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REGION II

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Report No: 50-325/98-08, 50-324/98-08

Licensee: Carolina Power & Light (CP&L)

Facility: Brunswick Steam Electric Plant, Units 1 & 2

Location: 8470 River Road SE
Southport, NC 28461

Dates: July 19 - August 29, 1998

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Enclosure

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EXECUTIVE SUMMARY

Brunswick Steam Electric Plant, Units 1 & 2
NRC Inspection Report 50-325/98-08, 50-324/98-08

This integrated inspection included aspects of licensee operations, maintenance, engineering, and plant support. The report covers a 6-week period of resident inspection; in addition, it includes the results of a fire protection inspection by a regional inspector.

Operations

- Licensed simulator training was adequately performed. The operations crew responded satisfactorily to all the accident scenarios. Due to the time constraints involved with the implementation of the Thermal Hydraulic Instability modification, the licensee did not meet their normal level of operator training expectations (Section 01.1).
- No problems were identified during verification of several clearances on the Residual Heat Removal and Residual Heat Removal Service Water Systems (Section 02.1).

Maintenance

- Maintenance and testing activities conducted on motor-operated valves in the Residual Heat Removal System were completed satisfactorily. Review of the internals of the associated motor control center panel revealed no evidence of moisture intrusion (Section M1.1).
- Instrumentation & Control technicians were generally knowledgeable and experienced in conducting electrical breaker preventive maintenance. Maintenance activities were conducted adequately with one exception involving the failure to follow procedures after the identification of sluggish breaker handle response. This condition did not affect breaker operability and the licensee responded to the concern by initiating lessons learned training and appropriate corrective maintenance. This issue was identified as a minor violation (Section M1.2).
- Surveillances were properly performed. Procedures affected by the implementation of the Improved Technical Specifications were being revised according to the implementation plan (Section M3.1).
- The maintenance rule expert panel conducted thorough reviews of system classification changes. The Plant Nuclear Safety Committee chairman provided a good safety focus and knowledge of industry maintenance rule experience (Section M7.1).

Engineering

- The licensee satisfactorily implemented the long-term solution for thermal hydraulic instabilities in response to NRC Generic Letter 94-02, Long-term Solutions and Upgrade of Interim Operating Recommendations for

Thermal-Hydraulic Instabilities in Boiling Water Reactors (Section E1.1).

- The licensee identified a missed Technical Specifications surveillance associated with the Standby Gas Treatment system when they identified a deficiency in the aerosol mixing testing. This condition was treated as a Non-Cited Violation (Section E2.1).
- Long standing inspection findings identified between 1996 and 1997 involving potential discrepancies between plant as-found conditions and the plant licensing basis resulted in four violations being identified. However, for each of these violations, the NRC exercised discretion in accordance with the Enforcement Policy and refrained from issuing a citation (Section E8.1).

Plant Support

- The licensee's preparations for Hurricane Bonnie were timely and comprehensive. Corrective actions for plant restart were appropriate (Section P1.1).
- Security activities regarding access to the protected area (PA) were conducted satisfactorily. The PA fence was found to be in good condition and the isolation zones were free of obstructions (Section S1.1).
- The implementation of procedural requirements for using and storing transient combustibles in safety-related areas was good. Controls for combustible gas bulk storage and cutting and welding operations were being enforced. The observed level of plant housekeeping reflected good organization and cleanliness practices on the part of plant workers (Section F1.1).
- Corrective maintenance on degraded fire protection systems was accomplished in a timely manner. The maintenance and material condition of the fire protection equipment and features were satisfactory (Section F2.1).
- The fire brigade organization, staffing, and qualification training met the requirements of the site procedures (Section F5.1).
- A fire brigade drill program weakness was identified for not specifically demonstrating fire brigade response through drills in fire areas where deviations from NRC fire protection requirements had been approved (Section F5.2).
- The 1998 Nuclear Assessment Section assessment of the facility's fire protection program was comprehensive and was effective in identifying fire protection program programmatic deficiencies to management. The audit identified significant deficiencies in the past change management practices in the fire protection program. Planned corrective actions in

response to the audit issues were substantial and included the initiation of a Fire Protection Program Upgrade Project (Section F7.1).

Report Details

Summary of Plant Status

Unit 1 operated continuously until August 25, 1998, when the unit was shut down for Hurricane Bonnie. The unit had been on-line continuously for 89 days. Preparations for unit restart were being made at the end of the report period.

Unit 2 operated continuously until August 25, 1998, when the unit was shut down for Hurricane Bonnie. The unit had been on-line continuously for 65 days. The unit operated with two control rods inserted to suppress power around a leaking fuel assembly. The unit was restarted on August 29, 1998.

I. Operations

01 Conduct of Operations

01.1 Simulator Training Observations

a. Inspection Scope (71707)

On July 30, 1998, the inspector observed simulator training for licensed senior and reactor operators. The inspector observed the training for deficiencies and discrepancies in the training and to assess operator performance.

b. Observations and Findings

The inspector observed two drill scenarios and part of a third drill. The inspector noted that the drill scenarios were realistic and accurate. The inspector did not observe any problems with simulation nor did the crew have any feedback on simulation problems during the drill debrief. The drill period was conducted for training; therefore, no evaluated watches were observed. The inspector found that the crew maintained good communications and that minor communication problems were identified and discussed during the drill debrief. The drill instructor and the shift superintendent took opportunities to stop the simulation and provide appropriate training.

The inspector noted that Abnormal Operating Procedure 2AOP-04.0, Low Core Flow, Revision (Rev.) 5, was trained on extensively by the instructor. This procedure had been revised on July 25, 1998, to incorporate changes resulting from the Thermal Hydraulic Instability (THI) modification. The inspector observed that the operators were not familiar with the THI required actions in the AOP, in that, the operators were not able to answer specific questions asked by the instructor. Based on discussions with the Shift Superintendent, the inspectors learned that the operators had not received formal classroom training, nor was the AOP change provided in required operator reading prior to its implementation. The operators had received a THI modification overview during the Improved Technical Specification (ITS) training. The licensee indicated that, due to the short time constraints associated with the ITS implementation, they had not

provided training to the operators via the normal training program methods, such as classroom or simulator training prior to modification implementation. During discussions with licensee management, they acknowledged that they did not meet their normal training expectations associated with this modification.

c. Conclusions

The inspector found no discrepancies or deficiencies in the simulator training. The crew responded satisfactorily to all the accident scenarios observed by the inspector. The inspector noted that the licensee did not meet their own operator training expectations regarding the implementation of the THI modification.

02 **Operational Status of Facilities and Equipment**

02.1 Residual Heat Removal (RHR) Clearances

a. Inspection Scope (71707)

The inspector verified the proper implementation of several clearances associated with RHR system maintenance.

b. Observations and Findings

On July 22, 1998, the inspector walked-down clearances 2-98-1103, 2-98-1125, 2-98-1182. These clearances were hung to support maintenance on several RHR system valves and adjust an oil filter on an RHR Service Water (RHRSW) system pump. All valves were verified to be in the designated position. Electrical feeder breakers were verified to be racked out or locked off as appropriate. Clearance tags reviewed were properly marked and hung. The inspector verified proper restoration of the clearance.

On August 19, 1998, the inspector verified restoration of clearance 2-98-1215. This clearance was hung to support maintenance and testing of several motor-operated valves in the RHR system. All valves were in the proper position for testing. Observations regarding the valve testing are discussed in Section M1.1. The inspector verified proper configuration control during test activities, as well as verified restoration from the test configuration.

c. Conclusions

No problems were identified during verification of several clearances on the Residual Heat Removal and Residual Heat Removal Service Water Systems.

II. Maintenance

M1 Conduct of Maintenance

M1.1 Motor-Operated Valve (MOV) Maintenance

a. Inspection Scope (62707)

The inspector observed preventive maintenance and test activities on components in the Unit 2 RHR system.

b. Observations and Findings

On August 19, 1998, the inspector observed the performance of testing on RHR MOVs 2-E11-F004B(D) and 2-E11-F020B. The inspector verified that this preplanned testing was performed in accordance with the instructions provided in approved work requests/job orders (WR/JOs). Procedures for this testing were verified to be "reference use" and were available at the work location. Adequate supervisory oversight was present and the testing was completed without any major deficiencies identified. The inspector reviewed the material condition inside the motor control center (MCC) for the valve motor breakers. No evidence of excessive moisture intrusion was evident and the sealing around the wiring entering the MCC from the top showed no evidence of degradation.

c. Conclusions

Maintenance and testing activities conducted on MOVs in the RHR system were completed satisfactorily. Review of the internals of the MCC panel associated with these valves revealed no evidence of moisture intrusion.

M1.2 Electrical Breaker Preventive Maintenance

a. Inspection Scope (62707)

On August 19, 1998, the inspector observed the performance of preventive maintenance (PM) OPM-BKR008, PM-Functional Testing of Molded Case Circuit Breakers, Rev. 17, on the supply circuit breaker for the RHRSW system heat exchanger B discharge valve.

b. Observations and Findings

The inspector observed all portions of the maintenance except the reinstallation of the breaker and the post maintenance testing. The inspector reviewed the completed paperwork and identified no discrepancies with the acceptance criteria for satisfactory performance or for proper documentation.

Generally, the inspector found that the technicians were knowledgeable and experienced in the task. The technicians used the maintenance work package and procedure as required throughout the observed maintenance activities with one exception. The procedure contained a note which

stated that close observation of the movement of the breaker handle was necessary to ensure the handle moved rapidly to the "trip" position. Additionally, the procedure indicated that hesitation or sluggish movement of the handle to the "trip" position required breaker replacement. The inspector observed that the technicians had accepted the fact that the breaker handle was barely moving each time that it was tripped for testing. The inspector questioned the technicians why this condition was acceptable to them based on the procedure statements

The technicians indicated to the inspector that the sluggish breaker condition had been found on all the breakers which were similar to that one. After further discussion the technicians realized the discrepancy and notified their supervisor and engineering to obtain a course of action. A Deficiency Log Entry (DLE) 98D03335 was initiated to address the repair of the breaker handles. This was a generic concern for all breakers of that type from that particular vendor and the licensee expressed to the inspector that it was going to be addressed by engineering as such. The technicians verified that this condition did not affect operability of the breaker, but was a handle mechanism problem particular to this vendor type. This breaker application had a mechanism attached to the breaker trip lever which was causing the problem.

The inspector determined that the technicians would have accepted the sluggish response of the breaker handle as an accepted condition based on having seen the same improper response in the past, had the inspector not been present and questioned them regarding the procedure requirement. This was discussed with the licensee who agreed with the inspectors determination. The licensee informed the inspector that lessons learned were discussed with electrical technicians the day after this preventive maintenance occurred.

The failure to follow the requirements of procedure OPM-BKR008 constitutes a violation of minor significance and will not be the subject of formal enforcement action. Recently, several human performance issues have been noted in the Instrumentation and Controls (I&C) group. This procedural noncompliance demonstrates a continuing challenge in the performance of maintenance and test activities. Other maintenance and test activity problems were discussed in NRC Inspection Report (IR) 50-325(324)/98-07. The licensee has instituted a human performance improvement initiative to reduce human performance problems in the I&C group.

c. Conclusions

I&C technicians were generally knowledgeable and experienced in conducting electrical breaker preventive maintenance. Maintenance activities were conducted adequately with one exception involving the failure to follow procedures after the identification of sluggish breaker handle response. This minor violation did not affect operability and the licensee responded to the concern by initiating lessons learned training and initiating corrective maintenance.

M3 Maintenance Procedures and Documentation

M3.1 ITS Surveillance Procedure Implementation

a. Inspection Scope (61726)

The inspector reviewed the following surveillance procedures:

- Periodic Test OPT-13.1. Reactor Recirculation Jet Pump Operability, Rev. 30
- Periodic Test OPT-01.11. Core Performance Parameter Check, Rev. 39

b. Observations and Findings

The inspector performed an independent review of the data obtained to verify that the acceptance criteria was met for each of the procedures. The inspector also verified the impact of ITS implementation on the two procedures. OPT-01.11 was revised on July 25, 1998, which coincided with the ITS implementation date. However, procedure OPT-13.1 had not been revised. The inspector verified that this procedure was one of about 1,500 procedure changes identified for ITS implementation. This change was identified as a less restrictive change and could be made at a later date. Most of these changes only involved a change in the TS number due to ITS implementation. Restrictive changes were changes required to be made prior to ITS implementation.

c. Conclusions

The inspector concluded that surveillances checked were properly performed. Procedure changes were being conducted according to the ITS implementation plan.

M7 Quality Assurance in Maintenance Activities

M7.1 Maintenance Rule Expert Panel

a. Inspection Scope (62707)

On August 5, 1998, the inspector attended a meeting of the licensee's maintenance rule expert panel. The inspector reviewed the activities associated with system classification changes between a(1) to a(2).

b. Observations and Findings

The main topic of the meeting was to review a 3-month goal for fuel assemblies. The goal was that, if no fuel leak occurred during three months of an operating cycle, the system classification was changed from a(1) to a(2). However, during the past several operating cycles, fuel leaks developed late in the cycle and the system classification was changed back to a(1). The Plant Nuclear Safety Committee (PNSC) had questioned the goal and felt something, such as a full operating cycle without a fuel leaker, was more realistic. The expert panel decided to

make the goal based on a fuel reliability task force recommendation expected later in the fall.

The chairman noted that a self-assessment had identified that some goals were not conservative. This had allowed some systems to be taken off the a(1) list too early without correction of the problem.

Other items discussed were NRC enforcement issues and annual reports obtained from the NRC home page. A discussion of "Run to Failure" classification designation was reviewed to develop guidelines for use. The chairman provided a good safety focus and knowledge of industry maintenance rule experience.

c. Conclusions

The inspector concluded the maintenance rule expert panel was conducting thorough reviews of system classification changes. The chairman provided a good safety focus and knowledge of industry experience.

III. Engineering

E1 Conduct of Engineering

E1.1 Neutronic/Thermal Hydraulic Stability Solution

a. Inspection Scope (37551)

The inspector reviewed the implementation of the licensee's long-term solution for thermal hydraulic instabilities in the reactor.

b. Observations and Findings

On July 25, 1998, the licensee implemented their long-term stability corrective action, as required by NRC Generic Letter (GL) 94-02, Long-term Solutions and Upgrade of Interim Operating Recommendations for Thermal-Hydraulic Instabilities in Boiling Water Reactors. Actual plant modifications occurred during outages previous to this date. The implementation of the long-term solution was planned to occur at the same time that the new ITS were to go into effect, since the ITS was planned to implement and control the procedural requirements for the modification. This was discussed in NRC IR 50-325(324)/98-07.

The inspector found that the licensee performed training on the modification near to the implementation date which covered the components in the modification, system performance, procedural impact, ITS compliance, and system interactions, including normal and abnormal system interactions. Licensed operators were tested on this information. The licensee chose to wait until after the implementation date to train and evaluate the operators on the simulator regarding the use of changed procedures associated with the modification. The necessary procedure changes were behind planned schedules and therefore did not provide the opportunity to train personnel on the simulator

prior to the implementation date. The licensee determined that the classroom training, at which time the procedures had not been written, was sufficient to implement the modification.

The inspector noted that the modification required a few changes of significance, such as tie power-to-flow operating curves, added ITS requirements, added control room annunciators, and changed Abnormal Operating Procedures (AOPs). The inspector verified that the ITS surveillance requirements associated with the modification, required up to the time of the inspection, had been completed and changes were made to the required surveillance sheets indicating the correct ITS requirements.

The inspector noted that no challenges to the plant or the modification had resulted since the implementation date. The inspector noted that the final required plant changes were made over several days immediately prior to the date planned for implementation. This was necessary due to the required coordination with ITS implementation. The sequence of the changes, specifically to the neutron monitoring system, including planning and maintenance, at first appeared to be underestimated by the licensee based on the decision to extend a previous implementation date by the PNSC, which was directly associated with the modification final implementation timing. The licensee satisfactorily planned and executed the final modifications following the implementation date change.

c. Conclusions

The inspector found that the licensee satisfactorily implemented the long term solution for thermal hydraulic instabilities in response to GL 94 f2.

E2 Engineering Support of Facilities and Equipment

E2.1 Standby Gas Treatment (SBGT) System Aerosol Mixing Test Failure

a. Inspection Scope (37551)

The inspector reviewed the SBGT Air Aerosol mixing test failure, which occurred on June 27, 1998, and the actions taken by the licensee following the test failure.

b. Observations and Findings

The inspector was informed, through discussions with the licensee and review of Condition Report (CR) 98-01502, Standby Gas Mixing Test, that the licensee could not locate a required aerosol mixing test which supported the test location they were using to perform the 18 month dioctylphthalate (DOP) and Freon tests. This testing was required by the licensee's commitment to Regulatory Guide 1.52, Design, Testing, and Maintenance Criteria for Post accident Engineered-Safety-Feature Atmospheric Cleanup System Air Filtration and Adsorption Units of Light-Water-Cooled Nuclear Power Plants, Rev. 1, 1976. To correct the

discrepancy, the licensee decided to perform an aerosol mixing test to validate the procedural test point location which had been used for the last approximately 20 years. The licensee understood the risk associated with the potential for invalidating what was the current testing method and had satisfactory contingencies preplanned.

The licensee explained to the inspector that they had no concerns for operability of the SBT units at that time because for the past approximately 20 years they had been performing the surveillance the same way and had no indication of mixing problems. This determination was possible because the data was very consistent over that entire time frame.

When the aerosol mixing test was performed on June 27, 1998, the test indicated that inadequate mixing was being achieved by the test wand specified in Periodic Test (PT) 2PT-15.1.2B, Standby Gas Treatment Filter Test. The mixing test failure occurred on the second High Efficiency Particulate Air (HEPA) filter in the 2B SBT unit. This finding invalidated the TS surveillance, for all of the SBT units. The surveillance test procedures, 1/2PT-15.1.1A, B, 2A, and 2B, were specified by TS 4.6.6.1.b.1, Containment Atmospheric Control Standby Gas Treatment System. The wand was modified following the failure and the aerosol mixing test was reformed and validated. The revised TS surveillance was completed as required on all four SBT Units, two in each reactor building for Unit 1 and Unit 2. This was accomplished in approximately six hours, within the 24 hours allowed by TS 4.0.3, which was entered for the missed surveillance.

The invalidation of procedures 1/2PT-15.1.1A, 1B, 2A, and 2B constituted a missed surveillance and thus a violation of TS 4.6.6.1.b.1. This non-repetitive, licensee-identified and corrected violation is being treated as a Non-Cited Violation (NCV), consistent with Section VII.B.1 of the NRC Enforcement Policy. This is identified as NCV 50-325(324)/98-08-01, SBT Aerosol Mixing Test Deficiency.

c. Conclusions

The inspector found that the licensee identified a surveillance deficiency when they identified that the SBT Filter tests failed the aerosol mixing tests as specified in the surveillance. This issue was identified as a NCV.

E8 **Miscellaneous Engineering Issues (92903)**

E8.1 (Closed) Unresolved Item (URI) 50-325(324)/96-05-02: FSAR Discrepancies.

This item encompasses numerous inspection findings involving potential discrepancies between plant as-found conditions and the plant licensing basis from March 31, 1996 to date. Eleven separate issues were considered and are dispositioned as follows:

- 1) Lack of Voltage Designation on Cable Trays (IR 50-325(324)/96-18, Section 02.1): FSAR Section 8.3.1 stated that the voltage class of a particular tray could be determined via the tray identification markings. An NRC inspector noted that, contrary to this, the trays did not contain voltage markings, although determination of the voltage class could be made by reference to a matrix in a plant document. This discrepancy was corrected by the licensee by adding the voltage matrix to the FSAR. This discrepancy was considered a failure to comply with 10 CFR 50.59 and constitutes a violation of NRC requirements. However, the NRC is exercising discretion in accordance with Section VII.B.3 of the Enforcement Policy and refraining from issuing a citation for this Severity Level IV violation. This issue is closed.
- 2) Lack of Drip Shields (IR 50-325(324)/96-16, Section F2.1): FSAR Section 3.4.2.1 stated that Class I MCCs and instrument racks, when near leakage sources, were provided with drip shields to minimize damage. An NRC inspector noted that, contrary to this, drip shields were not present on these pieces of equipment. However, the licensee had previously determined that drip shields were not necessary because the instrument racks in question were impervious to water damage, though they had failed to change the FSAR to reflect that fact. This discrepancy was corrected by adding the phrase, "where required," to the FSAR section. This failure to comply with 10 CFR 50.71(e) constitutes a violation of NRC requirements. However, the NRC is exercising discretion in accordance with Section VII.B.3 of the Enforcement Policy and refraining from issuing a citation for this Severity Level IV violation. This issue is closed.
- 3) Inconsistencies in Containment Atmosphere Control System Valve Lineup (IR 50-325(324)/96-15, Section 02.1): An NRC inspector identified that numerous inconsistencies existed between operating procedure IOP-24, Containment Atmosphere Control System, associated plant drawings, and drawings in the FSAR with respect to valve positions for the containment atmosphere control system. Specifically, several valves were shown mispositioned, some were missing a valve designation, and several were incorrectly labeled in these documents. The licensee made several changes to these documents to correct this problem, including revisions to Figures 6.2.5-1 and 6.2.5-2 in the FSAR (Rev. 15). This failure to comply with 10 CFR 50.59 constitutes a violation of NRC requirements. However, the NRC is exercising discretion in accordance with Section VII.B.3 of the Enforcement Policy and refraining from issuing a citation for this Severity Level IV violation. This issue is closed.
- 4) Spent Fuel Pit Supplemental Cooling (IR 50-325(324)/96-05, Section 7.0 and IR 96-10, Section E7.1): This item concerns several issues identified during a spent fuel pool review by the NRC in May 1996. These issues were concerns regarding the completeness and clarity of the FSAR description of the plant spent fuel pool

cooling system. The licensee implemented several changes to the FSAR to address these concerns, but none of the issues was a violation of NRC requirements. As such, this issue is closed.

- 5) Control Building Ventilation System Filter Type (IR 50-325(324)/96-04, Section 7.0 - formerly URI 96-04-07): FSAR Section 9.4.1 stated that a roll type filter was used for the control building ventilation system, when in fact, a cartridge type filter was used. The licensee modified the FSAR to indicate the actual filter type. Also, FSAR Section 2.3.3.3 stated that the sensor for measuring barometric pressure would be replaced annually; however, the procedure for maintenance and calibration did not provide for annual replacement. The licensee subsequently installed a new meteorological monitoring system and revised the appropriate section of the FSAR to account for this. This failure to comply with 10 CFR 50.59 constitutes a violation of NRC requirements. However, the NRC is exercising discretion in accordance with Section VII.B.3 of the Enforcement Policy and refraining from issuing a citation for this Severity Level IV violation. This issue is closed.
- 6) Drywell Temperature Indication (IR 50-325(324)/96-05, Section 2.2): FSAR Section 6.2.1 stated that volumetric average temperature in the drywell would be maintained below 135°F, while peak temperatures would be maintained below 200°F. NRC inspector review of licensee records indicated that peak drywell temperatures had been above 200°F for extended periods of time. A violation (EA 97-520) was subsequently issued for the failure to take appropriate corrective actions once the peak temperature exceeded the design basis. The licensee also removed the peak temperature value from the FSAR in a subsequent revision. No other violations of NRC requirements were identified. This issue is closed.
- 7) Radwaste Processing Outside Radwaste Building (IR 50-325(324)/96-10, Section R2.1 - formerly URI 96-10-03): FSAR Section 11.4.2.1 stated that the purpose of the radwaste building is to contain leaks or spills from the radwaste system. However, the licensee identified that a contractor mobile processing unit was processing the solid wet or liquid waste in facilities located outside on the radwaste loading dock. This item was addressed in Licensee Event Report (LER) 50-325(324)/1-96-009, which was discussed and closed in NRC Inspection Report 50-325(324)/98-07. This issue is closed.
- 8) Criticality Monitor Setpoint (IR 50-325(324)/96-13, Section E7.2): FSAR Table 12.3.4-3 specified the alarm setpoints for the Unit 1 and 2 area radiation monitors (ARMs) located north of the respective fuel storage pools at 3 mR/hr. An NRC inspector identified that these values were not consistent with the values (6 mR/hr) specified in the plant procedure (OPIC-ETU003) used to calibrate the instruments. One related violation was cited in NRC Inspection Report 50-325(324)/96-13 against 10 CFR 70.24(a)(2) for

a failure to maintain a preset alarm point of not less than 5 mR/hr (both monitor setpoints were erroneously set back to the original 3 mR/hr for some time) for these criticality monitors. Updated NRC guidance led to the later retraction of this violation. Based on retraction of this violation, this issue is closed.

- 9) ADS Operation (IR 50-325(324)/97-300): FSAR Chapter 15, Event 34, Pipe Breaks Inside Primary Containment, described the equipment required to mitigate a loss-of-coolant accident (LOCA). This section referred to the automatic operation of the automatic depressurization system (ADS). An NRC inspector found that this section did not indicate that the system's automatic feature would be defeated per plant emergency operating procedure and operated manually by the operators during the blowdown phase of the event. Further NRC review of this issue has determined that the plant's current configuration and operating procedures are not in conflict with the design basis of this system as described in the FSAR. This issue is closed.
- 10) HPCI Valve Stroke Times (IR 50-325(324)/97-02, Sections E1.4 and E1.5): This issue concerned a discrepancy between the minimum high-pressure coolant injection (HPCI) valve stroke times listed in the FSAR and those listed in a plant test procedure. A violation was issued for the failure to initiate a condition report when this discrepancy was identified. This violation was dispositioned in NRC Inspection Report 50-325(324)/98-07 (Section E8.2). This issue is closed.
- 11) Changes to Testing Frequency not Updated in Fire Hazard Analysis (FHA) (IR 50-325(324)/97-09, Sections E3.1 and F3.1): This issue concerned an erroneous change to fire protection surveillance intervals and the consequent failure of the licensee to perform the surveillances at the required frequency. A Non-Cited Violation (NCV 50-325(324)/97-09-07) was issued for the failure to perform fire protection surveillance testing in accordance with the frequency established in the Fire Protection Program. This issue is closed.

E8.2 (Closed) LER 50-325(324)/97-008-00: Main Stack Radiation Monitor Surveillance Interval Exceeded.

This issue was discussed in detail in NRC IR 50-325(324)/98-04. Four apparent violations were resolved with issuance of an NCV by NRC letter dated July 19, 1998. A related LER, 50-325(324)/97-003, was closed in IR 50-325(324)/98-04. This LER is closed.

E8.3 (Closed) LER 50-325(324)/98-004-00: Standby Gas Treatment System Surveillance Deficiency.

The event scenario for this LER was discussed in section E2.1 of this report. The LER determined the cause of this event to be a failure of

the individuals responsible for the development of the SBTG DOP test procedure to fully understand the aerosol mixing uniformity test requirements. The licensee will complete revisions to the applicable surveillance test procedures by August 31, 1998. Enforcement dispositioning was discussed in section E2.1 of this report. This LER is closed.

IV. Plant Support

P1 Conduct of Emergency Planning Activities

P1.1 Hurricane Bonnie

a. Inspection Scope (71750 and 93702)

The inspector monitored licensee activities associated with Hurricane Bonnie.

b. Observations and Findings

The site entered an Unusual Event at 5:20 a.m. on August 25, 1998, due to the issuance of a hurricane warning. The Unusual Event was terminated at 11:24 a.m. on August 27, 1998. Bonnie was a category III hurricane. The eye of the storm passed over the site.

The licensee started preparations for the storm's approach on August 22 1998. Once the hurricane warning was issued, both units were taken to cold shutdown and the emergency response facilities activated. The plant remained connected to off-site power during the storm and the Emergency Diesel Generators were not used.

During the storm the Technical Support Center (TSC)/Emergency Operating Facility (EOF) Diesel Generator failed and the Southport power feeder failed, which normally supplies power to this facility. Eventually emergency lighting, emergency response data system (ERDS), emergency response facility information system (ERFIS), and the plant process computers were lost. Battery backup was able to maintain the equipment operable for 90 minutes, but these also ran down. The systems were restored after battery power was lost for about 30 minutes when the Southport power was returned.

The majority of the plant's 35 emergency sirens were lost during the storm. In addition, Direct Current (DC) grounds were experienced on all of the battery buses. During the hurricanes in 1996, similar grounds were received. At that time consideration was given to install switchyard batteries to isolate these grounds from the safety batteries. Switchyard batteries were not considered necessary because an effective preventive maintenance would resolve the ground problem. Subsequently, it was found that the preventive maintenance for maintaining sealing of panels, etc. for the switchyard was not effective. However, with the grounds experienced during Hurricane Bonnie, this issue requires further review. This issue was identified as an inspector followup item (IFI)

50-325(324)/98-08-02. Review Licensee Actions to Resolve DC Ground Problems.

All sirens were repaired. The site only sustained minor damage to administrative buildings. Following replacement of the TSC/EOF Diesel Generator breaker, an extended load run was successfully conducted.

Following coordination with Federal Emergency Management Agency (FEMA) and the NRC, permission to restart the units was given on August 28, 1998. Unit 2 was taken critical on August 29, 1998. Plans were to take Unit 1 critical 24 hours later.

c. Conclusions

The licensee's preparations for Hurricane Bonnie were timely and comprehensive. Corrective actions for plant restart were appropriate.

S1 Conduct of Security and Safeguards Activities

S1.1 Protected Area Access Observations

a. Inspection Scope (71750)

The inspector verified the integrity of the protected area (PA) fence and site manning, observed the conduct of security activities regarding personnel searches and PA access.

b. Observations and Findings

During routine inspection activities, the inspector walked-down the PA fence. The isolation area was found to be maintained free of debris and obstructions. No gaps or warping was observed on the PA fence. Security static positions were appropriately manned. PA access activities were determined to be satisfactory. Challenges were made by members of the security force as appropriate in response to alarms from the access detectors. Personnel searches were observed to be thorough and adequate supervisory oversight was present.

c. Conclusions

Security activities regarding access to the protected area were conducted satisfactorily. The PA fence was found to be in good condition and the isolation zones were free of obstructions.

F1 Control of Fire Protection Activities

F1.1 Combustible Material Controls/Fire Hazards Reduction

a. Inspection Scope (64704)

The inspector reviewed the licensee's fire protection procedures OFPP-013, Transient Fire Load Evaluation, Rev. 25, and OFPP-014, Control of

Combustible, Transient Fire Loads and Ignition Sources, Rev. 17, to determine if they satisfied the combustible control and housekeeping objectives established by the licensee's approved fire protection program. The inspector also toured selected plant areas to inspect the licensee's implementation of these procedures.

b. Observations and Findings

During plant walkdowns with the licensee's fire protection engineer, the inspector observed that controls were being properly maintained for limiting transient combustibles in designated separation zones and other restricted plant areas. No transient combustible materials were stored or used in the cable vault rooms or cable spreading room that might challenge the fire loading limits. Lubricants and oils for normal maintenance activities were placed in approved safety containers and properly stored within approved fire resistive flammable liquids storage cabinets. Waste material trash cans utilized safety covered lids and were emptied on a frequent basis. Controls for combustible gas bulk storage and cutting and welding operations were being enforced.

The housekeeping for areas containing potential lubrication oil and diesel fuel leaks, such as the diesel generator rooms, was controlled. The licensee made use of oil absorption materials to catch and soak up the oil from leaks associated with diesel generators. The oil absorption materials were being replaced at frequent intervals.

The inspector concluded that the observed combustible material control practices met the requirements of the licensee's procedures as described in the UFSAR. Controls were being properly maintained for areas containing potential lubrication oil and diesel fuel leaks, such as the diesel generator rooms. The observed level of plant housekeeping reflected good organization and cleanliness practices on the part of plant workers.

c. Conclusions

The implementation of procedural requirements for using and storing transient combustibles in safety-related areas was good. Controls for combustible gas bulk storage and cutting and welding operations were being enforced. The observed level of plant housekeeping reflected good organization and cleanliness practices on the part of plant workers.

F2 Status of Fire Protection Facilities and Equipment

F2.1 Operability of Fire Protection Facilities and Equipment

a. Inspection Scope (64704)

The inspector observed selected Operation's fire protection shift turnovers, reviewed fire protection daily impairment reports on the facility's fire protection systems and features, and inspected these

items to determine the performance trends and the material conditions of this equipment.

b. Observations and Findings

A review of the daily Impairment Reports for July 27-29, 1998, indicated that the following fire protection components or systems for safety related areas were out of service:

<u>Fire Protection System</u>	<u>Number of Impairments</u>
Thermo-Lag Fire Barriers	1
Fire Doors	0
Cable Coating	0
Fire Detection System	0
Fire Suppression	0
Emergency Lighting	6
Alternate Safe Shutdown (ASSD)	4

The inspector noted that a number of emergency lights were out of service. This number was attributed to discrepancies identified during current battery lighting periodic tests. The corrective maintenance on degraded lighting systems was accomplished in a timely manner.

During Operation's fire protection shift turnovers on July 27-28, 1998, the inspector observed improved sensitivity to degraded ASSD components in that, identified degraded ASSD components were evaluated by the operators and engineering staffs for their affect on ASSD procedures and achieving safe plant shutdown in case of fire.

During the plant tours, the inspector noted that the maintenance and material condition of the fire protection equipment were satisfactory.

c. Conclusions

Corrective maintenance on degraded fire protection systems was accomplished in a timely manner. The maintenance and material condition of the fire protection equipment and features were satisfactory.

F5 Fire Protection Staff Training and Qualification

F5.1 Fire Brigade Organization and Training

a. Inspection Scope (64704)

The inspector reviewed the fire brigade organization, fire brigade shift staffing, and fire brigade training program for compliance with NRC guidelines and licensee program requirements.

b. Observations and Findings

The organization, staffing, qualifications and training requirements for the plant fire brigade were established by OFPP-051, Loss Prevention Emergency Response Qualification/Training and Drill Program, Rev. 1. The fire brigade for each of the five shifts was composed of an operations support fire protection technician shift incident commander (fire brigade leader) and at least four additional brigade members consisting of Auxiliary Operators, Chemistry Technicians and Maintenance personnel. Each operations shift also had a Fire Brigade Advisor (Senior Reactor Operator (SRO) or Reactor Operator (RO)) assigned to respond to fires with the fire brigade. The inspector verified that sufficient shift personnel were available to staff each shift's fire brigade with at least five qualified fire brigade members.

A review of the training records for the fire brigade members indicated that the training, drill, respiratory and physical examination requirements for each active member were up to date and met the established site training requirements.

c. Conclusions

The fire brigade organization, staffing, and qualification training met the requirements of the site procedures.

F5.2 Fire Brigade Drills

a. Inspection Scope (64704)

The inspector reviewed fire brigade drill scenarios and critique data and observed an Operation's fire brigade fire drill summary meeting to evaluate fire brigade effectiveness and performance.

b. Observations and Findings

The inspector observed the Operation's fire brigade fire drill summary meetings conducted following shift turnovers on July 27-28, 1998. The shift meetings summarized the response and performance of manual fire fighting activities for recent 1998 drills and emphasized that additional brigade training and drill practice would be required to achieve a higher level of leadership confidence and brigade proficiency in fighting fires in safe shutdown areas. The response and performance of manual fire fighting activities for recent 1998 drills were considered adequate to meet procedural requirements.

A fire brigade drill was not conducted during this inspection. To evaluate fire brigade effectiveness, the drill critique data and drill scenarios required by procedure OFPP-051 for drills conducted in the time period 1995 through 1998 were reviewed by the inspector. Based on this review, the overall brigade responses and personnel participation for these drills were considered satisfactory. Following each drill an

exercise critique was conducted to discuss the drill, participant's performance, and recommendations for improvements.

The inspector noted that, for the time period reviewed, brigade drills had not been conducted in the control building cable vaults or the diesel building basement fire areas where deviations from NRC fire protection requirements had been approved. These plant areas were evaluated by the NRC in Supplemental Safety Evaluation Reports (SERs), dated July 27, 1983 and December 30, 1986. The inspector found that the exemptions were granted for these plant locations which did not have required redundant train cable spacial separation or full area suppression in conformance with Section III.G of Appendix R to 10 CFR 50. The exemptions were granted based on the existing fire protection features and an early warning fire detection system that would detect a fire early in an incipient stage and, by an alarm, would alert the control room operators to dispatch the fire brigade. The inspector determined that the fire drill program was weak in that it excluded these areas from the fire drill exercises. The licensee acknowledged the weakness and initiated Condition Report 98-01618 to address the conduct of fire drill exercises in safety-related plant fire areas.

c. Conclusions

A fire brigade drill program weakness was identified for not specifically demonstrating fire brigade response through drills in fire areas where deviations from NRC fire protection requirements had been approved.

F7 **Quality Assurance in Fire Protection Activities**

F7.1 Fire Protection Audits

a. Inspection Scope (64704)

The following fire protection audit report and the plant response to the issues were reviewed:

- Nuclear Assessment Section (NAS) Report B-FP-98-01, Brunswick Fire Protection - Triennial, dated July 27, 1998.
- Brunswick Nuclear Plant Response to Audit Report B-FP-98-01, Brunswick Nuclear Plant Response to Nuclear Assessment Section Report B-FP-98-01, dated July 20, 1998.

b. Observations and Findings

The NAS performed an assessment of the fire protection program on June 8-19, 1998, and documented the results in report No. B-FP-98-01. The assessment report identified seven program element issues and four weaknesses.

The inspector reviewed the final audit report, the licensee's response to the identified issues, and the planned corrective actions. This NAS

assessment of the facility's fire protection program was comprehensive and effective in identifying fire protection program performance deficiencies to management. The audit team identified significant deficiencies in the past change management practices in the fire protection program. Corrective actions in response to the identified issues were substantial and included the initiation of a Fire Protection Program Upgrade Project (FPPU) under direct management of the Shift Operations Manager.

c. Conclusions

The 1998 Nuclear Assessment Section assessment of the facility's fire protection program was comprehensive and was effective in identifying fire protection program programmatic deficiencies to management. The audit team identified significant deficiencies in the past change management practices in the fire protection program. Planned corrective actions in response to the audit issues were substantial and included the initiation of a Fire Protection Program Upgrade Project.

F8 Miscellaneous Fire Protection Activities (92904)

F8.1 (Closed) IFI 50-325(324)/97-13-04: Review of Licensee Records and Engineering Evaluations to Establish the Fire Resistant Capabilities of Fire Rated Silicone Foam Penetration Seals.

This item concerned the qualifications of fire seal installer/repair personnel and engineering evaluations for deviations from the fire barrier configurations qualified by tests of copper element penetrant seals and compliance with NRC GL 86-10, Implementation of Fire Protection Requirements. The inspectors reviewed the corrective actions identified by the licensee in Condition Report 98-00093 initiated to address the issue. The licensee's evaluation determined that training documentation was not maintained for the Loss Prevention Unit (LPU) personnel who performed repair work on two penetration seals in 1996; however, the personnel recalled receiving the training and thought they were qualified to perform fire seal work activities. Subsequently, the seals were inspected by a qualified fire protection engineer. In December 1997, the former LPU fire seal maintenance personnel were placed in the Brunswick maintenance organization and now fall under that accredited training program. The inspector also reviewed engineering evaluations ESR-98-00054, Rev. 0, and the associated analysis 85-125-0-0-03-F-9400174, Rev. 2A, for specific fire barrier penetration seals with copper elements. The inspector determined that the evaluations properly demonstrated that the fire barrier seals were adequate to perform their fire barrier function and complied with the guidance provided by GL 86-10. The inspectors concluded that the licensee's evaluations and corrective actions for the issues were reasonable and complete. This item is closed.

F8.2 (Closed) URI 50-325(324)/97-13-05: UFSAR Discrepancy on Fire Doors.

This URI involved an inconsistency in the UFSAR description concerning the location of fire door evaluation results. UFSAR Section 9.5.1.4.3.4.b, Fire Doors, stated that, "...Doors and frames are either listed by a national testing laboratory or are constructed similar to listed doors and frames. All doors and frames have been evaluated to assure satisfactory ratings. Results are documented in the FHA..." During review of the FHA, the inspectors noted that, while evaluations of fire doors existed in engineering documents, they were not included in the FHA.

The inspectors reviewed licensee Condition Report 97-04103, which was initiated by the licensee to address this concern. The licensee's evaluation determined that door evaluations have been performed and consistently documented with other fire protection evaluations in accordance with UFSAR Section 9.5.1.2, References. Section 9.5.1.2 states that adherence (of the fire protection program) to the referenced codes and standards was made to the extent possible, with any significant deviations documented in engineering evaluations. The inspectors determined that the licensee complied with the guidance provided by NRC's GL 86-10, Implementation of Fire Protection Requirements, with regard to the use of engineering evaluations for documenting fire protection program deviations.

The inspectors concluded that, since Section 9.5.1.2 allowed for fire door deviations to be documented via engineering evaluations, there was not a clear requirement that the evaluations had to be included specifically in the FHA located in UFSAR Section 9.5.1.5. Regardless, as part of the licensee's corrective actions listed in Condition Report 97-04103, the licensee planned to revise UFSAR Section 9.5.1.4.3.4.b to accurately state that fire door evaluation results would be located in engineering evaluations. This issue is closed.

V. Management Meetings

X1 Exit Meeting Summary

The inspector presented the inspection results to members of licensee management at the conclusion of the inspection on September 4, 1998. The licensee acknowledged the findings presented.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

A. Brittain, Manager Security
 R. Deacy, Manager Outage and Scheduling
 N. Gannon, Manager Maintenance
 J. Gawron, Manager Nuclear Assessment
 M. Herrell, Training Manager
 K. Jury, Manager Regulatory Affairs
 J. Keenan, Site Vice President
 B. Lindgren, Manager Site Support Services
 J. Lyash, Plant General Manager
 G. Miller, Manager Brunswick Engineering Support Section
 R. Mullis, Manager Operations

Other licensee employees or contracts included office, operation, maintenance, chemistry, radiation, and corporate personnel.

E. Brown
 E. Guthrie
 C. Patterson
 G. Wiseman

INSPECTION PROCEDURES USED

IP 37551: Onsite Engineering
 IP 61726: Surveillance Observations
 IP 62707: Maintenance Observations
 IP 64704: Fire Protection Program
 IP 71707: Plant Operations
 IP 71750: Plant Support Activities
 IP 92903: Followup - Engineering
 IP 92904: Followup - Plant Support
 IP 93702: Prompt Onsite Response to Events at Operating Power Reactors

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

50-325(324)/98-08-01 NCV SBTG Aerosol Test Deficiency (Section E2.1)
 50-325(324)/98-08-02 IFI Review Licensee Actions to Resolve DC Ground Problems (Section P1.1)

Closed

50-325(324)/98-08-01 NCV SBTG Aerosol Test Deficiency (Section E2.1)
 50-325(324)/96-05-02 URI FSAR Discrepancies (Section E8.1)

50-325(324)/97-008-00	LER	Main Stack Radiation Monitor Surveillance Interval Exceeded (Section E8.2)
50-325(324)/98-004-00	LER	Standby Gas Treatment System Surveillance Deficiency (Section E8.3)
50-325(324)/97-13-04	IFI	Review of Licensee Records and Engineering Evaluations to Establish the Fire Resistant Capabilities of Fire Rated Silicone Foam Penetration Seals (Section F8.1)
50-325(324)/97-13-05	URI	UFSAR Discrepancy on Fire Doors (Section F8.2)