



PECO ENERGY

Robert W. Boyce
Plant Manager
Limerick Generating Station

PECO Energy Company
Limerick Generating Station
PO Box 2300
Sanatoga, PA 19454-0920
215 327 1200 Ext. 2000

10CFR 50.73

January 22, 1996
Docket Nos. 50-352
50-353
License Nos. NPF-39
NPF-85

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

SUBJECT: Licensee Event Report
Limerick Generating Station - Units 1 and 2

This LER reports Engineered Safety Feature actuations when a manual isolation of the Unit 1 Reactor Enclosure (RE) Secondary Containment was performed causing the common plant Standby Gas Treatment System and the Unit 1 Reactor Enclosure Recirculation System to automatically start. The cause of this event was a combination of equipment malfunctions encountered with the Reactor Enclosure Equipment Compartment Exhaust and the RE ventilation exhaust fan systems.

Reference:	Docket Nos. 50-352 50-353
Report Number:	1-95-010
Revision Number:	00
Event Date:	December 23, 1995
Report Date:	January 22, 1996
Facility:	Limerick Generating Station P.O. Box 2300, Sanatoga, PA 19464-2300

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

Very truly yours,

DMS:cah

cc: T. T. Martin, Administrator Region I, USNRC
N. S. Perry, USNRC Senior Resident Inspector, LGS

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LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

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 (MNB 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) Limerick Generating Station, Unit 1	DOCKET NUMBER (2) 05000 352	PAGE (3) 1 OF 4
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TITLE (4) Manual U/1 Secondary Containment Isolation with Operation of the Common Plant SGTS & U/1 Reactor Enclosure Recirculation System, ESF Actuations, due to Equipment Problems.

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	
12	23	95	95	-- 010 --	0	01	22	96	Limerick, Unit 2	05000353	
									FACILITY NAME	DOCKET NUMBER	
										05000	

OPERATING MODE (9) 1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)									
POWER LEVEL (10) 100	20.402(b)	20.405(c)	X	50.73(a)(2)(iv)	73.71(b)					
	20.405(a)(1)(i)	50.36(c)(1)		50.73(a)(2)(v)	73.71(c)					
	20.405(a)(1)(ii)	50.36(c)(2)		50.73(a)(2)(vii)	OTHER					
	20.405(a)(1)(iii)	50.73(a)(2)(i)		50.73(a)(2)(viii)(A)	(Specify in Abstract below and in Text, NRC Form 366A)					
	20.405(a)(1)(iv)	50.73(a)(2)(ii)		50.73(a)(2)(viii)(B)						
	20.405(a)(1)(v)	50.73(a)(2)(iii)		50.73(a)(2)(x)						

LICENSEE CONTACT FOR THIS LER (12)	
NAME J. L. Kantner, Manager-Experience Assessment, LGS	TELEPHONE NUMBER (Include Area Code) (610) 718-3400

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

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 15 single-spaced typewritten lines) (16)

On 12/23/95 a manual isolation of the Unit 1 Reactor Enclosure (RE) Secondary Containment (SC), an Engineered Safety Feature (ESF) actuation, was initiated due to low RE SC differential pressure (dp). The Standby Gas Treatment System and Reactor Enclosure Recirculation System, also ESFs, started per design. The low dp occurred during restoration of the RE HVAC system following maintenance on the '1C' RE HVAC exhaust fan. The consequences of this event were minimal. Troubleshooting determined that the RE Equipment Compartment Exhaust (REECE) system flow transmitter was out of calibration, an air leak existed on the REECE flow controller, and an instrument air tube to the '1C' RE HVAC system exhaust fan was cracked and leaking. On 12/23/95, temporary repairs were completed, the isolation was reset, and the RE HVAC system was returned to service. Permanent repairs were made on 12/26/95. The causes of the REECE system equipment malfunctions were determined to be isolated occurrences. The cause of the cracked instrument air tube was chronic vibration induced failure of the instrument air tubing servicing the '1C' RE HVAC exhaust fan blade pitch positioner. Repairs to the '1C' exhaust fan have been completed. Corrective actions to minimize future chronic vibration will be evaluated for station HVAC systems.

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TEXT CONTINUATION

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2 OF 4					

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

Unit Conditions Prior to the Event:

Units 1 and 2 were in Operational Condition 1 (Power Operation) at the time of this event.

On December 23, 1995, the Unit 1 Reactor Enclosure (RE) Heating, Ventilation, and Air Conditioning (HVAC, EIIS:VA) system was removed from service for scheduled maintenance on the '1C' RE HVAC system exhaust fan due to high vibration concerns. Prior to this event, the '1C' exhaust fan was operated only when absolutely needed until the maintenance commenced. The common plant Standby Gas Treatment System (SGTS, EIIS:BH) and the Unit 1 Reactor Enclosure Recirculation System (RERS, EIIS:AD) were in operation to maintain Unit 1 Secondary Containment (SC) integrity.

Description of the Event:

On December 23, 1995, during restoration of the RE HVAC system following the scheduled maintenance, Operations personnel observed that a low differential pressure (dp) condition existed between the RE SC and the outside atmosphere. During normal RE HVAC system operation, the RE to the outside air dp is maintained at the Technical Specifications (TS) required negative pressure of greater than or equal to 0.25 inches of water gauge. At 0440 hours on December 23, 1995, a manual isolation of the Unit 1 RE SC, an Engineered Safety Feature (ESF) actuation, was performed by Operations personnel per approved procedures to allow investigation of the low dp condition. Following the manual insertion of the isolation signal, the common plant SGTS and the Unit 1 RERS, also ESFs, automatically started per design to restore the RE SC dp to the required TS negative 0.25 inches of water gauge.

Following the manual initiation of the RE SC isolation, Operations personnel observed that the Reactor Enclosure Equipment Compartment Exhaust (REECE) system flow indicator was showing 35,000 scfm, without the system in operation. Normal air flow while this system is in operation is 43,000 scfm. An investigation revealed that the low RE SC dp resulted from a combination of the REECE system flow transmitter FT-076-136 being out of calibration, an air leak on the REECE system flow controller FC-076-136, and an air leak from a cracked copper instrument air tube supplying the '1C' RE HVAC system exhaust fan blade pitch positioner. The aggregate effect of these equipment malfunctions caused the RE HVAC exhaust fans to operate at

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

their minimum capacity, which was not sufficient to maintain the negative 0.25 inches of water gauge dp.

On December 23, 1995 at 1930 hours, temporary repairs were made to the relevant equipment, the RE SC isolation signal was reset, and the Unit 1 RE HVAC system was returned to service.

An evaluation concluded that the manual RE SC isolation was reportable, and a notification was made to the NRC on December 23, 1995 at 0950 hours, pursuant to the requirements of 10CFR50.72(b)(2)(ii), since this event resulted in manual and automatic ESF actuations. This report is being submitted in accordance with the requirements of 10CFR50.73(a)(2)(iv).

Analysis:

There were no adverse consequences and no radioactive material was released to the environment as a result of this event. The RE SC isolation system and the SGTs and RERS responded as designed following the receipt of the RE SC low negative dp condition and the manual insertion of the RE SC isolation signal.

Cause of the Event:

The cause of this event was equipment malfunctions on the REECE system air flow control loop and the RE HVAC system exhaust fan blade pitch positioner control system. Specifically, the REECE system flow transmitter FT-076-136 was found out of calibration, an air leak existed on the REECE system flow controller FC-076-136, and a copper instrument air tube supplying the '1C' RE HVAC system exhaust fan blade pitch positioner was cracked and leaking.

When the RE HVAC and REECE systems were placed in operation on December 23, 1995, the false REECE system flow signal caused the REECE air inlet blade pitch positioners to remain at their minimum setting, resulting in significantly reduced air flow. The cracked and leaking instrument air tubing supplying the '1C' RE HVAC system exhaust fan blade pitch positioner is common to the remaining exhaust fan positioners. The air leakage caused all three RE HVAC system exhaust fan blade pitch positioners to remain at their minimum settings, resulting in operation of the RE HVAC exhaust fans at minimum capacity. The aggregate effects of these equipment malfunctions caused the low negative dp condition within the RE.

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An evaluation of the REECE air flow control system revealed that this control loop was last successfully functionally tested and calibrated on June 13, 1992. This loop has a seven year calibration frequency. The REECE transmitter and controller are located within the local control panel 10C205, and therefore, have a low potential for damage or jarring. A component history search indicated that the REECE transmitter and controller and similar components have not experienced previous failures or problems. Therefore, it has been concluded that the REECE system equipment malfunctions are isolated occurrences.

The cause of the cracked instrument air tube was chronic vibration induced failure of the instrument air tubing servicing the '1C' RE HVAC system exhaust fan blade pitch positioner. This particular vibration is the result of normal system operation with a minor contribution from increased vibration of the '1C' exhaust fan. The crack occurred approximately one inch adjacent to a tubing support clamp.

Corrective Actions:

On December 26, 1995, the RE HVAC system was removed from operation to allow calibration of the REECE system flow transmitter FT-076-136, and permanent repairs to the REECE system flow controller FC-076-136. The cracked copper instrument air tube supplying the '1C' RE HVAC exhaust fan blade pitch positioner was replaced. Appropriate corrective actions to minimize future chronic vibration induced tubing failures will be implemented following completion of comprehensive analyses of relevant station HVAC systems.

Previous Similar Occurrences:

There have been no previous events reported at the Limerick Generating Station (LGS) where the RE SC dp was exceeded due to REECE system equipment malfunctions. However, LGS LERs 1-88-020, 1-88-034, and 2-90-011 reported RE SC isolations due to leaks in the instrument air system servicing the RE HVAC system exhaust fans. An evaluation of these previous events revealed that these tubing failures were caused by either Swagelok fittings being over-tightened such that the ferrule cut into the tubing or acute vibration induced fatigue. Therefore, the corrective actions from these previous events would not have prevented the equipment malfunctions identified in this LER.