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

Report No.: 50-261/91-27

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: November 9 - December 9, 1991

Lead Inspector: W. M. Garner 12/30/91
L. W. Garner, Senior Resident Inspector Date Signed

Other Inspector: K. R. Jury, Resident Inspector

Approved by: H. O. Christensen 12/30/91
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, maintenance observation, safety assessment, shift staffing and followup.

Results:

The Robinson design basis did not preclude a passive failure of a single electrical cable which would render the ventilation system inoperable for both emergency diesel generators. This item, identified as an inspector followup item, is under review by the NRC (paragraph 2).

The minimum required shift staffing was determined to be adequate to provide five members to the fire brigade while simultaneously performing the required emergency preparedness classification and communications functions along with performing control room emergency operating procedure steps. If inplant equipment manipulations would become necessary, then personnel assigned to the fire brigade or other functions would have to be reassigned to the equipment manipulations. However, the licensee normally exceeds the minimum staffing requirements and should be able to handle the additional work load (paragraph 5).

The failure to have developed a plan to incorporate Technical Support system review identified items into maintenance procedures was a weakness (paragraph 6).

REPORT DETAILS

1. Persons Contacted

*W. Biggs, Manager, Nuclear Engineering Department Site Unit
*R. Chambers, Plant General Manager, Robinson Nuclear Project
*C. Dietz, Vice President, Robinson Nuclear Project
D. Dixon, Manager, Control and Administration
*J. Dobbs, Manager, Nuclear Assessment Department Site Unit
R. Femal, Shift Supervisor, Operations
B. Harward, Manager - Mechanical Systems, Technical Support
*J. Kloosterman, Manager, Regulatory Compliance
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
*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.

*Attended exit interview on December 10, 1991

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

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, 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.

Poor Design Of EDG Room Ventilation Fan Control Circuits

On December 4, 1991, while performing engineering activities for a potential plant improvement, the licensee determined that a single failure in the non-safety related fire protection circuitry could render the safety related supply and exhaust ventilation fans in both the A and B EDG rooms inoperable. The fire protection system was designed such that either train A or train B of the fire protection system could secure the supply and exhaust fans to a EDG room if a fire were to occur in that room. Though the fans' control circuit wiring for the A and B EDG rooms was separated up to the interface with the fire protection circuitry, one multiple conductor electrical cable which contained part of the control wiring for each of the fans was installed between the A and B fire protection train electrical panels. Thus, a failure of this one cable could render all the EDG room ventilation fans inoperable. The unavailability of room ventilation while the EDGs are operating had not been analyzed, therefore the licensee initiated an operability determination (91-024) to determine if the EDGs were operable with the installed fan control wiring configurations. In addition, since the fire protection system was not installed to withstand a seismic event, the operability determination also addressed this fact. Engineering concluded and the PNSC concurred on December 7, 1991, that the plant licensing bases had not included any requirement that a support system to an ESF system be designed and constructed to the same standards as that required of the ESF system. Hence, the licensee concluded that the EDG room ventilation subsystems did not have to meet a single failure criterion. The potential interaction between the fire protection system and a safety related support system during a seismic event was considered by the licensee to be part of GSI-57 and should be resolved in the future as part of that issue. Therefore, operability determination 91-024 concluded that the EDGs were operable. However, the present circuit configurations were considered undesirable and thus the licensee plans to modify the circuitry during RO-14 which was scheduled to begin in March 1992. The review of the licensee's position on support system design basis is identified as IFI 91-27-01.

No violations or deviations were identified.

3. 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 and approved procedures. The inspectors determined that these activities did not violate LCOs and that required redundant components were operable. The inspectors verified that required administrative, testing, and fire prevention controls were adhered to. In particular, the inspectors observed/reviewed the following maintenance activities:

CM-640	EDG Exhaust System Maintenance
MST-004	Pressurizer Pressure Protection Channel Testing

No violations or deviations were identified.

4. 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 special PNSC on December 7, 1991 which reviewed Operability Determination 91-024 (see paragraph 2). It was ascertained that provisions of the TS dealing with membership and review process were satisfied.

No violations or deviations were identified.

5. Shift Staffing Survey (71707)

The inspectors reviewed the present Operations shift staffing policies and practices to determine if adequate manpower would be available to simultaneously implement required emergency operating and emergency preparedness procedures while fully manning the fire brigade. The minimum shift complement as defined in OMM-001, Operations - Conduct Of Operations, was consistent with that required by TS. Both TS and OMM-001 required five fire brigade members which excluded three shift members who are necessary for safe shutdown of the plant and any personnel required for other essential functions during a fire emergency. The inspectors concluded that the minimum shift complement as defined by TS and OMM-001 would be able to perform the necessary emergency response and emergency operating procedure control room actions while simultaneously providing five members to the fire brigade. However, if inplant equipment manipulations would be required, personnel assigned to the emergency preparedness functions or fire brigade would have to be redirected to the inplant manipulations or additional personnel would have to be available. A similar conclusion was reached concerning the minimum staff's response capabilities involving potential use of the dedicated shutdown procedures. Staffing levels of the five operations shifts were at least 1 licensed operator and 4 non-licensed operators above the minimum

requirements. On each shift, the fire brigade included a fire protection technician as one of the five members. TS allowed the STA to fulfill the role of both a STA and a licensed operator.

No violations or deviations were identified.

6. Followup (92700, 92701, 92702)

(Open) URI 88-16-01, Resolution Of EQ Issues Associated With SI And RHR Pump Rooms. The licensee has combined the EQ upgrading of the SI and RHR pump room coolers with the project to provide a long term solution to the room coolers' coil erosion issue. This latter item which includes the SI, RHR, and AFW room coolers has been identified as IFI 89-13-01. The proposed project will upgrade the cooler motors and fan drive belts to EQ standards and provide an improved coil design utilizing more erosion resistant materials. This project was not funded for 1992; however, funding was anticipated to be available to start engineering activities in 1993. This item as well as 89-13-01 will remain open pending implementation of the proposed modification.

(Closed) IFI 89-09-03, Review Actions To Be Taken When An Instrument Loop Exhibits Random Behavior. Subsequent to the identification of this item, the licensee has implemented a structured operability determination process to address operability concerns when equipment performance is questionable. Implementation of this operability determination process as defined in OMM-39, Operability Determination, is sufficient to address the issue identified in IFI 89-09-03. This item is closed.

(Open) URI 89-12-01, Ensure Adequacy Of Upgraded Maintenance Procedures. Approximately 20% of the procedures identified in the program have been revised with approximately another 20% in process. The upgrade project was anticipated to be completed by the end of 1992. However, some procedure deficiencies as well as new procedures which were and are being identified by the Technical Support system review for PM and predictive maintenance activities were not included in the maintenance procedure upgrade scope. The system review was scheduled for completion by the end of 1993. However, a specific schedule and mechanism for incorporation of identified procedure deficiencies from the system reviews into the maintenance procedures had not been developed. The lack of integration of these two efforts was considered a weakness. This item remains open pending incorporation of the system review identified items into maintenance procedures and review of the adequacy of the upgraded procedures. The inspectors plan to review the quality of the upgraded procedures during utilization of these procedures during RO-14.

(Open) IFI 89-13-01, Review Corrective Actions To Ensure Improved HVH Unit Reliability. See URI 88-16-01.

(Open) IFI 89-17-01, Review AFW System Hardware Modifications And Testing. The acceptability of the hardware modifications to correct the AFW pump NPSH issue has been documented in IR 89-23, 89-32, and 91-05.

The remaining issue, recirculation damage to the MDAFW pumps, has been partially addressed by the licensee. The inspectors verified that, as committed, OST 201, Motor Driven Auxiliary Feedwater System Component Test - Monthly, has been revised to require increased flow rates during testing to reduce the potential for pump recirculation damage. In a management meeting, held on December 28, 1989, in the Region II Office, the licensee committed to the installation of larger mini-flow recirculation lines for the AFW pumps. This modification, identified as PCN 89-209, is scheduled for development in 1992 and installation in the 1993 refueling outage (RO-15). This item remains open pending installation of the larger recirculation lines. All other aspects of the 89-17-01 IFI have been satisfactorily addressed and are considered closed.

(Closed) IFI 89-25-01, Review EDG Undervoltage Relay Calibration Problem. The root cause of the failure to properly calibrate the undervoltage relay was attributed to an inadequate calibration procedure and a misunderstanding of how the relay operated. The Westinghouse type CV-7 undervoltage relays were being used to provide a permissive to close the EDG's output breaker when rated voltage was sensed, e. g., when the undervoltage condition reset. The miscalibration occurred when I&C technicians utilizing the technical manual to calibrate the relays thought that the time for relay reset was the same as the time for relay actuation. Since the reset function required 3 to 4 times more time to occur than the actuation function, setting a relay at an actuation time of 1 second actually resulted in a reset time of between 3 and 4 seconds. The inspectors verified that the applicable calibration procedure PIC-805, Westinghouse Type CV-7 Undervoltage Relays, was revised to provide specific steps for checking and adjusting the EDG undervoltage relays. This should preclude recurrence of this problem. However, on January 16, 1991, during performance of OST-163, Safety Injection Test and Emergency Diesel Generator Auto Start On Loss Of Power And Safety Injection And Emergency Diesel Trips Defeat, the B EDG undervoltage relay reset occurred approximately four seconds late. This resulted in the test acceptance criteria not being met. The relay was calibrated and the test successfully performed. Review of this later event failed to identify a root cause. Prior to OST-163, both the A and B EDG undervoltage relays had been calibrated by the same I&C technician using the revised procedure, thus procedural or personnel knowledge should not have been factors. Based upon the procedure revision, this IFI is considered closed. Future performance of the B EDG undervoltage relay will be monitored by the inspectors as part of the routine inspection program.

No violations or deviations were identified.

7. Exit Interview (30703)

The inspection scope and findings were summarized on December 10, 1991, with those persons indicated in paragraph 1. The inspectors described the areas inspected and discussed in detail the inspection finding 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
91-27-01	IFI - Review Licensee's Position on Support System Design Bases (paragraph 2).

8. List of Acronyms and Initialisms

AFW	Auxiliary Feedwater
CM	Corrective Maintenance
e.g.	For Example
EDG	Emergency Diesel Generator
EQ	Environmental Qualifications
ESF	Engineered Safety Feature
GSI	Generic Safety Issue
HVE	Heating Ventilation Exhaust
HVH	Heating Ventilation Handling
I&C	Instrumentation & Control
IFI	Inspector Followup Item
IR	Inspection Report
LCO	Limiting Condition for Operation
MDAFW	Motor Driven Auxiliary Feed Water
MST	Maintenance Surveillance Test
NPSH	Net Positive Suction Head
OMM	Operations Management Manual
OST	Operations Surveillance Test
PCN	Project Change Notice
PIC	Process Instrument Calibration
PM	Preventive Maintenance
PNSC	Plant Nuclear Safety Committee
RHR	Residual Heat Removal
RO	Refueling Outage
SI	Safety Injection
STA	Shift Technical Advisor
SW	Service Water
TS	Technical Specification
URI	Unresolved Item*
WR/JO	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.