

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Limerick Generating Station Unit 1	DOCKET NUMBER (2) 05000352	PAGE (3) 1 OF 4
---	-------------------------------	--------------------

TITLE (4) Control Room HVAC Isolation Resulting From False High Chlorine Concentration Signal Believed To Have Been Caused By Rainwater

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)
04	16	88	88	014	00	05	09	88			05000

OPERATING MODE (9) 4	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR § (Check one or more of the following) (11)									
POWER LEVEL (10) 01010	<input type="checkbox"/> 20.402(b)	<input type="checkbox"/> 20.405(c)	<input checked="" type="checkbox"/> 50.73(a)(2)(iv)	<input type="checkbox"/> 73.71(b)						
	<input type="checkbox"/> 20.406(a)(1)(i)	<input type="checkbox"/> 50.36(a)(1)	<input type="checkbox"/> 50.73(a)(2)(v)	<input type="checkbox"/> 73.71(c)						
	<input type="checkbox"/> 20.406(a)(1)(ii)	<input type="checkbox"/> 50.36(a)(2)	<input type="checkbox"/> 50.73(a)(2)(vi)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)						
	<input type="checkbox"/> 20.406(a)(1)(iii)	<input type="checkbox"/> 50.73(a)(2)(i)	<input type="checkbox"/> 50.73(a)(2)(vii)(A)							
	<input type="checkbox"/> 20.406(a)(1)(iv)	<input type="checkbox"/> 50.73(a)(2)(ii)	<input type="checkbox"/> 50.73(a)(2)(vii)(B)							
	<input type="checkbox"/> 20.406(a)(1)(v)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)							

LICENSEE CONTACT FOR THIS LER (12)		TELEPHONE NUMBER	
NAME Charles A. Mengers, Senior Engineer, Licensing Section		AREA CODE 215	841-5184

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)										
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPROS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPROS	

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)  
Abstract: 88-014

On April 16, 1988 at 1615 hours, the main control room ventilation system isolated due to a false 'D' channel high chlorine concentration signal. The 'B' train of the Control Room Emergency Fresh Air Supply (CREFAS) system, an Engineered Safety Feature, initiated as designed. The event occurred during a rain storm and the false high chlorine concentration signal is believed to have been caused by rainwater coming in contact with the chlorine analyzer probe resulting in a chemical imbalance in the probe's electrolyte. The analyzer probes are located close to the outside air intake louvers of the control enclosure air intake plenum. After the 'D' channel chlorine indicator spiked, the control room operators implemented Toxic Gas procedure (SE-2), until the signal was verified to be spurious, by performing a channel check of the 'A', 'B' and 'C' chlorine detector indicators in the main control room. All chlorine channels indicated a normal level (less than 0.1 ppm) and the isolation was reset at 1653 hours. The duration of the Control Room isolation was zero hours 38 minutes. There was no release of radioactive material to the environment as a result of this event. A modification to CREFAS, designed to change the chlorine detector system logic and location of the probes, has been developed and is scheduled to be installed by July 15, 1988.

8805120141 880509  
PDR ADOCK 05000352  
S DCD

1122  
3/1

## 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	SEQUENTIAL NUMBER	REVISION NUMBER		
		8 8	- 0 1 4	- 0 0	0 2	OF 0 4

TEXT (If more space is required, use additional NRC Form 356A 9/ (17))

Unit Conditions Prior to the Event:

Operating Mode 4 (Cold Shutdown)

Reactor Power 0%

Description of the Event:

On April 16, 1988 at 1615 hours, the main control room ventilation system isolated due to a false 'D' channel high chlorine concentration signal believed to have been caused by rainwater depositing on the analyzer probe.

The 'B' train of the Control Room Emergency Fresh Air Supply (CREPAS) system, an Engineered Safety Feature, initiated as designed. The 'D' channel chlorine analyzer, which functions to isolate the control room ventilation system in the event of a high chlorine concentration in the Control Enclosure intake plenum spiked to approximately 0.50 ppm for approximately 60 seconds. The Anacon model M-17 chlorine analyzer isolation setpoint is 0.42 ppm. When the 'D' channel reached its setpoint and caused the isolation, the control room operators implemented Toxic Gas Procedure (SE-2), until the isolation signal was confirmed as spurious, by performing a channel check of the 'A', 'B' and 'C' chlorine detector indicators in the main control room. Operations personnel verified the isolation occurred, in accordance with procedures, and Instrumentation and Controls (I&C) was notified to inspect the chlorine detection system to determine the cause of the malfunction. The isolation was reset and normal control room ventilation was restored by 1653 hours. The duration of the Control Room isolation was zero hours 38 minutes.

Consequences of the Event:

The control room ventilation system tripped and isolated. CREPAS responded as designed. There was no release of radioactive material to the environment. If one of the chlorine detection system channels had failed to function in the event that chlorine concentrations exceeded normal levels, the redundant channel

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
Limerick Generating Station Unit 1	05100035288	-	014	-	00	03 OF 04

TEXT (if more space is required, use additional NRC Form 365A w/ (17))

would be available to isolate the control room ventilation system.

Cause of the Event:

The cause of the control room ventilation system isolation and initiation of the 'B' train of CREFAS apparently was rainwater coming in contact with the 'D' chlorine analyzer probe causing a chemical imbalance in the probe's electrolyte which simulated a high chlorine condition. The probe is located approximately one foot away from the outside air intake louvers of the Control Enclosure intake plenum. No other reason for the event was identified.

Corrective Actions:

Control room personnel implemented Toxic Gas Procedure (SE-2) immediately following the isolation until the signal was confirmed as spurious. Operations personnel verified that all four chlorine detector channels ('A', 'B', 'C' and 'D') indicated chlorine concentration levels below the alarm setpoint. The isolation was verified to have occurred, in accordance with procedures, and the control ventilation system isolation was reset at 1653 hours and normal control room ventilation was restored.

Actions Taken to Prevent Recurrence:

A modification to CREFAS has been developed to:

- 1) provide for the analyzer probes to be relocated to a position further away from the air intake louvers. This will prevent contact of the probes with rainwater and snow.
- 2) change the control room ventilation system isolation logic to a one out of two twice logic. This will

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 8 8 - 0 1 4 - 0 0 0 4 OF 0 4	LER NUMBER (6)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		

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

prevent a false signal in one of the chlorine probes from causing an isolation signal and CREFAS actuation.

The modification is scheduled for installation by July 15, 1988.

EIIS Codes:

Control Room Ventilation - (VI)  
Analyzer - (AE)  
CREFAS - (VI)

Previous Similar Occurrences:

Limerick LERs 86-46, 87-03, 87-06, 87-09, and 87-051 reported CREFAS actuations that resulted from a false "C" or "D" channel high chlorine concentration signal during a rainstorm.

Tracking Codes: (C) External Cause  
(B99) Design Deficiency

PHILADELPHIA ELECTRIC COMPANY

2301 MARKET STREET  
P.O. BOX 8699  
PHILADELPHIA, PA. 19101

(215) 841-4000  
May 9, 1988

Docket No. 50-352

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

SUBJECT: Licensee Event Report  
Limerick Generating Station - Unit 1

This LER reports an automatic actuation of the Control Room Emergency Fresh Air Supply (CREFAS) system, an Engineered Safety Feature, resulting from a false high chlorine concentration signal believed to be caused by rainwater.

Reference: Docket No. 50-352  
Report Number: 88-014  
Revision Number: 00  
Event Date: April 16, 1988  
Report Date: May 9, 1988  
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,



R. H. Logue  
Assistant to the Manager  
Nuclear Support Division

cc: W. T. Russell, Administrator, Region I, USNRC  
T. J. Kenny, NRC Senior Resident Inspector

TE22  
11