Commonwealth Edison Company
Dresden Generating Station
6500 North Dresden Road
Morris, IL 60450
Tel 815-942-2920

ComEd

March 27, 1995

TPJLTR 95-0038

U.S. Nuclear Regulatory Commission
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Licensee Event Report 95-004, Docket 50-249 is being submitted as required by Technical Specification 6.6, NUREG 1022 and 10CFR50.73(a)(2)(v)(B).

Sincerely,

Thomas P. Joyce
Site Vice President

TPJ/MAC:cfq

Enclosure

cc: J. Martin, Regional Administrator, Region III
NRC Resident Inspector's Office
File/NRC
File/Numerical

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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 7

TITLE (4)
HPCI System Declared Inoperable Due to Steam Line Drain Valve Diaphragm 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
03	09	95	95	-- 004 --	00	04	06	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)
Mark Churilla, System Engineer Ext. 2788	(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
E	BJ	LOV	C635	Y						

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 March 8, 1995, at 1615 hours, with Unit 3 at 97% rated core thermal power, while performing a walkdown of the 903-3 Control Room panel the Unit 3 Nuclear Station Operator (NSO) observed dual indication on AO3-2301-64, High Pressure Coolant Injection (HPCI) [BJ] Stop Valve Above Seat Drain Valve. The valve was examined and found to have a leaking diaphragm. The Shift Manager contacted the System Engineer and an operability evaluation was performed in accordance with Dresden Administrative Procedure (DAP) 7-31. The evaluation concluded that the system was operable since the valve would fail in the closed position. The valve is normally open and receives a close signal on a HPCI auto initiation. The closure of the valve would not have effected HPCI system operation. During the development of the repair package the diaphragm leak worsened causing the valve to close fully at 0327 hours on March 9, 1995. The Unit 3 Shift Manager decided to conservatively declare the system inoperable. The diaphragm was replaced and system was declared operable at 1105 hours on March 9, 1995. There were no previous HPCI events involving diaphragm failures. The safety significance is minimal since the valve was in the fail safe position and system function was unaffected.

EVENT IDENTIFICATION:

HPCI [BJ] System Declared Inoperable Due to Steam Line Drain Valve Diaphragm Failure

A. PLANT CONDITIONS PRIOR TO EVENT:

Unit: 3 Event Date: 03/9/95 Event Time: 0327

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

Reactor Coolant System Pressure: 1000 psig

B. DESCRIPTION OF EVENT:

On March 8, 1995, at 1615 hours, with Unit 3 at 97% rated core thermal power, while performing a walkdown of the 903-3 Control Room panel the Unit 3 Nuclear Station Operator (NSO) observed dual indication on AO3-2301-64, High Pressure Coolant Injection Stop Valve Above Seat Drain Valve. The valve was examined and found to have a leaking diaphragm. The Shift Manager contacted the System Engineer and an operability evaluation was performed in accordance with Dresden Administrative Procedure (DAP) 7-31. The evaluation concluded that the system was operable since the valve would fail in the closed position. The valve is normally open and receives a close signal on a HPCI auto initiation. The closure of the valve would not have effected HPCI system operation. The System Engineer developed repair plans for immediate implementation. However, during the development of the repair package the diaphragm leak became worse causing the valve to close fully at 0327 hours on March 9, 1995. The Unit 3 Shift Manager decided to conservatively declare the system inoperable. The system was isolated by placing the control switch for MO3-2301-4, HPCI Steam Inboard Isolation Valve in pull to lock closed. The diaphragm was replaced at 0630 hours on March 9, 1995. The valve was then successfully tested and the system was declared operable at 1105 hours on March 9, 1995. The safety significance is minimal since the valve was in the fail safe position and HPCI system function was unaffected because the normal position of the AO3-2301-64 valve for system operation is closed.

C. CAUSE OF EVENT:

This report is being submitted in accordance with 10CFR50.73 (a)(2)(v)(B), which requires the reporting of any event that alone could have prevented the fulfillment of the safety function of systems that are needed to remove residual heat.

The HPCI Stop valve has two drains which remove condensate prior to and during turbine operation. The above seat drain removes any trapped condensate between MO3-2301-3, HPCI Turbine Steam Admission Valve (refer to Diagram 1) and the Stop Valve. The above seat drain line routes the condensate to the HPCI room floor drain sump and is only open during standby conditions. On system initiation the above seat drain line is automatically isolated by the closing of AO3-2301-64 and AO3-2301-65, HPCI Stop Valve Above Seat Drain Valves. The above seat drain valves will also close on a loss of instrument air. The below seat drain line removes condensate from the turbine inlet steam line area above the control

valves. The below seat drain is the primary drain during turbine initiation and operation.

During this event AO3-2301-64 valve developed a diaphragm leak causing the valve to partially close. Over a ten hour period the leak increased causing the valve to fully close. The valve actuator was disassembled to inspect the diaphragm. The diaphragm was found to be worn in a ten inch diameter circle. The circle corresponded to the area that contacts the diaphragm plate. A ½ inch tear in the diaphragm plate contact area was the source of the air leakage. The area immediately around the tear showed more signs of wear than the rest of the diaphragm (Reference Figure 1).

A further inspection of the diaphragm plate did not show any "rough" spots that would have caused the diaphragm to wear prematurely. The diaphragm plate was cleaned and a new diaphragm was installed. The valve was stroked and verified to be within timing specifications.

Root Cause of the tear was caused by normal wear of the diaphragm during valve cycling. Wear is caused in this type of Air Operated Valve (AOV) by the diaphragm plate shifting when the valve opens and closes. The diaphragm plate will rub against the diaphragm during the cycling of the valve. In this event a localized wear spot was created which caused a leak to develop. The leak quickly propagated causing the valve to close under normal spring force. A review of the operating history indicates that AO3-2301-64 valve was cycled approximately 80 times since the last replacement in March 1992. The valve was last cycled on February 22, 1995 during normal monthly HPCI surveillance testing. There were no AOV diaphragm leaks identified during a Unit 3 HPCI system walkdown that was conducted two days prior to the event.

A Unit 2/3 maintenance review was conducted for all four of the Above Seat Drain Valves. The review identified several instances of as found inspections which noted wear on the diaphragms. However, the were no indications of severe diaphragm leaks which caused the valve to drift closed.

The diaphragms for the Unit 2 valves were replaced in May 1993. The diaphragms for the Unit 3 valves were replaced in March 1992. The diaphragms were on a preventative maintenance (PM) schedule that required inspection and replacement every 2 refuel outages.

The PM schedules for the above seat drain valves were changed from replacement of diaphragms every 2 refuel outages to every 1 refuel outage based on valve cycling. The new PM schedule will begin starting with D2R15 refuel outage in 1997 and D3R14 refuel outage in 1996. The implementation dates listed are based on valve cycling data. AO2-2301-64 and AO2-2301-65 have been cycled approximately 45 times since the diaphragms were replaced in 1993. It is anticipated that the valves would be cycled a total of 70 times until the D2R15 refuel outage is reached in 1997. It is anticipated that AO3-2301-65 will be cycled a total of 92 times until the D3R14 refuel outage is reached. A reduction in valve cycling will occur when the Upgraded Technical Specifications are implemented. The Upgraded Technical Specifications require quarterly HPCI testing as opposed to the present monthly HPCI testing requirements.

The two other normally open spring close valves on the HPCI System are AO2(3)-2301-29 and AO2(3)-2301-30, HPCI Inlet Drain Pot to Main Condenser Valves. The present PM of diaphragm replacement every 2 refuel outages is appropriate for these valve since the number of valve cycles is approximately 1/4 less than the above seat drain valves.

A review of the PM schedules for all HPCI Air Operated Valves (AOVs) was conducted by the HPCI system engineer and were found to be acceptable. In addition, a review of all HPCI AOVs fail safe positions was conducted and found to be consistent with system design requirements.

All HPCI AOVs will continue to be stroke tested every quarter under the present IST program.

D. SAFETY ANALYSIS:

The HPCI Stop valve has an above seat drain which is open during standby conditions. The above seat drain will remove minor leakage past MO3-2301-3, HPCI Turbine Steam Admission Valve to the HPCI room floor drain sump. The drain isolates during system initiation by the automatic closure of AO3-2301-64 and AO3-2301-65, HPCI Stop Valve Above Seat Drain Valves. The failure of the valves to close would result in steam being admitted to the HPCI room. The steam entering the room would potentially cause the system to isolate prematurely during an accident. The failure of a valve(s) to open would not effect the system initiation or operation. The fail safe positions of AO3-2301-64 and AO3-2301-65 are closed.

In this event the system was conservatively declared inoperable and isolated once AO3-2301-64 failed fully closed at 0327 hours on March 9, 1995. The decision was based on the possibility on sudden leakage developing past MO3-2301-3. It was believed that MO3-2301-3 may suddenly begin to leak by, allowing condensate to accumulate above the stop valve while AO3-2301-64 was closed. The condensate would then be entrained in the steam flow and potentially cause turbine rotor damage if the system automatically or was manually started. In order to prevent any unnecessary challenges to turbine the HPCI inlet steam line was isolated.

The system may have remained unisolated and operable during the time AO3-2301-64 was closed. The potential for MO3-2301-3 developing a sudden leak during the three hours AO3-2301-64 was failed closed was unlikely. Prior to AO3-2301-64 valve closing there were no signs of leakage past MO3-2301-3. The above seat drain line temperature is monitored daily by the operations department and has not indicated any signs of leak by of MO3-2301-3 since Unit 3 startup in November 1994. If minor leakage would have developed during the time AO3-2301-64 was closed the below seat drain would have removed any condensate that had not already been flashed to steam prior to the turbine control valves opening. Therefore, since there were no impacts on the HPCI system prior to the system being isolated and all other Emergency Core Cooling systems required by Technical Specification 3.5.C.2.a were operable throughout this event the safety significance is minimal.

E. CORRECTIVE ACTIONS:

The diaphragm for AO3-2301-64 was inspected and replaced per Dresden Maintenance Procedure (DMP) 2300-11, HPCI Stop Valve Seat Drain Isolation Valve 2301-64 Maintenance. The valve was then stroked and verified to open and close smoothly. The valve was also verified to be within Inservice Testing (IST) timing limits.

The Quad Cities Nuclear Station HPCI system engineer was contacted about the conclusions reached in the root cause investigation.

PS 3636 plant event report was generated by Dresden Station Regulatory Assurance Department on March 10, 1995.

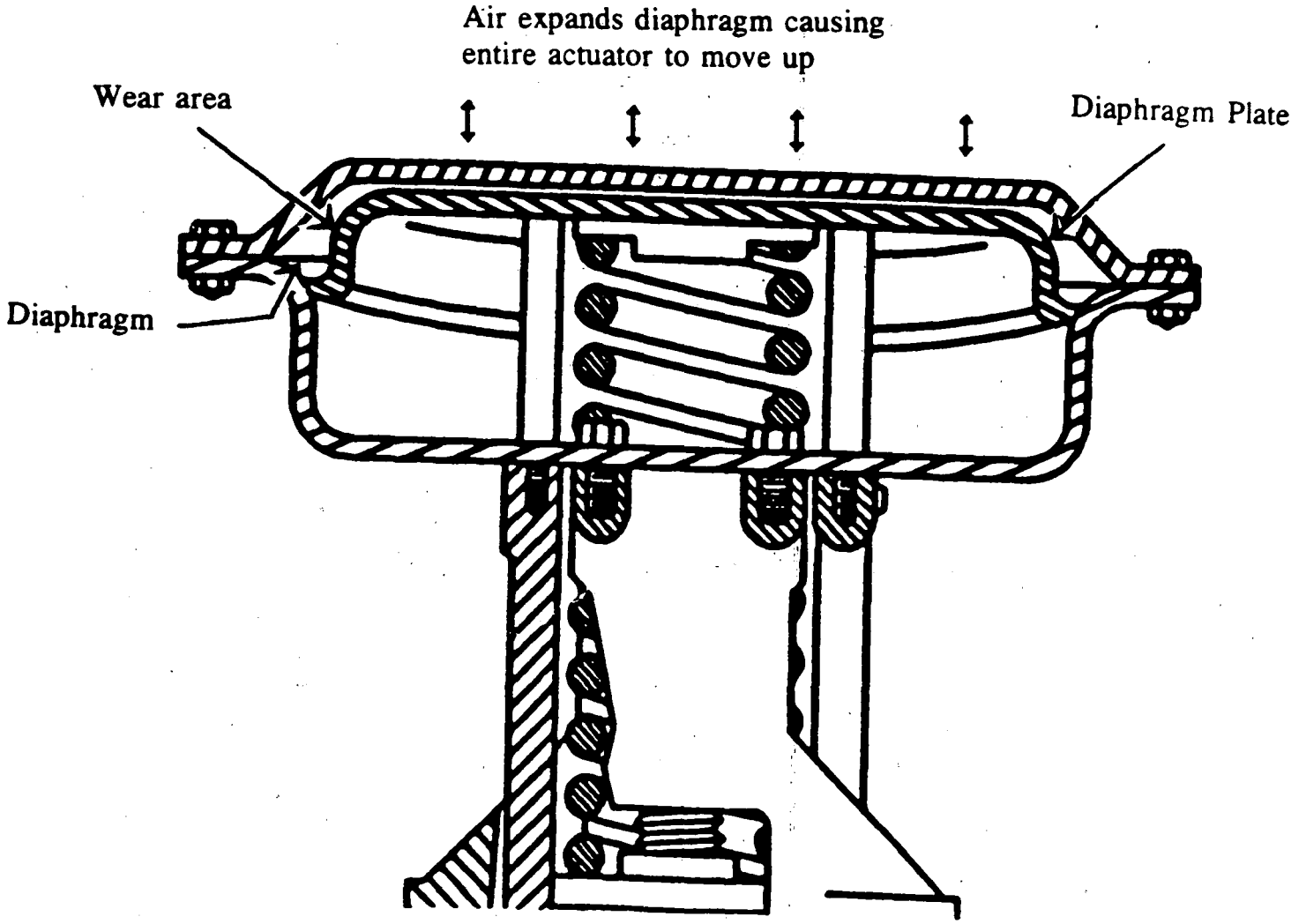
A Nuclear Design Information Transmittal (NDIT) was performed on the AO3-2301-64 diaphragm failure by the Site Engineering Department AOV Team. The root cause conclusions reached in the NDIT concur with the root cause investigation contained in the apparent cause section of this report.

F. PREVIOUS OCCURRENCES:

None.

G. COMPONENT FAILURE DATA:

Copes Vulcan Model D100-60 Air Operated Valve Diaphragm



AO3-2301-64 Actuator
Figure 1

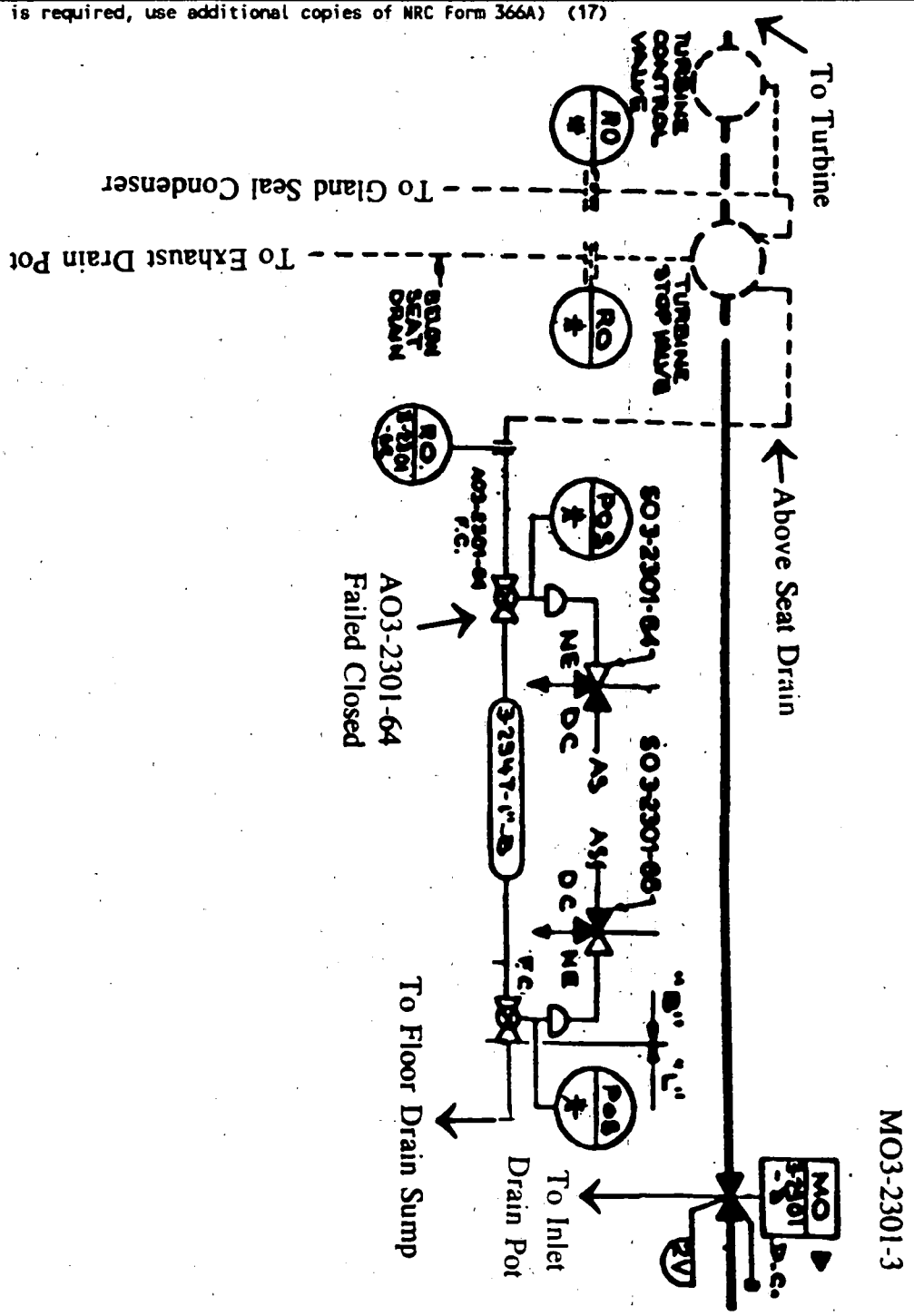


Diagram 1
HPCI Turbine Inlet Steam Line