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SUBJECT: LER 90-005-00:on 900302,failure to test RPS logic channels,
 per Tech Specs.

W/9 ltr.

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United States Nuclear Regulatory Commission
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H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2
DOCKET NO. 50-261
LICENSE NO. DPR-23
LICENSEE EVENT REPORT 90-005

Gentlemen:

The enclosed Licensee Event Report (LER) is submitted in accordance with
10 CFR 50.73 and NUREG-1022 including Supplements No. 1 and 2.

Very truly yours,

R. E. Morgan
General Manager
H. B. Robinson S. E. Plant

CTB:lht

Enclosure

cc: Mr. S. D. Ebnetter
Mr. L. W. Garner
INPO

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NRC Form 366
(9-83)

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104

EXPIRES: 8/31/88

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2										DOCKET NUMBER (2) 0 5 0 0 0 2 6 1				PAGE (3) 1 OF 0 8		
TITLE (4) FAILURE TO TEST RPS LOGIC CHANNELS IN ACCORDANCE WITH TECHNICAL SPECIFICATIONS																
EVENT DATE (5)			LER NUMBER (6)				REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)						
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAMES				DOCKET NUMBER(S)			
0 3	0 2	9 0	9 0	0 0 5	0 0 0	0 4	0 2	9 0					0 5 0 0 0			
OPERATING MODE (9) N		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)														
POWER LEVEL (10) 0 6 8		20.402(b)				20.405(c)				50.73(a)(2)(iv)				73.71(b)		
		20.405(a)(1)(i)				50.36(c)(1)				50.73(a)(2)(v)				73.71(c)		
		20.405(a)(1)(ii)				50.36(c)(2)				50.73(a)(2)(vii)				OTHER (Specify in Abstract below and in Text, NRC Form 366A)		
		20.405(a)(1)(iii)				50.73(a)(2)(i)				50.73(a)(2)(viii)(A)						
		20.405(a)(1)(iv)				50.73(a)(2)(ii)				50.73(a)(2)(viii)(B)						
		20.405(a)(1)(v)				50.73(a)(2)(iii)				50.73(a)(2)(x)						
LICENSEE CONTACT FOR THIS LER (12)																
NAME C. T. Baucom, Senior Specialist										TELEPHONE NUMBER 8 0 3 3 8 3 - 1 2 5 3						
COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)																
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPD		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPD						
SUPPLEMENTAL REPORT EXPECTED (14)												EXPECTED SUBMISSION DATE (15)		MONTH	DAY	YEAR
<input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE)												<input checked="" type="checkbox"/> NO				

ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)

On March 2, 1990, site maintenance personnel identified a procedural deficiency in that monthly testing of logic channels associated with certain Reactor Protection System (RPS) features was not being performed as required by Technical Specification Table 4.1-1, Item 27. The logic channels affected are only applicable during plant startup and reduced power operation. The cause of this procedural deficiency has been attributed to the configuration of originally installed equipment for testing of RPS logic channels, and a misinterpretation of the Technical Specification testing requirements. Changes to applicable procedures were promptly implemented for testing of logic channels for RPS features which are credited for mitigation of analyzed accidents. The logic channels for these features were successfully tested on March 14 and 15, 1990. The remaining affected RPS logic channels will be further reviewed to establish the proper and appropriate testing requirements and methods, with necessary procedure changes to be developed. This Licensee Event Report is submitted pursuant to 10CFR50.73(a)(2)(i)(B) as an operation or condition prohibited by the plant's Technical Specifications.

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TEXT (If more space is required, use additional NRC Form 364A's) (17)

I. Description of Event

In February of 1990, H. B. Robinson Unit No. 2 was at 68% power for fuel conservation and load management.¹ Site maintenance personnel were involved in the review and upgrade of certain maintenance surveillance test procedures for the testing of Train "A" and Train "B" of the Reactor Protection System (RPS) Logic. These test procedures included:

MST-011, Reactor Protection Logic Train "A" and "B" at "0" Power

MST-020, Reactor Protection Logic Train "A" at Power

MST-021, Reactor Protection Logic Train "B" at Power

Test procedure MST-011 is performed prior to startup at either cold shutdown or hot shutdown during outages in which the monthly intervals of MST-020 and MST-021 cannot be maintained. Test procedures MST-020 and MST-021 are performed monthly when the unit is at power. The performance of these tests satisfies the Surveillance Requirements of Technical Specification Table 4.1-1, Item 27.

During review of these surveillance test procedures, certain differences between the at power tests (MST-020 and MST-021) and the prior to startup test (MST-011) caused maintenance personnel to more closely examine the scope of these tests. Upon further review, site personnel identified on March 2, 1990 that certain RPS features were not being tested as required by the Technical Specifications. Specifically, the following logic channels were identified as being tested prior to startup by MST-011, but were not being tested monthly by MST-020 and MST-021 while the unit was at power:

1. Source Range High Flux Trip
2. Intermediate Range High Flux Trip
3. Power Range High Flux Trip - Low Setpoint

¹ H. B. Robinson Steam Electric Plant Unit No. 2 is a Westinghouse Pressurized Water Reactor power plant in commercial operation since March 1971.

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4. Two-of-Three Loop Low Flow Trip

The failure to perform monthly logic channel testing on these RPS features is a violation of the requirements of Technical Specification Table 4.1-1, Item 27.

II. Cause of Event

The cause of this event is a procedural deficiency in that the surveillance tests in question did not perform logic channel testing on the affected RPS features as required by the Technical Specifications.² Two factors have been identified which ultimately resulted in this procedural deficiency.

First, the design of plant equipment originally installed for the overall testing of RPS logic channels apparently did not consider testing of the four logic channels in question. This equipment can be used to perform functional tests of these logic channels, however, the required testing sequence is atypical of the testing method for RPS logic channels associated with normal, at-power RPS features. In summary, the design of originally installed testing hardware contributed to the presumption that routine monthly testing of these RPS logic channels was not required.

Second, the Technical Specification requirements for testing of the affected logic channels are not explicit and could have been subject to misinterpretation. Specifically, the Source Range High Flux Trip, Intermediate Range High Flux Trip, and Power Range High Flux Trip - Low Setpoint are blocked when reactor power is above 10%. Since these features are not normally in service during steady-state, full power operation, it may have been assumed that monthly testing was not required. This assumption, however, does not account for the possibility that a significant amount of time might elapse between performances of MST-011. Any shutdown occurring during this time period which did not last longer than one month would not have required performance of MST-011 prior to startup. This in turn would create a situation where the affected logic channels would be required for service, but would not have been tested within the preceding month as required by the Technical Specifications. Similarly, the Two-of-Three Loop Low Flow Trip is only applicable when reactor power is above 10%, but less than 40%. This feature is also not applicable during steady-state, full power operation, which again may have resulted in the

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Cause Code: D

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assumption that monthly testing was not required. However, any reactor shutdown or period of operation at less than 40% reactor power would have required that this feature be operable. If MST-011 had not been performed within the month preceding the unit shutdown or reduced power operation, this RPS feature would have been required for service without having been tested as required by the Technical Specifications. In summary, the limited applicability of the affected RPS features contributed to the failure to address the Technical Specification testing requirements within the at power test procedures.

It should be noted, however, that during the period between identification of the deficiency on March 2, 1990, and completion of testing on March 15, 1990, the unit was not operated at power levels which would have required operability of these RPS features.

III. Analysis of Event

A review of the affected RPS features and associated logic channels has been performed to assess the safety significance of the identified procedural deficiency. This deficiency resulted in the failure to perform monthly testing of certain RPS logic channels as required by the Technical Specifications. As described in Section 7.2.1.1.6 of the Updated Final Safety Analysis Report (UFSAR), the logic channel identity begins at the logic relay coil/relay contact interface (Reference Figure 1). This interface defines the transition from channel identity to logic identity, and provides both electrical and physical separation between the analog and the logic portions of the RPS. The RPS logic channels would, therefore, encompass the wiring and relays between the analog channels and the reactor trip breakers. The testing requirements of the Technical Specifications for the analog channels and reactor trip breakers were verified to be properly addressed within site surveillance procedures; therefore, the logic channel testing only affects the wiring and relays between the analog channels and the reactor trip breakers.

Typically, the wiring and relays associated with these logic channels are assumed to be more reliable than other components such as transmitters and detectors. These components are not subject to "instrument drift;" there is no check or calibration associated with the logic channels, only a functional test. The potential for a failure or malfunction of these components is considered small. Should a failure occur, the component would fail to the trip or actuate position. Therefore, such a failure would not degrade the ability of the system to respond to a transient. Also, it is considered unlikely that simultaneous failures would occur which would affect both Train "A" and Train "B" of a particular RPS feature.

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With respect to the specific RPS features in question, Section 7.2.1.1.2 of the UFSAR describes the Source Range High Flux Trip, the Intermediate Range High Flux Trip, and the Power Range High Flux Trip - Low Setpoint as features that provide protection during reactor startup. Also, Section 15.4.1 of the UFSAR credits the Power Range High Flux Trip - Low Setpoint for terminating the uncontrolled rod cluster control assembly bank withdrawal from subcritical or low power. It is considered unlikely that both trains of three separate startup protection features could be rendered inoperable by the simultaneous failure of independent logic channel components. Therefore, there is a reasonable assurance that one or more of these RPS features would have automatically actuated in response to a reactivity event from a subcritical or low power condition.

Section 7.2.1.1.2 of the UFSAR describes the Reactor Coolant System Low Flow Trip as core protection from Departure from Nucleate Boiling (DNB) following a low flow or loss of flow accident. Also, Section 15.3 of the UFSAR describes the Decrease in RCS Flow Rate Event, however, the analyzed transient is initiated from 102% reactor power, as this is the bounding transient. The Two-of-Three Loop Low Flow Trip is only applicable when reactor power is between 10% and 40%. Typically, reactor operation at less than 40% power occurs infrequently. During periods of reactor operation at less than 40% power, this feature is partially backed up by the RPS actuation from Reactor Coolant Pump (RCP) breakers opening or an undervoltage on the RCP electrical busses. Also, although the automatic response would be delayed by some amount, other RPS features such as the high pressurizer pressure reactor trip would be available for event mitigation. Finally, it is again considered unlikely that both trains of this RPS feature would be rendered inoperable by the simultaneous failure of independent logic channel components during the period when this feature would be required for service, i.e., between 10% and 40% reactor power.

Also, it should again be noted that during the period between identification of the deficiency on March 2, 1990, and completion of testing on March 15, 1990, the unit was not operated at power levels which would have required operability of these RPS features.

This Licensee Event Report is submitted pursuant to 10CFR50.73(a)(2)(i)(B) as an operation or condition prohibited by the plant's Technical Specifications

IV. Corrective Actions

As stated above in the Analysis of Event, the Power Range High Flux

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Trip - Low Setpoint and the Two-of-Three Loop Low Flow Trip are credited for mitigation of events analyzed in Chapter 15 of the UFSAR. In order to promptly address testing of these features, temporary procedure changes were implemented on March 13, 1990 which incorporated monthly testing of these features into MST-020 and MST-021. These revised procedures were used to successfully test affected Train "A" logic channels on March 14, 1990, with successful testing of affected Train "B" logic channels being completed on March 15, 1990. As required by Technical Specification 6.5.1.1.5, these temporary procedure changes must be reviewed and approved within 21 days of the date of approval. Therefore, temporary changes to MST-020 and MST-021 will be approved as permanent changes by April 3, 1990.

The Intermediate Range High Flux Trip will also be tested monthly by MST-020 and MST-021. This testing sequence will be incorporated during the overall review and upgrade of these maintenance surveillance test procedures. Permanent revisions to MST-020 and MST-021 which incorporate the Intermediate Range High Flux Trip logic channel testing will be completed and implemented by June 18, 1990.

At the present time, physical limitations associated with instrument channel hardware will prohibit testing of the Source Range High Flux Trip logic channels when the unit is at power. However, a review will be performed to further evaluate the requirement for testing, and to evaluate possible alternatives for accomplishing this testing, should it be verified as required. This review will be completed by July 27, 1990.

Finally, the failure to properly incorporate testing of these RPS logic channels into surveillance test procedures will be further reviewed within the Corrective Action Program. Significant Condition Report No. 90-019 has been initiated to evaluate this event and determine root cause. This review will help to ensure that each causal factor which contributed to this occurrence has been identified and addressed.

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V. Additional Information

A. Failed Component Identification

None

B. Previous Similar Events

Licensee Event Report No. 88-011-01 described a situation where periodic TROTS functional test and calibration procedures required by Technical Specification Table 4.1-1, Item 28, had omitted the TROTS solenoid valves for the turbine stop and control valves.

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FIGURE 1

