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Dresden Nuclear Power Station
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10 CFR 50.73

SVPLTR # 10-0018

March 29, 2010

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

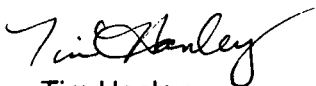
Dresden Nuclear Power Station, Unit 2
Renewed Facility Operating License No. DPR-19
NRC Docket No. 50-237

Subject: Licensee Event Report 237/2009-002-01, "Unit 2 High Pressure Coolant Injection Suction Valve Fails to Close"

Enclosed is Supplemental Licensee Event Report 237/2009-002-01, "Unit 2 High Pressure Coolant Injection Suction Valve Fails to Close" for Dresden Nuclear Power Station, Unit 2. This event was reported in accordance with 10 CFR 50.73(a)(2)(v)(C) and (D), "Any event or condition that could have prevented the fulfillment of the safety function of structures or systems that are needed to: (C) control the release of radioactive material and (D) mitigate the consequences of an accident." There are no regulatory commitments contained in this submittal.

Should you have any questions concerning this report, please contact Mr. Patrick Quealy, Acting Regulatory Assurance Manager, at (815) 416-2800.

Respectfully,



Tim Hanley
Site Vice President
Dresden Nuclear Power Station

Enclosure

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

JE22
MRR

LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records and FOIA/Privacy Service Branch (T-5 F52), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects@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 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.

1. FACILITY NAME Dresden Nuclear Power Station, Unit 2	2. DOCKET NUMBER 05000237	3. PAGE 1 OF 5
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4. TITLE
Unit 2 High Pressure Coolant Injection Suction Valve Fails to Close

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO.	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
03	15	2009	2009	002	01	03	31	2010	N/A	N/A
									FACILITY NAME	DOCKET NUMBER
									N/A	N/A

9. OPERATING MODE 1	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)									
	<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.73(a)(2)(i)(C)	<input type="checkbox"/> 50.73(a)(2)(vii)						
10. POWER LEVEL 100	<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)						
	<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.73(a)(2)(ii)(B)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)						
	<input type="checkbox"/> 20.2203(a)(2)(i)	<input type="checkbox"/> 50.36(c)(1)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)(A)						
	<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(iv)(A)	<input type="checkbox"/> 50.73(a)(2)(x)						
	<input type="checkbox"/> 20.2203(a)(2)(iii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	<input type="checkbox"/> 73.71(a)(4)						
	<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.46(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	<input type="checkbox"/> 73.71(a)(5)						
<input type="checkbox"/> 20.2203(a)(2)(v)	<input type="checkbox"/> 50.73(a)(2)(i)(A)	<input checked="" type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> OTHER							
<input type="checkbox"/> 20.2203(a)(2)(vi)	<input type="checkbox"/> 50.73(a)(2)(i)(B)	<input checked="" type="checkbox"/> 50.73(a)(2)(v)(D)	Specify in Abstract below or in NRC Form 366A							

12. LICENSEE CONTACT FOR THIS LER

FACILITY NAME Dresden Nuclear Power Station – Riley Ruffin.	TELEPHONE NUMBER (Include Area Code) (815) 416-2815
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13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX
B	BJ	V	C665	Y	N/A				

14. SUPPLEMENTAL REPORT EXPECTED	15. EXPECTED SUBMISSION DATE	MONTH	DAY	YEAR
<input type="checkbox"/> YES (If yes, complete 15. EXPECTED SUBMISSION DATE)	<input checked="" type="checkbox"/> NO			

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

On March 15, 2009, at approximately 2025 hours (CDT), with Unit 2 at approximately 100 percent power, Dresden Nuclear Power Station Operations personnel discovered during a maintenance activity that motor operated valve 2-2301-6, Unit 2 High Pressure Coolant Injection Suction Valve, would not close. The valve is a normally open valve and is required to close during the transfer of High Pressure Coolant Injection System pump suction from the Condensate Storage Tanks to the Torus to prevent high Torus water level. Troubleshooting and diagnostic testing identified that the valve's failure to close was attributed to valve internal binding.

The Root Cause of this event was that when the valve was in the full open position, the center of gravity of the solid gate valve disc extends past the end of the in-body valve guides, which caused the disc to tip and bind with the in-body guides.

A contributing cause to this event is increased stem friction. The higher than normal thrust associated with the binding caused a loss of stem lubricant through extrusion, which increased the friction at the stem and stem nut interface.

The in-body valve guides were lengthened into bonnet to ensure the valve disc's center of gravity is supported by guides when the valve is in the Open position. Preventative maintenance activities for motor operated valve stem lubrication were revised, as needed, to ensure that the frequency does not exceed two-years for the motor operated valve program valves with horizontal disc/stem orientation that exhibit internal binding.

The safety significance of the event is minimal. An evaluation concluded that HPCI would have operated long enough to fulfill its safety function. A review of the actual Torus water levels during this time frame identified that the Torus would not have exceed its structural design values during a postulated accident. Therefore, the consequences of this event had minimal impact on the health and safety of the public and reactor safety.

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Subsequent troubleshooting and diagnostic testing were performed to determine the failure mode. The electrical circuit was inspected up to and including the valve actuator. There were no issues identified with the electrical control power circuit. During the diagnostic testing, the valve did go fully closed when operated electrically. Subsequent testing showed reduced thrust and torque during each of the next couple of strokes. The diagnostic test identified an internal valve binding force during the close stroke for about the first 40% of travel. The open stroke was observed to be as expected with no evidence of binding. The diagnostic testing found no issues with the Limitorque actuator.

During the MOV diagnostic testing evolution several actions were taken to ensure the valve would achieve the full close stroke: (1) The process of numerous strokes appears to have lowered the magnitude of the binding forces from the initial value of greater than 4800 lbs to approximately 3000 lbs. (2) The stem was cleaned and lubricated to improve the efficiency of the actuator torque to stem thrust conversion. The as-found stem Coefficient of Friction (COF) was measured at 0.2 and after the lubrication activity it was improved to 0.06 COF. (3) The actuator output torque switch setting was increased to ensure sufficient margin between the actuator output and the binding forces. The valve was stroked a total of 12 times.

The valve was declared operable and capable to perform its design function after it was verified that all diagnostic test parameters for torque and thrust were within prescribed specifications. Monthly diagnostic testing was performed on MOV 2-2301-6 to verify its continued operability until internal valve inspections were performed in the Unit 2 refuel outage (D2R21) which was completed in November 2009.

The Root Cause of this event was that when the valve was in the full open position, the center of gravity of the solid gate valve disc extending past the end of the in-body valve guides, which caused the disc to tip and bind with the in-body guides. Industry operating experience found similar events that were caused by either friction between disc and guide or disc alignment issues known as "tipping", however their root cause was attributed to excessive in-body guide wear which was not evident during D2R21 internal valve inspections.

A contributing cause to this event is increased stem friction. The higher than normal thrust associated with the binding caused a loss of stem lubricant through extrusion, which increased the friction at the stem and stem nut interface. Additional monthly diagnostic testing monitored the stem friction and the condition of the lubricant until the valve was repaired.

A detailed extent of condition review found 13 motor operated valves with the disc/stem oriented horizontally with some internal binding identified during the most recent diagnostic testing. In most cases, the binding load was very small. Each of these valves has been evaluated and determined to have significant margin or have been tested within the past six years, so there is minimal risk of a similar failure. The preventative maintenance activities for these valves will be revised as needed to perform diagnostic testing on an increased frequency.

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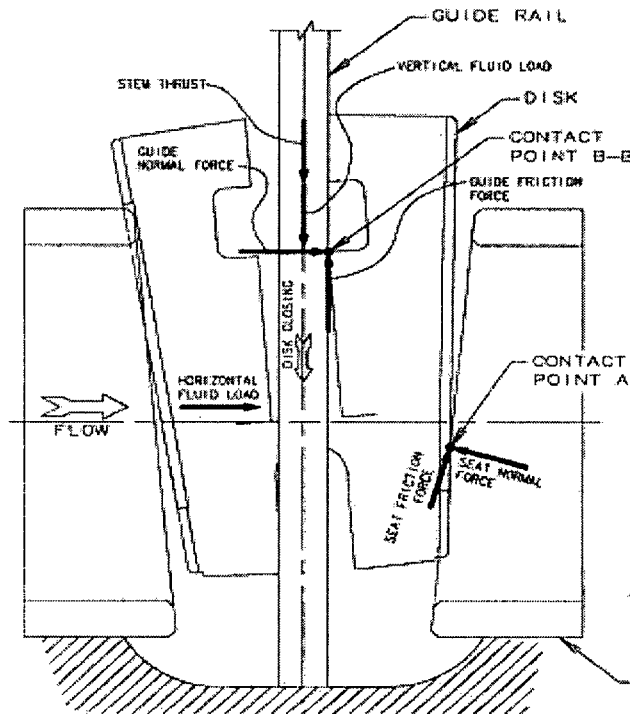


Figure 1. This is a typical example of valve disc tipping.

D. Safety Analysis:

The safety significance of the event is minimal. An evaluation was performed to determine the effect of this event on the operability of the HPCI and Torus during the time that it is hypothesized that MOV 2-2301-6 would not electrically close (i.e., January 13, 2009 to March 15, 2009). The evaluation concluded that HPCI would have operated long enough to fulfill its safety function. A review of the actual Torus water levels during this time frame identified that the Torus would not have exceeded its structural design values during a postulated accident. Therefore, the consequences of this event had minimal impact on the health and safety of the public and reactor safety.

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E. Corrective Actions:

MOV 2-2301-6 was returned to operable status.

Monthly diagnostic testing was performed on MOV 2-2301-6 to verify its operability until internal valve inspections were performed in the Unit 2 refuel outage which was completed in November 2009.

Dresden MOV diagnostic testing for MOV Program valves with horizontal disc and stem orientation that exhibit internal binding was revised to ensure the testing frequency does not exceed six years.

Dresden MOV stem lubrication for MOV Program valves with horizontal disc and stem orientation that exhibit internal binding was revised to ensure the lubrication frequency does not exceed two years.

F. Previous Occurrences:

A review of DNPS Licensee Event Reports (LERs) for the last three years did not identify any LERs associated with failure of valve closure due to internal binding.

G. Component Failure Data:

16" Crane Class 150 cast steel wedge gate valve with flanged ends