

## PHILADELPHIA ELECTRIC COMPANY

LIMERICK GENERATING STATION

P. O. BOX 2300

SANATOGA, PA 19464-2300

(215) 327-1200 EXT. 2000

J. DOERING, JR.  
PLANT MANAGER  
LIMERICK GENERATING STATION

June 7, 1993  
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 a Unit 1 Primary Containment and Reactor Vessel Isolation Control System (PCRIVICS) isolation signal, an Engineered Safety Feature, initiated by the Steam Leak Detection System, resulting in a Reactor Water Cleanup (RWCU) system isolation. The RWCU system isolation was caused by an increase of the 'A' RWCU system pump room temperature beyond its isolation setpoint due to the normal Reactor Enclosure Ventilation system being taken out-of-service.

Reference:	Docket No. 50-352
Report Number:	1-93-006
Revision Number:	00
Event Date:	May 6, 1993
Report Date:	June 7, 1993
Facility:	Limerick Generating Station P.O. Box 2300, Sanatoga, PA 19464-2300

Although Operations personnel expected the RWCU system isolation, plant personnel concluded that the event should be reported as a conservative measure, and this LER is being submitted pursuant to 10 CFR 50.73(a)(2)(iv).

Very truly yours,

140039

*LA Hopkins for J Doering*

DMS:cah

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

9306150042 930607  
PDR ADOCK 05000352  
S PDR

*Heard*

## 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 4		
TITLE (4) Engineered Safety Feature Actuation Resulting from a Reactor Water Cleanup (RWCU) System Isolation due to High 'A' RWCU Pump Room Temperature.																	
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 6	9 3	9 3	0 0 6	0	0 0	6	0 7	9 3					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) 1 0 0			20.402(b)				20.405(c)				<input checked="" type="checkbox"/> 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)(vi)				OTHER (Specify in Abstract below and in Text, NRC Form 366A)		
			20.405(a)(1)(iii)				50.73(a)(2)(i)				50.73(a)(2)(vii)(A)						
			20.405(a)(1)(iv)				50.73(a)(2)(ii)				50.73(a)(2)(vii)(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 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	
<input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE)												<input checked="" type="checkbox"/> NO					

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

On May 6, 1993, at 1320 hours, a Group III Primary Containment and Reactor Vessel Isolation Control System (PCRIVICS) isolation signal occurred, an Engineered Safety Feature (ESF), initiating a Reactor Water Cleanup (RWCU) system isolation. The PCRIVICS isolation signal was initiated when the Steam Leak Detection System (Division 1) detected high temperatures in the 'A' RWCU pump room above the 135 degrees F trip setpoint. The increase in the pump room temperature was due to removal of normal Reactor Enclosure (RE) Heating Ventilation, and Air Conditioning (HVAC) system from service for maintenance. The consequences were minimal and reactor coolant conductivity and purity remained well within the required limits. The cause was the result of a combination of several factors. First, the normal RE HVAC system was secured for maintenance prior to the isolation, and created a high temperature condition in the 'A' RWCU pump room. Secondly, the improper location of a steam leak detection temperature probe resulted in inaccurate high ambient room temperature representation. Thirdly, the RE HVAC system failed to restart to reduce the 'A' RWCU pump room temperature, due to a faulty fan motor breaker. The faulty breaker was replaced and the RE HVAC system was repaired and returned to operation. A work request has been initiated to relocate the temperature probe. The cause of the faulty fan motor breaker is currently under investigation.

## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

APPROVED OMB NO. 3150-0104

EXPIRES: 8/31/85

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
Limerick Generating Station, Unit 1	0 5 0 0 0 3 5 2	9 3	— 0 0 6	— 0 0	0 2	OF 0 4

TEXT (If more space is required, use additional NRC Form 365A's) (17)

Unit Conditions Prior to the Event:

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

The Unit 1 Reactor Enclosure (RE) Heating, Ventilation and Air Conditioning (HVAC) system (EIIS:VA) was secured with the 'A' Train of the Standby Gas Treatment System (SGTS) (EIIS:BH) and the 'A' Train of the Reactor Enclosure Recirculation System (RERS) (EIIS:AD) in operation for the performance of maintenance activities on the RE HVAC system.

Description of the Event:

On May 6, 1993, at 1320 hours, a Group III Primary Containment and Reactor Vessel Isolation Control System (PCRVICES) isolation signal occurred, an Engineered Safety Feature (ESF) actuation, initiating a Reactor Water Cleanup (RWCU) (EIIS:CE) system isolation. The RWCU system inboard primary containment isolation valve (HV-44-1F001) closed as designed upon receipt of the isolation signal. The PCRVICES isolation signal was initiated when the Steam Leak Detection System (Division 1) (EIIS:IJ) detected high temperatures in the 'A' RWCU system pump room above the 135 degrees F trip setpoint.

On May 6, 1993, when the Unit 1 RE HVAC system was secured for maintenance activities, Operations personnel began monitoring and recording temperatures for various RE rooms including the 'A' RWCU system pump room. The room temperatures were being monitored and recorded in accordance with the System (S) operating procedure S76.0.C, "Tracking of Room Temps While Reactor HVAC is Secured." Prior to the event, Operations personnel were aware that the 'A' RWCU system pump room temperature was increasing toward the PCRVICES isolation setpoint. Operations personnel clearly recognized that the RWCU system would automatically isolate on high room temperature, if the room temperatures were not lowered by restarting the RE HVAC system. Operations personnel continued to attempt to restore the RE HVAC system to service prior to reaching the isolation setpoint; however, the RE HVAC system failed to restart and the RWCU system isolation automatically occurred.

Following the RWCU isolation, Operations personnel restarted the 'A' trains of the SGTS and RERS, thereby re-establishing the RE differential pressure and air flow. The 'A' RWCU system pump room temperature then decreased below the isolation reset temperature. Operations personnel reset the PCRVICES isolation at 1349 hours, in accordance with the General Plant (GP) procedure GP-8, "Primary and Secondary Containment Isolation Verification and Reset." At 1408 hours, the RWCU system was returned to service using procedure S44.7.A, "Reactor Water Cleanup Fast Startup." Operations personnel then contacted the System Manager to investigate the cause of the RE HVAC system failure.

Although Operations personnel expected the RWCU system isolation, plant personnel concluded that the event should be reported as a conservative measure.

## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

APPROVED OMB NO. 3150-0104  
EXPIRES 8/31/85

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
Limerick Generating Station, Unit 1	0 5 0 0 0 3 5 2	9 3	— 0 0 6	— 0 0 0	3	OF	0 4

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

Therefore, a four hour notification was made to the NRC at 1549 hours on May 6, 1993, in accordance with 10CFR50.72(b)(2)(ii) since this event resulted in an automatic actuation of an ESF. This report is being submitted in accordance with 10CFR50.73(a)(2)(iv).

Analysis of the Event:

The consequences of this event were minimal. There was no release of radioactive material to the environment as a result of this event. The RWCU system isolated in response to the high 'A' RWCU system pump room temperature as sensed by the Steam Leak Detection System. The RWCU system isolation was not due to a steam leak, and was not required to mitigate the consequences of the event. The RWCU system was isolated for 48 minutes. During the interval that the RWCU system was affected by this event, conductivity (an indicator of reactor water purity) increased only slightly. The reactor water purity remained well within the limits specified by Technical Specifications during this event.

Cause of the Event:

The cause of this event was identified to be a combination of:

- o the normal RE HVAC system being taken out-of-service for maintenance activities, which removed normal area cooling,
- o improper location of a Steam Leak Detection probe resulting in an inaccurately high ambient room temperature representation, and
- o the failure of the RE HVAC system to operate when Operations personnel attempted to restart the system to reduce the 'A' RWCU system pump room temperature.

These factors created a high temperature condition in the 'A' RWCU system pump room above the trip setpoint of 135 degrees F causing an actuation of the PCRVICS. This was a localized high temperature reading which was not representative of ambient room temperature due to location of the probe. This resulted in the automatic isolation of the RWCU system. The cause of the improperly located temperature probe was a design deficiency. Due to a designer error, the probe was installed too close to the 'A' RWCU system pump suction piping.

The cause of the failure of the RE HVAC system to restart was determined to be the result of a faulty fan motor breaker (E11S:BKR) for the 'C' RE exhaust fan. Two operating RE exhaust fans are required for normal RE HVAC system operation. The 'B' RE exhaust fan was removed from service for maintenance work leaving no standby exhaust fan. With the 'B' RE exhaust fan not fully returned to service, and the 'C' RE exhaust fan unable to be started, all attempts to restart the normal RE HVAC system were unsuccessful. The cause of the faulty fan motor



## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104

EXPIRES: 8/31/95

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
Limerick Generating Station, Unit 1	0 5 0 0 0 3 5 2	9 3	— 0 0 6	— 0 0 0	1 4	OF 0 4

TEXT (If more space is required, use additional NRC Form 365A's) (17)

breaker is currently under investigation. If a significant issue is identified during this investigation, a revision to this LER will be submitted.

Corrective Actions

System Manager investigation revealed that, unlike the 'B' and 'C' RWCU system pump rooms, the 'A' RWCU system pump room Division 1 Steam Leak Detection probe is located just above the RWCU system pump suction piping. Consequently, when the 'A' RWCU system pump is in service, the Division 1 probe senses radiant heat from this piping and reads 15 to 20 degrees F higher than the Division 4 probe which senses actual ambient room temperature. The Division 1 probe was verified to read correctly for its installed location; however, this temperature reading is not representative of the ambient temperature in the room. Therefore, this temperature probe is not in conformance with its original design intent. An inspection of the temperature probes for the remaining Unit 1 and Unit 2 RWCU systems was performed. A similar deficiency was identified with the Unit 2 'A' RWCU system pump room temperature probe. A Non-Conformance Report (NCR) has been initiated along with a work request to relocate these temperature probes along the center lines of the pumps where they will sense ambient room temperature readings. In the interim, to facilitate removing the RE HVAC system from service for maintenance work, the 'A' RWCU system pump will be secured, and the backup RWCU system pump will be started.

The faulty fan motor breaker on the 'C' RE exhaust fan was replaced with the operable fan motor breaker from the 'B' RE exhaust fan, and the 'A' and 'C' exhaust fans were successfully restarted. The faulty fan motor breaker is expected to be repaired or replaced by July 5, 1993, pending the results of the investigation. When the operable fan motor breaker is installed, the 'B' RE exhaust fan will be tested for its return to an operable condition.

Previous Similar Occurrences:

There have been no previous LERs which reported an isolation of the RWCU system resulting from high RWCU pump room air temperature caused by inadequate room ventilation. The cause of the faulty fan motor breaker is currently under investigation. Therefore, an assessment of previous events relating to this breaker problem cannot be completed for this report.