

LICENSEE EVENT REPORT (LER)

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 5
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TITLE (4) Failure of the Unit 2 Diesel Generator Output Breaker to Close During Surveillance Due to a Failed Auxiliary Contact Switch

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	5	8	7	8	7	-	0	0	9	-	0	0	0	4	1	1	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)			20.402(b)			20.406(e)			80.73(a)(2)(iv)			73.71(b)										
POWER LEVEL (10)			20.406(a)(1)(i)			80.36(a)(1)			80.73(a)(2)(v)			73.71(c)										
0 0 0			20.406(a)(1)(ii)			80.36(a)(2)			X 80.73(a)(2)(vi)			OTHER (Specify in Abstract below and in Text, NRC Form 365A)										
			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 Lawrence E. Bihlman Technical Staff Engineer								TELEPHONE NUMBER AREA CODE 8 1 5 9 4 2 1 - 2 9 2 1 0			
COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)											
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPROS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPROS		
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SUPPLEMENTAL REPORT EXPECTED (14)										EXPECTED SUBMISSION DATE (15)		
<input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE) <input checked="" type="checkbox"/> NO										MONTH	DAY	YEAR

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

On March 15, 1987 at 1400 hours with Unit 2 in the shutdown mode during the performance of Dresden Operating Surveillance (DOS) 6600-5, Bus Undervoltage and Emergency Core Cooling System Integrated Functional Test for the Unit 2 Diesel Generator, the Unit 2 diesel generator output breaker failed to close onto its bus. The failure was caused by an auxiliary contact switch, acting as an electrical interlock. The switch failed to return to normal when the reserve bus feed breaker was opened. The switch components were inspected. There was no evidence of damage or excessive wear to the mechanical parts and the electrical contacts were not burned or pitted. The switch utilizes a spring to return the contacts to normal. It appeared that the spring may have "hung-up" or failed due to mechanical relaxation. The automatic closure circuitry of this breaker was last demonstrated operable on August 16, 1985 during a loss of offsite power event (Dresden Unit 2 Licensee Event Report #85-034 on Docket No. 050237). The safety significance was judged to be minimal based on the fact that the unit was in the shutdown mode and only one diesel generator was required. Procedures were in place detailing operator responses when a diesel generator fails. The defective switch was replaced and the test was completed satisfactorily on March 17, 1987. This event was the first occurrence where the failure of an auxiliary contact prevented the diesel generator output breaker from closing.

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TEXT (If more space is required, use additional NRC Form 386A'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:

Failure of the Dresden Unit 2 Diesel Generator [EK] output breaker to close into the 4160 volt bus during the performance of Dresden Operating Surveillance (DOS) 6600-5: Bus Undervoltage and Emergency Core Cooling System [JE] (ECCS) Integrated Functional Test for the Unit 2 Diesel Generator.

A. PLANT CONDITIONS PRIOR TO EVENT:

Event Date: March 15, 1987 Event Time: 1400
Reactor Mode: N - Shutdown Power Level: 0%

B. DESCRIPTION OF EVENT:

On March 15, 1987, at 1400 hours, with the reactor in the shutdown mode during the performance of Dresden Operating Surveillance (DOS) 6600-5, Bus Undervoltage and ECCS Integrated Functional Test for Unit 2 Diesel Generator, the Unit 2 diesel generator (DG) [EK] output breaker failed to close into 4160V bus 24-1 [EA]. The purpose of the integrated functional test was to demonstrate the first level load shedding ability of emergency bus undervoltage relays; the secondary level undervoltage trips of the emergency bus; the ability of the diesel generator to automatically start and load sequence on an emergency actuation signal; and to demonstrate low pressure coolant injection [BO] (LPCI) and core spray [BM] (CS) automatic start capability. The first two objectives had been adequately demonstrated and the plant equipment was properly aligned for the simulated loss of off-site power and subsequent DG automatic start. Upon receipt of the undervoltage signal, the DG started as required. However, the generator output breaker, #2422, failed to close into the bus. Auxiliary contacts from the normal bus feed breakers, 2411 and 2430 (see one line diagram on page 5 of 5), are utilized as interlocks in the closing circuitry of the DG output breaker #2422. These auxiliary contacts were initially suspected of not making up when the breakers were tripped thus preventing the DG output breaker from closing. In an attempt to alleviate the problem, the suspect breakers, 2411 and 2430, were exercised. The test was resumed and the output breaker again failed to close. At this point, the test was terminated and work request No. 63138 was generated to investigate and repair the cause of the failure. It was determined that the auxiliary contacts on the feed breakers from bus 24 to bus 24-1, breakers 2411 and 2430, operated properly. The auxiliary contacts on breaker 2432, reserve feed breaker from bus 34-1, had failed to return to the normal position when the breaker had been opened. This resulted in an open contact in the automatic closure circuitry of the DG output breaker, #2422, preventing it from closing onto bus 24-1. The logic of the DG output breaker prevents it from automatically closing to the bus if any of the following breakers are closed: 2411, 2430 and 2432. The auxiliary contacts come off a General Electric type SBM switch which is operated off the breaker at the associated switchgear. The SBM switch was replaced in breaker cubicle 2432 and the test was successfully completed on March 17, 1987.

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C. CAUSE OF EVENT:

The proximate cause of the event was the failure of the auxiliary contact switch of breaker 2432 to return to its normal state, which interlocked the diesel generator output breaker open under automatic start/accident conditions. The root cause of the event, the reason for the switch failure, has not been determined. The switch was disassembled and inspected. The mechanical parts were intact and there was no evidence of excessive wear. The electrical contacts were not burned or pitted. The contacts return to normal through a spring return off the shaft. The root cause of contact failure is not known. However, it is believed that the spring may have "hung-up" or relaxed preventing the contacts from returning to normal.

D. SAFETY SIGNIFICANCE:

The Dresden Station nuclear reactors can be safely shutdown under postulated accident conditions utilizing one division of electrical power. There are two divisions per unit, the Unit 2 4kv busses 23, 23-1, 24 and 24-1 may be energized from a number of different sources. Each bus may be energized from the unit auxiliary transformer on the reserve auxiliary transformer, which have separate excitation sources. Busses 23 and 23-1, Division I, are energized by the Unit 2/3 diesel generator and Busses 24 and 24-1, Division II, are energized by the Unit 2 diesel generator or the crosstie to Unit 3 via safety related bus 34-1, during loss of off site power conditions. Therefore, each of the safety related busses may be energized from multiple sources.

The Unit 2 DG is functionally tested and loaded monthly which requires the operation of the output breaker. The failure encountered during the DOS 6600-5 surveillance does not affect the monthly test. The automatic closure circuitry is bypassed during the test, which utilizes a synchronizing switch in the control room to close the output breaker onto a live bus. The synchronizing relay circuitry prevents the breaker from being closed onto a de-energized bus. If an equipment failure were to prevent the completion of the output breaker's automatic closure circuitry, the breaker could be closed locally at bus 24-1 utilizing an insert plug pushbutton control at the switchgear. The automatic closure circuitry of the Unit 2 DG output breaker, #2422, had last been demonstrated operable during an August 16, 1985 loss of off site power event (Dresden Unit 2 Licensee Event Report 85-034 Docket No. 050237). The diesel generator was operable and the output breaker could have been closed manually if it had been required due to the loss of power to busses 24 and 24-1.

The consequences of a loss of power to busses 24 and 24-1 could have also been mitigated through the use of the Unit 3 crosstie to bus 34-1. The crosstie breakers are operated manually. Upon the unlikely loss of power to busses 24 and 24-1 in conjunction with the failure of the diesel generator, the reactor operator could have restored power to the busses by manually closing the crosstie breakers between busses 24-1 and 34-1 from the control room. These breakers were out of service approximately four times since the Unit 2 DG output breaker was demonstrated functional through the automatic closure circuitry. However, the 2/3 DG was operable during each out of service interval.

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The Unit 2/3 diesel generator is also functionally tested and manually loaded monthly. The automatic closure circuitry was demonstrated operable on March 11, 1987 per DOS 6600-6, Bus Undervoltage and ECCS Integrated Functional Test for the Unit 2/3 Diesel Generator". Although the Unit 2/3 DG can not be utilized to energize busses 24 and 24-1, its operability assures that one division of emergency electrical power is available. The unit 2/3 DG was out of service seven times for a total of approximately sixteen days since the Unit 2 DG output breaker's automatic closure was demonstrated operable on 8-16-85. The Unit 2/3 DG and the crosstie were not simultaneously out of service from 8-16-85 to 3-17-87.

Based on the fact that the Unit 2 diesel generator was operable with the capability to close the output breaker locally and that at least one division of electric power was available through the Unit 2/3 DG or the bus 24-1 to 34-1 crosstie to assure a safe unit shutdown under postulated accident conditions, this event was judged to be of minimal safety significance.

E. CORRECTIVE ACTIONS:

The defective switch was replaced and the DG output breaker was demonstrated to function properly on March 17, 1987. The integrated functional test will continue to be performed each refueling outage. Further corrective action is not deemed necessary at this time based on the fact that, the breaker may be closed locally, an alternate source is available to energize the bus via the Unit 3 crosstie, and that this is the first occurrence at Dresden Station of this type of failure.

F. PREVIOUS OCCURRENCE:

This is the first occurrence of an auxiliary contact switch failing to return to normal thus preventing the DG output breaker from closing.

G. COMPONENT FAILURE DATA:

Manufacturer: General Electric
 Nomenclature: Control Transfer Switch
 Model Number: Type SBM
 Part No. 10AX1ZG3

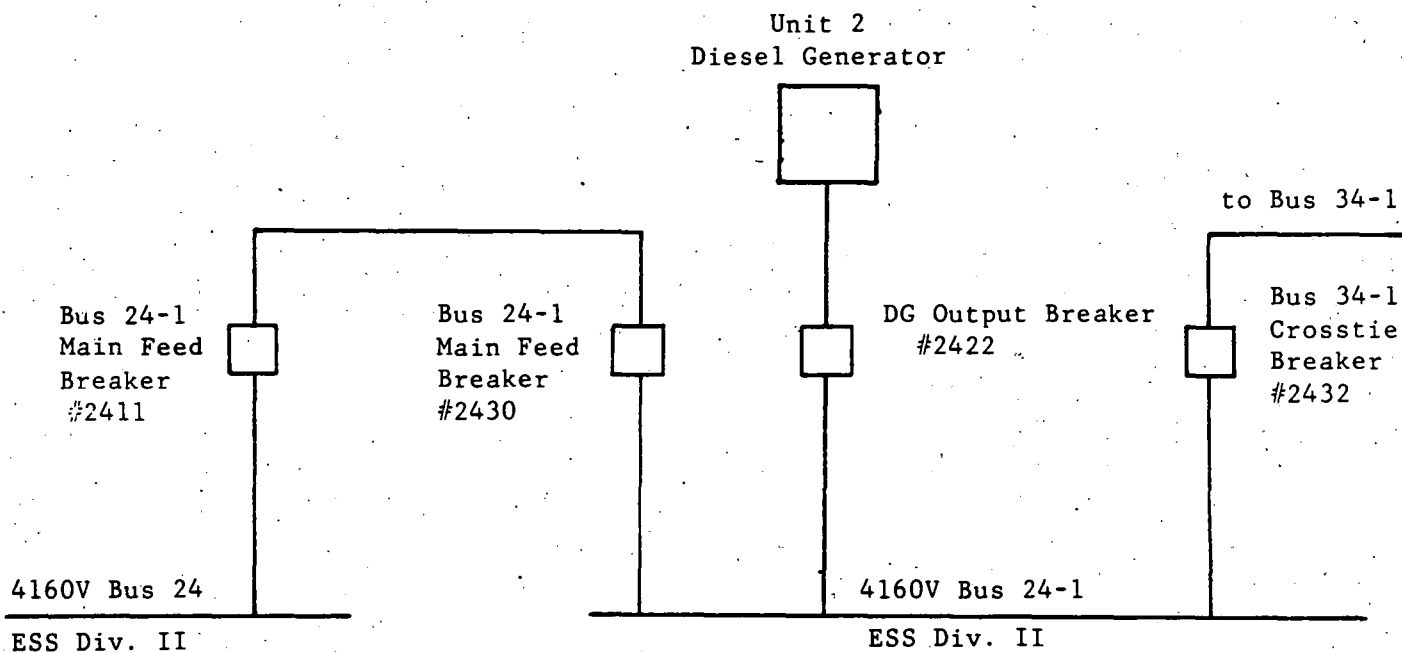
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TEXT (If more space is required, use additional NRC Form 368A's) (17)

Dresden Station Unit 2
4160V Busses 24 and 24-1

partial one line diagram





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

April 11, 1987

EDE LTR #87-237

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

Licensee Event Report #87-009-0, Docket #050237 is being submitted as required by Technical Specification 6.6, NUREG 1022 and 10 CFR 50.73 (a)(2)(vii)(A)(D).

Richard A. Eeningburg
E.D. Eeningburg
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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