

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) DOCKET NUMBER (2) PAGE (3)  
 Perry Nuclear Power Plant, Unit 1 0 5 0 0 0 4 4 0 1 OF 0 3

TITLE (4) Auxiliary Boiler Exhaust and Other Indeterminate Problems Cause Trips of Ethylene Oxide Detectors Resulting in Control Room HVAC Realignment to Emergency Recirculation

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
0	6	23	88	02	00	0	7	22	
									DOCKET NUMBER(S) 0 5 0 0 0

OPERATING MODE (9) THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR § (Check one or more of the following) (11)  
 3

POWER LEVEL (10) 0 0 0	20.402(b)	20.405(a)(1)(i)	20.405(a)(1)(ii)	20.405(a)(1)(iii)	20.405(a)(1)(iv)	20.405(a)(1)(v)	20.405(a)(1)(vi)	50.73(a)(2)(iv)	50.73(a)(2)(v)	50.73(a)(2)(vii)	50.73(a)(2)(viii)(A)	50.73(a)(2)(viii)(B)	50.73(a)(2)(ix)	73.71(b)	73.71(c)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
								<input checked="" type="checkbox"/>								

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER
Gregory A. Dunn, Compliance Engineer, Extension 6484	2 1 1 6 2 5 9 - 1 3 7 3 1 7

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)

YES (if yes, complete EXPECTED SUBMISSION DATE)	<input checked="" type="checkbox"/> NO	EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR

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

On June 23, 1988 at 1227 and July 15 at 1927, both trains of the control room heating, ventilating and air conditioning (CRHVAC) system shifted into the Emergency Recirculation mode due to high toxic gas signals. Prior to each event, one train of the system had been in normal operation while one was in standby. The high toxic gas signals originated from three ethylene oxide detectors located in the CRHVAC intake duct.

The first event has been attributed to heavy black smoke exhausting from the auxiliary boiler which was started just prior to the actuation. This event was not initially reported in accordance with 10 CFR 50.72(b)(2)(i) because of inaccurate guidance in an administrative procedure. Although the ethylene oxide detectors provide no engineered safety feature (ESF) signal, the Emergency Recirculation mode of CRHVAC is an ESF. The initial investigation of the second event suspected that exhaust from a truck parked upwind of the CRHVAC intake caused the trip. However, the ethylene oxide detectors remained at abnormally high levels following the event indicating a calibration problem. Checks of control room air using hand held detectors identified no abnormal readings.

To prevent recurrence, the three affected ethylene oxide detectors have been recalibrated and the administrative procedure which provides guidance regarding reporting requirements will be revised to clarify ESF actuation reporting. Additionally, an evaluation of the feasibility of deleting the ethylene oxide detector automatic actuation function, while leaving the alarm function operable, will be performed.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1)  Perry Nuclear Power Plant, Unit 1	DOCKET NUMBER (2)  0 5 0 0 0 4 4 0	LER NUMBER (6)			PAGE (3)	
		YEAR 8 8	SEQUENTIAL NUMBER - 0 2 8	REVISION NUMBER - 0 0	0 2	OF 0 3

TEXT (If more space is required, use additional NRC Form 388A's) (17)

On June 23, 1988 at 1227 and July 15 at 1927, Trains A and B of the control room heating, ventilating and air conditioning (CRHVAC) system [VI] shifted into the Emergency Recirculation mode due to high toxic gas signals. During the first event, the plant was in Operational Condition 3 (Hot Shutdown), reactor vessel [RPV] temperature was approximately 450 degrees and pressure was approximately 340 psig. For the second event, the plant was in Operational Condition 1 (Power Operation), reactor power was approximately 97% and reactor vessel pressure was approximately 1004 psig. Prior to both events, one train of the CRHVAC system was in normal operation while the other train was in standby.

On July 15, 1988 at 1927, high toxic gas alarms/trip from three of the four ethylene oxide detectors [DET] caused an automatic shift of the CRHVAC system to its Emergency Recirculation mode (the remaining detector was out of service). The detectors are located in CRHVAC intake duct. Operators placed Train A in standby in accordance with the system operating instructions, leaving the B train in Emergency Recirculation, and then commenced an investigation. At 2011, the A train received a second automatic initiation signal from these detectors causing it to restart in Emergency Recirculation. Operators subsequently secured the A train. The B train remained in Emergency Recirculation pending completion of an investigation by operators and instrument troubleshooting. Control room air was checked for toxic gas using hand held detectors. No abnormalities were detected.

It was initially believed that the high ethylene oxide alarms/trips were the result of exhaust from a truck parked upwind of the CRHVAC air intake. However, ethylene oxide readings continued to remain at higher than normal levels and alarms were received several days later with no apparent cause indicating a calibration problem. (The ethylene oxide monitors were reading in excess of 30 ppm). Calibration checks were not immediately performed because of the unavailability of ethylene oxide calibration kits which were on order.

During a review of this event for reportability, it was determined that a previous similar event had occurred on June 23 at 1227, but had not been reported to the NRC in accordance with 10 CFR 50.72(b)(2)(ii), unexpected actuations of ESF systems. Heavy smoke exhaust resulting from a startup of the auxiliary boiler, upwind of the control room, was observed just prior to this event and has been attributed as the cause of the ethylene oxide monitor trips. Operators performed similar actions to those described above. At 1309, the system was returned to its normal configuration. It is not believed that the cause of this event is related to the July 15 event. The cause of the missed notification was due to inaccurate administrative guidance. It was determined that the administrative procedure describing the various reporting requirements contains a paragraph intended to clarify whether a particular system actuation was reportable. The paragraph which states in part, that the ESF logic must cause the actuation, implies that a non-ESF sensor which trips ESF logic and the associated system would not be a reportable event.

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		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
		8   8	-   0   2   8	-   0   0	0   3	OF	0   3

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

Subsequent review determined this to be incorrect in that, unexpected actuations of ESF systems (the Emergency Recirculation mode of CRHVAC is an ESF) are reportable to the NRC.

The function of the CRHVAC system is to provide cooling, heating, ventilation, and when required, smoke removal for the control room equipment areas and offices during normal plant operation, plant shutdown, loss of offsite power and during periods of emergency including loss of coolant accidents or high radiation conditions. Additionally, because of shipments of toxic chemicals on nearby railroads, the CRHVAC system provides protection against high toxic gas levels. However, the Updated Safety Analysis Report (USAR) Section 2.2.3 concludes that there are no chemicals stored in the plant which could interfere with control room occupancy nor any potential hazards to the Perry control room from toxic chemicals associated with nearby industrial and military facilities. Additionally, the CRHVAC system operated as designed during the events and there was no actual detection of ethylene oxide in the control room. Consequently, the event is not considered safety significant. No previous similar events were identified.

To prevent recurrence the following actions have been or will be taken:

- 1) The three affected ethylene oxide detectors have been recalibrated.
- 2) The administrative procedure which provides guidance regarding reporting requirements will be changed to clearly delineate when ESF system actuations are reportable.
- 3) Engineering will evaluate the feasibility of deleting the ethylene oxide detector automatic control room emergency recirculation actuation function while leaving the alarm function operable.

Energy Industry Identification System Codes are identified in the text as [XX].