NRC FORM 366 (4-95) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104
EXPIRES 04/30/98

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.

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Dresden Nuclear Power Station, Unit 2	05000237	1 of 4

TITLE (4)
High Pressure Coolant Injection System Inoperable Due to Turbine Stop Valve Trip Failure Caused by Inadequate Preventive Maintenance Resulting in Corrosion on Trip Solenoid Valve Terminal Strip Electrical Leads

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
									N/A	N/A
04	17	98	98	005	00	05	15	98	FACILITY NAME: N/A	DOCKET NUMBER: N/A

OPERATING MODE (9)	2	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR § (Check one or more) (11)					
POWER LEVEL (10)	013	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)		50.73(a)(2)(iv)		OTHER
		20.2203(a)(2)(iii)	50.36(c)(1)	X	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	TELEPHONE NUMBER (Include Area Code)
D. S. Smith, System Engineer	(815) 942-2920 ext 3087

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 April 17, 1998, at 0403, while performing Dresden Operating Surveillance (DOS) 2300-03, High Pressure Coolant Injection (HPCI) Operability Testing, the HPCI turbine stop valve did not trip closed when the control room "Remote Turbine Trip" push-button was depressed. The turbine stop valve had to be manually tripped closed locally. Troubleshooting revealed high resistance readings in the 125 VDC circuit that supplies power to the turbine trip solenoid valve. Inspection of terminal strip leads in this circuit, located in a terminal box in the Unit 2 HPCI room, discovered corrosion product buildup on the surfaces of the leads. The terminal strip leads were cleaned and re-landed. Resistance readings across the portion of the circuit containing the leads decreased significantly. Following the troubleshooting and repairs, the HPCI turbine stop valve was opened and tripped closed satisfactorily from the control room three times. Unit 2 HPCI was declared operable and the LCO exited at 1210 on April 17, 1998. The apparent cause of the corrosion product buildup is inadequate preventive maintenance of the main terminal box. The safety significance of this event was minimal since the HPCI turbine, although incapable of being tripped from the control room, would have been available initially to respond to an accident initiation signal. Additionally, all other emergency core cooling systems were available during the time that the HPCI system was inoperable.

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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 (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:

High Pressure Coolant Injection System Inoperable Due to Turbine Stop Valve Trip Failure Caused by Inadequate Preventive Maintenance Resulting in Corrosion on Trip Solenoid Valve Terminal Strip Electrical Leads

A. PLANT CONDITIONS PRIOR TO EVENT:

Unit: 2 Event Date: 4/17/98 Event Time: 0403 CDT

Reactor Mode: 2 Mode Name: Startup Power Level: 013

Reactor Coolant System Pressure: 930 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 LER 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 April 17, 1998, at 0403, while performing Dresden Operating Surveillance (DOS) 2300-03, High Pressure Coolant Injection (HPCI)[BJ] Operability Testing, the turbine stop valve did not trip closed when the control room "Remote Turbine Trip" push-button was depressed. The turbine stop valve had to be manually tripped locally. A 14-day Limiting Condition of Operation (LCO) was entered 0403 and an ENS notification was made at 0517 CDT.

Normally the HPCI turbine is remotely tripped from the control room by depressing the "Remote Turbine Trip" push-button. The push-button energizes the turbine trip solenoid valve (2-2303-SV12) via a 125 VDC control circuit. Upon energization, the turbine trip solenoid valve opens and dumps turbine control oil. Decrease in turbine control oil pressure causes a relay valve to move and dump high pressure turbine hydraulic oil from the turbine stop valve operating cylinder, thereby tripping the stop valve closed. The turbine overspeed trip and local manual trip mechanically dump the same control oil to trip the turbine without the turbine trip solenoid valve being energized. The three automatic HPCI turbine trips (high turbine exhaust pressure, low booster pump suction pressure, and high reactor water level) energize the turbine trip solenoid valve to trip the stop valve closed.

Troubleshooting revealed high resistance readings in the 125 VDC circuit that supplies power to the turbine trip solenoid valve. Inspection of terminal strip leads in this circuit, located in the main terminal box in the Unit 2 HPCI room, identified a small amount of corrosion product buildup on the surfaces of the leads. The terminal strip leads were cleaned and re-landed. Resistance readings across the portion of the circuit containing the leads decreased significantly to an acceptable level (from 2.4 k ohms to 22 ohms).

Following the troubleshooting and repairs, the HPCI turbine stop valve was opened and tripped closed satisfactorily from the control room three times. Unit 2 HPCI was declared operable and the LCO exited at 1210 on April 17, 1998.

Further inspection of the main terminal box revealed that the box had a missing conduit knockout plug and the terminal box door gasket was not making full contact with the mating surface in all locations. It is believed that these materiel condition deficiencies resulted in corrosion buildup on the terminal strip leads by allowing HPCI room humidity to enter the box.

C. CAUSE OF EVENT:

Failure of the Unit 2 HPCI turbine stop valve to trip closed by operation of the control room "Remote Turbine Trip" push-button was caused by high resistance in the 125 VDC control circuit to the turbine trip solenoid valve (2-2303-SV12). The high resistance was a result of corrosion product build up on the terminal strip leads in the main terminal box, located in the Unit 2 HPCI room. The apparent cause of this event is inadequate preventive maintenance which resulted in poor terminal box materiel condition that allowed corrosion product buildup (Cause Code E). Terminal boxes are not typically included in the preventative maintenance program. Should the subsequent inspection and evaluation identify a cause other than previously stated, a supplemental LER will be submitted.

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. Failure of the remote or automatic HPCI turbine trips would not have prevented the HPCI turbine from starting. Therefore, the HPCI system would have operated if needed. Following initiation, the turbine would not have tripped under conditions that would normally cause a turbine trip even with an initiation signal present (high reactor water level or high turbine exhaust pressure). As a result of the failure to automatically trip or inability to remotely trip the turbine, the HPCI turbine could have been damaged and would not have been available for subsequent use. The safety significance of this event was minimal since the HPCI turbine, although incapable of being tripped from the control room, would have been available initially to respond to an accident initiation signal. Additionally, all other emergency core cooling systems were available during the time that the HPCI system was inoperable.

E. CORRECTIVE ACTIONS:

1. Leads in the Unit 2 HPCI turbine trip solenoid valve control circuit in the HPCI turbine main terminal box were cleaned. (Complete)

2. The HPCI turbine stop valve was opened and tripped closed from the control room using "Remote Turbine Trip" push-button three times satisfactorily. (Complete)

3. The Unit 3 HPCI main terminal box was inspected and the materiel condition of the box was found to be adequate. (Complete)

4. Materiel condition discrepancies of the Unit 2 HPCI main terminal box will be corrected. (NTS 237-180-98-00501)

5. All additional terminal strip leads will be inspected, and cleaned if needed, in the Unit 2 HPCI turbine main terminal box. (NTS 237-180-98-00502)

6. Inspection of selected terminal strip leads in the Unit 3 HPCI turbine main terminal box for potential cleaning, will be conducted based on importance to HPCI operability and visual indication of corrosion product buildup. (NTS 237-180-98-00503)

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

7. An inspection and evaluation will be conducted of all HPCI system terminal boxes located in the Unit 2 and 3 HPCI rooms for materiel condition and to determine need and scope of appropriate preventive maintenance. Should the inspection and evaluation identify a cause other than stated in LER 2-98-005, a supplemental LER will be submitted. (NTS 237-180-98-00504).

F. PREVIOUS OCCURRENCES:

None

G. COMPONENT FAILURE DATA:

None