

PHILADELPHIA ELECTRIC COMPANY

LIMERICK GENERATING STATION

PA 19464

PHILADELPHIA, PENNSYLVANIA 19464

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J. DOERING, JR.
PLANT MANAGER
LIMERICK GENERATING STATION

June 20, 1991

Docket No. 50-353
License No. NPF-85

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

SUBJECT: Licensee Event Report
Limerick Generating Station - Unit 2

This Special Report and voluntary LER concerns a loose wire in the potential transformer sensing network of an Emergency Diesel Generator (EDG) which resulted in a test failure. As a result of this problem, the EDG output voltage increased above the acceptance criterion value. During the event investigation it could not be determined the cause or time the wire may have become loose. With the potential transformer sensing network in this condition, the operability of the EDG following a design basis event such as a safe shutdown earthquake could not be assured. If the EDG was inoperable since August 25, 1989, Technical Specifications (TS) Section 3.8.1.1b was violated because the associated TS Actions were not implemented within the required time period.

Reference: Docket No. 50-353
Report Number: 2-91-009
Revision Number: 00
Discovery Date: May 21, 1991
Report Date: June 20, 1991
Facility: Limerick Generating Station
P.O. Box A, Sanatoga, PA 19464

This LER is being submitted pursuant to TS Section 6.9.2, as required by TS Surveillance Requirement 4.8.1.1.3, and using the guidance of 10CFR50.73 and NUREG-1022.

Very truly yours,



JLP:cah

cc: T. T. Martin, Administrator, Region I, USNRC
T. J. Kenny, USNRC Senior Resident Inspector, LGS

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LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Limerick Generating Station, Unit 2										DOCKET NUMBER (2) 0 5 0 0 0 3 5 3				PAGE (3) 1 OF 0 4		
TITLE (4) Voluntary LER and Special Report for a loose wire in the potential transformer sensing network of an Emergency Diesel Generator.																
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	2	1	9	1	0	0	9					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)		5		20.402(b)		20.405(c)		50.73(a)(2)(iv)		73.71(v)						
POWER LEVEL (10)		0 0 0		20.405(a)(1)(i)		50.36(a)(1)		50.73(a)(2)(iv)		73.71(v)						
				20.405(a)(1)(ii)		50.36(a)(2)		50.73(a)(2)(iv)		X OTHER (Specify in Abstract below and in Part 3 of NRC Form 366A)						
				20.405(a)(1)(iii)		50.73(a)(2)(i)		50.73(a)(2)(viii)(A)		Voluntary Report						
				20.405(a)(1)(iv)		50.73(a)(2)(ii)		50.73(a)(2)(viii)(B)		Special Report						
				20.405(a)(1)(v)		50.73(a)(2)(iii)		50.73(a)(2)(ix)								
LICENSEE CONTACT FOR THIS LER (12)																
NAME G. J. Madsen, Regulatory Engineer, Limerick Generating Station										TELEPHONE NUMBER						
										AREA CODE 2 1 5 3 2 7 - 1 2 0 0						
COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)																
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC						
SUPPLEMENTAL REPORT EXPECTED (14)												EXPECTED SUBMISSION DATE (15)		MONTH	DAY	YEAR
YES (if yes, complete EXPECTED SUBMISSION DATE)												X NO				

ABSTRACT (Limit to 1,000 spaces, i.e., approximately fifteen single-space typewritten lines) (16)

On 5/21/91, with Unit 2 in a refueling condition, plant personnel were performing Surveillance Test (ST) procedure ST-1-092-114-2, "D24 Diesel Generator 4KV SFGD Loss of Power LSF/SAA and Outage Testing." While performing this procedure, the D24 Emergency Diesel Generator (EDG) output voltage increased above the acceptance criterion value. The cause of this event was a loose wire in the potential transformer sensing network which resulted in a loss of generator output voltage feedback to the automatic voltage regulator. The cause or time that the wire became loose cannot be determined. In this condition the operability of the D24 EDG was not assured if a design basis event had occurred, such as a safe shutdown earthquake. This situation represents a potential condition prohibited by Technical Specifications (TS) since the D24 EDG may have been inoperable since 7/05/89, and the associated TS Actions were not taken within the required time period. This voluntary LER is being submitted to report a condition that may have been prohibited by TS in addition to the requirements of TS Section 6.9.2 as required by TS Surveillance Requirement 4.8.1.1.3 due to an EDG test failure. On 5/22/91, the loose wire was corrected. The remaining connections on the D24 EDG as well as all other Unit 2 EDGs were inspected and no abnormalities in the wiring of the potential transformer sensing network were found. Because this is the first failure for the D24 EDG, the ST procedure frequency remained unchanged at 31 days.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104

EXPIRES 8/31/95

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		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
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TEXT (If more space is required, use additional NRC Form 365A (1) (7))

Unit Conditions Prior to the Event:

Unit 2 was in various operational conditions and power levels from July 5, 1989, to March 22, 1991. Unit 2 then entered a refueling outage on March 22, 1991, which continued through June 5, 1991.

Unit 2 Emergency Diesel Generators (EDG) (E11S:EK) were periodically removed from service one at a time between July 5, 1989, to March 22, 1991, to perform necessary maintenance and surveillance testing. An offsite transmission circuit was inoperable for approximately 83 hours in October, 1990, and 54 hours in April, 1991, for modification activities.

Description of the Event:

On May 21, 1991, with Unit 2 in the refueling condition, plant personnel were performing Surveillance Test (ST) procedure ST-1-092-114-2, "D24 Diesel Generator 4KV SFGD Loss of Power LSF/SAA and Outage Testing." The D24 EDG had been declared inoperable to perform this procedure. While starting the 2D Residual Heat Removal (RHR) system (E11S:BO) pump motor (E11S:MO), the D24 EDG output voltage increased above the acceptance criterion value to approximately 5200 volts. The Main Control Room operator rapidly responded to this test failure by opening the D24 EDG output breaker and placing the D24 EDG handswitch to stop and pull-to-lock to shut down the diesel engine.

Upon further investigation we determined that the cause of this event was a loose wire in the D24 EDG potential transformer sensing network. The cause or time that the wire became loose cannot be conclusively determined. With the wire in the potential transformer sensing network in this condition, the operability of the EDG following a design basis event such as a safe shutdown earthquake could not be assured. The D24 EDG could not provide AC power within the acceptable voltage range with a loose wire that resulted in loss of feedback to the automatic voltage regulator. As such, the safeguard loads could be adversely affected during operation with the high voltage condition. This represents a potential condition prohibited by Technical Specifications (TS) in that the D24 EDG may have been inoperable since the last time procedure ST-1-092-114-2 was successfully completed on July 5, 1989, during startup testing, and the associated TS Actions were not implemented within the required time period. If the D24 EDG was inoperable since July 5, 1989, TS Limiting Conditions for Operation 3.8.1.1 (A.C. Sources-Operating) and 3.8.1.2 (A.C. Sources-Shutdown) were violated because the associated TS Actions were not taken within the required time period when EDGs and an offsite transmission circuit were inoperable for modification activities, maintenance, and surveillance testing.

This Special Report is being submitted pursuant to TS Section 6.9.2, as required by TS Surveillance Requirement 4.8.1.1.3 since this event resulted in an EDG test failure. This report is also being submitted as a voluntary LER using the

LICENSEE EVENT REPORT (ER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED DMB NO. 2150-0104

EXPIRES 8/31/85

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (8)	PAGE (3)						
Limerick Generating Station, Unit 2		<table border="1"><tr><td data-bbox="991 244 1073 287">YEAR</td><td data-bbox="1073 244 1239 287">SEQUENTIAL NUMBER</td><td data-bbox="1239 244 1338 287">REVISION NUMBER</td></tr><tr><td data-bbox="991 287 1073 329">91</td><td data-bbox="1073 287 1239 329">009</td><td data-bbox="1239 287 1338 329">00</td></tr></table>	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	91	009	00	
YEAR	SEQUENTIAL NUMBER	REVISION NUMBER							
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TEXT (If more space is required, use additional NRC Form 365A (1) (1))

guidance of 10CFR50.73 and NUREG-1022, "Licensee Event Report System," because a condition prohibited by TS could have resulted.

Analysis of the Event:

The actual consequences of this event were minimal in that there was no event requiring the D24 EDG to perform its design function. The effects of the high voltage condition on equipment powered by the D24 EDG were minimal. Plant personnel inspected all loads of the D24 bus and found no abnormalities.

Because the wire in the potential transformer sensing network was not analyzed for its as-found condition, the operability of the D24 EDG following a design basis event is uncertain. Had an accident coincident with a loss of offsite power occurred in which the onsite Emergency AC Power system was called upon to perform its design function, an analysis referenced in the Limerick Generating Station Updated Final Safety Analysis Report states that adequate core cooling would have been maintained with as few Emergency Core Cooling Systems as a single Low Pressure Coolant Injection subsystem with all its support systems.

Cause of the Event:

The cause of this event was a loose wire in the potential transformer sensing network. We cannot determine the reason that the wire became loose. A review of the D24 EDG maintenance history determined that the wire was not associated with any maintenance. The loose wire was at a location that has not been associated with troubleshooting or surveillance testing.

The D24 EDG successfully passed all monthly operability tests between July 5, 1989, and May 21, 1991. During performance of the monthly operability test, the D24 EDG is synchronized to the utility grid. Procedure ST-1-092-114-2 which was performed during Unit 2 startup on July 5, 1989, and on May 21, 1991, does not synchronize the D24 EDG to the utility grid during the LOCA/Loss of Power portion of the test. It is postulated that on May 21, 1991, the voltage drop from starting the 2D RHR pump motor together with less than adequate contact of this wire to its terminal in the potential transformer sensing network caused an increased resistance at the wire terminal resulting in loss of generator output voltage feedback to the automatic voltage regulator. The loss of feedback caused the voltage regulator to maximize generator output voltage.

Corrective Actions:

On May 22, 1991, the D24 EDG wire in the potential transformer sensing network was properly terminated. Inspection of the remaining connections on the D24 EDG as well as the wiring in the potential transformer sensing network of the other three Unit 2 EDGs was performed and no additional abnormalities were found. On May 30, 1991, procedure ST-1-092-114-2 was successfully performed. The D24 EDG was declared operable on June 4, 1991. This is considered an isolated case and no further corrective action is planned. Because this is the first failure

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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EXPIRES 8/31/85

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (3)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
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TEXT (if more space is required, use additional NRC Form 306A at (17))

for the D24 EDG, the ST procedure frequency remained unchanged at 31 days which conforms with TS Table 4.8.1.1.2-1 and Regulatory Position C.2.d of Regulatory Guide 1.108, Revision 1, August 1977, "Periodic Testing of Diesel Generator Units used as Onsite Electric Power System at Nuclear Power Plants."

Previous Similar Occurrences:

LER 2-91-008 reported the loss of generator output voltage feedback to the automatic voltage regulator on the D21 EDG. The cause of the event was an improperly seated potential transformer primary fuse. There has been no previous unavailability of an EDG due to a loose wire in the potential transformer sensing network.

Tracking Codes: X1 - Failure with unknown cause