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)
Fermi 2	0 5 0 0 0 3 4 1	1 OF 0 4

TITLE (4) Actuation of Control Center HVAC Emergency Mode - Caused by Malfunction of Radwaste Building Exhaust Radiation Monitor

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 5 0 0 0
0 1	0 6	8 6	8 6	0 0 1	0 1	0 3	2 1	8 6		0 5 0 0 0

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)	0 0 0	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
L. P. Bregni, Compliance Engineer	AREA CODE 3 1 3 5 8 6 - 5 3 1 3

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	
B	IL	RBE	0 7 0	N							

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)

ENTIRE ABSTRACT REWRITTEN

At 2359 hours on January 6 1986, the Control Center HVAC entered the Recirculation mode, which is an Engineered Safety Feature actuation. This occurred when the Radwaste Building gaseous effluent radiation monitor malfunctioned. The monitor is an Eberline System Particulate Iodine and Noble Gas (SPING) 3. A logic analyzer was installed on the SPING to detect any initiation signals, because the actual cause for the malfunction was not known. At 1927 hours on January 27, power to the logic analyzer was lost causing actuation of the Recirculation mode of the Control Center HVAC. During both actuations of the Recirculation mode, the plant was in Operational Condition 4 (Cold Shutdown).

Detroit Edison and Eberline have determined that the programming in an Erasable Programable Read Only Memory (EPROM) was in error. A test EPROM with the programming corrected has been used in one of the SPINGs and has operated without a failure. An Engineering Design Package is being prepared to procure and install the new EPROM in the other SPINGs.

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TEXT (If more space is required, use additional NRC Form 366A's) (17)

At 2359 hours on January 6, 1986 while the plant was in Operational Condition 4 (Cold Shutdown), the control room Nuclear Supervising Operator (NSO) noticed annunciation in alarm window 3D46, "Radwaste Bldg Vent Exhaust Radiation Monitor Upscale/Inop". Annunciation in this window indicates a high radiation alarm/trip of the Radwaste Building ventilation exhaust gaseous effluent radiation monitor. This monitor is an Eberline System Particulate Iodine and Noble Gas (SPING) 3 monitor. Per plant design and Technical Specifications, this alarm/trip automatically isolates the Radwaste Building HVAC and initiates the Recirculation mode of the Control Center HVAC; the latter is an Engineered Safety Feature (ESF) actuation. Automatic isolation of Radwaste HVAC and actuation of the Control Center HVAC recirculation mode were verified by the operator.

Concurrently, the shift chemistry technician noticed local (flashing light) alarms at the Radwaste Building SPING monitor, indicating high radiation and/or mechanical trouble conditions. The chemistry technician verified the local reading at the monitor for the low range noble gas channel. The chemistry technician returned to the Control Center and notified the operator of these conditions.

The SPING monitor reading was 9.1 E-7 microcuries per cubic centimeter (uCi/cc) (Xe-133 Equivalent), which was below the high radiation alarm/trip setpoint of 2.0 E-6 uCi/cc. The high radiation alarm/trip setpoint was established at three times average background level, based on guidance in the Offsite Dose Calculation Manual (ODCM), which states that if no release is planned for a particular pathway, the monitor setpoint should be established as close to background as practical, to alarm if an inadvertent release should occur, without causing spurious alarms.

The shift chemistry technician attempted to verify the monitor high radiation alarm at the SPING radiation monitoring system control terminal, the Eberline CT-2B, in the Control Center. The chemistry technician noted that the alarm condition light on the CT-2B was not illuminated. He then cleared and reset the alarm, returning the Radwaste SPING unit to normal status. Detail history printouts from the CT-2B showed an alarm condition and average concentration of 5.08 E-6 uCi/cc in the noble gas channel of the Radwaste Building SPING during the ten minute interval from 2350-0000 hrs.

The Control Room NSO conferred with the chemistry technician and the Radwaste Control Room operator to verify that there were no known radiological operations in progress in the Radwaste Building, (e.g., radwaste processing), that no area radiation monitors were indicating a high radiation alarm condition, and that the Radwaste Building SPING alarms had been cleared and the unit was indicating normal conditions.

In addition, the Control Room NSO had been made aware of spurious alarms which had occurred on previous occasions around midnight. The previous alarms had been attributed to problems in the microprocessor and communications interface between the SPING CT-2B control terminal and SPING units. From this information, the Control Room NSO determined that the alarm condition was no longer present and probably was spurious.

At 0012 hours on January 7, the Control Room NSO restored the Control Center HVAC and the Radwaste HVAC to normal status. The chemistry technician was assigned to obtain a followup noble gas grab sample at the Radwaste SPING monitor. This was done at 0150 hours. Sample analysis revealed no activity above the Lower Limit of Detection (LLD) as defined in Technical Specification Table 4.11.1.1.1-1. This was reported to the Control Room NSO at 0300 hours. The Nuclear Shift Supervisor (NSS) notified the NRC Operation Center of the ESF actuation, in accordance with 10CFR50.72(b)(2)(ii), at 0338 hours.

Detroit Edison has reviewed this event and has determined that system alarm/trips and resulting automatic actuations were in accordance with plant design and Technical Specifications. Automatic actuation of the Control Center HVAC recirculation mode upon detection of high radiation in building effluent SPING monitors is part of the conservative design basis of the Fermi-2 Control Room. This design is intended to provide the maximum protection to the Control Room operators in case of a radiological release from any of the buildings of the power plant. In the January 6 event, the Control Center HVAC responded to the high radiation signal as designed.

Response actions of plant personnel appear to have been timely, effective and in accordance with approved plant procedures. It does not appear that there was at any time a deviation from plant Technical Specifications related to this event, nor any release of radioactive effluents in excess of limits prescribed in the Radioactive Effluent Technical Specifications (RETS).

Detroit Edison and Eberline jointly researched the problems experienced with the SPING unit at Fermi 2. This work resulted in determining that the Erasable Programable Read Only Memory (EPROM) that contains the instructions for updating the SPING clocks contained programming errors. Under certain conditions, the errors resulted in either a false high alarm condition and actuation of the emergency mode of the Control Center HVAC, or a low failure alarm. Eberline has supplied Detroit Edison a test EPROM with the programming corrected. This EPROM has been installed in the SPING unit that monitors the exhaust stack of the Onsite Storage Facility. Monitoring equipment was also installed on this SPING to assess its performance.

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To date there have been no low failures or high alarms on this unit. Sufficient confidence has now been gained on the new EPROM programming, to allow work to proceed on an Engineering Design Package to procure and install the new EPROMs in the other SPINGs.

Part of the investigation to determine the cause for the January 6, 1986 event included the use of a logic analyzer connected between the SPING and CT-2E to capture any initiation signal. The logic analyzer was connected to a standard 120 volt A.C. utility feed. On January 27, 1986, the power feed to the analyzer was lost. Loss of power to the analyzer caused the SPING central processing unit (CPU) to malfunction. This resulted in actuation of the Recirculation mode of the Control Center HVAC about 1927 hours. To prevent this from recurring, the logic analyzer was connected to the same power feed as the SPING through an isolation transformer. As an added precaution against other potential sources of electrical noise causing the SPING to malfuntion, an auxiliary sample pump that had been connected to the same power feed as the SPING was removed from that feed and connected to a utility feed.

When the Control Center HVAC Recirculation mode was actuated on January 27, Division I, which was shut down at the time, did actuate. Division II, which was operating at the time, did not actuate. Operations personnel tried unsuccessfully to determine why Division II did not automatically actuate, and eventually manually placed it in the Recirculation mode. Because only one division was affected and the safety function was not lost, this occurrence is not a reportable event. However, an extensive investigation was conducted to determine cause, including attempting to recreate the occurrence. During the test to recreate the event both divisions operated properly and no cause could be determined from the test. An exhaustive check of relay contacts and their connections was done and they were found acceptable. A further check of wiring and terminations did result in locating one loose terminal connection in the circuit. The terminal screw was turned one full turn to retighten the connection. A check of the schematic diagram for the affected circuit revealed that a loose connection in that particular part of the logic could have prevented Division II from actuating.

The safety consequence of these events is minimal. The results of the failures experienced on the SPING units involves either a high or low condition. When a unit fails high, the emergency mode of the Control Center HVAC is actuated, which is a conservative response. When a unit fails low, the condition is alarmed, which informs Operations of the condition to allow operator response. Also, because a failure in one unit does not affect the remaining SPINGs, the remaining units are available to monitor effluents and intake air to the Control Center HVAC.

Robert S. Lenart
Plant Manager

Detroit Edison

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Nuclear Operations

March 21, 1986
NP860134

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555

Gentlemen:

Reference: Fermi 2
NRC Docket No. 50-341
NRC Operating License No. NPF-43

Subject: Transmittal of Licensee
Event Report 86-001-01

Please find enclosed LER No. 86-001-01, dated March 21, 1986. This supplement is being submitted as committed in our original transmittal of this LER, Detroit Edison letter NP860055, February 5, 1986. As indicated below, a copy of this LER is being sent to the Administrator Region III.

If you have any questions, please contact us.

Sincerely,

MDLynch for RSL

R. S. Lenart
Plant Manager

Enclosure: NRC Forms 366, 366A

cc: W.G. Rogers
M.D. Lynch

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