



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

Report No.: 50-261/90-15

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: July 10-13, 1990

Inspector: G. R. Wiseman 8-2-90  
G. R. Wiseman Date Signed

Contributing Personnel: P. Fillion

Approved by: M. Hunt 8-2-90  
M. Hunt, Acting Chief Date Signed  
Plant Systems Section  
Engineering Branch  
Division of Reactor Safety

SUMMARY

Scope:

This routine, announced inspection was conducted in the areas of Inspector Follow-up Items (IFI), and Violations related to Electrical and Fire Protection Systems. The inspector also reviewed the licensee's Fire Protection program (64704).

Results:

In the areas inspected, violations or deviations were not identified.

Recent reorganization of the site Fire Protection Staff has had a positive affect in the long term management of the Fire Protection Program as evidenced by self-identification of potential programmatic problems in the fire barrier penetration seal area.

## REPORT DETAILS

### 1. Persons Contacted

#### Licensee Employees

- \*R. L. Barnett, Manager, Outages and Modifications
- \*S. A. Billings, Technical Aide - Regulatory Compliance
- \*R. D. Crook, Senior Specialist - Regulatory Compliance
- \*C. R. Dietz, Manager, Robinson Nuclear Power Plant
- \*J. D. Kloosterman, Director - Regulatory Compliance
- \*R. E. Morgan, Robinson Plant General Manager
- \*E. Y. Roper, Fire Protection Specialist, Operations
- \*E. M. Shoemaker, Project Engineer - Operations Programs

Other licensee employees contacted during this inspection included craftsmen, engineers, security force members, technicians, and administrative personnel.

#### NRC Resident Inspectors

L. Garner  
K. Jury

\*Attended exit interview.

### 2. Fire Protection/Prevention Program (64704)

#### a. Plant Tour and Inspection of Fire Protection Equipment.

##### (1) Outside Fire Protection Walkdown

The following sectional control valves in the outside fire protection water supply system were inspected and verified to be properly aligned, and locked in position:

PIV - FP-244	PIV - FP-441
PIV - FP-245	PIV - FP-443
	PIV - FP-447
PIV - FP-246	PIV - FP-466
FP-8	

The following fire hydrants and fire hydrant equipment houses were inspected:

HY - 1	HY - 4
HY - 2	HY - 7
HY - 3	HY - 13

The equipment houses contained the minimum equipment requirements of that specified by NFPA-24, Private Fire Service Mains and Their Appurtenances, and/or the FSAR commitments. The equipment appeared to be adequately maintained.

A tour of the exterior of the plant indicated that sufficient clearance was provided between permanent safety-related buildings and structures and temporary buildings, trailers, and other transient combustible materials. The general housekeeping of the areas adjacent to the permanent plant structures was satisfactory.

(2) Permanent Plant Fire Protection Features

A plant tour was made by the inspector. During the plant tour, the following safe shutdown related plant areas within the Auxiliary Building and their related fire protection features were inspected:

Fire Area A

- Fire Zone 1 - Diesel Generator "B" Room
- Fire Zone 2 - Diesel Generator "A" Room
- Fire Zone 3 - Safety Injection Pump Room
- Fire Zone 7 - Auxiliary Building First Level Hallway
- Fire Zone 13- Chemical Storage and Boric Acid Batching Tank
- Fire Zone 15- Auxiliary Building Second Level Hallway
- Fire Zone 19- Unit 2 Cable Spreading Room
- Fire Zone 20- Emergency Switchgear Room

Fire Area B

- Fire Zone 4 - Charging Pumps Room

Fire Area C

- Fire Zone 5 - Component Cooling Pumps Room

Fire Area D

- Fire Zone 9 - North Cable Vault

Fire Area E

- Fire Zone 10 - South Cable Vault

The fire/smoke detection systems, manual fire fighting equipment (i.e., portable extinguishers, hose stations, etc.) and the fire area boundary walls, floors and ceiling associated for the above plant areas were inspected and verified to be in service or functional.

The automatic sprinkler system installed in the Auxiliary Building hallway was inspected and had been placed out-of-service by the licensee due to a malfunction of the system isolation valve. The inspector verified that the appropriate Technical Specification (T.S.) actions were in place. The licensee had posted a continuous fire watch in the Hallway area. The fire watch activities were being properly monitored and logged by the on shift Fire Protection Technical Aide. A review of the Fire Protection Log for July 11 and 12, 1990 indicated the above activities were being tracked. The fire watch personnel appeared attentive and knowledgeable of their required duties.

Based on this inspection, it appears that the fire protection features associated with the above plant areas are satisfactorily maintained.

The plant tour also verified the licensee's implementation of the fire prevention administrative procedures. The control of combustibles and flammable materials, liquids and gases, and the general housekeeping were found to be satisfactory in the areas inspected.

3. Action on Previous Inspection Findings (92701, 92702)

The licensee's actions associated with the following items were reviewed:

- a. (Closed) Violation 88-36-01, Unanalyzed Loss of Safety-Related Motor Control Centers (MCC).

In October, 1988, the licensee, through a formal Design Basis Reconstitution Program identified a design problem that resulted in the issuance of a Notice of Violation (NOV). The subject of this NOV was the failure to recognize the maximum coincidental load on the safety-related motor control centers supplying power to various smaller but essential loads.

MCC 5 is 480/277 Volt, three-phase. It has a current limiting reactor at the incoming terminals. Motor Control Center 5A is basically an extension of MCC 5, because the two buses are directly connected (no circuit breaker.) MCC 10 is 208/277 Volt, three-phase, and fed from MCC 5A. MCC's 6, 6A and 9 are similarly arranged and redundant. For purposes of this discussion, the system may be simplified to MCC 5 (Train A) and MCC 6 (Train B).

In October, 1988, the maximum coincidental load on MCC 5 was calculated to be 800 Amperes (later refined to 760 Amperes). This load represented a case where MCC 5 was aligned to offsite power, a safety injection signal was present and MCC 6 (the redundant MCC) was de-energized. MCC 6 de-energized represented application of the single failure criterion. The single failure criterion applied

in this way resulted in the addition of 140 Amperes to the previously analyzed worst case. Qualitatively, the additional 140 Amperes may be explained as follows. Non-safety-related loads, fed from MCC-5, would be present when offsite power was available. In addition, the design concept of redundancy was applied to these non-safety-related loads, i.e., designated normal and automatic start backup. In general with redundant power supplies available the non-safety related loads would be balanced between MCC's 5 and 6. This would be ensured by operator action taken during normal operation. However, if MCC 6 was de-energized, the corresponding non-safety-related backup loads could appear on MCC 5.

The critical problem identified in October, 1988, was that 760 Amperes could cause tripping of the feeder breaker to MCC 5, and result in loss of both redundant trains of multiple safety-related systems. The long time element of the overcurrent trip device for the feeder breaker to MCC 5 was set at 800 Amperes since December 1975. Previously, it had been set lower. Even at the 800 Amperes setting, tripping could have occurred because the tolerance band is 720 to 880 Amperes. A similar situation with slightly different load values existed on MCC 6.

The NOV for this problem cited 10CFR 50.46, Appendix K, Section D.1, "Single Failure Criterion." In the reply to the NOV, the licensee stated that the problem apparently existed since original plant design. In the reply to the Nov, the Licensee Event Report (LER 88-23) and the Enforcement Conference the licensee stated that the following corrective actions were taken or were to be taken:

- (1) The maximum coincidental load on MCC's 5 and 6 was reduced to 620 Amperes and 596 Amperes respectively by blocking automatic start of backup non-safety-related loads. In addition, the breakers for the turbine turning gear were opened and tagged to further reduce automatically sequenced loads. These temporary actions were taken on October 6, 1988.
- (2) On October 14, after an overload situation was thought to exist on the MCC 6 feeder cable even with the compensatory measures of item 1, the plant was shutdown. Before restarting the plant, items 3, 4 and 5 were accomplished.
- (3) The MCC's were inspected for signs of damage due to overload, and none was found.
- (4) Safety-related power cables in general were evaluated for ampacity concerns and immediate concerns were not found. Project 88-192/04 continues to evaluate cable ampacity for long term concerns.

- (5) The MCC 6 feeder cable was replaced with one having greater ampacity i.e., same conductor size but 90°C insulation with new routing. However, this was later determined to have been not necessary.
- (6) During refuel No 12, several non-safety-related loads were removed, but the maximum coincidental load remained above the MCC rating of 600 Amperes, 613 Amperes for MCC 5 and 592 Amperes for MCC 6, because the temporary action of item 1 was cancelled. An Engineering Evaluation was performed which supported the acceptability of this condition, and justified continued operation until refuel No. 13.
- (7) On February 2, 1989, monitoring of MCC loading was initiated, although this was not part of the required corrective action.

The NRC inspector confirmed each of these corrective actions, compared the load calculation results to equipment ratings, and reviewed portions of the overcurrent protection coordination study having a bearing on the subject problem. In consideration of the above discussion, Violation 88-36-01, Unanalyzed Loss of Safety-Related Motor Control Centers, is closed.

- b. (Open) IFI 88-31-01, Review of Engineering Evaluations for Fire Barriers.

The licensee has initiated Plant Improvement Request 88-203/00 to review the Engineering Evaluations (EE) for penetration seals which failed the required Technical Specification surveillance OST-623.

LER 90-003-00 identified fire barrier electrical penetrations with no internal fire barrier seals. Compensatory actions as required by T.S. were taken, and the penetrations were repaired to provide required seals.

As a result, the licensee on April 16, 1990, initiated a Fire Barrier Penetration Inspection Project to provide inspection of all fire barrier penetrations to insure the seal is operable per OST-623. This inspection is intended also as a Design Verification and to provide an updated and accurate computer database for fire barrier penetrations.

The licensee's objectives of the 1990 Fire Barrier Penetration Inspection Project are:

- (1) Verify the fire barrier penetration data base on EDB is up-to-date and accurate.
- (2) Verify all fire barrier penetration drawing, show all penetrations, and reflect as-built configuration.

- (3) Verify each fire barrier penetration is adequately sealed per OST-623 criteria.
- (4) Verify all penetrations covered by Engineering Evaluations correspond to the evaluated configuration.
- (5) Verify that no seismic supports are mounted to any fire barrier penetration blockouts.

This project will provide an improved basis for future fire barrier surveillances and Design Modification Reviews. At present approximately 40% of the seal inspection is complete; full complete implementation scheduled by March 30, 1991. Revised EEs as a result of the inspection effort are presently in the licensee's review cycle.

This item remains open pending the completion of the 1990 Fire Barrier Penetration Inspection Project and the licensee's final review of the associated Engineering Evaluations.

- c. (Closed) Inspector Followup Item 50-261/86-18-01, Periodic Testing/Surveillance of Appendix R Protective Devices Associated with Appendix R. Coordination Study.

This item was previously discussed in NRC Inspection Report 50-261/90-08, paragraph 3.0. The IFI was incorrectly identified in the report as (IFI 50-261/90-18-01) and, was closed by the inspector based on a commitment by the licensee to incorporate the item on the plant work management prioritization system as an NRC commitment.

During this inspection, it was verified that the licensee has indeed revised their work management prioritization system [Regulatory Action Item List-R.A.I.L.] to indicate this item as a NRC commitment. The licensee has initiated a Plant Change Notice (PCN) 87-026/00-03, dated May 23, 1990, which requests 1990 budget funding authorization for completion of the project by December 31, 1990. To accomplish the project commitment two procedures should be developed for fuse control and molded-case circuit breaker testing. Draft procedure PLP-020 has been developed for Fuse control. Existing procedure, PM-402 has been revised and is in draft form also for testing of Appendix R. 480V switchgear breakers.

#### 4. Exit Interview

The inspection scope and results were summarized on July 13, 1990, with those persons indicated in paragraph 1. The inspectors described the areas inspected and discussed in detail the inspection results listed below. Proprietary information is not contained in this report. Dissenting comments were not received from the licensee.