Joseph H. Plona
Site Vice President

6400 N. Dixie Highway, Newport, MI 48166
Tel: 734.586.5910 Fax: 734.586.4172

DTE Energy

10CFR50.73

May 19, 2010
NRC-10-0043

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. 2010-001, "Automatic Reactor Shutdown due to Generator Current Transformer Wiring Failure"

Pursuant to 10 CFR 50.73(a)(2)(iv)(A), Detroit Edison is hereby submitting the enclosed Licensee Event Report (LER) No. 2010-001. This LER documents an automatic reactor shutdown that occurred on March 25, 2010 due to a failure of the generator output current transformer wiring resulting in a main generator trip with a subsequent main turbine trip and automatic reactor shutdown.

No commitments are made in this LER.

Should you have any questions or require additional information, please contact Mr. Rodney W. Johnson of my staff at (734) 586-5076.

Sincerely,

Joseph H. Plona

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

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

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.

LICENSEE EVENT REPORT (LER)

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

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4. TITLE

Automatic Reactor Shutdown due to Generator Current Transformer Wiring Failure

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
03	25	2010	2010	- 001	- 00	05	19	2010	FACILITY NAME	DOCKET NUMBER
										05000

9. OPERATING MODE

1

10. POWER LEVEL

63%

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)
Jeffrey M. Olnhausen – Principal Licensing Engineer	(734) 586-1059

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
B	EL	CND	T&B	Y					

14. SUPPLEMENTAL REPORT EXPECTED

☐ YES *(If yes, complete 15. EXPECTED SUBMISSION DATE)* ☒ NO

15. EXPECTED SUBMISSION DATE

MONTH	DAY	YEAR

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

At 16:27 EDT on March 25, 2010, the reactor mode switch was taken to shutdown following an automatic scram due to a main turbine trip. The Main Turbine Trip relays actuated causing a turbine control valve fast closure which initiated a scram signal. The scram was uncomplicated. The reactor protection system (RPS) performed as expected, and all control rods were fully inserted into the core. Both safety and non-safety related plant equipment responded as expected to the reactor scram. At the time of the event, all Emergency Core Cooling Systems (ECCS) and Emergency Diesel Generators (EDGs) were operable.

All reactor parameters were maintained well within analyzed limits. Plant procedures were appropriately utilized to complete scram recovery actions.

Investigation determined that the turbine trip relays actuated due to a generator differential current relay trip in the Main Generator Z phase protection circuit. The cause of the Z phase relay actuation was the result of a shorted current transformer wire in the Main Generator Z phase line terminal bushing enclosure. The wire was repaired and other preventive measures were implemented for similar wiring. Additional corrective actions are being considered in accordance with the corrective action program.

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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 63 percent

Description of the Event

At 16:27 EDT on March 25, 2010, the reactor mode switch [HS] was taken to shutdown following an automatic scram due to a main turbine [TA] trip. The Operations Department was in the process of raising power prior to the event. The Main Turbine Trip relays actuated causing a turbine control valve fast closure which initiated a scram signal. Investigation determined that the Main Turbine Trip relays actuated due to a generator differential current relay trip in the Main Generator Z phase protection circuit. The Z phase relay actuation was caused by a shorted current transformer wire in the Main Generator Z phase line terminal bushing enclosure.

The scram was uncomplicated. The reactor protection system (RPS) [JD] performed as expected, and all control rods were fully inserted into the core. Reactor water level reached a low of approximately 135 inches above top of active fuel and recovered to normal level of 173 to 214 inches automatically with the reactor feedwater system [SJ] following the scram without operator intervention. Reactor water Level 3 isolations occurred and Reactor water level was maintained above Level 2 as expected. No primary containment isolations or safety injection system initiations associated with Level 2 occurred.

Reactor pressure control was maintained by the turbine bypass valves. The peak Reactor Pressure was 1000 psig, within normal pressure control limits and no safety relief valves (SRVs) actuated.

There was no maintenance or testing in progress that would affect generator differential relaying. Safety related plant equipment responded as expected to the reactor scram. At the time of the scram, all Emergency Core Cooling Systems (ECCS) and Emergency Diesel Generators (EDGs) [DG] were operable.

This report is being made in accordance with 10 CFR 50.73(a)(2)(iv)(A), as an event that resulted in an unplanned manual or automatic actuation of the reactor protection system (RPS) when the reactor was critical.

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 automatic reactor trip. Important safety-related and non-safety related equipment performed as discussed in the description of the event, and plant response was as expected. There was no significant increase in reactor pressure, and the reactor core was adequately covered and cooled throughout the event.

Therefore, the health and safety of the public were not affected by this event.

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This event is being reported under 10 CFR 50.73(a)(2)(iv)(A), as an event or condition that resulted in automatic actuation of the reactor protection system and a reactor scram. A 4-hour non-emergency notification was made to the NRC Operations Center at 18:18 EDT on March 25, 2010 (EN 45789) in accordance with 10 CFR 50.72(b)(2)(iv)(B) for an actuation of the reactor protection system.

Cause of the Event

The automatic reactor scram was due to Main Turbine Trip relays actuating causing a turbine control valve fast closure. Investigation determined that the Main Turbine Trip relays actuated due to a generator differential current relay trip in the Main Generator Z phase protection circuit. The cause of the Z phase relay actuation was the result of a shorted current transformer (CT) wire in the Main Generator Z phase line terminal bushing enclosure.

One of the wires connected to the generator differential protection current transformer, installed on the Main Generator Z phase line terminal bushing, shorted to ground inside the CT/bushing enclosure. The impedance/current imbalance in the Z phase differential protection circuit, caused by the ground short condition, resulted in actuation of the Z-87G protection relay, energizing the Main Turbine Trip relays and causing the turbine control valve fast closure logic to initiate an automatic reactor scram.

The CT wire failure was due to abrasion at the conduit entrance to the CT/bushing enclosure. The conduit bulkhead connecter utilizes a nylon insulated throat that was found degraded at the location where the wire shorted to ground.

Corrective Actions

The shorted CT wire was located and repaired in accordance with plant design specifications. Protective layers of tape were added to this and other similar generator CT wiring in locations where the wiring interfaces with the conduit entries as a preventive measure for all output and neutral phases. This event is documented and evaluated in the Fermi 2 corrective action program. Other actions are being considered to address this event. These actions will be tracked and implemented by the corrective action program.

Additional Information

A. Failed Components: The conduit that failed was a Thomas & Betts (T&B) insulated throat fitting used for jacketed flexible liquid tight conduit entry.

B. Previous LERs on Similar Problems: None