

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-8 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.

FACILITY NAME (1)

Dresden Nuclear Power Station, Unit 2

DOCKET NUMBER (2)

05000237

PAGE (3)

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TITLE (4)

Supplement to High Pressure Coolant Injection System Inoperable Due to Gland Seal Leak Off Condenser Hotwell Level Control Malfunction From A Drain Pump Start Level Switch Failure Caused by Manufacturer Design Deficiency.

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
05	04	98	98	009	01	10	26	98	N/A	N/A
OPERATING MODE (9)			THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR § (Check one or more) (11)							
1			20.2201(b)		20.2203(a)(2)(v)		50.73(a)(2)(i)		50.73(a)(2)(viii)	
POWER LEVEL (10)			20.2203(a)(2)(i)		20.2203(a)(3)(i)		50.73(a)(2)(ii)		50.73(a)(2)(x)	
098			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)		X OTHER	
			20.2203(a)(2)(iii)		50.38(c)(1)		X 50.73(a)(2)(v)		Specify in Abstract below or in NRC Form 366A	
			20.2203(a)(2)(iv)		50.38(c)(2)		50.73(a)(2)(vii)		PART 21	

LICENSEE CONTACT FOR THIS LER (12)

NAME

K. Yates, System Engineer

TELEPHONE NUMBER (Include Area Code)

(815) 942-2920 ext 2715

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC
B	BJ	LS	M040	Y					

SUPPLEMENTAL REPORT EXPECTED (14)

YES	X	NO	EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
(If yes, complete EXPECTED SUBMISSION DATE)						

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

On May 4, 1998, at 0433 hours, while performing Dresden Operating Surveillance (DOS) 2300-09, High Pressure Coolant Injection (HPCI) Gland Seal Leak Off (GSLO) Drain Pump and Condenser Hotwell Level Control Functional Test, the hotwell drain pump exhibited erratic operation and resulted in a hotwell low level. The 'HPCI Gland Seal Condenser Hotwell Lvl Hi/Lo' alarm was received and the low level in the hotwell confirmed. The HPCI system was declared inoperable and the action statement for the Limiting Condition For Operation (LCO) was entered. An ENS notification was performed at 0524 hours. Though not operable, the system remained available while troubleshooting work packages were prepared. The symptoms and troubleshooting results indicated that the GSLO drain pump start float switch (2-2300-LCS-2) had failed in the closed position. The root cause, based on the Original Equipment Manufacturer (OEM) failure analysis, was inadequate magnetic force to consistently actuate the microswitch resulting from a manufacturer design deficiency. The OEM modified their design specification based on the OEM's failure analysis. Corrective actions from this event include replacement of both the Unit 2 and Unit 3 GSLO drain pump control level switches with the OEM modified switches. Functional testing, DIS 2300-15, High Pressure Coolant Injection Gland Seal Condenser Level Control/Alarm Switch Functional Test, and DOS 2300-09 was completed satisfactorily on the Unit 2 HPCI GSLO pump/level control and the LCO was exited at 1500 hours on May 12, 1998. The overall safety significance of this event was minimal because all other Emergency Core Cooling Systems (ECCS) were operable while HPCI was inoperable. This failure is considered to be 10 CFR Part 21 reportable.

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FACILITY NAME (1) Dresden Nuclear Power Station, Unit 2	DOCKET (2) 05000237	LER NUMBER (6)		PAGE (3) 3 OF 3
		YEAR 98	SEQUENTIAL NUMBER 009	

TEXT (If more space is required, use additional copies of NRC Form 386A) (17)

C. CAUSE OF EVENT:

The root cause of this event was a manufacturer design deficiency of the installed HPCI GSLO condenser hotwell level control switches (NRC Cause Code B). The switches failed due to a combination of insufficient magnet strength and too much travel in the float mechanism to consistently actuate the float switch microswitch.

D. SAFETY ANALYSIS

The HPCI system is designed to provide make up coolant to the reactor in the event of a small-break Loss Of Coolant Accident. When the HPCI System initiates, leakoff collected by the HPCI turbine gland seal leak off system is drawn to the GSLO condenser. The condensate is then returned to the HPCI pump suction via the GSLO condenser drain pump. If the GSLO condenser hotwell level control system fails to maintain a normal level in the hotwell, then the GSLO condenser can flood and steam will no longer be drawn off of the turbine shaft glands, stop valve stem, or control valve stems. This can happen due to an abnormally high or low level in the hotwell. For the event described in this report, a low level in the GSLO condenser hotwell, the GSLO drain pump can become air bound. Once the pump is airbound, the pump no longer maintains normal level in the condenser. Thus, even though the pump is running, no condensate is removed from the condenser hotwell, resulting in condenser flooding (high level). Continued steam leakage into the HPCI room could result in a HPCI system isolation (Group IV) due to high room temperature, rendering the system inoperable. This condition alone would not have prevented the HPCI system from initiating during a design basis accident. The safety significance of this event was minimal since all other emergency core cooling systems were available during the time that the HPCI system was inoperable.

E. CORRECTIVE ACTIONS:

The Unit 2 HPCI GSLO hotwell pump start/stop level switches were replaced with the OEM modified design switches, and satisfactorily tested. (Complete)

The Unit 3 HPCI GSLO hotwell pump start/stop level switches were replaced with the OEM modified design switches, and satisfactorily tested. (Complete)

The parts requisition system (SI system) was updated to specify the modified OEM switches enhanced with stronger magnets and float stops. (Complete)

F. PREVIOUS OCCURRENCES:

None.

G. COMPONENT FAILURE DATA:

<u>Manufacturer</u>	<u>Nomenclature</u>	<u>Model/ Part Number</u>
Magnetrol (dedicated by ComEd)	Tuffy Level Switch	039-5000-400

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		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Dresden Nuclear Power Station, Unit 2	05000237	98	009	01	2 OF 3

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:

High Pressure Coolant Injection System Inoperable due to Gland Seal Leak Off Condenser Hotwell Level Control Malfunction from a Drain Pump Start Level Switch Failure Caused by Manufacturer Design Deficiency.

A. PLANT CONDITIONS PRIOR TO EVENT:

Unit: 2 Event Date: 5/4/98 Event Time: 0433 CDT
 Reactor Mode: 1 Mode Name: Run Power Level: 099
 Reactor Coolant System Pressure: 1003 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 report is being submitted pursuant to 10 CFR 50.73(a)(2)(v)(D), which requires the reporting of any event or condition that alone could have prevented the fulfillment of the safety function of a system required to mitigate the consequence of an accident.

On May 4, 1998, at 0433 hours, while performing Dresden Operating Surveillance (DOS) 2300-09, High Pressure Coolant Injection (HPCI)[BJ] Gland Seal Leak Off (GSLO) Drain Pump and Condenser Hotwell Level Control Functional Test, the hotwell drain pump exhibited erratic operation and resulted in a hotwell low level. The "HPCI Gland Seal Condr Hotwell Lvl Hi/Lo" alarm was received and the low level in the hotwell confirmed. The HPCI system was declared inoperable and the action statement for the Limiting Condition For Operation (LCO) was entered. An ENS notification was performed at 0542 hours. Though not operable, the system remained available while troubleshooting work packages were prepared.

The subject level switch assembly used in the GSLO level control system application is of a new style and manufacturer, first installed in April 1998.

The symptoms and troubleshooting results indicated that the GSLO drain pump start float switch (2-2300-LCS-2) had failed closed. The switch was replaced with an identical new switch. During switch replacement, the new switch was observed to fail in the same manner. Both failed switches were then shipped to the Original Equipment Manufacturer (OEM) on May 7, 1998, for analysis. The OEM analysis indicated that the switches failed due to insufficient magnetic strength and too much travel in the float mechanism to consistently actuate the float switch microswitch. Based on their analysis the OEM modified the switch design.

The OEM supplied new float switches that were assembled and tested in accordance with the OEM's modified design. The pump start (LCS-2) and pump stop (LCS-1) switches on both Unit 2 and Unit 3 were replaced with the OEM modified design switches. The new switches were satisfactorily tested by performance of DIS 2300-15, High Pressure Coolant Injection Gland Seal Condenser Level Control/Alarm Switch Functional Test, and DOS 2300-09. Following replacement and testing of the new switches, the Unit 2 HPCI LCO actions were exited at 1500 hours on May 12, 1998. There have not been any further instances of HPCI GSLO level switch failures since replacement with the OEM modified design. The parts requisition system (SI system) was revised to specify the modified OEM switch design.

Power Reactor

Event # 34963

Site: DRESDEN		Notification Date / Time: 10/27/199 14:45 (EST)	
Unit: 2	Region: 3	Event Date / Time: 10/27/199 13:45 (CST)	
Reactor Type: [1] GE-1,[2] GE-3,[3]		State: IL	Last Modification: 10/27/199
Containment Type:			
NRC Notified by: KYATES		Notifications: CREED, JAMES R3	
HQ Ops Officer: JOHN MacKINNON		HODGE, VERN NRR	
Emergency Class: Non Emergency			
10 CFR Section:			
21.21 UNSPECIFIED PARAGRAPH			

Unit	Scram Code	RX Crit	Init Power	Initial RX Mode	Curr Power	Current RX Mode
2	N	Yes	99	Power Operation	99	Power Operation

HIGH PRESSURE COOLANT INJECTION (HPCI) GLAND SEAL LEAK OFF (GSLO) LEVEL SWITCHES FAILURE.

THIS PART 21 WAS FACSIMILE TO THE NRC HEADQUARTERS OPERATION CENTER

"ON MAY 4, 1998, AT 0433 HOURS, WHILE PERFORMING DRESDEN OPERATING SURVEILLANCE (DOS) 2300-09, HPCI GSLO DRAIN PUMP AND CONDENSER HOTWELL LEVEL CONTROL FUNCTIONAL TEST, THE HOTWELL DRAIN PUMP EXHIBITED ERRATIC OPERATION AND RESULTED IN A HOTWELL LOW LEVEL."

CAUSE OF THE EVENT

"THE ROOT CAUSE OF THIS EVENT WAS A MANUFACTURER DESIGN DEFICIENCY OF THE INSTALLED HPCI GSLO CONDENSER HOTWELL LEVEL CONTROL SWITCHES (NRC CAUSE CODE B). THE SWITCHES FAILED DUE TO A COMBINATION OF INSUFFICIENT MAGNET STRENGTH AND TOO MUCH TRAVEL IN THE FLOAT MECHANISM TO CONSISTENTLY ACTUATE THE FLOAT MICORSWITCH."

CORRECTIVE ACTIONS:

"THE UNIT 2 HPCI GSLO HOTWELL PUMP START/STOP LEVEL SWITCHES WERE REPLACED WITH OEM MODIFIED DESIGN SWITCHES, AND SATISFACTORILY TESTED.

"THE UNIT 3 HPCI GSLO HOTWELL PUMP START/STOP LEVEL SWITCHES WERE REPLACED WITH OEM MODIFIED DESIGN SWITCHES, AND SATISFACTORILY TESTED.

"THE PARTS REQUISITION SYSTEM (SI SYSTEM) WAS UPDATED TO SPECIFY THE MODIFIED OEM SWITCHES ENHANCED WITH STRONGER MAGNETS AND FLOAT STOPS."

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