10 CFR 50.73

PHILADELPHIA ELECTRIC COMPANY

LIMERICK GENERATING STATION
P. O. BOX A
SANATOGA, PENNSYLVANIA 19464
(215) 327-1200 EXT. 2000

J. DOERING, JR.
PLANT MANAGER
LIMERICK GENERATING STATION

May 12, 1992
Docket Nos. 50-352
50-353
License Nos. NPF-[illegible]
NPF-[illegible]

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 two manual isolations of the Main Control Room Ventilation system and the actuation of the Control Room Emergency Fresh Air Supply system, both Engineered Safety Features. These isolations were required by procedures in response to a high toxic chemical concentration alarm on separate occasions. The cause of these isolations was momentary high toxic chemical concentration indication of an intermittance nature.

Reference:	Docket Nos. 50-352 and 50-353
Report Number:	1-92-006
Revision Number:	00
Event Dates:	April 17, 1992
	April 28, 1992
Report Date:	May 12, 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,

KOS:cah

cc: T. T. Martin, Administrator, Region I, USNRC
T. J. Kenny, USNRC Senior Resident Inspector, LGS

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1/1

NRC Form 366
(9-83)

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO. 3150-0104
EXPIRES 8/31/88

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Limerick Generating Station, Unit 1	0 5 0 0 0 3 5 2	1 OF 0 4

TITLE (4)
Manual Isolation of the Main Control Room due to High Toxic Chemical Concentration Alarm.

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 4	1 7	9 2	9 2	— 0 0 6	— 0 0	0 5	1 2	9 2	Limerick, Unit 2	0 5 0 0 0 3 5 3
										0 5 0 0 0

OPERATING MODE (9): N

POWER LEVEL (10): 0 0 0

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)

20.402(b)	20.405(c)	X 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)(vii)	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)(viii)(A)	
20.405(a)(1)(iv)	50.73(a)(2)(ii)	50.73(a)(2)(viii)(B)	
20.405(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(x)	

LICENSEE CONTACT FOR THIS LER (12)

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

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	

SUPPLEMENTAL REPORT EXPECTED (14)

		EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
YES (If yes, complete EXPECTED SUBMISSION DATE)	X NO				

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

On April 17, 1992 and again on April 28, 1992, Main Control Room (MCR) personnel received a MCR annunciator alarm indicating high toxic gas concentration in the MCR ventilation fresh air intake. In each instance, MCR personnel entered Special Event procedure SE-2, "Toxic Gas," donned self-contained breathing apparatus, and manually initiated a MCR ventilation system isolation, an Engineered Safety Feature (ESF). As a result of the MCR ventilation system isolation, the Control Room Emergency Fresh Air Supply (CREFAS) system, also an ESF, initiated as designed and provided total recirculation of the MCR air without any fresh air intake from the outside atmosphere. Chemistry personnel were notified and air samples from the MCR were obtained. No toxic gas concentrations were detected. The consequences of these events were minimal in that no toxic gas was present in the MCR. The cause of these events was a momentary high toxic chemical concentration (i.e., ethylene oxide) indication of an indeterminate nature. Subsequent troubleshooting failed to clarify the exact cause of the high indications. We are investigating several options to decrease the vulnerability of the toxic gas detection system to a single analyzer malfunction or spurious signal to minimize the required MCR isolations. Additionally, an improved Preventive Maintenance (PM) program which was recommended in March, 1992 by the manufacturer, Foxboro Analytical, is being implemented which will improve the analyzer reliability and may minimize spurious signals.

Unit Conditions Prior to the Event:

Unit 1 reactor core was offloaded.

Unit 2 was in Operational Condition 1 (Power Operation) at 100% Power Level.

The Main Control Room Ventilation System (EIIS:VI) was aligned in its normal operating mode with the fresh air supply from the outside atmosphere. There were no structures, systems, or components out of service which contributed to these events.

Description of the Event:

On April 17, 1992, at approximately [illegible] licensed Main Control Room (MCR) personnel received a MCR annunciator alarm indicating that a high toxic gas concentration was detected in the MCR ventilation fresh air intake by the toxic gas detection system. Licensed MCR operations personnel immediately entered Special Event procedure SE-2, "Toxic Gas," donned self-contained breathing apparatus (SCBA), and manually initiated a MCR Ventilation system isolation, an Engineered Safety Feature (ESF). As a result of the manual MCR ventilation system isolation, the B train of the Control Room Emergency Fresh Air Supply (CREFAS) system, also an ESF, initiated as designed and provided total recirculation of the MCR air without any fresh air intake from the outside atmosphere. The A train of the CREFAS system remained in the automatic standby mode.

A MCR operator observed that the ethylene oxide concentration indication spiked to 4.63 parts per million (ppm) on only the B analyzer and then returned to a normal level. The ethylene oxide high concentration alarm setpoint is 3.5 ppm. No other indications of any toxic gas were observed on the A and B toxic gas analyzers.

Chemistry personnel then donned SCBAs, entered the MCR, and obtained air samples. The results of the air sample analysis indicated that there were no detectable toxic gas concentrations present in the MCR. At 0500 hours, MCR personnel removed their SCBAs. Chemistry personnel verified no toxic gas in the fresh air intake plenum, and the MCR chlorine isolation was reset at 0540 hours.

On April 28, 1992, at 0006 hours, licensed MCR personnel received a second MCR annunciator alarm associated with the toxic gas detection system. Licensed MCR operations personnel immediately entered procedure SE-2, donned SCBAs, and manually initiated a MCR ventilation system isolation. As a result of the manual MCR ventilation system isolation, the B train of the CREFAS system initiated as designed and provided total recirculation of the MCR air without any air intake from the outside atmosphere. The A train of the CREFAS system remained in the automatic standby mode. A MCR operator observed that the ethylene oxide concentration indication rose to 10.12 ppm on only the B analyzer and then returned to a normal level. No other indications of any toxic gas were observed on the A and B toxic gas analyzers.

Chemistry personnel then donned SCBAs, entered the MCR, and obtained air samples. The results of the air sample analysis indicated that there were no detectable toxic gas concentrations present in the MCR. At 0028 hours, MCR personnel removed their SCBAs. Chemistry personnel verified no toxic gas in the fresh air intake plenum, but the MCR isolation was not immediately reset due to the possibility of receiving another high toxic chemical concentration alarm. The MCR isolation was reset at 0747 hours.

Four hour notifications to the NRC were made in accordance with the requirements of 10 CFR 50.72(a)(2)(ii) at 0600 hours on April 17, 1992 and at 0158 hours on April 28, 1992, since these events resulted in manual actuations of ESFs. This written report is being submitted in accordance with 10 CFR 50.73(a)(2)(iv).

Analysis of the Event:

The consequences of these events were minimal in that no toxic gas was present in the MCR. There was no release of radioactive material to the environment as a result of this event. The MCR ventilation system was isolated, and the B train of CREFAS started and operated as designed during each event. The redundant A train of CREFAS was in the automatic standby mode and was available for operation in the event the B train failed to properly function.

In addition, if an actual concentration of toxic gas had been present, the MCR was properly isolated from the outside atmosphere; thereby ensuring adequate protection for the MCR operators. In addition, MCR operators donned SCBA which provided the necessary immediate protection.

Cause of the Event:

The cause of these events was a momentary indication of a high toxic gas concentration of an indeterminate nature on the B toxic gas analyzer. The sampling by Chemistry personnel did not detect any toxic gases in the MCR or outside air intake plenum. Subsequent monitoring of the B toxic gas analyzer by Instrumentation and Controls (I&C) personnel failed to identify the exact cause of the high indications.

Corrective Actions:

Following each of these failures, the plant operations and I&C staff reviewed the events and the operation of the B toxic gas analyzer and concluded that the events were spurious and that the analyzer was operating properly. The historical data from the B analyzer was reviewed and no other toxic chemical concentration spikes were observed. There was no indication of system malfunction alarms or analyzer error messages before, during, or after these events. Site personnel concluded that the toxic gas analyzer was operable and capable of detecting a high toxic chemical concentration.

In March of this year, discussions with the equipment manufacturer, Foxboro Analytical, were conducted. These discussions concluded that a more detailed

preventive maintenance (PM) program should be implemented for the toxic chemical analyzers. The PM program will improve the analyzer reliability and may minimize spurious signals. This PM program will include routine component replacements, inspections, cleaning, and calibration when each analyzer is returned to the equipment manufacturer for periodic routine maintenance. This PM program was being performed for the first time on the spare analyzer assembly at the time of these events. The analyzer assembly which was installed in the B channel had not yet had the newly developed PM program performed on it. After the refurbished spare is fully functional, it will be installed to replace the assembly in the B channel within 5 days. The performance of this analyzer will then be monitored to determine the effectiveness of the new PM program.

As discussed in LER 1-91-025, we are currently investigating options to decrease the vulnerability of the toxic gas detection system to a single analyzer malfunction or spurious signal, to minimize the required MCR isolations. This investigation was initiated on December 6, 1991, following LER 1-91-025, and was conducted by corporate engineering. The proposed changes to the system include system replacement, logic changes and/or setpoint changes. Recommendations were received on April 29, 1992. A decision on which corrective actions will be implemented and the schedule for implementation is expected to be made by July 31, 1992.

Previous Similar Occurrences:

LERs 1-85-90, 1-86-22, 1-86-28, 1-88-43, 1-89-29, 1-91-21 and 1-91-25 reported manual isolations of the MCR ventilation system due to high toxic chemical concentration signals. None of these events occurred as a result of indeterminate high indications except LERs 1-85-90 and 1-91-25. The exact cause of the event discussed in LER 1-85-90 was never determined and no further deficiencies were identified before the event reported in LER 1-91-25. Since the investigation of options to decrease the vulnerability of the toxic gas detection system to a signal analyzer malfunction or spurious signal is ongoing, this corrective action would not have prevented the high toxic chemical isolations on April 17, 1992 or April 28, 1992.

Tracking Code: X1 (Failure with unknown cause)