

NRC FORM 366 (5-92)				U.S. NUCLEAR REGULATORY COMMISSION				APPROVED BY OMB NO. 3150-0104 EXPIRES 5/31/95			
LICENSEE EVENT REPORT (LER)								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.			
FACILITY NAME (1) Dresden Nuclear Power Station, Unit 3						DOCKET NUMBER (2) 05000249		PAGE (3) 1 OF 6			
TITLE (4) Dresden Unit 3 Inability to Meet Technical Specification 3.9 Limiting Condition for Operation Due to Redundant Emergency Diesel Generators Inoperable											
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	
10	15	96	96	-- 016 --	0	11	13	96	None		
OPERATING MODE (9)		N	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)								
POWER LEVEL (10)		100	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)			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)		X	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 I. Rivera, System Engineer						TELEPHONE NUMBER (Include Area Code) Ext. 2549 (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	27	G080	YES							
X	EK	XFMR	G080	YES							
SUPPLEMENTAL REPORT EXPECTED (14)						EXPECTED SUBMISSION DATE (15)		MONTH	DAY	YEAR	
X	YES (If yes, complete EXPECTED SUBMISSION DATE).				NO			03	30	97	

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

During power operations, in preparation for running the Unit 3 Emergency Diesel Generator (EDG), approximately 13 gallons of coolant was found inside the airbox of the EDG. The Unit 3 EDG was declared inoperable. Because the redundant 2/3 EDG was inoperable due to an electrical problem the unit was unable to meet Technical Specification 3.9 Limiting Condition for Operation and provisions of TS 3.0.A were required to be implemented.

The apparent cause of the coolant leak is a failure of the liner on EDG cylinder #7. Cylinder #7 cylinder/piston assembly was replaced. The cooling water system was successfully pressure tested and the EDG was operationally returned to service.

The safety significance of the event was minimal because the Unit 3 EDG would have started and loaded the busses as designed, and personnel could have maintained cooling water make-up and airbox blowdown.

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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] and are obtained from IEEE Standard 805-1984, IEEE Recommendation Practice for System Identification in Nuclear Power Plants and Related Facilities.

Emergency Diesel Generator/Onsite Power Supply System [EK]

EVENT IDENTIFICATION:

Dresden Unit 3 Inability to Meet Technical Specification 3.9 Limiting Condition for Operation Due to Redundant Emergency Diesel Generators Inoperable.

A. PLANT CONDITIONS PRIOR TO EVENT:

Unit: 2(3) Event Date: 10/15/96 Event Time: 1636
Reactor Mode: N(N) Mode Name: Run/Run Power Level: 100(80)%
Reactor Coolant System Pressure: 991(1003) psig

B. DESCRIPTION OF EVENT:

This report is submitted in accordance with 10CFR50.73(a)(2)(i)(B), which requires the reporting of any operation or condition prohibited by the plant's Technical Specifications. Specifically, the Unit entered Technical Specification 3.0.A. because of an inability to meet Technical Specification 3.9 Limiting condition for operation due to redundant emergency diesel generators being inoperable. On October 15, 1996, at 1636, the Unit 3 Emergency Diesel Generator (EDG) [EK], was declared inoperable when it was discovered that 13 gallons of coolant had leaked and drained into the airbox. This occurred while the redundant Unit 2/3 Emergency Diesel Generator was inoperable due to an unrelated failure in MCC 28-1, Cubicle G3.

On September 27, 1996 in accordance with DOS 6600-01, "Diesel Generator Surveillance Tests", a periodic monthly operability demonstration of the Unit 3 EDG was successfully performed. This test checks the performance of the engine for a one hour period and includes a visual check of the engine air box drains for leaking engine fluids. During this operability run there was no fluid observed from the air box drains.

Between September 27, 1996 and October 15, 1996 Operations personnel added ten to fifteen gallons of makeup water to the Unit 3 EDG engine cooling system. This was a small percentage of makeup tank volume, and given several heatup and cool-down cycles, was not thought to be significant.

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On October 15, 1996, at 1315, a fire was reported at Motor Control Center (MCC) 28-1 cubicle G3. This cubicle is the Unit 2 feed to the 2/3 EDG Vent Fan. The 2/3 EDG vent Fan can also be supplied by Unit 3 by MCC 38-1. Procedure Dresden Operating Abnormal (DOA) 0010-010 "Fire/Explosion" was entered by the Operations team to coordinate actions to contain the fire. Both the Unit 2 MCC breaker at MCC 28-1 and the Unit 3 breaker at MCC 38-1 were turned off. At 1319 the Unit 2/3 EDG was declared inoperable. At 1325 the fire was declared out and DOA 0010-010 was exited.

Because the Unit 2/3 Emergency Diesel Generator (EDG) was inoperable, the Unit 2 and Unit 3 Emergency Diesel Generators were required to be demonstrated operable using Dresden Operating Surveillance (DOS) 6600-01, "Diesel Generator Surveillance Tests". The Operations team decided to first test the Unit 3 EDG then the Unit 2 EDG.

At approximately 1630 during preparation for the Unit 3 Emergency Diesel Generator operability test an engine coolant leak was discovered by observing fluid from the Unit 3 EDG engine air box drain. The Unit 3 EDG was declared inoperable at 1636. As there were no actions that applied in TS 3/4.9 for a condition of two EDGs inoperable the Unit entered TS 3.0.A. This initiated a Unit 3 twelve hour LCO to Hot Shutdown and Cold Shutdown within the following twenty-four hours.

At 1957 an Operability Evaluation was completed for the Unit 2/3 EDG. The 2/3 Emergency Diesel Generator was evaluated to be capable of performing it's function under all design basis scenarios for Unit 3 and was therefore declared operable to Unit 3 only. Specific actions were taken to ensure that the 2/3 EDG remained aligned to Unit 3.

This operability did not change required Unit 2 TS actions. The Unit 2 7-day LCO remained in effect because of the 2/3 EDG remained inoperable to Unit 2 since the vent fan would not function in the event the diesel was loaded to Unit 2 and MCC 38-1 on Unit 3 was not powered as would occur in a Loss of offsite power on unit 3.

Unit 3 exited the twelve hour shutdown LCO. The Unit 3 7-day LCO which started at 1636 due to the engine cooling leak remained in effect. Repairs to the engine continued and focused on an internal engine cooling component failure. Troubleshooting activities are discussed in a following section.

At 2117 the Unit 2 EDG operability demonstration run was completed in accordance with DOS 6600-01. This completed immediate TS required actions for Unit 2.

October 18, 1996, at 0618, after repairs were performed to the Unit 3 EDG, an operability demonstration run was completed in accordance with DOS 6600-01 and the EDG was declared operable.

MCC 28-1 Cubicle Failure

Work request 960096652-01 was initiated to troubleshoot and repair the MCC cubicle components. Inspection of MCC 28-1 concluded that damage was isolated to the control transformer and associated circuitry in cubicle G3. Damaged components were replaced and successfully bench tested.

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MCC 28-1 cubicle G3 was placed back in service. During testing, it was identified that the control circuit would not allow automatic power selection to the bus carried by the 2/3 Emergency Diesel Generator. Troubleshooting identified an open-circuited coil in a General Electric HGA relay located in an auxiliary panel in the 2/3 EDG room. This relay was replaced and tested under work request 960096652-02.

Unit 3 Engine Cooling Water Leak

Prior to the operability demonstration run of October 15, 1996 approximately 13 gallons of engine coolant was discovered in the airbox by Operations personnel. Initial indication of the internal leak was observation of fluid flow from the engine air box drain. The coolant system was pressurized and inspection revealed engine coolant flowing from around cylinder #7. Cylinder #7 indications were that the outer wall of the cylinder/piston assembly (power pack) liner may be cracked. All cylinders were inspected and found to be dry internally at the top of the piston. The entire #7 power pack was replaced in accordance with Dresden Station Procedures with on-site support from the vendor.

Upon replacement of the power pack, the coolant system was again pressurized and additional leakage from the cylinder #10 cooling water supply jumper flange was identified. It should be noted that the initial inspection did not identify any leakage from this flange. The flange was torqued in accordance with the vendor recommendations. The air box was inspected, no coolant leakage was observed from cylinder #7, and the operability run was performed.

Offsite vendor pressure testing of the failed power pack #7 will be performed to verify its condition.

C. CAUSE OF EVENT:

- C.1 A Failure Analysis of the components of the 2/3 EDG Vent fan control circuitry was performed. Both the Control transformer in MCC 28-1, and the HGA control relay suffered internal damage as a result of an electrical fault. The remaining components were externally damaged as a result of exposure to excessive heat.

The failure analysis identified the cause of the failure was an internal short in the control power transformer (NRC Cause Code X) which caused the failure of the HGA control relay. A search of the NPRDS data base was conducted which failed to reveal any significant correlation in failure modes, or any adverse trends of failures of these components.

- C.2 The internal Unit 3 EDG coolant leak resulted from cracks in cylinder #7's power pack liner outer wall (NRC Cause Code X). This will be verified by offsite vendor pressure testing of the power pack. The cause of the cracking is not yet known.

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D. SAFETY ANALYSIS:

Coolant leakage on the Unit 3 EDG would not have precluded performance of its safety function. The observed leakage from #7 cylinder did not communicate with the engine's oil system and would not have prevented air induction because of airbox configuration and drain arrangement. Operations personnel routinely check makeup tank level, and can blow down the airbox while operating.

The failure of the control power transformer and relay prohibited the proper operation and automatic transfer of the EDG room ventilation system from Unit 3 busses to Unit 2. It did not impact the ability to start and operate the EDG to provide power to Unit 3.

No loss of power event has occurred at Unit 3 since the last successful surveillance that required the start and operation of the Unit 3 or Unit 2/3 EDG.

The safety significance of this event is considered minimal because the Unit 3 EDG would have started and loaded the busses as designed, and Operations personnel could have maintained cooling water make-up and airbox blowdown, as required. As well, the Unit 2 DG was operable while the 2/3 EDG was unavailable to Unit 2.

E. CORRECTIVE ACTIONS:

- E.1 The Unit 3 EDG cylinder #7 power pack was replaced. The coolant system has been pressure tested satisfactorily. The EDG surveillance has been performed and the Unit 3 EDG restored to operability.
- E.2 MCC 28-1 cubicle components and the HGA relay were replaced, rewired, and successfully tested. The Unit 2/3 EDG and it's accompanying ventilation system have been declared operable.
- E.3 The HGA relays associated with Unit 2/3 EDG auxiliaries have been identified and will be replaced under work order 960101520. The removed relays will be analyzed for indications of potential failure and Dresden responses to previous relay related correspondence will be reviewed. Changes will be made to the preventive maintenance program, if necessary. (2491809601601)
- E.4 Cylinder #7's power pack will be pressure tested to verify the outer wall of the power pack liner is cracked. Results of the testing will be documented in the Nuclear Tracking System. (2491809601602)
- E.5 A root cause evaluation will be performed for the failure of the cylinder liner wall. The results of the root cause evaluation, as well as any recommendations to prevent recurrence, will be reported in a supplemental report to this LER. (2491809601603)
- E.6 The expectations regarding communication of abnormal indications between Operations and System Engineering will be identified and communicated to appropriate departmental personnel. (2491809601604)

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F. PREVIOUS OCCURRENCES:

LER/Docket Number Title

94-04/050000249 Dresden Unit 3 Inability to Meet Technical Specification 3.9 Limiting Condition for Operation Due to Redundant Emergency Diesel Generators Inoperable

During performance of rounds, the operator discovered the Unit 2/3 Emergency Diesel Generator (EDG) Air Start System leaking by, creating an overpressure condition and challenging the integrity of the air start motors and other downstream system components. The redundant Unit 3 EDG had been declared inoperable earlier pending an investigation into the cause of a High Crankcase Pressure trip received during the performance of the monthly operability surveillance. With both EDGs inoperable, Unit 3 entered into a 24 hour Limiting Condition for Operation (LCO) and Unit 2 entered into a 7 day LCO.

94-014/050000237 Tech Spec LCO Not Met Due to Inoperable Redundant EDGs

The Unit 2/3 Emergency Diesel Generator (EDG) [EK] had been made administratively inoperable due to the service water temperatures rising above 82 degrees. During the performance of a Tech Spec required operability demonstration of the Unit 2 EDG, the Unit 2 EDG tripped on overspeed. The Unit 2 EDG was declared inoperable and the unit entered a 24 hour LCO. Once the service water temperature dropped below 83 degrees, the 2/3 EDG was demonstrated operable. Unit 2 was removed from the 24 hour LCO and continued on a 7 day LCO.

G. COMPONENT FAILURE DATA:

Manufacturer	Nomenclature	Model Number
GE	Relay	12HGA11J70
GE	Control Transformer	9T58B2805G5