

PHILADELPHIA ELECTRIC COMPANY

LIMERICK GENERATING STATION

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J. DOERING, JR.
PLANT MANAGER
LIMERICK GENERATING STATION

June 7, 1991

Docket No. 50-352
License No. NPF-39

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

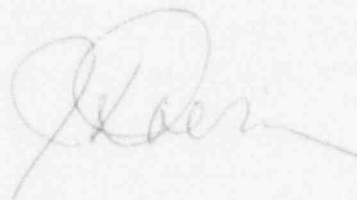
SUBJECT: Licensee Event Report
Limerick Generating Station - Unit 1

This LER reports the opening of a Reactor Enclosure Secondary Containment blowout panel that alone could have prevented the fulfillment of the safety function of structures or systems that are needed to control the release of radioactive material.

Reference:	Docket No. 50-352
Report Number:	1-91-012
Revision Number:	00
Event Date:	May 8, 1991
Report Date:	June 7, 1991
Facility:	Limerick Generating Station P.O. Box A, Sanatoga, PA 19464

This LER is being submitted pursuant to the requirements of 10 CFR 50.73(a)(2)(v)(C).

Very truly yours,



DMS: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 1										DOCKET NUMBER (2) 0 5 0 0 0 3 5 2 1										PAGE (3) 1 OF 0 5					
TITLE (4) Loss of Reactor Enclosure Secondary Containment Integrity due to a Reactor Enclosure Overpressurization Transient causing a Blowout panel to open.																									
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	0	8	9	1	9	1	0	1	2	0	0	0	6	0	7	9	1	0	5	0	0	0		
OPERATING MODE (9) 1			THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR § (Check one or more of the following) (11)																						
POWER LEVEL (10) 100			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 NRC Form 365A)										
			20.405(a)(1)(iii)				50.73(a)(2)(iii)				50.73(a)(2)(viii)(A)														
			20.405(a)(1)(iv)				50.73(a)(2)(iv)				50.73(a)(2)(viii)(B)														
			20.405(a)(1)(v)				50.73(a)(2)(v)				50.73(a)(2)(ix)														
LICENSEE CONTACT FOR THIS LER (12)																									
NAME G. J. Madsen, Regulatory Engineer, Limerick Generating Station										TELEPHONE NUMBER 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 1400 spaces, i.e. approximately fifteen single-space typewritten lines) (16)

On May 8, 1991, at 1220 hours, the normal Reactor Enclosure (RE) Heating, Ventilation, and Air Conditioning (HVAC) system was secured for performance of the Standby Gas Treatment System (SGTS) and Reactor Enclosure Recirculation System (RERS) flow verification Surveillance Test (ST), and the RE high differential pressure (dp) annunciator alarmed. The status lights for the RE HVAC supply air fans were checked and indicated that no supply air fans were operating. Performance of the ST continued, but the SGTS experienced difficulty in maintaining the required RE negative dp. At 1249 hours, a RE blowout panel was discovered open causing a loss of RE Secondary Containment Integrity (SCI). The opening of the blowout panel was caused by the 'C' RE HVAC supply air fan over-pressurizing the RE, after the RE HVAC system was secured. The necessary actions and repairs were implemented, and the RE SCI was restored at 1326 hours on May 8, 1991. The radioactive release as a result of this event was limited to less than 0.01 percent of the Offsite Dose Calculation Manual Limits. The cause of the malfunctioning 'C' RE HVAC supply air fan was due to a burned out power supply breaker trip coil. An investigation of the trip coil failure identified no apparent cause. The Preventive Maintenance (PM) procedures for the 480 volt power supply breakers will be revised to inspect for evidence of trip coil degradation. A routine PM task will be initiated to inspect frequently operated 480 volt breakers every six months.

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TEXT (If more space is required, use additional NRC Form 366A's) (17)

Unit Conditions Prior to the Event:

Unit 1 Operational Condition was 1 (Power Operation) at 100% power level.

There were no structures, systems or components out of service or being tested which contributed to this event.

Description of the Event:

On May 8, 1991, at 1220 hours, operations personnel secured the Reactor Enclosure (RE) Heating, Ventilation, and Air Conditioning (HVAC) system for performance of the monthly Standby Gas Treatment System (SGTS) (E1IS:BH) and Reactor Enclosure Recirculation System (RERS) (E1IS:AD) flow verification Surveillance Test (ST) procedure ST-6-076-250-1. During normal RE HVAC operation, the RE to outside air differential pressure (dp) is maintained at the Technical Specifications (TS) required negative pressure of greater than or equal to 0.25 inches of water gauge. After operations personnel secured the RE HVAC system at the local RE HVAC control panel, the local RE high dp annunciator alarmed, and the local dp meter indicated positive RE pressure. Operations personnel then checked the local control panel status lights for the RE supply air fans which indicated that the supply air fans were not operating. Therefore, the operators concluded that all supply air fans were shutdown, and the RE high dp condition was attributed to another problem. Operations personnel then contacted the RE HVAC system engineer to investigate the problem.

At approximately 1231 hours, operations personnel continued with the ST procedure and placed the SGTS and the RERS in operation; however, the SGTS experienced difficulty in maintaining the required RE negative dp of 0.25 inches of water gauge. Also, instrumentation indicated that RE air inleakage was above the TS limit of 1250 cubic feet per minute (CFM). At approximately 1233 hours, Main Control Room (MCR) operations personnel initiated Off Normal (ON) procedure ON-111, "Loss of Secondary Containment," to locate a possible Secondary Containment Integrity (SCI) problem.

At 1249 hours, twenty-nine minutes after the RE high dp annunciator was received, a plant operator confirmed that a RE blowout panel had actuated and was open resulting in a loss of RE SCI. Operations personnel immediately entered the four hour Action for TS Section 3.6.5.1.1, "Reactor Enclosure Secondary Containment Integrity," to restore the RE SCI. The four hour Action was started at 1220 hours, when the RE high dp annunciator was received. Maintenance personnel were notified to begin reinstallation of the open blowout panel, and Health Physics (HP) personnel were contacted to survey and monitor the blowout panel area for evidence of radioactive material contamination.

At 1312 hours, the RE HVAC system engineer identified that the 'C' RE HVAC supply air fan was still operating and could not be shutdown without manually tripping its power supply breaker. At 1323 hours, operations personnel manually tripped the power supply breaker for the 'C' RE HVAC supply air fan, and the fan then shutdown. Maintenance personnel closed the blowout panel, and at 1326

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hours, operations personnel verified that RE SCI had been restored and was being maintained at the required TS limits for dp and allowable air inleakage; thereby satisfying the Action for TS Section 3.6.5.1.1.

A four hour notification was made to the NRC at 1645 hours on May 8, 1991, in accordance with the requirements of 10CFR50.72(b)(2)(iii)(C) since this event resulted in a condition that alone could have prevented the fulfillment and the safety function of structures or systems that are needed to control the release of radioactive material. This LER is being submitted in accordance with the requirements of 10CFR50.73(a)(2)(v)(C).

Analysis of the Event:

HP personnel were notified after the discovery of the open blowout panel. HP surveys and monitoring results indicated that very minimal amounts of radioactive material existed in the area of the open blowout panel, and a very minimal amount of radioactive material was released to the environment during the time period in which the blowout panel was open. This radioactive release was limited to less than 0.01 percent of the Offsite Dose Calculation Manual (ODCM) limits. Therefore, the actual consequences of this event were minimal.

If an accident condition had occurred with the blowout panel open, the RE negative differential pressure would not have been maintained by the SGTS and the RERS. Therefore, if the accident resulted in a radioactive release within the RE, an unmonitored release of radioactive material to the environment could have occurred with the blowout panel open. In response to this type of accident, the operators would have initiated Transient Response Implementing Plan (TRIP) procedures T-103, "Secondary Containment Control," and T-104, "Radioactivity Release Control," for directions to mitigate a radioactive material release. Licensed operators receive requalification training to review and practice responses to simulated plant transients of this type. The procedures, training, and operator actions would have mitigated the consequences of this type of accident.

Cause of the Event:

The cause of the RE overpressurization and opening of the blowout panel was due to the failure of the 'C' RE HVAC supply air fan to properly shutdown after operations personnel secured the RE HVAC system. The supply air fan failed to shutdown as a result of a burned out power supply breaker trip coil. The cause of the trip coil failure has been investigated by Philadelphia Electric Company (PECo) and the manufacturer; however, no apparent cause can be determined. A review of sixty-two Nuclear Plant Reliability Data System (NPRDS) events reporting failures of identical power supply breakers supplied by the same manufacturer, revealed that three events were caused by failed trip coils as a result of unknown causes.

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TEXT (If more space is required, use additional NRC Form 366A-1) (17)

Corrective Actions:

1. The 'C' RE HVAC supply air fan power supply breaker trip coil was replaced and satisfactorily tested on May 10, 1991.
2. The power supply breaker trip coil for the 'B' RE HVAC supply air fan will be inspected and tested. This inspection/testing is expected to be completed by June 18, 1991, and appropriate actions will be implemented as necessary.

On January 8, 1991, a similar event occurred where a Unit 1 RE blowout panel opened as a result of over-pressurization of the RE after the RE HVAC system inadvertently tripped during the performance of the monthly SGTS and RERS flow verification ST procedure. The 'A' RE HVAC supply air fan continued to operate after the RE HVAC system inadvertently tripped, and had to be manually shutdown at its local power supply breaker due to a malfunctioning trip coil. This event was reported in LER 1-91-001 dated February 6, 1991.

One of the six corrective actions previously reported in LER 1-91-001 discussed an evaluation that was to be performed for the trip coil failure for the 'A' RE HVAC supply air fan. This evaluation was to determine if a method could be developed to identify a potential trip coil deficiency prior to its failure. This evaluation, was completed on May 30, 1991, and revealed that the trip coil burned as a result of a broken trip rod lock nut. The cause of the broken lock nut was determined to be an end of life fatigue failure, a conclusion reached by PECO and the manufacturer. The lock nut is utilized to raise the trip rod and trip the breaker. When the breaker trips the coil is de-energized. Since this evaluation was not scheduled to be completed until May 31, 1991, and was in progress at the time of this event, it would not have prevented this event from occurring. The remaining five corrective actions were specific to LER 1-91-001, and do not apply to this event.

As a result of the above evaluation and conclusion for LER 1-91-001, the following corrective actions will be implemented in conjunction with the two corrective actions stated above in order to prevent recurrence of a similar event.

- A. The Preventive Maintenance (PM) procedures that inspect/overhaul 480 volt load center power supply breakers will be revised by August 30, 1991, to specifically examine for:
 - o broken, damaged or cracked trip rod lock nuts,
 - o freedom of movement of the trip coil plunger and trip rod,
 - o proper adjustment of the trip rod, and
 - o discoloration due to overheating of the trip coil plunger and frame.

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These PM procedures are presently performed on a frequency of every five years. A separate routine PM task will be initiated to perform the examinations listed above on frequently operated load center power supply breakers by July 31, 1991. This PM task will then be continued to be performed on a six month frequency after the initial performance, or until observed trends indicate the frequency can/should be changed.

- B. Since no apparent cause of the trip coil failure being reported in this event could be determined, the manufacturer will perform a failure analysis of the power supply breaker. The results of this analysis will be evaluated by PECO and the appropriate actions will be implemented as necessary. This item is expected to be completed by July 31, 1991.
- C. The RE HVAC system procedure S76.2.B, "Reactor Enclosure HVAC Shutdown," has been revised and implemented to ensure that a Reactor Enclosure Equipment Compartment Exhaust (REECE) fan is kept in operation until all RE HVAC supply air fans have been verified to be shutdown when the RE HVAC system is secured. This procedure revision will prevent over-pressurization of the RE in the event that a RE HVAC supply air fan fails to properly shutdown.

Previous Similar Occurrences:

LER 1-91-001 reported an event where the Unit 1 RE overpressurized causing a blowout panel to actuate and open. The overpressurization resulted from a RE HVAC supply air fan that failed to shutdown when its power supply breaker trip coil malfunctioned. The corrective actions for LER 1-91-001 were in the process of being implemented when this event occurred and could not have prevented this event from occurring.

Tracking Codes: X1 Failure with unknown cause