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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 2	05000237	1 OF 8

TITLE (4)
Unit 2 Shutdown Performed Because of Inability to Meet Allowed LCO Time for High Pressure Coolant Injection System Testing

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	18	96	96	-- 002 --	00	05	16	96	None	
									FACILITY NAME	DOCKET NUMBER

OPERATING MODE (9)	N
POWER LEVEL (10)	001

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)		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)	X	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)
Ralph M. Fenili, Operations Staff Ext. 2917	(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

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)

At 0820 on April 18, 1996 during unit startup, it was determined that the temperature of the High Pressure Coolant Injection (HPCI)[BJ] discharge line would not decrease to less than 150 degrees F, as stated in the precaution section of DOS 2300-03, "High Pressure Coolant Injection System Operability Verification", and a 24 hour LCO was entered in accordance with T.S. 3.5.C.3 for HPCI operability. At 0920 hours on April 18, 1996, Unit 2 commenced shutdown because of the inability to meet the Limiting Condition for Operations (LCO) time requirements of TS 3.5.C.3. Unit shutdown was completed at 1300 on April 18, 1996 with the initiation of a manual scram in accordance with DGP 2-1, Normal Unit Shutdown. The cause of the elevated HPCI discharge piping temperatures was due to a steam leak from the Main Steam (MS) drain bypass line orifice plate which impinged on the HPCI discharge line piping, in conjunction with some minor leakage into the HPCI discharge line due to a modified valve lineup. Corrective Actions include permanent repair of the MS drain line orifice plate steam leak and modification of the HPCI 2-2301-8 valve, eliminating the need for the modified valving configuration.

EVENT IDENTIFICATION:

Unit 2 Shutdown Performed Because of Inability To Meet Allowed LCO Time for High Pressure Coolant Injection System Testing.

A. PLANT CONDITIONS PRIOR TO EVENT:

Unit: 2 Event Date: April 18, 1996 Event Time: 1300

Reactor Mode: N Mode Name: Startup Power Level: 1%

Reactor Coolant System Pressure: 315 psig

B. DESCRIPTION OF EVENT:

This report is submitted in accordance with 10CFR50.73(a)(2)(i)(A) which states that the completion of any nuclear plant shutdown required by the plant's Technical Specification (TS) will be reported. At 0920 hours on April 18, 1996, Unit 2 commenced shutdown because of the inability to meet the Limiting Condition for Operations (LCO) time requirements of TS 3.5.C.3. The NRC ENS notification center was advised of commencement of unit shutdown at 1209 on April 18, 1996 pursuant to 10CFR50.72(b)(1)(i)(A). Unit shutdown was completed at 1300 on April 18, 1996, with the initiation of a manual scram in accordance with DGP 2-1, Normal Unit Shutdown.

Orderly shutdown discussion.

At 0820 on April 18, 1996 during unit startup, it was determined that the temperature of the High Pressure Coolant Injection (HPCI)[BJ] discharge line would not decrease to less than 150 degrees F, as required by the precaution section of DOS 2300-03, "High Pressure Coolant Injection System Operability Verification", and a 24 hour LCO was entered in accordance with T.S. 3.5.C.3 for HPCI operability. Operations determined that it would not be prudent to utilize the LCO clock for troubleshooting and ordered that preparations for unit shutdown be made per DGP 2-1, "Normal Unit Shutdown".

HPCI system and associated valving alignment to the normal operating configuration was completed at 1057. The torus pump down valving was reconfigured at 1111. The manual scram was initiated in accordance with DGP 2-1 Normal Unit Shutdown, concurrent with DGP 2-3, Reactor Scram, at 1300 on April 18, 1996, with all systems and components operating as designed.

Background

On August 17, 1995, the NRC issued Generic Letter (GL) 95-07, "Pressure Locking and Thermal Binding of Safety-Related Power-Operated Gate Valves," to request that licensees take actions to ensure that safety-related power-operated gate valves that are susceptible to pressure locking or thermal binding are capable of performing their safety functions within the current licensing bases of the facility. As stated in GL 95-07, pressure locking occurs in flexible-wedge and double-disk gate valves when fluid becomes pressurized within the valve bonnet and the actuator is not capable of overcoming the additional thrust required because of the differential pressure created across both valve disks. On February 5, 1996, NRC Information Notice 96-08, "Thermally Induced Pressure

Locking of a High Pressure Coolant Injection Gate Valve", was issued. This NRC Information Notice stated that on November 11, 1995, Susquehanna Steam Electric Station, Unit 1, identified a bent retaining ring in a Unit 1 HPCI valve while performing a modification to eliminate susceptibility to pressure locking. The valve was an Anchor Darling 14-inch flexible-wedge motor-operated pressure seal gate valve installed in their HPCI discharge line, from the HPCI pump. The notice additionally stated that the licensee believed that heating from feedwater caused thermally induced pressure locking and the bent retaining ring. As a result of these information notices, an evaluation was performed and it was determined that until a permanent repair could be performed, a revision to station procedure DGP 1-1, "Normal Unit Startup", would be required to address issue of pressure locking of the HPCI pump discharge valve, 2-2301-8. Requirements were added to DGP 1-1 to maintain the HPCI 2-2301-8 valve open and the 2-2301-9 valve closed during the unit startup. This modified valve alignment was to be maintained until the HPCI system was tested at rated primary system pressure and declared operable per TS 3.5.C. Long term resolution of the pressure binding issue would require the drilling of a hole in the valve disc for pressure equalization with the valve closed.

Conditions preceding the orderly shutdown.

Reactor startup from D2R14 was initiated at 0345 hours on April 15, 1996. At 1220 on April 17, 1996 with the reactor critical, reactor control rod withdrawal commenced to allow an increase of reactor pressure from 130 psig to 180 psig. When 180 psig was achieved, turbine bypass valves would be opened to support Automatic Depressurization System (ADS)[AD] and HPCI operability testing.

At 1228 reactor pressure attained 150 psig and the Unit entered a 24 hour shutdown LCO for ADS and HPCI being inoperable (TS 3.5.D.4) and a concurrent 7 day LCO for HPCI inoperability (TS 3.5.C.2.a).

Dresden Operations Surveillance (DOS) 2300-02, "HPCI Overspeed Test" is performed at a low reactor pressure (approximately 180 psig) and requires the HPCI turbine to be uncoupled from the HPCI pump. Prior to the reactor achieving 150 psig, Operations dispatched an Equipment Attendant (non-licensed) to obtain initial piping temperatures. On HPCI initiation, system logic opens the HPCI 2-2301-8 discharge valve, resulting in a decrease in header pressure. Prior to HPCI flow testing, discharge piping temperature is checked at five pre-determined points along the HPCI discharge line, looking for areas where voiding could occur within the discharge line piping. A discharge line high temperature acceptance criteria of less than 150 degrees F had been previously established to provide margin from this voiding region. The Equipment Attendant found the HPCI discharge line temperature monitoring point (pt 1, Figure 1) to be 200 degrees F, above the acceptance criteria limit of 150 degrees F specified in the surveillance.

At the request of Engineering, the HPCI 2-2301-8 valve was closed and an evaluation of HPCI system performance was initiated.

Engineering Operational Problem Response (EOPR# 96-02-23-162) was issued to Operations, stating that system line temperature decreased when the HPCI 2-2301-8 valve was closed. In addition, the HPCI line had been walked down without finding any other signs of elevated temperatures. The conclusion was

that the elevated temperature was as a result of mixing between Reactor Water Cleanup [CE] water and the water in the HPCI discharge line. Normally the 2-2301-7 HPCI discharge check valve would adequately maintain the water separate, but there had not yet been a large enough differential pressure to firmly seat the check valve. The 2-2301-7 is not designed to be a zero leakage barrier, as the downstream feedwater check valves provide this function as primary containment isolation valves. The small amount of 2-2301-7 valve leakage was anticipated to be resolved as reactor pressure was increased, subjecting the check valve to a higher differential pressure.

With the 2-2301-8 valve closed and temperature less that 150 degrees F, HPCI overspeed testing was successfully performed.

At 2120 hours on April 18, 1996, reactor pressure was increased to 200 psig and Unit 2 entered a 12 hour LCO per T.S. 3.5.C. During the pressure ascension, the HPCI 2-2301-8 valve was periodically cycled to support HPCI temperature troubleshooting. Control Rod pulls were utilized to augment the pressure ascension, resulting in the reactor steady at 320 psig with 2 turbine bypass valves open. DOS 0250-04, "Relief Valve Testing at Low and at High Pressure", was initiated by the Operating Team and was completed at 0450 hours on April 18, 1996, exiting the 24 hour LCO for TS 3.5.D.4.

At 0500 hours, with the HPCI uncoupled overspeed test completed, reactor pressure was maintained at 315 psig in readiness for the low pressure (coupled) HPCI pump test. With the HPCI 2-2301-8 valve closed, HPCI temperatures were found to be 159 degrees F, exceeding the value contained in the precaution section of DOS 2300-03. Operations decided to monitor the line temperature to see if it would decrease. Under the impression that the 2-2301-8 valve was leaking by, periodic cycling of the HPCI 2-2301-8 valve was performed in an attempt to seat the valve.

At 0820 hours, it was determined that the HPCI pump discharge line temperature would not decrease to less than 150 degrees F as required by DOS 2300-03 and a 24 hour LCO was entered per T.S. 3.5.C.3 for HPCI operability. Operations management decided not to utilize the allowed LCO time of TS 3.5.C.3 and made preparations for unit shutdown per DGP 2-1, "Normal Unit Shutdown". At 1057 alignments to the HPCI system and associated valving for the normal operating configuration was completed. Torus pumpdown valving was reconfigured at 1111. Chemistry was notified of the pending shutdown. At 1300 on April 18, 1996 a manual scram was initiated, in accordance with DGP 2-1, "Normal Unit Shutdown", and DGP 2-3, "Reactor Scram", without incident.

On April 19, 1996, Engineering issued EOPR 96-02-23-167 which recommended continued cycling of the 2-2301-08 valve every 20 degrees F during the heatup and also monitoring the temperature at Pt 1 every 2 hours. With this plan in place, the second reactor startup from D2R14 was begun at 1920 hours on April 20, 1996. The data indicated that temperatures were consistently less than 100 degrees F at five monitoring points along the HPCI discharge line.

At 1356 on April 21, 1996 the low pressure HPCI run was successfully completed. After the HPCI run the temperature at Pt 1 increased to 160 degrees F. The HPCI injection valves were cycled and the temperature decreased to less than 100 degrees F two hours later. This was attributed to maintaining 2-2301-8 valve closed during the time period, which prevented backflow through the 2-2301-7.

Between 2200 on April 21, 1996 and 0015 on April 22, 1996, the temperature at Pt. 1 started to increase and was first noted at 0020 to be at 148 degrees F. This temperature rise could not be correlated to any valve cycling event. The temperature at Pt 1 reached 188 degrees F at 0100 and subsequently decreased and stabilized between 160-170 degrees F. At 1100 hours on April 22, 1996, an entry into the X-Area (room housing the Outboard Main Steam Isolation Valves and HPCI 2-2301-8 valve) identified a steam leak from a Main Steam Line drain bypass line orifice plate. Engineering recognized that this steam leak was impinging directly upon the HPCI discharge line piping and reported this to the Shift Manager (Licensed SRO).

Based upon the temperatures observed, concurrent with the discovery of the steam leak, Engineering concluded that localized heating near the Pt 1 thermocouple was occurring. At 2015 a steam deflector was installed to direct steam away from the HPCI piping, resulting in the temperature at Pt 1 remaining steady at 170 degrees F for the next four hours.

At 0032 on April 23, 1996 the 2-2301-08 valve was cycled and the temperatures were monitored at the normal location per DOS 2-2300-08, as well as contact readings at Pt 1 prior to and after valve cycling. This temperature decrease was attributed to deflection of the steam from the HPCI piping. These readings showed conclusively that the HPCI piping temperatures in the X-area were well below the point at which steam voids would form. At 0400 additional contact readings were taken of the piping in the X-Area which confirmed again that the piping did not contain steam voids. At 0530 the 2-2301-8 and 2-2301-9 valves were cycled to verify the piping between the 2-2301-8 valve and the 2-2301-9 valve were properly filled and vented. This provided further confirmation that no steam existed in the piping between the 2-2301-8 and 2-2301-9 valves. At 0600 the 2-2301-8 and 2-2301-9 valves were cycled again. Temperatures at Pt. 1 were obtained using a contact pyrometer and remotely via the permanent thermocouple. Both methods showed close correlation and were in the 81 to 86 degrees F range.

An Engineering analysis of the data indicates that some minor leakage through the 2-2301-07 check valve, past the open 2-2301-8 valve, and through the 2-2301-10 valve, may have been occurring. The leakage, known to be less than .5 gpm, was derived by the performance of an augmented leak test during D2R14. This test also determined that there was no leakage past the 2-2301-8 or 2-2301-9 valves. Additionally, thermal conductive heat transfer from the check valve back through the 2-2301-8 valve in the normally insulated line can account for some of the temperature gradient that has been observed. However, various hand-held pyrometer readings taken in the X-area on 4/23/96 shows conclusively that voiding was not occurring in the HPCI injection piping in the X-area. Additionally, temperature readings taken at Points 2,3,4 and 5 (Figure 1) showed conclusively that voiding was not occurring in the HPCI piping located in the HPCI room.

Engineering concluded that voiding was not occurring in the HPCI piping and recommended that the plant startup (heatup) continue.

C. CAUSE OF EVENT:

The cause of this event was as a result of a combination of two problems: (1) steam leakage impinging on the HPCI discharge line piping, which produced an inaccurate and higher than actual thermocouple indication, and (2) some minor leakage past the 2-2301-7 check valve, the open 2-2301-8 valve, and the 2-2301-10 valve, which was previously calculated to be less than .5 gpm, as determined by a leak test during D2R14.

D. SAFETY ANALYSIS:

The safety significance of these events was minimal because Low Pressure Injection systems were available to provide reactor inventory control under postulated accidents for this low pressure operating condition. The Unit was operated within the bounds of the Technical Specifications throughout the event. The premature piping heating and potential back leakage conditions is believed to have not resulted in internal water temperatures which would have voided the discharge piping, as a result, this condition would not have rendered the HPCI systems functionally inoperable. In addition, this piping volume had successfully passed Local Leak Rate Testing during D2R14.

E. CORRECTIVE ACTIONS:

The steam leak from the Main Steam drain bypass line orifice plate has been temporarily repaired.

Permanent repair of the Main Steam drain bypass line orifice plate will be performed. (2371809600201)

During the current reactor start-up and power ascension, Engineering provided operations with a Main Control Room temperature reading of Pt.1 to assist in better monitoring the condition of the HPCI system.

Engineering will relocate the Pt.1 thermocouple away from the floor slab and onto the elbow in the torus to provide a more representative indication of fluid temperature in the HPCI piping in the Torus area. (2371809600202)

Operations procedures have been revised to state that if the temperature at Pt.1 exceeds 150 degrees F for 4 hours, then HPCI should be declared inoperable and the appropriate LCO entered.

A hole will be drilled in the HPCI MO2-2301-8 valve disc eliminating the valve pressure binding concerns. (2371809600203)

F. PREVIOUS OCCURRENCES:

LER/Docket Number	Title
89-029/50-237	Elevated HPCI Discharge Piping Temperature Due to Reactor Feedwater System Back Leakage.

Previous event corrective actions were to prevent Reactor Feedwater System back leakage into the HPCI system by temporarily revising system valve configuration for MOV 2(3)-2301-9 (normally open) to a closed position, and MOV 2(3)-2301-8 (normally closed) to an open position. This revised, off-normal valve lineup was reviewed in accordance with 10 CFR 50.59 Safety Evaluation Guidelines and documented by Dresden On Site Reviews 89-44 and 89-45. Procedure changes were also implemented to control the revised valve lineup. Numerous inspections were performed on valve internals and piping supports on the HPCI piping. Lastly, a permanent procedure revision to DOS 2300-8, HPCI Pump Discharge Line Temperature Monitoring, completed Dresden On-Site Review Process (DOSR) on April 12, 1990 and required the performance of temperature surveys of the HPCI pump discharge line on a monthly basis or when directed by other HPCI procedures. This corrective measure provided adequate piping monitoring during this event, and created the 150 degree F conservative temperature limit, preventing event recurrence of valve and piping support degradation.

G. COMPONENT FAILURE DATA:

None.

FIGURE 1
UNIT 2 HPCI PUMP DISCHARGE LINE