NRC FORM 366 (5-92) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104
EXPIRES 5/31/95

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNBB 7714), 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.

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Dresden Nuclear Power Station, Unit 3	05000249	1 of 6

TITLE (4)
HPCI System Declared Inoperable Following Gland Seal Leakoff Condenser Hotwell High Level Due To Drain Pump Stop Switch Failure.

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	05	97	97	-- 009 --	00	10	03	97	FACILITY NAME	DOCKET NUMBER

OPERATING MODE (9)	1
POWER LEVEL (10)	099

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)

	20.2201(b)		20.2203(a)(3)(i)		50.73(a)(2)(iii)		73.71(b)
	20.2203(a)(1)		20.2203(a)(3)(ii)		50.73(a)(2)(iv)		73.71(c)
	20.2203(a)(2)(i)		20.2203(a)(4)	X	50.73(a)(2)(v)		OTHER
	20.2203(a)(2)(ii)		50.36(c)(1)		50.73(a)(2)(vii)		(Specify in Abstract below and in Text, NRC Form 366A)
	20.2203(a)(2)(iii)		50.36(c)(2)		50.73(a)(2)(viii)(A)		
	20.2203(a)(2)(iv)		50.73(a)(2)(i)		50.73(a)(2)(viii)(B)		
	20.2203(a)(2)(v)		50.73(a)(2)(ii)		50.73(a)(2)(x)		

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (Include Area Code)
D. Smith - Plant Engineering Ext. 3087	(815) 942-2920

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
X	BJ	LS	M235	N						

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 September 5, 1997, at 1438 with Unit 3 in Mode 1(Run) while performing the quarterly High Pressure Coolant Injection (HPCI) system operability verification, the gland seal leak off (GSLO) condenser hotwell high level alarm was received while bringing the turbine up to full speed following the turbine warm up. The gland steam exhauster tripped off resulting in a GSLO condenser high pressure alarm. The HPCI turbine was manually tripped from the control room, the HPCI System was declared inoperable and the appropriate actions were taken. The cause of this event was the failure of the GSLO condenser drain pump low level stop switch to shut off the pump at the required low level. This led to cavitation/air entrainment in the pump suction and air accumulation in the discharge pressure regulating valve sensing line causing a reduction in the pump capacity. The GSLO condenser drain pump low level stop switch was replaced and the HPCI system was declared operable on September 8, 1997 at 0348 following a satisfactory operability surveillance. The safety significance of this event was minimal.

PLANT AND SYSTEM IDENTIFICATION

General Electric - Boiling Water Reactor - 2527 MWt rated core thermal power.

Energy Industry Identification System (EIIS) 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:

HPCI System Declared Inoperable Following Gland Seal Leakoff Condenser Hotwell High Level Due To Drain Pump Stop Switch Failure.

A. PLANT CONDITIONS PRIOR TO EVENT:

Unit: 3 Event Date: 09/05/97 Event Time: 1449 hrs

Reactor Mode: 1 Mode Name: Run Power Level: 99

Reactor Coolant System Pressure: 1000 psig

B. DESCRIPTION OF EVENT:

This LER is being submitted pursuant to 10 CFR 50.73(a)(2)(v)(D) which requires 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 September 5, 1997, at 1438 hours with Unit 3 in Mode 1(Run), while performing the scheduled quarterly Dresden Operating Surveillance (DOS) 2300-03, High Pressure Coolant Injection System Operability Verification, the High Pressure Coolant Injection (HPCI) [BJ] gland seal leak off (GSLO) condenser hotwell high level alarm was received. The alarm occurred while bringing the turbine up to full speed following turbine warm up. At 1449 the gland steam exhauster tripped off resulting in a GSLO condenser high pressure alarm. The HPCI turbine was manually tripped from the control room at 1451. The HPCI System was declared inoperable and a 14 day LCO was entered in accordance with Technical Specification 3.5.A.

Following the GSLO condenser high level alarm the level in the GSLO condenser hotwell was verified to be high out of sight in the local sightglass. The GSLO drain pump was verified to be running with normal discharge pressure. Following shutdown of the HPCI turbine the GSLO drain pump pumped down the GSLO condenser hotwell. Since the gland steam exhauster takes suction from the top of the GSLO condenser and discharges to the Standby Gas Treatment system, it is likely that the gland steam exhauster tripped on overload due to water entrainment in the exhauster suction. No water was noted at the gland steam exhauster shaft.

The gland steam exhauster breaker was satisfactorily inspected. The gland steam exhauster operating current was verified to be normal and the exhauster has been observed to operate satisfactorily. No further inspection of the exhauster is warranted due to the lack of water at the exhauster shaft and considering that any water entering the exhauster casing would have drained to the GSLO condenser via the exhauster casing drain line. The gland steam exhauster performed satisfactorily during the subsequent HPCI operability surveillance.

The GSLO condenser hotwell level control and alarm switches were satisfactorily tested by performance of Dresden Instrument Surveillance (DIS) 2300-15, High Pressure Coolant Injection System (HPCI) Gland Seal Condenser Level Control/Alarm Switch Functional Test. This surveillance did not indicate any abnormal switch operation, yet during subsequent manual hotwell pump-down in preparation for inspection of the level switches, the GSLO condenser drain pump low level stop switch (LS 3-2300-LCS-1) failed to operate (open) and shut off the GSLO condenser drain pump prior to receiving the GSLO condenser low level alarm. The pump was manually secured. Inspection of the GSLO condenser drain pump low level stop switch revealed that the switch mercury bulb was rotated approximately 90 degrees from its normal position. Switch rotation would have contributed to a delay in the opening of the drain pump stop switch. The GSLO condenser drain pump low level stop switch was replaced. Physical inspection of the GSLO condenser drain pump low level stop switch following removal did not show any indication of float or linkage binding or damage.

A satisfactory internal boroscope inspection was performed on the horizontal and accessible vertical portions of GSLO condenser hotwell level control and alarm switch instrumentation piping. No obstructions or blockages were identified.

During restoration from the boroscope inspection the GSLO drain pump discharge pressure regulating valve (3-2399-79) sensing line was purged of air. Air in the sensing line will result in slow valve operation, causing a delayed and slow pump down of the GSLO condenser hotwell. The GSLO condenser drain pump discharge pressure regulating valve (3-2399-79) and the GSLO condenser/lube oil cooler cooling water pressure regulating valve (3-2301-46) were functionally tested satisfactorily.

A review of maintenance history did not identify any previous failures or replacements for this specific level switch.

DOS 2300-03 was successfully performed and the HPCI system was declared operable on September 8, 1997 at 0348 hours. During this surveillance satisfactory operation of the GSLO condenser drain pump and level switches was observed during six hotwell pump-down cycles. The Unit 3 HPCI system was operated satisfactorily again on September 10, 1997 following maintenance not related to this LER.

There were no structures, systems or components inoperable at the beginning of this event which contributed to the level switch failure.

C. CAUSE OF EVENT:

The cause of this event was the failure of the GSLO drain pump to maintain level in the GSLO condenser hotwell. Failure of the GSLO drain pump to pump-down the GSLO condenser hotwell resulted in a GSLO condenser hotwell high level condition that overloaded the gland steam exhauster, causing it to trip and resulting in a GSLO condenser high pressure alarm. The GSLO drain pump failed to pump-down the hotwell due to air entrainment/cavitation in the GSLO drain pump suction and air accumulation in the sensing line of the GSLO drain pump discharge pressure regulating valve.

The cause for the air entrainment/cavitation in the GSLO drain pump suction and air accumulation in the GSLO drain pump discharge pressure regulating valve sensing line was failure of the GSLO condenser drain pump low level stop switch [NRC cause code X] to shut off the pump at the required low level. This resulted in air entrainment in the pump suction, slow operation of the pump discharge pressure regulating valve, and the resulting delayed pump-down of the GSLO condenser hotwell.

Inspection of the Gland Seal Condenser drain pump stop switch found that the mercury bulb was rotated approximately 90 degrees in its spring clip holder. The mercury bulb is secured in place by glue. The cause for the glue failure and bulb rotation was not determined.

D. SAFETY ANALYSIS:

Following HPCI system initiation, turbine and valve stem steam leakoff is collected by the HPCI turbine GSLO system and is condensed in the GSLO condenser. The condensate is then returned to the HPCI booster pump suction by the GSLO drain pump. A high level and high pressure condition in the GSLO condenser due to failure of the GSLO drain pump to pump-down the GSLO condenser hotwell would result in steam leakage from the turbine glands and the stop and control valve stems. Initially, this occurrence alone would not prevent the HPCI system from functioning during a design basis accident. Continued steam leakage into the HPCI room could result in a HPCI system isolation (Group IV) due to high room temperature.

With the HPCI system inoperable due to the high level and high pressure condition in the GSLO condenser, the Isolation Condenser, Automatic Depressurization System, and Low Pressure Emergency Core Cooling Systems (LPCI, Core Spray) were available to provide reactor pressure and inventory control during any postulated design basis accident. For these reasons, the safety significance of this event is considered to be minimal.

E. CORRECTIVE ACTIONS:

1. The gland steam exhauster fan breaker was inspected and the fan was operated while monitoring motor current and locally observing the fan for abnormal operation. (Complete)

2. The GSLO drain pump stop level switch (LS 3-2300-LCS-1) was replaced and functionally tested. (Complete)

3. The GSLO drain pump discharge pressure regulating valve (3-2399-79) sensing line was purged of air and functionally verified during the subsequent HPCI operability surveillance. (Complete)

4. A satisfactory internal boroscope inspection was performed on the horizontal and accessible vertical portions of GSLO condenser hotwell level control and alarm switch instrumentation piping. (Complete)

5. Enhance DIS 2300-15, High Pressure Coolant Injection System (HPCI) Gland Seal Condenser Level Control/Alarm Switch Functional Test, to physically inspect all four GSLO condenser hotwell level control and alarm switches. Inspection will include mercury bulb integrity. (NTS 249-180-97-00901)

F. PRIOR SIMILAR OCCURRENCES:

LER/Docket	Title
97-013-00/0500237	HPCI System Declared Inoperable Due to Excessive Cycling of the Gland Seal Condenser Hotwell Drain Pump due to Pump Stop Level Switch Malfunction.

On June 6, 1997, during scheduled performance of Dresden Operability Surveillance (DOS) 2300-03, High Pressure Coolant Injection System Operability Verification, the High Pressure Coolant Injection (HPCI) Gland Seal Leak Off (GSLO) condenser hotwell drain pump began cycling (on/off) excessively. The cause for the excessive pump cycling was attributed to failure (sticking) of the HPCI condenser hotwell pump stop level control switch 2-2300-LCS-1 in the open position. Corrective actions for this event were to replace the defective switch and functionally verify operability. The corrective actions from this event would not have prevented the September 5, 1997, Unit 3 HPCI event from occurring.

G. COMPONENT FAILURE DATA:

Manufacturer	Nomenclature	Model Number
Mercoid Corporation	Level Switch	123

An industry wide NPRDS data base search was performed on Mercoid Corporation, Model 123 level switches for HPCI System application. One level switch failure was identified. Failure was caused by the mercury bulb coming loose from its holder.