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Detroit Edison



10CFR50.73

May 12, 2000
NRC-00-0052

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

Reference: 1) Fermi 2
NRC Docket No. 50-341
NRC License No. NPF-43

Subject: Licensee Event Report (LER) No. 00-006

Pursuant to 10 CFR 50.73(a)(2)(iv), Detroit Edison is submitting the enclosed Licensee Event Report (LER) No. 00-006. The LER documents an invalid automatic closure of the E1150F008, Residual Heat Removal (RHR) Division 1 and 2 Shutdown Cooling Outboard Containment Isolation Valve, resulting in a brief interruption of shutdown cooling.

No new commitments are being made in this LER.

Should you have any questions or require additional information, please contact Mr. Norman K. Peterson of my staff at (734) 586-4258.

Sincerely,



cc: J. Dyer
A. J. Kugler
M. A. Ring
M. V. Yudas, Jr.
NRC Resident Office
Region III
Wayne County Emergency Management Division

IE22

LICENSEE EVENT REPORT (LER)

(See reverse for required number of
digits/characters for each block)

Estimated burden per response to comply with this mandatory information collection request: 50 hrs. Reported lessons learned are incorporated into the licensing process and fed back to industry. Forward comments regarding burden estimate to the Records Management Branch (T-6 F33), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, and to the Paperwork Reduction Project (3150-0104), Office of Management and Budget, Washington, DC 20503. If an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

FACILITY NAME (1)

Fermi 2

DOCKET NUMBER (2)

05000341

PAGE (3)

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TITLE (4)

ESF Actuation: Invalid Automatic Closure of E1150F008 Resulting in Shutdown Cooling Interruption

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 NAME	DOCKET NUMBER
04	17	00	00	--0 0 6--	00	05	12	00	FACILITY NAME	DOCKET NUMBER
OPERATING MODE (9)		5	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)							
POWER LEVEL (10)		00	20.2201(b)		20.2203(a)(2)(v)		50.73(a)(2)(i)		50.73(a)(2)(viii)	
			20.2203(a)(1)		20.2203(a)(3)(i)		50.73(a)(2)(ii)		50.73(a)(2)(x)	
			20.2203(a)(2)(i)		20.2203(a)(3)(ii)		50.73(a)(2)(iii)		73.71	
			20.2203(a)(2)(ii)		20.2203(a)(4)		X 50.73(a)(2)(iv)		OTHER	
			20.2203(a)(2)(iii)		50.36(c)(1)		50.73(a)(2)(v)		Specify in Abstract below or in NRC Form 366A	
			20.2203(a)(2)(iv)		50.36(c)(2)		50.73(a)(2)(vii)			

LICENSEE CONTACT FOR THIS LER (12)

NAME

Peter W. Smith – Supervisor, Compliance

TELEPHONE NUMBER (Include Area Code)

(734) 586-4271

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX

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 15 single-spaced typewritten lines) (16)

At 0251 hours on April 17, 2000, the reactor was in Mode 5 with the vessel head removed, the reactor cavity filled with water, and the fuel pool gates removed. While removing Division 2 Core Spray from service for planned maintenance, operators removed power fuses to deenergize instrument power supply inverter E21K601B as directed by Safety Tagging Record (STR) 2000-000501. This inverter feeds one of two paralleled DC power supplies in panel H21P081. However, inverter R31K004, which feeds the other DC power supply, had previously been deenergized to support other activities. Therefore, when E21K601B was shutdown, the associated Division 2 instrumentation was deenergized, including the Reactor Steam Dome Pressure instrument loop which initiates the Shutdown Cooling System Isolation on Reactor Steam Dome Pressure – High. Deenergization of this loop initiated the automatic closure of E1150F008, Residual Heat Removal (RHR) Division 1 and 2 Shutdown Cooling Outboard Containment Isolation Valve, causing a trip of the operating RHR pump and a brief interruption of shutdown cooling. Once the cause of the isolation and pump trip was confirmed, power fuses for E21K601B were reinstalled and shutdown cooling was returned to operation. Shutdown cooling was interrupted for 21 minutes due to this isolation, however no change in reactor temperature was observed. This event occurred because proper power supply verification was not performed prior to shutting down inverter E21K601B.

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

Initial Plant Conditions:

Mode	5 (Refueling)
Reactor Power	0 Percent
Reactor Pressure	0 psig
Reactor Temperature	88 Degrees Fahrenheit

Description of the Event:

At 0251 hours on April 17, 2000, while removing Division 2 Core Spray [BM] from service for planned maintenance, operators (utility, non-licensed) removed power fuses to deenergize instrument power supply inverter [INVT] E21K601B (Core Spray Inverter) as directed by Safety Tagging Record (STR) 2000-000501. This Core Spray Inverter feeds one of two paralleled DC power supplies in panel H21P081 (power supply B21K609D) and one of two paralleled DC power supplies in panel H21P083 (power supply B21K610D) such that shutting down the Core Spray Inverter would not affect the associated instrumentation. However, inverter [INVT] R31K004, which feeds the other DC power supplies (B21K609B for H21P081 and B21K610B for H21P083), had previously been deenergized to support other activities, leaving the Core Spray Inverter as the only energized power supply for the associated Division 2 instrumentation. Therefore, when the Core Spray Inverter was shutdown, the associated Division 2 instrumentation was deenergized, including the Reactor Steam Dome Pressure instrument loop which initiates the Shutdown Cooling System [BO] Isolation on Reactor Steam Dome Pressure – High. Deenergization of this loop initiated the automatic closure of E1150F008, Residual Heat Removal (RHR) Division 1 and 2 Shutdown Cooling Outboard Containment Isolation Valve [BO][ISV], causing a trip of the operating RHR pump and a brief interruption of shutdown cooling. This isolation resulted from an invalid partial (outboard) Group 4 (Residual Heat Removal and Head Spray) isolation signal (Reactor Steam Dome Pressure – High) that occurred when the instrument loop was deenergized. The Head Spray valves were already closed at the time of this event, and the Residual Heat Removal (RHR) Division 1 and 2 Shutdown Cooling Inboard Containment Isolation Valve [BO][ISV], E1150F009, was unaffected by the outboard isolation signal.

The control room staff, responding to "Division 2 RHR Pump B/D Motor Tripped" alarm 2D45, entered the loss of shutdown cooling Abnormal Operating Procedure. Once the cause of the isolation and pump trip were confirmed, power fuses for the Core Spray Inverter were reinstalled and shutdown cooling was returned to operation. Shutdown cooling was interrupted for 21 minutes due to this isolation, and no change in reactor temperature was observed. At the time of this event, the reactor had been shutdown for more than two weeks; the reactor was in Mode 5 with the vessel head removed, the reactor cavity filled with water, and the fuel pool gates removed.

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Cause of the Event:

During preparation of STR 2000-000501, the dependent role of the Core Spray Inverter (E21K601B) and inverter R31K004 was identified. Power supply monitoring lights are available on panels H21P081 and P083 that can be used to verify the status of the paralleled power supplies. However, limitations of the software in use at that time for preparation of the STR discouraged the author of the STR from including a specific sequential step directing verification of these monitoring lights prior to deenergizing the Core Spray Inverter. Instead, clarifying comments to this effect were included in the STR.

It is primarily the responsibility of the Work Control Nuclear Assistant Shift Supervisor (WCNASS)(utility, licensed) to ensure that plant conditions are appropriate when releasing a STR. In this case, the WCNASS did not recognize that the tagging for the Core Spray Inverter was included in the overall Core Spray system STR. Combining the inverter tags with the rest of the system STR instead of using a separate STR contributed to this oversight.

The supervisor (utility, licensed) directing the Core Spray tag out was aware of the comment in the STR regarding verification of power supplies and had intended to cover it in his briefing for the evolution. However, verification of the power supply lights was not covered in the briefing.

As a result, verification of the power supplies did not occur prior to deenergizing the Core Spray Inverter. Since power supply inverter R31K004 had been previously removed from service under a different STR, deenergization of the Core Spray Inverter deenergized the associated instrument loops, initiating the isolation signal.

Analysis of the Event:

At the time of this event, the reactor had been shutdown for more than two weeks; the reactor was in Mode 5 with the vessel head removed. The reactor cavity was filled with water greater than 20-feet, 6-inches above the top of the Reactor Pressure Vessel (RPV) flange, and the fuel pool gates were removed. Fuel pool cooling and cleanup system was in service, providing cooling for the spent fuel pool. No CORE ALTERATIONS, handling of irradiated fuel in secondary containment, or operations with a potential for draining the reactor vessel (OPDRVs) were in progress. In this condition, Technical Specification 3.9.7 requires one RHR shutdown cooling subsystem to be operable unless heat losses to ambient are greater than or equal to heat input to the reactor coolant. Continuous operation of RHR shutdown cooling is not required in this condition.

With the unit in MODE 5, the RHR System is not required to mitigate any events or accidents evaluated in the safety analyses. The RHR System is required for removing decay heat to maintain the temperature of the reactor coolant. Although the RHR System does not meet a specific criterion of the NRC Policy Statement, it was identified in 10 CFR 50.36(c)(2)(ii) as an important contributor to risk reduction. Therefore, the RHR System is retained as a Specification. Only one RHR shutdown cooling subsystem is required to be OPERABLE in MODE 5

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with irradiated fuel in the RPV and the water level greater than 20-feet, 6-inches above the RPV flange. Only one subsystem is required because the volume of water above the RPV flange provides backup decay heat removal capability. Additionally, each RHR shutdown cooling subsystem is considered OPERABLE if it can be manually aligned (remote or local) in the shutdown cooling mode for removal of decay heat. Operation (either continuous or intermittent) of one subsystem can maintain and reduce the reactor coolant temperature as required.

Shutdown cooling was interrupted for 21 minutes. During that time there was no observable increase in reactor coolant temperature.

This event resulted in no damage or degradation of plant structures, systems, or components and had no significant potential for causing such damage or degradation.

Corrective Actions:

Operations personnel will be briefed on this event and its causes. This event was documented in the Fermi 2 corrective action program (CARD 00-11412). Further corrective actions are being considered, and will be developed and implemented commensurate with established priorities and processes of the Fermi 2 corrective action program. Additionally, CARD 00-15147 was written to initiate an overall evaluation of human performance issues during STR activities.

Additional Information:

A. Failed Component Data

None

B. Previous Similar Events

LER 96-020-01 documents invalid isolation of the inboard Residual Heat Removal (RHR) Division 1 and 2 Shutdown Cooling Containment Isolation Valve, E1150F009, resulting in a brief interruption of shutdown cooling.