



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

Report No.: 50-400/90-26

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

Docket No.: 50-400

License No.: NPF-63

Facility Name: Harris 1

Inspection Conducted: December 15, 1990 - January 25, 1991

Inspectors: J. O. Christensen for 1/30/91
 J. Tedrow, Senior Resident Inspector Date Signed

M. Shannon for 1/30/91
 M. Shannon, Resident Inspector Date Signed

Approved by: H. O. Christensen 1/30/91
 H. Christensen, Section Chief Date Signed
 Reactor Projects Branch 1
 Division of Reactor Projects

SUMMARY

Scope:

This routine inspection was conducted by two resident inspectors in the areas of plant operations, radiological controls, security, fire protection, surveillance observation, maintenance observation, licensee event reports and 10 CFR Part 21 reports, design changes and modifications, followup of onsite events, and licensee action on previous inspection items. Numerous facility tours were conducted and facility operations observed. Some of these tours and observations were conducted on backshifts.

Results:

Five violations were identified: failure to maintain administrative control of a high radiation area key, paragraph 2.b.(4); failure to properly implement a radiochemistry procedure, paragraph 2.b.(7); a non-cited violation for improper documentation of lifted electrical leads, paragraph 4; a non-cited licensee identified violation regarding a failure to test the containment personnel air lock, paragraph 2.c.; and a non-cited licensee identified violation regarding a failure to make a four hour report to the NRC, paragraph 5.e. The failure to properly implement radiochemistry procedures shows a continued lack of attention to detail by the licensee's chemistry department.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

- *J. Collins, Manager, Operations
- *C. Gibson, Manager, Programs and Procedures
- *C. Hinnant, Plant General Manager
- *B. Meyer, Manager, Environmental and Radiation Monitoring
- *T. Morton, Manager, Maintenance
- *C. Olexik, Manager, Regulatory Compliance
- *R. Richey, Vice President, Harris Nuclear Project
- E. Willett, Manager, Outages and Modifications
- *L. Woods, Manager, Technical Support

Other licensee employees contacted included office, operations, engineering, maintenance, chemistry/radiation and corporate personnel.

*Attended exit interview

Acronyms and Initialisms used throughout this report are listed in the last paragraph.

2. Review of Plant Operations (71707)

The plant continued in power operation (Mode 1) for the duration of this inspection period.

a. Shift Logs and Facility Records

The inspector reviewed records and discussed various entries with operations personnel to verify compliance with the Technical Specifications (TS) and the licensee's administrative procedures. The following records were reviewed: Shift Foreman's Log; Control Operator's Log; Night Order Book; Equipment Inoperable Record; Active Clearance Log; Jumper and Wire Removal Log; Temporary Modification Log; Chemistry Daily Reports; Shift Turnover Checklist; and selected Radwaste Logs. In addition, the inspector independently verified clearance order tagouts.

No violations or deviations were identified.

b. Facility Tours and Observations

Throughout the inspection period, facility tours were conducted to observe operations, surveillance, and maintenance activities in progress. Some of these observations were conducted during backshifts. Also, during this inspection period, licensee meetings

were attended by the inspectors to observe planning and management activities. The facility tours and observations encompassed the following areas: security perimeter fence; control room; emergency diesel generator building; reactor auxiliary building; waste processing building; turbine building; fuel handling building; emergency service water building; battery rooms; electrical switchgear rooms; and the technical support center.

During these tours, the following observations were made:

- (1) Monitoring Instrumentation - Equipment operating status, area atmospheric and liquid radiation monitors, electrical system lineup, reactor operating parameters, and auxiliary equipment operating parameters were observed to verify that indicated parameters were in accordance with the TS for the current operational mode.
- (2) Shift Staffing - The inspectors verified that operating shift staffing was in accordance with TS requirements and that control room operations were being conducted in an orderly and professional manner. In addition, the inspector observed shift turnovers on various occasions to verify the continuity of plant status, operational problems, and other pertinent plant information during these turnovers.
- (3) Plant Housekeeping Conditions - Storage of material and components, and cleanliness conditions of various areas throughout the facility were observed to determine whether safety and/or fire hazards existed.
- (4) Radiological Protection Program - Radiation protection control activities were observed routinely to verify that these activities were in conformance with the facility policies and procedures, and in compliance with regulatory requirements. The inspectors also reviewed selected radiation work permits to verify that controls were adequate.

On December 10, at approximately 5:25 p.m., licensee personnel discovered that a high radiation area access key was missing during a routine shift inventory of administratively controlled keys. Technical Specification 6.12.2 requires that accessible areas with radiation levels greater than 1000 mR/hr at 18 inches from a radiation source be provided with locked doors to prevent unauthorized entry with keys maintained under administrative control.

The missing key was subsequently found in the keyhole for the door to the drum storage area in the waste processing building at approximately 11:30 p.m. on December 10. Discussion with the



technician who last used the key determined that the key had been in the door lock since approximately 11:00 a.m. on December 10. Based upon RWP and dosimetry records, the licensee does not believe an unauthorized entry was made into the locked area. Licensee personnel removed the key from the keyhole and initiated a SOOR (SOOR 90-187) to investigate this incident. The inspector reviewed radiation surveys of the drum storage area and discovered that existing radiation levels required that this area be locked in accordance with the TS.

The licensee has recently been experiencing problems with the control of high radiation areas. SOOR 90-78 reported that on May 25, 1990, a locked radiation area gate in the reactor containment building was found not to be locked with the door ajar. SOOR 90-135 reported that flashing lights, used to identify a high radiation area, were found not to be functioning on October 5, 1990. SOOR 90-161 reported that on November 13, 1990, the restricted high radiation area key box was improperly accessed by an unauthorized individual. All of these problems, which occurred in a relatively short period of time, indicate the need for the licensee to review the controls associated with high radiation areas with appropriate personnel.

The missing key event of December 10 is a violation of TS 6.12.2. Although this matter was identified by the licensee, it is being cited due to recurrent problems in this area.

Violation (400/90-26-01): Failure to maintain administrative control of a high radiation area key.

- (5) Security Control - In the course of the monthly activities, the inspector included a review of the licensee's physical security program. The performance of various shifts of the security force was observed in the conduct of daily activities which included: protected and vital area access controls; searching of personnel, packages, and vehicles; badge issuance and retrieval; escorting of visitors; patrols; and compensatory posts. In addition, the inspector observed the operational status of Closed Circuit Television (CCTV) monitors, the Intrusion Detection system in the central and secondary alarm stations, protected area lighting, protected and vital area barrier integrity, and the security organization interface with operations and maintenance.
- (6) Fire Protection - Fire protection activities, staffing and equipment were observed to verify that fire brigade staffing was appropriate and that fire alarms, extinguishing equipment, actuating controls, fire fighting equipment, emergency equipment, and fire barriers were operable.



- (7) Chemistry Sampling Program -- Reactor coolant sampling and analysis and boric acid tank analysis were observed to verify that the sample was representative, appropriate acceptance criteria were met, test results were properly evaluated, and sampling and analysis procedures were utilized and properly implemented.

On January 8, 1991, the inspector observed the sampling of the reactor coolant system which was done for compliance with T.S. 4.4.7. While the chemistry technician was purging the sample lines, the inspector questioned the length of the purge time. The technician stated that a one to two minute purge was required prior to sampling. Upon returning to the chemistry lab, the inspector reviewed chemistry procedure CRC-100, Reactor Coolant System Chemistry Control, Rev. 7, and noted that the required sample purge time per step 10.1.1.6 was ten minutes. The technician was again questioned about the length of the purge time and responded that during previous on-the-job training, she had been instructed to purge the sample line for one to two minutes. The failure to purge the sample line as required by procedure CRC-100 is considered to be a violation of TS 6.8.1.a.

Violation (400/90-26-02): Failure to properly implement a radiochemistry procedure.

This violation and violation 90-21-01, continues to show a lack of attention to detail by the licensee in implementing radiochemistry procedures. When informed of this finding, the licensee implemented additional corrective action consisting of: counseling the chemistry technician and foremen, management discussion of procedural compliance with supervisors and specialists, initiation of spot checks of procedure performance, and corporate chemistry department initiation of an independent review of this incident and previous incidents.

c. Review of Nonconformance Reports

Significant Operational Occurrence Reports (SOORs) and Nonconformance Reports (NCRs) were reviewed to verify the following: TS were complied with, corrective actions as identified in the reports were accomplished or being pursued for completion, generic items were identified and reported, and items were reported as required by the TS.

SOOR 90-186 reported that a TS required surveillance test on the personnel air lock was not performed as required. Following multiple containment entries on December 6, 1990, the licensee was testing the



personnel air lock for overall leakage in accordance with TS 4.6.1.3.b. This test was satisfactorily completed on December 10. Upon review of containment entry logs, licensee personnel discovered that periodic testing of the personnel air lock door seal leakage was not performed every 72 hours, as required by TS 4.6.1.3.a. Although unofficial door seal leakage tests were performed during the overall leakage test, these tests were not documented. All unofficial test results were satisfactory. The licensee's corrective action to prevent recurrence included adding a caution note to the testing procedure which specifies the additional requirement to perform a door seal leakage test. This matter is considered to be a licensee identified NCV and is not being cited because the criteria specified in section V.G.1 of the NRC Enforcement Policy were satisfied.

NC4 (400/90-26-03): Failure to periodically test the containment personnel air lock every 72 hours.

3. Surveillance Observation (61726)

Surveillance tests were observed to verify that approved procedures were being used; qualified personnel were conducting the tests; tests were adequate to verify equipment operability; calibrated equipment was utilized; and TS requirements were followed.

The following tests were observed and/or data reviewed:

- CRC-100 Reactor Coolant System Chemistry Control
- CRC-524 Boron Using the Mettler DL40RC Memotitrator
- EST-702 Moderator Temperature Coefficient - EOL Using The Boron Method
- EST-0719 Incore Versus Excore Axial Flux Difference Comparison
- EPT-160T Temporary Procedure for the Boundary Test for the RAB Emergency Exhaust System.
- FMP-101 Incore Thermocouple and Flux Mapping
- LP-T-6903B Loop Calibration Diesel Generator Room B Temperature
- MST-E0006 480 VAC Molded Case Circuit Breaker Test
- MST-E0039 Reactor Coolant Pump (1C-SN) Undervoltage Relay Channel Calibration



- MST-E0043 Reactor Coolant Pump (1C-SN) Underfrequency Relay (KF) Channel Calibration
- MST-E0044 6.9 KV Emergency-Bus, 1B-SB Under Voltage Channel Calibration
- MST-I0012 Main Steamline Pressure, Loop 2 Channel Calibration
- MST-I0088 Reactor Coolant Loop 1 Hot Leg Temperature Instrument Calibration
- MST-I0122 Pressurizer Pressure P-04455 Operational Test
- MST-I0169 Nuclear Instrumentation System Source Range N31 Operational Test
- OST-1013 1A-SA Emergency Diesel Generator Operability Test. Monthly Interval
- OST-1503 Pressurizer PORV Operability Quarterly Interval
- OST-1805 Pressurizer PORV Operability 18 Monthly Interval
- PIC-E004 General Electric 6.9 KV Overcurrent Relay Calibration

No violations or deviations were identified.

4. Maintenance Observation (62703)

The inspector observed/reviewed maintenance activities to verify that correct equipment clearances were in effect; work requests and fire prevention work permits, as required, were issued and being followed; quality control personnel were available for inspection activities as required; and, TS requirements were being followed.

Maintenance was observed and work packages were reviewed for the following maintenance (WR/JO) activities:

- Troubleshoot slow start of the "A" emergency diesel generator in accordance with procedure MPT-M0040, Emergency Diesel Generator On-Engine Starting Air Valve's Periodic Maintenance.
- Replacement of fan belt on the RAB equipment room fan AH-16A.
- Disassembly and cleaning of an emergency service water screen wash pump and post maintenance testing in accordance with procedure OST-1214, Emergency Service Water System Operability, Train A, Quarterly Interval.



- Troubleshoot 1SI-1 BIT isolation valve failure to operate per corrective maintenance procedure CM-I-004, Limitorque Calibration Check and Stroking, and CM-M-0050, Limitorque Valve Actuator Size SMB-000 Disassembly.
- Troubleshoot the non vital inverter due to voltage spiking.
- Replacement of S-4 fan ITE breakers with Westinghouse breakers, per plant modification PCR 4687.
- Troubleshoot of the RCP underfrequency trip circuit failure.
- Disassembly and inspection of 1SI-2 BIT isolation valve and 1RH-69, RHR Recirc valve.

On January 2, 1991, the BIT Inlet Isolation Valve (1SI-1) was disassembled for corrective maintenance because the valve would not stroke. It was found that a locking ring which held the torque switch bearing in place, was missing. This allowed the torque switch internals to shift and prevented valve movement. The licensee is conducting further inspections of other torque switches to insure the locking rings are in place.

During disassembly, the inspector noted that the technicians failed to document lifted electrical leads in the valve operator. The licensee was issued a similar violation in NRC Inspection Report 50-400/90-20 (VIO 400/90-20-03) in which lifted leads were not properly documented. Procedure PLP-702, Independent Verification, was revised following Violation 400/90-20-03 to include a log sheet which would individually document all lifted leads. This sheet was not completed as required when the Limitorque leads were lifted. However, the licensee has not yet completed training all personnel on the procedure revision. Therefore, this matter will not be cited, but instead will be considered to be another example of violation 400/90-20-03.

5. Review of Licensee Event Reports and 10 CFR Part 21 Reports (92700)

The following LERs and 10 CFR Part 21 Reports were reviewed for potential generic impact, to detect trends, and to determine whether corrective actions appeared appropriate. Events that were reported immediately were reviewed as they occurred to determine if the TS were satisfied. LERs were reviewed in accordance with the current NRC Enforcement Policy.

- a. (Closed) LER 90-05: This LER reported an actuation of an engineered safety system due to a radiation monitor spike caused by a loose pin connection. This event was previously discussed in NRC Inspection Report 50-400/90-06. The licensee has revised the applicable test procedure to delete the unnecessary loss of counts test thereby reducing wear on the coaxial connector.

- b. (Closed) LER 90-10: This LER reported inadequate administrative control of the RAB emergency exhaust system ventilation boundary. This matter was previously discussed in NRC Inspection Report 50-400/90-10. As a result of the licensee's corrective action to review other ventilation systems for similar problems, the licensee discovered an inoperable control room ventilation damper and was issued a non-cited licensee identified violation (NC4 400/90-14-02). The licensee submitted a supplemental report dated September 5, 1990, documenting results of the review of the other ventilation systems. The licensee has completed testing of various ventilation boundary doors and determined that the system is not capable of maintaining the required negative pressure with doors left open. Plant procedures were revised to add administrative controls for specific ventilation boundary doors.
- c. (Closed) LER 90-16: This LER reported inadequate testing of the FHB emergency exhaust system. This event was previously discussed in NRC Inspection Report 50-400/90-13 and was the subject of a licensee identified violation (NC4 400/90-13-02). The licensee has revised the test procedure for acceptable flow measurements and comparisons of data collected.
- d. (Closed) LER 90-22: This LER reported that a surveillance test was not performed on radiation monitor REM-3542 due to a procedural deficiency. This matter was previously discussed in NRC Inspection Report 50-400/90-24 and was the subject of a licensee identified NCV (400/90-24-05). The licensee has counseled maintenance procedure personnel on this incident and has tested the monitor with satisfactory results.
- e. (Closed) LER 90-23: This LER reported the inadvertent start of the "A" emergency diesel generator. This event occurred due to personnel error on the part of a licensed reactor operator. The licensee counseled the operator and will review self-verification techniques with all operators during their next annual training.

Although this event occurred on November 24, 1990, it was not verbally reported to the NRC Operations Center until November 26, 1990. Initially, the shift foreman and STA did not consider the event to be immediately reportable. Further review of the event by the licensee's compliance staff determined that the event should have been reported within four hours, as required by 10 CFR 50.72(b)(2)(ii). The licensee reviewed this event with STA's and shift foremen and plan to revise applicable procedures to require independent reviews for reportability determination. This matter is considered to be a licensee identified NCV and is not being cited because the criteria specified in section V.G.1 of the NRC Enforcement Policy were satisfied.



NC4(400/90-26-04): Failure to make a four hour report to the NRC Operations Center.

- f. (Closed) LER 90-24: This LER reported that inadequate fuses were installed in safety related 125 VDC applications. The licensee has replaced the fuses with fuses properly rated for the application.
- g. (Open) LER 90-25: This LER reported a required plant shutdown due to excessive air leakage through the containment personnel air lock. As stated in the LER, a plant shutdown to Mode 5 (cold shutdown) was performed on December 8, 1990, following an unsatisfactory test on the personnel air lock. Subsequent repairs were performed on the air lock and testing was satisfactorily performed on December 9, 1990. The licensee plans to implement a plant modification (PCR-3877) to improve the reliability of the air lock. The LER will remain open pending completion of this modification.
- h. (Closed) P2189-12: This 10 CFR Part 21 Report, dated September 29, 1989, discussed a problem with Limitorque SMB-000 and SMB-00 CAM-type torque switches with fiber spacers. A plant modification, PCR-4110, was implemented to replace various affected torque switches during the 1989 outage. Additional torque switches outside of containment and the steam tunnel still contain fiber spacers, however due to the plant design that bypasses the torque switch during an SI, an evaluation has determined that no safety hazard existed.
- i. (Closed) P2189-19: This 10 CFR Part 21 Report, dated November 13, 1989, discussed a problem with potentially defective pressure reducing sleeves supplied as spare parts for Pacific Pumps manufactured by Dresser Industries. Two pump sleeves were found in the spare parts warehouse, one of which was returned to Dresser Industries. All sleeves received from the manufacturer will be hardness tested as part of receipt inspection in the future.

6. Design Changes and Modifications (37828)

Installation of new or modified systems were reviewed to verify that the changes were reviewed and approved in accordance with 10 CFR 50.59, that the changes were performed in accordance with technically adequate and approved procedures, that subsequent testing and test results met acceptance criteria or deviations were resolved in an acceptable manner, and that appropriate drawings and facility procedures were revised as necessary. This review included selected observations of modifications and/or testing in progress. The following modifications/design changes were reviewed:

- PCR-5636 Equalizing Valve Penetration Plugging
- PCR-5610 CSIP-B Balancing Line Vibration Problem
- PCR-5605 ASCO Solenoid Valve FT831654
- PCR-5549 125/250 VDC Fuse Voltage Rating

No violations or deviations were identified.

7. Followup of Onsite Events (93702)

At 1:54 p.m. on January 24 an unusual event was declared due to a TS required plant shutdown for excessive leakage past containment purge isolation valves. During the performance of a periodic local leak rate test on the containment purge exhaust penetration, licensee personnel discovered excessive seat leakage. This leakage amount caused the total combined leakage rate to exceed the limits of TS 3.6.1.2.b and a plant shutdown was initiated. At approximately 30 percent power, the purge isolation valves were repaired and a local leak rate test completed satisfactory. At 4:15 p.m. the unusual event was terminated and a power increase back to 100 percent was initiated.

8. Licensee Action on Previously Identified Inspection Findings (92702 & 92701)

- a. (Closed) IFI 400/89-13-02: Instantaneous trip testing of molded case circuit breakers.

The licensee has purchased additional breaker testing equipment and has revised testing procedures to incorporate the pulse trip testing method versus the run-up method.

- b. (Closed) VIO 400/89-21-01: Failure to adequately evaluate the suitability of commercial grade items used in safety grade applications.

The inspector reviewed and verified completion of the corrective actions listed in the licensee's response letter dated December 21, 1989. The subject breaker models were seismically tested by Wyle Test Labs and evaluated to be satisfactory for seismic applications. The critical characteristics for breakers already installed in safety-related applications were tested with satisfactory results. Receipt inspection instructions for new breakers have been revised to include appropriate testing. Finally, the licensee reviewed this incident with plant and NED personnel to avoid future miscommunication between these groups.

- c. (Closed) IFI 400/89-30-01: Review the opening stroke time test results for the pressurizer power operated relief valves.

The licensee performed the test procedures for measuring the open stroke time of these valves with satisfactory results on December 12, 1989.

- d. (Closed) URI 400/90-13-04: Failure to perform a timely evaluation of Boric Acid Pump Test data.

A review of this item found that the boric acid pump remained operable and could always perform its intended function. A thoroughly documented evaluation would have resolved the boric acid

pump concern much sooner. Technical support personnel have been cautioned to document their decision process and the reason for coming to the conclusion that was reached.

- e. (Closed) IFI 400/90-21-03: Follow the licensee's activities to prevent leaks on the "B" charging/safety injection pump.

Licensee personnel determined that the failure of the balancing line piping for this pump to be due to cyclic fatigue. Vibration was measured on this pump's balancing line and compared with the identical train "A" pump. The "B" vibration was an order of magnitude higher. The licensee installed a modification (PCR-5610) to provide a temporary fix to dampen and reduce the balancing line vibration. The modification significantly reduced the vibration by an order of magnitude. The licensee is considering a more permanent fix which could include new mechanical seals for the pump.

- f. (Closed) VIO 400/90-20-04: Failure to perform compensatory actions for an inoperable radiation monitor.

The licensee has submitted LER 90-20 on this event. For record purposes the violation will be closed and further action tracked by the LER.

- g. (Closed) IFI 400/89-34-05: Follow the licensee's activities to replace HVAC system actuators.

The licensee has replaced/rebuilt 24 of the 37 affected actuators. Due to extremely long lead times involved with the refurbishment of these components, the licensee expects to complete the remaining 13 by mid-1993. The licensee continues to perform compensatory measures and the justification for continued plant operation remains in effect until all actuators are repaired.

9. Exit Interview (30703)

The inspectors met with licensee representatives (denoted in paragraph 1) at the conclusion of the inspection on January 25, 1991. During this meeting, the inspectors summarized the scope and findings of the inspection as they are detailed in this report, with particular emphasis on the violations addressed below. The licensee representatives acknowledged the inspector's comments and did not identify as proprietary any of the materials provided to or reviewed by the inspectors during this inspection.

Item Number

Description and Reference

400/90-26-01

VIO: Failure to maintain administrative control of a high radiation area key, paragraph 2.b.(4).

- 400/90-26-02 VI0: Failure to properly implement a radiochemistry procedure, paragraph 2.b.(7).
- 400/90-26-03 NC4: Failure to periodically test the containment personnel air lock every 72 hours, paragraph 2.c.
- 400/90-26-04 NC4: Failure to make a four hour report to the NRC Operations Center, paragraph 5.e.

10. Acronyms and Initialisms

BIT	-	Boron Injection Tank
CCTV	-	Closed Circuit Television
CFR	-	Code of Federal Regulations
CM	-	Corrective Maintenance
CRC	-	Chemistry Radiochemistry
CSIP	-	Changing - Safety Injection Pump
EOL	-	End of Life
EPT	-	Engineering Performance Test
EST	-	Engineering Surveillance Test
FHB	-	Fuel Handling Building
FMP	-	Fuel Management Procedure
HVAC	-	Heating, Ventilation and Air Conditioning
IFI	-	Inspector Follow-up Item
LER	-	Licensee Event Report
LP	-	Loop Calibration Procedure
MPT	-	Maintenance Performance Test
mR/hr	-	Milliroentgen per hour
MST	-	Maintenance Surveillance Test
NCR	-	Non-Conformance Report
NCV	-	Non-Cited Violation
NED	-	Nuclear Engineering Department
NRC	-	Nuclear Regulatory Commission
OST	-	Operations Surveillance Test
PCR	-	Plant Change Request
PIC	-	Primary Instrument Control
PLP	-	Plant Program Procedure
PORV	-	Power Operated Relief Valve
RAB	-	Reactor Auxiliary Building
RCP	-	Reactor Coolant Pump
RHR	-	Residual Heat Removal
RWP	-	Radiation Work Permit
SI	-	Safety Injection
SOOR	-	Significant Operational Occurrence Report
STA	-	Shift Technical Advisor
TS	-	Technical Specification



URI	-	Unresolved Item
VAC	-	Volts Alternating Current
VDC	-	Voltage Direct Current
VIO	-	Violation
WR/JO	-	Work Request/Job Order

