



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

Report No.: 50-400/88-08

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 20 - April 20, 1988

Inspector: *G. F. Maxwell* 5/5/88  
G. F. Maxwell Date Signed

Accompanying Personnel: P. Moore

Approved by: *P. E. Fredrickson* 5/6/88  
P. E. Fredrickson, Section Chief Date Signed  
Division of Reactor Projects

SUMMARY

Scope: This routine, announced inspection involved inspection in the areas of Operational Safety Verification, Monthly Maintenance Observation, Temporary NRC Inspection Instruction for Natural Circulation Cooldown and Receipt of New Fuel on Site.

Results: In the areas inspected, violations or deviations were not identified.

## REPORT DETAILS

### 1. Persons Contacted

#### Licensee Employees

J. M. Collins, Manager, Operations  
G. L. Forehand, Director, QA/QC  
J. L. Harness, Plant General Manager  
C. S. Hinnant, Manager of Maintenance  
D. L. Tibbitts, Director, Regulatory Compliance  
R. B. Van Metre, Manager, Harris Plant Technical Support  
R. A. Watson, Vice President, Harris Nuclear Project

Other licensee employees contacted included technicians, operators, mechanics, security force members, engineering personnel and office personnel.

### 2. Exit Interview

The inspection scope and findings were summarized on April 22, 1988, with the Plant General Manager, Operations. Proprietary information is not contained in this report.

Note: A list of abbreviations used in this report is contained in Paragraph 7.

### 3. Operational Safety Verification (71707, 71709, 93702)

#### a. Plant Tours

The inspector conducted routine plant tours during this inspection period to verify that the licensee's requirements and commitments were being implemented. These tours were performed to verify that systems, valves and breakers required for safe plant operations were in their correct position; fire protection equipment, spare equipment and materials were being maintained and stored properly; plant operators were aware of the current plant status; plant operations personnel were documenting the status of out-of-service equipment; security and health physics controls were being implemented as required by procedures; there were no undocumented cases of unusual fluid leaks, piping vibration, abnormal hanger or seismic restraint movements; and all reviewed equipment requiring calibration was current.

Tours of the plant included review of site documentation and interviews with plant personnel. The inspector reviewed the shift foreman's log, control room operator's log, clearance center tag out

logs, system status logs, chemistry and health physics logs, and control status board. During these tours the inspector noted that the operators appeared to be alert and aware of changing plant conditions.

The inspector evaluated operations shift turnovers and attended shift briefings. He observed that the briefings and turnovers provided sufficient detail for the next shift crew.

The inspector verified that various plant spaces were not in a condition which would degrade the performance capabilities of any required system or component. This inspection included checking the condition of electrical cabinets to ensure that they were free of foreign and loose debris, or material.

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 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.

b. Forced Outage

- (1) On March 20 the licensee reduced plant power and placed the plant in Hot Standby (Mode 3). The plant shutdown was conducted in accordance with plant operating procedure GP-006, "Normal Plant Shutdown from Power to Hot Standby (Mode 1 to Mode 3)".

The licensee determined that the shutdown was required to allow an inspection of the main condenser tubes for a possible leak and/or leaks. The decision to shut down was reached after management evaluated the secondary chemistry test results, which indicated that perhaps a condenser tube was leaking. The tests indicated a significant increase in condensate water conductivity, however, none of this water was allowed to get into the steam generator feedwater system.

After the plant shutdown, the condenser vacuum was removed and the secondary system configuration was changed. Personnel were then allowed to enter the main condenser for inspection. Inspection revealed that five of the 18 low pressure main turbine extraction steam line bellows were in need of repair. The bellows, measuring about 20 inches in diameter and four feet in length, were cracked and damaged beyond repair. The damaged bellows were replaced and an engineering evaluation was conducted to try to determine the causes of the failures, which were:



- The degree of cold metal work introduced during the bellows' manufacturing process;
- Chloride contamination which was possibly introduced during the manufacturing process and the subsequent handling and storage of the bellows.

Licensee management stated that all of the 18 bellows will be replaced during the next scheduled outage. The replacement bellows will be designed and manufactured to significantly reduce the likelihood of their failure.

The inspector evaluated the inspection and repair work activities associated with the condenser inspection, bellows removal and replacement, and the repair of the main condenser tubes. The inspection and replacement of the damaged bellows was authorized by Work Requests WR 88-AGFK1, WR 88-AGQF1, WR 88-AGEX1, and WR 88-AGMX1. The condenser tubes were inspected and found to have several tubes damaged. The damaged tubes were sealed by installing plugs in each end of the damaged tubes. The inspection and plugging of the damaged tubes was authorized by WR 88-AGJP1.

- (2) During the outage other work activities were accomplished, including the following:
- Replacing a heater drain pump motor and repairs on the pump's seals;
  - Repairing a body to bonnet leak on a reactor coolant valve 1RC-53 (Loop A hot leg RTD manifold isolation valve);
  - Calibrating the rod control system.

By March 27 each of the preceding work activities was satisfactorily completed; the plant heat-up began and the plant was returned to power operation (Mode 1).

No violations or deviations were identified in the areas inspected.

#### 4. Monthly Maintenance Observation (61726, 62703)

The inspector reviewed the licensee's maintenance activities during this inspection period to verify the following: maintenance personnel were obtaining the appropriate tag out and clearance approvals prior to commencing work activities, correct documentation was available for all requested parts and material prior to use, procedures were available and adequate for the work being conducted, maintenance personnel performing work activities were qualified to accomplish these tasks, no maintenance

activities reviewed were violating any limiting conditions for operation during the specific evolutions; the required QA/QC reviews and QC hold points were implemented; post-maintenance testing activities were completed, and equipment was properly returned to service after the completion of work activities.

The following were evaluated:

- The inspector observed portions of the maintenance checks which were conducted on the internals of the condensate suction check valve for the turbine driven auxiliary feedwater pump. The valve (1CE-56) was disassembled and inspected to assure that the internals would properly function when required. This maintenance activity was authorized by WR 87-BLBB1 as a part of the ongoing inspection program required by ASME Section XI, "Pump and Valve Program".
- Steam generator blowdown valve 1BD-39 was reworked as required by WR 88-ACQQ2. The work required disassembling the valve operator and replacing its diaphragm. Afterwards the valve was satisfactorily tested per OST-1104 and returned to service.
- The isolation valve for the "A" steam generator narrow range level transmitter (LT-0476) developed a packing leak. The valve was repacked and returned to service in accordance with WR 88-AGJE1.

No violations or deviations were identified.

#### 5. Natural Circulation Cooldown (25586)

A review was conducted of the licensee's actions to implement the requirements of Generic Letter 81-21, Natural Circulation Cooldown. This review included the following documents:

EOP-EPP-005, Rev. 3, Natural Circulation Cooldown;

EOP-EPP-006, Rev. 2, Natural Circulation Cooldown with Steam Void in Vessel with RVLIS;

EOP-EPP-007, Rev. 2, Natural Circulation Cooldown with Steam Void in Vessel without RVLIS;

SHNPP/WOG EOP Step Deviation Document for EPP-005, Rev. 3;

SHNPP/WOG EOP Step Deviation Document for EPP-006, Rev. 2;

SHNPP/WOG EOP Step Deviation Document for EPP-007, Rev. 2;

GP-007, Rev. 2, Normal Plant Cooldown (mode 3 to mode 5) through change 7;

OMM-006, Rev. 4, Emergency Operating Procedure Writer's Guide; Reactor Operator Replacement Training - Fluid Flow (Theory), FF-LP-3.4, Rev. 0, dated 4/9/85;

Reactor Operator Replacement Training - Procedures (EOPs), EOP-LP-3.8, Rev. 1, dated 12/14/87;

Reactor Operator Replacement Training - Simulator, Natural Circulation Demonstration, MCD-SIM-3.00, Rev. 0, dated 9/25/87;

Reactor Operator Hot License Simulator Training, EOP-SIM-2.39, Rev. 1, dated 11/16/87;

Reactor Operator Requalification Training - Heat Transfer/Fluid Flow, Augmented Lesson Plan, subject title RQ86405, "Natural Circulation Cooldown Problem", dated 11/17/86;

Reactor Operator Requalification Training - EOP Requal Overview, session number N07001H, Rev. 0 dated 2/12/87;

Reactor Operator Requalification Training - Simulator, Natural Circulation, SIM-RQ-023, Rev. 1, dated 12/17/87;

Transient and Accident Analysis-LP-2.19, Loss of Flow Accident, Rev. 0, dated 4/1/87.

In addition, the inspector reviewed training records for 15 licensed operators to verify that they had received training in Natural Circulation Cooldown.

The licensee's EOPs for Natural Circulation Cooldown closely followed the Westinghouse Owners Group Emergency Response Guidelines. Differences were noted in the foldout pages wherein the licensee deleted the red path summary, choosing instead to address it in the first step by implementing the Function Restoration Procedures via the Critical Safety Function Status Trees. Other differences in the procedure reflected Technical Specification considerations and plant specific configuration such as the absence of a high head safety injection.

The SHNPP/WOG EOP Step Deviation Document was well organized and provided adequate justification for the differences between the licensee's EOPs and the WOG ERGs.

A review of the training courses and simulator scenarios for both initial and requalification training for reactor operators demonstrated that the licensee's training program adequately addressed the topic of Natural Circulation Cooldown. Requalification training contained a Natural Circulation Cooldown problem that required the operators to calculate the





mass flow rate and core delta T for time increments following shutdown. Simulator scenarios contained multiple failures in addition to the Natural Circulation, such as stuck rods. Classroom training included discussions of the St. Lucie Event.

A review of training records for 15 licensed operators revealed that they had received both classroom and simulator training on Natural Circulation Cooldown since January 1, 1988.

No violations or deviations were identified in this area.

#### 6. Receipt of New Fuel on Site (25586)

The inspector observed the transport of new fuel for Cycle 2 through the security access point into the protected area. The following procedures relating to the handling of fuel were reviewed:

- FHP-001, Rev. 1, Handling Limitations for New and Irradiated Fuel Assemblies;
- FHP-002, Rev. 1, Handling Limitations for New and Irradiated Fuel Inserts;
- FHP-003, Rev. 4, Unpacking and Handling of New Fuel Assemblies, Fuel Inserts and New Fuel Shipping Containers.

The inspector also observed licensee personnel perform the removal of fuel from the storage cask, subsequent inspection of the new fuel, and the storage of the new fuel in the fuel pool. The licensee observed all precautions and performed the activities according to procedure. Personnel handling the fuel, other than the overhead crane operator, wore protective clothing and gloves to prevent contamination of the fuel. Other personnel on hand to observe the movements took proper precautions by taping all pockets shut and securing badges and TLDs with tape.

No violations or deviations were identified in this area.

#### 7. List of Abbreviations

ASME	American Society of Mechanical Engineers
CP&L	Carolina Power and Light Company
EOP	Emergency Operating Procedures
ERG	Emergency Response Guidelines
FHP	Fuel Handling Procedure
GP	General Procedure
NRC	Nuclear Regulatory Commission
OMM	Operations Management Manual
OST	Operational Surveillance Test
QA	Quality Assurance
QC	Quality Control
RII	Region II
RTD	Resistance Temperature Detector

RVLIS	Reactor Vessel Level Indication System
SHNPP	Shearon Harris Nuclear Power Plant
TLD	Thermoluminescent Dosimeter
WOG	Westinghouse Owners Group
WR	Work Request