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 5

TITLE (4) High Pressure Coolant Injection Declared Inoperable Due to Broken Room Cooler Drive Belt on Dresden Unit 3

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
04	16	95	95	-- 009 --	01	06	23	95	None	
									FACILITY NAME	DOCKET NUMBER

OPERATING MODE (9)	N
POWER LEVEL (10)	097

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)
Greg Lupia, Plant Engineering Ext. 2792	(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	FAN	B515	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 April 16, 1995, at 1358 hours, with Unit 3 at 97% rated core thermal power, during Nuclear Station Operator (NSO) panel walkdowns, it was noted that the High Pressure Coolant Injection (HPCI) room cooler was running with no change in room temperature. An Operator was dispatched to inspect the cooler and found that the drive belt had broken. The HPCI System was declared inoperable and a seven day Limiting Condition for Operation (LCO) was entered per Technical Specification 3.5. The Electrical Maintenance Department (EMD) replaced the drive belt per Nuclear Work Request 950037405-01. Additionally, the failed drive belt was sent to the Original Equipment Manufacturer (OEM) to determine the cause of failure. The LCO was terminated on April 17, 1995, at 2009 hours. The Safety Significance of this event is minimal since all other Emergency Core Cooling Systems (ECCS) required by TS 3.5.C.2.a were operable. A similar previous occurrence was reported by LER 89-022 on docket 050249 and LER 93-1 on docket 050249. This supplemental report is being submitted in accordance with 10CFR50.73(a)(2)(v)(D).

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EVENT IDENTIFICATION:

High Pressure Coolant Injection Declared Inoperable Due to Broken Room Cooler Drive Belt on Dresden Unit 3

A. PLANT CONDITIONS PRIOR TO EVENT:

Unit: 3 Event Date: 04/16/95 Event Time: 1358

Reactor Mode: N Mode Name: RUN Power Level: 97%

Reactor Coolant System Pressure: 1002 psig

B. DESCRIPTION OF EVENT:

On April 16, 1995, at 1358 hours, with Unit 3 at 97% rated core thermal power, during Nuclear Station Operator (NSO) panel walkdowns, it was noted that the High Pressure Coolant Injection (HPCI) [BJ] room cooler was running with no change in room temperature. An Operator was dispatched to inspect the cooler and found that the drive belt had broken. The HPCI system was declared inoperable and a seven day Limiting Condition for Operation (LCO) was entered per Technical Specification (TS) 3.5. The EMD took immediate actions to install a new drive belt and adjust it to the proper tension requirements. Dresden Electrical Procedure (DEP) 5700-04, HPCI Room Fan Preventive Maintenance, was successfully completed. The HPCI system was returned to service and the LCO was terminated at 2009 hours on April 17, 1995. The safety significance of this event was determined to be minimal since the HPCI system remained capable of automatically initiating, and all other Emergency Core Cooling Systems (ECCS) required by TS 3.5.c.2 were operable.

C. CAUSE OF EVENT:

This report is being submitted in accordance with 10CFR50.73(a)(2)(v)(D), which requires the reporting of any condition that could have prevented the fulfillment of a safety system needed to mitigate the consequences of an accident. Although failure of the HPCI room cooler would not have defeated the design function of the HPCI system, the room cooler fans are required for recirculation of air in the event of a postulated design basis accident. Therefore, the system was declared inoperable.

The current motor mounting design is a result of an upgrade to the motor mount bracket. This was initiated, in part, to address the previous event when a belt broke, LER 93-17 on docket 050249. The previous design caused the belt pulleys to become misaligned, thus causing the belts to brake. The intent of the upgrade was to provide additional rigidity for the mounting of the motor to the HPCI room cooler external metal skin. The new mount significantly reduced the vibration experienced by the cooler. In addition, the conventional 'V' drive belt and pulleys were replaced with a toothed drive belt and sprocket. The current HPCI room cooler belt design parameters were reviewed, with no errors or oversights identified. The HPCI room cooler was inspected per DEP 5700-04, and no anomalies were found.

Inspection of the failed belt showed no unusual wear, except at the point of failure. The belt was sent to the OEM to try to determine root cause of failure. A letter from the OEM to Engineering (dated May 5,1995) identified two possible causes of failure. The OEM analysis, to determine the cause of failure, concluded that the design of the drive is satisfactory but indicated that the belt may have been crimped or kinked during storage or shipping and/or shockloaded due to shaft flex. The store room was checked, one belt was on the shelf and determined not to have been crimped or kinked. Shaft flex is more difficult to determine; however, the primary cause of flex, shockload, has been ruled out as this is caused by bearing failures or motor lock up and there is no history of this problem while this belt was installed. Normal starts and stops should not cause the type of loading to cause the shaft to flex. The OEM could not specifically rule out a manufacturing defect as the cause of failure. The OEM recommended reverifying the belt alignment and tension.

The belt was originally installed per work request D19095; this work package contained engineering guidance (CHRON letter 0122285, dated 11/2/93) for installing and DEP 5700-04 tensioning the new belts. Engineering provided this guidance for the electrical procedure on installing HPCI fan belts.

A review of industry LER's for belt failures and their causes led engineering to also examine area temperatures and vibrations. The root cause of the belt failure could not be specifically identified by the station or the OEM at this time. The most probable root cause is either a problem during manufacturing of this particular belt or improper handling during the shipping process.

D. SAFETY ANALYSIS:

The HPCI system is designed to pump water into the reactor vessel under loss of coolant conditions which do not result in rapid depressurization of the 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. The anticipated operational requirements of the HPCI system is for less than four hours.

Although the HPCI system was declared inoperable, the automatic function of the HPCI system was not hindered. The HPCI system would still have been able to perform its function until the temperature of the room reached 175 degrees, during the event of a postulated accident. When 175 degrees is reached, the HPCI system would isolate on area high temperature, assuming a steam leak in the HPCI room. It was determined through engineering calculations (Nuclear Fuel Services Report RSA-D-92-06) that the room temperature would reach the HPCI isolation point after 19 hours with the fan running (without cooling water) and the initial room temperature of 120 degrees. During this event the initial room temperature was at 104 degrees. Through extrapolation, engineering judgment suggests that with the lower initial HPCI room temperature and without the fan running, the HPCI system would have been able to perform its function for a number of hours prior to reaching the isolation temperature.

However, the HPCI room cooler fans are required for circulation (without cooling water) during the event of a postulated accident. This analysis is documented in the Nuclear Fuel Services Report RSA-D-92-06. Additionally, all other Emergency Core Cooling Systems (ECCS) required by T.S. 3.5.c.2 were operable.

Therefore, for the above reasons, the safety significance of this event was considered minimal.

E. CORRECTIVE ACTIONS:

Nuclear Tracking System (NTS) tracking code numbers are identified in the text as (XXX-XXX-XX-XXXXX).

1. The electrical procedure that contains HPCI fan belt installation instructions DEP 5700-04, will be revised to include inspecting the belt for flaws. (249-180-95-00900S1-01)

2. Use of a stronger belt for the Unit-2 HPCI room cooler fan is being investigated for possible installation during D2R14. (249-180-95-00900S1-02)

3. Vibrations and speed checks were performed on 6/17/95 and found to be satisfactory and evaluation of HPCI Room temperature was conducted.

4. The HPCI room temperature does not go above 120°F at any time (worst case), this is not a problem for the belts.

5. The current HPCI room cooler drive belt design was reviewed with the OEM Representative and no errors or oversights were identified. (April 20, 1995)

6. The HPCI room cooler was visually inspected (including the drive belt) on a weekly basis from 4/27/95 to 6/16/95 for any indication of degradation; none was identified. Therefore, this inspection will be discontinued.

7. The HPCI room cooler belt was sent to the OEM for analysis to determine the cause of failure. The results and conclusions of the Manufacturer's analysis, could not specifically rule out a manufacturers defect. The impact of the frequency of HPCI room cooler start/stops on the drive belt were addressed by site engineering and the OEM and do not appear to be a problem.

8. Original belt installation was done per engineering/OEM's guidance and determined to be correct per review of original work package.

9. The HPCI room cooler drive belt tension and alignment was reverified per DEP 5700-04 on 6/16/95.

F. PREVIOUS OCCURRENCES:

LER/Docket Numbers	Title
89-022/050249	HPCI Inoperable Due to Broken Room Cooler Belts

The HPCI system was inoperable due to the failure of room cooler drive belts. The failure of the belts were attributed to increased frequency of cooler operation due to elevated HPCI room ambient temperatures.

93-017/050249 HPCI Declared Inoperable Due to Broken Room Cooler Drive Belt

The HPCI system was inoperable due to the failure of room cooler drive belts. The failure of the belts were attributed to the poor design of the HPCI room cooler motor mount. The original motor mount supplied with the coolers was inadequately designed and as such, the belt pulleys were subject to misalignment. This condition led to premature belt failures.

G. COMPONENT FAILURE DATA:

MANUFACTURER	MODEL	PART NUMBER
Gates (Buffalo Forge)	Poly Chain	8M-1280-12 (catalog number)

The belt drive is not reportable to NPRDS.