

Douglas R. Gipson  
Senior Vice President, Nuclear Generation

Fermi 2  
6400 North Dixie Hwy., Newport, Michigan 48166  
Tel: 313.586.5201 Fax: 313.586.4172

**Detroit Edison**



10CFR50.73

December 10, 1999  
NRC-99-0110

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. 99-007

Pursuant to 10CFR50.73(a)(2)(iv), Detroit Edison is submitting the enclosed LER No. 99-007. The LER documents a Reactor Water Cleanup (RWCU) System isolation due to a high area ventilation differential temperature condition following a trip of the Reactor Building Heating, Ventilation, and Air Conditioning (RBHVAC) System.

No new 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, appearing to read "D. R. Gipson".

cc: J. Dyer  
A. J. Kugler  
A. Vogel  
M. V. Yudas, Jr.  
NRC Residents Office  
Region III  
Wayne County Emergency Management Division

IE22

POR A00en 0500 0341

**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,

**FACILITY NAME (1)**

Fermi 2

**DOCKET NUMBER (2)**

05000341

**PAGE (3)**

1 of 5

**TITLE (4)**

Reactor Water Cleanup (RWCU) System Isolation Due to a High Area Ventilation Differential Temperature Condition

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
11	11	99	99	--0 0 7--	00	12	13	99	FACILITY NAME	DOCKET NUMBER
										05000
									FACILITY NAME	DOCKET NUMBER
										05000

  

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

<b>NAME</b>	<b>TELEPHONE NUMBER (Include Area Code)</b>
Norman K. Peterson, Director - Nuclear Licensing	(734) 586-4258

**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)**

<b>YES</b> (If yes, complete EXPECTED SUBMISSION DATE).	<input checked="" type="checkbox"/> <b>NO</b>	<b>EXPECTED</b>	<b>MONTH</b>	<b>DAY</b>	<b>YEAR</b>

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

At 0715 hours on November 11, 1999, an automatic actuation occurred in the Reactor Water Cleanup (RWCU) System portion of the Primary Containment Isolation System (PCIS) due to a high area ventilation differential temperature condition that existed in the South RWCU Pump Room. This actuation automatically closed RWCU Primary Containment Outboard Isolation Valves, G3352-F004 and G3352-F220, isolating reactor coolant flow to the RWCU System. Immediate corrective actions were taken to verify that no actual system leakage had occurred.

The cause of the RWCU isolation was determined to be an undetected trip of the RWCU "B" Pump Room Cooler which occurred on November 9, 1999. This led to the RWCU isolation when the Reactor Building Heating, Ventilation, and Air Conditioning (RBHVAC) System tripped at 0648 hours on November 11, 1999 due to freestat actuation (low outside temperature). Investigation revealed that the thermal overloads on the RWCU "B" Pump Room Cooler had tripped and gone unnoticed by operations personnel because of the RWCU "B" Pump Room Cooler location, inadequate equipment indications available to the operators, and inadequate work practices.

A four hour notification required by 10CFR50.72(b)(2)(ii) was made at 0959 hours on November 11, 1999, Event Number 36425.

**LICENSEE EVENT REPORT (LER)**  
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET (2) NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Fermi 2	05000341	99	--0 0 7--	00	2 of 5

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 1024 psig  
 Reactor Temperature 535 degrees Fahrenheit

Description of the Occurrence:

At 0648 on November 11, 1999, the Reactor Building Heating, Ventilation, and Air Conditioning (RBHVAC) [VA] System tripped. Emergency Operating Procedure (EOP) 29.100.01, "Secondary Containment and Rad Release," and Abnormal Operating Procedure (AOP) 20.000.11, "Loss of Secondary Containment Integrity," were entered. At 0650 hours, Division I of the Standby Gas Treatment (SGTS) System was started in accordance with the AOP and System Operating Procedure (SOP) 23.404, "Standby Gas Treatment System." Operations personnel verified proper operation of Division I SGTS in accordance with the SOP and were directed by the Nuclear Shift Supervisor (NSS) to exit the EOP. It was determined that RBHVAC [VA] had tripped on low freezestat temperature. Operations personnel continued following applicable steps in the AOP and exited the AOP at 0709 hours.

At 0715 hours on November 11, 1999 a high area ventilation differential temperature condition existed in the South Reactor Water Cleanup (RWCU) Pump Room that initiated isolation of the RWCU System [CE] outboard isolation valves. This actuation automatically closed RWCU Primary Containment outboard isolation valves, G3352-F004 [ISV] and G3352-F220 [ISV], and caused the North and South RWCU Pumps [P] to trip isolating reactor coolant flow to the RWCU system. The device providing this isolation signal is G33N602B, the RWCU Division 2 Steam Leak Detection Pump "B" Room Temperature Differential Switch [TRS], which is a part of the Differential Temperature Monitoring System [IM]. A thermocouple is mounted at the outlet of the supply air duct and inlet of the return air duct for the RWCU pump rooms. The differential temperature switch [TRS] compares the signal of each pair of thermocouples to the setpoint. Should this be exceeded, an alarm is annunciated on Control Room Panel H11-P601, and RWCU is isolated. The trip setpoint for this device is 50 degrees Fahrenheit. The maximum area ventilation differential temperature observed during this event was 53 degrees Fahrenheit. EOP 20.707.01, "Loss of RWCU," was entered at that time and all personnel were directed to exit the Reactor Building.

Upon receipt of the isolation, operations personnel performed an inspection of the RWCU "B" Pump Room. It was verified that there was no leakage evident which could have caused the high area ventilation differential room temperature. The operator discovered that the RWCU "B" Pump Room Cooler, T4100B055 [CLR], was not running with its controller set for "automatic" operation and that the thermal overloads had tripped.

At 0759 hours, the thermal overloads for RWCU "B" Pump Room Cooler [CLR] were reset and the room cooler was restarted. Operations personnel reported that the room cooler operated normally after resetting the overloads. The RWCU outboard Group 11 isolation signal was reset at 0956 hours in accordance with SOP 23.427, "Primary Containment Isolation System."

A four hour notification required by 10CFR50.72(b)(2)(ii) was made at 0959 hours on November 11, 1999, Event Number 36425. This event is being reported under 10CFR50.73(a)(2)(iv) as an Engineered Safety Feature Actuation.

**LICENSEE EVENT REPORT (LER)**  
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET (2) NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Fermi 2	05000341	99	--0 0 7--	00	3 of 5

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

Cause of the Occurrence:

The cause of the RWCU isolation was determined to be an undetected trip of the RWCU "B" Pump Room Cooler [CLR] which occurred on November 9, 1999. This led to an increase in ventilation differential temperature, resulting in the RWCU isolation shortly following a trip of the Reactor Building Heating, Ventilation, and Air Conditioning (RBHVAC) System [VA] on November 11, 1999.

The evaluation team determined that there were two root causes that led to the undetected trip of the RWCU "B" Pump Room Cooler [CLR] involving equipment indications/alarms and inattention to detail. The South RWCU Pump Room Cooler [CLR] is located in a Locked High Radiation Area. The room cooler thermal overloads and operating indications are inside the room, not visible to the installed cameras (cameras positioned to allow monitoring for leaks). The design of the room cooler did not include indications outside the room, specifically, no alarms were provided to indicate a room cooler trip condition. The design did not provide for directly monitoring the status of this equipment.

The second root cause involves shiftly readings that were taken which indicated the ventilation differential temperature was approaching its trip setpoint. Shiftly temperature readings are obtained by operations personnel for RWCU pump room differential temperatures and area temperatures in accordance with surveillance procedure 24.000.02, "Shiftly, Daily, and Weekly Required Surveillances." Surveillance data for the week of November 7, 1999, for both the South RWCU pump room differential temperature and area temperature were recorded by operations personnel. However, operations personnel involved in recording and reviewing the data did not recognize the increase in differential temperature as being abnormal. The evaluation team reviewed both the shiftly surveillance sheets for the week of November 7, 1999 and the ambient room temperature printouts from the Relay Room Recorder, G33-R620, Temperature Recorder - Leak Detection [TR]. It was determined that the South RWCU Room Cooler [CLR] had tripped at approximately 1430 on November 9, 1999. The review revealed that, prior to that time, the South RWCU Room Cooler [CLR] had been cycling every few minutes between 107 and 111 degrees Fahrenheit corresponding to "automatic" operation. The cycling ceased at approximately 1430 hours and the South RWCU room temperature rose to a steady 115 degrees Fahrenheit. As previously stated, there is no direct indication of the status of the pump room coolers anywhere outside of the room, and radiological conditions prevent routine entry. However, the surveillance data did show increasing South RWCU room temperature and ventilation differential temperature, indicating that the South RWCU Room Cooler [CLR] was no longer operating. Recorded surveillance area temperatures increased about 9 degrees Fahrenheit (from 117 to 126 degrees Fahrenheit) but never approached any trip setpoint. Area ventilation differential temperature increased to 44 degrees Fahrenheit (had been ranging from 25 to 34 degrees Fahrenheit), and the trip setpoint is 50 degrees Fahrenheit. The approach toward this trip setpoint was not noticed/considered exceptional by operations personnel involved in recording and reviewing the surveillance data, and the plant operated for two shifts approximately 6 degrees Fahrenheit from the differential temperature trip setpoint.

The evaluation team also determined that the recent operation of the North Auxiliary Boiler [BLR] was a contributing event that resulted in the trip of the RBHVAC System due to freezestat actuation (low outside

**LICENSEE EVENT REPORT (LER)**  
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET (2) NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Fermi 2	05000341	99	--0 0 7--	00	4 of 5

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

temperature), which subsequently resulted in the RWCU isolation. Prior to the event on November 11, 1999, in response to variations in outdoor temperatures, several startups and trips occurred on the North Auxiliary Boiler [BLR] which lead to the boiler being shutdown on November 8, 1999. The expectation for boiler operation is to start the boiler if the outside temperature reaches approximately 40 degrees Fahrenheit; however, no written requirements for auxiliary boiler starting temperature conditions exist. On the early morning hours on November 11, 1999, outside temperatures were not expected to drop to 40 degrees Fahrenheit. Therefore, operations personnel did not start the North Auxiliary Boiler [BLR]. During review of the event, it was identified that the outside air temperature did drop below 40 degrees Fahrenheit at approximately 0530 hours on November 11, 1999. The operations shift on duty at the time did recognize the decrease in outside temperature, but believed that there was no advantage in starting the boiler since sunrise (warmer outside temperatures) would occur within the time needed to start the boiler. However, outside air temperature continued to decrease, resulting in the freezestat trip of RBHVAC. Several areas for improvement were identified in regards to auxiliary boiler operation including: no explicit guidance prescribing temperatures for operation of the auxiliary boiler; and lack of operating margin between the temperatures when auxiliary boiler operation may be needed and the higher temperature when the boiler will not operate reliably due to low load.

Analysis of the Occurrence:

This event did not adversely affect the health and safety of the public. RWCU System [CE] recirculates a portion of reactor coolant through a filter-demineralizer to remove particulate and dissolved impurities from the reactor coolant. It also removes excess coolant from the reactor system under controlled conditions. This system is not required for the safe shutdown of the plant. The system design includes automatic capability to isolate the system in response to a detected leak (e.g., sensed by high differential room temperature) and to protect the system filter-demineralizer resins from damage due to high temperature. Immediate corrective actions were taken to verify that no actual system leakage had occurred during this event. The events described by this LER demonstrated the ability of these isolation capabilities to properly function. No damage or adverse conditions resulted in or from this event.

Corrective Actions:

This event was documented in the Fermi 2 corrective action program. Immediate corrective actions included evacuation of all personnel from the Reactor Building and dispatch of an operator to the RWCU "B" Pump Room to investigate. It was verified that there was no leakage evident which could have caused the high area ventilation differential room temperature and Reactor Building access was reinstated. The thermal overloads for RWCU "B" Pump Room Cooler [CLR] were reset and the room cooler was restarted. Operations personnel reported that the room cooler operated normally after resetting the overloads. Streamers were installed shortly after the event to

**LICENSEE EVENT REPORT (LER)**  
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET (2) NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Fermi 2	05000341	99	--0 0 7--	00	5 of 5

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

allow remote monitoring of the South RWCU Room Cooler Fan [FAN]. Even though the fan is now operating, the evaluation team initiated several work requests to identify and correct any degradation. The work requests will investigate the RWCU "B" Room Cooler [CLR] and the control circuitry, perform a calibration check of the RWCU Pump Room Fan Coil Temperature Switch, T41N379, and perform a partial surveillance via 44.020.159, "NSSSS – RWCU Area and Area Differential Temperature, Division 1, Calibration/Functional."

As part of the Condition Assessment Resolution Document (CARD) evaluation for this event, lessons learned training is projected for operations personnel to reinforce the expectation that the review of surveillance data needs to be comprehensive to ensure that any implications regarding plant status are identified and pursued.

Further corrective actions are being considered including providing equipment indication outside the RWCU pump rooms to provide local indication or alarms for room cooler trips; define expectations and written guidance for proper auxiliary boiler operation; and to determine if there are other room coolers that may need local indication or alarms to identify operational equipment status. These and any further actions relating to this event will be developed and implemented commensurate with established priorities and processes of the Fermi 2 corrective action program.

Additional Information:

A. Failed Components

None

B. Previous Similar Events

LER 91-019, "Reactor Water Cleanup System Isolations Due to High Pump Room Differential Temperature and Personnel Error During System Restoration," described two Engineered Safety Features actuations of the RWCU System on November 20, 1991. The first isolation occurred at 1051 hours due to a high differential room temperature in the "B" RWCU Pump Room. The cause of the high temperature was determined to be a failure (loss of calibration) of a switch in the automatic control circuit for the "B" RWCU Pump Room cooler. The second isolation occurred at 2231 hours while removing a jumper, utilized during restoration of the RWCU system from the first isolation, in accordance with the system operating procedure. The cause of the isolation was believed to be a personnel error when the jumper was inadvertently grounded during removal, which resulted in a blown fuse in the isolation circuitry for one RWCU isolation valve.