



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

May 18, 1993

CWS PMLTR 93-0186

U. S. Nuclear Regulatory Commission  
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Licensee Event Report 93-012, Docket 050237 is being submitted as required by Technical Specification 6.6, NUREG 1022 and 10CFR 50.73(a)(1) and 50.73(a)(2)(v).

*W. Schrod* for 5-18-93  
Charles W. Schroeder  
Station Manager  
Dresden Station

CWS/slb

enclosure

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

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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) Failure of Unit 2 Emergency Diesel Generator Output Breaker to Close Due to Mechanical 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	4	1   8	9   3	9   3	---	0   1   2	---	0	0	0   5   1   8	9   3	N/A							
OPERATING MODE (9)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10CFR (Check one or more of the following) (11)																	
POWER LEVEL (10)		0		0		0		20.402(b)	20.405(c)	50.73(a)(2)(iv)	73.71(b)								
								20.405(a)(1)(i)	50.36(c)(1)	X 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)									
LICENSE CONTACT FOR THIS LER (12)																			
NAME T. J. Johnson										TELEPHONE NUMBER Ext. 3526									
										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	E	K	5	2	G	0	B	0	Yes										
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)

On April 18, 1993 at 1020 during the performance of Dresden Operating Surveillance (DOS) 6600-05 Revision 17, "Bus Undervoltage and ECCS Integrated functional Test for Unit 2 Diesel Generator", with Unit 2 in a refueling outage, the Unit 2 Emergency Diesel Generator (EDG) output 4160V breaker failed to auto-close to BUS 24-1. When the breaker failed to close, the surveillance was suspended. Inspection revealed that the linkage arm for the stationary auxiliary switch was bent out of shape for the Bus 24-1 from Bus 24 main feed breaker. The bent linkage arm prevented the actuation of the stationary auxiliary switch contacts when the bus 24-1 Main Feed breaker opened which resulted in the failure to complete the closure logic for the Emergency Diesel Generator output breaker. The cause of the bent leakage arm is unknown. Corrective Actions will be to modify our installation practices, evaluate installing a newly desinged linkage assembly and evaluate the possibility of constructing a test breaker and cubicle. A TJM work history sort revealed 5 similar instances of bent linkage arms since January 1990.

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		9	3	--	0	1	2					

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:

Failure of Unit 2 Emergency Diesel Generator Output Breaker to Close Due to Mechanical Failure

A. CONDITIONS PRIOR TO EVENT:

Unit: 2    Event Date: April 18, 1993      Event Time:  
 Reactor Mode: Refuel      Mode Name: R    Power Level: 0%  
 Rector Coolant System Pressure: 0 psig

B. DESCRIPTION OF EVENT:

On April 18, 1993 at 1020 with Unit 2 in a refueling outage, the Unit 2 Emergency Diesel Generator output breaker to BUS 24-1 failed to auto-close during conduct of DOS 6600-05. This test is the AC Distribution System Division II undervoltage test for the Unit 2 diesel generator.

The surveillance was immediately suspended and the investigation was begun. Investigation revealed that the breaker stationary auxiliary switch (SBM switch) linkage was bent for BUS 24-1 Main Feed From BUS 24 breaker (Cubicle 2411). The cubicle mounted auxiliary switch (SBM) in this compartment has a normally closed contact that is in the closing circuit of the Unit 2 Emergency Diesel Generator output breaker. The logic is designed so that when the BUS 24-1 Main Feed breaker opens, the cubicle mounted switch will operate. This would cause the auxiliary contact to close, thus satisfying part of the closing logic for the EDG output breaker. The bent linkage assembly did not satisfy the EDG output breaker logic which requires that the BUS 24-1 breaker is open.

Had this been an actual event, the BUS cross-tie between BUS 24-1 and BUS 34-1 could be closed. It is also possible to close the EDG output breaker locally utilizing a local pushbutton (part of Safe Shutdown equipment).

C. APPARENT CAUSE OF EVENT:

The cause of the event was a bent linkage arm on the Main Feed breaker to BUS 24-1 from BUS 24. How the linkage was bent to the point where it failed to operate is indeterminable. The bent linkage assembly made removal of the breaker from the cubicle extremely difficult, and this potentially caused further damage to the linkage assembly.

The 4160V breakers in the plant are large and difficult to move easily. Damage to the alignment guide assemblies is evident in almost all of the breaker cubicles in the plant. Components of the breaker can be damaged during installation or removal, or via accidental contact when the breakers are being stored outside of their cubicles. It is possible that the breaker linkage was damaged during installation.

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A maintenance history review was conducted. The search was done on the SBM switch and its associated components. Since January of 1990, 5 separate work requests were written to, or involved, correction of problems associated with a bent or damaged linkage.

An NPRDS search was conducted. There appears to be some problems associated with the design of the linkage assembly. The manufacturer, General Electric, has replaced the old linkage assembly with a sturdier assembly. The new assembly, besides being much stronger, also has provisions to adjust the linkage to the eccentricities of the particular breaker and cabinet.

Dresden Technical Staff personnel have been in contact with personnel from Quad Cities Station. They were asked to conduct a similar search of their database. Their search revealed no adverse trend.

D. SAFETY ANALYSIS OF EVENT:

The safety significance of the event is considered minimal. The failure of the emergency feed breaker to close would be mitigated by the ability of the Unit 2/3 Diesel Generator to supply redundant equipment on Bus 23-1. Also the Bus 24-1 to Bus 34-1 would be available to supply Bus 24-1. Lastly, the Unit 2 diesel generator output breaker could be closed locally.

E. CORRECTIVE ACTIONS:

The affected breaker was repaired and the undervoltage testing was successfully completed the following day.

Corrective actions to prevent re-occurrence are as follows:

- Whenever a breaker is completely removed from the breaker cubicle, two personnel must be present to re-install the breaker. One of the personnel must be a qualified High Voltage Operator. This will help to reduce the potential for damage to the breaker roller that operates the auxiliary switch linkage. Policy to completely implemented by August 13, 1993 (NTS # 237-180-93-01202).
- Dresden Station Technical Staff will evaluate the feasibility of replacing the existing linkage with the new design. To be completed by July 31, 1993 (NTS # 237-180-93-01203).
- Dresden Station Electrical Maintenance and Technical Staff will evaluate the need for a test breaker and test breaker cubicle for post-maintenance testing of any breaker work. Evaluation to be complete by August 13, 1993 (NTS # 237-180-93-01204).
- Dresden Station recently began a project to upgrade the existing 250 MVA buses which could receive fault currents in excess of their short circuit capacity, with breakers of greater capacity. This action was addressed during the Dresden EDSFI. The Nuclear Engineering Department will review this linkage problem for possible design consideration during the upgrade (NTS # 237-180-93-01205).

F. PREVIOUS OCCURRENCES:

None Found.

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G. COMPONENT FAILURE DATA:

<u>Manufacturer</u>	<u>Nomenclature</u>	<u>Model Number</u>	<u>Mfg. Part Number</u>
General Electric	4160 V. Breaker	AMH 4.76 -250-OD	