NRC Form 366
(9-83)

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO. 3150-0104
EXPIRES: 8/31/88

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Fermi 2	0 5 0 0 0 3 4 1	1 OF 0 3

TITLE (4) Failed Relay Causes Residual Heat Removal Shutdown Cooling Outboard Isolation Valve to Close

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 4	2 0	8 8	8 8	— 0 1 6	— 0 0	0 5	2 0	8 8	N/A	0 5 0 0 0
									N/A	0 5 0 0 0

OPERATING MODE (9)	4	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)			
POWER LEVEL (10)	0 0 0	20.402(b)	20.405(c)	50.73(a)(2)(iv)	73.71(b)
		20.405(a)(1)(i)	50.36(c)(1)	X 50.73(a)(2)(v)	73.71(c)
		20.405(a)(1)(ii)	50.36(c)(2)	50.73(a)(2)(vii)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
		20.405(a)(1)(iii)	50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	
		20.405(a)(1)(iv)	50.73(a)(2)(ii)	50.73(a)(2)(viii)(B)	
		20.405(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(x)	

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER
Joseph Pendergast, Licensing Engineer	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 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 (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)

Primary Containment Isolation System (PCIS) logic relay A71B-K75 was replaced as part of a preventative maintenance program activity on April 15, 1988.

On April 20, 1988, at 1930 hours, the relay failed which initiated a closure of the Residual Heat Removal (RHR) Shutdown Cooling (SDC) outboard isolation valve, E11-F008. Division II of the RHR SDC isolated when E11-F008 closed. The isolation valve was reopened manually, and Division II RHR SDC was reestablished at 2007 hours.

The event was caused by the failure of Agastat relay A71B-K75 to remain in an energized state, following a reset of the E11-F008's isolation logic. Upon sensing the presence of an isolation signal from the de-energized relay, the isolation valve stroked closed.

The relay was replaced. PCIS logic was successfully tested on April 24, at 2313 hours. E11-F008 was then returned to normal operation upon restoration of power.

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
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TEXT (If more space is required, use additional NRC Form 366A's) (17)

Initial Plant Conditions:

Operational Condition: 4 (Cold Shutdown)
Reactor Power: 0 Percent
Reactor Pressure: 0 psig
Reactor Temperature: 115 degrees Fahrenheit

Description of the Event:

Primary Containment Isolation System (PCIS) (JM) logic relay (RLY) A71B-K75 was replaced as part of a preventative maintenance program activity on April 15, 1988. The new relay was subject to a brief functional test on April 16. This functional test was conducted to ensure that the replacement relay would support its primary function within the logic string. An extensive functional test had not yet been performed on the newly replaced relay.

On April 20, 1988, at 1930 hours, the relay failed to remain energized following a reset of the Residual Heat Removal (RHR) Shutdown Cooling (SDC) (BO) outboard isolation valve (ISV) E11-F008 isolation logic. The de-energized relay then initiated an automatic closure of the isolation valve. Division II of the RHR SDC suction path isolated when E11-F008 closed. RHR SDC was isolated for approximately 37 minutes. The isolation valve was reopened manually, and Division II RHR SDC restored at 2007 hours.

Operations personnel investigating the event found the isolation logic power source fuse (FU) F63 in panel H11-P623 blown, which they believed caused E11-F008 to stroke closed. The fuse was replaced twice. Each time the valve's isolation logic was reset, the fuse blew. Further investigation found isolation relay A71B-K75 in a degraded condition. Relay A71B-K75 is in circuit with the PCIS logic string and is used to produce an automatic isolation signal for E11-F008. The relay in its energized state produces an open permissive and in its de-energized state produces a trip signal for E11-F008.

An examination of the relay's integral Metal Oxide Varistor determined that a failure had occurred. The Varistor had developed a low resistance path to ground. The low resistance condition caused high current flow from the 120 VAC source power. Power source fuse F63 in the circuit with the relay solenoid had failed open due to the high current flow. The relay and fuse were replaced on April 20. The PCIS logic for E11-F008 was successfully tested April 24, at 2313 hours.

Cause of the Event:

The event was caused by premature failure of the newly replaced Agastat relay A71B-K75. A failure of the relay's Metal Oxide Varistor Transient Suppression Device (TSD) was experienced within the isolation relay. The TSD is installed across the relay coil. One side of the Metal Oxide Varistor TSD is common with the neutral for the 120 VAC logic power source. A low D.C. resistance was developed. Power source fuse F63 in circuit with the relay failed open when an attempt was made to reset E11-F008's isolation logic, prior to re-energizing the valve.

Isolation valve E11-F008 stroked closed due to the presence of a isolation signal. The signal was produced by a failure of the PCIS relay A71B-K75 to remain energized following a reset of E11-F008's isolation logic. As designed, the valve stroked closed in the presence of an isolation signal.

Analysis of the Event:

SDC is required to remove decay heat and provide mixing of the reactor coolant to assure proper temperature indication. Technical Specifications require that two loops of shutdown cooling be operable when the plant is in this Operational Condition. Both loops of SDC became inoperable when E11-F008 closed. However, operations personnel acted promptly to restore SDC, and were well within the time frame allowed by the Technical Specification Action Statement 3.4.9.2.b. This event is reportable since it was a loss of the RHR SDC system for a breif period of time. This event can only occur while Shutdown Cooling is in use and not while the plant is at power.

Corrective Action:

SDC was promptly re-established by manually opening E11-F008. The relay and fuse were replaced. PCIS logic successfully passed testing on April 24, at 2313 hours. The valve was then returned to normal operation upon restoration of power.

Previous Similar Events:

Three previous Licensee Event Reports (LER) have reported the isolation of SDC. LER 88-013 described an event where E11-F008 was closed and isolated RHR SDC. This event was caused by a combination of procedural inadequacies and personnel error. LER 88-006 describes an event where E11-F008 stoked closed when the valve's logic was improperly reset. LER 87-009 described an event where E11-F009, the RHR SDC inboard isolation valve isolated during an intermittent transmitter failure (PDT).

William S. Orser
Vice President
Nuclear Operations

Detroit Edison

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10CFR50.73

Nuclear Operations

May 20, 1988
NRC-88-0125

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. 88-016-00

Please find enclosed LER No. 88-016-00, dated May 20, 1988, for a reportable event that occurred on April 20, 1988. A copy of this LER is also being sent to the Regional Administrator, USNRC Region III.

If you have any questions, please contact Joseph Pendergast at (313) 586-1682.

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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