



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

Report No.: 50-261/92-21

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: June 28, - July 17, 1992

Lead Inspector: *L. W. Garner* 8/12/92
 L. W. Garner, Senior Resident Inspector Date Signed

Accompanying Personnel: C. R. Ogle, Resident Inspector

Approved by: *H. O. Christensen* 8/13/92
 H. O. Christensen, Chief Date Signed
 Reactor Projects Section 1A
 Division of Reactor Projects

SUMMARY

Scope:

This routine, announced inspection was conducted in the areas of operational safety verification, surveillance observation, maintenance observation, plant safety review committee activities, and followup.

Results:

A non-cited violation was identified involving failure to close sample isolation valves after completion of sample collection as required by procedures (paragraph 4).

An unresolved item was identified concerning foreign material introduction into piping which rendered the B safety injection pump inoperable (paragraph 3).

A Waiver of Compliance Request for a 48-hour extension to remain in hot shutdown with only one safety injection pump operable was technically well developed and associated compensatory measures focused on safety (paragraph 3). However, the initial plant safety review committee meeting concerning the Waiver of Compliance Request included management/production decisions and was not entirely focused on safety (paragraph 6).

A weakness was identified in an instrumentation and control technician's procedure usage (paragraph 4).

REPORT DETAILS

1. Persons Contacted

- R. Barnett, Manager, Outages and Modifications
- *R. Beverage, Manager, Quality Control
- *S. Billings, Technical Aide, Regulatory Compliance
- *R. Chambers, Plant General Manager, Robinson Nuclear Project
- *B. Christensen, Environmental and Chemistry Supervisor, Environmental and Radiation Control
- *B. Clark, Manager, Maintenance
- T. Cleary, Manager - Balance of Plant Systems and Reactor Engineering, Technical Support
- *M. Crabtree, Health Physics Supervisor, Environmental and Radiation Control
- D. Crook, Senior Specialist, Regulatory Compliance
- *J. Davis, Principal Engineer, Nuclear Engineering Department Site Unit
- *C. Dietz, Vice President, Robinson Nuclear Project
- J. Dobbs, Manager, Nuclear Assessment Department Site Unit
- *J. Eaddy, Manager, Environmental and Radiation Support
- *J. Epperly, Manager, Modification Implementation
- R. Femal, Shift Supervisor, Operations
- B. Harward, Manager - Mechanical Systems, Technical Support
- P. Jenny, Manager, Emergency Preparedness
- D. Knight, Shift Supervisor, Operations
- A. McCauley, Manager - Electrical Systems, Technical Support
- R. Moore, Shift Supervisor, Operations
- A. Padgett, Manager, Environmental and Radiation Control
- *M. Page, Manager, Technical Support
- D. Seagle, Shift Supervisor, Operations
- *E. Shoemaker, Project Engineer - Operations Program, Operations
- W. Stover, Shift Supervisor, Operations
- *D. Taylor, Manager, Materials Control and Contract Services
- *G. Walters, Operating Event Followup Coordinator, Regulatory Compliance
- D. Winters, Shift Supervisor, Operations

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

*Attended exit interview on August 3, 1992.

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

2. Plant Status

The unit started the report period in power ascension after the completion of RO-14. The unit achieved full power operation at 12:45 a.m., on July 1, 1992, and remained in that condition until July 9, when the unit was placed in hot shutdown as required by TS 3.3.1.2.b. Blockage of the B SI pump recirculation line resulted in less than two operable SI pumps (see paragraph 3). On July 11, a Wavier of Compliance was issued to allow an additional 48 hours in hot shutdown before preceding to cold shutdown. The obstructions in the

recirculation line were removed and the B SI pump returned to service before the extension expired. The unit was returned to service on July 12. Later that same day, reactor power was stabilized at 98% of full power to investigate a heater drain tank high level. The next day power was reduced to 85% to allow isolation of the 6A feedwater heater for repairs (see paragraph 3). After successful tube plugging of the 6A feedwater heater, the unit resumed full power operation on July 17, 1992.

3. 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-progress 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 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 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.

Plant Shutdown Due To Inoperable SI Pumps

On July 8, 1992, at 11:07 p.m., the B SI pump was declared inoperable after the flow through its recirculation line failed to meet the acceptance criteria contained in OST-151, Safety Injection System Component Test. The measured recirculation flow was approximately 10% of the normal 32 gpm flow rate. The A SI pump was successfully tested per OST-151, being operable with no reduction in its recirculation flow from that measured in previous tests. Recirculation flow from each SI pump was directed to a common header which discharged into the RWST. The recirculation piping unique to each SI pump consisted of 3/4-inch

piping containing an orifice, check valve, and a manual isolation valve. The B SI pump recirculation line check valve, SI-893B, was found to have its piston type plug frozen in an almost closed position. The check valve was replaced and OST-151 was reperformed on July 9; however, the measured recirculation flow rate remained at approximately 3 gpm. In accordance with TS 3.3.1.2, the unit was placed in hot shutdown at 10:59 p.m., on July 9. Removal of the B SI pump recirculation line revealed several small, fingernail size, plastic pieces blocking the inlet to the orifice. The B SI pump was flushed by flowing approximately 7 gpm of water through a pump vent and out the open recirculation line. The piping was reinstalled and the B SI pump recirculation line flow rate was again measured. Initially, the flow rate was normal; however, the flow rate decreased to half its original value in discrete steps before the pump was stopped. Subsequent inspection revealed that plastic pieces had again partially blocked the orifice inlet. In addition to clearing the blockage, the B SI pump discharge check valve, SI-879B, and the pump suction spool piece were removed. This allowed visual and camera assisted inspection on parts of the discharge and suction piping, as well as the pump. The system was reassembled with a temporary strainer installed in the recirculation line. The B SI pump was started and run for 30 minutes and then secured. The temporary strainer was then flushed to remove any captured foreign material. This process was repeated three times without collecting any material. When the temporary strainer was removed, two small plastic pieces were found in the strainer's elbow. The system was restored to its design configuration and OST-155, Safety Injection System Integrity Test, was successfully performed to return the B SI pump to service. OST-155 measured the recirculation flow and the recirculation flow plus test line flow rates. Both these values were normal. At the end of the test the recirculation flow was again verified to be normal. The B SI pump was declared operable at 8:12 a.m., on July 12, 1992. The unit was returned to service at 1:01 p.m. the same day. In addition to the above discussed corrective actions associated with the B SI pump, other safety related pumps that share a common suction header with the B SI pump were reviewed or flow tested. The CV spray pumps were verified to have normal eductor flow rates. The A SI pump recirculation flow rate was verified as satisfactory several times. The RHR pumps were not tested since sufficient information was available to indicate that they were operable.

On July 11, 1992, projected work activities indicated that the B SI pump would not be returned to service prior to the time the unit was required by TS 3.3.1.2. to be in cold shutdown. A waiver of compliance, which was granted by the NRC on July 11, was requested to allow an additional 48 hours in hot shutdown. To support the waiver request, several actions were taken. Included among these were: (1) RCS boron concentration was adjusted to the cold shutdown level to preclude a restart if a steam line break were to occur; (2) calculations were performed to demonstrate that one charging pump would deliver sufficient flow to remove decay heat; (3) redundant charging pumps were maintained operable; and (4) applicable emergency procedures were reviewed by

Operations personnel. The waiver request was technically well developed and potential safety concerns were adequately addressed.

Investigation revealed that the plastic material was inadvertently introduced into the RHR piping during M-1087, RHR Pumps Minimum Flow Recirculation, work activities. During check valve RHR-782 installation, 9-inch plastic discs were cut to be used as purge gas dams. However, the plastic discs did not form a sufficient seal for this application and were removed from the piping. It was surmised that a piece (or pieces) of the plastic material had been broken off and left in the piping during plastic disc installation or removal. A camera assisted QC cleanliness inspection was performed (in accordance with MMM-010, Cleanliness and Flushing Requirements) as part of M-1087 prior to closing the system. ACR 92-249 was initiated to review foreign material controls. During previous outages, problems were also experienced with foreign material introduction into safety systems. For example, a wooden two by four in the B SW booster pump suction line was found to be the cause of this pump failing a surveillance test after maintenance had been performed on the system. Corrective action resulting from ACR 92-249 will be reviewed by the inspectors. This item is identified as an URI: Review Foreign Material Control Practices Developed In Response To ACR 92-249, 92-21-01.

SI Pump Blown Control Power Fuse

On July 9, 1992, at 6:39 p.m., the A SI pump control power fuse blew while operating the supply breaker. Since the B SI pump was already inoperable as discussed above, this resulted in no operable SI pumps. Since TS 3.3.1.2.b only addressed one of the two required SI pumps being inoperable, TS 3.0 applied. TS 3.0 requires that if a LCO cannot be satisfied because of circumstances in excess of those addressed in the specification, the unit shall be placed in hot shutdown within eight hours and in cold shutdown within the next 30 hours. The control power fuses were replaced and the A SI pump was successfully started three times prior to declaring it operable at 10:09 p.m. later that same day. Since the A SI pump was returned to service in 3 1/2 hours (i.e., TS 3.0 exited), unit shutdown was not initiated. Investigation determined that only one of the two control power fuses, had blown. The cause of the fuse failure was not apparent. Both fuses, which were removed from the A SI pump control circuit, were saved for further examination in order to determine, if possible, the failure mechanism. Entry into TS 3.0 was reported to the NRC as required by 10 CFR 50.72.

Power Reduction Due To Feedwater Heater Tube Leak

On July 12, 1992, at 9:12 p.m., a heater drain tank high level alarm was received. Investigation indicated tube leakage in the 6A feedwater heater was the cause of the high level. Power was reduced from 98% to 85% of full power to allow the 6A feedwater heater to be isolated. The unit remained at this power level until the leaking tube was plugged and the 6A feedwater heater returned to service on July 17. Full power operation resumed on July 18, at 7:25 a.m. While the 6A feedwater

heater was out of service, there was approximate 50 degree F difference among the S/G feedwater inlet temperatures. This resulted in abnormal loop differential temperatures which could cause an abnormal flux distribution in the reactor core. However, due to mixing in the reactor vessel, there were no observable power tilts in the reactor core. Consequently, this proved not to be a concern.

No violations or deviations were identified. Based on information obtained during the inspection, the program area was adequately implemented.

4. 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, and met TS requirements, and that the systems were properly returned to service. Specifically, the inspectors witnessed/reviewed portions of the following test activities:

OST-155	Safety Injection System Integrity Test
CP-003	Systems Sampling Procedure

Procedure Usage Problem During RCS Sample Collection

On July 2, 1992, the inspectors witnessed a RCS liquid sample collection and analysis. CP-003, section 10.1, required that the sampling piping be purged to the VCT for approximately 10-minutes prior to collecting the sample. Instead, the technician purged to the sample sink for the specified 10 minute interval. The technician indicated that this step change was a common practice. Subsequently, interviews of other technicians by the cognizant chemistry supervisor revealed that the practice of purging to the sample sink during a RCS sample was limited to this one technician. The technician was counselled on management's expectations concerning procedure usage.

RCS Sampling Valves Left Open

On July 8, 1992, during a routine tour of the auxiliary building, the inspectors noted that normally closed primary sampling containment isolation valves PS-956E and PS-956F were open. Investigation revealed that sampling was not in progress and the valves had been inadvertently left open following a RCS sample collection the previous day. This oversight occurred despite explicit instruction in CP-003 to close

PS-956E and PS-956F after completing sample collection. This event had minimal safety significance, in that these valves receive a phase A containment isolation signal. The failure to close the valves as required by the procedure is a violation of TS 6.5.1.1.1.c. Subsequent to the report period, on July 23, 1992, the inspectors again discovered that these same valves had been left open. Two different technicians were involved. Since corrective actions associated with the first event were under development and not fully implemented, this second event was not considered as a failure to take corrective action to preclude recurrence. Interim corrective actions taken now, including those implemented after the second event, should preclude recurrence of this problem. These actions include procedure usage training, review of the specific events, posting of signs at the sample sink to remind personnel to close these valves, and independent verification that these valves are closed. This NRC identified violation is not being cited because criteria specified in Section VII.B of the NRC Enforcement Policy were satisfied. This is identified as an NCV: Failure To Close Sample Valves After Sample Collection As Required By Procedure CP-003, 92-21-02.

One NCV was identified. Except as noted above, the program area was adequately implemented.

5. 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 92-AKDRI	PT-466 Transmitter Replacement
WR/JO 92-AKKYI	B SI Pump Recirculation Line Check Valve, SI-893B, Inspection/Repair
WR/JO 92-AKMT1	Spray Additive Tank Flow Transmitter, FIT-949, Calibration
WR/JO 92-AKMY1	B SI Pump Discharge Check Valve, SI-879B, Disassembly and Assembly
WR/JO 92-AKMZ1	B SI Pump Suction Spool Piece Removal/Installation
WR/JO 92-AKNC1	Temporary Strainer Installation/Removal For B SI Pump Recirculation Line Flush

PT-466 Transmitter Replacement

On July 1, 1992, at 6:45 a.m., PT-466 failed high. This transmitter provided a steam line pressure input into the high steam line differential pressure safeguards actuation logic. In accordance with operating procedures, the associated bistables were tripped. Since this logic was normally two out of three, placement of one of the channels in the tripped condition resulted in a one out of two SI actuation logic configuration. The inspectors observed the transmitter replacement. During field calibration of the replacement transmitter, the pre-installation bench calibration was determined to have been improperly performed. The I & C technician indicated that, based upon memory, he had adjusted the transmitter for a 0 to 1000 psi span. The calibration sheet required the full range to be 0 to 1400 psi. Since the field calibration was required to be performed with the data compared to that on the calibration data sheet, there was no chance that the transmitter would have been improperly returned to service. However, since the transmitter had to be totally adjusted twice, this error resulted in the unit being in a one out of two logic configuration longer than necessary, approximately 45 minutes. Failure to refer to the data sheet for the full span value was considered to be a weakness in procedure utilization by this individual.

No violations or deviations were identified. Except as noted above, the program area was adequately implemented.

6. Onsite Review Committee (40500)

The inspectors evaluated certain activities of the PNSC to determine whether the onsite review functions were conducted in accordance with TS and other regulatory requirements. In particular, the inspectors attended the July 10 and 11, 1992 PNSC meetings associated with the B SI pump waiver of compliance request reviews (see paragraph 3). The inspectors noted that the July 10 PNSC meeting mixed management/production decisions with their safety review. A similar problem was also noted during an earlier waiver of compliance request which was discussed in IR 91-20. The subsequent PNSC meeting on July 11, which approved the waiver request, was focused on safety. The inspectors verified that TS membership requirements were met and that the meeting minutes accurately reflected decisions and recommendations.

No violations or deviations were identified. Except as noted above, the program area was adequately implemented.

7. Followup (92700, 92701, 92702)

(Closed) LER 92-03, Inoperable Fire Barrier Door Due To Installation Deficiency. On February 26, 1992, the A EDG fire door was determined to have been incorrectly installed during original construction. The door's design required that the door have a rear binder to resist buckling during a fire. The similar fire door to the B EDG room was correctly installed. An investigation was unable to determine why no rear binder was installed on the A EDG room fire door. The condition was corrected by installation of a rear binder. The inspectors observed

selected portions of the modification and verified that procedures were adhered to and adequate precautions were taken to address cutting rebar in the seismic category I wall. The inspectors have no further questions at this time and this item is considered closed.

(Closed) LER 92-05, A Single Relief Valve Inside The Cold Leg SI Containment Isolation Boundary Did Not Provide Redundancy As Required By Containment Design Criteria. This item was described in IR 92-07 and the actions to correct the condition was discussed in IR 92-16. Thus, this item is considered closed.

(Closed) IFI 92-07-03, Review Actions To Resolve SI Cold Leg Penetration Design Deficiency. This item was addressed in LER 92-05 and was the subject of VIO 92-16-04. As further inspection of this item will be tracked under the VIO 92-16-04, this item is considered closed.

(Closed) LER 92-06, Inoperability Of Both EDGs Required An Unusual Event Declaration While In Cold Shutdown. This item was previously addressed in IR 92-11 and therefore, is considered closed.

(Closed) LER 92-07, Fire Suppression System Actuation In The North Cable Vault Resulted In An Alert Declaration. This item was addressed in IR 92-11 and was the subject of VIO 92-11-01. Thus, further inspection of this item will be performed in conjunction with the closeout inspection of that VIO. This item is considered closed.

(Closed) LER 92-12, Reactor Trip While In Hot Shutdown Due To Surveillance Test Activities. Inspection of this item was discussed in IR 92-16. The inspectors have no further questions at this time. This item is considered closed.

No violations or deviations were identified. Based on the information obtained during the inspection, the program area was adequately implemented.

8. Exit Interview (71701)

The inspection scope and findings were summarized on August 3, 1992, 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.

<u>Item Number</u>	<u>Description/Reference Paragraph</u>
92-21-01	URI - Review Foreign Material Control Practices Developed In Response To ACR 92-249 (paragraph 3).
92-21-02	NCV - Failure To Close Containment Isolation

Valves After Sample Collection As Required By
Procedure CP-003 (paragraph 4).

9. List of Acronyms and Initialisms

a. m.	Ante Meridiem
ACR	Adverse Condition Report
CFR	Code of Federal Regulations
CP	Chemistry Procedure
CV	Containment Vessel
EDG	Emergency Diesel Generator
F	Fahrenheit
FIT	Flow Indicating Transmitter
gpm	Gallons Per Minute
i. e.	That is
I & C	Instrumentation & Control
IFI	Inspector Followup Item
IR	Inspection Report
LCO	Limiting Condition for Operation
LER	Licensee Event Report
M	Modification
NCV	Non-cited Violation
NRC	Nuclear Regulatory Commission
OST	Operations Surveillance Test
p. m.	Post Meridiem
PNSC	Plant Nuclear Safety Committee
PS	Primary Sample
psi	Pounds per square inch
PT	Pressure Transmitter
QC	Quality Control
RCS	Reactor Coolant System
RHR	Residual Heat Removal
RO	Refueling Outage
RWST	Refueling Water Storage Tank
S/G	Steam Generator
SI	Safety Injection
SW	Service Water
TS	Technical Specification
URI	Unresolved Item
VCT	Volume Control Tank
WR/JO	Work Request/Job Order