William S. Orser
Vice President
Nuclear Operations

Detroit Edison

Fermi 2
6400 North Dixie Highway
Newport, Michigan 48166
(313) 586-5201

10CFR50.73

Nuclear Generation

November 30, 1989
NRC-89-0251

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

Licensee Event Report 89-019-00 dated
September 18, 1989, NRC-89-0182

Subject: Licensee Event Report (LER) No. 89-019-01

Please find enclosed LER No. 89-019-01, dated November 30, 1989, for a reportable event that occurred on August 19, 1989. This report is being revised to include the results of the analysis performed upon the failed component. 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. W. Defayette/W. L. Axelson
W. G. Rogers
J. F. Stang

Wayne County Emergency
Management Division

IE22
1/1

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 4

TITLE (4) Failure of Division I Control Center Heating, Ventilating and Air Conditioning Recirculation Fan

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)
									N/A	0 5 0 0 0
0 8	1 9	8 9	8 9	0 1 9	0 1	1 1	3 0	8 9	N/A	0 5 0 0 0

OPERATING MODE (9)	1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)					
POWER LEVEL (10)	0 9 6	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)	X 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
Patricia Anthony, Compliance 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	
X	V I	F A N	B 5 1 5	Y							

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)

On August 19, 1989, Division I of the Control Center Heating, Ventilating and Air Conditioning System (CCHVAC) was operating in recirculation mode. At 1010 hours, pressure control was lost which resulted in a decrease in control room air pressure. It was discovered that the Division I recirculation fan was not rotating and Division I of CCHVAC was placed in its normal mode of operation in order to restore system pressure.

In order to repair the fan, it was necessary to breach the emergency filter housing which is common to both divisions of CCHVAC. Division II of CCHVAC was placed in normal mode of operation. Division I of CCHVAC was shutdown and Technical Specification 3.0.3 was entered. The filter housing was restored within an hour. On August 20, 1989, the filter was again breached to complete repairs on the fan.

The cause of the failure was that one of the bearings seized. An analysis has shown that this event was caused by lack of lubrication. Two theories as to the cause of this have been identified. Improvements to the lubrication program, the preventative maintenance program and the CCHVAC performance monitoring program are being evaluated.

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

Initial Plant Conditions:

Operational Condition: 1 (Power Operation)
Reactor Power: 95.5 percent
Reactor Pressure: 990 psig
Reactor Temperature: 535 degrees Fahrenheit

Description of Occurrence:

On August 19, 1989 at 0328 hours, the Division I Control Center Heating, Ventilating and Air Conditioning System [(CCHVAC)(VI)] was placed in recirculation mode as part of surveillance 24.413.03, "Control Room Emergency Filter Monthly Operability Test". A burning smell was noticed by Control Room personnel and an investigation into the cause was initiated. At 1010 hours, pressure control for Division I CCHVAC was lost which caused control center pressure to drop from a positive quarter inch of water to approximately a negative third of an inch of water. The Division I recirculation fan, T41-C047, was found not rotating at 1107 hours. It was discovered that the bearing had seized. Division I CCHVAC was placed in its normal mode of operation and system pressure control was restored.

At 1155 hours, Division II CCHVAC was placed in normal mode of operation so that Division I could be shutdown for repairs. Since the recirculation filter train housing which contains the recirculation fan is common to both divisions of CCHVAC, both had to be declared inoperable while the housing was breached. Since this resulted in entry into Technical Specification 3.0.3 at 1342 hours. Reactor power was decreased approximately one percent starting at 1415 hours in accordance with Technical Specification 3.0.3. The damaged fan was removed and the filter train housing was returned to service at 1424 hours. This made Division II of CCHVAC operable.

Once the fan was ready on August 20, 1989, the filter train housing was again breached in order to complete the repairs on the fan. This required entry into Technical Specification 3.0.3 from 1415 hours to 1534 hours. An Unusual Event was declared and shutdown of the plant commenced as required by Technical Specification 3.0.3. Upon completion of repairs, Division I of CCHVAC was returned to operable status and the Unusual Event terminated.

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

Cause of Event:

Based upon analysis by Detroit Edison's Engineering Research Department, it was determined that the bearing had failed due to lack of lubrication. Two possible theories as to the cause of this have been proposed. First, the new bearing installed in 1984 might not have been suitably packed with grease initially. Subsequent lubrications with a measured quantity of grease would not have filled the void present due to the inadequate initial lubrication. Eventually, this could have caused the bearing failure. The second theory is that the bearing was loose on the shaft. This would have caused heating on the bearing inner race where it contacts the shaft. The increased temperatures could have caused lubrication breakdown, and eventually bearing failure.

Analysis of Event:

The other operational modes of Division I CCHVAC were not affected by the fan failure. Division II of CCHVAC recirculation mode was only affected while the common filter train housing was breached. Since Technical Specification 3.7.2, Control Room Emergency Filtration System, does not allow both divisions of recirculation to be unavailable concurrently, Technical Specification 3.0.3 was entered. If repairs had not been completed expediently, the plant would have continued to shutdown as required. There were no challenges to the engineered safety features due to this event. This event did not impact the safe operation of plant or the health and safety of the public.

Corrective Actions:

As previously described, the shaft and the bearings were replaced and the fan was placed back in service at 1534 hours on August 20, 1989.

Evaluation of improvements to the lubrication program for open pillow-block bearings, such as the one that failed, and improvements to the fans preventative maintenance as it relates to checking bearing tightness are being pursued. In addition, recommendations for additional monitoring as part of the Performance Evaluation Program for CCHVAC, including identification of any modifications necessary to support this, are being evaluated. These actions will be completed by the end of January 1990.

Previous Similar Events:

In September of 1984, prior to plant operation, a bearing failure occurred on the same fan due to shifting on the pillow block. The lubricants for the bearings were switched from oil to grease at the recommendation of the vendor at that time.

Failed Component Data:

T41-C047: Buffalo Forge model 77K255045