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CONTROL NO: 2492

FILE: INCIDENT REPORT

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| FROM: Carolina Power & Light Co. Raleigh, N.C. 27602 E.E. Utley | | DATE OF DOC 2-14-75 | DATE REC'D 3-5-75 | LTR XX | TWX | RPT | OTHER |
| TO: Mr. Norman C. Moseley | | ORIG 1 signed | CC 39 | OTHER | SENT AEC PDR XX SENT LOCAL PDR XX | | |
| CLASS | UNCLASS XXX | PROP INFO | INPUT | NO CYS REC'D 40 | DOCKET NO: 50-261 | | |

DESCRIPTION: Ltr trans the following:

ENCLOSURES: Abnormal Occurrence AO-50-261/
75-4 on 2-6-75 failure of comparator circuit
TC-412B....

(40 cys encl rec'd)

ACKNOWLEDGE

Do Not Remove

PLANT NAME: H.B. Robinson Unit 2

FOR ACTION/INFORMATION

DHL 3-6-75

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Carolina Power & Light Company

Regulatory Docket File

February 14, 1975

File: NG-3513 (R)

Serial: NG-75-231

Mr. Norman C. Moseley, Director
U. S. Nuclear Regulatory Commission
Region II, Suite 818
230 Peachtree Street, N.W.
Atlanta, Georgia 30303

Dear Mr. Moseley:

H. B. ROBINSON UNIT NO. 2
LICENSE NO. DPR-23
FAILURE OF COMPARATOR CIRCUIT TC-412B

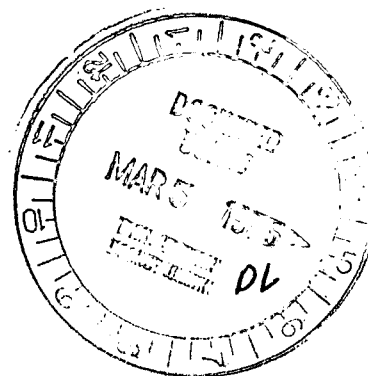
In accordance with 6.6.2.a of the Technical Specifications for H. B. Robinson Unit No. 2, the attached Abnormal Occurrence Report is submitted for your information. This report fulfills the requirement for a written report within ten days of an Abnormal Occurrence and is in accordance with the format set forth in Regulatory Guideline 1.16, Revision 1.

Yours very truly,

E. E. Utley
Vice-President
Bulk Power Supply

TAW:KPY:mvp
Attachment

cc: Messrs. N. B. Bessac
P. W. Howe
R. E. Jones
D. Knuth
J. B. McGirt
D. B. Waters



2492

Abnormal Occurrence Report

1. Report No. 50-261/75-4 ~~Received 1/17/75~~ 2-14-75
- 2a. Date February 13, 1975
- 2b. Occurrence Date February 6, 1975
3. Facility H. B. Robinson Unit No. 2
Hartsville, South Carolina

4. Identification of Occurrence

Failure of Reactor Protection Overpower Channel Set No. I to generate a rod stop signal for a simulated overpower condition. This constitutes an Abnormal Occurrence as defined in Technical Specification 1.8.d.

5. Conditions Prior to Occurrence

The reactor was at 100% power with all parameters normal. PT 5.1, "Overtemperature and Overpower Channel Set I" was being conducted.

6. Description of Occurrence

At approximately 1030 on February 6, 1975, Instrument and Control Technicians began conducting PT 5.1 on Overtemperature and Overpower Channel Set I. PT 5.1 is a bi-weekly test which includes testing the overpower protection circuitry to determine if it will detect an overpower condition and send the appropriate rod stop or reactor trip signal to the reactor protection logic. This is accomplished by removing only one of the three channels at a time from service and simulating T_{hot} , T_{cold} , flux^{upper} and flux^{lower} signals to the overpower circuitry. By varying these signals, overpower conditions can be simulated and the appropriate rod stop or reactor trip signal checked. At 1100 it was determined that no value or combination of values of delta T or delta flux would result in a rod stop signal from Channel I. The reactor trip function of the protection channel was checked and determined to be operating properly. The technicians immediately reported the trouble and effected repairs to the overpower circuitry. Repairs were completed at 1144.

7. Description of Apparent Cause of Occurrence

One of the two comparator circuits in a dual circuit signal comparator, box number TC-412B, had failed in a nonconservative direction. This comparator takes an overpower setpoint signal computed from flux^{upper}, flux^{lower}, T_{hot} , and T_{cold} ; compares it with a signal derived in the delta T protection circuitry; and then determines if an overpower condition exists. If a rod stop or reactor trip is required, a signal is sent to the reactor protection logic from this box.

In this particular occurrence only the comparator circuit which deals with rod stop failed. Since the reactor trip comparator circuit operated properly, there is no possibility that a failure external to TC-412B precluded operation of the rod stop signal.

The exact cause of the comparator failure has not been determined, as described under Item 9, Corrective Action.

8. Analysis of Occurrence

To obtain a rod stop signal from the overpower protection circuitry, two of the three overpower channels must detect an overpower condition. Prior to commencing the test on Overpower and Overtemperature Protection Channel I, the rod stop and reactor trip bistables for this channel were placed in the tripped position. Therefore, at the time TC-412B was found to be malfunctioning, the overpower protection logic was one out of two. This satisfies Technical Specification Table 3.5-2 which requires a minimum of two overpower channels to be operable, with a minimum degree of redundancy of one. From the time the violation was discovered to the time the repairs were affected and Channel I returned to service, no limiting operating conditions were violated.

Since PT 5.1 is a bi-weekly test, and the previous test detected no trouble with TC-412B, the comparator could have been out of service for a maximum of two weeks.

9. Corrective Action

TC-412B was removed from the protection circuitry and replaced with an identical comparator. PT 5.1 was again run on Overpower and Overtemperature Protection Channel I with satisfactory results. The test was completed at 1144 on February 6, approximately 44 minutes after the trouble was detected. In accordance with PT 5.1, the two remaining Overpower and Overtemperature Channels were tested and found to be functioning normally. To determine the exact cause of the failure, a number of tests have been conducted on TC-412B. These tests were:

- (1) Power supply voltages checked.
- (2) Installed in a test rig and trip functions checked.
- (3) Installed in a spare location of a protection rack for two days, checking for possible component failures due to heat.
- (4) Individual components heated.

To date the comparator functions normally and no trouble has been found.

Since the problem now seems to no longer exist, the reliability of the comparator is questionable. Therefore, this particular box will not be put into use in any reactor protection or safety related control circuitry until the cause of the failure is located and repaired. Investigation as to the cause of the failure will continue to be pursued.

10. Failure Data

(a) Two previous failures have occurred.

- (1) October 3, 1974 - TC-412C, comparator in Overtemperature Protection Channel Set I failed due to defective 50 μ f capacitor in the comparator power supply.
- (2) January 20, 1975 - LC-460A, comparator in Pressurizer Water Level Protection Channel Set II due to defective 50 μ f capacitor in the comparator power supply.

(b) The comparators are Westinghouse, Model 139-118, dual circuit comparators.