



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

Report No.: 50-400/89-02

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: March 29 - April 24, 1989

Inspectors:	<u><i>W. H. Bradford</i></u>	<u>5/18/89</u>
	W. H. Bradford	Date Signed
	<u><i>M. C. Shannon</i></u>	<u>5/18/89</u>
	M. C. Shannon	Date Signed
Approved by:	<u><i>H. C. Dance</i></u>	<u>5/18/89</u>
	H. C. Dance, Section Chief	Date Signed
	Division of Reactor Projects	

SUMMARY

Scope:

This routine, safety inspection was conducted in the areas of operational safety verification, surveillance observations, maintenance observations, licensee event reports, information meeting, onsite followup of events, licensee quality assurance program implementation, review of periodic and special reports, and followup on previous inspection findings.

Results:

One licensee identified violation was identified involving the failure to test a thermal overload bypass circuit, paragraph 7.a.

One unresolved item was identified concerning the adequacy of testing reverse flow through component cooling water pump discharge check valves, paragraph 3.

An additional concern was identified involving the monthly verification of proper valve position for component cooling water throttle valves in the residual heat removal heat exchangers' return lines, paragraph 3.

During this inspection period, the licensee demonstrated excellent work practices contributing to safe plant operation, paragraph 7.a. and b.

## REPORT DETAILS

### 1. Persons Contacted

#### Licensee Employees

W. Batts, Supervisor, Mechanical Maintenance  
D. Braud, Supervisor, Security  
\*J. Collins, Manager, Operations  
G. Forehand, Director, QA/QC  
C. Gibson, Director, Programs and Procedures  
\*C. Hinnant, Plant General Manager  
T. Lentz, Operations Supports Supervisor  
T. Morton, Manager, Maintenance  
C. Olexik, Supervisor, Shift Operations  
J. Sipp, Manager, Environmental and Radiation Monitoring  
H. Smith, Supervisor, Radwaste Operations  
\*D. Tibbits, Director, Regulatory Compliance  
\*B. Ban Metre, Manager, Technical Support  
A. Watson, Vice President, Harris Nuclear Project  
E. Willet, Manager Outages and Modifications  
W. Wilson, Performance Engineering  
L. Woods, Engineering Supervisor

Other licensee employees contacted during this inspection included engineers, operators, mechanics, security force members, technicians, and administrative personnel.

\*Attended exit interview

Note: Acronyms and initialisms used in the report are listed in paragraph 13.

### 2. Operational Safety Verification (71707)

The inspectors observed control room operations, reviewed applicable logs, and conducted discussions with control room operators during the report period. The operability of selected emergency systems was verified, tagout records were reviewed, and proper return to service of affected components was verified. The inspector conducted routine plant tours during this inspection period to verify that the licensee's requirements and commitments with selected LCOs and results of selected surveillance tests. The verifications were accomplished by direct observation of monitoring instrumentation, valve positions, switch positions, accessible hydraulic snubbers, and review of completed logs, records, and chemistry results. The licensee's compliance with LCO action statements were reviewed as events occurred.



The inspectors routinely attended meetings with certain licensee management and observed various shift turnovers between shift foremen and licensed operators. These meetings and discussions provided a daily status of plant operations, maintenance, and testing activities in progress, as well as discussions of significant problems.

Site security was evaluated by observing personnel in the protected and vital areas to ensure that these persons had the proper authorization to be in the respective areas. The inspectors also verified that vital area portals were kept locked and alarmed. The security personnel appeared to be alert and attentive to their duties and those officers performing personnel and vehicular searches were thorough and systematic. Responses to security alarm conditions appeared to be prompt and adequate.

Selected activities of the licensee's Radiological Protection Program were reviewed by the inspectors to verify conformance with plant procedures and NRC regulatory requirements. The areas reviewed included: operation and management of the plant's health physics staff, ALARA implementation, Radiation Work Permits for compliance to plant procedures, personnel exposure records, observation of work and personnel in radiation areas to verify compliance to radiation protection procedures, and control of radioactive materials. No discrepancies were noted.

Several inspector hours were spent on back shift inspections and observations. Various other aspects of plant operations were observed and evaluated. The operators appeared to be alert, knowledgeable, and competent in their duties. The licensee has developed a high degree of professionalism in the control room staff.

No violations or deviations were identified.

### 3. Surveillance Observation (61726)

Portions of the following surveillance inspections and tests required by the Technical Specifications (TS) were witnessed, observed or reviewed by the inspectors:

OST-111	-	Auxiliary Feedwater Pump 1X-SAB Operability
MST-I0234	-	Containment Monitor Operational Test
OST-1045	-	ESFAS Train B Slave Relays (Valve MS-72 thermal overload test)
OST-1090	-	Spent Fuel Pool System Quarterly
OST-1007	-	CVCS/SI Operability
OST-1216	-	Component Cooling Water System Operability

The inspectors verified that the surveillances were performed in accordance with adequate procedures; instrumentation was calibrated; limiting conditions were met; test results met acceptance criteria and were reviewed by personnel other than the individual directing the test;

deficiencies identified during the testing were properly reviewed and resolved by appropriate management personnel; and personnel conducting the test were qualified.

In addition to the drawing verification (paragraph 8), the inspectors reviewed and walked down various operating and surveillance procedures. It was noted during the review that the CCW return from each RHR heat exchanger is throttled and is verified in the throttled position on the monthly essential flow path valve alignment verification. However, the throttled position is not specified, even though there are minimum and maximum flows required during operation or accident conditions. Various alarms would alert the operator to abnormal flow conditions and the throttle valves were found to be in the required position. The licensee is in the process of modifying their surveillance procedure to verify actual CCW flow through each RHR heat exchanger as a means of verifying the correct valve position for the essential flow path verification. The concern with the CCW return from each RHR heat exchanger is identified as an Inspector Followup Item: IFI 89-08-02, Throttled Valve Position Verification.

It was also noted that the acceptance criteria for the CCW pump discharge check valves appeared to be inadequate. Reverse flow through the discharge check valves is verified by measuring the idle pump discharge pressure while leaving the pump suction valve open. Since the pump suction is tied directly to the running CCW pump, it appears that only substantial check valve failures could be identified using the present acceptance criteria. This concern is identified as an Unresolved Item: URI 89-08-01, Adequacy of Check Valve Surveillance Testing.

No violations or deviations were identified.

#### 4. Monthly Maintenance Observation (62703)

The inspector observed/reviewed the following maintenance activities of safety-related and non safety-related systems and components to ascertain that they were conducted in accordance with approved procedures, regulatory guides, industry codes and standards, and were in conformance with TS:

1A-SB Battery Charger - Clean and Inspect Charger per PM-E0023

"A" Diesel Generator - Clean DFO-164 fuel oil pump strainer per WR/JO 89-2FEZ1

Limitorque Valves 1CS-170 and 168 adjustment

PCR 4314 - Terry Turbine Electronic Overspeed Trip Point Reset

1CC-V167 Component Cooling Water Supply to the RHR Heat Exchanger - Repair

Items considered during the review included: verification that limiting conditions for operations were met while components or systems were removed from service; approvals were obtained prior to initiating the work; approved procedures were used; completed work was inspected as applicable; functional testing and/or calibrations were performed prior to returning components or systems back to service; quality control records were maintained; activities were accomplished by qualified personnel; parts and materials were properly certified; and radiological and fire prevention controls were implemented. Work requests were also reviewed to determine the status of outstanding jobs to assure that priority was assigned to safety-related equipment maintenance which may affect system performance.

No violations or deviations were identified.

#### 5. Licensee Event Reports

The following Licensee Event Reports (LERs) were reviewed for potential generic problems to determine trends, to determine whether information included in the report meets the NRC reporting requirements, and to consider whether the corrective action discussed in the report appears appropriate. Licensee action, with respect to selected reports, were reviewed to verify that the event had been reviewed and evaluated by the licensee as required by the TS; that corrective action was taken by the licensee; and that safety limits, limiting safety settings, and LCOs were not exceeded. The inspector examined selected incident reports, logs and records, and interviewed selected personnel. The following reports are considered closed and were discussed in earlier inspection reports.

- LER 89-01 - Plant Trip Due to Low Condenser Vacuum Caused by Personnel Error on Valve Lineup
- LER 89-02 - Inadvertent Lowering of Fuel Pool Level While Restoring Equipment Clearance Due to Valve Misposition
- LER 89-03 - Reactor Trip On Low-low Steam Generator Level Due To Main Feedwater Pump Shaft Failure
- LER 89-04 - Reactor Trip/Turbine Trip On Loss Of Condenser Vacuum Caused By Loss Of Condenser Circulating Water Pumps
- LER 89-05 - Reactor Trip On Low Steam Generator Level With Steam/Feed Flow Mismatch Due to Performance of Calibration Test Procedure

#### 6. Information Meeting (94600)

On March 30, 1989, the resident inspectors participated in an information meeting with Dr. Murley and Mr. E. Holland of the Triangle J Council of Governments. Subjects discussed included daily activities of the resident inspectors, Technical Specifications, Licensee Event Reports, Systematic Assessment of Licensee Performance, certain plant trips, and the NRC resident inspector program. The meeting was considered to be informative to the resident inspectors; especially that portion discussing the workings and function of the Triangle J Council of Governments.

7. Onsite Followup of Events (92702)

The following events/concerns were reviewed by the inspectors during this inspection period:

a. Surveillance Testing

An onsite Nuclear Safety Group engineer witnessed the testing of various thermal overload electrical bypass circuits. He noted that AC circuits were tested differently than the DC circuits. After a detailed review, he found that in all cases except one, the actuating signal picks up the relay that actuates the equipment and also bypasses the thermal overload trip. The actuation of the equipment is considered to be adequate testing of the relay.

For the exception, valve IMS-72 (auxiliary feedwater turbine isolation valve), two relays are used; one to actuate the equipment and another to bypass the thermal overload trip. The actuating relay was periodically tested, but the procedure did not test the bypass circuit as required by TS 3.8.4.2. When the discrepancy was discovered, auxiliary feedwater pump "C" was declared inoperable. The bypass circuit was subsequently tested by lifting leads and verifying circuit continuity when the relay was actuated. The relay tested satisfactory and the auxiliary feedwater pump was returned to service. Other electrical circuits have been reviewed and IMS-72 appeared to be the only valve with this particular electrical control design. The surveillance procedure incorporating this change has been issued, and this event is to be reported under LER 89-008. This is considered to be a licensee identified violation: LIV 89-08-03, Inadequate Test of Thermal Overload Bypass Circuit. This violation meets the criteria specified in Section V of the NRC Enforcement Policy for not issuing a Notice of Violation and is not cited.

The noting of the differences in circuit testing and the detailed electrical circuitry review necessary to track down this deficiency are considered to be excellent work practices and important contributions to safe plant operation.





b. Main Feedwater Isolation Valve Closure

On April 16, 1989, at 2:58 a.m., the licensee was performing required inservice testing on main steam isolation valves (MSIV) and main feedwater isolation valves (MFWIV); all of which are containment isolation valves. The test was conducted using OST-1018, MSIV/MFWIV Operability Test. This test consisted of actuating a test switch in the control room, which causes the valve to stroke from 100% open to 90% open with a resulting indicating light. The test switch is then returned to normal which allows the valve to return to 100% open and the test indicating light to go out.

During the testing of MFWIV 1F-217 to "C" steam generator, limit switch CR-6 malfunctioned and feedwater valve 1F-217 went completely closed. The valve was reopened by operator manual action from the control room and steam generator level was stabilized at 53%. Relay CR-6 gives an automatic open signal after the 90% test switch makes up. Without this signal the valve will travel fully closed.

Prior to performing this test, the operating Shift Foreman reviewed the test procedure with the operating crew. Plant operation was evaluated as to what could happen during the test which could cause a perturbation of the Unit. Corrective actions were considered and courses of action were determined. As it turned out, this was a very prudent thing to do. Pre-determination of possible challenges to the plant is very important to safe plant operation, and such action by the licensee is commendable.

c. Heater Drain Pump Trip

On April 23, 1989, at 6:58 p.m. "A" heater drain pump tripped due to low net positive suction head. The low suction pressure trip was caused by loss of flow from the 5B feedwater heater when HD-V-8, feedwater heater 5B drain valve, failed closed. The cause for the HD-V-8 failure is unknown and has been returned to service.

An automatic turbine runback did not occur as required when the heater drain pump tripped. The operators took the appropriate manual controls and reduced power as required to 90%. It was noted by the inspectors that the manual runback caused less plant perturbations than previous automatic runbacks. It was subsequently found that the auxiliary contacts in the "A" heater drain pump 6900V breaker had not actuated as required, and therefore, did not initiate the turbine runback. The contacts were repaired and the "A" heater drain pump was returned to service.

One licensee identified violation was identified.

## 8. Drawing System Verification (Resident Action Item 88-01)

The resident inspectors reviewed control room and TSC critical drawings to ensure legibility and current revision. Drawings for component cooling water, residual heat removal, containment spray, nuclear instrumentation, and boric acid systems were reviewed.

Modification Procedure 204, Modification Implementation, is used for updating control room drawings. Each modified control drawing is identified with a procedure change request number and the complete procedure change request package is maintained in the operations clearance center. The drawings are updated by the operations shift clerk during the turnover process. Partially completed work is identified with the PCR number upon turnover to operations, the same as a completed modification.

Drawings in the TSC are not revised during the turnover phase of the modification procedure. The drawings are verified correct prior to use, as required, by RMP-002, Document Distribution and Control. The working document must be compared to the latest revision and this is obtained by use of the applicable computer data base. Document control maintains the latest revisions to drawings, and changes are made during the turnover process.

Identified drawing discrepancies are resolved by issuing a procedure change request per Modification Procedure 204. Safety reviews are performed as necessary through the plant modification program. Control room prints are flagged as necessary and updated prints and drawings are normally in place within 4 weeks.

The component cooling water system was walked down to verify as-built conditions. No discrepancies were identified; vents, drains and branch lines were as shown on the control drawings. All valves, major equipment, and instruments were clearly identified. The material condition of the system appeared to be excellent. No valve leaks, rusting components, loose or damaged components or system deficiencies were noted by the inspectors that were not already identified by the licensee.

Resident action item 88-01 for the Harris site is considered complete.

No violations or deviations were identified.

## 9. Review of Periodic and Special Reports (90713)

The surveillance reports listed below were reviewed by regional inspectors to verify reporting requirements, technical content, data collection, acceptance criteria, and treatment of deficiencies noted. Major modifications and repairs were also reviewed.

- ° Unit 1 Inservice Inspection Report, first interval, first outage (Serial No. NLS 89-008)

- Steam Generator Tube Inservice Inspection Results, first interval, first outage (File No. SHF/10-13510C)

No violations or deviations were identified.

10. Licensee Quality Assurance Program Implementation (35502)

An internal office evaluation was conducted on January 19, 1989, of the licensee's quality assurance program implementation by reviewing recent inspection reports, SALP reports, open items, licensee corrective actions for NRC inspection findings, and licensee event reports. Particular emphasis was placed on all new items or findings since the last SALP report (June 30, 1988). Five reactor trips in 1989 and two escalated security enforcement cases were noted. All functional areas appeared to be satisfactory.

11. Action on Previous Inspection Findings (92701) (92702)

(Closed) Violation 87-20-01, Failure to Perform Adequate Safety Evaluation. The licensee's letter of response, dated August 21, 1987, detailed the corrective action initiated to correct the problem. The licensee formed a panel to review over 100 safety evaluations to further correct inadequate documentation of safety evaluation basis statements.

(Closed) Violation 87-31-02, Failure to Notify NRC Operations Center via the Emergency Notification System. The licensee's letter of response, dated October 1, 1987, detailed the corrective action initiated to correct this problem. The inspectors verified this corrective action had been completed.

(Closed) Violation 87-37-01, Operators Manipulating Valves Which Were Known to Operate in Unsafe Manner. This violation is closed based on the licensee's corrective action, an enforcement conference held on November 20, 1987, and the licensee's report to NRC (LER 87-59).

(Closed) Violation 87-40-01, Repeat Violations of Breach of Containment Integrity. This violation is closed based on verification of corrective actions delineated in the licensee's letter of response dated February 26, 1988.

(Closed) Violation 400-87-40-02, Failure to Follow Operating Procedures. The inspectors reviewed and verified that corrective actions described in the licensee's letter of response, dated February 24, 1988, has been completed. Procedure changes and training have been completed.

(Closed) Violation 400-87-40-03, Failure to Take Prompt Corrective Action on Conditions Adverse to Quality. This violation is closed based on the

corrective actions delineated in the licensee's letter of response, dated February 26, 1988, and an enforcement conference held on November 20, 1987.

No violations or deviations were identified.

## 12. Exit Interview

The inspection scope and findings were summarized during management interviews throughout the reporting period and on April 24, 1989, with those persons indicated in paragraph 1. The inspection findings listed below and those addressed in the report summary were discussed in detail. The licensee acknowledged the inspection findings and did not identify as proprietary any material reviewed by the inspector during the inspection.

<u>Item Number</u>	<u>Description</u>
89-08-01	URI* - Adequacy of CCW Check Valve Surveillance Testing (paragraph 3)
89-08-02	IFI - Throttled Valve Position Verification (paragraph 3)
89-08-03	LIV - Inadequate Test of Thermal Overload Bypass Circuit (paragraph 7.a.)

## 13. Acronyms and Initialisms

AFW	-	Auxiliary Feedwater
AH	-	Air Handling
ALARA	-	As Low as Reasonably Achievable
AP	-	Administrative Procedure
CCW	-	Component Cooling water
CW	-	Circulating Water
ECCS	-	Emergency Core Cooling System
EIR	-	Equipment Inoperable Records
EPT	-	Engineer Periodic Test Procedure
ESF	-	Emergency Safeguards Features
EST	-	Engineering Surveillance Test
ESW	-	Emergency Service Water
ETP	-	Engineering Test Procedure
FSAR	-	Final Safety Analysis Report
IFI	-	Inspector Follow-up Item
ISI	-	Inservice Testing
KV	-	Kilo Volt
LCO	-	Limiting Condition for Operation

\*An unresolved item is a matter about which information is required to determine whether it is acceptable or may involve a violation or deviation.

LER	-	Licensee Event Report
LIV	-	Licensee Identified Violation
LOCA	-	Loss of Coolant Accident
LTOP	-	Low Temperature Operations Protection
MCB	-	Main Control Board
MFP	-	Main Feed Pump
MS	-	Main Steam
MSIV	-	Main Steam Isolation Valve
MST	-	Maintenance Surveillance Test
NRC	-	Nuclear Regulatory Commission
OP	-	Operating Procedure
OST	-	Operations Surveillance Test
PCR	-	Plant Change Request
PIC. Cab	-	Primary Instrument Control Cabinet
PMTR	-	Post Maintenance Test Requirements
PNSC	-	Plant Nuclear Safety Committee
QA	-	Quality Assurance
QC	-	Quality Control
RAB	-	Reactor Auxiliary Building
RCDT	-	Reactor Coolant Drain Tank
RCS/RC	-	Reactor Coolant System
RHR	-	Radiation Heat Removal System
RWP	-	Radiation Work Permit
SF	-	Spent Fuel System
SG	-	Steam Generator
SIS	-	Safety Injection Signal
STA	-	Shift Technical Advisor
TS	-	Technical Specification
Vac	-	Volt A.C.
WR/JO	-	Work Request/Job Order

