

NRC FORM 366 (4-95)	U.S. NUCLEAR REGULATORY COMMISSION	APPROVED BY OMB NO. 3150-0104 EXPIRES 04/30/98 <small>ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS MANDATORY INFORMATION COLLECTION REQUEST: 50.0 HRS. REPORTED LESSONS LEARNED ARE INCORPORATED INTO THE LICENSING PROCESS AND FED BACK TO INDUSTRY. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (T-6 F33), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.</small>
<h2 style="margin: 0;">LICENSEE EVENT REPORT (LER)</h2>		

FACILITY NAME (1) Dresden Nuclear Power Station, Unit 2	DOCKET NUMBER (2) 05000237	PAGE (3) 1 of 4
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TITLE (4)
Unit 2 Rod Block Monitor Inoperable due to Improper Setting of the Input LPRM Low Level Bypass Trip Reference due to Inadequate Design Documentation

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 NAME	DOCKET NUMBER
09	26	98	98	015	00	10	26	98	Dresden Unit 3	05000249
									N/A	N/A

OPERATING MODE (9)	1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR § (Check one or more) (11)								
		20.2201(b)	20.2203(a)(2)(v)	X	50.73(a)(2)(i)	50.73(a)(2)(viii)				
POWER LEVEL (10)	99	20.2203(a)(2)(i)	20.2203(a)(3)(i)		50.73(a)(2)(ii)	50.73(a)(2)(x)				
		20.405(a)(1)(ii)	20.2203(a)(3)(ii)		50.73(a)(2)(iii)	73.71				
		20.2203(a)(2)(ii)	20.2203(a)(4)		50.73(a)(2)(iv)	OTHER				
		20.2203(a)(2)(iii)	50.36(c)(1)		50.73(a)(2)(v)	Specify in Abstract below or in NRC Form 366A				
		20.2203(a)(2)(iv)	50.36(c)(2)		50.73(a)(2)(vii)					

LICENSEE CONTACT FOR THIS LER (12)

NAME K. W. Robbins, System Engineer	TELEPHONE NUMBER (Include Area Code) (815) 942-2920 ext 2314
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COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS

SUPPLEMENTAL REPORT EXPECTED (14)				EXPECTED SUBMISSION DATE (15)		
YES <small>(If yes, complete EXPECTED SUBMISSION DATE).</small>	X	NO				

ABSTRACT (Limit to 1400 spaces, i. e., approximately 15 single-spaced typewritten lines) (16)

On September 25, 1998, during routine Control Rod Drive (CRD) exercising on Unit 3, it was observed that the Rod Block Monitor (RBM) failed to generate a 'Too Few Inputs' rod block as expected. Troubleshooting revealed that the Input Local Power Range Monitor (LPRM) Low Level Bypass trip circuit was not functioning properly, preventing proper operation of the Count Circuit. This problem was found to be common to both Unit 2 and Unit 3. The cause of this failure was improper setting of the Input LPRM Low Level Bypass trip reference as a result of inadequate design documentation. The corrective actions included obtaining the proper trip reference setting from GE and adjusting the trip reference to the correct value. The safety consequences of this event are minimal. This report is submitted pursuant to 10 CFR 50.73(a)(2)(i).

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LICENSEE EVENT REPORT (LER)

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TEXT (If more space is required, use additional copies of NRC Form 366A) (17)

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] and are obtained from IEEE Standard 805-1984, IEEE Recommended Practice for System Identification in Nuclear Power Plants and Related Facilities.

EVENT IDENTIFICATION:

Unit 2 Rod Block Monitor Inoperable due to Improper Setting of the Input LPRM Low Level Bypass Trip Reference due to Inadequate Design Documentation

A. PLANT CONDITIONS PRIOR TO EVENT:

Unit: 2 Event Date: 9/26/98 Event Time: 1700 CDT
Reactor Mode: 1 Mode Name: Run Power Level: 099
Reactor Coolant System Pressure: 1000 psig

No systems or components were inoperable or out of service at the start of this event which contributed to the event.

B. DESCRIPTION OF EVENT:

This event was initially reported pursuant to 10 CFR 50.72(b)(1)(iii)(D) which requires four hour notification of any condition that alone could have prevented the fulfillment of the safety function of structures or systems that are needed to mitigate the consequences of an accident. Following a thorough review of this event and the Updated Final Safety Analysis Report (UFSAR), it has been determined that the Rod Block Monitor [IG] (RBM) is used to mitigate the rod withdrawal error (RWE) transient. It has been shown analytically that even with a failure of the RBM, no fuel damage will result during the RWE. Therefore, this LER is being submitted pursuant to 10 CFR 50.73(a)(2)(i) which requires the reporting of any operation or condition prohibited by the plant's Technical Specifications.

On September 25, 1998, during routine Control Rod Drive (CRD) exercising on Unit 3, it was observed that the Rod Block Monitor (RBM) failed to generate a 'Too Few Inputs' rod block as expected. It was also observed that the Local Power Range Monitor [IG](LPRM) indications for LPRMs that should have been bypassed were reading approximately 6 watts per square cm.

On September 26, 1998, Electrical Maintenance Department (EMD) with support from an Instrument Maintenance Department (IMD) Component Specialist began troubleshooting Unit 3 RBM.

On September 27, 1998, General Electric (GE) was contacted to support the troubleshooting effort.

A review of the initial calibration procedure for the RBM was conducted. In accordance with the vendor manual (GEK 13968A, Section 4.7.1.3), the reference level for the Input LPRM Low Level Bypass is set to 10/125 of scale (10 watts per square cm). This setting is not part of the routine functional or calibration tests. During troubleshooting the settings varied between channels from about 2.5/125 to 4.5/125 of scale. If the LPRM input does not drop to a low enough value for a long enough period of time, the Input LPRM Low Level Bypass trip circuit will not function properly. This results in feedback being coupled back through the input circuit, preventing the Input LPRM Low Level Bypass trip from actuating. In addition, the input to the count circuit comes from the Input LPRM Low Level Bypass trip circuit. Therefore, the count circuit would not function properly, possibly preventing a 'Too Few Inputs' Inop Rod Block.

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On September 30, 1998, GE provided the basis for the Input LPRM Low Level Bypass reference setting (GENE-C5100197-15). The setting shall be at least greater than 3/125 to ensure the input LPRMs are responding to neutron flux in the core. This establishes a low limit, and is the same basis as for the LPRM Downscale alarm. The upper limit may be established based on plant operating experience. Therefore, the setting shall be greater than 3/125 but not exceeding a level such that more than 50 percent of the possible LPRM inputs would be automatically bypassed during rod withdrawal when above 30 percent Core Thermal Power (CTP).

C. CAUSE OF EVENT:

The cause of the failure was improper adjustment of the trip reference signal to the Input LPRM Low Level Bypass trip circuit due to inadequate design documentation (NRC Cause Code B).

D. SAFETY ANALYSIS

The RBM system is designed to prevent local fuel damage as a result of a single rod withdrawal error under the worst permitted RBM bypass conditions. Also, the RBM system provides a signal to permit operator evaluation of the change in the local relative power level in the vicinity of a rod that is being withdrawn.

The effectiveness of the RBM to prevent local fuel damage as a result of a single rod withdrawal error has been analytically determined. The initial condition is conservatively defined such that the reactor is operating at maximum permitted power with fuel thermal margins at steady-state limits (Minimum Critical Power Ratio (MCPR) and Maximum Linear Heat Generation Rate (MLHGR)) in a region adjacent to a fully inserted control rod; no credit is taken for the action of the rod worth minimizer. The response of the least responsive RBM channel is calculated as a function of rod withdrawal distance. The thermal margins are also calculated as a function of rod position. The analysis indicates that the rod block level is reached well before MCPR reaches 1.0 and before the linear heat generation rate reaches the damage level.

A detailed analysis was made of the functional requirements of the RBM. The analysis revealed that the rod block monitor system performs no primary reactor protection function.

Although local fuel damage poses no significant threat in terms of radioactive material release from the nuclear system, the trip setting is selected so that no local fuel damage results from a single control rod withdrawal error during power range operation. The RBM system is also recirculation flow referenced and operates when power is above 30 percent.

The analysis results from the latest reload licensing package indicate that the delta Critical Power Ratio (CPR) calculated for the RWE without RBM is bounded by the feedwater controller failure event. The calculated peak LHGR during the RWE is compared to the LHGR limit associated with 1 percent plastic strain in the cladding to ensure that fuel damage is not expected during the event. Therefore the safety consequences of this event are minimal.

E. CORRECTIVE ACTIONS:

Setpoint change was implemented. (Complete)

Dresden Instrument Surveillance (DIS) 0700-08, Rod Block Monitor Calibration Test, was revised to include verification of the reference setting. (Complete)

The basis for the Input LPRM Low Level Bypass was obtained from GE. (Complete)

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F. PREVIOUS OCCURRENCES:

Several other nuclear stations were contacted during this investigation and an OPEX search was conducted with the following results:

Quad Cities experienced the same problem approximately one year ago. The corrective action was to adjust the Input LPRM Low Level Bypass trip reference signal to a value slightly above the level of the feedback signal.

Monticello experienced a similar problem. The problem they observed was isolated to only one rod, and was corrected by replacement of two relays on the output of the quad trip card.

G. COMPONENT FAILURE DATA:

<u>Manufacturer</u>	<u>Nomenclature</u>	<u>Model/ Part Number</u>
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N/A