

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
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TITLE (4) Control Room HVAC Isolation Resulting From a High Chlorine Concentration Signal Caused by Rainwater Contacting an Analyzer Probe

EVENT DATE (5)			LER NUMBER (8)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (9)		
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAMES		DOCKET NUMBER(S)
0 8	1 7	8 8	8 8	0 2	0 0	0 9	0 6	8 8			0 5 0 0 0 0
											0 5 0 0 0 0

OPERATING MODE (6) 1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR § (Check one or more of the following) (11)									
POWER LEVEL (10) 0 8 7	<input type="checkbox"/> 20.402(b)	<input type="checkbox"/> 20.406(a)	<input checked="" type="checkbox"/> 80.73(a)(2)(iv)	<input type="checkbox"/> 73.71(b)						
	<input type="checkbox"/> 20.406(a)(1)(i)	<input type="checkbox"/> 80.36(a)(1)	<input type="checkbox"/> 80.73(a)(2)(v)	<input type="checkbox"/> 73.71(a)						
	<input type="checkbox"/> 20.406(a)(1)(ii)	<input type="checkbox"/> 80.36(a)(2)	<input type="checkbox"/> 80.73(a)(2)(vi)	OTHER (Specify in Abstract below and in Text, NRC Form 305A)						
	<input type="checkbox"/> 20.406(a)(1)(iii)	<input type="checkbox"/> 80.73(a)(2)(i)	<input type="checkbox"/> 80.73(a)(2)(vii)(A)							
	<input type="checkbox"/> 20.406(a)(1)(iv)	<input type="checkbox"/> 80.73(a)(2)(ii)	<input type="checkbox"/> 80.73(a)(2)(viii)(B)							
<input type="checkbox"/> 20.406(a)(1)(v)	<input type="checkbox"/> 80.73(a)(2)(iii)	<input type="checkbox"/> 80.73(a)(2)(ix)								
<input type="checkbox"/> 20.406(a)(1)(vi)	<input type="checkbox"/> 80.73(a)(2)(iv)	<input type="checkbox"/> 80.73(a)(2)(x)								

LICENSEE CONTACT FOR THIS LER (12)		TELEPHONE NUMBER	
NAME Charles A. Mengers, Senior Engineer, Licensing Section		AREA CODE 2 1 5	NUMBER 8 1 4 1 - 5 1 8 4

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)  
Abstract: 88-028

On August 17, 1988 at 1832 hours, the main control room ventilation system isolated on a "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 severe local thunderstorms. The high chlorine concentration signal was 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 plenum louvers. When the "D" chlorine detector spiked, operators implemented Special Event Procedure SE-2 (Toxic Gas Procedure) and manually tripped the "A", "B", and "C" chlorine isolation channels in accordance with procedures. Proper control room isolation was verified. After the spike, Operations personnel verified that all chlorine channels were within normal levels (less than 0.1 ppm). The isolation was reset at 1910 hours, and normal control room ventilation was restored. There was no chlorine intake to the main control room. There was no release of radioactive material to the environment as a result of this event. A modification was implemented on August 25, 1988 to mitigate false, environmentally related, automatic control room ventilation system isolations.

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LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1)  Limerick Generating Station Unit 1	DOCKET NUMBER (2)  0 6 0 0 0 3 5 2	LER NUMBER (6)			PAGE (3)	
		YEAR 8 8	SEQUENTIAL NUMBER - 0 2 8	REVISION NUMBER - 0 0	0 2	OF 0 4

TEXT (if more space is required, use additional NRC Form 366A (1/77))

Unit Conditions Prior to the Event:

Operating Mode 1 (Power Operation)

Reactor Power 87%

Description of the Event:

On August 17, 1988 at 1832 hours, the main control room ventilation system isolated on a "D" channel high chlorine concentration signal. The "B" train of the Control Room Emergency Fresh Air Supply (CREFAS) system, an Engineered Safety Feature, started as designed when the chlorine analyzer momentarily spiked to approximately 1.0 ppm. The isolation occurred during severe local thunderstorms. After the isolation, control room operators implemented Special Event Procedure SE-2 (Toxic Gas Procedure). Operators verified that the "A", "B", and "C" chlorine detectors indicated normal levels and determined that the "D" channel isolation signal was false. Operations personnel then manually tripped the "A", "B", and "C" chlorine isolation channels according to procedures to ensure complete isolation of the control room ventilation system. Proper control room isolation was verified. After the spike, Operations personnel verified that all four chlorine isolation channels were within normal range (less than 0.1 ppm). The isolation was reset at 1910 hours, and normal control room ventilation was restored. The duration of the control room isolation was 38 minutes.

Consequences of the Event:

The main control room ventilation system tripped and isolated. The "B" train of the CREFAS responded as designed. The "A" train of the CREFAS was in standby and available for operation. There was no chlorine intake to the main control room. If actual chlorine had been detected, as indicated by the redundant chlorine detectors, the chlorine detection system would have responded as designed and all control room personnel would have donned self-contained breathing apparatus within two minutes as required by SE-2. There was no release of radioactive material as a result of this event.

## 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   2   8	-   0   0	0   3	OF	0   4

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

Cause of the Event:

The cause of the main control room ventilation system isolation and initiation of the "B" train of CREFAS was rainwater coming in contact with the chlorine analyzer probe during severe local thunderstorms. This caused 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 making it susceptible to moisture intrusion during inclement weather conditions.

Corrective Actions:

Control Room personnel implemented Special Event Procedure SE-2 (Toxic Gas Procedure) immediately following the isolation. Operations personnel then verified that the "A", "B", and "C" chlorine detectors indicated normal levels and determined that the "D" channel isolation signal was false. Operations personnel then manually tripped the "A", "B", and "C" chlorine isolation channels, in accordance with System Procedure S78.0.B - "Verification of Control Room HVAC Response to a Control Room Isolation Signal", to ensure complete isolation of the main control room ventilation system as directed by SE-2. After the spike, Operations personnel verified that the chlorine detector channels ("A", "B", "C", and "D") indicated chlorine concentration levels were within normal levels (less than 0.1 ppm). The main control room ventilation system isolation was reset and normal control room ventilation was restored at 1910 hours.

Actions Taken to Prevent Recurrence:

On August 28, 1988 a modification to CREFAS, relocating the chlorine detector probes away from the outside air intake plenum louvers, was implemented. This modification provides better protection from rainwater, dirt, or other contaminants coming in contact with the detector probes mitigating future false, environmentally related, control room ventilation system isolations. A second modification, designed to change the present chlorine detection system logic from a "one-out-of-one-once" to a "two-out-of-two-once" configuration, will be

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FACILITY NAME (1)  Limerick Generating Station Unit 1	DOCKET NUMBER (2)  0   5   0   0   0   3   5   2	LER NUMBER (6)			PAGE (3)	
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		8   8	-   0   2   8	-   0   0	0   4	OF 0   4

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

implemented; however, a complete date has not been determined. This modification is designed to prevent future false, environmentally related, control room ventilation system isolations. A supplement to this report will be issued upon completion of this modification.

EEIS Codes:

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

Previous Similar Occurrences:

Limerick LERs 86-46, 87-03, 87-06, 87-09, 87-051, 88-014, 88-018, 88-021, 88-026, and 88-027 reported CREFAS actuations resulting from false "C" or "D" high chlorine concentration signal during rainy weather conditions.

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

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E. P. FOGARTY  
MANAGER  
NUCLEAR SUPPORT DIVISION

10 CFR Part 50  
Section 73

September 6, 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 Air Supply (CREFAS), an Engineered Safety Feature, resulting from a chlorine concentration signal caused by rainwater contacting a chlorine analyzer probe.

Reference:	Docket No. 50-352
Report Number:	88-028
Revision Number:	00
Event Date:	August 17, 1988
Report Date:	September 6, 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,



E. P. Fogarty  
Manager  
Nuclear Support Division

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

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