

LICENSEE EVENT REPORT (LER)

Facility Name (1) Dresden Nuclear Power Station, Unit 2	Docket Number (2) 0   5   0   0   0   2   4   9	Page (3) 1   of   0   3
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TITLE (4) Low Reactor Water Level Scram Switch Found Below Setpoint Limits Due to Logic Card Instrument Drift

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   9	1   5	8   7	8   7	0   2   6	0   1	0   5	2   0	8   8	N/A	0   5   0   0   0	
N/A 0   5   0   0   0											

OPERATING MODE (9) N	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10CFR (Check one or more of the following) (11)											
POWER LEVEL (10) 0   9   6	<input type="checkbox"/> 20.402(b)	<input type="checkbox"/> 20.405(c)	<input type="checkbox"/> 50.73(a)(2)(iv)	<input type="checkbox"/> 73.71(b)	<input type="checkbox"/> 20.405(a)(1)(i)	<input type="checkbox"/> 50.36(c)(1)	<input type="checkbox"/> 50.73(a)(2)(v)	<input type="checkbox"/> 73.71(c)	<input type="checkbox"/> 20.405(a)(1)(ii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(vii)	<input type="checkbox"/> Other (Specify in Abstract below and in Text)
	<input type="checkbox"/> 20.405(a)(1)(iii)	<input checked="" type="checkbox"/> 50.73(a)(2)(i)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)		<input type="checkbox"/> 20.405(a)(1)(iv)	<input type="checkbox"/> 50.73(a)(2)(ii)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)		<input type="checkbox"/> 20.405(a)(1)(v)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(x)	

LICENSEE CONTACT FOR THIS LER (12)

Name Lawrence E. Bihlman, Technical Staff Engineer (X-549)	TELEPHONE NUMBER AREA CODE 8   1   5   9   4   2   -   2   9   2   0
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COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFAC-TURER	REPORTABLE TO NPRDS		CAUSE	SYSTEM	COMPONENT	MANUFAC-TURER	REPORTABLE TO NPRDS	
X	J   E	L   I   S	R   3   6   9	Y							

SUPPLEMENTAL REPORT EXPECTED (14)

<input type="checkbox"/> Yes (If yes, complete EXPECTED SUBMISSION DATE)	<input checked="" type="checkbox"/> NO	Expected Submission Date (15)	Month	Day	Year
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ABSTRACT (Limit to 1400 spaces, i.e, approximately fifteen single-space typewritten lines) (16)

At 2300 hours on September 15, 1987, with Dresden Unit 2 in the run mode at 96% power, while performing Dresden Instrument Surveillance (DIS) 500-2, the Channel B reactor vessel low water level scram setpoint was found at 13 inches below instrument zero. This instrumentation also initiates automatic primary containment Group II and III isolations. The Technical Specification limit, when compensated for 100% steam flow, is 8 inches above instrument zero. The proximate cause was determined to be instrument drift of the master trip unit 2-263-140B logic card. The safety significance of the event was deemed minimal because the redundant Channel B switch in combination with the A switches were available to provide the automatic scram and primary containment isolations. The setpoint of master trip unit 2-263-140B was adjusted within the limits of DIS 500-2 within approximately one hour. The logic card was subsequently replaced and the old card repaired. A failed Zener diode was the root cause of the trip unit's drift. DIS 500-2 will continue to be performed on a monthly basis. This was the first occurrence of instrument drift of the Rosemount master trip unit at Dresden Station.

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TEXT

PLANT AND SYSTEM IDENTIFICATION:

General Electric Boiling Water Reactor - 2527 MWt rated core thermal power. Energy Industry Identification System (EIS) codes are identified in the text as [XX].

EVENT IDENTIFICATION:

The reactor vessel Channel B low water level automatic scram and primary containment Group II and III isolation setpoint [JM] was found to be below the Technical Specification setpoint limit due to instrument drift of the master trip unit 2-263-140B logic card.

A. CONDITIONS PRIOR TO EVENT:

Unit: 2	Event Date: 9/15/87	Event Time: 2300 hours
Reactor Mode: N	Mode Name: Run	Power Level: 96%
Reactor Coolant System (RCS) Pressure: 1005 psig		

B. DESCRIPTION OF EVENT:

At 2300 hours on September 15, 1987, with the Unit 2 reactor in the run mode at 96% power, while performing Dresden Instrument Surveillance (DIS) 500-2, Reactor Vessel Low Water Level Scram and Low Low Water Level Isolation Analog Trip System Calibration, it was found that the low water level setpoint had drifted below the Technical Specification (T.S.) limit of Table 3.1.1 and Table 3.2.1. The Reactor Protection System (RPS) [JE] low water level and Group II and III trip setpoint is greater than or equal to one inch above instrument zero, which correlates to 144 inches above the top of active fuel. Due to the full power pressure drop across the steam dryer a seven inch level difference exists between the shroud and the annulus which contains the instrument tap. This correction factor is added to the T.S. trip setpoint resulting in a low level instrument trip setpoint of eight (8) inches above instrument zero. The as-found setpoint was thirteen (13) inches below instrument zero. Within approximately one hour the setpoint was adjusted to 14.85 inches above instrument zero per the requirements of DIS 500-2. The half scram received on RPS Channel B as a result of the surveillance was reset and the instrument requirements of T.S. Tables 3.1.1 and 3.2.1 were restored. Work Request #68930 was initiated to repair or replace the master trip unit.

C. APPARENT CAUSE OF EVENT:

The Instrument Mechanics initiated a system check to determine the root cause of the setpoint discrepancy. Low water level transmitter 2-263-578 and the master trip unit were evaluated and the proximate root cause of the event was determined to be instrument drift of the master trip unit logic card. The logic card was adjusted to provide the required setpoint. Subsequently, on September 21, 1987 the logic card was replaced in order to ensure instrument drift was not recurring. Further inspection and testing of the removed logic card revealed the root cause of the event to be a failed Zener diode. A review of the previous calibration on August 18, 1987 indicated that the instrument was within the tolerances of DIS 500-2 and that no adjustments were necessary.

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TEXT

D. SAFETY ANALYSIS OF EVENT:

The RPS vessel level instrumentation consists of four independent devices arranged in one out of two taken twice logic system. Each of the two RPS and Group II and III Primary Containment isolation channels contain two level switches, each capable of initiating a trip of that channel. Both channels must trip to generate a full reactor scram and Group II and III isolations. The remaining level switch and trip unit in RPS and containment isolation system Channel B were functioning properly at the time of the event, as well as both level switches and trip units in Channel A, and would have generated a full scram and the group isolations had vessel level dropped below the setpoint. The master trip unit, 2-263-140B, was last tested satisfactorily on August 18, 1987. Based on the fact that the RPS systems would function as designed with one inoperable level switch/trip unit this event was deemed to be of minimal safety significance.

E. CORRECTIVE ACTIONS:

The potentiometer in the voltage divider network of the logic card was adjusted to bring the trip setpoint up to 14.85 inches above instrument zero. To ensure the setpoint would not begin to drift again, the logic card was subsequently replaced on September 21, 1987 and Work Request #69033 generated to inspect and test the removed logic card to determine the root cause of the instrument drift. Further testing of the removed logic card revealed a Zener diode that was not functioning properly. After replacement of the Zener diode, the logic card was tested satisfactorily. DIS 500-2 will continue to be performed on a monthly basis to verify the calibration of the reactor vessel water level instrumentation. No further corrective action is deemed necessary at this time.

F. PREVIOUS EVENTS:

This is the first occurrence of instrument drift of a Rosemount master trip unit which resulted in the low water level scram setpoint being below the T.S. limit. A similar event for Unit 3 is documented on LER 85-4-0 on Docket #050249 which involved instrument drift of a Yarway level switch resulting in the low water level scram setpoint below the T.S. limit. As a result of instrument drift problems associated with the Yarway switches the system was replaced by the Rosemount analog trip system.

G. COMPONENT FAILURE DATA:

Manufacturer: Rosemount  
 Nomenclature: Master Trip Unit  
 Model Number: 710-DU  
 Component: Zener Diode - CR2

An NPRDS search was performed to determine the number of failures of Rosemount Model 710 trip units from 1/1/80 to the present. No failures due to instrument drift of the logic card were found.




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May 20, 1988

EDE LTR #88-399

U.S. Nuclear Regulatory Commission  
Document Control Desk  
Washington, D.C. 20555

Licensee Event Report #87-026-1, Docket #050237 is being submitted as required by Technical Specification 6.6, NUREG 1022 and 10 CFR 50.73(a)(2)(i)(B). This revised report is submitted in order to provide the results of further inspection and testing of a master trip unit logic card.

  
E.D. Eenigenburg  
Station Manager  
Dresden Nuclear Power Station

EDE/kjl

Enclosure

cc: A. Bert Davis, Regional Administrator, Region III  
File/NRC  
File/Numerical

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*Handwritten initials/signature*