

**LICENSEE EVENT REPORT (LER)**

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.

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TITLE (4)  
**Unexpected High Pressure Coolant Injection System Steam Supply Isolation During Testing Due to Spurious Actuation of the Isolation Circuit**

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
12	22	97	97	018	01	07	06	98	N/A	05000
									N/A	05000

OPERATING MODE (9) <b>1</b>	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR § (Check one or more) (11)									
POWER LEVEL (10) <b>099</b>	20.2201(b)	20.2203(a)(2)(v)	50.73(a)(2)(i)	50.73(a)(2)(viii)						
	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)	X	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 <b>D. S. Smith, System Engineer</b>	TELEPHONE NUMBER (Include Area Code) <b>(815) 942-2920 ext 3087</b>
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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)		MONTH	DAY	YEAR
YES (If yes, complete EXPECTED SUBMISSION DATE)	X	NO						

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

On December 22, 1997, at approximately 0303 hours, an unexpected Group IV (High Pressure Coolant Injection (HPCI)) Primary Containment Isolation signal was received while testing the HPCI Steam Line Low Pressure Isolation circuitry. Subsequent to the occurrence, a troubleshooting effort was initiated. However, no equipment faults were identified. Two relays which were suspected to have caused the isolation were replaced and successfully tested. A failure analysis was performed on the relays that were removed. The analysis showed that the relays were in acceptable physical condition and operated satisfactorily. The analysis did not confirm that the relays contributed to the cause of the HPCI isolation. A detailed calibration and acceptance test was performed on the multimeter that was used during the testing when the HPCI isolation occurred. The multimeter was within tolerance and passed the acceptance test, ruling out the possibility of a multimeter malfunction contributing to the HPCI isolation. The cause of this event is a spurious actuation of the HPCI low reactor pressure isolation circuit. The safety significance of this event is minimal due to other safety systems being available for operation. This LER is being submitted pursuant to 10 CFR 50.73(a)(2)(iv) which requires the reporting of any event or condition that results in a manual or automatic actuation of any Engineered Safety Feature.

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		97	018	01
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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 (EIIIS) 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:**

Unexpected High Pressure Coolant Injection System Steam Supply Isolation During Testing Due to Spurious Actuation of the Isolation Circuit

**A. PLANT CONDITIONS PRIOR TO EVENT:**

Unit: 2	Event Date: 12-22-97	Event Time: 0303
Reactor Mode: 1	Mode Name: Run	Power Level: 099
Reactor Coolant System Pressure: 1000 psig		

**B. DESCRIPTION OF EVENT:**

This LER is being submitted pursuant to 10 CFR 50.73(a)(2)(iv) which requires the reporting of any event or condition that results in a manual or automatic actuation of any Engineered Safety Feature.

On December 22, 1997, while performing Dresden Instrument Surveillance (DIS) 2300-03, High Pressure Coolant Injection Low Reactor Pressure Isolation Channel Functional Test, for Master Trip Unit (MTU) 2-2391-01B and trip relay 2-2391-02B, an unexpected HPCI Isolation (Group IV Primary Containment Isolation [JM]) signal was received. The HPCI steam supply isolation valves, MO 2-2301-4 and MO 2-2301-5, closed as designed. Following the isolation, HPCI was declared inoperable.

On December 22, 1997, at approximately 0100, a prejob brief was conducted in preparation for the performance of DIS 2300-03 for MTUs 2-2391-01B and 3-2391-01B. At approximately 0210, the surveillance was begun for MTU 3-2391-01B (Unit 3). The Unit 3 surveillance was completed satisfactorily at approximately 0225.

At approximately 0300, the surveillance was started for MTU 2-2391-01B (Unit 2). At approximately 0303, the Instrument Maintenance (IM) Control Systems Technician (CST) inserted a trip signal to MTU 2-2391-01B. An IM B Mechanic had been stationed in the Auxiliary Electrical Equipment Room to monitor relay contact position using a Fluke Digital Multimeter (DMM). Upon receipt of the trip signal, the IM B mechanic noted that the DMM indication increased as expected, but also noted that other relays chattered at the same time. The mechanic was unable to identify the relay or relays that had actuated during the trip.

The initial signal occurred at 0303:27. At 0303:39, approximately 12 seconds after the initial signal was received, the isolation signal reset and was received again at 0303:44. The signal reset at 0303:46 and immediately re-tripped. Finally, the signal cleared at 0303:49. At 0304:54, the Analog Trip System was returned to normal (times obtained from the process computer). HPCI was declared inoperable and the actions for Technical Specification 3.2.A.3 were entered at the time of the initial occurrence at 0303 hours.

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

Two relays were suspected to have caused the isolation. The relays were replaced and satisfactorily tested on December 24, 1997. Due to a Unit 2 automatic shutdown that occurred on December 23, 1997, which was a result of an unrelated occurrence, the HPCI system was no longer required to be operable at 1749 hours on December 23, 1997 when reactor pressure was reduced to less than 150 psig.

No other systems, components or structures were identified which contributed to the isolation event.

**C. CAUSE OF EVENT:**

The cause of this event is a spurious actuation of the HPCI low reactor pressure isolation circuit (Cause Code X). Troubleshooting of the HPCI isolation circuit identified no equipment failures or malfunctions. As a precautionary step, MTU 2-2391-01C and 2-2391-01D trip relays were replaced. DIS 2300-03, High Pressure Coolant Injection Low Reactor Pressure Isolation Channel Functional Test, has been satisfactorily performed 24 times on Unit 2 since this event.

The Commonwealth Edison Materials Engineering Group (MEG) performed a failure analysis of the relays that were removed. The analysis showed that the relays were in acceptable physical condition and operated satisfactorily. The analysis did not confirm that the relays contributed to the cause of the HPCI isolation.

A detailed calibration and acceptance test was performed on the multimeter that was used during the performance of DIS 2300-03 when the HPCI isolation occurred. The multimeter was within tolerance and passed the acceptance test, ruling out the possibility of a multimeter malfunction contributing to the HPCI isolation.

Human error was ruled out as a cause of this event based on interviews with the IM technicians involved in the surveillance and based on a review of the sequence and manner in which the event occurred. The speed in which the three isolation signals came in and cleared does not correlate with the symptoms that would be expected during an isolation signal introduced by human error. The IM technicians involved indicated that the surveillance had been performed in strict accordance with the procedure. The technicians had just completed the same surveillance on Unit 3. The multimeter setting had not been changed since the performance of the surveillance on Unit 3. Therefore, inserting the multimeter into the isolation circuitry should not have resulted in an isolation.

**D. SAFETY ANALYSIS**

The HPCI subsystem is designed to pump water into the reactor vessel under those LOCA conditions which do not result in rapid depressurization of the reactor pressure vessel. The loss of coolant might be due to a loss of reactor feedwater or to a small line break which does not cause immediate depressurization of the reactor vessel.

There were no actual isolation conditions at the time of the Group IV isolation. Reactor pressure did not deviate from its steady state condition. Additionally, there were no indications of a high steam flow or high area temperature conditions which would have resulted in an isolation signal of the HPCI system during this event.

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TEXT (If more space is required, use additional copies of NRC Form 306A) (17)

The safety consequences of a degraded HPCI system were minimal at the time of the event due to the availability of the automatic depressurization system (ADS). The ADS is an ECCS subsystem which is employed as a backup to the HPCI subsystem to depressurize the reactor pressure vessel for small area breaks. In the event that HPCI is not effective, the ADS reduces pressure by blowdown through automatic opening of the relief valves to vent steam to the suppression pool. For small breaks, the vessel is depressurized in sufficient time to allow low pressure ECCS systems to inject and provide adequate core cooling.

**E. CORRECTIVE ACTIONS:**

The immediate corrective action was to declare the Unit 2 HPCI system inoperable and enter an LCO action statement in accordance with the Plant's Technical Specifications. (Completed)

The suspect relays were replaced and successfully tested in accordance with the Instrument Department surveillance prior to declaring the system operable. (Completed)

A failure analysis has been performed on the relays that were removed (2-2391-02C and D). (Completed)

The multimeter used in performance of the surveillance has been tested and calibrated. (Completed)

**F. PREVIOUS OCCURRENCES:**

None.

**G. COMPONENT FAILURE DATA:**

None.