

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 0 3

TITLE (4)

Unplanned Manual Reactor Trip on loss of Generator Hydrogen

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	5	1	6	8	5	8	5	0	1	3	0 0 0 6 2 7 8 5
0 5 0 0 0 0 0 0 0 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(a)(i)(i)

20.405(a)(i)(ii)

20.405(a)(i)(iii)

20.405(a)(i)(iv)

20.405(a)(i)(v)

20.405(c)

50.38(e)(1)

50.38(c)(2)

50.73(a)(2)(i)

50.73(a)(2)(ii)

50.73(a)(2)(iii)

50.73(a)(2)(iv)

50.73(a)(2)(v)

50.73(a)(2)(vii)

50.73(a)(2)(viii)(A)

50.73(a)(2)(viii)(B)

50.73(a)(2)(ix)

73.71(b)

73.71(c)

OTHER (Specify in Abstract below and in Text, NRC Form 366A)

LICENSEE CONTACT FOR THIS LER (12)

NAME

Jerry Day - Licensing

TELEPHONE NUMBER

AREA CODE

7 1 0 4 3 1 7 1 3 - 1 7 1 0 1 3 1 3

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC

SUPPLEMENTAL REPORT EXPECTED (14)

YES (If yes, complete EXPECTED SUBMISSION DATE)

NO

EXPECTED SUBMISSION DATE (15)

MONTH DAY YEAR

A6: If ACT (L) mit to 1400 spaces, i.e. approximately fifteen single-space typewritten lines (16)

On May 16, 1985, at 0924, the Unit 2 main turbine was manually tripped following a significant loss of main generator hydrogen. A reactor trip automatically followed. Hydrogen was being vented and added ("feed and bleed") in an effort to increase hydrogen purity.

Unit 2 was in Mode 1 at approximately 96% power at the time of the incident.

This incident is classified as a Procedural Deficiency because the procedure "Generator Hydrogen System" did not provide the proper method to increase the hydrogen purity of the main generator while preventing excessive hydrogen leakoff.

The generator was repressurized with hydrogen and the unit was restarted.

Had the generator been permitted to continue running with low hydrogen, it could have been damaged due to high temperature. No problems were encountered that would have prevented tripping the turbine.

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LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

APPROVED OMB NO. 3150-0104

EXPIRES: 8/31/85

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
McGuire Nuclear Station - Unit 2	0 5 0 0 0 3 7 0 8 5 -	0	13	- 0 0	0	2	OF 0 3

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

Enclosure 4.2 of the procedure "Generator Hydrogen System" had never been performed until May 16, 1985. On that morning, control room personnel received indication that the hydrogen in the main generator had fallen to approximately 91% purity. (The procedure requires the main generator hydrogen purity to be maintained above 95% during normal operation.) A NEO was dispatched to increase the hydrogen purity.

The NEO began performing Enclosure 4.2 of the procedure. He had never performed this procedure before, although he had met the required qualifications to perform such a test. The procedure enclosure did not point out that hydrogen makeup should equal venting to prevent loss of pressure. Operation of the makeup and vent should have been monitored continuously by someone watching the pressure during the process. The vent valve (2GH-33) is located on a 2½ inch diameter pipe line. The hydrogen make up line, from the hydrogen bulk storage system, is 3/4 of an inch in diameter. The NEO stated that he opened 2GH-33 (which is a gate valve) only about 1/2 turn. He then left this area to check hydrogen pressure, flow, and purity. During this time, main generator hydrogen pressure dropped from ~75 psig to ~2 psig. It is estimated that the main generator ran from approximately 5 to 10 minutes at this reduced hydrogen pressure. Operations had the NEO close 2GH-33 while they were reducing load and VARs (reactive power). However, due to the small hydrogen make up line, hydrogen was not being introduced into the main generator housing fast enough. A manual turbine/reactor trip was initiated to prevent damage to the main generator as advised by General Office personnel. The unit was tripped with minor problems.

Following the trip, primary pressure and temperature dropped (as expected) before returning to reference values. Pressurizer level dropped below the target value following the trip before being returned to the target value. A work request has been written to investigate pressurizer level controller response.

Emergency boration flow was manually initiated prior to the trip in an attempt to reduce power. Flow was terminated when the reactor tripped.

Steam pressure increase on load reduction and the pressure spike following the trip challenged the steam generator PORV's. The PORV on S/G "C" did not open, the other three did open. The PORV on S/G "D" cycled at approximately 1070 psig following the trip. This pressure was high enough not to cause overcooling. When the operators noticed the valve was cycling, it was isolated. Work requests have been written to investigate valve response on S/G's "C" and "D". S/G Level responded as expected.

CORRECTIVE ACTION:

Immediate: Control Room personnel began reducing VARs to reduce generator heat and then began reducing load.

The NEO closed 2GH-33 and aligned hydrogen supply to the main generator.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

APPROVED OMB NO. 3150-0104

EXPIRES 8/31/85

FACILITY NAME (1) McGuire Nuclear Station - Unit 2	DOCKET NUMBER (2) 0 5 0 0 0 3 7 0 8 5 - 0 1 3 - 0 0 0 3	LER NUMBER (6)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			

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

Subsequent: Control personnel initiated a manual turbine/reactor trip as advised by General Office personnel.

Enclosure 4.2 of "Generator Hydrogen System" was revised to minimize the possibility of excessive venting of main generator hydrogen to the atmosphere. A caution statement was also added in the enclosure prior to the step which requires 2GH-33 to be opened.

SAFETY ANALYSIS: If the main generator had been permitted to continue running with a very low hydrogen content to cool the rotors, the generator could have been severely damaged. Damage could have resulted from high temperature or the generator could become grounded due to expansion of materials from lack of cooling. No problems were encountered which would have prevented tripping the turbine.

Following the reactor trip, heat was removed to the condenser and to the atmosphere. Heat removal was adequate and maintained, no overcooling occurred and no safety systems were actuated.

The health and safety of the public were not affected by this incident.

DUKE POWER COMPANY

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VICE PRESIDENT
NUCLEAR PRODUCTION

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June 27, 1985

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

Subject: McGuire Nuclear Station, Unit 2
Docket No. 50-370
LER 370/85-13

Gentlemen:

Pursuant to 10 CFR 50.73 Sections (a)(1) and (d), attached is Licensee Event Report 370/85-13 concerning an unplanned manual reactor trip due to loss of generator hydrogen. 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
Hal B. Tucker

JBD/mjf

Attachment

cc: Dr. J. Nelson Grace, Regional Administrator
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Atlanta, Georgia 30323

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