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10CFR50.73



Nuclear  
Operations

February 15, 1993  
NRC-93-0020

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. 93-002

Please find enclosed LER No. 93-002, dated February 15, 1993, for a reportable event that occurred on January 14, 1993. A copy of this LER is also being sent to the Regional Administrator, USNRC Region III.

If you have any questions, please contact Paul Jahn, Compliance Engineer, at (313) 586-1617.

Sincerely,

Enclosure: NRC Forms 366, 366A

cc: T. G. Colburn  
A. B. Davis  
W. J. Kropp  
M. P. Phillips  
P. L. Torpey

Wayne County Emergency  
Management Division

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## LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Fermi 2										DOCKET NUMBER (2) 0 1 0 0 0 3 4 1										PAGE (3) 1 OF 0 4									
TITLE (4) HPCI Failure to Start																													
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	1	1	4	9	3	9	3	0	0	2	0	0	0	2	1	5	9	3	0	5	0	0	0						
OPERATING MODE (9)		1		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5. (Check one or more of the following) (11)																									
POWER LEVEL (10)		19		20.402(b)		20.405(e)		50.73(a)(2)(iv)		73.71(b)																			
				20.405(a)(1)(i)		50.38(c)(1)		50.73(a)(2)(v)		73.71(c)																			
				20.405(a)(1)(ii)		50.38(c)(2)		50.73(a)(2)(vi)		OTHER (Specify in Abstract below and in Text, NRC Form 365A)																			
				20.405(a)(1)(iii)		50.73(a)(2)(i)		50.73(a)(2)(vii)(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)(ix)																					
LICENSEE CONTACT FOR THIS LER (12)																													
NAME Paul Jahn, Compliance Engineer										TELEPHONE NUMBER AREA CODE 3 1 3 5 8 6 - 1 6 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																			
x	B, J	J, X	W	2, 9, 0	Yes																								
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)

On January 14, 1993 at 1351 hours, the High Pressure Coolant Injection System (HPCI) failed to start on a simulated auto injection signal during the performance of surveillance 24.202.01, "HPCI Pump Time Response and Operability Test at 1025 psi". The surveillance was suspended. Because surveillance 24.202.01 requires HPCI injection valve E41F006 to be deenergized in the closed position the Technical Specification Limiting Condition for Operation (LCO) had already been entered at 1313 hours with the HPCI system declared inoperable.

HPCI failed to start due to a loss of supply voltage to the governor control system. This was caused by a failed voltage dropping resistor (E41K204). The resistor drops voltage from the 130 VDC bus to 48 VDC. The failed resistor was replaced with an identical resistor. The surveillance was performed satisfactorily, HPCI was declared operable, and the LCO was cleared at 0230 hours on January 15, 1993.

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRR. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (F-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

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		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
		1993	002	00	02	OF	04

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

Initial Plant Conditions:

Operational Condition: 1 (Power Operation)  
Reactor Power: 98%  
Reactor Pressure: 1025 psig  
Reactor Temperature: 540°F

Description of Event:

On January 14, 1993 at 1351 hours, the High Pressure Coolant Injection (HPCI) system failed to start on a simulated auto injection demand signal. Governor valve E4100F068 failed to open during the performance of surveillance 24.202.01 (sect. 5.2) "HPCI Pump Time Response and Operability Test at 1025 psi". The surveillance was stopped. Because surveillance 24.202.01 requires HPCI injection valve E41F006 to be deenergized in the closed position the Technical Specification Limiting Condition for Operation (LCU) had already been entered at 1313 hours with the HPCI system declared inoperable. In accordance with Technical Specification section 3.5.1.c.1, the Core Spray System [(CSS)(BM)], the Low Pressure Coolant Injection System [(LPCI)(BO)]; the Automatic Depressurization System [(ADS)(RV)] and the Reactor Core Isolation Cooling System [(RCIC)(BN)] were verified operable.

An investigation was initiated. The investigation revealed that the governor control circuit was inoperable due to a loss of control power, however, the HPCI system control logic functioned as designed. The HPCI turbine EG-M governor control voltage dropping resistor (E41K204) had failed open, causing the loss of power to the control circuit. The failed resistor was replaced. HPCI was successfully retested per surveillance 24.202.01 and declared operable. The LCO was cleared at 0230 hours on January 15, 1993.

Cause of Event:

The root cause of the HPCI failure to start upon receipt of a simulated initiation signal was a failed voltage dropping resistor. The Technical and Engineering Service failure analysis report states "the resistor showed evidence of overheating and it appears that with time this contributed to the melting and opening of the resistance wire within the resistor". This failure was similar to the type of

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

ESTIMATED BURDEN PFR RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 500 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-630), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1)  Fermi 2	DOCKET NUMBER (2)  0500034193	LER NUMBER (6)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
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TEXT (If more space is required, use additional NRC Form 365A's) (17)

failure reported in Information Notice (IN) 90-51, "Failure of Voltage-Dropping Resistors in Power Supply Circuitry of Electric Governor Systems".

The failure described in IN 90-51 occurred on a dropping resistor assembly that consisted of two voltage-dropping resistors in parallel. Supplement 1 to IN 90-51 described a Woodward governor product improvement which provides a replacement assembly which substitutes a single resistor assembly for the dual resistor design. Fermi 2 utilizes the dropping resistor assembly design which uses a single resistor.

Analysis of Event:

The failure of this resistor would have prevented the HPCI system from performing its safety function. While HPCI was inoperable, the ADS (part of ECCS) would have been available to reduce reactor pressure to the point where LPCI and CSS could have been used. RCIC was available to provide reactor water inventory control at normal operating reactor pressures for modes 1, 2 and 3. If an event had occurred which would have challenged HPCI, the remaining 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:

The E41K204 voltage-dropping resistor was replaced with an identical voltage dropping resistor.

Since the RCIC dropping resistor is of similar design, it was checked to verify its integrity. The RCIC voltage dropping resistor was determined to be functioning, however, to assure RCIC availability it will be replaced by June 1993 during the next system outage.

A team will be formed to review and identify electronic and electrical components that are susceptible to thermal aging. This team will review current practices for monitoring and replacing these



LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE: TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

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TEXT (If more space is required, use additional NRC Form 306A's) (17)

components. As appropriate, they will make recommendations to improve the system availability. Installation of supervisory circuits will be considered. The initial review, to be completed by June 15, 1993, will consist of HPCI and RCIC system components, including the governor control voltage dropping resistors. Based on the results of the review of these two systems, additional systems may be evaluated.

Previous Similar Events:

None.

Failed Component Data:

Woodward Governor EG-M Control Box Power Source Dropping Resistor Box, manufacturer part number 8270-281 S/N 1057467. Pacific resistor wire wound 200 OHMS, 70 watts.