

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Fermi 2	DOCKET NUMBER (2) 0 5 0 0 0 3 4 1	PAGE (3) 1 OF 0 4
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TITLE (4)
Isolation of Reactor Water Cleanup due to Steam Void Formation at a Flow Element

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 NAMES			DOCKET NUMBER(S)											
0	8	22	8	8	0	0	3	3	0	0	0	0	9	2	1	8	8	N/A	0	5	0	0	0
												N/A	0	5	0	0	0						

OPERATING MODE (9) 4

POWER LEVEL (10) 0 0 0

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §. (Check one or more of the following) (11)

20.402(b)	20.406(c)	<input checked="" type="checkbox"/>	50.73(a)(2)(iv)	73.71(b)
20.406(a)(1)(i)	50.36(a)(1)	<input type="checkbox"/>	50.73(a)(2)(v)	73.71(c)
20.406(a)(1)(ii)	50.36(a)(2)	<input type="checkbox"/>	50.73(a)(2)(viii)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
20.406(a)(1)(iii)	50.73(a)(2)(i)	<input type="checkbox"/>	50.73(a)(2)(viii)(A)	
20.406(a)(1)(iv)	50.73(a)(2)(ii)	<input type="checkbox"/>	50.73(a)(2)(viii)(B)	
20.406(a)(1)(v)	50.73(a)(2)(iii)	<input type="checkbox"/>	50.73(a)(2)(ix)	

LICENSEE CONTACT FOR THIS LER (12)

NAME Patricia Anthony, Compliance Engineer	TELEPHONE NUMBER
	AREA CODE: 3 1 3 5 8 6 - 1 6 1 7

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC

SUPPLEMENTAL REPORT EXPECTED (14)

YES (If yes, complete EXPECTED SUBMISSION DATE) NO

EXPECTED SUBMISSION DATE (15)

MONTH	DAY	YEAR

ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single space typewritten lines) (16)

On August 22, 1988, at 0105 hours, the Reactor Water Cleanup (RWCU) System inboard and outboard isolation valves automatically closed upon receipt of a high differential flow isolation signal. The isolation was verified and determined to be erroneous. The system was returned to service at 0245 hours. Selected system components were walked down to identify if any damage had occurred. None was found.

Investigation determined that the isolation signal resulted from steam voiding in the system at the pump discharge flow element. Void formation occurred after the RWCU pumps tripped on low flow and isolation of the blowdown path. The isolation valves closed when a gravity drain path was established 2.5 hours later. As corrective action, methods will be developed to control cooldown and depressurization so that the RWCU pumps do not trip. In the event of a trip, a method to restore the RWCU pumps to service as soon as possible will be developed and applicable procedures will be revised accordingly.

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FACILITY NAME (1) Fermi 2	DOCKET NUMBER (2) 0 5 0 0 0 3 4 1 8 8	LER NUMBER (6)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
		— 0 3 3	— 0 0 0 2	OF	0 4	

NOTE: If more space is required, use additional NRC Form 388A's (17)

Initial Plant Conditions:

Operational Condition: 4 (Cold Shutdown)
 Reactor Power: 0 percent
 Reactor Temperature: 140 degrees Fahrenheit
 Reactor Pressure: 0 psig

Description of Event:

At 2116 hours on August 21, 1988, during reactor cooldown and depressurization, the Reactor Water Cleanup System (RWCU) (CE) was placed in blowdown mode to the main condenser (COND) in order to control reactor vessel water level. At 2204 hours, the RWCU recirculation pumps (P) tripped on a low flow signal. The blowdown path was isolated. At 0033 hours on August 22, 1988, after completing reactor cooldown and depressurization, the RWCU was placed in a gravity drain line-up to the Liquid Radwaste System (WD), again to control reactor water level. At approximately 0100 hours, the blowdown path was isolated due to erratic pump discharge pressure and differential flow indications. This condition persisted and an isolation of the RWCU inboard and outboard isolation valves, G3352F001 and G3352F004, (ISV) on high differential flow occurred at 0105 hours.

The isolation was verified and found to be erroneous. The system was subsequently returned to service at 0245 hours on August 22, 1988. In addition, a walkdown of selected sections (based on engineering analysis, which are expected to experience a potential pressure transient event) of RWCU pump suction and discharge piping was performed to identify if any damage to system components had occurred. No damage to the system was found.

Cause of Event:

The isolation signal resulted from steam void formation at the pump discharge flow element. Tripping of the RWCU pumps, subsequent securing of blowdown to the main condenser, and establishing a gravity drain 2.5 hours afterwards contributed to the event. Maintaining the pumps in operation allows the system piping to cool uniformly and prevents the formation of steam voids which may occur in an isolated or stagnant system. Continued pump operation throughout the entire cooldown and depressurization is the key to reducing the probability of an erroneous system isolation.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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

TEXT (if more space is required, use additional NRC Form 388A's) (17)

Analysis of the August 21 and 22, 1988 reactor cooldown data indicates that the net positive suction head available (NPSH_A) to the pumps dropped below that required (NPSH_R). NPSH_A fell to 3.7 ft water under the existing flow rate of 270 gpm. NPSH_R was equal to 5.0 ft water at these conditions. One week later, the unit was again shutdown utilizing a slower cooldown rate. This time, the RWCU pumps did not trip and a system isolation did not occur. At no time did the NPSH_A drop below 21 ft of water during this shutdown.

Comparison of the two shutdowns reveals that the rate of reactor depressurization exceeded that necessary to prevent flashing in the pump suction line.

Safety Analysis:

The RWCU system functions to control reactor vessel water level and remove impurities from the reactor coolant and therefore reduces the concentration of radioactive and corrosive materials in the reactor. The system is not required for the safe shutdown of the plant. The inboard and outboard isolation valves automatically closed in accordance with design upon receipt of the high differential flow signal. This event did not pose any danger to the health and safety of the public or plant personnel.

Corrective Actions:

Guidelines will be established to reduce the likelihood of automatic RWCU isolation during the last 100 psig of reactor depressurization. Examples of such guidelines may be manual RWCU isolation or control of the rate of reactor depressurization. The appropriate procedures to achieve this objective will be revised by October 15, 1988.

In the event the RWCU pumps do trip when reactor pressure is less than or equal to 100 psig, pump operation needs to be re-established as soon as possible. The appropriate procedures will be revised by October 15, 1988 in order to implement this corrective action.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1) Fermi 2	DOCKET NUMBER (2) 0 5 0 0 0 3 4 1 8 8	LER NUMBER (5)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
		88	033	010	04	OF 04

NOTE: If more space is required, use additional NRC Form 385A's (17)

Previous Similar Events:

In Licensee Event Reports 85-024, 85-046, 85-061, 85-063 and 85-065, isolation of the RWCU due to high differential flow conditions were reported. These isolations were determined to be due to problems with the differential flow transmitter calibration and the setpoint of the control room differential flow alarm being too high to give the operators an opportunity to respond. Resolution of those problems has effectively addressed the recurrence of such isolations. In Licensee Event Report 87-056, an isolation on high differential flow was reported. Removal of a delay volume line was done during the Local Leak Rate Testing Outage in order to reduce the number of isolations experienced by the RWCU.

William S. Orser
Vice President
Nuclear Operations

10CFR50.73

Detroit
Edison

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Newport, Michigan 48166
(313) 586-5300



Nuclear
Operations

September 21, 1988
NRC-88-0215

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

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

Subject: Licensee Event Report (LER) No. 88-033-00

Please find enclosed LER No. 88-033-00, dated September 21, 1988, for a reportable event that occurred on August 22, 1988. A copy of this LER is also being sent to the Regional Administrator, USNRC Region III.

If you have any questions, please contact Patricia Anthony at (313) 586-1617.

Sincerely,

Enclosure: NRC Forms 366, 366A

cc: A. B. Davis
J. R. Eckert
R. C. Knop
T. R. Quay
W. G. Rogers

Wayne County Emergency
Management Division

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