

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Dresden Nuclear Power Station, Unit 3		DOCKET NUMBER (2) 0   5   0   0   0   2   4   9	PAGE (3) 1   OF   0   4
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TITLE (4) Spurious Reactor Scram During the Performance of Dresden Operating Surveillance (DOS) 500-3 "APRM Rod Block and Scram Functional Test"

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	1	1	8	7	8	7	0	4	0	9	8	7	N/A	Dresden Unit 2	0   5   0   0   0   2   3   7
0	3	1	1	8	7	8	7	0	4	0	9	8	7	N/A		0   5   0   0   0

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5: (Check one or more of the following) (11)

OPERATING MODE (9) N	20.402(b)	20.405(a)	X	80.73(a)(2)(iv)	73.71(b)
POWER LEVEL (10) 0   0   1   0	20.406(a)(1)(i)	80.38(a)(1)		80.73(a)(2)(v)	73.71(a)
	20.406(a)(1)(ii)	80.38(a)(2)		80.73(a)(2)(vi)	OTHER (Specify in Abstract below and in Text, NRC Form 355A)
	20.406(a)(1)(iii)	80.73(a)(2)(i)		80.73(a)(2)(vii)(A)	
	20.406(a)(1)(iv)	80.73(a)(2)(ii)		80.73(a)(2)(vii)(B)	
	20.406(a)(1)(v)	80.73(a)(2)(iii)		80.73(a)(2)(viii)	

LICENSEE CONTACT FOR THIS LER (12)

NAME Brian C. McCabe Technical Staff Engineer (X-483)	TELEPHONE NUMBER AREA CODE 8   1   5   9   4   2   -   2   9   2   0
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COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRPDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRPDS

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 March 11, 1987 at 0526 hours with Dresden Unit 3 in the shutdown mode, Operating personnel were performing Dresden Operating Surveillance (DOS) 500-3, "APRM Rod Block and Scram Functional Test". While performing DOS 500-3, the Reactor Operator (RO) was at a step in the test where Average Power Range Monitor (APRM) Channel 2 and Channel 6 were in Bypass. Following the functional test on APRM Channel 2, the back panel Operator inadvertently left the test switch in the Power/Flow Test position instead of returning it to the Operate position per the procedure. He then requested the front panel RO to remove APRM Channel 2 from Bypass as called for in the procedure. This error should only have resulted in an RPS Channel A half scram, but instead a full reactor scram was received. Several attempts to duplicate the event proved unsuccessful. An investigation was conducted to determine possible causes of the event. This investigation included an inspection of the RPS scram relays, interviews with involved Control Room personnel, and repeated attempts to duplicate the event. None of the theorized possible causes of the event could be confirmed as the root cause. Safety significance was minimal since the Reactor Protection System responded in a conservative manner during this event. The APRM rod block and scram functions were successfully tested immediately prior to and following the event. The corrective actions included a thorough inspection of the RPS scram relays (590-108A-H) and the RPS 109 relays (590-109A-D). Although the mispositioned APRM test switch was not the root cause of the event, the RO was counselled on the importance of strict adherence to procedural detail. Last previous occurrence was documented under non-reportable Deviation #12-3-86-92.

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TEXT (If more space is required, use additional NRC Form 366A's) (17)

PLANT AND SYSTEM IDENTIFICATION:

General Electric Boiling Water Reactor - 2527 Mwt rated core thermal power. Energy Industry Identification System (EIIS) codes are identified in the text as [XX].

EVENT IDENTIFICATION:

A spurious reactor scram occurred during the performance of Dresden Operating Surveillance (DOS) 500-3, "APRM [IG] Rod Block and Scram Functional Test".

B. PLANT CONDITIONS PRIOR TO EVENT:

Mode: Unit 2 - N - Refueling/Unit 3 - N - Shutdown

Reactor Power: Unit 2 - 0%/Unit 3 - 0%

B. DESCRIPTION OF EVENT:

On March 11, 1987 Dresden Unit 3 was shut down and performing surveillances in preparation for unit startup. Included in these surveillances was DOP 500-3. The purpose of this surveillance is to provide a step-by-step method of functionally testing the Average Power Range Monitor (APRM) [IB] rod block and scram functions. The APRM system consists of six APRM channels (1 through 6). APRM Channels 1 through 3 provide scram signals to Reactor Protection System (RPS) Channel A while APRM Channels 4 through 6 provide scram signals to RPS Channel B. One APRM in either RPS Channel A or B can be bypassed during normal operation. This allows for maintenance and testing on an APRM while still providing redundant instrumentation in each RPS logic channel. While performing DOS 500-3, the Reactor Operator was at a step in the test where APRM Channel 2 and Channel 6 were in Bypass. At 0526 hours, following the functional test on APRM Channel 2, the back panel Operator inadvertently left the test switch in the Power/Flow Test position instead of returning it to the Operate position per the procedure. He then requested the front panel Reactor Operator to remove APRM Channel 2 from Bypass as called for in the procedure. This error should only have resulted in an RPS Channel A half scram, but instead a full reactor scram was received. Prior to removing APRM Channel 2 from Bypass, three licensed Control Room personnel verified that all eight scram pilot lights were illuminated. This indicates that both RPS channels were properly reset prior to removing APRM Channel 2 from Bypass and that only a Channel A half scram should have occurred. The scram was reset immediately.

C. CAUSE OF EVENT:

The root cause of the event could not be determined. Several attempts to duplicate the event proved unsuccessful as only a Channel A half scram resulted. An extensive investigation of the event was conducted by Operations, Electrical Maintenance, Instrument Maintenance, and General Electric personnel. Included in this investigation was a thorough review of computer printouts, appropriate electrical prints, and related scram information. Three possible causes were

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investigated. These were; 1) the possibility that a spurious APRM signal spike in the B RPS Channel occurred at the same time that the A RPS Channel APRM was removed from Bypass; 2) the possibility that the B RPS Channel had been tripped and overlooked by the Nuclear Station Operator (NSO) prior to removal of A RPS Channel APRM from Bypass; and 3) the possibility that contacts in scram solenoid relays 590-108B and F or 590-108D and H (located in the B RPS Channel) were dirty and "dropped out" when the A RPS Channel APRM had been removed from bypass.

The possibility of a spurious APRM signal spike in the B RPS Channel was considered improbable. The reactor was at 0% power and a review of the associated computer alarm printouts did not support this possible cause. The possibility that a half scram in the B RPS Channel existed before the full scram occurred was also considered improbable. All involved Control Room personnel were interviewed by station management to determine whether a personnel error was the root cause of the event. Several of the personnel interviewed verified that both RPS Channels were reset prior to the full scram. These interviews found that although the inadvertent mispositioning of the APRM Channel 2 test switch would have caused a half scram, this action alone was not the root cause of the full scram. Finally, failure of the scram solenoid relay contacts were ruled out as a possible root cause. A complete inspection was conducted on relays 590-108A, B, C, D, E, F, G, H and relays 590-109A, B, C, D (General Electric model CR105-GEH 2416A). No problems related to the scram functions were discovered.

D. SAFETY SIGNIFICANCE

The safety significance of this event is minimal since the Reactor Protection System responded in a conservative manner (full reactor scram vs. the expected Channel A half scram) during this event. Furthermore, the APRM rod block and scram functions were successfully tested immediately prior to and following the event and remained operable throughout the event. An extensive inspection of the RPS scram relays (590-108A, B, C, D, E, F, G, H) and RPS 109 relays (590-109A, B, C, D) discovered no problems related to the scram. The Emergency Core Cooling Systems (ECCS) remained operable throughout the event although none were called upon to initiate.

E. CORRECTIVE ACTIONS:

Immediate actions were taken to duplicate this event. Following several unsuccessful attempts to duplicate the event, the Electrical Maintenance Department conducted a thorough inspection of the RPS scram relays (590-108A, B, C, D, E, F, G, H) and the RPS 109 relays (590-109A, B, C, D) per Work Request #D63003, #D63009, and #D63010. Also, the 590-108 and 109 relays on Unit 2 were inspected. This investigation discovered no problems that could be related to the reactor scram.

The involved Control Room personnel were interviewed by station management to determine whether a personnel error was the cause of the event. These interviews found that although the inadvertent mispositioning of the APRM Channel 2 test switch would have caused a half scram, this action alone was not the root cause of the full reactor scram. The Reactor Operator responsible for the mispositioned test switch was counselled by station management on the importance of strict adherence to procedural detail.

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TEXT (If more space is required, use additional NRC Form 366A's) (17)

Long term corrective actions include a thorough inspection of the RPS scram relays (590-108A, B, C, D, E, F, G, H) and the RPS 109 relays (590-109A, B, C, D) on both Units 2 and 3 during the respective units' next refueling outage. Work Requests (#D63670, D63671, D63674 and D63675) were written for the Electrical Maintenance Department to inspect and overhaul (if necessary) these relays per instructions given in General Electrical Maintenance Guide GEH-2416A. Following this inspection and prior to unit operation, DOS 500-3 will be successfully completed. Any discrepancies or failures found during these inspections will be documented on the station's NPRDS system.

F. PREVIOUS OCCURRENCES

Non Reportable Deviation  
#12-3-86-92

Scram Pilot Solenoid Group A2 Unable to Reset  
During Dresden Operating Surveillance 500-10  
Due to Stuck Relay Contacts

In Non Reportable Event #12-3-86-92, the Group II (A-2) RPS scram solenoid lights on panels 903-3 and 903-15 would not illuminate on RPS Channel A after the NSO attempted to reset a half scram generated while performing DOS 500-10, "Turbine Stop Valve Closure Scram Circuit Sensor Tests". The NSO repeated the half scram and the lights illuminated. The cause of the event could not be determined although the most likely cause was attributed to a stuck contact on scram solenoid relays 590-108C, 108G or 109C. Since the problem could not be duplicated, no further corrective actions were taken.

G. COMPONENT FAILURE DATA:

Investigation of this event could not identify any component failure.



**Commonwealth Edison**

Dresden Nuclear Power Station

R.R. #1

Morris, Illinois 60450

Telephone 815/942-2920

April 9, 1987

EDE LTR #87-237

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

Licensee Event Report #87-009-0, Docket #050249 is being submitted as required by Technical Specification 6.6, NUREG 1022 and 10 CFR 50.73(a)(2)(iv).

*for* E.D. Eenigenburg  
Station Manager  
Dresden Nuclear Power Station

EDE/kjl

Enclosure

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

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