

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)
McGuire Nuclear Station, Unit 2DOCKET NUMBER (2)
0 5 0 0 0 3 7 0PAGE (3)
1 OF 0 3

TITLE (4)

Loss of Centrifugal Charging Pump 28 Speed Changer Lubrication

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	2	2	3	8	4	8	4	0	0	8	0	5	0	0	0			
0	2	2	3	8	4	0	0	0	3	2	6	8	4	0	5	0	0	0

OPERATING MODE (9)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)									
POWER LEVEL (10) 11010	1	20.402(b)	20.406(e)	50.73(a)(2)(iv)	73.71(b)						
		20.406(a)(1)(i)	50.38(e)(1)	X 50.73(a)(2)(v)	73.71(c)						
		20.406(a)(1)(ii)	50.38(e)(2)	50.73(a)(2)(vii)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)						
		20.406(a)(1)(iii)	50.73(a)(2)(i)	50.73(a)(2)(viii)(A)							
		20.406(a)(1)(iv)	50.73(a)(2)(ii)	50.73(a)(2)(viii)(B)							
		20.406(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(ix)							

NAME		TELEPHONE NUMBER	
Phillip B. Nardoci, Licensing Engineer		AREA CODE	71014 317131-17141312

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (12)									
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPDs	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPDs
D	C	B	P	1025	Y				

SUPPLEMENTAL REPORT EXPECTED (14)		EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
<input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE)		<input checked="" type="checkbox"/> NO			

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

On February 23, 1984 at approximately 0915, a technician removed a thermometer from the speed changer on Centrifugal Charging Pump 2B (NV Pump 2B) for calibration (while the pump was running). This resulted in a loss of lubrication to the speed changer which led to serious damage to the bearings.

Due to the loss of the speed changer, NV Pump 2B and Chemical and Volume Control System (NV) Train 2B were declared inoperable, pursuant to Technical Specifications 3.5.2, 3.1.2.2, and 3.1.2.4. These specifications require that both trains of NV be operable in Modes 1, 2, and 3. Unit 2 was in Mode 1 at 100% power at the time of the incident. NV Pump 2A was started to maintain charging flow, and NV Pump 2B was shutdown.

This incident is attributed to Administrative/Procedural Deficiency. Thermometers on the speed changer and outboard bearing of the pump were installed in the wrong location. The thermometer to be calibrated was not listed in the McGuire Instrument and Control List, and the generic calibration procedure and work request were inadequately prepared for the removal of the thermometer for calibration.

The thermometers were exchanged, the speed changers shaft, bearing, and gears replaced, and the pump tested and declared operable. Procedures and work requests will be revised with restrictions to aid in the removal and installation of the thermometers.

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LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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

On February 23, 1984 at approximately 0915, a technician removed a thermometer [EIIS:XE] from the speed changer [EIIS:65] on Centrifugal Charging Pump 2B (NV Pump 2B) [EIIS:P] for calibration (NV Pump 2B was running). This resulted in a loss of lubrication to the speed changer which led to serious damage to the bearings.

The Control Room received a fire alarm in the pump room, and investigation found smoke coming out of the overheated speed changer. NV Pump 2A was started to maintain charging flow, and NV Pump 2B was shutdown.

Due to the loss of the speed changer, NV Pump 2B and Chemical and Volume Control System (NV) Train 2B were declared inoperable, pursuant to Technical Specifications 3.5.2, 3.1.2.2, and 3.1.2.4. These specifications require that both trains of NV be operable in Modes 1, 2, and 3. Unit 2 was in Mode 1 at 100% power at the time of the incident.

The thermometer was located on the suction side of the speed changer lube oil pump. During its initial calibration, the thermometer (2MNVTH9340, "Centrifugal Charging Pump 2A Oil Temperature"), was calibrated and labelled. Then it was installed on the speed changer instead of the outside thrust bearing of the pump. The thermometer designated for the speed changer was installed on the thrust bearing instead. Since the thermometer was located at the high point of the suction piping, its removal resulted in a loss of the prime of the lube pump when the lube pump was operating. A check valve [EIIS:V] in the suction line prevents a loss of pump prime when the lube pump is not operating. Therefore, when the technician removed the thermometer of the operating pump, the lubrication pump prime was lost.

The following were contributing factors that led to the damage of the speed changer:

- 1) A generic calibration procedure, "Calibration Procedure for Ashcroft Bi-Metal Thermometers", was used to calibrate the thermometer. This procedure only covered the bench calibration. There were no provisions in the procedure for the thermometers removal or installation.
- 2) There was a lack of adequate information on the work request, e.g. the pump should be off.
- 3) The thermometer was not listed in the McGuire Instrument and Control (I&C) List. Without the information that would have been available from the I&C List, the technician was unaware that the thermometer did not have a well.
- 4) A visual inspection of the thermometer by the technician showed a bushing connecting the thermometer to the piping, which led him to believe that the thermometer had a well.
- 5) The technician was also unaware that the gauge labelled 2MNVTH9340 was in the wrong location. It was supposed to be on the pump thrust bearing.

The thermometer on the outside thrust bearing was the gauge needed to perform the "Centrifugal Charging Pump 2B Performance Test". The work request to calibrate the thermometer was on gauge 2MNVTH9340, which was located on the speed changer instead of the pump. The gauge used on the bearing had not been calibrated in over a year. The gauge was checked for accuracy and found it to be within the tolerances needed for the tests.

Even though the gauge was in the wrong location, the thermometer nomenclature was stated on the work request. The nomenclature made it clear that the thermometer was on the pump, but the technician went only by the instrument number to find the gauge. The

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

technician did not realize until after the incident that 2MNVTH9340, Centrifugal Charging Pump 2A Oil Temperature Gauge was in the wrong location. If the thermometer had been in the right location, it's removal with the pump running would have slung oil out of the hole. The bearing is forced lubrication, but it has a large reservoir of oil and the lube pump prime would not be lost unless a large part of the oil was lost by the open thermometer penetration.

All these factors led to the technician removing the wrong thermometer which destroyed the speed changer. The shaft, bearing, and gears of the speed changer were replaced due to the damage caused by the lack of lubrication. It was found that the thermometers on the speed changers of NV Pump 2A and NV Pump 2B should be located on the outboard bearing of the pump. The thermometers on the speed changers of each pump were exchanged with the thermometers on the outboard bearing of each pump, and labelled correctly. The pump was retested per the "Centrifugal Charging Pump 2B Performance Test", and declared operable on February 26, 1984.

Three thermometer calibration procedures will be reissued by March 15, 1984 with guidelines for the removal of thermometers. Changes to the work request will be made to give more information on gauge location, whether or not a well is present, red tages needed, and instructions to aid in the removal and installation of the gauge.

The loss of Chemical and Volume Control System (NV)[EIIS:CB] Train B had no impact on the health and safety of the public. NV Train A was started immediately to maintain reactor coolant system pressure and pressurizer level. NV Train 2B was declared operable within the 72 hour limit as specified by Technical Specifications.

DUKE POWER COMPANY

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HAL B. TUCKER
VICE PRESIDENT
NUCLEAR PRODUCTION

March 26, 1984

TELEPHONE
(704) 373-4531

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

Subject: McGuire Nuclear Station, Unit 2
Docket No. 50-370
LER 370/84-08

Gentlemen:

Pursuant to 10 CFR 50.73 Section (a)(1) and (d), attached is Licensee Event Report 370/84-08 concerning a loss of centrifugal charging pump 2B speed changer lubrication which is submitted in accordance with §50.73(a)(2)(v)/(vi). This event was considered to be of no significance with respect to the health and safety of the public.

Very truly yours,

H.B. Tucker / BT

Hal B. Tucker

PBN:dyh

Attachment

cc: Mr. James P. O'Reilly, Regional Administrator
U. S. Nuclear Regulatory Commission
Region II
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Atlanta, Georgia 30303

Records Center
Institute of Nuclear Power Operations
1100 Circle 75 Parkway, Suite 1500
Atlanta, Georgia 30339

Mr. W. T. Orders
NRC Resident Inspector
McGuire Nuclear Station

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