

PHILADELPHIA ELECTRIC COMPANY

LIMERICK GENERATING STATION  
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J. DOERING, JR.  
PLANT MANAGER  
LIMERICK GENERATING STATION

May 15, 1992  
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 the manual isolation of the Main Control Room Ventilation System and the actuation of the Control Room Emergency Fresh Air Supply system, both Engineered Safety Features, due to rising chlorine concentration indications on two of four channels of the chlorine detection system.

Reference: Docket Nos. 50-352  
50-353  
Report Number: 1-92-007  
Revision Number: 00  
Event Date: April 23, 1992  
Report Date: May 15, 1992  
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,

JLP:cah

cc: T. T. Martin, Administrator, Region 1, 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 OF 0 4 PAGE (3)

TITLE (4)  
Manual Isolation of the Main Control Room due to Rising Chlorine Concentration.

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)		
MONTH	DAY	YEAR	YEAR	SEQUENCE NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAMES		DOCKET NUMBER (8)
04	23	92	92	007	00	05	15	92	Limerick, Unit 2		0 5 0 0 0 3 5 3
											0 5 0 0 0 1 1 1

OPERATING MODE (9) - THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 50.73 (Check one or more of the following) (11)

20.402(b)	<input type="checkbox"/>	50.73(a)(2)(iv)	<input checked="" type="checkbox"/>	73.71(a)
20.405(a)(1)(i)	<input type="checkbox"/>	50.73(a)(2)(v)	<input type="checkbox"/>	73.71(b)
20.405(a)(1)(ii)	<input type="checkbox"/>	50.73(a)(2)(vi)	<input type="checkbox"/>	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
20.405(a)(1)(iii)	<input type="checkbox"/>	50.73(a)(2)(vii)(A)	<input type="checkbox"/>	
20.405(a)(1)(iv)	<input type="checkbox"/>	50.73(a)(2)(vii)(B)	<input type="checkbox"/>	
20.405(a)(1)(v)	<input type="checkbox"/>	50.73(a)(2)(viii)	<input type="checkbox"/>	

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER
G. J. Madsen, Regulatory Engineer, Limerick Generating Station	2 1 1 5 3 2 7 1 - 1 1 2 1 0 1 0

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRPDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRPDS

SUPPLEMENTAL REPORT EXPECTED (14)

YES (If yes, complete EXPECTED SUBMISSION DATE)  NO

EXPECTED SUBMISSION DATE (15)

MONTH	DAY	YEAR

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

On April 23, 1992, Main Control Room (MCR) personnel used System procedure S78.8.A, "Manual Initiation of Control Room Radiation or Chlorine/Toxic Chemical Isolation," to manually initiate a MCR ventilation system chlorine isolation in response to indicated rising chlorine concentration on the 'A' and 'B' channel indicators of chlorine detection system. As a result of the manual MCR chlorine isolation, an Engineered Safety Feature (ESF), the 'A' train of the Control Room Emergency Fresh Air Supply (CREFAS) system, also an ESF, initiated automatically as designed and provided total recirculation of the MCR air without any intake from the outside atmosphere. The actual consequences of this event were minimal. The MCR ventilation system isolated and the 'A' train of the CREFAS system automatically started and operated as designed. The toxic limit of chlorine is 15 ppm and the maximum concentration observed during this event was 0.5 ppm which is well below this toxic limit. This event resulted from an off-site release of chlorine from an unknown source that was detected at Limerick Generating Station (LGS). The chlorine detection system was checked and verified to be operating properly. At LGS all detection and isolation systems responded as designed and performed their intended functions; therefore, no further corrective actions to prevent recurrence are planned.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1)  Limerick Generating Station, Unit 1	DOCKET NUMBER (2)  0 5   0   0   0   3   5   2	LER NUMBER (6)			PAGE (3)	
		YEAR 9   2	SEQUENTIAL NUMBER 0   0   7	REVISION NUMBER 0   0	0   2	OF 0   4

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

Unit Conditions Prior to the Event:

Unit 1 reactor core was offloaded.

Unit 2 Operational Condition was 1 (Power Operation) at 100% power level.

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

Description of the Event:

On April 23, 1992, at 1405 hours, Main Control Room (MCR) personnel used System procedure S78.8.A, "Manual Initiation of Control Room Radiation or Chlorine/Toxic Chemical Isolation," to manually initiate a MCR ventilation system (EIIS:VI) chlorine isolation in response to indicated rising chlorine concentration on the 'A' and 'B' channel indicators of the chlorine detection system (EIIS:VI). The 'A' and 'B' channels of the chlorine detection system reached a concentration of 0.5 ppm, exceeding the isolation setpoint of 0.42 ppm. A chlorine concentration above 0.42 ppm on the 'A' and 'C' channels or the 'B' and 'D' channels is required to initiate an automatic MCR ventilation system chlorine isolation. As a result of the manual MCR chlorine isolation, an Engineered Safety Feature (ESF), the 'A' train of the Control Room Emergency Fresh Air Supply (CREFAS) system (EIIS:VI), also an ESF, initiated automatically as designed and provided total recirculation of the MCR air without any intake from the outside atmosphere. The 'B' train of the CREFAS system remained in the automatic standby mode. Chemistry personnel obtained and analyzed a sample of the MCR air. The chemistry results indicated no detectable level of chlorine. At 1503 hours, MCR personnel observed the 'D' channel indicator of the chlorine detection system increase to 0.3 ppm while the 'C' channel indicator of the chlorine detection system did not respond.

A four hour notification to the NRC was made at 1716 hours on April 23, 1992, in accordance with 10CFR50.72(b)(2)(ii) because this event resulted in a manual actuation of an ESF. This report is being submitted in accordance with the requirements of 10CFR50.73(e)(2)(iv).

Analysis of the Event:

The actual consequences of this event were minimal. There was no release of radioactive material to the environment as a result of this event. The MCR ventilation system isolated and the 'A' train of the CREFAS system automatically started and operated as designed. The redundant 'B' train of the CREFAS system was in the automatic standby mode and was available for operation in the event the 'A' CREFAS train failed to properly function.

In the event these systems had failed to properly function, the consequences would have remained minimal because available data indicated the levels of chlorine present at the intake plenum were low. NRC Regulatory Guide 1.78,

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1)  Limerick Generating Station, Unit 1	DOCKET NUMBER (2)  0   5   0   0   0   3   5   2	LER NUMBER (3)			PAGE (3)  0   3   OF   0   4
		YEAR 9   2	SEQUENTIAL NUMBER -   0   0   7	REVISION NUMBER -   0   3	

TEXT (If more space is required, use additional NRC Form 306A 2) (17)

"Assumptions for Evaluating the Habitability of a Nuclear Power Plant Control Room during a Postulated Hazardous Chemical Release," as committed to in the Limerick Generating Station (LGS) Updated Final Safety Analysis Report (Section 6.4.1), establishes the toxic limit of chlorine at 15 ppm. The maximum concentration observed during this event was 0.5 ppm which is well below this toxic limit.

After completion of the functional surveillance test for each of the four channels of the chlorine detection system all channels of the chlorine detection system were determined to be operating properly and would have initiated an automatic MCR ventilation system chlorine isolation as designed.

Cause of the Event:

The cause of this event was increased indication of chlorine concentration levels in the Control Enclosure air intake plenum. The source of the chlorine is unknown. Liquid sodium hypochlorite is used for cooling tower chlorination. At the time of the event, chlorination of a cooling tower was not in progress. No other source for the chlorine from LGS could be identified.

Conrail was contacted to determine if a train could have been the source of the chlorine. Conrail indicated that no chlorine was being transported in the LGS vicinity at the time of the event.

On April 23, 1992, between 1300 and 1400 hours, a reservoir that supplies drinking water to local municipality residents was shock treated with 2500 pounds of calcium hypochlorite because of a severe problem due to mayfly larvae. A warning was issued to residents to not drink the water until it was boiled. The dispersion over the distance that the chlorine had to travel from the reservoir to LGS makes the reservoir an unlikely source for the chlorine.

Occidental Chemical Company (OCC), a chemical company in the vicinity of LGS, was contacted to determine if it was a possible source for the chlorine. OCC indicated that no chlorine was released from their facility.

No other potential sources of the chlorine could be identified.

Corrective Actions:

This event resulted from an off-site release of chlorine from an unknown source that was detected at LGS. MCR personnel used procedure S78.8.A to manually initiate a MCR ventilation system chlorine isolation to maintain habitability of the MCR. On April 25, 1992, at 0505 hours, MCR personnel reset the MCR ventilation system chlorine isolation when chlorine concentration levels indicated on all channels of the chlorine detection system had returned to normal and remained there for a period of time. The chlorine detection system was checked and verified to be operating properly. At LGS, all detection and

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (8)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
		0 5 0 0 0 3 5 2 9 2	0 0 7	0 0	0 4	OF 0 4

TEXT (If more space is required, use additional NRC Form 2074's, 117)

isolation systems responded as designed and performed their intended functions; therefore, no further corrective actions to prevent recurrence are planned.

Previous Similar Occurrences:

LER 1-87-047 also reported a manual isolation of the MCR ventilation due to elevated chlorine levels. At LGS, all subject systems responded as designed in that event. Due to the unknown source of the chlorine in that event, no actions to prevent recurrence were identified.

Tracking Codes: C99 - Other External Cause