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10 CFR 50.73

December 3, 2002

RHLTR: #02-0087

U. S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, DC 20555-0001

Dresden Nuclear Power Station, Unit 3  
Facility Operating License No. DPR-25  
NRC Docket No. 50-249

Subject: Licensee Event Report 2002-005-00, "Unit 3 High Pressure Coolant Injection System Inoperable Due to Water Hammer Event"

Enclosed is Licensee Event Report 2002-005-00, "Unit 3 High Pressure Coolant Injection System Inoperable Due to Water Hammer Event," for the Dresden Nuclear Power Station. This event is being reported in accordance with 10 CFR 50.73(a)(2)(i)(B). "Any operation or condition which was prohibited by the plant's Technical Specifications."

Corrective actions include:

Repaired the Unit 3 High Pressure Coolant Injection (HPCI) supports, M-1187D-80 and M-1187D-83.

Vented Units 2 and 3 HPCI pump discharge piping in the X-Area, Torus Area and HPCI Pump Room.

Revised appropriate station procedures to include all high point vents when venting and require venting of the HPCI pump discharge piping when lined up to the CCST.

Performed a modification on Unit 3 to eliminate potential steam voids on HPCI initiation by adding a pressure permissive on the injection valve.

Scheduled a modification to be performed on Unit 2 to eliminate potential steam voids on HPCI initiation by adding a pressure permissive on the injection valve.

Developed and implemented a Design Engineering Plan to address the knowledge and management deficiencies in the areas of problem solving, performance of operability evaluations, walk-downs, recognizing safety significance of issues without being prompted by outside agencies, identification and resolution of issues, communication, and issue management.

JE22

Revised NES-MS-03.2 "Evaluation of Discrepant Piping and Support Systems", to recommend expediting repair when the cause of the degradation is unknown and to include guidance on when to consider cause as an integral element of Operability Determination.

Reviewed Open Operability Determinations for Extent of Condition.

Performance managed individuals involved on challenging the quality of ACE's, Operability Determinations and being aware of compensatory actions. Reinforced expectations regarding ACE quality and operability determinations.

Developed guidance on how to properly evaluate and respond to NRC concerns and presented as a discussion topic at the Engineering Support Personnel Training session.

Developed a post-transient system walk-down process with a standard walk-down checklist and appropriate review by engineering management.

If you have any questions, please contact Mr. Jeff Hansen, Regulatory Assurance Manager at (815) 416-2800.

Respectfully,



*JRH*  
R. J. Hovey  
Site Vice President  
Dresden Nuclear Power Station

Enclosure

cc: Regional Administrator – NRC Region III  
NRC Senior Resident Inspector – Dresden Nuclear Power Station

Estimated burden per response to comply with this mandatory information collection request: 50 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records Management Branch (T-6 E6), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to bjs1@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202 (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

**LICENSEE EVENT REPORT (LER)**

<b>1. FACILITY NAME</b> Dresden Nuclear Power Station Unit 3	<b>2. DOCKET NUMBER</b> 05000249	<b>3. PAGE</b> 1 of 4
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**4. TITLE** High Pressure Coolant Injection System Inoperable Due to Water Hammer Event

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MO	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO	MO	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
07	05	2001	2002	005	00	12	03	2002	N/A	N/A
									FACILITY NAME	DOCKET NUMBER
									N/A	N/A

<b>9. OPERATING MODE</b> 1	<b>11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR § (Check all that apply)</b>									
<b>10. POWER LEVEL</b> 100	20 2201(b)		20.2203(a)(3)(ii)		50.73(a)(2)(ii)(B)		50 73(a)(2)(ix)(A)			
	20 2201(d)		20.2203(a)(4)		50.73(a)(2)(iii)		50 73(a)(2)(x)			
	20 2203(a)(1)		50.36(c)(1)(i)(A)		50.73(a)(2)(iv)(A)		73 71(a)(4)			
	20 2203(a)(2)(i)		50.36(c)(1)(ii)(A)		50.73(a)(2)(v)(A)		73.71(a)(5)			
	20 2203(a)(2)(ii)		50.36(c)(2)		50.73(a)(2)(v)(B)		OTHER			
	20 2203(a)(2)(iii)		50.46(a)(3)(ii)		50.73(a)(2)(v)(C)		Specify in Abstract below or in NRC Form 366A			
	20 2203(a)(2)(iv)		50.73(a)(2)(i)(A)		50.73(a)(2)(v)(D)					
	20 2203(a)(2)(v)		X 50.73(a)(2)(i)(B)		50.73(a)(2)(vii)					
20 2203(a)(2)(vi)		50.73(a)(2)(i)(C)		50.73(a)(2)(viii)(A)						
20.2203(a)(3)(i)		50.73(a)(2)(ii)(A)		50 73(a)(2)(viii)(B)						

12. LICENSEE CONTACT FOR THIS LER	
NAME Timothy P. Heisterman	TELEPHONE NUMBER (Include Area Code) (815) 416-2815

13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT									
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX

14. SUPPLEMENTAL REPORT EXPECTED				15. EXPECTED SUBMISSION DATE		
YES (If yes, complete EXPECTED SUBMISSION DATE)	X	NO		MONTH	DAY	YEAR

16. ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)

On July 19, 2001, Dresden Nuclear Power Station (DNPS) personnel identified a Unit 3 High Pressure Coolant Injection (HPCI) discharge piping support in a degraded condition. An operability determination was performed, which supported continued HPCI operability. Due to perceived low safety significance, the damaged support was not immediately repaired. Corrective actions were to restore the supports during the next scheduled maintenance window. A review of Transient Analysis Display System (TADS) data made it apparent that a hydrodynamic transient / water hammer had occurred on July 5, 2001, during an automatic initiation of the Unit 3 HPCI system. The hydrodynamic transient / water hammer event was the result of a combination of air pockets and steam voids in the discharge piping, which resulted from inadequate venting of the system. The support was repaired and the discharge piping vented on September 30, 2001. On November 16, 2001, the Nuclear Regulatory Commission (NRC) issued an Inspection Report which identified an Unresolved Item associated with the operability of the HPCI system with the degraded support. In January 2002, DNPS provided engineering analysis to the NRC and in June of 2002, the NRC transmitted a Request for Additional Information associated with the analysis. These questions were discussed in a meeting on July 25, 2002, and in subsequent teleconferences between members of Exelon and NRC. In response to these questions, DNPS performed additional evaluations. Subsequently, DNPS has been unable to demonstrate through analysis that the Unit 3 HPCI piping and supports would have met operability evaluation acceptance criteria following an additional automatic initiation. On October 4, 2002, DNPS concluded that the Unit 3 HPCI system was inoperable for the period following the hydrodynamic transient / water hammer on July 5, 2001, until September 30, 2001.



NRC FORM 366A U.S. NUCLEAR REGULATORY COMMISSION (7-2001)		APPROVED BY OMB NO. 3150-0104 EXPIRES 07/31/2004	
LICENSEE EVENT REPORT (LER) TEXT CONTINUATION		Estimated burden per response to comply with this mandatory information collection request 50 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 If an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection	
FACILITY NAME (1)		DOCKET NUMBER (2)	
Dresden Nuclear Power Station Unit 3		05000249	
		LER NUMBER (6)	
		YEAR	SEQUENTIAL NUMBER
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(If more space is required, use additional copies of NRC Form 366A)(17)

During this time period the Transient Analysis Display System (TADS) was reviewed for the July 5, 2001, scram. Engineering personnel concluded the HPCI system had experienced a hydrodynamic transient / water hammer on July 5, 2001.

October 17, 2001, a CR was issued to document the July 5, 2001, HPCI pressure and flowrate transient data and its impact on Operability Determination 01-031. From the period between October 2001 and October 2002, numerous communications between Exelon and the NRC were conducted. Although the support had been repaired and the discharge piping vented, engineering performed detailed analyses assuming the pipe support was in a degraded condition and the system not properly vented in order to determine past reportability of the condition. Subsequently, DNPS has been unable to demonstrate through analysis that the Unit 3 HPCI piping and supports would have met operability evaluation acceptance criteria following an additional automatic initiation. Thus, it has been concluded that the Unit 3 HPCI system was inoperable for the period following the hydrodynamic transient / water hammer on July 5, 2001, until September 30, 2001.

**C. Cause of Event:**

Two root causes were identified as a result of this event. One root cause addressed the cause of the damage to the support and the other addressed the station's management of the issue. The root cause of the HPCI support failure was a hydrodynamic transient / water hammer during the system actuation on July 5, 2001, due to air pockets and steam voids in the HPCI pump discharge piping. The cause of the air pockets was due to inadequate venting of the system. The root cause of the management issues was the failure of Design Engineering to evaluate the HPCI operability issue from the proper safety perspective because the focus was on demonstrating operability and not on recognizing the extent of the degraded condition, which resulted in untimely corrective actions. Corrective actions to prevent recurrence are: (1) to implement modifications and revise appropriate procedures as required, to ensure that air/steam voids do not recur and (2), to develop and implement a Design Engineering Excellence Plan to address the management issues and knowledge deficiencies.

**D. Safety Analysis:**

This event has been determined to be of low to moderate safety significance. This result is based on an assumption that the HPCI discharge piping stresses would exceed operability limits if HPCI injected during the period of approximately 80 days during which the support was degraded and the potential for an additional hydraulic transient existed. The Automatic Depressurization, Isolation Condenser [BL], Low Pressure Coolant Injection [BO], and Core Spray [BM] systems were operable and available, except for short periods during maintenance (within Technical Specification compliance), to provide reactor pressure / inventory control under postulated design basis accident conditions.

**E. Corrective Actions:**

The Unit 3 HPCI supports M-1187D-80 and M-1187D-83 were repaired.

The Unit 2 and 3 HPCI pump discharge piping in the X-Area, torus Area and HPCI pump room was vented.

Appropriate station procedures were revised to include all high point vents when venting and require venting of the HPCI pump discharge piping when lined up to the CCST.

A modification was performed on Unit 3 to eliminate potential steam voids on HPCI initiation by adding a pressure permissive on the injection valves. A similar modification will be performed on Unit 2.

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		2002	005	00
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(If more space is required, use additional copies of NRC Form 366A)(17)

Developed and implemented a Design Engineering Plan to address the knowledge and management deficiencies in the areas of problem solving, performance of operability evaluations, walk-downs, recognizing safety significance of issues without being prompted by outside agencies, identification and resolution of issues, communication, and issue management.

NES-MS-03.2 "Evaluation of Discrepant Piping and Support Systems," was revised to recommend expediting repair when the cause of the degradation is unknown and to include guidance on when to consider cause as an integral element of operability determinations.

Open operability determinations were reviewed for extent of condition.

Performance managed individuals involved on challenging the quality of ACE's, Operability Determinations and being aware of compensatory actions. Reinforced expectations regarding ACE quality and operability determinations.

Developed guidance on how to properly evaluate and respond to NRC concerns and presented as a discussion topic at the Engineering Support Personnel Training session.

A post-transient system walk-down process was developed with a standard walk-down checklist and appropriate review by engineering management.

**F. Previous Occurrences:**

None

**G. Component Failure Data:**

N/A