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Nuclear Operations

10CFR50.73

May 24, 1991
NRC-91-0069

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

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

Subject: Licensee Event Report (LER) No. 90-012-01

Please find enclosed LER No. 90-012-01, dated May 24, 1991, for a reportable event that occurred on October 16, 1990. A copy of this LER is also being sent to the Regional Administrator, USNRC Region III.

If you have any questions, please contact Barbara Siemasz, Compliance Engineer, at (313) 586-1683.

Sincerely,

Enclosure: NRC Forms 366, 366A

cc: A. B. Davis
J. R. Eckert
R. W. DeFayette
W. G. Rogers
J. F. Stang

Wayne County Emergency
Management Division

IE22
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)
Fermi 2	0 5 0 0 0 3 4 1	1 OF 0 4

TITLE (4)
HPCI Steam Line Flow Transmitter Failure

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)
1 0	1 6	9 0	9 0	0 1 2	0 1	0 5	2 4	9 1		0 5 0 0 0
										0 5 0 0 0

OPERATING MODE (9)	1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)			
POWER LEVEL (10)	9 6 . 1	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)	X 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
Barbara Siemasz, Compliance Engineer	AREA CODE 3 1 3 5 8 6 - 1 6 8 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	
X	B J	P D T	R 3 6 9	Yes							

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 October 16, 1990, at 1715 hours, the High Pressure Coolant Injection System (HPCI) was found to have a failed channel for HPCI Steam Line Differential Pressure High, Division I (Logic A). The system was in standby at the time of discovery of the channel failure. In compliance with Technical Specification action statement requirements, the channel was declared inoperable. The HPCI System was subsequently declared inoperable and the appropriate Limiting Condition for Operation was entered.

Initial investigation revealed that one or both internal circuit boards on differential pressure transmitter, E41-N057A, had failed. The failed circuit boards were sent to Rosemount Inc., for failure analysis to aid in determining the root cause of the channel failure. Results of this analysis indicated a capacitor on the amplifier circuit board failed due to a short circuit across the capacitor plates.

The transmitter was repaired. Post maintenance surveillance testing demonstrated the effectiveness of the repair work and the channel was declared operable. Subsequently, HPCI was declared operable.

Initial Plant Conditions:

Operational Condition: 1 (Power Operation)
Reactor Power: 96.1%
Reactor Pressure: 999 psig
Reactor Temperature: 535°F

Description of Event:

At 1715 hours on October 16, 1990, the High Pressure Coolant Injection System [(HPCI)(BJ)] was found to have a failed channel for HPCI Steam Line Differential High Pressure, Division I (Logic A). The failed channel was found during the performance of a channel check in accordance with surveillance 24.000.02, "Shiftly, Daily, Weekly and Situation Required Surveillances." The failed Division I channel was immediately declared inoperable and the 2 hour action statement for Technical Specification (TS) 3.3.2.b was entered. The 2 hour action statement subsequently expired, and Action 23 of TS 3.3.2-1 was entered. This requires the isolation valves (ISV) for HPCI to be closed within 1 hour and the system to be declared inoperable. Prior to reaching the 1 hour Technical Specification time limit, troubleshooting of the failed Division I channel was conducted by performing surveillance 44.020.203, "NSSSS-HPCI Steam Line Flow Division I, Calibration." At this time, all other Emergency Core Cooling Systems (ECCS) and the Reactor Core Isolation Cooling [(RCIC)(BN)] system were verified operable as required by TS 3.5.1.c.1, Action c.1. Data gathered during the performance of 44.020.203 showed that differential pressure transmitter (PT), E41-N057A, was malfunctioning and had caused the failed channel check. At 1957 hours, HPCI was declared inoperable and HPCI isolation valves, E41-F002 and E41-F042, were de-energized in the closed position in accordance with TS 3.3.2-1, Action 23. A Deviation Event Report (DER 90-0611) was written to investigate and evaluate the Division I channel failure.

At 1430 hours on October 17, 1990, after repair and successful testing of differential pressure transmitter E41-N057A, the HPCI system was declared operable.

Cause of Event:

Initial investigation of the failed Division I channel revealed that one or both circuit boards internal to differential pressure transmitter E41-N057A had failed. The suspect circuit boards were sent to the manufacturer, Rosemount Inc., for failure analysis to aid in determining the root cause of the channel failure. The results of this analysis indicate a capacitor on the amplifier circuit board failed due to a short circuit. The likely cause of the capacitor short circuit was metal migration between the capacitor plates. Along with the failure analysis, Rosemount Inc. reviewed data relating to similar transmitter failures and concluded that this capacitor failure was random.

Analysis of Event:

The Division I channel failure rendered inoperable the capability to detect a HPCI steam line break, therefore HPCI, as required by Technical Specifications, was isolated and declared inoperable. The appropriate Technical Specification actions were met following this event. While HPCI was inoperable, the Automatic Depressurization System (part of ECCS) would have been available to reduce reactor pressure to the point where Low Pressure Coolant Injection (BO) and Core Spray (BM) could have been used. RCIC was available to provide reactor water inventory control. If an event had occurred which would have challenged HPCI, the other ECCS systems and RCIC would have fulfilled this safety function.

Based upon the availability of adequate ECCS and RCIC, this event did not impact the safe operation of the plant or the health and safety of the public.

Corrective Actions:

Initial investigation of the failed Division I channel revealed that one or both circuit boards internal to differential pressure transmitter E41-N057A had failed. The suspect circuit boards were replaced. The effectiveness of the repair work was verified by post maintenance surveillance testing. Along with the failure analysis, Rosemount Inc. reviewed data relating to similar transmitter failures and concluded that this capacitor failure was random.

Previous Similar Events:

This is the only reportable event due to a failed circuit board on a differential pressure transmitter.

Failed Component Data:

E41-N057A, Rosemount Inc. Differential Pressure Transmitter, Model No. 1153DB6RC Serial No. 413862.