

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) McGuire Nuclear Station, Unit 1	DOCKET NUMBER (2) 0 5 0 0 0 3 1 6 1 9 1	PAGE (3) 1 OF 0 5
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TITLE (4)
Turbine Driven Auxiliary Feedwater Pump Automatically Started Because of a Failed Fuse

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)
08	17	88	88	021	00	09	19	88	N/A		0 5 0 0 0 0 0 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) 1	POWER LEVEL (10) 1 0 0	20.402(b)	20.406(a)(1)(i)	20.406(a)(1)(ii)	20.406(a)(1)(iii)	20.406(a)(1)(iv)	20.406(a)(1)(v)	20.406(a)(1)(vi)	20.406(a)(1)(vii)	20.406(a)(2)(i)	20.406(a)(2)(ii)	20.406(a)(2)(iii)	20.406(a)(2)(iv)	20.406(a)(2)(v)	20.406(a)(2)(vi)	20.406(a)(2)(vii)	20.406(a)(2)(viii)	20.406(a)(2)(ix)	20.406(a)(2)(x)	73.71(i)	73.71(j)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
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LICENSEE CONTACT FOR THIS LER (12)

NAME Steven E. LeRoy, Licensing	TELEPHONE NUMBER
	AREA CODE: 710 6 317 1 31-1 61 2 1 3 3

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPROS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPROS
X	B ₁ A	F U D	1 1 1 8	N					

SUPPLEMENTAL REPORT EXPECTED (14)

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

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

On 08/17/88 at 2258, Operations (OPS) received indications that the Unit 1 Turbine Driven (T/D) Auxiliary Feedwater (CA) pump automatically started. Observing no indications or alarms supporting why the pump started, OPS attempted to stop the pump and discovered they could not. At 2301, OPS closed the T/D CA Pump discharge regulating valves, which redirected the discharge flow through the pump mini-flow recirculation line. OPS declared Unit 1 T/D CA Pump inoperable retroactive from the pump start time and directed Instrumentation and Electrical (IAE) to begin troubleshooting the problem. On 08/18/88, at approximately 0100, IAE determined a blown fuse had caused the start of the T/D CA Pump, and that there was not a replacement fuse available. On 08/19/88, at 1214, IAE replaced the fuseblock and fuse. On 08/19/88, at 1340, OPS declared the Unit 1 T/D CA Pump operable. This event is assigned a cause of Other because of a blown fuse which caused the T/D CA Pump to automatically start.

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LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1) McGuire Nuclear Station, Unit 1	DOCKET NUMBER (2) 0 5 0 0 0 3 6 9 8 8	LER NUMBER (8)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
		8 8	- 0 2 1	- 0 0	0 2	OF	0 5

TEXT (if more space is required, use additional NRC Form 3884's) (17)

INTRODUCTION:

On August 17, 1988 at 2258:42, Operations (OPS) Control Room personnel received indications that the Unit 1 Turbine Driven (T/D) Auxiliary Feedwater (CA) pump automatically started. Observing no indications or alarms supporting why the pump started, OPS Control Room personnel attempted to stop the pump and discovered they could not.

At 2301:32, OPS Control Room personnel closed the T/D CA Pump discharge regulating valves, which redirected the discharge flow through the pump mini-flow recirculation line. OPS personnel declared the Unit 1 T/D CA Pump inoperable retroactive from the pump start time and directed Instrumentation and Electrical (IAE) personnel to begin troubleshooting the problem. At 2315, OPS personnel notified the NRC of the T/D CA Pump start.

On August 18, 1988, at approximately 0100, IAE personnel determined a blown fuse had caused the start of the T/D CA Pump. IAE personnel also determined there was not a replacement fuse available. On August 19, 1988, at 1214, IAE personnel replaced the fuseblock and fuse according to a Nuclear Station Modification work request.

On August 19, 1988, at 1340, OPS personnel declared the Unit 1 T/D CA Pump operable.

Unit 1 was in Mode 1, Power Operation, at 100% power at the time of this event.

This event has been assigned a cause of Other because of a blown fuse which caused the T/D CA Pump to automatically start.

EVALUATION:

Background

The CA system [EIIS:BA] is provided as a backup for the Main Feedwater system [EIIS:SJ]. It is designed as a means to remove heat from the Reactor Coolant system [EIIS:AB] when normal systems are not available. The CA system contains two motor [EIIS:MO] driven pumps [EIIS:P], one turbine [EIIS:TRB] driven pump and associated piping, valves, and controls. The T/D CA Pump is capable of supplying feedwater to all four steam generators [EIIS:SG].

Technical Specification 3.7.1.2 requires that at least three independent CA pumps and associated flow paths shall be operable in Modes 1, 2 (Startup), and 3 (Hot Standby). The Action Statement specifies that if one CA pump is inoperable, it must be restored to operable status within 72 hours or the unit shall be in at least Hot Standby within the next six hours and in Mode 4 (Hot Shutdown) within the following six hours. The Action Statement also specifies that with two CA pumps inoperable, the unit shall be in at least Hot Standby within six hours and in Hot Shutdown within the following six hours.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1): McGuire Nuclear Station, Unit 1	DOCKET NUMBER (2): 0 5 0 0 0 3 6 9	LER NUMBER (8):			PAGE (3):	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
		8 8	- 0 2 1	- 0 0	0 3	OF 0 5

TEXT OF THIS NOTICE IS PRELIMINARY. USE ADDITIONAL NRC Form 288A (2/117)

When the T/D CA Pump automatically starts, the mini-flow recirculation line isolation valve closes and the T/D CA Pump discharge regulating valves open. To gain control of the pump and associated valves, OPS personnel must depress the T/D CA Pump "Auto Reset" switch on the Main Control Board.

Description of Event

On August 17, 1988, at 2258:42, OPS Control Room personnel received Operator Aid Computer and Main Control Board indications that the Unit 1 T/D CA Pump automatically started but saw no other supporting indications or alarms to justify the start. When OPS Control Room personnel attempted to stop the pump, they discovered they could not. Lights for the T/D CA Pump "Auto Reset" switch and the T/D CA Pump discharge regulating valves position indicators were not illuminated which indicated to OPS personnel a loss of power (i.e. possibly a blown fuse).

At 2301:32, OPS Control Room personnel closed valves 1CA-64AR, 1CA-52AB, 1CA-48AR, and 1CA-36AB, T/D CA Pump Flow To Steam Generator A, B, C, and D, respectively, using the pneumatic manual loaders on the Main Control Board. This redirected T/D CA Pump discharge flow through the pump mini-flow recirculation line to the Upper Surge Tank.

OPS personnel declared the Unit 1 T/D CA Pump inoperable retroactive from the pump start time. OPS personnel directed IAE personnel to begin troubleshooting the start of the T/D CA Pump. At 2315, OPS personnel notified the NRC of the T/D CA Pump start using procedure RP/O/A/5700/10, NRC Immediate Notification Requirements.

On August 18, 1988, at approximately 0100, IAE personnel determined a blown fuse in the Unit 1 CA Pump Turbine Control Panel had caused the start of the Unit 1 T/D CA Pump. IAE personnel also determined there was not a direct replacement fuse available. Also at approximately 0100, OPS personnel closed the T/D CA Pump steam supply stop valve and secured the pump. During the morning of August 18, 1988, IAE Technical Support personnel submitted to Project Services personnel documentation including a recommended resolution to replace the blown fuse with a more commonly used and stocked type. Project Services personnel submitted the documentation to Design Engineering (DE) personnel. DE personnel evaluated the problem ensuring the replacement fuse was adequately sized and breaker-coordinated and gave approval to Project Services personnel to implement the change.

On August 19, 1988, at 1214, IAE personnel replaced the blown fuse, a Bussman Model No. FRN-R, 7 ampere time delay type with a Bussman Model No. FNQ, 7 ampere type and also changed the fuse block to a Model No. 2808 to accommodate the physically smaller FNQ fuse. The change was made according to Nuclear Station Modification Work Request 95991 and OPS Work Request 135816. IAE personnel functionally verified the indications and controls fed through the fuse and at 1340, OPS personnel returned the Unit 1 T/D CA Pump to operable status.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (3)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
		0 5 0 0 0 3 6 9 8 8 --	0 2 1 --		

McGuire Nuclear Station, Unit 1

TEXT IF MORE SPACE IS REQUIRED, USE ADDITIONAL NRC Form 305A (17)

Conclusion

This event is assigned a cause of Other because of a blown fuse which caused the T/D CA Pump to start. The fuse is fed from the 120 volt AC Auxiliary Power Panel Board KXA and supplies nonessential power to several CA system valve indications and miscellaneous controls for the T/D CA Pump. During their troubleshooting, IAE personnel located no other damaged or failed components that would have caused the fuse to fail. Therefore, IAE personnel attributed this failure to age with no external conditions contributing to the failure, such as environment or circuit overloading.

IAE personnel concluded that when the fuse failed, power was removed from two relays which opened contacts and deenergized the solenoid valves that admit air to hold the steam supply to the T/D CA Pump isolation valves closed. The isolation valves moved to the failed open (safety) position and admitted steam to start the Unit 1 T/D CA Pump.

A review of the McGuire Licensee Event Reports (LER) for the past three years revealed numerous incidents involving Engineered Safety Features actuations caused by a failed component, but only LER 370/85-29 was similar to this event. A Unit 2 T/D CA Pump start occurred when the fuse that feeds the identical circuitry affected in this incident failed from harmonics produced as IAE personnel lifted a lead to a pressure switch. The corrective actions for LER 370/85-29 could not have prevented this event from occurring because the failure of the fuse in this event is attributed to age. Therefore, this event is not considered to be recurring.

This event is not reportable to the Nuclear Plant Reliability Data System (NPRDS).

CORRECTIVE ACTIONS:

Immediate: 1) OPS Control Room personnel closed the T/D CA Pump discharge regulating valves which redirected pump discharge flow through the mini-flow recirculation line to the upper surge tank.

2) OPS personnel closed the T/D CA Pump steam supply stop valve and secured the pump.

Subsequent: IAE personnel determined that a blown fuse had caused the start of the T/D CA Pump and replaced the fuse according to Nuclear Station Modification Work Request 95991 and OPS Work Request 135816.

Planned: None

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1) McGuire Nuclear Station, Unit 1	DOCKET NUMBER (2) 0 5 0 2 0 0 3 1 8 8	LER NUMBER (5)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
					0 0 0 5	OF 0 5

TEXT (if more space is required, use additional NRC Form 256A 2/177)

SAFETY ANALYSIS:

The Action Statement for Technical Specification 3.7.1.2 specifies that if one CA pump is inoperable, it must be restored to operable status within 72 hours. The T/D CA Pump was inoperable for approximately 39 hours. During this time, Motor Driven CA Pumps 1A and 1B were operable and capable of supplying water to the steam generators if the Main Feedwater system became inoperable. The McGuire Final Safety Analysis Report, Section 15, assumes that the T/D CA Pump fails during a Loss of Normal Feedwater Flow transient and the Motor Driven CA Pumps remain available to deliver feedwater to the steam generators. Even though the T/D CA Pump was technically inoperable, OPS personnel could have reopened the T/D CA Pump steam supply stop valve and the discharge regulating valves and used the pump to deliver feedwater to all four steam generators.

The Main Feedwater system was operable during this time period and provided adequate feedwater flow at the required pressure and temperature to the steam generators.

During the 39 hour time period, no incident occurred which would have challenged the Main Feedwater system and required the CA system to supply feedwater flow to the steam generators.

There were no personnel injuries, radiation overexposures, or releases of radioactive material as a result of this event.

This event is considered to be of no significance with respect to the health and safety of the public.



DUKE POWER

September 19, 1988

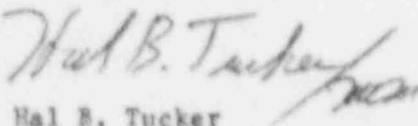
U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, D.C. 20555

Subject: McGuire Nuclear Station, Unit 1
Docket No. 50-369
Licensee Event Report 369/88-21

Gentlemen:

Pursuant to 10 CFR 50.73 Sections (a)(1) and (d), attached is Licensee Event Report 369/88-21 concerning a Unit 1 turbine driven Auxiliary Feedwater Pump automatic start due to a failed fuse. This report is being submitted in accordance with 10CFR 50.73(a)(2)(iv). This event is considered to be of no significance with respect to the health and safety of the public.

Very truly yours,


Hal B. Tucker

SEL/330/mmf

Attachment

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September 19, 1988
Page 2

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