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Detroit Edison



10CFR50.73

February 7, 2000
NRC-00-0015

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. 00-001

Pursuant to 10 CFR 50.73(a)(2)(i)(B) and 10 CFR 50.73(a)(2)(v)(D), Detroit Edison is submitting the enclosed LER No. 00-001. The LER documents an event in which both divisions of Residual Heat Removal (RHR) Low Pressure Coolant Injection (LPCI) System were declared inoperable on January 7, 2000 due to a loss of power to the Division I LPCI Inboard Isolation Valve, E1150-F015A.

The following commitment is being made in this LER:

- This event will be discussed at the next Fermi 2 human performance stand down day to be held prior to the Seventh Refueling Outage (RFO7).

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

Sincerely,

A handwritten signature in black ink, appearing to read "D. R. Gipson".

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.

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TITLE (4)
Residual Heat Removal (RHR) Low Pressure Coolant Injection (LPCI) System Declared Inoperable due to Loss of Power to the Division I LPCI Inboard Isolation Valve

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
01	07	00	00	--0 0 1--	00	02	07	00	FACILITY NAME	DOCKET NUMBER 05000
									FACILITY NAME	DOCKET NUMBER 05000

OPERATING MODE (9)	1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)								
			20.2201(b)		20.2203(a)(2)(v)	<input checked="" type="checkbox"/>	50.73(a)(2)(i)		50.73(a)(2)(viii)	
POWER LEVEL (10)	97		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)		50.73(a)(2)(iv)		OTHER	
			20.2203(a)(2)(iii)		50.36(c)(1)	<input checked="" type="checkbox"/>	50.73(a)(2)(v)		<small>Specify in Abstract below or in NRC Form 366A</small>	
			20.2203(a)(2)(iv)		50.36(c)(2)		50.73(a)(2)(vii)			

LICENSEE CONTACT FOR THIS LER (12)	
NAME Kimberly Harsley – Licensing Engineer	TELEPHONE NUMBER (Include Area Code) (734) 586-1255

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)		
YES (If yes, complete EXPECTED SUBMISSION DATE).	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)
 On January 7, 2000, at 0829 hours, the Division I Low Pressure Coolant Injection (LPCI) Inboard Isolation Valve, E1150-F015A, lost power. The Fermi 2 Accident Analysis takes credit for the operation of the E1150-F015A valve with the initiation of "LPCI Loop Select Logic" during a Loss of Coolant Accident (LOCA). In the event of a break in one of the two reactor recirculation system loops, "LPCI Loop Select Logic" is provided to sense the broken loop and to inject coolant flow into the unbroken loop. Thus, the flow from the two LPCI system loops are interconnected by valving. With the E1150-F015A valve inoperable, both divisions of LPCI were declared inoperable. Technical Specification 3.5.1, Action J, was invoked and Limiting Condition for Operation (LCO) 3.0.3 was immediately entered. At 0837 hours on January 7, 2000, power was restored to the E1150-F015A valve and LCO 3.0.3 was exited, terminating the event.

The cause of the loss of power to the E1150-F015A valve was determined to be a human performance error that most likely resulted from a contract employee inadvertently contacting the Motor Control Center (MCC) 72C-F Position 2C switch while erecting scaffolding in the MCC area. This event will be discussed at the next Fermi 2 human performance stand down day to be conducted prior to the Seventh Refueling Outage (RFO7).

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

Initial Plant Conditions:

Mode 1 (Power Operation)
 Reactor Power 97 Percent
 Reactor Pressure 1023 psig
 Reactor Temperature 540 Degrees Fahrenheit

Description of the Event:

At 0829 hours on January 7, 2000, a control room "Division I Residual Heat Removal (RHR) Valves Thermal Overload" alarm [ALM] was received indicating that one or more Division I RHR System [BO] valves had potentially lost power. Operations personnel were immediately dispatched to the Motor Control Center (MCC) [MCC] 72C-F area on the second floor of the reactor building to investigate the event. The investigation revealed that the Motor-Operated Valve (MOV) [ISV] E1150-F015A, "RHR Division I Low Pressure Coolant Injection (LPCI) Inboard Isolation Valve," had lost power and the MCC 72C-F Position 2C switch was in the "OFF" position. The MCC bucket and switch were inspected and no damage was evident. Operations personnel noted that scaffolding installation activities were being conducted in the area at the time of the event.

The Fermi 2 Accident Analysis takes credit for the operation of the E1150-F015A valve with the initiation of "LPCI Loop Select Logic" during a Loss of Coolant Accident (LOCA). In the event of a break in one of the two reactor recirculation system loops, "LPCI Loop Select Logic" is provided to sense the broken loop and to inject coolant flow into the unbroken loop. Thus, the flow from the two LPCI system loops are interconnected by valving. With the E1150-F015A inoperable, both divisions of LPCI were declared inoperable at 0829 hours on January 7, 2000. Technical Specification 3.5.1, Action J, was invoked and Limiting Condition for Operation (LCO) 3.0.3 was immediately entered. During this event, the Division I Core Spray System [BM] was also in a scheduled maintenance outage.

At 0837 hours on January 7, 2000, power was restored to the E1150-F015A valve by placing the MCC 72C-F Position 2C switch to the "ON" position. A follow-up discussion with the operator that re-energized the MCC indicated that no equipment problems were encountered when the switch was returned to the "ON" position. All scaffolding installation activities in the reactor building in the vicinity of MCC 72C-F were suspended pending further investigation. LPCI was restored to operable status at 0837 hours on January 7, 2000 and LCO 3.0.3 was exited, terminating the event.

Inoperability of both LPCI subsystems, resulting from de-energization of a single valve, E1150-F015A, is considered an event or condition which alone could have prevented fulfillment of a safety function and is reportable under 10 CFR 50.73(a)(2)(v)(D). A four hour notification required by 10 CFR 50.72(b)(2)(iii)(D) was made at 1058 hours on January 7, 2000, Event Number 36569. This event is also being reported as a condition prohibited by the plant's Technical Specifications resulting from LCO 3.0.3 entry under 10 CFR 50.73(a)(2)(i)(B).

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Cause of the Event:

The cause of the loss of power to the E1150-F015A valve was determined to be a human performance error that most likely resulted from a contract employee inadvertently contacting MCC 72C-F Position 2C switch while erecting scaffolding in the MCC area. Although interviews and individual statements from the contract workers were not able to confirm that anyone had made accidental contact with the switch, the investigation results indicated that inadvertent contact with the switch was the most likely cause. The probability of deenergizing the MCC switch alone without accidental contact is extremely unlikely because the newly installed MCC and its internal components have been seismically qualified by the vendor, in accordance with Detroit Edison MCC equipment specification required for safety related components. As stated by the vendor, an average force of approximately 25 pounds is required for the switch to be shifted to the "OFF" position. This ensures that the equipment is operable during a seismic event. A follow-up discussion with the operator that re-energized the MCC indicated that no equipment problems were encountered when the switch was returned to the "ON" position and the same amount of force was needed to re-energize the switch as other similar MCC switches of that type. Fermi 2 is confident that the MCC switch is functioning properly due to confirmation from the operator when the switch was exercised.

During the investigation of this event, the investigation team determined that supervisory personnel followed Fermi 2 management expectations regarding working in areas that could impact plant safety. Individual statements and interviews from the contract support personnel involved in this event revealed that a proper pre-job brief with the contract crew prior to the job was performed. The pre-job brief, conducted by the shift foreman and the supervisor, stressed the significance and importance of the MCC and how accidental contact with the switches could impact plant safety.

When the contract crew arrived at the job site, a peer check was conducted by the shift foreman ensuring that safety requirements were met. The shift foreman again reiterated the sensitivity of the MCC and pointed out to the crew the switches on the MCC panel to avoid. The foreman observed the progress of the installation and periodically reminded his crew to exercise caution while working at the MCC. At approximately 0825 hours on January 7, 2000, with the task underway, the foreman had enough confidence that the work was being performed correctly, that he left the job site to check on other work activities. The contract supervisor was also present at the job site during the start of the work overseeing the scaffolding activities; however, he left the area shortly after the job had begun to observe other activities under his purview.

A number of other factors could have contributed to inadvertent contact with the MCC switch, including the failure of the crew to apply the "Stop, Think, Act, Review" (STAR) philosophy; and on-the-job distractions such as increased noise and temperatures in the working environment, and restricted mobility within the protective barrier where the work was being conducted.

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Analysis of the Event:

The safety function of the Low Pressure Coolant Injection (LPCI) mode of Residual Heat Removal (RHR) System is to inject water from the Suppression Pool into the Reactor Vessel via injection lines connected to the reactor recirculation [AD] piping following a large break Loss-of-Coolant Accident (LOCA). Since it must be assumed that a Large break LOCA could occur in either of the two reactor recirculation loops, the "LPCI Loop Select Logic" Function is designed to select an undamaged reactor recirculation loop for LPCI injection. Recirculation Loop B is set up to be the default loop for injection. Therefore, LPCI would always inject via the B loop unless the "LPCI Loop Select Logic" determines that the break is in Recirculation Loop B, then Recirculation Loop A is selected for LPCI injection. Under the conditions of this event, with the Loop A injection valve deenergized, had a LOCA occurred in Recirculation Loop B, the Loop A injection valve would not have opened, thus preventing automatic LPCI injection to the reactor vessel. In addition, the "LPCI Loop Select Logic" inhibits opening of the injection valves for the non-selected loop for ten minutes, preventing manual initiation of LPCI injection via the non-selected loop for that time.

Inoperability of the E1150-F015A valve, for the brief time period on January 7, 2000, rendered both divisions of LPCI inoperable for a LOCA scenario occurring in Recirculation Loop B. The risk impact of having Division I of the Core Spray System and the LPCI inboard isolation valve, E1150-F015A, simultaneously out of service for eight minutes has been determined to be negligible. While a Probabilistic Safety Assessment (PSA) analysis indicates a moderate increase in instantaneous core damage frequency, the very short time duration of the degraded condition resulted in a negligible integrated risk increase. The degraded condition only affects LOCA mitigation capability, in which one division of the Core Spray System was still available for coolant injection throughout the event. Other systems were available to mitigate transients including the High Pressure Coolant Injection System (HPCI) [BJ], Automatic Depressurization System (ADS), Reactor Core Isolation Cooling System (RCIC) [BN], and the Standby Feedwater System (SBFW) [BA].

Fermi 2 is currently in the process of implementing the Nuclear Regulatory Commission's Revised Regulatory Oversight Process (RROP) which is scheduled for full implementation in April 2000. Inoperability of both LPCI subsystems, resulting from de-energization of a single valve, is considered an event or condition that alone prevented, or could have prevented, the fulfillment of a safety function needed to mitigate the consequences of an accident. Therefore, this event falls within the context of the new RROP Performance Indicator Program under the Safety System Functional Failures (SSFF) performance indicator.

Based upon the above discussion, the health and safety of the public were not adversely affected by this event.

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Corrective Actions:

Operations personnel were immediately dispatched to the MCC 72C-F area and determined that the E1150-F015A valve had lost power and the MCC 72C-F Position 2C switch was in the "OFF" position. The MCC was inspected and no damage was evident. At 0837 hours on January 7, 2000, power was restored to the E1150-F015A valve by placing the MCC 72C-F Position 2C switch to the "ON" position. All scaffolding activities in the vicinity of the MCC in the Reactor Building were suspended and another job briefing was conducted. Scaffold work in the MCC 72C-F area resumed at 1250 hours on January 7, 2000 with a peer checker assigned to oversee the scaffold work to ensure that the workers would not inadvertently contact the MCC switches.

A review of Maintenance Conduct Manual Procedure, MMA08, "Scaffolding," the governing Fermi 2 site scaffolding installation procedure, was conducted by the evaluation team to determine if the procedure contained adequate instructions for installing scaffolding around plant equipment. The team determined that MMA08 does contain adequate instructions regarding scaffold installation for maintaining safe distance from plant equipment.

A review of Maintenance Department Instructions, MDI-002, "Pre-Job Briefing," was conducted by the evaluation team to determine if MDI-002 contained adequate instructions for installing scaffolding around plant equipment. The team determined that MDI-002 does contain adequate guidance to identify plant hazards and required safeguards to be taken when working at or near plant equipment.

This event will be discussed at the next Fermi 2 human performance stand down day to be held prior to the Seventh Refueling Outage (RFO7).

Further corrective actions relating to this event are being considered for implementation commensurate with established priorities and processes of the Fermi 2 Corrective Action Program.

Additional Information:

A. Previous Similar Events

None.