



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

Report No.: 50-261/90-02

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

Docket No.: 50-261

License No.: DPR-23

Facility Name: H. B. Robinson

Inspection Conducted: January 11 - February 10, 1990

Inspectors:

W. L. Garner
for L. W. Garner, Senior Resident Inspector

3/8/96
Date Signed

K. R. Jury
for K. R. Jury, Resident Inspector

3/8/96
Date Signed

Approved by:

H. C. Dance
for H. C. Dance, Section Chief
Division of Reactor Projects

3/8/96
Date Signed

SUMMARY

Scope:

This routine, announced inspection was conducted in the areas of operational safety verification, surveillance observation, maintenance observation, and onsite followup of events at operating power reactors.

Results:

One violation was identified for failure to follow surveillance procedure OST-007. This personnel error resulted in a reactor trip.

The capability to obtain accurate and repeatable data during IST pump test is questionable.

When a CCW pump entered the required action range, it was not promptly reported to the control room.

Diesel generator exhaust smoke initiated fire alarms. Fire brigade members arrived on the scene within three minutes.

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REPORT DETAILS

1. Persons Contacted

- C. Baucom, Senior Specialist, Regulatory Compliance
- C. Bethea, Manager Training
- *J. Benjamin, Engineering Supervisor, Technical Support
- R. Chambers, Engineering Supervisor, Plant Performance
- D. Crook, Senior Specialist, Regulatory Compliance
- J. Curley, Manager, Environmental and Radiation Control
- *C. Dietz, Manager, Robinson Nuclear Project
- R. Femal, Shift Foreman, Operations
- W. Gainey, Supervisor, Operations Support
- *S. Griggs, Technical Aide, Regulatory Compliance
- *E. Harris, Director, Onsite Nuclear Safety
- *J. Kloosterman, Director, Regulatory Compliance
- D. Knight, Shift Foreman, Operations
- A. McCauley, Principal Engineer, Onsite Nuclear Safety
- R. Moore, Shift Foreman, Operations
- *R. Morgan, Plant General Manager
- D. Myers, Shift Foreman, Operations
- M. Page, Manager, Technical Support
- *R. Powell, Engineering Supervisor, Technical Support
- *S. Pruitt, Senior Specialist, Technical Support
- D. Quick, Manager, Plant Support
- *J. Russ, Senior Specialist, Quality Assurance/Quality Control
- D. Seagle, Shift Foreman, Operations
- *J. Sheppard, Manager, Operations
- R. Smith, Manager, Maintenance
- R. Steele, Shift Foreman, Operations
- *R. Weber, Senior Specialist, Technical Support
- H. Young, Director, Quality Assurance/Quality Control

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

*Attended exit interview on February 23, 1990.

Acronyms and initialisms used throughout this report are listed in the last paragraph of the inspection report.

2. Operational Safety Verification (71707)

The inspectors evaluated licensee activities to confirm that the facility was being operated safely and in conformance with regulatory requirements. These activities were confirmed by direct observation, facility tours, interviews and discussions with licensee personnel and management, verification of safety system status, and review of facility records.

To verify equipment operability and compliance with TS, the inspectors reviewed shift logs, operations' records, data sheets, instrument traces, and records of equipment malfunctions. Through work observations and discussions with Operations Staff members, the inspectors verified the staff was knowledgeable of plant conditions, responded properly to alarms, adhered to procedures and applicable administrative controls, cognizant of in-process surveillance and maintenance activities, and aware of inoperable equipment status. The inspectors performed channel verifications and reviewed component status and safety-related parameters to verify conformance with TS. Shift changes were routinely observed, verifying that system status continuity was maintained and that proper control room staffing existed. Access to the control room was controlled and operations personnel carried out their assigned duties in an effective manner.

Plant tours and perimeter walkdowns were conducted to verify equipment operability, assess the general condition of plant equipment, and to verify that radiological controls, fire protection controls, physical protection controls, and equipment tagging procedures were properly implemented.

No violations or deviations were identified.

3. Monthly Surveillance Observation (61726)

The inspectors observed certain safety-related surveillance activities on systems and components to ascertain that these activities were conducted in accordance with license requirements. For the surveillance test procedures listed below, the inspectors determined that precautions and LCOs were adhered to, the required administrative approvals and tagouts were obtained prior to test initiation, testing was accomplished by qualified personnel in accordance with an approved test procedure, test instrumentation was properly calibrated, the tests were completed at the required frequency, and that the tests conformed to TS requirements. Upon test completion, the inspectors verified the recorded test data was complete, accurate, (except as noted below), met TS requirements, and that the systems were properly returned to service. Specifically, the inspectors witnessed/reviewed portions of the following test activities:

OST 202 (revision 21)	SDAFW System Component Test
OST 401 (revision 24)	Emergency Diesels
OST-908 (revision 17)	Component Cooling System Component Test
<u>OST-401</u>	

On February 5, 1990, after starting B EDG in accordance with OST-401, fire alarms were received from parts of the auxiliary building. Both the A and B trains of fire zone 12 and one train in zone 10 actuated causing

the fire header deluge valve to open. No water was sprayed since no sprinkler heads actuated. Fire brigade members were on the scene within three minutes of the first alarm. Smoke was observed in sections of the first floor auxiliary building but no fire was detected. The smoke had the characteristic smell of diesel exhaust. Based on observations of personnel outside the auxiliary building, smoke from the EDG muffler had apparently blown around the side of the building into the HVS-1 supply fan intake. The fan had distributed the smoke back into the building via the normal ventilation system. There are no known previous occurrences of this phenomena. The inspectors observed the site manager and operations manager in the control room during the event.

OST-908

OST-908 is utilized to verify mechanical performance and to assess operational readiness of CCW pumps and valves. During performance of this test and subsequent data review on February 7, 1990, several test anomalies were identified. The first anomaly occurred during the testing of B CCW pump when the pump flow was such that it placed the pump in the alert range in accordance with ASME Section XI, Subsection IWP. The pump's flow was determined to be only 84 gallons above the minimum required action flow by the technician performing the test. The inspectors questioned the accuracy of the flow readings as the pump flow measured by the flow instrumentation was varying by approximately 600 gpm and appeared to be at a flow at least 100 gpm below the minimum required action range flow during the majority of the test. The inspectors were subsequently informed that there was a more accurate measurement technique available which would measure average flow over a period of time. Due to the subjectivity of the methodology utilized during the test, the licensee is planning to review whether the more accurate and consistent methodology for determining flow should be procedurally mandated. The location utilized for flow measurement was questioned due to the flow variations (approximately 15% of nominal). The inspectors were informed that due to ALARA considerations, the current location is the most practical for access; however, apparently it is not the most desirable for flow measurement accuracy. The licensee is currently evaluating a more accurate location as well as permanently installed hard-wired instrumentation to address the ALARA considerations. The B CCW pump is currently scheduled to be tested on an increased frequency per Section XI requirements.

The second anomaly occurred during review of the test data, when it was identified that C CCW pump's differential pressure had entered the required action range. Upon identification of this situation by the shift foreman, he declared the pump inoperable. The pump's pressure indicators were recalibrated and the applicable portion of test performed again, and acceptable differential pressure was obtained. This situation was a concern as the high differential pressure was not identified as

making the pump inoperable until 3 hours after the high differential pressure was recorded. The individual performing the test was informed of the necessity to promptly recognize test discrepancies as well as timely notification of the control room. Evidently the individual did not recognize the differential pressure had reached the required action range. This was considered to be an isolated occurrence.

Additionally, the inspectors expressed concern with the necessity to recalibrate the pressure indicators, which were within their required calibration interval. Installed pressure instrument accuracy has been previously questioned by the inspectors during flow testing of RHR system (identified as an URI in report 89-17). As a result of the instrument accuracy concerns, coupled with the concern with procedural control of test methodology and of flow measurement locations, the capability to obtain accurate and repeatable data is questionable. Accuracy and repeatability is essential in determining degraded pump/system performance. The previous URI (89-17-02) is considered closed. All these issues will now be considered as a URI: Determine if IST Program is Capable of Determining Pump Operability and Degradation: 90-02-01.

No violations or deviations were identified.

4. Monthly Maintenance Observation (62703)

The inspectors observed safety-related maintenance activities on systems and components to ascertain that these activities were conducted in accordance with TS, approved procedures, and appropriate industry codes and standards. The inspectors determined that these activities did not violate LCOs and that required redundant components were operable. The inspectors verified that required administrative, material, testing, radiological, and fire prevention controls were adhered to. In particular, the inspectors observed/reviewed the following maintenance activities:

WR/JO 90-AATT1	Repair SDAFW Pump Oil Leak
WR/JO 90-AAWR1	Inspect/Repair SDAFW Pump Recirculation Check Valve, AFW-9A
WR/JO 90-AAWS1	Inspect/Repair SDAFW Pump Recirculation Isolation Valve, AFW-17

During performance of OST-202, SDAFW System Component Test, revision 21, on January 18, 1990, a leak was identified on the SDAFW pump shaft oil seal. Work request 90-AATT1 was initiated and the oil return lines were visually examined for blockage. No blockage was observed, and the oil pressure to the bearings was reduced to 3 psig, per the vendor. The pump was restarted; however, oil leakage was still present. The turbine end of

the pump was disassembled. Upon removal of the bearing cover, it was determined that heat shrink tubing around the thermocouple wires to the bearings was blocking the oil return ports. The heat shrink material was removed, additional visual inspection performed, and the pump and piping were reassembled. When the pump was run again, leakage was still present. After an unsuccessful attempt to stop the leak by adjusting the oil pressure, the pump's turbine end was disassembled again. This disassembly revealed the oil return port was filled with Copatite (used to seal the bearing cover) and that the bearing cover was not sealing securely. The return port was cleared and the pump and piping were reassembled. These maintenance activities were performed per CM-008, SDAFW Pump Overhaul, revision 6. The pump was subsequently run with no oil leakage evident.

During the maintenance evolutions described above, an anomaly in the amount of recirculation flow was identified, in that, recirculation flow was identified to be less than half of its nominal value. To determine the root cause, the SDAFW pump recirculation check valve, AFW-9A, was disassembled and inspected per WR 90-AAWR1 for possible binding. The valve internals were inspected and no problems were found. When the pump was run without the check valve internals installed, recirculation flow was less than expected. The check valve internals were cleaned and reinstalled and further cause determinations were made. Work request 90-AAWS1 was subsequently initiated to disassemble and inspect the manually operated SDAFW pump recirculation isolation valve, AFW-17. Upon valve disassembly and boroscopic inspection of the piping, it was identified that the valve disc had separated from the stem and that the wafer that the valve stem pivots on had become dislodged. The dislodged wafer had partially blocked the flow orifice, thus restricting recirculation flow. The valve disc was tack welded back to the union and the valve was reassembled and returned to service. On January 23, 1990, OST-202 was satisfactorily performed, and the SDAFW pump was returned to service.

No violations or deviations were identified.

5. Onsite Followup of Events at Operating Power Reactors (93702)

On January 17, 1990, at 8:26 p.m. the unit experienced an OT delta T trip from 100% of power. Plant systems responded as anticipated. The unit was placed in hot shutdown in accordance with emergency procedure PATH-1. Subsequent to the transient review and root cause determination, the unit was returned to service on January 18, 1990. The transient had resulted from a personnel error during the performance of OST-007, Nuclear Instrumentation Comparator Channel, revision 4. The operator had tripped protection channel I bistables for OT delta T and OP delta T, as required by step 7.1.6.1. However, he believed that two additional bistables had to be tripped, e.g., the rod stop bistables for this channel also had to

be tripped. Without recognizing that the next step specified two bistables associated with protection channel II, he tripped the OT delta T bistable listed in step 7.1.6.2. This action completed the two out of three logic for the OT delta T reactor trip protection function. However, step 7.1.6 had instructed him to place the OP delta T and OT delta T trip bistables "associated only with the power range channel being tested, in the tripped mode." Failure to perform step 7.1.6 correctly was a violation: Failure To Follow Procedure OST-007 Resulted In Reactor Trip, 90-02-02.

One violation was identified.

6. Exit Interview (30703)

The inspection scope and findings were summarized on February 23, 1990, with those persons indicated in paragraph 1. The inspectors described the areas inspected and discussed in detail the inspection findings listed below and in the summary. Dissenting comments were not received from the licensee. Proprietary information is not contained in this report.

<u>Item Number</u>	<u>Description/Reference Paragraph</u>
90-02-01	URI - Determine If IST Program Is Capable Of Determining Pump Operability And Degradation
90-02-02	VIO - Failure To Follow Procedure OST-007

7. List of Acronyms and Initialisms

AFW	Auxiliary Feedwater
ALARA	As Low As Reasonably Achievable
ASME	American Society of Mechanical Engineers
CCW	Component Cooling Water
CM	Corrective Maintenance
EDG	Emergency Diesel Generator
gpm	Gallons per minute
HVS	Heating Ventilation Supply
IST	Inservice Testing
LCO	Limiting Condition for Operation
MST	Maintenance Surveillance Test
OST	Operations Surveillance Test
OP Delta T	Overpower Delta Temperature
OT Delta T	Overtemperature Delta Temperature
psig	Pounds per square inch - gage
RHR	Residual Heat Removal
SDAFW	System Driven Auxiliary Feedwater

TS
URI
W/R
WR/JO

Technical Specification
Unresolved Item*
Work Request
Work Request/Job Order

*Unresolved items are matters about which more information is required to determine whether they are acceptable or may involve violations or deviations.