NRC Form 366
(9-83)

U.S. NUCLEAR REGULATORY COMMISSION

LICENSEE EVENT REPORT (LER)

APPROVED OMB NO. 3150-0104
EXPIRES: 8/31/85

FACILITY NAME (1)
Limerick Generating Station - Unit 1

DOCKET NUMBER (2) 0 5 0 0 0 3 5 2

PAGE (3) 1 OF 0 3

TITLE (4)
Non-Conservative Toxic Gas Detection System Setpoint

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 7	2 9	8 5	8 5	- 0 6 5	- 0 0	0 8	2 8	8 5		0 5 0 0 0
										0 5 0 0 0

OPERATING MODE (9): 4

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)	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)	X 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: John C. Nagle, Engineer - Special Projects

TELEPHONE NUMBER: AREA CODE 2 1 5 8 4 1 - 5 1 8 4

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)

[ ] YES (If yes, complete EXPECTED SUBMISSION DATE)

[X] NO

EXPECTED SUBMISSION DATE (15): MONTH | DAY | YEAR

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

Abstract: 85-065

On July 22, 1985, during discussions with a representative of The Foxboro Company, the supplier of the control room Toxic Gas Detection System (TGDS), it was learned that the alarm limit being utilized for phosgene gas detection was non-conservative. The TGDS monitors the fresh air intake of the control room ventilation system for ammonia, ethylene oxide (EtO), formaldehyde, vinyl chloride, and phosgene gases. Phosgene is detected on the EtO channel due to the similar light absorption properties of the two gases. The EtO channel alarm setpoint of 50 parts per million (ppm) should have been 4.0 ppm in order to cause an alarm upon detection of phosgene gas concentrations in excess of the Technical Specification limit. The EtO alarm setpoint was decreased to 3.5 ppm. There were no adverse consequences as a result of this event.

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Description of the Event:

On July 22, 1985, during discussions with a representative of The Foxboro Company, it was learned that the alarm setpoint being used for detection of phosgene gas, one of five toxic gases monitored by the control room Toxic Gas Detection System (TGDS), was non-conservative. The MIRAN 981 TGDS monitors the fresh air intake of the Main Control Room Ventilation System for ammonia, ethylene oxide (EtO), formaldehyde, vinyl chloride, and phosgene gases. Detection of concentrations above the predetermined limit for any of these gases will activate an alarm. The system, which utilizes spectrophotometric techniques, does not detect phosgene directly, but instead responds to phosgene on the EtO channel, due to the similar light absorption characteristics of the two gases. Recent testing performed at Foxboro indicates that the EtO channel alarm setpoint used since October, 1984 was such that phosgene concentrations in excess of the Technical Specification limit (0.4 parts per million (ppm)) would not have actuated the alarm.

The EIIS code for the affected system is VI.

Consequences of the Event:

The potential for undetected control room phosgene gas concentrations above the Technical Specification limit existed. Phosgene gas is a byproduct of the combustion of vinyl chloride, which may be present outside of the plant site. However, since the likelihood of the simultaneous occurrence of a significant leakage of vinyl chloride combined with a large fire and unfavorable meteorology is relatively small, the consequences of this event are minimal. In addition, it is likely that the presence of phosgene would have been detected by control room personnel due to the physical effects and odor of the gas at low concentrations, with sufficient time to permit the proper response. Moreover, the TGDS would still have alarmed at phosgene levels of approximately 5.0 ppm with the EtO channel alarm setpoint of 50 ppm.

Cause of the Event:

Technical Specification 3.3.7.8.2 requires that the TGDS alarm actuates upon detection of EtO concentrations of 50 ppm and upon detection of phosgene concentrations of 0.4 ppm. Foxboro had informally stated during the initial startup of the system that an EtO alarm setpoint of 50 ppm would also cause an alarm upon detection of concentrations of 0.4 ppm of phosgene gas. Accordingly, the 50 ppm EtO setpoint was used, with the understanding that reliable phosgene detection capability existed. In response to a PECo Quality Assurance finding (N-440), Foxboro was requested to document the actual equivalency for the two gases. Results of the equivalency test performed by Foxboro on a spare detector indicate that a 0.4 ppm concentration of phosgene corresponds to 4.0 ppm of EtO, not 50 ppm as previously stated. Therefore, the establishment of an EtO alarm setpoint greater than 4.0 ppm resulted in a non-conservative alarm limit for phosgene gas detection.

Corrective Actions:

The EtO/phosgene equivalency for the spare detector indicates that an EtO setpoint of 4.0 ppm is necessary to cause an alarm upon 0.4 ppm of phosgene gas. The two detectors in service, the 'A' and 'B', will be tested for EtO/phosgene equivalency when they are returned to Foxboro for nitrogen zero calibration. Pending this testing, the EtO alarm setpoint of the 'A' and 'B' detectors has been decreased to a more conservative value of 3.5 ppm.

Previous Similar Occurrences:

None.

PHILADELPHIA ELECTRIC COMPANY

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August 28, 1985

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 concerns a non-conservative phosgene gas alarm limit in the control room Toxic Gas Detection System.

Reference:	Docket No. 50-352
Report Number:	85-065
Revision Number:	00
Event Date:	July 29, 1985
Report Date:	August 28, 1985
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)(i).

Very truly yours,

W. T. Ullrich
Superintendent
Nuclear Generation Division

cc: Dr. Thomas E. Murley, Administrator, Region I, USNRC
E. M. Kelly, Senior Site Inspector
See Service List

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cc: Judge Helen F. Hoyt
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Atomic Safety & Licensing Appeal Board
Atomic Safety & Licensing Board Panel
Docket & Service Section (3 Copies)
E. M. Kelly
Timothy R. S. Campbell

July 3, 1985