



Commonwealth Edison

Dresden Nuclear Power Station
R.R. #1
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Telephone 815/942-2920

February 4, 1992

CWS LTR #92-071

U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, D.C. 20555

Licensee Event Report #92-02, Docket #050237 is being submitted as required by Technical Specification 6.6, NUREG 1022 and 10 CFR 50.73(a)(2)(iv).

L. J. Denner for 2/11/92
Charles W. Schroeder
Station Manager
Dresden Nuclear Power Station

CWS/slp

Enclosure

cc: A. Bert Davis, Regional Administrator, Region III
NRC Resident Inspector's Office
File/NRC
File/Numerical

(ZDVR/472)

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LICENSEE EVENT REPORT (LER)

Form Rev 2.0

Facility Name (1) Dresden Nuclear Power Station, Unit 2	Docket Number (2) 0 5 0 0 0 2 3 7	Page (3) 1 of 0 4
Title (4) Spurious Closure of 2-203-2A Main Steam Isolation Valve Due to Failure of DC Pilot Solenoid		

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	1	1	3	9	2	9	2	0	2	0	4	9	2	N/A	
				0	0	0	0	0	2	0	4	9	2	N/A	

OPERATING MODE (9) N

POWER LEVEL (10) 0 | 0 | 0

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10CFR (Check one or more of the following) (11)

<input type="checkbox"/> 20.402(b)	<input type="checkbox"/> 20.405(c)	<input checked="" 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
<input type="checkbox"/> 20.405(a)(1)(iii)	<input type="checkbox"/> 50.73(a)(2)(i)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)	in Abstract
<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)	below and in
<input type="checkbox"/> 20.405(a)(1)(v)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(x)	Text)

LICENSEE CONTACT FOR THIS LER (12)

Name Neil Spooner, Technical Staff System Engineer	TELEPHONE NUMBER
Ext. 2789	AREA CODE 8 1 5 9 4 2 - 2 9 2 0

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	J M	S 0 L	A 6 1 3	Y					

SUPPLEMENTAL REPORT EXPECTED (14)

Yes (If yes, complete EXPECTED SUBMISSION DATE) NO

Expected Submission Date (15)	Month	Day	Year

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

On January 13, 1992 at 0254 hours, with Unit 2 in Cold Shutdown, outboard Main Steam Isolation Valve (MSIV) 2-203-2A was observed to spuriously isolate (close). At the time of this event, preparations were being made to de-energize Motor Control Center (MCC) 28-2 prior to performing Modification M12-2-91-027A. As part of the preparation, the Instrument Bus was transferred from its normal power feed (MCC 28-2) to its reserve power feed (MCC 25-2), when the MSIV was observed to spuriously isolate. The apparent cause of this event was attributed to failure of the MSIV DC pilot solenoid due to an open coil. De-energization of both AC and DC pilot solenoids is required to cause MSIV closure. Transfer of the Instrument Bus provided a normal, momentary loss of power to the MSIV AC solenoid. This allowed for closure of the 2-203-2A MSIV due to de-energization of both the AC and DC pilot solenoids. The safety significance of this event was considered minimal since the isolation logic performed as designed upon failure of the solenoid, and the unplanned ESF actuation had no effect on plant status. The DC solenoid was replaced under Work Request 05964 and the 2-203-2A MSIV was returned to service on January 15, 1992 at 0115 hours. A previous similar event was reported by LER 90-002/050237.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

Form Rev 2.0

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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:

Spurious Closure of 2-203-2A Main Steam [SB] Isolation Valve Due to Failure of DC Pilot Solenoid

A. CONDITIONS PRIOR TO EVENT:

Unit: 2 Event Date: January 13, 1992 Event Time: 0254 Hours

Reactor Mode: N Mode Name: Shutdown Power Level: 0%

Reactor Coolant System (RCS) Pressure: 0 psig

B. DESCRIPTION OF EVENT:

On January 13, 1992 at 0254 hours with Unit 2 in the Shutdown mode, outboard Main Steam Isolation Valve (MSIV) 2-203-2A was observed to spuriously isolate (close). At the time of this event, preparations were being made for the de-energization of Motor Control Center (MCC) 28-2 [ED] under modification M12-2-91-027A, which involved taking MCC 28-2 out of service for performance of cable pulling work. As part of the work preparation, the Instrument Bus [EE] was transferred from its normal power feed (MCC 28-2) to its reserve power feed (MCC 25-2) in accordance with Dresden Operating Procedure (DOP) 6800-2, Instrument Bus System. Immediately after the power transfer occurred, the 2-203-2A outboard MSIV was observed in the closed position. Prior to this event, all inboard MSIVs were isolated (closed) and all outboard MSIVs were in the open position. During the Instrument Bus transfer, no other unexpected occurrences were noted, and no activities were being performed that could have contributed to this event. The outboard MSIV DC pilot solenoid indicating lights were checked on panel 902-62 and found to be lit, indicating that the DC solenoids had not lost power. An investigation was initiated to determine the cause of the spurious MSIV closure.

C. APPARENT CAUSE OF EVENT:

This event is reported in accordance with 10CFR50.73(a)(2)(iv), which requires the reporting of any unplanned Engineered Safety Feature (ESF) actuation.

The root cause of this event is attributed to failure of the outboard 2-203-2A MSIV DC pilot solenoid. Each MSIV is equipped with an AC and DC pilot solenoid. De-energization of both solenoids is required to cause MSIV closure. Investigation revealed that the DC solenoid on outboard MSIV 2-203-2A had failed due to an open coil, and that the MSIV was being held in the open position by the AC solenoid, as designed. However, during the Instrument Bus power transfer, a normal expected momentary loss of AC power was experienced at the bus. Since the AC pilot solenoids for all MSIVs are fed from the Instrument Bus, the outboard MSIV AC solenoids (which were energized at the time of this event) experienced a momentary loss of AC power as expected. This allowed for closure of the 2-203-2A MSIV upon de-energization of both AC and DC pilot solenoids. The remaining three outboard MSIVs were held in the open position during the Instrument Bus power transfer by their corresponding DC pilot solenoids, as designed. Further investigation of the

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solenoid did not reveal the cause of the open coil. Visual examination of the coil exterior and the coil leads did not indicate any heat related problems. Review of the circuitry for the solenoid indicating lights, located on panel 902-62, revealed that the lights do not provide coil continuity indication but they rather provide indication that voltage is supplied to the coil. Although this does not impact proper MSIV operation, indication of actual solenoid continuity would have alerted Operators of the DC solenoid failure in a more timely manner while performing routine checks of the indicating lights.

A maintenance history review determined that the solenoid was last replaced in February, 1989, under Work Request 79156 in order to maintain required to meet Environmental Qualification. There has been one recent previous occurrence of an open DC coil on an MSIV pilot solenoid; refer to Section F of this report.

D. SAFETY ANALYSIS OF EVENT:

Closure of the 2-203-2A outboard MSIV occurred properly upon temporary loss of AC power concurrent with failure of the DC pilot solenoid. Valve closure is designed to occur upon de-energization of both the AC and DC pilot solenoids. As such, the MSIV failed in the conservative (isolated) position. Although spurious closure of an MSIV at relatively high power levels could result in a Primary Containment Group I Isolation [JM] and scram on Main Steam Line High Flow, this occurrence under cold shutdown conditions had no effect on plant status. Therefore, the safety significance of this event was minimal.

E. CORRECTIVE ACTIONS:

Work Request 05964 was initiated to replace the DC pilot solenoid for outboard MSIV 2-203-2A. The solenoid was replaced and successfully tested by the Electrical Maintenance Department (EMD), with the 2-203-2A MSIV returned to service on January 15, 1992 at 0115 hours. Approximately three hours later, at 0435 hours, the Instrument Bus was returned from its reserve power feed (MCC 25-2) to its normal power feed (MCC 28-2), in accordance with DOP 6800-2. During the power transfer, all four outboard MSIVs remained open, further verifying operability of the DC pilot solenoids. The MSIV DC pilot solenoids are replaced on a preventative maintenance interval of every third refuel outage. In addition, functional checks of the DC solenoids are performed during cold shutdowns under Dresden Operating Surveillance (DOS) 1600-18, Cold Shutdown Valve Testing. DOS 1600-18 was last successfully performed on October 23, 1991 with all MSIV pilot solenoids performing satisfactorily. The Technical Staff and Corporate Engineering will evaluate changes to the MSIV circuitry in order to provide improved indication of DC pilot solenoid failures. Action Item Record 12-91-14 has been written to document this.

F. PREVIOUS OCCURENCES:

<u>LER/Docket Number</u>	<u>Title</u>
90-002/ 050237	Reactor Scram Following Condensate/Condensate Booster Pump Failure and Subsequent Loss of Offsite Power
	During this event, following a reactor scram and loss of offsite power, the 2-203-2C MSIV spuriously closed. The root cause of the MSIV closure was attributed to failure of its DC pilot solenoid. Corrective actions included replacement of the solenoid, and initiation of functional testing for all MSIV DC pilot solenoids during cold shutdowns.

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

G. COMPONENT FAILURE DATA:

<u>Manufacturer</u>	<u>Nomenclature</u>	<u>Model Number</u>	<u>Mfg. Part Number</u>
Automatic Valve Co.	125V DC soleniod	6910-020	N/A

An industry wide NPRDS data base search revealed no adverse trend of previous events involving failures of DC solenoids manufactured by the Automatic Valve Co.