NRC FORM 366 (5-92) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104
EXPIRES 5/31/95

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNBB 7714), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Dresden Nuclear Power Station, Unit 2	05000237	1 OF 5

TITLE (4)
Failure of Diesel Generator Output Breaker to Close During Testing Due to Improper Configuration of the Auxiliary Contact Linkage

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 NAME	DOCKET NUMBER
01	13	96	96	-- 001 --	00	02	09	96	None	
									FACILITY NAME	DOCKET NUMBER

OPERATING MODE (9)	N
POWER LEVEL (10)	000

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)

	20.2201(b)		20.2203(a)(3)(i)		50.73(a)(2)(iii)		73.71(b)
	20.2203(a)(1)		20.2203(a)(3)(ii)		50.73(a)(2)(iv)		73.71(c)
	20.2203(a)(2)(i)		20.2203(a)(4)		50.73(a)(2)(v)		OTHER
	20.2203(a)(2)(ii)		50.36(c)(1)	X	50.73(a)(2)(vii)		(Specify in Abstract below and in Text, NRC Form 366A)
	20.2203(a)(2)(iii)		50.36(c)(2)		50.73(a)(2)(viii)(A)		
	20.2203(a)(2)(iv)		50.73(a)(2)(i)		50.73(a)(2)(viii)(B)		
	20.2203(a)(2)(v)		50.73(a)(2)(ii)		50.73(a)(2)(x)		

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (Include Area Code)
Ron Jackson, Maintenance Staff Ext. 2483	(815) 942-2920

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	EK	52	G080	YES						

SUPPLEMENTAL REPORT EXPECTED (14)			EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
X	YES (If yes, complete EXPECTED SUBMISSION DATE).	NO		05	16	96

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

On January 13, 1996, with Unit 2 in the refuel mode, during surveillance testing, the Unit 2 Diesel Generator (DG) output breaker (152-2422) failed to close and energize emergency Bus 24-1 after simulation of a loss of offsite power (LOOP) and loss of coolant accident (LOCA). A contact in the electrical interlock from the Bus 24-1 to Bus 34-1 Tie failed to operate properly and prevented the closing circuitry of DG output breaker from being completed. The failure of the contact to close was due to the improper configuration of the auxiliary contact linkage in the Bus 24-1 to Bus 34-1 Tie breaker cubicle at Bus 24-1. Investigation has determined that the leakage was damaged during outage activities when the breaker was removed from it's cubicle. The root cause of the improper configuration of the auxiliary contact linkage has not yet been determined and will be provided in a supplement to this LER, along with any additional corrective actions. The auxiliary contact linkage was replaced with a new linkage assembly and Bus Tie 24-1 to 34-1 auxiliary contact with the DG output breaker close circuitry was successfully tested.

EVENT IDENTIFICATION:

Failure of Diesel Generator Output Breaker to Close During Testing Due to Improper Configuration of the Auxiliary Contact Linkage

A. PLANT CONDITIONS PRIOR TO EVENT:

Unit: 2 Event Date: 01/13/96 Event Time: 1210

Reactor Mode: N Mode Name: Refuel Power Level: 0

Reactor Coolant System Pressure: 0 psig

B. DESCRIPTION OF EVENT:

On January 13, 1996, with Unit 2 in Refuel, the Unit 2 Diesel Generator (DG) [EK] output breaker (152-2422) failed to close on to 4160 volt emergency Bus 24-1 during the performance of Dresden Operating Surveillance (DOS) 6600-05, "Bus Undervoltage And ECCS Integrated Functional Test". During the failed portion of the surveillance, Bus 24-1 was first de-energized with the Unit 2 DG blocked from starting on bus undervoltage. The Unit 2 DG was then automatically started by simulating a Loss of Coolant Accident (LOCA) signal. The DG output breaker is designed to close when the DG achieves nominal voltage and the ECCS pumps are designed to automatically start in sequential time intervals after the output breaker closure. The output breaker failed to close and the ECCS loads failed to start due to bus undervoltage. Bus 29, which is the power source for the Unit 2 DG vital auxiliary systems, also remained de-energized due to the breaker failure. Immediate actions were to reset the LOCA signal and place the DG control switch in STOP. The DG entered its cooldown sequence as designed and subsequently ran unloaded without cooling water until it tripped on high temperature.

Prior to the event, on January 11, 1996, a pre-surveillance check of the DG output breaker interlock logic was performed. Plant Engineering had tested contacts in the Unit 2 DG breaker logic per Dresden Technical Surveillance (DTS) 6600-03, Safety Related Contact Testing. During this testing the DG output breaker failed to operate while racked to test position. It was determined that a "B" auxiliary contact (closed when the breaker is open) from the Bus 24-1 to Bus 34-1 Tie breaker cubicle at Bus 24-1 (152-2432) failed to operate properly. The "B" contact was opening when the crosstie breaker was placed in the open position when it should have been closed.

The crosstie breaker was removed from the cubicle and the auxiliary switch operating arm on the breaker was found to be bent. From observation of scratches on the linkage, the arm appeared to have slipped past the linkage without actuating it when the breaker closed. When the breaker was tripped, it is postulated that the arm moved down on top of the linkage, forcing the linkage forward and actuating the switch. The incorrect position of the "B" contact was the result of the bent breaker arm.

A spare breaker was installed into the cubicle on January 11, 1996 and DTS 6600-03 was successfully completed on the breaker in the test position. However, all auxiliary contacts were not tested with the breaker connected to the bus prior to continuing the DG testing/surveillance.

The DG testing proceeded and failure of the auxiliary contacts to properly line up occurred on January 13, 1996. The breaker was removed from the cubicle and the cubicle auxiliary linkages were identified with loose and improperly configured components.

C. CAUSE OF EVENT:

The failure of the bus crosstie breaker to provide the permissive interlock to the DG output breaker was due to the improper configuration of the station auxiliary switch linkage in the 24-1 and 34-1 crosstie breaker cubicle. When the crosstie breaker was racked to the "test" position for the logic interlock surveillance, the operating arm on the breaker slipped past the linkage and ended up on top of the linkage instead of remaining under the actuating cam, thereby, changing the configurations of the linkage. When the spare breaker was racked in to the "connect" position and subsequently tripped for the test, the operating arm on the breaker forced the test position operating cam downward into a position below its standby position, which defeated the logic interlock needed to close the DG output breaker.

The root cause of the improper configuration of the auxiliary contact linkage has not yet been determined and will be provided in a supplement to this LER.

D. SAFETY ANALYSIS:

The failure of the Unit 2 DG output breaker resulted in the inability to supply emergency AC power to Division 2 safety buses in the event of a loss of the normal AC supply to the bus. The bus crosstie breaker which provided the permissive signal to the DG output breaker was damaged while removed from its associated switchgear cubicle and stored in a temporary location. The failure was detected during plant testing which was performed prior to Bus 24-1 or the Unit 2 DG being declared operable. Therefore, it has been concluded that this failure was not present during plant operations prior to the D2R14 outage or the associated bus 24-1 and Unit 2 DG work.

A review has been performed to determine if this failure could be present in other plant installations. This review evaluated failure data on similar breakers over the past 2 years. Conclusions are that although problems have occurred during storage, testing and installation, no failures of in-service plant equipment have occurred due to a failure of a breaker to open or close on demand.

Dresden Station's emergency on site AC power consists of a Unit DG sized to carry the units ECCS power requirements or supply the power necessary to safely shutdown the unit. Another DG is shared by Units 2 and 3. Had this event occurred when the Unit 2 DG was required to be OPERABLE, the failure of the Unit 2 DG output breaker to close would be mitigated by the ability of the Unit 2/3 DG to supply emergency power to redundant safety equipment. Additionally, the Unit 2 DG was available to be manually loaded to bus 24-1.

Therefore, the safety significance of this event is considered minimal.

E. CORRECTIVE ACTIONS:

The Bus 24-1 to Bus 34-1 Tie breaker cubicle linkage at Bus 24-1 was repaired with the manufacturer specified replacement linkage assembly. Post Maintenance Testing was successfully completed.

The Unit 2 DG was assessed for damage due to the brief run without auxiliary systems by Plant Engineering. This evaluation, which was documented in CHRON 314211, determined that the DG was not adversely impacted by lack of adequate cooling. The operability of the Unit 2 DG was re-established by the successful completion of DOS 6600-05.

A review has been performed which has determined that this event and other problems encountered with 4KV breakers over recent weeks is indicative of an adverse trend in this area. A root cause team has been formed to determine the root cause and recommend corrective actions to prevent recurrence. (NTS 2371809600101) The results of this investigation will be reviewed by Station Management prior to D2R14 startup. (NTS 2371809600102) Enhanced testing is being performed whenever breakers on busses 23(33), 23-1(33-1), 24(34) and 24-1(34-1) are installed in their respective switchgear cubicles. This testing verifies proper cubicle linkage and auxiliary contact operation. This testing will continue until permanent corrective actions have been implemented thus assuring a similar event will not occur. (NTS 2371809600103)

The root cause of the improper configuration of the auxiliary contact linkage has not yet been determined and will be provided in a supplement to this LER, along with any additional corrective actions. (NTS 2371809600100S1)

An effectiveness review will also be performed approximately 6 months following completion of the 4KV breaker performance improvement root cause review. (NTS 2371809600101.ER)

F. PREVIOUS OCCURRENCES:

LER 2-93-006, (Docket 05000237), Inadvertent Auto Start of 2/3 Diesel Generator Due to Bus 33 Main Feed Breaker Auxiliary Switch Failure. This event was due to the stationary auxiliary switch linkage disconnecting at a connection point.

LER 2-93-012, (Docket 05000237), Failure of Unit 2 Diesel Generator Output Breaker Due to Mechanical Failure. This event was due to a bent linkage on the main feed breaker to bus 24-1 from bus 24. This breaker provides a permissive signal to the DG output breaker.

LER 2-95-009, (Docket 05000237), Dresden Unit 2 Tech Spec Required Shut Down Due to Inoperable Unit DG and Subsequent Reactor Scram to Meet Tech Specs. This failure of the DG output breaker due to a combination of a failed Closed Latch Monitoring Switch coupled with binding of the breaker closing linkage, resulted in a Unit shutdown.

G. COMPONENT FAILURE DATA:

Manufacturer	Nomenclature	Model Number
General Electric	4610v Breaker	AMH 4.76-250-0D

An NPRDS data search was performed and 688 failures with 4KV breakers were reported. There were 26 failures involving auxiliary switch linkage and operator arm problems.