



**Commonwealth Edison**  
Dresden Nuclear Power Station  
R.R. #1  
Morris, Illinois 60450  
Telephone 815/942-2920

December 18, 1990

50-232

EDE LTR #90-811

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

Licensee Event Report #90-015-0, Docket #050237 is being submitted as required by Technical Specification 6.6, NUREG 1022 and 10 CFR 50.73(a)(2)(iv).

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/96)

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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 15 10 10 10 12 13 17 Page (3) 1 of 0 4

Title (4) Intermediate Range Monitor Full Scram Due to Inductive Noise

Input to the IRM/SRM Power Supplies

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	3	9	10	9	10	---	0	1	5	---	0	0	1	2	1	8	9	10	N/A	0	15	10	10	10			
																						N/A	0	15	10	10	10		

OPERATING MODE (9) N

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

20.402(b)	20.405(c)	X	50.73(a)(2)(iv)	73.71(b)
20.405(a)(1)(i)	50.36(c)(1)		50.73(a)(2)(v)	73.71(c)
20.405(a)(1)(ii)	50.36(c)(2)		50.73(a)(2)(vii)	Other (Specify in Abstract below and in Text)
20.405(a)(1)(iii)	50.73(a)(2)(i)		50.73(a)(2)(viii)(A)	
20.405(a)(1)(iv)	50.73(a)(2)(ii)		50.73(a)(2)(viii)(B)	
20.405(a)(1)(v)	50.73(a)(2)(iii)		50.73(a)(2)(x)	

POWER LEVEL (10) 0 0 0

LICENSEE CONTACT FOR THIS LER (12)

Name: Thomas C. Wolz, Technical Staff System Engineer Ext. 2567

TELEPHONE NUMBER: AREA CODE 8 1 5 9 4 2 1 -2 9 12 10

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	B	O	R	L	Y	G	O	B	O	Y

SUPPLEMENTAL REPORT EXPECTED (14)

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

Expected Submission Date (15) 0 6 3 10 9 11

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

At 1017 hours on November 23, 1990, an automatic reactor scram occurred due to a spurious high core flux signal from Intermediate Range Monitors (IRM) 13 and 15. During the performance of Dresden Instrument Surveillance (DIS) 1500-5, Low Pressure Coolant Injection Logic (LPCI) Test logic relay 2-1530-115 AY generated an abnormally large voltage spike on the 125 Volt DC power system. Through electromagnetic induction this voltage spike was transferred to the 24/48 Volt DC power system. The 24/48 Volt DC system provides power to the control logic for all eight IRM channels. The spike caused the IRM channels to exceed the high core flux scram setpoint thus causing a reactor scram. Corrective actions included replacement of the suspect relay and the initiation of further investigation. The safety significance of this event is minimal since Unit 2 was already shutdown for a refueling outage when the event occurred.



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

Based on a review of the event and interviews of the personnel involved, the root cause of the event was attributed to inductive noise caused by relay actuation in the LPCI logic. Relays naturally cause minor spiking due to their inductive nature to resist changes in current through the relay coil. After further investigation, Relay 1530-115 AY was believed to cause a higher than normal spike. It was noted during the LPCI logic testing that the 1530-115 AY relay failed to actuate properly. This relay is actuated several times during the logic testing. Spiking was seen on the IRMs and SRMs during the first two actuations, and the relay failed to actuate altogether the third time. The IRM scram was believed to have occurred upon the initial deenergization of the relay. As a result, the cause of the abnormal voltage spikes are attributed to the failure of this relay. This spike was enhanced by the coincident deenergization of several other relays in the LPCI logic.

The IRM and SRM channels are very sensitive instruments. IRM and SRM channels have been known to spike as a result of minor bumping of nearby equipment and the use of radio communication in the vicinity. In this case the identified relay caused a spike of 10 volts to occur on the IRM regulated 15 volt power supply fed from the 24/48 volt system. The 24/48 Volt DC system and the 125 Volt DC system originate from the same area in the plant and therefore use many of the same cable routes. This arrangement is believed to have allowed the voltage spike to affect both systems via electromagnetic induction. This interruption in the normally stable power supply caused the IRM channels to spike high enough to exceed the Technical Specification setpoint. This resulted in the scram initiation signal sent to Reactor Protection System channels A and B.

The defective relay was bench tested after it had been replaced with a like for like replacement. The relay functioned normally in its normal face front (vertical) position and in a face up position. The cause of the relay failure could not be determined.

D. SAFETY ANALYSIS OF EVENT:

The RPS logic consists of two separate channels, both of which must be tripped to initiate a reactor scram. Two SRMs and four IRMs provide inputs to each of the two RPS channels. A flux indication exceeding the Hi-Hi setpoint on any IRM will cause a trip of its associated RPS channel. Similarly, a Hi-Hi flux indication on any SRM will trip its associated RPS channel provided neutron monitoring shorting links have been removed. In this case RPS channels A and B received an initiation signal from IRMs 13 and 15 respectively due to indications in excess of the Technical Specification setpoint of 120/125 of full scale. The RPS operated as designed in this event.

LPCI logic relay 1530-115 AY energizes upon receiving a low low reactor water level signal or upon receiving a low reactor pressure signal (less than 350 psig) concurrent with a high drywell pressure (2 psig) signal. This relay is a redundant Division I device which initiates LPCI Loop Select Logic. LPCI Loop Select Logic is designed to determine the appropriate LPCI injection loop following a Loss of Coolant Accident by isolating the broken recirculation loop LPCI injection valves and directing the LPCI flow to the intact recirculation loop. Failure of a single relay, in this case the 1530-115 AY, does not prevent the proper operation of LPCI Loop Select Logic. Since the redundant Division II relays were tested satisfactorily, the safety significance of this relay failure is determined to be minimal. The relay was replaced with a like for like replacement and tested to demonstrate operability. The spikes on the IRMs and SRMs were significantly reduced.

The safety significance of this event is minimal since all safety systems performed as designed. The reliability of the LPCI system was not compromised because the redundant Division II relays performed as designed.

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

E. CORRECTIVE ACTIONS:

LPCI logic relay 2-1530-115 AY was replaced with a like for like replacement and demonstrated operable (237-200-90-13701). HFA relays will continue to be visually inspected per Dresden Maintenance Procedure (DMP) 500-2, HFA Relay Inspection, as part of a preventative maintenance program on a Refueling outage basis to detect gross defects and functionally tested during system logic testing (237-200-90-13702). To prevent recurrent spurious IRM spiking due to inductive noise, the Technical Staff will initiate an investigation to evaluate possible long term corrective actions to reduce the IRM/SRM power regulators susceptibility to random power supply fluctuations of this type (237-200-90-13703). The cause of the relay failure will be further investigated and a supplemental report will be issued in the event that further information is revealed (237-200-90-13704).

F. PREVIOUS OCCURENCES:

LER/Docket Numbers    Title

85-021-0/050237    Reactor Scram Due To IRM Hi-Hi - Spurious Radio Signals

IMD was troubleshooting SRM 21 when radio signals entered the SRM/IRM cabinet and caused IRM 13 and IRM 15 to erroneously read hi-hi causing a full scram. A modification was implemented to relocate the source of the radio signals.

G. COMPONENT FAILURE DATA:

<u>Manufacturer</u>	<u>Nomenclature</u>	<u>Model Number</u>	<u>Mfg. Part Number</u>
General Electric	HFA Relay	12HFA151A2H	GEK 45484

An industry wide NPRDS data base search revealed several relay figures due to binding problems. However, no incidences of excess spiking due to this problem were reported.