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DTE Energy

10 CFR 50.73

March 27, 2008
NRC-08-0021

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington D C 20555-0001

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

Subject: Licensee Event Report No. 2008-001, "Manual Reactor Scram in Response to a Trip of Both Recirculation Pumps"

Pursuant to 10 CFR 50.73(a)(2)(iv)(A), Detroit Edison is hereby submitting the enclosed Licensee Event Report (LER) No. 2008-001. This LER documents a manual scram that occurred on January 31, 2008 when plant operators placed the reactor mode switch to shutdown as required by plant procedures in response to a trip of both reactor recirculation pumps.

No commitments are made in this LER.

Should you have any questions or require additional information, please contact Mr. Ronald W. Gaston of my staff at (734) 586-5197.

Sincerely,

cc: NRC Project Manager
NRC Resident Office
Reactor Projects Chief, Branch 4, Region III
Regional Administrator, Region III
Supervisor, Electric Operators,
Michigan Public Service Commission

IE22
NRR

NRC FORM 366 (9-2007) U.S. NUCLEAR REGULATORY COMMISSION

LICENSEE EVENT REPORT (LER)

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

APPROVED BY OMB: No. 3150-0104 Expires 8/31/2010

Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records and FOIA/Privacy Service Branch (T-5 F52), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202 (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose 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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4. TITLE
Manual Reactor Scram in Response to a Trip of Both Reactor Recirculation Pumps

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER 05000
01	31	2008	2008	- 001 -	00	03	27	2008	FACILITY NAME	DOCKET NUMBER 05000

9. OPERATING MODE: 1

10. POWER LEVEL: 100%

11. THIS REPORT SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR§: *(Check all that apply)*

☐ 20.2201(b)	☐ 20.2203(a)(3)(i)	☐ 50.73(a)(2)(i)(C)	☐ 50.73(a)(2)(vii)
☐ 20.2201(d)	☐ 20.2203(a)(3)(ii)	☐ 50.73(a)(2)(ii)(A)	☐ 50.73(a)(2)(viii)(A)
☐ 20.2203(a)(1)	☐ 20.2203(a)(4)	☐ 50.73(a)(2)(ii)(B)	☐ 50.73(a)(2)(viii)(B)
☐ 20.2203(a)(2)(i)	☐ 50.36(c)(1)(i)(A)	☐ 50.73(a)(2)(iii)	☐ 50.73(a)(2)(ix)(A)
☐ 20.2203(a)(2)(ii)	☐ 50.36(c)(1)(ii)(A)	☒ 50.73(a)(2)(iv)(A)	☐ 50.73(a)(2)(x)
☐ 20.2203(a)(2)(iii)	☐ 50.36(c)(2)	☐ 50.73(a)(2)(v)(A)	☐ 73.71(a)(4)
☐ 20.2203(a)(2)(iv)	☐ 50.46(a)(3)(ii)	☐ 50.73(a)(2)(v)(B)	☐ 73.71(a)(5)
☐ 20.2203(a)(2)(v)	☐ 50.73(a)(2)(i)(A)	☐ 50.73(a)(2)(v)(C)	☐ OTHER
☐ 20.2203(a)(2)(vi)	☐ 50.73(a)(2)(i)(B)	☐ 50.73(a)(2)(v)(D)	Specify in abstract below or in NRC Form 366A

12. LICENSEE CONTACT FOR THS LER

FACILITY NAME	TELEPHONE NUMBER (Include Area Code)
Robert J. Salmon – Principal Licensing Engineer	(734) 586-4273

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

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX

14. SUPPLEMENTAL REPORT EXPECTED		15. EXPECTED SUBMISSION DATE	MONTH	DAY	YEAR
☐ YES *(If yes, complete 15. EXPECTED SUBMISSION DATE)*	☒ NO				

ABSTRACT *(Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)*

At 15:44 hours EST January 31, 2008, the reactor mode switch was taken to shutdown in response to the trip of both reactor recirculation pumps. This inserted a manual reactor scram within 9 seconds of the trip of the recirculation pumps. The reactor protection system (RPS) performed as expected, and all rods were fully inserted into the core. Reactor water level reached a low of approximately 157 inches above top of active fuel and recovered to normal automatically without operator intervention. Subsequent to the event, the main steam isolation valves (MSIVs) remained open and reactor water level was maintained in the normal band of 173 to 214 inches. Pressure control was maintained by the main turbine bypass valves. Reactor dome pressure peaked at about 1077 psig. Reactor water Level 3 isolations occurred as expected. There was no maintenance or testing in progress that would explain the pump trips. No operator performance issues were identified in response to this event. Safety related plant equipment responded as expected to the manual reactor scram. This event posed no significant safety implications because the reactor protection and safety related systems functioned as designed following the manual reactor trip. The cause of both recirculation pump trips was determined to be an intermittent failure of the 65G bus undervoltage trip logic. The undervoltage relay and its cutoff knife switches were replaced. The undervoltage circuit fuses were replaced, fuse clips tightened, connections cleaned, continuity checked, and the circuit was meggered to identify any potential faults prior to restart of the unit.

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

Initial Plant Conditions:

Mode 1

Reactor Power 100 percent

Description of the Event

At 15:44 hours EST January 31, 2008, the reactor mode switch was taken to shutdown in response to the trip of both reactor recirculation pumps. This inserted a manual reactor scram within 9 seconds of the trip of the recirculation pumps. The reactor protection system (RPS) [JD] performed as expected, and all rods were fully inserted into the core. Post scram feedwater logic [FCO] actuated, as expected. Reactor water level reached a low of approximately 157 inches above top of active fuel and recovered to normal automatically without operator intervention. Subsequent to the event, the main steam isolation valves (MSIVs) remained open and reactor water level was maintained in the normal band of 173 to 214 inches. Reactor water was supplied by the condensate [SD] and reactor feedwater systems [SJ], and the resultant reactor steam was sent to the condenser [SG] via the main turbine bypass lines. Pressure control was maintained by the main turbine bypass valves. Reactor dome pressure peaked at about 1077 psig. With reactor pressure maintained below the Safety Relief Valve (SRV) setpoints, none of the SRVs lifted. Reactor water Level 3 isolations [JM] occurred as expected. These included isolation Group 4 (Residual Heat Removal Shutdown Cooling and Head Spray), Group 13 (Drywell Sumps), and Group 15 (Traversing In-core Probe System) isolations. There was no maintenance or testing in progress that would explain the pump trips. No operator performance issues were identified in response to this event.

At the time of the scram all emergency core cooling systems (ECCS) and Emergency Diesel Generators (EDGs) [DG] were operable with the exception of the Division 1 Residual Heat Removal (RHR) [BO] system which was in surveillance testing. It was available if needed. The operating RHR pump was stopped and the system returned to standby by approximately 15:55 hours. Reactor water level was maintained above Level 2, and as expected, none of the isolations and safety injection systems initiations associated with Level 2 occurred. Safety related plant equipment responded as expected to the manual reactor scram.

Subsequent troubleshooting determined that the recirculation pump trips were received from the 65G bus undervoltage relay logic.

Significant Safety Consequences and Implications

This event posed no significant safety implications because the reactor protection and safety related systems functioned as designed following the manual reactor trip. The transient was compared to the UFSAR transient analysis for the trip of both recirculation pumps, and the actual response was enveloped by the UFSAR analysis. Therefore the health and safety of the public were not affected by this event.

This event is being reported under 10 CFR 50.73(a)(2)(iv)(A), as an event or condition that resulted in manual actuation of the reactor protection system that resulted in a reactor scram. A 4-hour non-emergency notification was made to the NRC at 18:06 EST on January 31, 2008 (EN 43948) in accordance with 10 CFR 50.72(b)(2)(iv)(B) for an actuation of the reactor protection system.

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Cause of the Event

The manual scram was inserted in response to a trip of both recirculation pumps in accordance with plant procedures. The cause of the recirculation pump trips was determined to be an intermittent failure of the 65G bus undervoltage trip logic. This could have been caused by a failure of the undervoltage relay, or by degraded connections in the relay circuit resulting in the relay sensing a low voltage condition and tripping in response to that condition. Field investigation determined that the intermittent failure was likely caused by a degraded relay cutoff switch in the undervoltage trip logic. The specific cause, however, could not be identified by failure analysis.

Corrective Actions

Since the failure was determined to be intermittent, additional corrective measures were taken to address possible faults based on a failure modes and effects analysis. The undervoltage relay and its cutoff knife switches were replaced, and the original components were sent out for analysis. The undervoltage circuit fuses were replaced, fuse clips tightened, connections cleaned, continuity checked, and the circuit was meggered to identify any potential faults prior to the restart of the unit. The failure analysis was inconclusive.

This event is documented and evaluated in the Fermi 2 corrective action program. Other actions are being planned to address this event. These actions will be tracked and implemented by the corrective action program.

Additional Information

A. Failed Components: Unknown

B. Previous LERs on Similar Problems:

There have been no previous events involving a manual trip in response to an undervoltage trip of the recirculation pumps.