

Results:

In the areas inspected, three violations were identified. The first violation involved the use of an incorrect lubricant on silicone O-rings, paragraph 2.b. The second violation contained two examples of procedural inadequacies involving valve replacement and post-modification testing, paragraph 2.a. A non-cited violation for the failure to accomplish the required 10 year inservice inspection hydrostatic testing of vent and drain lines was additionally identified, paragraph 2.a. The above events demonstrated that,

although the licensee has detailed procedures to cover the majority of tasks performed at the plant, it appears that personnel are still not observing such details as reading instructions contained on lubricant packages and tags on equipment. The results of one of the above violations also noted that personnel were performing tests and signing completions without fully understanding all test requirements.

A strength was identified for the use of thermography in predictive maintenance, paragraph 2.c.

Unit 2 was operated at essentially 100 percent power for the month. Unit 1 completed the 153 day refueling outage on February 26, 1991. It was noted that all work was completed within three days of the planned schedule. The unit was at approximately 50 percent power conducting component system and core physics testing at the end of the reporting period.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

K. Altman, Manager - Regulatory Compliance
F. Blackmon, Manager - Radwaste/Fire Protection
*S. Callis, On-Site Licensing Engineer
*T. Cantebury, Manager - Unit 1 Mechanical Maintenance
*G. Cheatham, Manager - Environmental & Radiation Control
R. Creech, Manager - Unit 2 I&C Maintenance
*J. Cribb, Manager - Quality Control (Onsite)
*M. Foss, Supervisor - Regulatory Compliance
*W. Hatcher, Supervisor - Security
*R. Helme, Manager - Technical Support
*J. Holder, Manager - Outage Management & Modifications (OM&M)
*M. Jones, Acting Manager - Project Assessment
R. Kitchen, Manager - Unit 2 Mechanical Maintenance
*B. Leonard, Manager - Training
J. Leviner, Manager - Engineering Projects
*J. Moyer, Manager - Operations
*P. Musser, Manager - Maintenance Staff
B. Poteat, Administrative Assistant to Plant General Manager
R. Poulk, Manager - License Training
*J. Simon, Manager - Operations Unit 1
*W. Simpson, Manager - Site Planning and Control
S. Smith, Manager - Unit 1 I&C Maintenance
*J. Spencer, General Plant Manager - Brunswick Steam Electric Plant
R. Starkey, Vice President - Brunswick Nuclear Project
R. Tart, Manager - Operations Unit 2
J. Titrington, Manager - Operations Staff
*R. Warden, Manager - Maintenance
*K. Williamson, Manager - Nuclear Engineering Department (Onsite)
B. Wilson, Manager - Nuclear Systems Engineering

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

*Attended the exit interview

Acronyms and initialisms used in the report are listed in the last paragraph.

2. 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.

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

91-ABUN1	2B NSW PRV Replacement
91-ACDZ1	Solenoid Valve 1-CAC-SV1211F O-Ring Replacement
91-ACMA1	DG 1 Jacket Water Cooling Pump Motor Breaker Replace

a. Contamination Caused By Excessive Leakage from Drain Valve E11-V89 in Unit 1

During routine WR/JO review on January 23, 1991, the inspector noted that WR/JO 91-ABKB1, which had been generated the previous day, described an occurrence in Unit 1 where an I&C technician's clothing was contaminated when he opened a drain valve on RHR valve E11-F047A, RHR Heat Exchanger Inlet. Excessive leakage occurred from the valve stem packing. The WR/JO stated that it appeared that no stem packing was installed in the drain valve, E11-V89. This valve is the first (inboard) of two 3/4 inch globe valves installed in series joined by a short piece of 3/4 inch pipe. The second valve (outboard) is E11-V90. Both valves were subsequently disassembled and neither had stem packing installed. Both valves are normally shut and are installed in the normal convention for globe valves such that system pressure is applied from under the seat. In this configuration, no fluid pressure is on the stem packing when the valves are shut (assuming no seat leakage exists). When the technician opened E11-V89, E11-V90 was still shut allowing water to exit the packing area of E11-V89. RHR was not in service nor pressurized at the time. Thus, the leakage was gravity drainage only.

These two valves were replaced during the 1988 - 1989 Unit 1 refueling outage under DRs 88-340 and 88-341 because the original valves were leaking by the seats. A maintenance records review revealed that no other WR/JOs had been generated since that replacement. The inspector, therefore, concluded that the valves had been installed without packing. The licensee stated that some valves are procured intentionally without packing. For these valves the procurement specification required that the valves be identified with a tag stating that no packing was installed. The valves are supposed to be packed during installation.

The licensee documented this event in ACR 91-051 on January 28, 1991.

Since the lack of packing in the inboard valve would have been obvious during a leak test, the valve most probably was not opened to perform post-maintenance testing. Thus, the welds between the valves were not tested. The inspector reviewed the completed DR packages to determine what testing was performed on the replaced valves. This review revealed that specific instructions were given to Maintenance to shop fabricate the two new valves and connecting pipe. The fit-up weld between V89 and F047A, was made in plant. The completed DR package did not contain instructions to perform bench testing of the subassembly prior to final installation. Although this is not a code requirement, shop testing is a general good practice and would have identified this deficiency. The weld between V89 and F047A is ASME Section XI, Class 2, with V89 being the class boundary. Therefore, the two welds between V89 and V90 are under ANSI B31.1, 1986. Section XI does not require hydrostatic testing for piping one inch and less. Therefore, testing of the weld in the Class 2 portion is covered under ANSI B31.1. The PMTR for V89 stated to perform "leak test per ANSI B31.1, 1986 edition." The PMTR was an acceptable retest requirement with regard to code compliance, but lacked detail and did not specify exactly what was to be inspected, what pressure would be required, and the acceptance criteria. The same PMTR appeared for V90. An additional PMTR sign off was included for V90 to "verify no leakage at system pressure." Again, no specifics were given. The ANSI B31.1 inspection for both valves was signed by a control operator on March 22, 1989. The sign off for "verify no leakage at system pressure" for V90 was signed by an auxiliary operator on February 12, 1989. The inspector interviewed both operators who stated they could not recall their specific actions. The control operator acknowledged that he was not knowledgeable of the requirements of ANSI B31.1 and speculated that he signed the PMTRs based on seeing no leakage anywhere on the new installation. The auxiliary operator stated that, to "verify no leakage at system pressure", he probably verified that the new installation corrected the original problem - leakage past the old valves' seats. Neither operator understood that the intent of the PMTRs was to test the weld

joints, although both stated that had weld leakage been observed, it would have been documented on the PMTR. Both stated that very little training had been provided for performing retests. Based on discussions with other operators the inspector concluded that the actions of the two subject operators were not isolated events but were representative of common practice for PMTRs of this sort and, generally, operators believe insufficient detail is provided to properly perform PMTRs. PMTRs are also performed by maintenance personnel. There was little safety significance to the lack of proper post-maintenance testing in this specific event, but serious programmatic weaknesses were revealed. 10 CFR 50, Appendix B, Criterion V, Instructions, Procedures and Drawings, requires that activities affecting quality shall be prescribed by documented instructions of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions. The instructions shall include appropriate quantitative or qualitative acceptance criteria for determining that important activities have been satisfactorily accomplished. These requirements were not met for the post-maintenance testing described above. This is one example of a Violation of 10 CFR 50, Appendix B, Criterion V: Installation and Testing of Unpacked Valves, (325,324/91-02-02).

A memorandum was issued to Operations shift foreman on February 14, 1991, listing the criteria to be met prior to any PMTRs being accomplished. The specified criteria was:

1) The testing requirements must be clearly understood.
2) The system configuration must be specified.
3) Any specific code requirements must be fully understood.
4) Any personnel qualification requirements for testing must be met.
5) Acceptance criteria must be known.
6) Testing should be adequate for the work performed.

The licensee conducted an analysis of the potential inadequate leak testing of vent and drain valve installations revealed by the V89 and V90 problem for the Reactor Coolant Pressure Boundary. This analysis was documented in EER-91-0059 and 91-0060 for Units 1 and 2, respectively, dated February 20 and February 16, 1991. The analysis concluded that the integrity of the RCPB has not been compromised. Further evaluation of identified potentially degraded components will be accomplished. A similar analysis was conducted for inadequate testing of components outside of the RCPB and was documented in EER-91-0062, dated February 26, 1991. The inspector considered these analyses to be appropriate.

The inspector conducted a data search using AMMS to locate all 3/4 inch Conval valves installed in the plant by WR/JOs. Seventeen additional installations were identified. Of these, two did not

contain specific instructions in the WR/JO to pack the valve. One of these, RHR valve 1-E11-V96, 1-E11-F004A Body Drain Valve, did not include packing in "parts used." The inspector located the valve in the plant and observed that the packing nut was fully inserted and an attached tag annotated that the valve was shipped from the manufacturer without installed packing. The inspector concluded that the valve was not packed and notified the licensee. Administrative controls were taken to prevent its operation. This valve was installed by Di[illegible]t Replacement 87-196 during the same time period (early 1989) as [illegible]9 and V90 and had the same PMTR requirements as V89 - Leak Test [illegible]r ANSI B31.1, 1986. This valve, however, is a single drain valve and opening the valve is not required [illegible] perform a proper leak test of the upstream weld.

A review of the WR/JO for V96 indicated that at least seven different individuals including mechanics, welders and QC and NDE inspectors observed the valve, with the tag attached, during prefabrication, installation, and testing. Ample opportunity existed to identify that the valve's packing may not have been installed.

Inasmuch as the three valves installed without packing were normally shut drain valves, the system operational safety significance is minimal. However, operation of the valve without packing could result in personnel injury or contamination. Proper post-maintenance testing of V89 and V90 would have identified the absence of packing earlier, but would not have prevented that person from being contaminated or injured. Installation of the valves without packing represents a second example of a Violation of 10 CFR 50 Appendix B, Criterion V.

During the investigation into this event, the licensee discovered that ASME Code Class 1 vent and drain valve installations were inadvertently omitted from the ten year ISI ASME Class 1 hydrostatic test for the period ending in 1984. Specifically, the licensee was unable to document that certain portions of the RCPB, currently included in the second ten year ISI program, were included in the first ten year ISI program. The lines in question consist of the section of various vent and drain lines between the first and second isolation valves (32 lines on Unit 1, five of which have undergone replacement and testing, and a similar number on Unit 2). This occurred because instead of maintaining the first isolation valve open and the second closed, as required by the ISI program, the first isolation valve was closed during performance of the first interval hydrostatic test, thereby, isolating the piping and welds between the valves.

The licensee discussed this issue with NRR and Region II management in a conference call on February 20, 1991. The licensee concluded that the identified non-conformance does not present a safety concern. The licensee will issue a LER on this event.

In a letter to the NRC dated February 20, 1991, the licensee stated that the above untested lines would be tested during the next scheduled refueling outage for each unit.

Technical Specification 4.4.8 requires that structural integrity of ASME Code Class 1, 2, and 3 components be demonstrated per the requirements of TS 4.0.5, which invokes the requirements of ASME Boiler and Pressure Vessel Code, Section XI. In that the identified piping between the first and second drain valves was not included in the first 10 year interval hydrostatic test, the requirements of TS 4.4.8 were not met. This is a Violation of TS 4.4.8: Failure to Include Vent and Drain Piping in 10 Year Interval ASME Hydrostatic Test, (325,324/91-02-03). This licensee identified violation is not being cited because criteria specified in Section V.G. 1 of the NRC Enforcement Policy were satisfied.

b. Improper Application of O-Ring Grease

On January 31, 1991, the licensee documented, on ACR 91-056, a maintenance procedure inadequacy that resulted in the improper lubricant being used on solenoid valve O-rings. The licensee was changing out the housing cover O-ring and coil shell assembly O-ring on Valcor solenoid valves in accordance with the instructions of OCM-SV001 in order to satisfy EQ maintenance requirements for these valves. Step 7.3.6 and 7.3.13 require that the O-rings be lubricated with DC-55M silicone grease or water. During the past Unit 1 outage, DC-55M was used for 50 Valcor solenoid valves. During subsequent rework of one of the valves, an I&C technician noted that the O-rings had become swollen. Further investigation by the licensee, revealed that the DC-55M, a silicone grease, should not be used with silicone rubber O-rings. The grease is chemically compatible with the silicone rubber. Therefore, it is absorbed by the rubber resulting in swelling and loss of resiliency.

The licensee has subsequently changed out the O-rings on the Unit 1 solenoid valves. Water was used as the O-ring lubricant during these replacements which is authorized by the vendor's technical manual. The licensee also researched documentation to determine if any DC-55M lubricant was used on any Unit 2 valves. Their review of records found 4 examples where the silicone grease was applied to the silicone O-rings. An operability determination, documented in TSM-91-096, dated February 13, 1991, concluded that this condition was acceptable based on the O-rings static application and the fact that chemical changes do not result in embrittlement of the O-rings. The licensee has also performed laboratory testing that showed only slight swelling and softening occurred.

Procedure OCM-SV001 was implemented on November 3, 1986, and was written to support Plant Modifications 84-195 and 84-196. The inspector noted that this procedure contained the requirements to use DC-55M or water as an O-ring lubricant. The inspector also reviewed the technical manual for these valves. The manual provides a lubricant section which specifies O-ring lubricants based on O-ring seal material. The note in Section I.9, states that the Dow Corning (DC-55M) shall not be used on silicone O-rings. This section also notes that the silicone O-rings are orange in color and other possible O-ring materials, such as ethylene propylene or viton, are black.

Revision 4 of OCM-SV001 was in effect at the time this condition was found. Whenever a procedure is revised, a technical evaluation is performed. Item 24 of the Procedure Technical Evaluation Sheet asks if the procedure is compatible with the technical manual, drawings and other references. This item is checked yes for the original procedure and subsequent revisions.

The inspector also reviewed procurement documentation for the DC-55M. Procurement documentation indicates that the grease was purchased from Rosemount for use as cover O-ring grease for Rosemount 1152 and 1153 transmitters. O-rings for these transmitters are made from ethylene propylene rubber. The product information sheet and the tube of the grease itself state that the grease is not recommended as a lubricant on silicone O-rings and seals.

The fact that the licensee identified this issue themselves is good. An I&C technician noting apparent swelling of an O-ring is an astute observation. The corrective actions taken to resolve the issue were also reasonable. However, there were several opportunities to recognize this condition before this occurrence. The disparity between the technical manual and the corrective maintenance procedures and its subsequent revisions concerning the use of DC-55M with silicone O-rings should have been caught. The fact that the tube of lubricant itself states that it is not recommended for use on silicone O-rings and stores information showing that the O-rings for the Valcor solenoid valves are constructed of silicone rubber are a detail that should have been noticed by someone in the plant organization. The inadequate maintenance procedure which allowed the improper O-ring lubricant/material combination is a Violation: Use of Improper O-Ring Lubricant on EQ Solenoid Valves, (325,324/91-02-01).

c. Thermography

The inspectors considered it noteworthy that the licensee's thermography program identified three equipment hot spots that could have resulted in equipment failures. The first item was a high

resistance connection on the 2A reactor feed pump auxiliary oil pump breaker. The second was high resistance connections on the 2B EHC oil pump breaker and the third instance was a hot bearing in the 2B RPS MG set. In the first instance, power was reduced to less than 60 percent, the reactor feed pump was taken out of service and repairs were completed during light system load conditions. The EHC system repairs were made without any effect on plant status. The RPS loads were transferred to an alternate supply, the MG set was placed out of service and its bearings were replaced prior to a possible on-line failure. The above items are indicative of successful application of thermography to the plant predictive maintenance program.

d. Commercial Grade Battery Cells

On February 7 and 8, the licensee identified that cells 42 and 46 of Unit 2 Battery 2B2 had individual cell voltages that were below the Category A float voltage of 2.13, but were above the Category B float voltage of 2.07. Since the battery had just recently received an equalizing charge, coupled with the fact that the battery is near the end of its service life, a decision was made to enter the TS seven day LCO and replace these two cells.

The licensee had recently been informed by their battery supplier that they would no longer provide safety-related replacement cells. Since the licensee only had one fully qualified replacement cell available, a decision was made to accelerate the commercial parts dedication that was underway for several replacement - commercial grade cells that had been recently procured from their vendor for replacement Gould batteries. This process was satisfactorily completed and cells 42 and 46 were replaced, the battery received an equalizing charge and was returned to service within the allowable LCO time limit.

The inspectors inspected the replacement batteries and they appeared to be identical to the old cells. EER-91-047, which was used to provide engineering guidance for the commercial dedication, and the applicable vendor technical manual for the old NCX 1200 and replacement NCX 17 cells, was additionally reviewed. The replacement cells appear to have the same critical design characteristics and electrical rating. The manufacturer's data indicates that the cells were seismically qualified to Wylie Report 48725-1, dated April 17, 1987. A review of the procurement data package indicated that cells of this same type (NCX 17) had been previously commercially dedicated and were in use at Commonwealth Edison's nuclear facilities. The inspectors' questions on this issue were all satisfactorily answered by the licensee's procurement section.

Two violations and no deviations were identified.

3. 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:

2MST-RPS21SA RPS Electrical Protection Assembly Channel Calibration

PT-9.2 HPCI System Operability Test

PT-12.2B No. 2 DG Monthly Load Test

Violations and deviations were not identified.

4. 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 of control room panels and instrumentation and recorder traces important to safety were conducted to verify operability and that operating parameters were within Technical Specification limits. The inspectors observed shift turnovers to verify that system status continuity was maintained. The inspectors verified the status of selected control room annunciators.

Operability of a selected Engineered Safety Feature division was verified weekly by insuring 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 conditions did not exist which could 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, postings, and instrument calibration.

The inspectors verified by general observations 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; effective compensatory measures were employed when required; and security's response to threats or alarms was adequate.

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

On January 23, 1991, the system engineer identified several potential problems associated with the CBEAF System design. The central design organization (NED) was contacted and design assistance was requested. NED determined that the initially identified problems were not a concern. However, as a result of their review, two new items were identified.

The first item revealed that a single electrical failure of a relay will cause both air inlet and outlet dampers on the CBEAF System to remain open. If the unit is operating in the recirculation mode, this could allow outside air to be drawn into the control room envelope. This could result in a loss of control room habitability in the event of a chlorine event. Upon discovery of this item, the licensee immediately removed the chlorine tank car from the site and reported the event to the NRC in a one hour red phone report. A licensee analysis of this event concluded that the safety significance of this event was minimal since the infiltration of chlorine would only be a concern for a design basis event which involves the rupture of a 55 ton chlorine tank car while weather conditions were in stability Class "G", concurrent with the loss of power to the dampers and the CBEAF System be[illegible] the recirculation mode during an actual high radiation actuation [illegible]m testing. The system testing is performed for approximately one [illegible] every 31 days and several days every 18 months. After an extensive review of this event and a determination of the very low probability of all the above events occurring at the same time, the chlorine tank car was returned to the site.

The second item identified that the failure of a single electrical relay could prevent both CBEAF trains from starting on a high radiation event. However, the high radiation event would provide annunciation in the control room and the operators could manually start the CBEAF from the RTGB. The licensee has provided special instruction to operations personnel on the correct action to take in this event. NED is currently working on design solutions to the two above items. The inspectors will track the resolution of the above items under LER 91-003 which the licensee is currently preparing.

Violations and deviations were not identified.

5. Onsite Review Committee (40500)

The inspectors attended selected Plant Nuclear Safety Committee meetings conducted during the period. The inspectors verified that the meetings were conducted in accordance with Technical Specification requirements regarding quorum membership, review process, frequency and personnel qualifications. However, since the majority of the items presented at the PNSC meetings PNSC meetings have been previously discussed, reviewed and member comments incorporated, the discussions at these meetings are generally very limited with few dissenting comments or remarks. It has been noted that the new General Plant Manager has a very questioning approach to all items that are presented and appears to encourage questions and differing viewpoints from other PNSC members. Meeting minutes were reviewed to confirm that decisions/recommendations were reflected in the minutes and followup of corrective actions was completed.

Violations and deviations were not identified.

6. Onsite Followup of Events (92700)

The below listed events 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, unless otherwise stated.

(CLOSED) LER 2-90-06, Hydraulic Perturbation of Reactor Vessel Level Instrumentation. The hydraulic perturbation of the reference leg was caused by a pressure spike of the reference leg, when tubing that had been loosened for venting was suddenly tightened and flow stopped, which resulted in an increased differential pressure being exerted on the system by all level instruments attached to the reference leg. This resulted in isolation of the Reactor Water Cleanup System, automatic initiation of SBGT

and isolation of the Reactor Building Ventilation System. Since the unit was in cold shutdown, this event posed no safety significance. As a result of this event, the licensee revised the process instrument calibration procedure, Calibration of GE Type 551 and 552 Pressure Transmitters, OPIC-PT001, on October 15, 1990, to include a precaution on valuing this instrument In/Out of Service and what effect it could have on other systems. The inspectors reviewed the LER and the revised procedure and they appear adequate to resolve this event.

Violations and deviations were not identified.

7. Installation and Testing of Modifications (37828)

The inspectors observed various aspects of in-progress modifications. Selected modifications were examined by direct observation of installation activities, review of documentation and discussion with involved personnel. The inspectors witnessed/reviewed portions of the following plant modifications:

PM-88-010	Diesel Generator Supply Fan Auto Actuation
PM-89-067	Replacement of Actuators on HPCI Valves 1-E41-F001, F006, and F011
PM-90-012	Provide Divisionalized IE Power to PCIS Isolation Valve Position Indicators and Upgrade Control Room RPV Pressure Indicators

The inspector verified that work was performed by qualified personnel and that modification procedures contained the necessary precautions, limitations, work instructions, acceptance testing and provisions for ensuring that plant drawings and procedures were updated. Where jumpers were used, appropriate independent verification or QC witnessing of removal was required.

The inspector noted that acceptance testing continued to be detailed and comprehensive. The licensee also tracks the number of field revisions required for each modification along with its closeout time to help correct previously known weaknesses in these areas. The inspector verified, through review of documentation, that licensee efforts in this area were reducing closeout time of plant modifications and ensuring that the number of field revisions were kept to a minimum.

Violations and deviations were not identified.

8. Restart from Refueling (71711)

Unit 1 was restarted on February 22, 1991, and was synchronized to the grid on February 26, to complete its refueling outage. Prior to restart, the inspector conducted routine restart inspections including closeout

tours of the torus and drywell in addition to general plant areas. Systems disturbed during the outage were inspected to independently ascertain that they had been properly returned to service. Portions of the approach to criticality, heatup, and restart testing were observed to verify conformance to approved procedures and adherence to TS.

The licensee's torus and drywell closeout process continues to be effective in identifying material deficiencies in these spaces that may have been caused during outages. Fewer deficiencies were identified during this Unit 1 closeout as compared to the previous Unit 2 closeout which also followed recirculation piping replacement. The licensee's actions to minimize drywell deficiencies during recirculation pipe replacement were, therefore, successful. Additionally, the review and observation of other space closeouts by the inspector noted that there were fewer discrepancies when compared to previous outages.

Violations and deviations were not identified.

9. Action on Previous Inspection Findings (92701, 92702)

a. (CLOSED) Violation 324/89-26-01, Fuel Pool Cooling Valve Out of Position. This item involved an operator changing the position of a valve without filling out an exception form as required by Operations procedure, Valve and Electrical Lineup Administrative Controls, OI-13, Revision 25. He opened a valve to permit draining the reactor dry well area following decontamination work. The valve was not identified as mispositioned due to the lack of documentation and was not placed in the correct position prior to reactor flood up. Some flooding occurred as a result of this event. The inspector verified that the licensee had completed the corrective actions stated in their letter of response to the violation dated December 6, 1989.

b. (CLOSED) Violation 324/89-26-02, Failure to Follow Procedures. This violation identified a clearance tag that had been placed on the wrong switch on the control board. This error had been made when the operator, who was accomplishing an independent verification, noted that the date was missing on the clearance tag. He lifted it, dated it and then placed it back in the wrong location without independent verification. The inspector verified that the licensee's corrective actions stated in their violation response letters to Region II, dated January 2 and February 28, 1990 have been completed. These corrective actions included HPES evaluation, procedural upgrades and training and counseling to operations personnel. These and other changes in the clearance program and the development of a dedicated Clearance Center in response to this and other violations have led to improvement in this area.

c. (CLOSED) Violation 325/89-40-01, Inoperable SCIDS Due to Unrecognized Design Logic Interface with SBGT. This violation identified that the licensee had rendered the SCIDS inoperable by deenergizing and removing the SBGT starter circuit from service. Since the CRMX relays, which are actuated on high drywell pressure and low reactor water level, receive their power from the SBGT starter circuitry and input into the Reactor Building supply and exhaust damper isolation logic, deenergizing the SBGT starter will also make these dampers inoperable. In this event, the licensee had entered the seven day LCO for SBGT when it was taken out of service, but had failed to recognize the eight hour LCO for SCIDS. The licensee identified and reported this item in LER 1-89-18. Report 89-40 noted that the licensee had prior opportunity to identify and correct the problem and that the planned and completed corrective action lacked depth and did not include a review to determine if other design interface problems existed. The inspectors reviewed the licensee's response to this violation dated January 26, 1990. In this letter, the licensee committed to review the results of completed and planned SSFIs for system interface problems. This item was planned to be completed under IAP Item D7. This item is currently scheduled for completion in 1993. The licensee additionally committed to perform a design basis reconstitution for safety systems starting in late 1990. The above actions, when completed, should identify any additional significant design interface problems.

d. (CLOSED) Violation 325/89-44-02, Failure to Supply Complete and Accurate Information About STSS Database Update. The violation was the result of the licensee's failure to complete and verify that all corrective actions for Violation 324/89-20-08 had been completed as stated in their response to Region II dated November 20, 1989. In this event, they had committed to annotate the STSS schedule for the SLC relief valve surveillance performance during an outage period and this had not been done. This annotation was completed immediately after notification of this event by the NRC on December 22, 1989. The inspector verified that this annotation still exists on procedure OPT-06.2.1.

Violations and deviations were not identified.

10. Exit Interview (30703)

The inspection scope and findings were summarized on March 1, 1991, 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.

Item Number	Description/Reference Paragraph
325,324/91-02-01	VIOLATION - Use of Improper O-Ring Lubricant On EQ Solenoid Valves, Paragraph 2.b.

325,324/91-[illegible]-02	VIOLATION - Installation and Testing of Unpacked Valves, Paragraph 2.a.
325,324/91-02-03	NON-CITED VIOLATION - Failure to Include Vent and Drain Piping in 10 Year Interval ASME Hydrostatic Test, paragraph 2.a.

11. Acronyms and Initialisms

ACR	Adverse Condition Report
AMMS	Automated Maintenance Management System
ANSI	American National Standards Institute
AO	Auxiliary Operator
ASME	American Society for Mechanical Engineers
BSEP	Brunswick Steam Electric Plant
CBEAF	Control Building Emergency Air Filtration
DG	Diesel Generator
DR	Direct Replacement
EER	Engineering Evaluation Report
EHC	Electro Hydraulic Control
EQ	Environmental Qualification
ESF	Engineered Safety Feature
F	Degrees Fahrenheit
FP	Foreign Print
HP	Health Physics
HPCI	High Pressure Coolant Injection
HPES	Human Performance Evaluation System
IAP	Integrated Action Plan
I&C	Instrumentation and Control
IE	NRC Office of Inspection and Enforcement
IFI	Inspector Followup Item
IPBS	Integrated Planning, Budgeting and Scheduling
ISI	In-Service Inspection
LCO	Limiting Condition for Operation
LER	Licensee Event Report
MG	Motor Generator
MST	Maintenance Surveillance Test
NDE	Non-Destructive Examination
NED	Nuclear Engineering Department
NRC	Nuclear Regulatory Commission
NRR	Nuclear Reactor Regulation
NSW	Nuclear Service Water
OI	Operating Instruction
PA	Protected Area
PCIS	Primary Containment Isolation System
PIC	Process Instrument Calibration
PMTR	Post-Maintenance Testing Requirements
PNSC	Plant Nuclear Safety Committee
PRV	Pressure Relief Valve

PT	Periodic Test
QA	Quality Assurance
QC	Quality Control
RCPB	Reactor Coolant Pressure Boundary
RHR	Residual Heat Removal
RPS	Reactor Protection System
RPV	Reactor Pressure Vessel
RTGB	Reactor Turbine Gauge Board
SBGT	Standby Gas Treatment
SCIDS	Secondary Containment Isolation Damper System
SCO	Senior Control Operator
SLC	Standby Liquid Control
SSFI	Safety System Functional Inspection
STA	Shift Technical Advisor
STSS	Surveillance Test Scheduling System
TS	Technical Specification
TSM	Technical Support Memo
URI	Unresolved Item
WR/JO	Work Request/Job Order