



**Commonwealth Edison**

Dresden Nuclear Power Station

R.R. #1

Morris, Illinois 60450

Telephone 815/942-2920

March 28, 1991

EDE LTR #91-200

U.S. Nuclear Regulatory Commission  
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Washington, D.C. 20555

Licensee Event Report #91-005-0, Docket #050237 is being submitted as required by Technical Specification 6.6, NUREG 1022 and 10 CFR 50.73(a)(2)(i)(A).

E. D. Eenigenburg  
Station Manager  
Dresden Nuclear Power Station

EDE/ade

Enclosure

cc: A. Bert Davis, Regional Administrator, Region III  
File/NRC  
File/Numerical

(ZDVR/176)

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LICENSEE EVENT REPORT (LER)

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Facility Name (1) <b>Dresden Nuclear Power Station, Unit 2</b>	Docket Number (2) <b>0 15 10 10 10 12 13 17</b>	Page (3) <b>1 of 0 5</b>
Title (4) Orderly Unit Shutdown Due to Leakage Through Primary Containment <b>Isolation Valves A0 2-220-44 and A0 2-220-45</b>		

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 Names	Docket Number(s)	
0	3	0 4 9 1 1 9 1 1		0 0 15	0 0	0	3	2 8 9 1 1	N/A	0 15 10 10 10 1 1	
OPERATING MODE (9) <span style="float:right">N</span> THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10CFR (Check one or more of the following) (11)											

POWER LEVEL (10) <b>0 7 3</b>	<input type="checkbox"/> 20.402(b)	<input type="checkbox"/> 20.405(c)	<input type="checkbox"/> 50.73(a)(2)(iv)	<input type="checkbox"/> 73.71(b)
	<input type="checkbox"/> 20.405(a)(1)(i)	<input type="checkbox"/> 50.36(c)(1)	<input type="checkbox"/> 50.73(a)(2)(v)	<input type="checkbox"/> 73.71(c)
	<input type="checkbox"/> 20.405(a)(1)(ii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(vii)	<input type="checkbox"/> Other (Specify in Abstract below and in Text)
	<input type="checkbox"/> 20.405(a)(1)(iii)	<input checked="" type="checkbox"/> 50.73(a)(2)(i)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)	
	<input type="checkbox"/> 20.405(a)(1)(iv)	<input type="checkbox"/> 50.73(a)(2)(ii)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)	
	<input type="checkbox"/> 20.405(a)(1)(v)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(x)	

**LICENSEE CONTACT FOR THIS LER (12)**

Name <b>Ronald R. Skoglund, Technical Staff System Engineer</b>	TELEPHONE NUMBER AREA CODE <b>8 1 5 9 14 2 1 -2 19 12 10</b>
Ext. 2543	

**COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)**

CAUSE	SYSTEM	COMPONENT	MANUFAC-TURER	REPORTABLE TO NPRDS	CAUSE	SYSTEM	COMPONENT	MANUFAC-TURER	REPORTABLE TO NPRDS
X	A	D	I S V B 3 1 4	Y					
X	A	D	I S V B 3 1 4	Y					

**SUPPLEMENTAL REPORT EXPECTED (14)**

<input checked="" type="checkbox"/> Yes (If yes, complete EXPECTED SUBMISSION DATE)	Expected Submission Date (15) <b>0 5 1 5 9 1 1</b>
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ABSTRACT (Limit to 1400 spaces, i.e, approximately fifteen single-space typewritten lines) (16)

At 1740 hours on March 4, 1991, with Unit 2 at 73% power, a steam leak was discovered at a fitting downstream of the 2-1299-16 valve located in the "A" Reactor Water Clean-Up Heat Exchanger Room. The leak was discovered during the performance of a modification test. Air operated Reactor Recirculation sample line Primary Containment isolation valves A0 2-220-44 and A0 2-220-45 were then closed in an attempt to isolate the leak. The leak continued, so downstream valve 2-1299-15 was closed by a Shift Supervisor. When this action stopped the leak, it was concluded that the A0 2-220-44 and A0 2-220-45 valves were leaking through. Both valves were then declared inoperable and a 24 hour LCO was entered per Technical Specification 3.7.D.3. An orderly shutdown was completed promptly. A primary containment drywell entry was also performed to close upstream manual valve 2-220-102 to assure primary containment integrity. Corrective actions included repacking, stem replacement, and machining of the valve seating surfaces; further actions are also under evaluation.

The safety significance of this event was minimal because performance of Dresden Technical Surveillance (DTS) 1600-1, Local Leak Rate Testing of Primary Containment Isolation Valves, indicated that the through leakage of the A0 2-220-44 and A0 2-220-45 valves did not result in violation of the allowable limits for total Primary Containment leakage. A previous non-reportable event involving leakage of these valves occurred on February 21, 1990.

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TEXT Energy Industry Identification System (EIIS) codes are identified in the text as [XX]

PLANT AND SYSTEM IDENTIFICATION:

General Electric - Boiling Water Reactor -2527 MWt rated core thermal power.

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

EVENT IDENTIFICATION:

Orderly Unit Shutdown Due to Leakage Through Primary Containment Isolation [JM] Valves A0 2-220-44 and A0 2-220-45

A. CONDITIONS PRIOR TO EVENT:

Unit: 2                                      Event Date: March 4, 1991                                      Event Time: 1740 Hours  
 Reactor Mode: N                                      Mode Name: Run                                      Power Level: 73%  
 Reactor Coolant System (RCS) Pressure: 971 psig

B. DESCRIPTION OF EVENT:

At 1740 hours on March 4, 1991, with Unit 2 at 73% power while performing a modification test for a Process Sampling Sample Panel [KN] modification, a small steam leak was found upstream of the 2-1299-16 valve (see Figure 1, attached). A call to the Control Room was then made for the Operator to isolate the leak. The air operated (A0) Reactor Recirculation [AD] sample line Primary Containment isolation valves A0 2-220-44 and A0 2-220-45 were then closed; however, the leak did not stop. A Shift Supervisor then closed the 2-1299-15 valve located in the "A" Reactor Water Clean-Up [CE] Heat Exchanger Room and the leak stopped, indicating that both containment isolation valves were leaking through. The A0 2-220-44 and A0 2-220-45 valves were then declared inoperable, resulting in entry into a 24 hour Limiting Condition for Operation (LCO) per Technical Specification 3.7.D.3, and an orderly Unit 2 shutdown was initiated to perform repairs. A primary containment drywell entry was also performed to close the upstream valve 2-220-102. Cold shutdown conditions were achieved at 1728 hours on March 5, 1991.

C. APPARENT CAUSE OF EVENT:

This report is submitted in accordance with 10CFR50.73 (a)(2)(i)(A), which requires the reporting of the completion of any shutdown required by the Technical Specifications.

The apparent cause of the A0 2-220-44 and A0 2-220-45 valves found leaking through was mechanical wear/seat leakage on the valves. The stem of the A0 2-220-44 valve was slightly bent and showed signs of galling. The root cause of this mechanical wear is unknown but is thought to be partially due to corrosion build-up. The 2-220-45 valve showed similar signs of mechanical wear, but not to the extent of the A0 2-220-44 valve. This mechanical wear apparently prevented proper seating, allowing the valves to leak. Improper seating may be attributed to reduced stem travel caused by resistance between the valve stem and the valve bonnet. Reduced travel of the stem would result in improper seating of the valve.

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TEXT Energy Industry Identification System (EIIS) codes are identified in the text as [XX]

A previous non-reportable event involving separate failures of the A0 2-220-44 and A0 2-220-45 valves occurred on February 21, 1990. Following this event, a preventative maintenance program was initiated to institute packing adjustments/lubrication and diaphragm replacement every refuel outage. The valves were also rebuilt as part of the corrective action associated with the February, 1990 event. In addition, the type of diaphragm being used has been changed. An improved ethylene propylene diaphragm has been installed on the valves. These actions were completed during a short outage in August 1990.

The pneumatic supply to operator pressure is currently higher than the recommended pressure from the manufacturer. Wear on the stem could be increased by this extra pressure. Installation of an operator spring with a higher stiffness is currently under evaluation. A maintenance history review listed the February 1990 event and various corrective maintenance activity since 1985.

**D. SAFETY ANALYSIS OF EVENT:**

A0 2-220-44 and A0 2-220-45 are Primary Containment Group I isolation valves and will close when one of the following conditions is met:

- Reactor low-low water level
- Main steam line high flow
- Main steam line high radiation
- Main steam line tunnel high temperature
- Main steam line low pressure

The purpose of isolating the reactor recirculation sample line is to prevent the release of radioactive materials in accordance with 10CFR100. The Copes Vulcan, Model D-100-60 valves that are currently being utilized as Reactor Recirculation sample line Primary Containment isolation valves are designed to close against a minimum of 1150 psi. The valves encounter 1000 psi during normal operation; therefore, an adequate differential pressure exists to allow these valves to close. Prior to maintenance working on these valves, a local leak rate test (LLRT) was performed to measure the as-found leakage rate. The as-found leak rate was 46.1 standard cubic feet per hour (SCFH). This leakage, when added to existing containment leakage data, was well below the allowable limits for total leakage of primary containment. Therefore, the safety significance of this event was minimal.

**E. CORRECTIVE ACTIONS:**

The immediate corrective actions performed included changing the packing on both valves and lapping the seats of the valves. The stems were also replaced on both of the valves. After this work was completed, Dresden Operating Surveillance (DOS) 1600-1, Quarterly Valve Timing, was performed. Adjustments were required to meet the timing requirements.

After all work was completed on the A0 2-220-44 and A0 2-220-45 valves, an as-left LLRT was then performed. The results of this test indicated a leakage of 15.7 SCFH, which verified satisfactory integrity of the valves.

Valves A0 2-220-44 and A0 2-220-45 have had several occasions where maintenance work has been required. Several potential further corrective actions are being considered to improve the performance of the A0 2-220-44 and A0 2-220-45 valves. These actions include:

1. REPLACING THE A0 2-220-44 AND A0 2-220-45 VALVES. An improved preventative maintenance program was instituted following the February 1990 event. Prior to that time, maintenance was performed on an as needed basis. Replacing both valves would remove the possibility that seat to body joint wear is increasing the leakage of these valves. In addition, any corrosion that may have occurred in the A0 2-220-44 and A0 2-220-45 valves would be eliminated by replacing both valves.

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- REPLACING THE VALVE OPERATOR SPRING. Another potential improvement under evaluation is to replace the present operator spring in the valves with one that has a greater stiffness. In doing so, a greater spring pressure would result. If stem to bonnet resistance is a contributing factor to improper seating, replacing the spring may alleviate the problem. In addition, if the operator springs in both valves were to be replaced, adjustment of the current setpoint pressures would be necessary.

The System Engineer and the Maintenance Staff are currently evaluating the above-listed potential improvements. A supplemental report will be issued once a determination is made concerning these topics (237-200-91-03801).

F. PREVIOUS OCCURRENCES:

<u>Non-Reportable Event No.</u>	<u>Title</u>
12-2-90-19/21	Failure of Primary Containment Isolation Valves A0 2-220-44 and A0 2-220-45 Due to Mechanical Binding

This event involved separate failures of valves A0 2-220-44 and A0 2-220-45. Corrective actions included repacking, lubrication, further maintenance during the subsequent refuel outage, and implementation of preventative maintenance surveillances for packing replacement and diaphragm replacement.

G. COMPONENT FAILURE DATA:

<u>Manufacturer</u>	<u>Nomenclature</u>	<u>Model Number</u>	<u>Mfg. Part Number</u>
Copes Vulcan (Division of Blaw Knox)	Diaphragm Operated Control Valve	D-100-60	N/A

An industry-wide NPRDS data base search revealed 17 occurrences of Copes Vulcan valve failures involving leakage of some sort. The majority of the failures were resolved by replacing the packing and/or diaphragm. This event is reportable to NPRDS since the valves are Primary Containment isolation valves.

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TEXT Energy Industry Identification System (EIIS) codes are identified in the text as [XX]

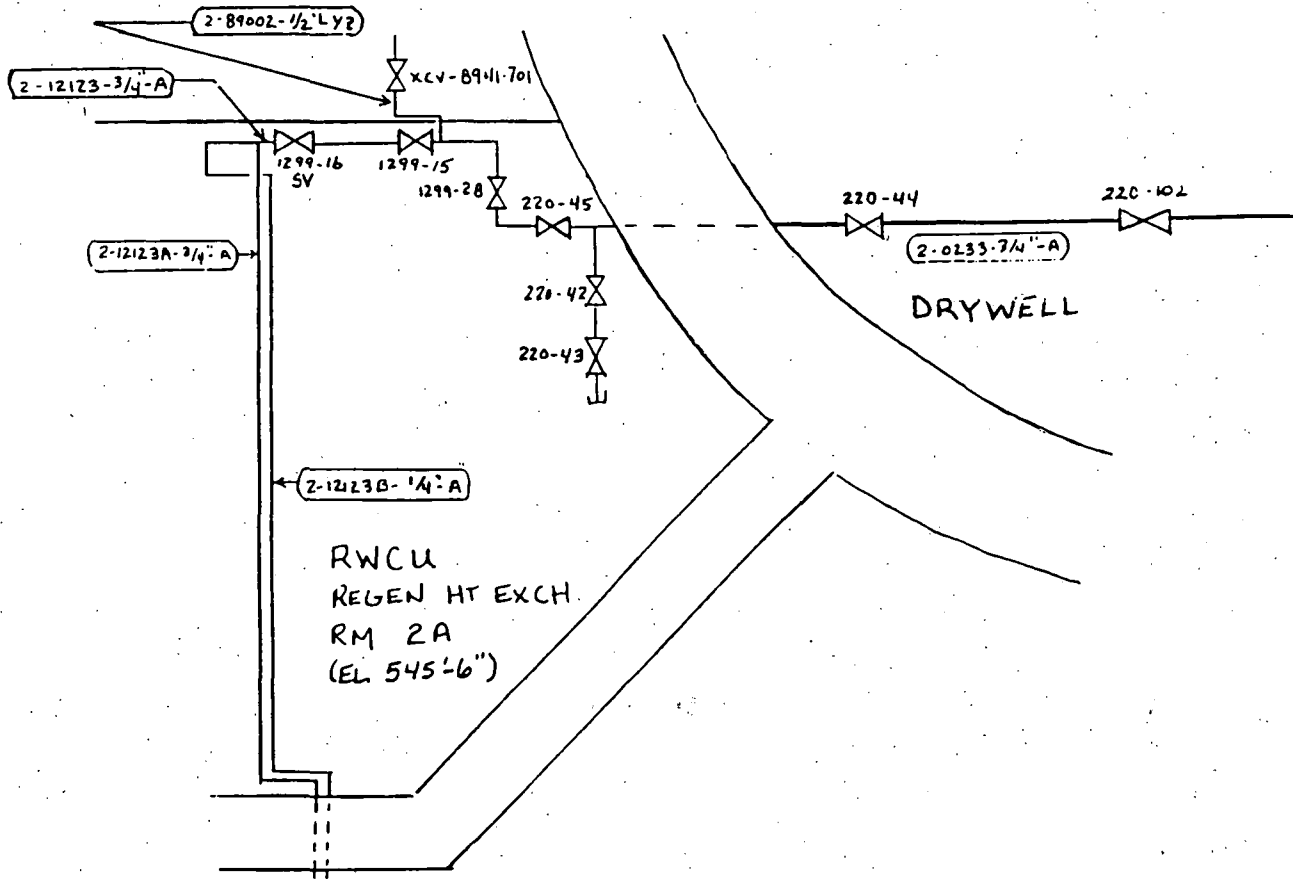


FIGURE 1