

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)

McGuire Nuclear Station Unit 2

DOCKET NUMBER (2)

0 5 0 0 0 3 7 1 0

PAGE (3)

1 OF 04

TITLE (4)

Manual Reactor Trip on Loss of Main Feedwater Pump

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)						
1	0	2	5	8	4	8	4	0	2	7	0	5	0	0	0		
1	0	2	5	8	4	8	4	0	2	7	0	5	0	0	0		

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

OPERATING MODE (9)	20.402(b)	20.405(c)	50.73(a)(2)(iv)	73.71(b)
1			X	
POWER LEVEL (10)	20.405(a)(1)(i)	50.36(c)(1)	50.73(a)(2)(v)	73.71(c)
0	2	7		
	20.405(a)(1)(ii)	50.36(c)(2)	50.73(a)(2)(vi)	
	20.405(a)(1)(iii)	50.73(a)(2)(i)	50.73(a)(2)(vii)(A)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
	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)(ix)	

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER
Scott Gewehr - Licensing	AREA CODE: 7 0 4 3 7 3 - 7 5 8 1

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPDs	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPDs

SUPPLEMENTAL REPORT EXPECTED (14)

YES (If yes, complete EXPECTED SUBMISSION DATE)	NO	EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
	X				

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

On October 25, 1984 a manual reactor trip was initiated following a loss of main feedwater pump 2A. Pump 2B was not operating at the time. Unit 2 was at 27% power, changing over from the main/auxiliary (upper) steam generator nozzles to the main (lower) nozzles. The mechanical cause of the event is attributed to water in the pump control oil system. This in turn was caused by a procedural deficiency, due to inadequate surveillance of the oil filter. Corrective Actions will address formalized surveillance of the control oil filters to detect water in the oil.

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LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

APPROVED OMB NO. 3150-0104

EXPIRES: 8/31/85

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							4

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

INTRODUCTION: At 1423 on October 25, 1984, a manual reactor trip was initiated following a loss of the main turbine feedwater pump 2A. The turbine feedwater pump tripped on high discharge pressure (1435 psi) when water in the control oil system caused the pump to overspeed.

Unit 2 was in Mode 1 at 27% power at the time of the trip.

An administrative/procedural Deficiency has been identified as the cause of this incident due to inadequate surveillance on the oil filter condition.

EVENT DESCRIPTION: During Unit 2 startup, with main feedwater pump 2A operating and pump 2B not in service, operators began changing flow from the upper steam generator main/auxiliary feedwater flow nozzles to the lower main flow nozzles. As the main feedwater (EIIIS: SJ) Isolation valves were opened, main feedwater (CF) header pressure dropped about 30 psi. Operators then increased CF pump speed to restore CF header pressure. Pump speed then increased rapidly, beyond the controller setpoint. CF pressure rose proportionately. CF pump 2A tripped on high discharge pressure (1435 PSI). With CF pump 2B not operating, the turbine generator tripped on loss of both CF pumps. The operators then manually tripped the reactor.

Reactivity was properly controlled by the reactor trip. Pressurizer pressure fell to its minimum value of 2166 psig, then recovered. Pressure stabilized within 10 psi of its reference value (2235 psig) within 30 minutes following the reactor trip. Peak pressurizer pressure was 2273 psig, which occurred ~19 minutes after the trip. Pressure remained well below the uncompensated PORV setpoint (2385 psig) and well above the Safety Injection setpoint (1845 psig) at all times. Reactor coolant average temperature fell following the trip to 564F, and recovered to ~548F about thirty minutes after the reactor trip. This is below the no-load target of 557F, and was due to the lower than normal steam pressure. (The steam pressure response will be discussed below.) Primarily wide range hot and cold leg temperatures responded similarly to average temperature. Pressurizer level fell following the trip to its minimum value of 20% about 12 minutes after the trip. Level recovered to 32% within 30 minutes after the trip. (The no-load target is 25%). Pressurizer level remained on scale at all times. Letdown was not isolated.

Steam pressure was 1040 psig prior to the manual reactor trip. This is 20 psi above its pre-transient value. Steam pressure had risen due an increase in reactor power prior to the reactor trip. Steam pressure peaked post-trip at 1100 psig. The steam generator PORVs and Main Steam Code Safety Valves were not challenged. (Their set-points are 1125 psig and 1170 psig respectively.) Auxiliary feedwater was initiated on loss of both main feedwater pumps. Pressure then fell to 1040 psig as a result of the auxiliary feedwater addition. The A main feedwater pump was reset about 3.5 minutes after the reactor trip, and was brought up to speed about seven minutes after the trip. (The operators were attempting to return the unit to main feedwater supply.) The A main feedwater pump was run for 7.5 minutes, until it tripped again on high discharge pressure. During this time period steam pressure fell to 995 psig, as a result of the auxiliary feedwater (and possibly main feedwater) flow. The main feedwater pump trip reinitiated auxiliary feedwater. Steam pressure decreased to its minimum value of 984 psig, due to the auxiliary feedwater addition. Pressure began to recover once auxiliary feedwater was secured, and had reached ~1005 psig

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3151-0104

EXPIRES: 8/31/85

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TEXT (If more space is required, use additional NRC Form 368A's) (17)

thirty minutes after the trip. The steam pressure was below the no-load target value of 1090 psig, but pressure was controlled at all times. Primary parameters were within acceptable limits at all times.

After the reactor trip level dropped to its minimum value of 26% in steam generator C. Both auxiliary feedwater pumps were initiated when the A main feedwater pump tripped. The operators reset the valves about 1.5 minutes later and adjusted flow to maintain steam generator levels, because they were above the post-trip low-low level setpoint (12%). The A main feedwater pump was reset about 3.5 minutes post-trip, and was brought up to speed about seven minutes after the trip, and the preheater bypass isolation valves were opened. (The operators were attempting to return the unit to main feedwater supply.) The B motor driven auxiliary feedwater pump was secured approximately five minutes later, while the A pump was secured about 1.5 minutes after B. The A main feedwater pump was run for 7.5 minutes, until it tripped again on high discharge pressure. During this time period the level in steam generators A and D increased to ~50% narrow range. The levels in steam generators B and C increased very slightly during this period. The main feedwater pump trip reinitiated auxiliary feedwater. (This occurred about 15 minutes after the trip.) Auxiliary feedwater fed all four steam generators for ~7.5 minutes. Both auxiliary feedwater pumps were secured at this time. Level stabilized at 58% narrow range in steam generators A and D, and 38% in steam generators B and C thirty minutes after the reactor trip. (The no-load target value is 38%.)

Safety Injection was not actuated. The Pressurizer PORVs and Code Safety Valves were not challenged. Pressurizer level and steam generator level remained on-scale at all times. Letdown was not isolated. The primary temperature decrease was within the 100F/hour Technical Specification limit. There was no abnormal release of radioactivity during this event, and no abnormal coolant leakage.

EVALUATION: The main turbine feedwater pump speed control system uses small orifices to admit control oil to the speed control servomotors. The pressure of the control oil is governed by the amount of leakage through 4 "cup" valves. As control signals vary, the seating force on these cup valves changes, allowing more variance in the leakage and pressure in the control oil to the servomotors.

The feedwater pump trip was caused by water in the control oil system. The water could have caused the overspeed condition (A) as it entered any of the orifices causing pressure surges or (B) as it entered a cup valve causing its back pressure to change suddenly.

The water was discovered in the recently installed Nugent filters on the control oil system. Previous problems with the orifices being clogged with trash had resulted in the installation of the filters. Instrument and Electrical (IAE) personnel drained approximately 2 to 2.5 gallons of water from the in-service filter and more than 2 gallons from the standby filter. If more than 1.25 gallons of water settles in the bottom of the filter, the water will flow with the oil into the control systems.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

APPROVED OMB NO. 3150-0104
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TEXT (If more space is required, use additional NRC Form 366A's) (17)

It is believed that the water got into the lube/control oil system by leaking past the turbine shaft seals. This leakage is higher during periods when the turbine pump is tripped and cooled down, as it was during the period prior to this start-up event. The lube/control system is periodically checked by knowledgeable Operations personnel. There were no procedures or administrative controls to do this. The only provisions for checking water in the filter is by drawing a sample from the drain. An indication such as a sight glass may have been helpful in determining the water problem and also preventing future problems.

Operations personnel were aware of the water problem and had been periodically checking the filter and draining the water as necessary.

After the water was drained from the filters, the turbine pump was restarted without problems and McGuire Unit 2 resumed start up.

CORRECTIVE ACTION: Water samples are being taken at regular intervals from the filters, to determine how often the water should be drained. When this frequency is determined, the filter surveillance will be added to the operators' routine surveillance checklist. Also, a determination will be made whether a sight glass is viable for this system.

DUKE POWER COMPANY

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CHARLOTTE, N.C. 28242

HAL B. TUCKER
VICE PRESIDENT
NUCLEAR PRODUCTION

November 26, 1984

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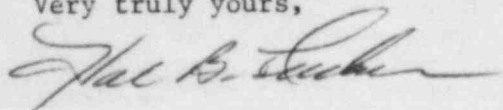
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Washington, D. C. 20555

Subject: McGuire Nuclear Station, Unit 2
Docket No. 50-370
LER 370/84-27

Gentlemen:

Pursuant to 10 CFR 50.73 Sections (a)(1) and (d), attached is Licensee Event Report 370/84-27 concerning a manual reactor trip resulting from a Loss of Main Feedwater Pumps which is submitted in accordance with § 50.73 (a)(2)(iv). Initial notification of this event was made (pursuant to § 50.72 Section (b)(2)(ii)) with the NRC Operations Center via the ENS on October 25, 1984. This event was considered to be of no significance with respect to the health and safety of the public.

Very truly yours,



Hal B. Tucker

SAG/mjf

Attachment

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

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