UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA STREET, N.W., SUITE 2900
ATLANTA, GEORGIA 30323-0199

Report No.: 50-261/94-15

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 Unit 2

Inspection Conducted: April 24 - May 21, 1994

Lead Inspector: W. T. Orders for — 6/15/94
W. T. Orders, Senior Resident Inspector — Date Signed

Other Inspector: W. T. Orders for — 6/15/94
C. R. Ogle, Resident Inspector — Date Signed

Approved by: — 6/15/94
H. O. Christensen, Chief — Date Signed
Reactor Projects Section 1A
Division of Reactor Projects

SUMMARY

Scope:

This routine, unannounced inspection was conducted in the areas of operational safety verification, surveillance observation, maintenance observation, and followup.

Results:

One violation with three examples was identified dealing with the licensee's failure to properly establish, implement, and maintain maintenance procedures as they related to maintenance on: control room pressure differential pressure instrument DPI-6520, paragraph 3; the B boric acid storage tank temperature controller and alarm, paragraph 4; and the EDG B lube oil strainer maintenance, paragraph 4.

A second violation was identified involving an operator erroneously draining safety injection accumulator A instead of accumulator B, paragraph 3.

A third violation was identified involving control room operators failing to take prompt corrective actions after being provided with chemistry sample results which indicated that the boric acid concentration in the A BAST was in excess of the concentration allowed by Technical Specification 3.2.2.c., paragraph 5.

An Unresolved Item was identified involving the operability of the control room ventilation system, paragraph 6.

REPORT DETAILS

1. Persons Contacted

*R. Barnett, Manager, Projects Management
S. Billings, Technical Aide, Regulatory Compliance
*A. Carley, Manager, Site Communications
*B. Clark, Manager, Maintenance
*D. Crook, Senior Specialist, Regulatory Compliance
J. Eaddy, Manager, Environmental and Radiation Support
*D. Gudger, Specialist Regulatory Affairs
*S. Farmer, Manager, Engineering Programs, Technical Support
B. Harward, Manager, Engineering Site Support, Nuclear Engineering Department
*M. Herrell, Manager, Robinson Training
*S. Hinnant, Vice President, Robinson Nuclear Project
J. Kozyra, Acting Manager, Licensing/Regulatory Programs
*R. Krich, Manager, Regulatory Affairs
A. McCauley, Manager, Electrical Systems, Technical Support
*G. Miller, Manager, Robinson Engineering Support
R. Moore, Acting Operations Manager
M. Pearson, Plant General Manager
M. Scott, Manager, Reactor Systems, Technical Support
L. Woods, Manager, Technical Support

*Attended exit interview on May 27, 1994.

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

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

2. Plant Status

The unit began the report period operating at 100 percent power, and performed at power for the entire report period with no major operational difficulties. Unit power was restricted to less than full power on selected days to prevent exceeding an environmental limitation on circulating water discharge temperature.

3. Operational Safety Verification (71707)

a. General

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.

The inspectors reviewed shift logs, Operation's records, data sheets, instrument traces, and records of equipment malfunctions to verify equipment operability and compliance with TS. The inspectors verified the staff was knowledgeable of plant conditions, responded properly to alarms, adhered to procedures and applicable administrative controls, cognizant of in-progress surveillance and maintenance activities, and aware of inoperable equipment status through work observations and discussions with Operations staff members. 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. Control room demeanor and communications were appropriate.

Plant tours 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.

b. Control Room Pressure Indicator In Error

On April 29, 1994, the inspectors observed that control room pressure, as indicated on differential pressure instrument DPI-6520, was less than atmospheric pressure. Following the licensee's investigation of this observation, the inspectors were informed that DPI-6520 was in error and that the control room was actually at a slightly positive pressure with respect to atmospheric pressure. The inspectors were also advised that to correct this instrument error, DPI-6520 was subsequently adjusted by the system engineer.

The inspectors determined from interviews of personnel involved, that maintenance was performed on DPI-6520 on April 27, 1994, to correct a previous indication problem with the instrument. This maintenance consisted of adjusting the control room manometer (DPI-6520) to the level position and tightening the mounting screws. Following this adjustment, no "zeroing" of the instrument was performed to compensate for the new instrument position. A review of the WR/JO indicated that this zeroing was not specified. Furthermore, the planner involved in generating the maintenance ticket was unaware of the need to zero the instrument following the leveling. Discussions with the system engineer and a review of a vendor bulletin on the instrument revealed that a zeroing was appropriate. The inspectors noted that DPI-6520 is used to verify that CR ventilation equipment performance complies with TS requirements. Overall the inspectors concluded that the maintenance instructions provided on the work request were inadequate.

TS 6.5.1.1, Procedures, Tests, and Experiments, requires in part, that written procedures be established, implemented, and maintained, covering the activities recommended in Appendix A of Regulatory Guide 1.33, Rev. 2, 1978, including procedures control of measuring and test equipment.

Work Request/Job Order, WR/JO 94-AEBT1 was provided to troubleshoot and repair the control room differential pressure instrument DPI-6520. This instrument is used to verify that control room ventilation equipment performance complies with Technical Specification requirements.

Contrary to the above, WR/JO 94-AEBT1 was inadequate in that, it did not provide adequate instructions for ensuring the instrument was properly initialized following maintenance. As a result, the instrument was returned to service following maintenance on April 27, 1994, with an erroneous indication of control room pressure. This is one of three examples, which in the aggregate, constitute violation, VIO: 94-15-01, Failure To Properly Establish, Implement, and Maintain Maintenance Procedures.

c. Inadvertent Draining Of Safety Injection Accumulator A

On April 30, 1994, while attempting to reduce the water level in the B SI accumulator, the reactor operator mistakenly opened the drain valve for the A accumulator. Shortly thereafter, a low level alarm was received for that accumulator. The level had been reduced to just below 61 percent before the drain valve was shut by the operator. Since the A accumulator level was then below the TS limit of 61.5 percent the licensee entered TS 3.3.1.2.a.. This TS requires that the unit be placed in hot shutdown if an accumulator is inoperable for greater than four hours. According to the reactor operator logs, eight minutes later SI accumulator A was refilled and the LCO was exited. Approximately 45 minutes later the B SI accumulator was drained in accordance with OP-202, Safety Injection and Containment Vessel Spray System. In response to this event, the licensee generated an ACR.

The inspectors reviewed the ACR, reactor operator log entries for the event, and written statements by key watchstanders involved. Additionally, the inspectors reviewed the completed Section 6.2 of OP 202 used to drain the accumulator. Based on this effort, the inspectors concluded that the incident was the result of a non-cognitive error on the part of the reactor operator. Imbedded in this error was the failure of the individual involved to properly implement the licensee's self-checking program. Additionally, the inspectors noted that though draining an accumulator is a relatively minor evolution, the reactor operator failed to inform the senior control operator of his actions. As a result, the senior control operator was unavailable to independently detect the error on the part of the reactor operator.

Technical Specification 6.5.1.1, Procedures, Tests, and Experiments requires, in part, that written procedures be established, implemented, and maintained covering the activities recommended in Appendix A of Regulatory Guide 1.33, Rev 2., 1978 including draining emergency core cooling system components. Operating Procedure, OP-202, Safety Injection and Containment Vessel Spray System, provides instructions for draining Safety Injection Accumulators.

Contrary to the above, on April 30, 1994, OP-202 was improperly implemented during efforts to drain Safety Injection Accumulator B in that, the drain valve for accumulator A was opened. As a result, safety injection accumulator A was inadvertently drained below the minimum technical specification level. This is identified as a violation, VIO: 93-15-02, Operator Error Results In Inadvertently Draining Incorrect Safety Injection Accumulator.

4. Maintenance Observation (62703)

a. General

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 detailed below:

WR/JO 94-ACYR1	Calibrate BAST A Temperature Controller and Alarm
WR/JO 94-AGRZ1	Troubleshoot Problem With LI-460 Indicating Out of Tolerance
WR/JO 94-ARW008	Perform B Emergency Diesel Generator Quarterly Inspections

b. Maintenance On Wrong BAST Controller

On April 12, 1994, the inspectors witnessed licensee efforts to calibrate the A boric acid storage tank temperature controller and alarm. When the inspectors arrived to witness this maintenance evolution, the technician was in the process of removing the temperature sensing bulb for the B boric acid storage tank. After reviewing the WR/JO present at the job site, the inspectors questioned the technician on whether he was removing the correct sensing bulb. The technician reviewed the tank labeling and

acknowledged his error to the inspectors. The bulb was then reinstalled and the calibration stopped.

TS 6.5.1.1, Procedures, Tests, and Experiments, requires in part, that written procedures be established, implemented, and maintained, covering the activities recommended in Appendix A of Regulatory Guide 1.33, Rev. 2, 1978, including procedures for control of measuring and test equipment.

Work Request/Job Order, WR/JO 94-ACYR1 was provided to calibrate the boric acid storage tank A temperature controller and alarm.

Contrary to the above, on April 12, 1994, WR/JO 94-ACYR1 was implemented incorrectly in that the maintenance technician assigned to perform the calibration, erroneously commenced work on the boric acid storage tank B temperature controller and alarm. This is one of three examples which in the aggregate constitutes a violation, VIO: 94-15-01, Failure To Properly Establish, Implement, And Maintain A Maintenance Procedure.

The inspectors also noted that within a minute of the inspector questioning the appropriateness of the maintenance technician's activities, an auxiliary operator entered the work area with similar questions. Subsequent discussions with control room personnel revealed that the auxiliary operator was dispatched based on the reactor operator's concerns with an unexpected alarm on the boric acid storage tank B. The inspectors concluded that this represented a positive example of a questioning attitude on the part of the reactor operator and on-shift personnel.

c. EDG B Lube Oil Strainer Maintenance

On April 25, 1994, the inspectors observed portions of EDG B quarterly maintenance activities. During the reassembly of the lube oil strainer, the inspectors observed that the pressure plate washer was not installed during the reassembly as required by Step 7.3.10 of CM-507, Emergency Diesel Generator Lube Oil Strainers. When the inspectors questioned the maintenance technicians on this apparent discrepancy, the strainer reassembly was halted and efforts were made to locate the washer. The inspectors were subsequently advised by the manager of mechanical maintenance that the washer was not present when the strainer was disassembled. Despite specific references to the washer in three separate, completed steps of the procedure (disassembly, inspection, and reassembly steps) the technicians involved failed to detect the missing washer. Following the installation of a replacement washer, the unit was assembled and the EDG returned to service that evening.

TS 6.5.1.1, Procedures, Tests, and Experiments, requires in part, that written procedures be established, implemented, and maintained, covering the activities recommended in Appendix A of

Regulatory Guide 1.33, Rev. 2, 1978, including procedures for the maintenance of safety related equipment. Corrective maintenance procedure, CM-507, Emergency Diesel Generator Lube Oil Strainers, provides instructions for the disassembly, inspection, and reassembly of the emergency diesel generator lube oil strainers.

Contrary to the above, on April 25, 1994, CM-507 was not properly implemented in that the lube oil strainer was improperly re-assembled. This occurred when the maintenance technicians failed to install a pressure plate washer as required by step 7.3.10 of the procedure.

This is one of three examples which in the aggregate constitute violation, VIO: 94-15-01, Failure To Properly Establish, Implement, And Maintain Maintenance Procedures.

On April 26, 1994, the inspectors questioned maintenance department management on whether the technician had documented the material condition of the non-existent washer on the maintenance data sheet in the procedure. The inspectors were advised that this had occurred, but that after the washer was identified as missing by the NRC inspectors, the maintenance data sheet was revised to correct the error. The inspectors' subsequent review of this data sheet revealed that the check mark in the satisfactory column denoting the satisfactory inspection of the washer had been crossed out and initialled. (The subsequent unsatisfactory entry was also crossed out to reflect the acceptable material condition of the replacement washer.) The inspectors were subsequently advised by the maintenance manager that recording the material condition of the non-existent washer was the result of a process error on the part of the technician. The technician had grouped all the strainer internals in one location during disassembly. The parts were then inspected in mass without individually referencing them on the procedure inspection checklist. Following this group inspection, the checklist was annotated to reflect all parts as satisfactory.

d. Pressurizer Level Indicator Restoration Following Maintenance

On May 6, 1994, the inspectors observed licensee troubleshooting of pressurizer level indicator, LI-460 in accordance with WR/JO 94-AGRZ1 and LP-017, Pressurizer Level Protection and Control Channel 460. This maintenance was conducted to remedy a reported out of tolerance condition of the instrument. Following the alignment of the instrument, the inspector noted that the technicians were about to perform the instrument restoration out of the sequence specified by LP-017. Specifically, the technicians were proceeding to return toggle switch, CT-460, to its normal position prior to removing the test equipment. This is reverse of the order specified in the procedure. The inspectors questioned the technicians on their intended sequence. Following this questioning, the technicians removed the test equipment and

returned the toggle switch to the correct position in the proper sequence. Based on their subsequent review of the instrument drawing, the inspectors concluded that the potential safety significance of this near-deviation from the procedure was minimal.

5. 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, and test instrumentation was properly calibrated. Upon test completion, the inspectors verified the recorded test data was complete and accurate. Test discrepancies were properly documented and rectified, and that the systems were properly returned to service. Specifically, the inspectors witnessed/reviewed portions of the following test activities:

OST-401	Emergency Diesels (Slow Speed Start) (EDG B Only)
SP-1307	Emergency Diesel Generator Test

a. BAST A Boric Acid Concentration Exceeds TS Limits

At approximately 6:30 p.m. on May 4, 1994, the shift supervisor recognized that BAST A exceeded the TS limit for boric acid concentration. This discovery occurred during his review of the daily chemistry sheet when he noted that the 22,681 ppm boric acid concentration recorded for the tank exceeded the 22,500 ppm limit in TS 3.2.2.c. Following this discovery, BAST B was placed in service and backup samples of tank A were ordered. These additional samples confirmed that the boric acid concentration in the tank exceeded the TS limit. Following an addition of water, the boric acid concentration in the tank was confirmed below the TS limit at 5.35 a.m. on May 5, 1994.

In response to this event, the inspector interviewed key control room watchstanders and chemistry personnel involved in the initial out of specification reading. The inspectors reviewed log entries for the event, chemistry surveillance results sheets, and historical graphics of BAST boric acid concentrations. During the course of this review, the inspectors were advised that the out of specification chemistry results were provided verbally to the control room almost seven hours prior to the shift supervisor's recognition of the problem. In fact, the out of specification results were recorded in the reactor operator's log at 11:46 a.m. that day.

From interviews, the inspectors noted that the reactor operator, chemistry technician, and chemistry supervisor all recognized the boric acid results as in excess of the administrative limit but failed to recognize exceeding the T.S. limit. This failure delayed action to correct the out of tolerance condition for almost seven hours. The inspectors also noted that several other factors contributed to the untimely resolution of this issue. These included: a communications failure between the reactor operator and the senior control operator which resulted in the senior control operator not being aware of the sample results in a timely fashion; the lack of acceptance criteria on the chemistry technical specification surveillance sheet; and a dulled sense of concern on the part of plant personnel for elevated BAST boric acid levels as a result of recent excursions above the administrative limit.

While the TS limit for BAST A boric acid concentration was exceeded, the inspectors concluded that sufficient boric acid was available in the other tank to satisfy TS requirements. The licensee is investigating the reason why the boric acid concentration in the A BAST increased to above the TS limit. The inspectors will monitor this effort.

Appendix B, Criterion XVI requires that measures be established so that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and non-conformance are promptly identified and corrected.

Contrary to the above on May 4, 1994, an out of specification boric acid concentration for BAST A was not promptly identified following sampling. As a result a boric acid concentration in excess of Technical Specification 3.2.2.c. went unrecognized for almost seven hours. This is identified as a violation, VIO 94-15-03: Failure To Take Adequate Corrective Action To An Out Of Spec BAST Boron Concentration.

6. Engineering

a. Control Room Ventilation Operability Evaluation

During a Region II specialist inspection which ended on May 6, 1994, the results of which are documented in Inspection Report 94-14, a Region II inspector questioned the licensee's testing methodology associated with confirming the ability of the control room ventilation system to maintain the control room at a positive pressure with respect to all adjacent areas during an accident. The inspector noted that previous testing assessed the system's ability to maintain a positive pressure relative to the outside atmosphere, but did not verify the system's ability to maintain a positive pressure in the control room envelope with respect to adjoining plant spaces, which is a design basis function. This apparent deviation from the test methodology as described in the

UFSAR, was identified to the licensee as an apparent Deviation. The resident inspectors questioned the system's operability, given the apparent inadequate scope of system testing. The Plant Manager directed his staff to ascertain, and perform the testing necessary to determine operability.

On the afternoon of May 6, 1994, the control room ventilation system was tested in the emergency pressurization mode to determine if the system could produce and maintain a positive pressure relative to adjacent areas. The testing revealed that the control room could only be pressurized to a pressure approximately equal to an adjacent electrical equipment room. By modifying the system's air flow balance, the licensee was successful in creating a positive pressure between the control room and the electrical equipment room, as well as all other adjacent areas.

On the following day, an auxiliary building exhaust fan was turned off to support ongoing auxiliary building ventilation flow balance efforts. This resulted in another electrical equipment room adjacent to the control room, the E1/E2 room, going to a pressure of 0.2 inches of water higher than the control room. This pressure was greater than the maximum pressure differential attainable by the control room ventilation system when in the emergency pressurization mode, based on the previous days testing. This in turn indicated that in that configuration, the E1/E2 room would have been at a positive pressure with respect to the control room during certain accident scenarios. The licensee restarted the auxiliary building exhaust fan, and declared the control room ventilation system inoperable until the issue could be resolved.

Ultimately, the licensee de-energized the auxiliary building supply fan which created a large negative pressure in the auxiliary building which resolved the immediate concern relative to the E1/E2 room and the control room. Subsequently, the licensee restarted the auxiliary building supply fan after applicable procedures were modified to de-energize the supply fan in certain accident scenarios.

At the end of the report period, the control room ventilation system had been balanced to maintain the control room at a positive pressure with respect to adjacent areas during accident scenarios. The licensee is evaluating the event to determine long term corrective actions, the past operability of the system, and the safety significance of having had a potentially inoperable system. Pending the completion of that evaluation, this issue will be maintained as Unresolved Item: URI 94-15-04, Control Room Ventilation System Operability.

7. Review of LERs (30703)

The below listed LERs were reviewed to determine if the information provided met NRC requirements. The determination included: adequacy of description, verification of compliance with Technical Specifications and regulatory requirements, corrective action taken, existence of potential generic problems, reporting requirements satisfied, and the relative safety significance of each event.

LER 92-012: Reactor Trip At Shutdown During Surveillance Testing.

LER 92-019: TS Violation Due To Mode Change With WCCU-1A Inoperable

LER 92-020: Alert Declaration Due To Unplanned Release Of Toxic Gas

LER 92-021: Failure To Enter TS Action Statement For Inoperable CV Isolation

LER 89-011: Auxiliary Feedwater Flowrate Could Exceed Limit

LER 90-001: Loss Of All Control Rod Indication

LER 90-006: Breech Of Containment Integrity

LER 91-003: Containment Vessel Fire During Refueling

LER 91-004: Rod Control System Urgent Failure

LER 91-008: TS 3.0 Implementation

The corrective actions for the above LERs have been completed. These items are closed.

8. Licensee Action on Previous Findings (92701, 90702)

a. (Open) URI 94-12-02, Basis For Closed Systems Outside Containment

IR 94-12 documents an URI related to credit taken in a licensee containment isolation valve study for closed systems outside containment which are normally vented to the RWST. In an attempt to understand the licensee's basis for this "closed" system classification, the inspectors reviewed testing associated with several systems which are normally vented to the RWST. Specifically, the inspectors reviewed the following Operations Surveillance Test: OST-155, Safety Injection System Integrity Test; OST-254, Residual Heat Removal System and RHR Loop Sampling System Leak Test; and OST-355, Containment Spray System Integrity Test. OST-254 is used to demonstrate compliance with RHR system leakage testing requirements specified in TS 4.4.3. All three OST procedures (and others) are used to verify compliance with

Operating License requirement 3.G.2 to conduct integrated leak tests of systems outside containment that would or could contain highly radioactive fluids during an accident. Following this review, the inspectors were concerned that potential inconsistencies and apparent shortcomings existed in the OSTs. These concerns could be categorized into two broad areas: the adequacy of OST methodology and the apparent failure to conduct an "integrated" leak test. The latter concern dealt primarily with the failure of the licensee to conduct a check for seat leakage past the SI-864 A/B RWST Discharge an SI-856 A/B High Head SI Test Lined to RWST, valves. Seat leakage past these valves during the recirculation phase could result in unmonitored release through the RWST vent.

These concerns were identified to cognizant licensee personnel during the week of May 9, 1994. In response, the inspectors were advised near the end of the inspection period that a licensee review of these concerns would be conducted. Additionally, immediately after the report period, the licensee advised the inspectors that no seat leakage testing had been conducted on the SI-864 A/B valves. Hence, no firm data existed to quantify the magnitude of this potential unmonitored release path. However, the licensee indicated their intention to develop a plan to resolve this potential shortcoming as well as review the adequacy of their existing leakage tests. The inspectors were presented an unverified calculation on May 27, 1994, that demonstrated that with seat leakage at the initial procurement limit for the SI-864 A/B valves, no appreciable increase in off-site doses would occur. Pending further review by the inspectors of the apparent test inconsistencies and a review of the potential unmonitored release path by NRR, this item remains open.

9. Exit Interview (71701)

The inspection scope and findings were summarized on May 27, 1994, 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. The licensee did not identify as proprietary any of the materials provided to or reviewed by the inspectors during this inspection.

Item Number	Description/Reference Paragraph
VIO: 94-15-01	Failure To Properly Establish, Implement, and Maintain Maintenance Procedures. (paragraphs 3 and 4)
VIO: 93-15-02	Operator Error Results In Inadvertently Draining Incorrect Safety Injection Accumulator. (paragraph 3)

VIO: 94-15-03	Failure To Take Adequate Corrective Action To An Out Of Specification BAST Boron Concentration. (paragraph 5)
URI: 94-15-04	Control Room Ventilation System Operability. (paragraph 6)

10. List of Acronyms and Initialisms

ACR	Adverse Condition Report
BAST	Boric Acid Storage Tank
CM	Corrective Maintenance
CV	Containment Vessel
DPI	Differential Pressure Indicator
EDG	Emergency Diesel Generator
LI	Level Indicator
OP	Operating Procedure
OST	Operators Surveillance Test
RWST	Refueling Water Storage Tank
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report
URI	Unresolved Item
VIO	Violation
WO/JO	Work Order/Job Order