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

Report No.: 50-261/92-07

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: March 14, 1992 - April 10, 1992

Lead Inspector: _____ 5/1/92
L. W. Garner, Sr. Resident Inspector Date Signed

Accompanying Personnel: C. R. Ogle, Resident Inspector

Approved by: _____ 5/1/92
H. O. Christensen, Section Chief Date Signed
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:

Cycle 14 which was completed on March 27, 1992, ended a 181 day record run for the unit (paragraph 2).

Security response to a loss of security lighting was observed to be prompt and proper (paragraph 3).

Management demonstrated sensitivity to shutdown risk concerns by development and implementation of a daily safety system status sheet and increased use of pre-evolution briefings (paragraph 3).

The intermediate range nuclear power instruments exhibited an unexplained decay type response after the reactor was subcritical (paragraph 3).

Portable radios were determined to be the probably cause of spurious emergency diesel generator fire detection system actuations. The failure to perform an evaluation of the potential impact of using radios with different frequencies than had previously been evaluated was considered a weakness (paragraph 3).

The Residual Heat Removal System heat exchangers were determined not to be supported at the top as required by vendor drawings (paragraph 3).

The utilization of a relief valve within the cold leg safety injection containment boundary was determined not to met design requirements (paragraph 3).

A high level of workmanship was evident in the concrete repairs to the underground north service water header (paragraph 5).

REPORT DETAILS

1. Persons Contacted

*R. Barnett, Manager, Outages and Modifications
*C. Baucom, Acting Director, Regulatory Compliance
J. Benjamin, Shift Outage Manager, Outages and Modifications
*R. Chambers, Plant General Manager, Robinson Nuclear Project
T. Cleary, Manager - Balance of Plant Systems and Reactor Engineering, Technical Support
D. Crook, Senior Specialist, Regulatory Compliance
*C. Dietz, Vice President, Robinson Nuclear Project
J. Dobbs, Manager, Nuclear Assessment Department Site Unit
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
D. Nelson, Shift Outage Manager, Outages and Modifications
*A. Padgett, Manager, Environmental and Radiation Control
M. Page, Manager, Technical Support
D. Seagle, Shift Supervisor, Operations
*R. Smith, Manager, Maintenance
W. Stover, Shift Supervisor, Operations
D. Winters, Shift Supervisor, Operations

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

NRC Management Visits

*H. Christensen, Section Chief, Division of Reactor Projects was on site April 14, 15, and 16, 1992, to meet with the resident inspectors and plant management.

*Attended exit interview on April 16, 1992,

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

2. Plant Status

On March 16, 1992, at 11:15 p. m. the packing blew out on HDV-286, the HDP discharge flow control bypass valve. At 1:50 a. m. on the next day a power reduction to 85 percent of full power was initiated to allow the A

HDP to be secured because of spray impingement from the failed packing. After temporary repair was completed to HDV-286, the A HDP was returned to service and power was increased to 95 percent of full power on March 17, 1992. The remainder of cycle 14 was operated at 95 percent of full power due to lack of fuel. A controlled unit shutdown was performed on March 27, 1992, to commence RO 14. The RO shutdown ended a 181 day record run. The RO, scheduled for 70 days, included: generic refueling activities, a full core offload, a combined ILRT and SIT, phase II electrical penetration replacement, installation of a larger RHR miniflow lines, visual inspection of the north service water underground header, UT inspection of the A and B S/G grith welds, RT inspection of the CV fan coolers' SW penetrations, replacement of the A RCP and C SW pump motors with refurbished motors, MOV VOTES testing, check valve inspections, repair of leaking CCW system valves, and disassembly and inspection of the low pressure turbine.

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, Operation's 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.

Loss Of Protected Area Security Lighting

On March 19, 1992, the inspectors observed that the security response to a loss of protected area security lighting was prudent and well implemented. At approximately 7:50 p. m. an electrical short on one high mast caused the breakers to trip to all the high mask lights. Partial lighting was restored in approximately one minute. Security personnel promptly manned the protected area boundary and continued compensatory measures as required.

RO 14 Activities

The inspectors observed selected outage activities during the inspection period. On March 27, 1992, the inspectors witnessed performance of GP-006, Normal Plant Shutdown From Power Operation To Hot Shutdown. The evolution was well controlled with an appropriate prebriefing, good communications among operating personnel, and limited access to the control room.

The inspectors verified that the licensee was sensitive to shutdown risk as demonstrated by the incorporation and use of a shutdown safety function status sheet in the daily schedule report. This status sheet identified current plant conditions, safety system status including which train was protected, and required and contingent lineups for: boration, cooling and makeup for the RCS and SFP, and electrical power sources. The licensee also extended the full core offload window, i. e., critical path, by an estimated four days to preclude the need for midloop operation.

Unexpected IR Nuclear Power Instrument Responses

After the reactor was subcritical the IR nuclear power instruments exhibited an unexpected response. Between approximately 10E-09 and 10E-10 microamps, IR channels NI-35 and NI-36 experienced decay responses with half lives of approximately 9.4 and 4.0 hours respectively. All other NI responded as anticipated. Neither the Technical Support engineer nor the vendor could explain the asymmetrical response of the IR nuclear monitors or determine if the condition was attributable to a natural phenomena or to an electronics problem. This was the first time since the new IR detectors were installed last RO that the response in this range was observable. Additional investigation into this unexpected response is planned during this outage. This item is identified as an IFI: Review Investigation Into Unexpected IR Detector Responses During Shutdown For RO 14, 92-07-01.

Radio Interference With Fire Detection Equipment

On April 1, 1992, at 2:09 a. m., a spurious actuation of the fire detection system resulted in the fire door and dampers in the A EDG room closing. All components functioned as designed. Since mid-1991 there has been three other spurious actuations of the EDG room fire detection system. The fire detector vendor (Cerebus Pyrotronics) has indicated that the sensor in the infra-red detector model S-121 had previously experienced sensitivity to strong high frequency electomagnetic radiation. Engineering reviews of potential sources of strong high frequency electromagnetic radiation had failed to determine the source. On April 2, 1992, testing was performed on the 800 megahertz radios used by maintenance and E & RC personnel. When these radios were stationary, the fire detector sensor might actuate; however, when they were moved around they almost always actuated the sensor. Thus, the recent spurious actuations of the EDG room fire detection system appeared to have been caused by these radios. The 400 megahertz radios used by Operations and Security personnel had previously been shown not to interfere with these fire detector sensors. This model fire detector was used only in the EDG fire zones. The area around the EDG rooms has now been posted with signs prohibiting the use of radios in the area. At the end of the report period, the vendor was modifying the detector design to provide additional shielding for the sensor.

Utilization of the 800 megahertz radios was initiated in early 1991 without the knowledge of Technical Support. Thus, no evaluation was performed of the potential impact of using a radio with a different radio frequency than those previously evaluated and approved. Failure to perform an engineering evaluation of the 800 megahertz radios was considered to be a weakness.

RHR Hx Support

Upon notification by another utility of a RHR Hx support deficiency, the NED initiated a review of the similar type Hxs installed here. Engineering determined that the RHR Hxs do not have lateral supports installed at the top lifting/seismic lugs as required by vendor drawings. Preliminary engineering evaluations indicate that the RHR Hx supports and associated piping supports would not fail during the maximum anticipated seismic event, i. e., calculated stresses are less than the materials' yield strength. However, the stresses are greater than that allowed by the ASME Code. At the end of the report period the licensee was evaluating modification options for installing lateral supports. In addition, two other vertical type Hxs, the CVCS non-regenative and seal water return Hxs, also have been determined not to have top lateral supports as required by vendor drawings. This condition was also under evaluation. Resolution and correction of the

vertical HX installation deficiencies is identified as an IFI: Review Actions To Resolve The Failure To Provide Top Lateral Support To Vertical Hxs, 92-07-02.

The design review performed was in response to a notification by another utility with similar Hxs of a deficiency at their facility. Discussions between the licensee and the NSSS vendor (Westinghouse) revealed that a breakdown in design control during plant's original design had occurred. Apparently, the Hx supplier (Atlas) had analyzed the Hx as being a flexible component requiring top lateral support, whereas, the NSSS vendor and plant architectural engineer (Ebasco) had considered the Hx as being a rigid structure, i. e., an anchor point. The inspectors discussed the condition with the onsite Westinghouse representative. On April 6, 1992, Westinghouse sent notification to all their site service managers informing them of the potential problem. Westinghouse has initiated a review to ascertain if this situation warrants opening a potential issue and to determine safety significance.

SI Cold Leg Penetration Configuration

On April 9, 1992, the three SI cold leg penetration configurations (penetration nos. 62, 63, and 64) were determined not to be in accordance with design criteria. Plant design required two CV barriers to prevent radiological releases from these penetrations. The first barrier consisted of the upstream piping from the CV wall up to and including the two normally closed SI-870A and B MOVs which were in parallel with one another. The second barrier was the closed SI system upstream of the SI-870A and B valves. A relief valve SI-857B which provided protection for the 1500 pound SI piping was installed within the first boundary. Relief valves were not considered as an acceptable isolation boundary. This condition was reported as required by 10 CFR 50.72(b)(2)(iii)(C). The condition was discovered as part of the CV isolation boundary study which was initiated in 1991 (see URI 90-17-02).
Resolution of this deficiency is identified as an IFI: Review Actions To Resolve SI Cold Leg Penetration Design Deficiency, 92-07-03.

CV Inspection

On March 29, 31, and April 5, 1992 the inspectors conducted general inspections of the CV excluding the CV sump. The inspection on March 31 was performed with the Maintenance and E & RC Managers during their management housekeeping tour. Boric acid buildup was found on a number of instrumentation fittings and manifold valves associated with RCS flow and accumulator level. Boric acid crystals were also observed on top of the

seal table and on the side of two guide tubes. The inspectors also noted that several of the isolation valves located at the seal table were not properly bolted, i.e., loose and/or missing bolts. Several small paint chips, the largest less than one square foot, had come loose from the floor. The above conditions were reported to the licensee. The presence of boric acid on the guide tubes could not readily be explained. The inspectors discussed this condition with the cognizant engineering supervisor. Visual inspection by engineering personnel also failed to determine the guide tube boric acid source. The engineering supervisor indicated a willingness to consider other methods of verifying that the these guide tubes were not the source of the boric acid crystals.

No violations or deviations were identified. Based on information obtained during the inspection, the program 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, 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:

EST-085 Containment Integrated Leak Rate Test

OST-001 Nuclear Instrumentation Source Range, Intermediate Range, Power Range Weekly (While Reactor Is Shutdown)

OST-553 Turbine Mechanical Overspeed Trip Test

SP-940 Inspection Of Service Water Piping And Intake Structure

SP-1033 Structural Integrity Test

No violations or deviations were identified. Based on information obtained during the inspection, the program 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, and testing controls were adhered to. In particular, the inspectors observed/reviewed the following maintenance activities:

EST-028 Main Steam Safety Valve Testing

SP-968 Cement Lining Repair Using "Speed Crete Blue Line"

North SW Header Inspection

The inspectors visually examined 400 feet, approximately 40 percent, of the 30 inch north SW underground header (30-CW-11). The interior of the concrete lined pipe including the concrete joint repairs made during the previous RO was observed to be in good condition. One joint was observed with a narrow circumferential crack. This condition had previously been evaluated by Technical Support personnel who had determined that repair at this time was not warranted. Only small areas between the joints were identified for repair. A high level of workmanship was evident in the concrete repair, i. e., smoothing and blending of the patches. Repair of the concrete liner was being conducted in accordance with SP-968 which included appropriate QC verifications. The inspectors also noted that the friction joint showed indications of surface rust and pitting. The cognizant engineer indicated that they were evaluating the possibility of applying a protective coat to the metal and/or replacing the friction joints during a future outage.

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

6. Plant Safety 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 special PNSC on April 3, 1992 concerning revisions to fire protection procedures which were needed to support the ILRT. It was ascertained that provisions of the TS dealing with membership, review process, frequency, and qualifications were satisfied. The meeting minutes were reviewed to confirm that decisions were accurately reflected in the minutes.

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

7. Followup (92700, 92701, 92702)

(Open) IFI 90-05-01, Review SW MIC Monitoring Program Changes Required By Accelerated MIC Growth Rates. IRs 91-01 and 91-05 discussed the discovery of MIC in the HVH-4 CV fan cooler supply and return lines which are located under the transfer canal inside the CV and in the SW CV penetrations associated with the CV fan coolers (HVH 1-4). The lines associated with HVH-4 are scheduled to be replaced during this RO. Examination of SW CV penetration radiographs taken during April 1992 revealed no apparent additional MIC growth. The inspectors verified the licensee's conclusion by comparing several of the radiographs taken this outage with those for similar areas taken during the previous outage. Due to the additional metal on the penetration piping which was sleeved last RO, the previously identified MIC indications were barely visible. Hence, it was not obvious whether or not additional MIC attack had occurred in these particular joints; however, the presents of the sleeve precluded this from being a safety issue. Radiographs associated with unsleeved joints did not show expansion of existing MIC or new MIC growth. Thus operation until permanent repairs are completed in RO 15, the next RO, was justified. This item remains open until this work is completed in RO 15.

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

8. Exit Interview (30703)

The inspection scope and findings were summarized on April 16, 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.

Item Number	Description/Reference Paragraph
92-07-01	IFI - Review Investigation Into Unexpected IR Detector Responses During Shutdown For RO 14 (Paragraph 3)
92-07-02	IFI - Review Actions To Resolve The Failure To Provide Top Lateral Support To Vertical Hxs (Paragraph 3)
92-07-03	IFI - Review Actions To Resolve SI Cold Leg Penetration Design Deficiency (Paragraph 3)

9. List of Acronyms and Initialisms

a. m.	Ante Meridiem
ASME	American Society of Mechanical Engineers
CCW	Component Cooling Water
CFR	Code of Federal Regulation
CV	Containment Vessel
CVCS	Chemical And Volume Control System
CW	Circulating Water
EDG	Emergency Diesel Generator
E & RC	Environmental and Radiation Control
EST	Engineering Surveillance Test
GP	General Procedure
HDP	Heater Drain Pump
HDV	Heater Drains And Vents
HVH	Heating Ventilation Handling
Hx	Heat Exchanger
i. e.	That Is
IFI	Inspector Followup Item
ILRT	Integrated Leak Rate
IR	Inspection Report
IR	Intermediate Range
LCO	Limiting Condition for Operation
MIC	Microbiologically Induced Corrosion
MOV	Motor Operating Valve
NI	Nuclear Instrumentation
NSSS	Nuclear Steam Supply System
OST	Operations Surveillance Test

p. m.	Post Meridiem
PNSC	Plant Nuclear Safety Committee
QC	Quality Control
RCP	Reactor Coolant Pump
RCS	Reactor Coolant System
RHR	Residual Heat Removal
RO	Refueling Outage
RT	Radiographic Test
SFP	Spent Fuel Pool
S/G	Steam Generator
SI	Safety Injection
SIT	Structural Integrity Test
SP	Special Procedure
SW	Service Water
TS	Technical Specification
URI	Unresolved Item
UT	Ultrasonic Test

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