

**PHILADELPHIA ELECTRIC COMPANY**

LIMERICK GENERATING STATION  
 P. O. BOX A  
 SANATOGA, PENNSYLVANIA 19464

(215) 327-1200 EXT. 2000

M. J. McCORMICK, JR., P.E.  
 PLANT MANAGER  
 LIMERICK GENERATING STATION

September 12, 1990  
 Docket No. 50 352  
 License No. NPF-39

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

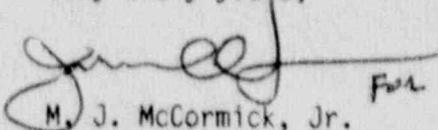
SUBJECT: Licensee Event Report  
Limerick Generating Station - Unit 1

This LER reports an actuation of the Primary Containment and Reactor Vessel Isolation Control System (PCRVICES), an Engineered Safety Feature actuation, initiated by the Steam Leak Detection System, that resulted in a Reactor Water Cleanup (RWCU) System isolation. The isolation was caused by an increase in the RWCU System Regenerative Heat Exchanger room temperature beyond its isolation setpoint due to steam leaks from two RWCU System valves.

Reference:	Docket No. 50-352
Report Number:	1-90-015
Revision Number:	00
Event Date:	August 13, 1990
Report Date:	September 12, 1990
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)(iv).

Very truly yours,

  
 M. J. McCormick, Jr.

DCS: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)

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TITLE (4) Reactor Water Cleanup System Isolation resulting from high Regenerative Heat Exchanger Room temperature caused by leaking system vent valves

EVENT DATE (5)			LER NUMBER (6)		REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)								
MONTH	DAY	YEAR	YEAR	SEQUENTIA NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	DOCKET NUMBER(S)							
0	8	13	90	0	15	0	0	9	1	2	90	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) 0   9   2	20.402(b)	<input checked="" type="checkbox"/>	20.405(c)	<input type="checkbox"/>	50.73(e)(2)(iv)	<input type="checkbox"/>	73.71(b)	<input type="checkbox"/>	OTHER (Specify in Abstract below and in Text, NRC Form 366A)		
	20.405(a)(1)(i)	<input type="checkbox"/>	50.73(e)(1)	<input type="checkbox"/>	50.73(e)(2)(v)	<input type="checkbox"/>	73.71(c)	<input type="checkbox"/>			
	20.405(a)(1)(iii)	<input type="checkbox"/>	50.73(e)(2)	<input type="checkbox"/>	50.73(e)(2)(vii)	<input type="checkbox"/>		<input type="checkbox"/>			
	20.405(a)(1)(iii)	<input type="checkbox"/>	50.73(e)(2)(ii)	<input type="checkbox"/>	50.73(e)(3)(viii)(A)	<input type="checkbox"/>		<input type="checkbox"/>			
	20.405(a)(1)(iv)	<input type="checkbox"/>	50.73(e)(2)(ii)	<input type="checkbox"/>	50.73(e)(2)(viii)(B)	<input type="checkbox"/>		<input type="checkbox"/>			
	20.405(a)(1)(v)	<input type="checkbox"/>	50.73(e)(2)(iii)	<input type="checkbox"/>	50.73(e)(2)(ix)	<input type="checkbox"/>		<input type="checkbox"/>			

LICENSEE CONTACT FOR THIS LER (12)		TELEPHONE NUMBER	
NAME Gil J. Madsen, Regulatory Engineer		AREA CODE 2   1   5	NUMBER 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 NFRDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NFRDS	

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 August 13, 1990, at 1935 hours, an actuation of the Group III Primary Containment and Reactor Vessel Isolation Control System (PCRVICES) occurred, an Engineered Safety Feature (ESF) actuation, initiating a Reactor Water Cleanup (RWC) system isolation. The PCRVICES isolation was initiated when the Steam Leak Detection System (Divisions 1 and 4) detected high temperatures in the RWC system regenerative heat exchanger room. Operations personnel reset the PCRVICES isolation at 0024 hours on August 14, 1990. The cause of the high area temperature was found to be steam leakage past the seats of two normally closed vent line drain valves in the RWC system. A four hour notification was made to the NRC at 2127 hours on August 13, 1990 in accordance with the requirements of 10CFR 50.72(b)(2)(ii) since this event resulted in an automatic actuation of an ESF. The leaking valves were replaced and the RWC system was returned to service. The RWC system isolated as designed in response to the high RWC system regenerative heat exchanger room temperature as sensed by the Steam Leak Detection System. The RWC system was isolated for 2 days and 12 hours. The reactor coolant conductivity and chloride concentration increased but remained within the limits specified by the Limerick Generating Station Unit 1 Technical Specifications. A review is being performed by station personnel to determine the need for additional actions (beyond the valve replacement) to prevent recurrence.

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

Unit 1 Conditions Prior to the Event:

Operating Condition: 1 (Power Operation)  
Power Level: 92%

Description of the Event:

On August 13, 1990, at 1935 hours, an actuation of the Group III Primary Containment and Reactor Vessel Isolation Control System (PCRVICES, EIIS:JM) occurred, an Engineered Safety Feature (ESF) actuation, initiating a Reactor Water Cleanup (RWCU, EIIS:CE) system isolation. The RWCU system inboard and outboard primary containment isolation valves (EIIS:VLV) (HV-44-1F001 and HV-44-1F004) closed as designed upon receipt of the isolation signal.

The PCRVICES isolation was initiated when the Steam Leak Detection System (EIIS:IJ) (Divisions 1 and 4) detected high temperatures in the RWCU system regenerative heat exchanger room above the 121 degrees F trip setpoint. Operations personnel then reset the PCRVICES isolation at 0024 hours on August 14, 1990 in accordance with General Plant procedure, GP-8, "Primary and Secondary Containment Isolation Verification and Reset," upon determination that the high regenerative heat exchanger room temperature was caused by steam leaking past the seats of two RWCU system drain valves. The RWCU system remained out of service until the cause of the high area temperature was corrected.

A four hour notification was made to the NRC at 2127 hours on August 13, 1990 in accordance with the requirements of 10CFR 50.72(b)(2)(ii) since this event resulted in an automatic actuation of an ESF. This report is being submitted in accordance with the requirements of 10CFR 50.73(a)(2)(iv).

Consequences of the Event:

The consequences of this event were minimal. There was no detectable release of radioactive material to the environment as a result of this event. The RWCU system isolated as designed in response to a high RWCU system regenerative heat exchanger room temperature as sensed by the Steam Leak Detection System.

The RWCU system was isolated for 2 days and 12 hours. During the interval that the RWCU system was affected by this event, reactor coolant conductivity (an indicator of reactor water purity) and chloride concentration increased. These

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TEXT (If more space is required, use additional NRC Form 306A's) (17)

increased levels resulted in a condition for entry into Action Level 1 of plant Chemistry (CH) procedure CH-1010, "Chemistry Sampling, Analysis and Calibration Schedule." Action Level 1 is an administrative limit which requires corrective action to reduce the increased reactor water chemistry parameters (in this case conductivity and chloride concentration) within a 96-hour operating time limit or develop a further action plan. The 96-hour operating time limit was not exceeded because the leaking RWCU system valves were replaced and the RWCU system was returned to service within 4 hours after entry into Action Level 1. The reactor coolant conductivity and chloride concentration remained within the limits specified by the Limerick Generating Station (LGS) Unit 1 Technical Specifications (TS) during the entire event. The reactor coolant chemistry returned to pre-event levels 4.5 hours following restoration of the RWCU system to operation.

Cause of the Event:

The cause of this event was determined to be steam leakage past the seats of two normally closed RWCU system manual valves, 44-1052 and 44-1053, located in vent lines within the regenerative heat exchanger room. These valves had previously experienced steam leakage which was a contributory factor in a prior RWCU system isolation (refer to LGS LER 1-90-014, dated August 6, 1990). The leaking steam created a high temperature condition in the RWCU system regenerative heat exchanger room causing the Steam Leak Detection System to actuate a RWCU system isolation. The valves were reseated following the previous RWCU system isolation reported in LER 1-90-014 and were scheduled for corrective maintenance during the next Unit 1 outage of sufficient duration. The Unit 1 Third Refueling Outage was scheduled for 1 month later. The decision to repair the valves at a later date was based on several factors, the primary consideration being the avoidance of a RWCU system shutdown and startup and the resulting pressure and temperature transients. These transients would be just as severe and potentially detrimental to system components as a system isolation. An additional consideration was that the previous isolation was determined to be caused by the combination of a lack of normal Reactor Enclosure ventilation during performance of a Surveillance Test (ST), high outside air temperature, and the steam leaks from these valves. Therefore, the steam leaks were considered to be small enough to tolerate as long as normal Reactor Enclosure ventilation was in service. Following the previous isolation, the temperatures of the regenerative heat exchanger room were being recorded by Operations personnel and monitored by the System Engineer to check for long term upward

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trends. The temperatures had stabilized over a two-week period at a maximum of 115 degrees F indicating that the steam leak had not increased. Subsequent to the monitoring, further unexpected degradation of these valves caused an increase in the regenerative heat exchanger room temperature resulting in the RWCU system isolation.

Corrective Actions:

Following the RWCU system isolation, Operations personnel verified that the RWCU system responded in accordance with its design. The PCRVICES isolator was reset on August 14, 1990, at 0024 hours. The RWCU system remained isolated during investigation and correction of the cause of the isolation. The leaking valves were replaced. Following completion of the replacement, the RWCU system was returned to service utilizing system operating procedure S44.7.C, "Reactor Water Cleanup Delayed Hot Startup," on August 16, 1990, at 0730 hours.

Actions Taken to Prevent Recurrence:

The replacement of the RWCU system valves, 44-1052 and 44-1053 has reduced ambient temperature in the regenerative heat exchanger room to a range of 100 to 105 degrees, which is considered normal for the current outside air temperatures.

A Routine Test, (RT-6-104-900-1, "HP Key Controlled/RWP Controlled Room Inspection") is performed periodically to monitor high radiation areas, such as the regenerative heat exchanger room, to identify system component leaks. These leaking valves were already identified and scheduled for replacement therefore performance of the RT could not have prevented this occurrence. Area temperatures are recorded each shift as part of the performance of ST-6-107-590-1, "Daily Surveillance Log/OPCONs 1,2,3." When high temperatures are recorded the appropriate group(s) are notified to facilitate response to a potential degradation.

The affected RWCU system valves, 44-1052 and 44-1053 had been replaced on July 4, 1987 due to steam leakage past their seats. A review by station personnel will be performed by February 28, 1991, to determine if additional actions should be taken to increase the reliability of these valves. Any significant additional actions identified will be included in a revision to this report.

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Previous Similar Occurrences:

LER 1-90-014 reported a RWCU system isolation on high regenerative heat exchanger room temperature due to a combination of steam leakage past system valves 44-1052 and 44-1053, high outside temperatures, and removal of the normal Reactor Enclosure ventilation system from service. Replacement of these valves was planned and, had the replacement been completed prior to this isolation, it would have prevented this isolation.

Tracking Codes: B17 - Deficient Equipment