

# LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) <b>Fermi 2</b>										DOCKET NUMBER (2) <b>0 5 0 0 0 3 4 1 1</b>										PAGE (3) <b>1</b> OF <b>4</b>			
TITLE (4) <b>Heat Balance Impact Due To Reactor Recirculation Pump Power Computer Point Scaling Error</b>																							
EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)														
MON	DAY	YR	YR	SEQUENTIAL NUMBER			REVISION NUMBER			MON	DAY	YR	FACILITY NAMES							DOCKET NUMBER (S)			
10	4	96	96	-	0	1	3	-	0	0	11	4	96								0 5 0 0 0		
OPERATING MODE (9)			THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR (11)																				
5																							
POWER LEVEL (10)			<div style="display: flex; justify-content: space-between;"> <div>10 CFR</div> <div><input checked="" type="checkbox"/> OTHER - Violation of License Condition 2 C</div> </div> (Specify in Abstract below and in text, NRC Form 366A)																				
0 0 0																							

LICENSEE CONTACT FOR THIS LER (12) <b>Norman K. Peterson - Supervisor, Compliance</b>										TELEPHONE NUMBER AREA CODE <b>313</b> NUMBER <b>586-4258</b>									
COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)																			
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS
SUPPLEMENTAL REPORT EXPECTED (14)										EXPECTED SUBMISSION DATE (15)					MONTH DAY YEAR				
[ ] YES (If yes, complete EXPECTED SUBMISSION DATE)										[X] NO									

**ABSTRACT (16)**

On October 4, 1996, Detroit Edison determined that a nonconservative bias existed in the heat balance methodology for calculating core thermal power. During performance of a Preventative Maintenance (PM) event, a discrepancy in the calibration as found data between the Recirculation Pump B Motor Power Wattmeter and the associated Process Computer Point was discovered. Initial investigation showed that the wattmeter was scaled for 0.0 to 8.0 megawatts fullscale and the Process Computer Point was effectively scaled for a 0.0 to 10.6 megawatt range fullscale. The impact on the heat balance calculation is that calculated core thermal power could be up to approximately three megawatts thermal (MWt) lower than actual power, at the highest Reactor Recirculation Pump speeds. Due to this bias, it is possible that Fermi 2 exceeded its licensed power limit of 3292 MWt on one or more occasions during Cycle 1 and 3293 MWt on one or more occasions during Cycles 2 and 3 by up to approximately three MWt. The current licensed power limit of 3430 MWt has not been exceeded as a result of this bias because of Fermi 2 turbine limitations on core operating power.

Based on the low order of magnitude of the bias and conservatism inherent in power levels used for safety analyses, this condition did not result in any adverse impact on the health and safety of the public.

The discrepancy between the Reactor Recirculation Pump Motor Power Wattmeters and the Process Computer Points has been corrected.

## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (8)				PAGE (3)	
Fermi 2	0   5   0   0   0   3   4   1	YEAR		SEQUENTIAL NUMBER		REVISION NUMBER	
		96	-	0 1 3	-	0 0	2   OF   4

TEXT (17)

### Initial Plant Condition:

Operation Condition: 5 (Refueling)  
 Reactor Power: 0 Percent  
 Reactor Pressure: 0 psig  
 Reactor Temperature: 88 degrees Fahrenheit

### Description of the Event:

#### A. Background

Section 2.C(1) of the Fermi 2 Operating License states: "DECo is authorized to operate the facility at reactor core power levels not in excess of 3430 megawatts thermal (100% power) in accordance with the conditions specified herein and in Attachment 1 [Preoperational Test, Startup Tests and Other Items] to this license...." Prior to the third refueling outage, Fermi 2 was authorized to operate at 3292 megawatts thermal under the original operating license, and at 3293 megawatts thermal for the second and third reactor core cycles. The original 3292 megawatt rating was a typographical error in the operating license.

Section 2.F of the Fermi 2 Operating License states: "Except as otherwise provided in the Technical Specifications or Environmental Protection Plan, DECo shall report any violations of the requirements contained in Section 2.C of this license in the following manner: initial notification shall be made within 24 hours to the NRC Operations Center via the Emergency Notification System with written followup within thirty days in accordance with the procedures described in 10 CFR 50.73(b), (c) and (e)."

#### B. Event Description

On September 30, 1996 during performance of a Preventative Maintenance (PM) event, a discrepancy in the calibration as found data between the Reactor Recirculation Pump B Motor [AD][MO] Power Wattmeter [AD][JI] and the Process Computer [ID] Point was discovered. Initial investigation showed that the wattmeter was scaled for 0.0 to 8.0 megawatts fullscale and the Process Computer Point was effectively scaled for a 0.0 to 10.6 megawatt range fullscale. On October 1, 1996, the Process Computer Point was rescaled to correspond with the wattmeter's range of 0.0 to 8.0 megawatts fullscale. On October 2, 1996, the PM event was successfully completed with all as-left data noted as satisfactory. Following a review of calibration records and plant data extending back to Cycle 1 operation, on October 4, 1996, Detroit Edison determined that a nonconservative bias had existed in the heat balance methodology for calculating core thermal power and that licensed power level may have been exceeded during the first three operating cycles.

## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)						PAGE (3)	
		YEAR		SEQUENTIAL NUMBER		REVISION NUMBER			
Fermi 2	0   5   0   0   0   3   4   1	96	-	0 1 3	-	0 0	3	OF	4

TEXT (17)

The same scaling discrepancy between the Reactor Recirculation Pump A Motor Power Wattmeter and the corresponding Process Computer Point was also found to exist. This scaling error has also been corrected. The scaling mismatch between the wattmeters and the Process Computer Points existed since Cycle 1 operation.

The calibration difference between the actual loop data and how the Process Computer was interpreting the loop data effectively could have over-predicted the heat added by the pump in the heat balance by up to approximately 3 megawatts at the highest Reactor Recirculation Pump speeds. This resulted in a nonconservative bias in the heat balance calculation. Due to this bias, it is possible that Fermi 2 exceeded its licensed power limit of 3292 MWt on one or more occasions during Cycle 1 and 3293 MWt on one or more occasions during Cycles 2 and 3 by up to approximately three MWt. The current licensed power limit of 3430 MWt has not been exceeded as a result of this bias because of Fermi 2 turbine limitations on core operating power.

### Cause of the Event

The most probable cause of this event was inadequate configuration control of the Reactor Recirculation Pump Motor Power instrument loop. Because of this there was insufficient design data available to clearly establish the specification to which the loop components, including the Process Computer Point, should be calibrated.

### Analysis of the Event:

The design basis Loss of Coolant Accident (LOCA), design basis Containment, and Transient Analyses incorporate a two percent power level measurement uncertainty. The maximum uncertainty due to instrument inaccuracies in the heat balance calculation of CTP is approximately 66 megawatts. Historically, the maximum heat balance calculation uncertainty when the Process Computer was used was 1.85 percent or approximately 61 megawatts. This results in approximately 5 MW margin to the two percent uncertainty assumption. The available margin to the allowable uncertainty from instrument inaccuracies for Process Computer heat balance calculation can absorb both this approximate three MWt nonconservative bias and an additional approximately one MWt nonconservative bias previously discussed in an earlier Licensee Event Report, LER 95-008. Previous operation with these biases were therefore within the bounds of the design basis LOCA, Containment, and Transient Analyses as described in the updated FSAR.

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

## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)	
Fermi 2	0   5   0   0   0   3   4   1	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	4   OF   4	
		96	-	0   1   3		
TEXT (17)						

### Corrective Actions:

#### A. Immediate Corrective Actions

The discrepancy between the Reactor Recirculation Pump Motor Power Wattmeters and the Process Computer Points has been corrected.

#### B. Corrective Actions to Prevent Recurrence

The Reactor Recirculation Pump Motor Power instrument loop will be added to the Fermi 2 configuration management system and the associated calibration instruction will be revised. These actions will be completed prior to startup from the fifth refueling outage.

Inputs to the Process Computer relating to the heat balance will be evaluated for similar problems prior to startup from the fifth refueling outage.

### Additional Information

#### A. Failed Components

None.

#### B. Previous LERs on Similar Problems

#### LER 95-008

On December 13, 1995, Detroit Edison discovered a nonconservative omission in the heat balance methodology for calculating core thermal power. Control rod drive flow that is directed to the Reactor Recirculation Pumps for seal flow contributes approximately four gallons per minute of cold water to the primary system. The impact on the heat balance calculation was that calculated core power was approximately one megawatt thermal (MWt) lower than actual power. Administrative controls were implemented to limit core thermal power to 3429 MWt, which will ensure that the current licensed power limit of 3430 MWt will not be exceeded.

This LER is similar in that the heat balance calculation was impacted in a nonconservative manner. However, in LER 95-008 the reason for this was a deficiency in the heat balance methodology. In the current LER it is due to a Process Computer input scaling error.