



**Commonwealth Edison**

Dresden Nuclear Power Station

R.R. #1

Morris, Illinois 60450

Telephone 815/942-2920

December 19, 1991

CWS LTR #91-054

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

Licensee Event Report #91-012, Docket #050249 is being submitted as required by Technical Specification 6.6, NUREG 1022 and 10 CFR 50.73(a)(2)(iv).

Charles W. Schroeder  
Station Manager  
Dresden Nuclear Power Station

CWS/dwh

Enclosure

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

(ZDVR/404)

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PDR 4008K 00000249  
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*J. E. J.*

LICENSEE EVENT REPORT (LER)

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Title (4)  
Partial Primary Containment Group II Isolation During Maintenance Repairs Due to Personnel Error

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)					
1	1	2	0	9	1	9	1	1	2	1	9	9	1	N/A	
				0	1	2			0	0				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 Kevin W. Sykes, Regulatory Assurance Engineer	Ext. 2704	TELEPHONE NUMBER AREA CODE 8   1   5	9   4   2   -   2   9   12   0
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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

SUPPLEMENTAL REPORT EXPECTED (14)

Expected Submission Date (15)

Yes (If yes, complete EXPECTED SUBMISSION DATE) X | NO

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

At 2213 hours, with Unit 3 in the shutdown mode, 14 of the 44 Group II Primary Containment Isolation Valves went closed when an Electrician lifted a neutral lead in preparation for replacement of a terminal block under Work Request 04380. This event has been attributed to personnel error on the part of the Electrical Work Analyst who prepared the work package. The Analyst did not fully research the wiring diagram for the panel which contains the terminal blocks, and thus did not identify the circuits "daisy-chained" to the neutral lead connected at the terminal block to establish the correct Out-Of-Service (OOS) boundaries. One of these "daisy-chained" circuits contains the trip contacts for the 14 valves which closed. This event had minimal safety significance because the unplanned valve closures had no effect on the plant status, and the Group II isolation function was not impaired. As a corrective action, this event will be discussed with the Electrical Maintenance Department Work Analysts. One previous event involving inadvertent Group II valve closures due to a lifted lead is reported in LER 90-22/0500237.

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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:

Partial Primary Containment Group II Isolation [JM] During Maintenance Repairs Due to Personnel Error.

A. CONDITIONS PRIOR TO EVENT:

Unit: 3                                      Event Date: November 20, 1991                                      Event Time: 2213 Hours  
 Reactor Mode: N                                      Mode Name: Shutdown                                      Power Level: 0%  
 Reactor Coolant System (RCS) Pressure: 0 psig

B. DESCRIPTION OF EVENT:

At approximately 2200 hours, with Unit 3 in the shutdown mode, two Electricians were sent to replace terminal blocks AA-9, AA-10, AA-11, AA-68, and AA-69 in the 903-3 panel in the Control Room under Work Request 04380. The Maintenance/Modification Procedure (MMP) written as a supplement to the Work Request specified that Inboard Main Steam [SB] Drain Valve M03-220-1 was to be taken Out-Of-Service (OOS) and the 595-711A fuse removed (Outage Number 1790) to interrupt power to the terminal blocks to accomplish the replacement. Removal of the M03-220-1 valve from service interrupted power to the AA-9, AA-10, and AA-11 terminal blocks, and removal of the 595-711A fuse interrupted power to terminal block AA-68 as expected; however, terminal block AA-69 remained energized. As a result, 14 of the 44 air operated valves associated with Group II Primary Containment Isolation unexpectedly went closed when the lead was lifted at terminal block AA-69.

The following valves went closed: 8501-1A, 8501-1B, 8501-3A, 8501-3B, 8501-5A, 8501-5B, 9205A, 9205B, 9206A, 9206B, 9207A, 9207B, 9208A, and 9208B.

The Electrical Work Analyst who prepared the work package selected the OOS boundaries using electrical drawings 12E3505A, 12E3806J, 12E3695, and 12E3504 (Sheet 2). Drawing 12E3504 (Sheet 2), which is the schematic diagram for the Inboard Main Steam Isolation Valve (MSIV) AC circuit, and drawing 12E3695, which is the wiring diagram for the 903-3 panel, show terminal block AA-69. The Electrical Work Analyst reviewed both drawings, but he erroneously based the OOS boundaries for replacement of the AA-69 terminal block on only the schematic drawing. The schematic drawing depicts the control circuit for the MSIV solenoid valves and shows the circuit neutral as terminated on AA-69. This control circuit may be de-energized by removing fuse 595-711A. However, removal of the 595-711A fuse only interrupts power in 1 of 5 circuits "daisy-chained" to the neutral lead connected at terminal block AA-69. If the wire connection coordinates shown on wiring drawing 12E3695 at terminal AA-69 are traced back, the following 5 circuits are identified as being "daisy-chained" at the neutral lead going to terminal block AA-69: (1) AC solenoids for inboard MSIVs; (2) AC solenoids for outboard MSIVs; (3) Drywell and Suppression Chamber (Torus) vent and purge valves; (4) Isolation Condenser [BL] valves; and (5) Condenser Offgas System [WF] isolation valves. The Drywell and Torus vent and purge valve circuit contains the trip contacts for valves 8501-1A, 8501-1B, 8501-3A, 8501-3B, 8501-5A, 8501-5B, 9205A, 9205B, 9206A, 9206B, 9207A, 9207B, 9208A, and 9208B.

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

Removal of fuse 595-711A, therefore, interrupted power in the Inboard MSIV circuit only; power from the other circuits continued to the AA-69 terminal block. Had the Electrical Work Analyst fully researched wiring drawing 12E3695, he would have identified these additional circuit connections.

When the Analyst reviewed the prints with the Electricians who were to perform the work in the pre-job briefing, he assured them that they had the necessary drawings and that no equipment should be affected when the leads were lifted to replace the terminal blocks.

When the Electricians went to begin the job, the leads were checked at terminal block AA-69. One of the leads read 10 volts. Having been assured by the Analyst that the circuit would be de-energized once the fuse was removed, it was concluded that this could have been: (1) the result of electrical backfeed from another circuit, or (2) it could have been due to induced current flow (i.e., current flow created in a de-energized cable due to the magnetic field generated by an energized cable in close proximity to the de-energized cable).

When the lead was lifted, a continuous spark was seen from one of the leads. It was believed that the original conclusion about the backfeed (or induction) in the wire was correct, since no relay position changes were heard.

At the point when the lead was lifted power was interrupted in the remaining 4 of the 5 circuits mentioned earlier (removal of the 595-711A fuse interrupted power in 1 of the 5 circuits): (1) AC solenoids for outboard MSIVs; (2) Drywell and Torus vent and purge valves; (3) Isolation Condenser valves; and (4) Condenser offgas system isolation valves. As mentioned earlier, the Drywell and Torus vent and purge valve circuit contains the trip contacts for valves 8501-1A, 8501-1B, 8501-3A, 8501-3B, 8501-5A, 8501-5B, 9205A, 9205B, 9206A, 9206B, 9207A, 9207B, 9208A, and 9208B. The power interruption caused the solenoids for these valves and seal-in relays for the individual valve circuits to de-energize, thereby causing valve closure.

The Group II isolation alarm which would normally annunciate in this type of condition was not activated because the Group II initiation relays for the trip contacts for the 14 valves (relays 595-104A, 595-104B, 595-104C, and 595-104D) are fed from the Reactor Protection System [JC] (RPS) bus, which was unaffected in this event. These relays, therefore, remained energized. Control Room personnel, however, were alerted to the problem by a message printed on the computer alarm typer at 2213 hours, indicating that the 14 valves had closed.

The leads were reconnected after replacing the terminal block. When power was restored upon reconnection of the leads, the valves did not automatically re-open because contacts in the vent and purge relay logic need to be closed using Group II manual reset switch 595-306 to re-energize the circuit. The control switches for the valves need to be manually operated to the open position to open the valves and energize the seal-in circuit to keep the valves open.

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When the Control Room personnel began their investigation of the valve closures, the Station Control Room Engineer (SCRE) called the Electricians who had worked on the terminal blocks and questioned them about what they had done. The Electricians returned to the Control Room and went through the work package and the drawings with the SCRE to see if they had lifted an energized lead. The cause of the valve closures could not be identified.

Control Room personnel checked the fuses for the affected valves and found them in satisfactory condition. Control Room personnel then attempted to open the 8501-3A valve. The valve could not be opened; therefore it was concluded that the valve closure was Group II isolation related. The Nuclear Station Operator (NSO) then operated the Group II reset switch and opened valve 8501-3A, thereby confirming the cause of the valve closure at 2314 hours. The valve was then reclosed and all 14 valves were left closed pending further investigation. Work Request 05093 was initiated to investigate the cause of the isolation signal.

An Event Notification System (ENS) red phone call was made to the NRC at 0107 hours on November 21, 1991, to report this event as an Engineered Safety Features (ESF) actuation in accordance with 10 CFR 50.72(b)(2)(ii).

C. APPARENT CAUSE OF EVENT:

This unplanned valve closure is being reported per 10 CFR 50.73(a)(2)(ii) which requires the reporting of any unplanned ESF actuation.

The root cause of the event is personnel error. The Electrical Work Analyst failed to fully research electrical drawing 12E3695, and thus did not identify the additional circuits "daisy-chained" at the neutral lead going to terminal block AA-69.

As a contributor to the event, Operations personnel did not identify the oversight when preparing the OOS documents.

D. SAFETY ANALYSIS OF EVENT:

This event had minimal safety consequences. The actuation was due to an inadvertent interruption of control power to the seal-in circuitry for the affected valves, causing the valves to move to their fail-safe position. Their unplanned closure had no effect on the plant status. The Group II initiation circuitry was unimpaired; therefore, had a Group II isolation condition developed, the signal would have been generated and the remaining Group II valves would have closed as required. Further, the Unit was in a shutdown condition with fuel removed from the reactor vessel with primary containment not being required.

E. CORRECTIVE ACTIONS:

1. Senior Station Management will conduct an interview with the Electrical Work Analyst involved in the event to discuss the specific management expectations that were not met. (249-200-91-09701)

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2. The Master Electrician will review this event with the Electrical Work Analysts. (249-200-91-09702)
3. The Maintenance Department will develop written guidance on the use of electrical drawings when selecting Out-Of-Service boundaries (249-200-91-09703)
4. The Operations Department will revise Memorandum 20, "Use of Electrical Prints for Out-Of-Service," to include a statement that some electrical circuits which contain a neutral wire may be "daisy-chained" to other circuits, which may not be readily apparent on the schematic drawings, and thus may require further review of the wiring diagrams. (249-200-91-09704)

F. PREVIOUS OCCURENCES:

LER/Docket Numbers    Title

90-22/0500237            Unexpected Closure of 11 Containment Isolation Valves During Surveillance Testing Due to Procedure Deficiency

In this event, 11 of 44 Group II primary containment isolation valves went closed when an Electrician lifted a lead while performing Dresden Electrical Surveillance (DES) 0200-39, Main Steam Isolation Valve Electrical Maintenance, on Main Steam Isolation Valve 203-2A. The event was attributed to a deficiency in DES 0200-39 which failed to identify a wiring configuration discrepancy in control room panel 902-3. Corrective actions included a field verification of the surveillance and correction of identified wiring configuration discrepancies on both Unit 2 and Unit 3.

G. COMPONENT FAILURE DATA:

This section is not applicable because this event did not involve component failure.