



Commonwealth Edison
Dresden Nuclear Power Station
6500 North Dresden Road
Morris, Illinois 60450
Telephone 815/942-2920

June 11, 1993

CWS PMLTR 93-0224

U.S. Nuclear Regulatory Commission
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Licensee Event Report 2-93-013, Docket 050237 is being submitted as required by Technical Specification 6.6, NUREG 1022 and 10 CFR 50.73(a)(2)(ii).

Charles W. Schroeder for 6-17-93
Charles W. Schroeder
Station Manager
Dresden Station

CWS/slb

Enclosure

cc: T. Martin, Regional Administrator, Region III
NRC Resident Inspector's Office
File/NRC
File/Numerical

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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
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Title (4)
 Momentary Reactor Manual Control System Rod Select Matrix Interlock Failure Due to Relay Failure

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	5	1	9	9	3	9	3	---	0	1	3	---	0	0	0	6	1	1	9	3	N/A					
																				N/A						

OPERATING MODE (9) N THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIRMENTS OF 10CFR
 (Check one or more of the following) (11)

POWER LEVEL (10)	0			20.402(b)	20.405(c)	50.73(a)(2)(iv)	73.71(b)
	0			20.405(a)(1)(i)	50.36(c)(1)	50.73(a)(2)(v)	73.71(c)
	0			20.405(a)(1)(ii)	50.36(c)(2)	50.73(a)(2)(vii)	Other (Specify in Abstract below and in Text)
	0			20.405(a)(1)(iii)	50.73(a)(2)(i)	50.73(a)(2)(viii) (A)	
				20.405(a)(1)(iv)	X 50.73(a)(2)(iii)	50.73(a)(2)(viii)(B)	
			20.405(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(x)		

LICENSE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER
T. Feron	Ext. 3524
	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	MANUFACTURER	REPORTABLE TO NPRDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS
X	J	D	R	L	Y				NO

SUPPLEMENTAL REPORT EXPECTED (14)	Expected Submission Date (15)	Month	Day	Year
Yes (If yes, complete EXPECTED SUBMISSION DATE)	X NO			

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

At 1030 hrs, on May 19, 1993, the Dresden Unit 2 Reactor Manual Control System's [JD] single rod selection interlock failed when it allowed two control rod drives to be selected at the same time with the reactor in the Refuel mode. A Nuclear Station Operator was performing a Control Rod Drive (CRD) Stall Flow Test at the time of the event. Both rods accepted an insert signal and traveled from position '00' to the overtravel-in position before settling back at position '00'. No rod withdrawal occurred during the event. The immediate corrective action was deselecting both rods by turning the power to the control rod select matrix off. The event was deemed reportable per 10CFR50.73(a)(2)(ii). The most probable cause of this event is a temporary malfunction of the auxiliary relay connected in parallel with the rod select matrix switch holding coil for rod H-09. A work request has been issued for the replacement of this relay.

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TEXT Energy Industry Identification System (EIS) 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:

Momentary Reactor Manual Control System Rod Select Matrix Interlock Failure Due to Relay Failure

A. CONDITIONS PRIOR TO EVENT:

Unit: 2 Event Date: 05/19/93 Event Time: 1030
 Reactor Mode: N Mode Name: Refuel Power Level: 0
 Reactor Coolant System (RCS) Pressure:

B. DESCRIPTION OF EVENT:

On May 19, 1993, at 1030 hours, during a Dresden Unit 2 refuel outage a Nuclear Station Operator (NSO) was performing Dresden Operating Surveillance (DOS) 0300-02, Control Rod Drive Stall Flow Test. The reactor was in Refuel mode. Control Rod Drive (CRD) H-09 was selected and at position '00'. Once a control rod is selected in the Refuel mode, it can only be deselected by turning off the power to the rod select matrix. The NSO turned the rod select matrix power switch to 'OFF' and then back to 'ON'. He then selected CRD L-09, which was also at position '00'. At this time, both CRD H-09 and L-09 were selected at the same time. This is a failure of the Reactor Manual Control System (RMCS) [JD] interlock that allows only one rod to be selected at a time. Both rods accepted an insert signal and traveled from position '00' to the overtravel-in position before settling back to the full-in '00' position. The NSO noticed that both rods were selected and rod movement was stopped. No control rod withdrawal occurred during the event. The NSO notified shift outage managers and shift engineers. Electrical and Instrument Maintenance personnel were also called to the control room along with a Qualified Nuclear Engineer. The Rod Worth Minimizer (RWM) was in operation in Rod Test Mode (see section D for explanation) at the time of the event. Personnel noted that the RWM did not accept either rod as being selected when both were selected. The RWM touchscreen showed CRD R-09 to be the selected rod. The rod select matrix power switch was turned to 'OFF' and all rods were deselected. When power was restored to the matrix, repeated attempts were made to duplicate the selection of both rods and different combinations of other rods. Only one rod was able to be selected at a time and the RWM selected rod always agreed with the rod select matrix selected rod. The Rod Worth Minimizer was therefore a faulted component in this event because the inputs it received from the two rods being selected at the same time caused the RWM to calculate that a single different rod was selected. Electrical maintenance personnel completed nuclear work request D18757 by vacuuming and cleaning the rod select matrix sockets and accessible areas.

C. APPARENT CAUSE OF EVENT:

Even though no rod withdrawal occurred, the event was deemed reportable per 10CFR50.73(a)(2)(ii), which requires reporting "...any event, found while the reactor is shutdown, that, had it been found while the reactor was in operation, would have resulted in the nuclear power plant, including its

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

principal safety barriers, being seriously degraded or being in an unanalyzed condition that significantly compromises plant safety".

A review of the maintenance history did not indicate that previous work has been required for an RMCS interlock problem.

Troubleshooting efforts were unable to duplicate the selection of two control rods, but it is believed that multiple contacts on the auxiliary relay associated with CRD H-09 remained in the closed position after the rod select matrix power was turned off. This relay, designated K1 in the Reactor Manual Control System [JD], provides several functions. These functions include supplying holding current to the pushbutton select switch, current to light the indicating lamp in the selected pushbutton, an indication of rod selection to the power range neutron monitoring systems, identification of the selected rod to the Rod Position Information System and it completes the circuit necessary to manipulate the CRD Directional control valves.

Since the initial investigation could not exclude the possibility of the select pushbutton for CRD H-09 mechanically binding up in the rod select matrix and allowing the rod select circuit path to be completed at the same time the rod select circuit path for CRD L-09 was completed, initial efforts focused on cleaning the pushbutton select switch. The binding was believed to have been due to dirt/dust in the rod select matrix. However, the rod select matrix pushbutton switches are enclosed switches and it is unlikely that debris would have bound up the switch. The floor under the control panels is currently vacuumed every refueling outage per a general surveillance that was first implemented in 1987.

D. SAFETY ANALYSIS OF EVENT:

The event was deemed reportable because if both control rods were withdrawn under certain conditions, the reactor core could have potentially been in an unanalyzed condition that could jeopardize fuel and compromise plant safety. The conditions that actually existed were that the plant was shutdown in the refuel mode and no rods were withdrawn. The Rod Worth Minimizer Rod Test Mode allows one rod to be fully withdrawn and re-inserted, only if all other rods are fully inserted. Movement of a control rod is blocked when selected if any other rod is withdrawn. Since both rods remained fully inserted at position '00', the RWM's Rod Test Mode rod block function was not challenged. Therefore, it is not known if the double rod selection input that faulted the RWM's ability to recognize what rods were selected would also have faulted the rod block function. Furthermore, the Reactor Manual Control System's [JD] single rod selection interlock is mentioned in the Technical Specifications, but is not specifically addressed as a LCO or Technical Specification required action and does not serve a Reactor Protection System (RPS) function. For these reasons, the safety significance of the event is minimal.

E. CORRECTIVE ACTIONS:

Immediate corrective actions were deselecting the rods and verifying that the event could not be duplicated. The Unit 2 rod select matrix's accessible areas were vacuumed/cleaned. A work request was written to replace the suspect K1 relay associated with CRD H-09. A work request has been written to clean the Unit 3 rod select matrix. A work request has been written to replace the possible faulty switches on the rod select matrix for the pushbuttons for CRDs H-09 and L-09. Also, because the Rod Worth Minimizer was faulted by the event, the event has been noted and included on the problems and ideas list for the pending RWM upgrade.

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While lack of operator training or operator error did not appear to be a causal factor in the event, two discoveries were made in the investigation that merited further action. Procedure DOP 0400-01, Reactor Manual Control System Operation, does not currently mention the unique nature of de-selecting rods with the reactor in the Refuel mode, nor does the written Licensed Operator Training module lesson plan for RMCS. For these reasons, a Procedure Inquiry Form has been initiated and a Training Request/Revision Form has been initiated.

Due to the very low failure rate for this type of relay and the minimal safety consequences of failure, a preventative maintenance program is not warranted. Replacement of the relay upon indication of failure is adequate. Given the design of the rod select matrix pushbutton switches, it is unlikely that debris fouling will cause a failure of the switch. Due to the minimal safety significance of a failed rod select matrix pushbutton switch, replacement of the switch upon indication of failure is adequate. No further corrective actions are required.

F. PREVIOUS OCCURRENCES:

A LER review shows no previous LERs for similar events

G. COMPONENT FAILURE DATA:

<u>Manufacturer</u>	<u>Nomenclature</u>	<u>Model Number</u>	<u>Mfg. Part Number</u>
C. P. Clare	Type LV 24 vdc relay	N/A	LBP0060D00

The Component is not reportable to NPRDS.