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**DTE Energy**



10CFR50.73

February 21, 2003  
NRC-03-0006

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. 02-006

Pursuant to 10 CFR 50.73(a)(2)(iv)(A), Detroit Edison is submitting the enclosed LER No. 02-006. This LER documents a manual reactor scram and the automatic actuation of systems listed in paragraph (a)(2)(iv)(B).

No 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,

A handwritten signature in black ink that reads "William T. O'Connor, Jr." with a large, stylized flourish at the end.

cc: M. A. Ring  
J. F. Stang, Jr.  
M. V. Yudas, Jr.  
NRC Resident Office  
Region III  
Regional Administrator, Region III  
Wayne County Emergency Management Division

JE22

Estimated burden per response to comply with this mandatory information collection request 50 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records Management Branch (T-6 E6), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to bjs1@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 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)

1. FACILITY NAME Fermi 2	2. DOCKET NUMBER 05000341	3. PAGE 1 OF 4
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4. TITLE  
**Manual Reactor Scram during Reactor Shutdown to Repair Modular Power Unit 3**

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MO	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO	MO	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
12	29	2002	2002	006	00	02	21	2003	FACILITY NAME	DOCKET NUMBER
										05000
										05000

9. OPERATING MODE 1	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)									
	20 2201(b)		20 2203(a)(3)(ii)		50 73(a)(2)(ii)(B)		50.73(a)(2)(ix)(A)			
10. POWER LEVEL 100	20.2201(d)		20 2203(a)(4)		50 73(a)(2)(iii)		50.73(a)(2)(x)			
	20.2203(a)(1)		50 36(c)(1)(i)(A)		X 50 73(a)(2)(iv)(A)		73 71(a)(4)			
20 2203(a)(2)(i)		50 36(c)(1)(ii)(A)		50 73(a)(2)(v)(A)		73 71(a)(5)				
20 2203(a)(2)(ii)		50 36(c)(2)		50 73(a)(2)(v)(B)		OTHER Specify in Abstract below or in NRC Form 366A				
20 2203(a)(2)(iii)		50 46(a)(3)(ii)		50 73(a)(2)(v)(C)						
20 2203(a)(2)(iv)		50.73(a)(2)(i)(A)		50.73(a)(2)(v)(D)						
20 2203(a)(2)(v)		50.73(a)(2)(i)(B)		50.73(a)(2)(vii)						
20 2203(a)(2)(vi)		50 73(a)(2)(i)(C)		50 73(a)(2)(viii)(A)						
20 2203(a)(3)(i)		50 73(a)(2)(ii)(A)		50 73(a)(2)(viii)(B)						

12. LICENSEE CONTACT FOR THIS LER

NAME P. Dwi Kusumawati – Licensing Engineer	TELEPHONE NUMBER (Include Area Code) 734-586-4205
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13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX
x	EE	RG	S245	Y					

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

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

On December 28, 2002, at 0440 hours, a low voltage condition was discovered on Modular Power Unit (MPU) 3, Distribution Cabinet 2. Investigation into this condition concluded that the 120 VAC voltage regulator associated with MPU 3 had degraded such that the output voltage was 93 VAC. MPU 3 is a non-Class 1E 120 VAC Instrumentation and Control Power (ICP) System that provides related Balance of Plant (BOP) instrumentation and control loads including several control circuits, indicators and recorders in the control room. It was concluded that a loss of the feedwater pumps and the circulating water pumps could occur if operation were allowed to continue, or if on line repair was attempted. Reactor power was reduced to approximately 73 percent using recirculation flow. Further power reduction using control rods was then attempted when it was found that control rods could not be moved using the Reactor Manual Control System (RMCS). The inability to manually move rods during the power reduction was attributed to the degraded voltage on MPU 3. The normal power reduction was stopped and the reactor was manually scrammed on December 29, 2002, at 0010 hours. All other systems responded as expected. Following shutdown, the voltage regulator in MPU 3 was bypassed under a temporary modification to allow an upstream voltage regulator associated with its normal power supply, Bus 72 F, to control the MPU 3 voltage.

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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**

On December 28, 2002, at 0440 hours, a low voltage condition was discovered on Modular Power Unit (MPU) 3, Distribution Cabinet 2. Operations personnel noticed an offset in control room recorders and several control room alarms that were associated with MPU 3. Investigation into this condition concluded that the 120 VAC voltage regulator associated with MPU 3 had degraded such that the output voltage was 93 VAC. MPU 3 is a non-Class 1E 120 VAC Instrumentation and Control Power (ICP) System that provides related Balance of Plant (BOP) instrumentation and control loads including several control circuits, indicators and recorders in the control room. In attempting to determine the prudent course of action, a review of the MPU 3 loads was conducted, and it was concluded that loss of the feedwater pumps and the circulating water pumps could occur if operation were allowed to continue, or if on line repair was attempted. Initial plans were made to perform a temporary modification that would bypass the MPU 3 voltage regulator, allowing the incoming 120 VAC to be supplied directly to the loads normally supplied through the voltage regulator. Based upon the risk of performing this work on line, it was decided to shutdown the unit in order to install the temporary modification. A normal reactor shutdown to install the temporary modification was then commenced at 2132 hours. Reactor power was reduced to approximately 73 percent using recirculation flow. Further power reduction using control rods was then attempted when it was found that control rods could not be moved using the Reactor Manual Control System (RMCS). The inability to manually move rods during the power reduction was attributed to the degraded voltage on MPU 3. The normal power reduction was stopped and the reactor was manually scrammed on December 29, 2002, at 0010 hours.

All control rods fully inserted in response to the manual scram signal. Reactor water level decreased as expected. Containment Isolation Group 4, Shutdown Cooling and Head Spray; Group 13, Drywell Sumps; and Group 15, Traversing Incore Probe Systems isolation signals were received as expected. The post scram feedwater logic actuated as designed and the Startup Level Control Valve returned level to the normal operating band. The NRC was notified of this event on December 29, 2002, at 0256 hours (NRC Event Number 39476).

This event is being reported in accordance with 10 CFR 50.73(a)(2)(iv)(A), as an event that resulted in a manual or automatic actuation of any systems listed in paragraph (a)(2)(iv)(B).

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

**Cause of the Event**

The cause of this event was a faulty voltage regulator that resulted in a degraded voltage condition on MPU 3, impacting the unregulated 28 VDC power supply for the rod motion timing circuit in the RMCS. Although this condition did not impact the ability of the control rods to move in response to a scram signal, it did prevent normal rod motion using the RMCS.

**Analysis of the Event**

The problem with control rod movement after control rod selection was due to the degraded voltage condition of MPU 3 impacting the unregulated 28 VDC power supply for the rod motion timing circuit in the RMCS. The RMCS allows operational manipulation of the control rods and the surveillance of associated equipment. This system includes interlocks that inhibit rod movement (rod block) under certain conditions. The RMCS does not include any of the circuitry or devices used to automatically or manually scram the reactor, or the mechanical devices associated with the control rod drive (CRD), or CRD hydraulic system. This system is nonessential for safety. Therefore, this condition did not impact the ability of the control rods to move in response to a scram signal.

The control rods provide the primary means for rapid reactivity control (reactor scram), for maintaining the reactor subcritical and for limiting the potential effects of reactivity insertion events caused by malfunctions in the CRD System. The capability to insert the control rods provides assurance that the assumptions for scram reactivity in the Design Basis Accident (DBA) and transient analyses are not violated. The scram function was not inhibited by the low voltage condition on MPU 3, and all other systems responded as expected. This event did not affect the ability of systems required to maintain safe shutdown conditions, remove residual heat, control the release of radioactive material, or mitigate the consequences of an accident. Therefore, it is concluded that there was no adverse impact on safety as a result of this event, nor did it present a threat to the health or safety of the public.

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

**Corrective Actions**

Following shutdown, the voltage regulator in MPU 3 was bypassed under a temporary modification to allow an upstream voltage regulator associated with its normal power supply, Bus 72 F, to control the MPU 3 voltage. The MPU 3, Distribution Cabinet 2 regulation is currently being provided by Bus 72F. The upstream electrical supply remains sufficiently regulated to ensure the MPU 3 loads are reliably fed.

Analysis of the MPU voltage regulator problem will be performed once the component has been removed during the upcoming refueling outage currently scheduled for March 2003, and a determination will be made to either repair, modify, or leave as is. Further corrective actions to provide a reliable voltage regulator in the MPU 3 circuitry will be taken in accordance with the Fermi 2 corrective action program. This event is documented in the Fermi 2 corrective action program in CARD 02-16674.

**Additional Information**

A. Failed Components:

Component: Voltage Regulator  
 Description: 15KVA at 120VAC output  
 Manufacturer: Sola Electric  
 Type: 33-16-315

B. Previous LERs on Similar Problems

None