



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

Report No.: 50-261/86-18

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: July 14-18, 1986

Inspector: A. B. Ruff

8/20/86
 Date Signed

Approved by: T. E. Conlon
 T. E. Conlon, Section Chief
 Plant Systems Section
 Division of Reactor Safety

8-20-86
 Date Signed

SUMMARY

Scope: This routine, special announced inspection was conducted in the areas of 10 CFR 50, Appendix R Associated Circuits.

Results: No violations or deviations were identified.

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REPORT DETAILS

1. Persons Contacted

Licensee Employees

- *R. E. Morgan, General Manager
- *H. J. Young, Director Quality Assurance/Quality Control (QA/QC)
- *D. B. Bates, NELD
- *D. Sayre, Regulatory Compliance
- *F. Lowery, Manager Operations
- J. Royal, NELD
- J. Hart, NELD

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

NRC Resident Inspectors

H. Krug

*Attended exit interview

2. Exit Interview

The inspection scope and findings were summarized on July 18, 1986, with those persons indicated in paragraph 1 above. The inspector described the areas inspected and discussed in detail the inspection finding listed below. No dissenting comments were received from the licensee.

Inspector Followup Item (IFI) 50-261/86-18-01, Periodic Testing/
Surveillance of Appendix R Protective Devices Associated With
Appendix R Coordination Study [Paragraph 5.(2)].

The licensee did not identify as proprietary any of the material provided to or reviewed by the inspector during this inspection.

3. Licensee Action on Previous Enforcement Matters

This subject was not addressed in the inspection.

4. Unresolved Items

Unresolved items were not identified during the inspection.

5. Associated Circuits

a. General

This inspection was a followup of the associated circuit portion of an inspection made in February 1985 covered by NRC report 85-07. At the time of the 1985 inspection, H.B. Robinson was not required to have its Fire Protection Plan analysis complete or in effect. Consequently, two Inspector Followup Items (IFIs) were identified in the associated circuits area as indicated below:

- (1) 50-261/85-07-03, Review Completed Coordination Study for Associated Circuits Common Power Supply
- (2) 50-261/85-07-04, Review of Common Enclosure Concerns for Normal/Alternative Shutdown Circuits

These items are closed as a result of this inspection.

The associated circuits of concern are identified in Generic Letter (G/L) 81-12 of February 20, 1981 and a supplement to this letter issued in the spring of 1982. Associated circuits of concern are those circuits that have physical separation less than that required by 10 CFR 50, Section III G of Appendix R and having one of the following:

- (1) A common power source (common bus) with the shutdown equipment and the power source is not electrically protected from the circuit of concern by coordinated breakers, fuses, or similar devices; or
- (2) A connection to circuits of equipment whose spurious operation (spurious signal) would adversely affect the shutdown capability; or
- (3) A common enclosure with the shutdown cables, and
 - (Type 1) are not electrically protected by circuit breakers, fuses or similar devices, or
 - (Type 2) will allow propagation of the fire into the enclosure.

H. B. Robinson's Associated Circuit Analysis is covered by their report 7107-P-200

b. Associated Circuits by Common Power Supply (Common Bus)

Circuits and cables associated by common power supply are simply nonsafe shutdown cables whose fire-induced failure will cause the loss of a power source (bus, distribution panel, or MCC) that is necessary to support safe shutdown. This problem could exist for power, control, or instrumentation circuits. The problem of associated circuits of

concern by common power supply is resolved by ensuring adequate electrical coordination between the safe shutdown power source supply breaker and the component feeder breaker or fuses.

The electrical distribution system coordination study is detailed by the licensee's task plan 7107-P-400. This report was reviewed and a sample selection of circuits were checked. The following are examples of the Time Current Curves (TCC) that were reviewed during this inspection.

<u>TCC Number</u>	<u>Description</u>
HBRAR.01-01	480V AC Bus 1
HBRAR.01-3	208V AC MCC #10
HBRAR.01-4	120V AC Inst. Bus 1 & 6
HBRAR.01-2	480V AC Bus E1 & MCC 5/5A
HBRAR.01-5	120V AC Inst. Bus 2 & 7
HBRAR.01-6	125V DC MCC A
HBRAR.02.4	120V AC Inst. Bus 4 & 9
HBRAR.06-1	480V AC Bus 2 B
HBRAR.04-1	480V AC Bus E2 & MCC 6/6A
HBRAR.05-2	Dedicated Shutdown Dist Sys.

The licensee was asked about a periodic Testing/Surveillance program for Appendix R protective devices associated with the above coordination study. CP&L's representative indicated that most, if not all, protective device were covered by their periodic Test/Surveillance program, Technical Specification or other NRC requirement. There was no specific program for these devices and no list was available to indicate that all devices were addressed. This item is identified as Inspector Followup Item 50-261/86-18-01, Periodic Testing/Surveillance of Appendix R Protective Devices associated with Appendix R Coordination Study.

IE Information Notice 85-09, Isolation Transfer Switches and Post-Fire Shutdown Capability, was issued January 31, 1985. This Notice identifies a potential problem concerning fuses in control circuits that are common for operation of equipment from the Control Room and Alternate Shutdown Systems. A fire in the Control Room could cause these common fuses to blow before transfer is made to the Alternate Shutdown System. If the control circuit is needed at the Alternate Shutdown System to energize a piece of equipment and if the fuse(s) blew before transfer, equipment would not be operable without replacing the blown fuse(s). The licensee indicated that the transfer scheme for their Dedicated/Alternate Shutdown system was reviewed as a result of this information notice and for all cases in which a common power source is used both in the normal and alternate shutdown modes (i.e., control transfer only) redundant fuses are provided.

Several electrical schematics listed below were reviewed for redundant fuses and were found to be acceptable:

<u>Drawing No B-190628</u>	<u>Description</u>
Sheet No. 201	Component Cooling Pump A
Sheet No. 161	Charging Pump A
Sheet No. 631A, B & C	Steam Driven FWP Steam Shut - off Valve V1-8A
Sheet No. 647A, B & C	Steam Driven FWP Steam Shut - off Valve V2 - 14A

c. Associated Circuits Causing Spurious Operation (Spurious Signals)

Circuits associated because of spurious operation are those that can, by fire-induced failures cause safe shutdown equipment of nonsafe shutdown equipment to maloperate in a way that affects the function of safe shutdown systems or equipment. Examples include the uncontrolled opening or closing of valves, or of circuit breakers, due to fire-induced damage to nonsafe shutdown instrument and control circuits that affect the control circuit of the safe shutdown components.

The licensee analysis of spurious operations was performed in conjunction with their Appendix R Separation Analysis 7107-P-300. This analysis considered equipment that could affect safe shutdown of the plant.

Redundancy between shutdown circuits with proper separation, protection, modification and/or analysis and the licensee's Alternate/Dedicated Shutdown System has been used to resolve this concern.

The high/low pressure interface electrically operated valves were reviewed in detail for spurious signal concerns. These valves are associated with the five systems listed below:

- (1) The reactor coolant vent system
- (2) The letdown system
- (3) The primary sampling system
- (4) The power operated relief valve (PORV)/block valve
- (5) The RHR system (suction side valves)

The spurious operation of these valves were mitigated by valve redundancy, proper separation, protection of cables, analysis, operator actions and/or flow restrictors on small diameter piping or tubing installed in some reactor coolant system fluid lines.

During this review it was noted that the valve position designation for some high/low pressure interface valves on sheet 1 of Reactor Coolant System Flow Diagram No. 5379-1971 Rev. 23 was incorrect. The Licensee issued their FACTS #86R0159 to track and correct this discrepancy on a future revision of the plan.

d. Associated Circuits by Common Enclosure

A circuit, whether safety-related or not, is classified as an associated circuit of concern if it shares a common enclosure (e.g., cable tray, conduit, panel or junction box) with a "Required Circuit," and is not adequately protected by circuit breakers, fuses or similar devices, or could allow fire propagation into the Shared Common Enclosure.

At H. B. Robinson, the definition of enclosure has been extended to include the entire fire area. The propagation of fire through or between enclosure will be mitigated for the following reasons:

- (1) Alternative/dedicated safe-shutdown circuits (Alternate A) are routed only in dedicated conduit and share no cabinets, raceways, or boxes with normal safe-shutdown circuits (Alternate B)
- (2) All Alternate A cables are IEEE 383 qualified
- (3) Alternate B cables in cable trays in high density cable routing areas of the Auxiliary have been coated with a flame-retardant mastic to the extent practicable within the constraints imposed by construction and maintenance practices.
- (4) Cable sizing and overcurrent protection are provided for safe-shutdown cables.
- (5) Fire stops are installed whenever a cable penetrates a fire area

e. Damage Control Measures

An audit was performed on the material and equipment listed in the following Dedicated Shutdown Procedures (DSP):

- (1) DSP-007, RHR Pump Power Repair Procedure
- (2) DSP-008, RHR System Flow Indicator Repair Procedure
- (3) DSP-009, SG PORV's Control Repair Procedure
- (4) DSP-010, RHR System Temp Indications Repair Procedure
- (5) DSP-011, Press PORV Control/Power Repair Procedure
- (6) DSP-012, RHR Flow Control Valves Repair Procedures

The material/equipment for the above procedures was dedicated and located, as indicated in the procedures, in H. B. Robinson central warehouse. Except for RHR power cable, all equipment for the above DSP's was located in one storage box. The equipment was not identified by label or tagging, nor was it separated for a specific DSP. It also appeared that there was equipment in this box for DSP's that had been superseded by the licensee new DSP's. The licensee stated that

equipment would be labeled for specific DSP's and that equipment not needed as a result of the issuance of their new DSP would be removed. This is being tracked to insure items are labelled or separated by DSP by the licensee's FACTS #86R012.