

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) McGuire Nuclear Station - Unit 2	DOCKET NUMBER (2) 0 5 0 0 0 0 3 7 0	PAGE (3) 1 OF 0 4
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TITLE (4)  
Steam Line 2C Water Hammer

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 4	2 9	8 5	8 5	0 0	9 0	0 6	2 0	8 5			0 5 0 0 0 0
											0 5 0 0 0 0

OPERATING MODE (9) 4	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR § (Check one or more of the following) (11)									
POWER LEVEL (10) 0 1 0 1 0	20.402(b)	20.405(c)	50.73(a)(2)(iv)	73.71(b)						
	20.405(a)(1)(i)	50.36(c)(1)	50.73(a)(2)(v)	73.71(c)						
	20.405(a)(1)(ii)	50.36(c)(2)	50.73(a)(2)(vii)	<input checked="" type="checkbox"/> OTHER (Specify in Abstract below and in Text, NRC Form 366A)						
	20.405(a)(1)(iii)	50.73(a)(2)(ii)	50.73(a)(2)(viii)(A)	Voluntary						
	20.405(a)(1)(iv)	50.73(a)(2)(iii)	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 Jerry Day - Licensing	TELEPHONE NUMBER 7 1 0 4 3 7 3 - 7 0 3 3
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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

SUPPLEMENTAL REPORT EXPECTED (14)

YES (if yes, complete EXPECTED SUBMISSION DATE)  NO

EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR

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

On April 29, 1985, a water hammer occurred on main steam line 2C. Water had accumulated in the line because the main steam line drain valves were closed. The water hammer occurred after the main steam isolation bypass valves were opened, causing the volume of water to be released down the steam line. Before the water hammer, an attempt had been made to open the main steam line drain valves, but they would not open. Gags (mechanism used to physically hold valves in position) had been installed on the valves, preventing them from opening. The gags were inadvertently left on the valves because two different types of gags were used on the valves, and only one type was removed.

The unit was in Mode 4, Hot Shutdown, at the time of the water hammer. This event is attributed to an Administrative Deficiency because no guidance or procedure is available to prevent using two types of gags on the same valve.

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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)

While Unit 2 was in the process of heating up, Performance personnel asked Operations personnel to cycle the main steam isolation valves (MSIVs) and the MSIV bypass valves. Performance personnel wanted to time response test these valves. Operations personnel closed the MSIVs, isolating the steam headers. (The MSIVs had been open to allow even heatup of the SM system). During the time the steam headers were isolated, condensation may have formed in the steam headers. One hour and forty minutes after the MSIVs were closed, the MSIV bypass valves were opened. Twenty minutes later, the water hammer occurred. Operations personnel believe the reason the twenty minute time delay occurred is that steam condensed in a low place in the piping until the water level blocked steam flow. The condensed water was then forced down the steam header.

The reason the water did not drain out of the steam header is that the main steam (SM) drain valves were closed. Their position when the plant is shutdown is closed. During startup, these valves are opened per the Controlling Procedure for Unit Startup. Operations personnel had opened the MSIVs to allow even heat up of the SM system. This was done before the main steam (SM) drain valves were opened. The Controlling Procedure for Unit Startup requires that the SM drain valves be opened prior to opening the MSIVs. Operations Management Procedure (OMP) 1-2 states that procedure steps may be completed out of order as long as the original intent of the procedure is met and with verbal approval of two licensed operators, one of which is a licensed SRO. Operations personnel tried to open the SM drain valves the day before the event but the valves would not indicate open. The problem had not been resolved when Performance personnel asked to cycle the MSIVs and MSIV bypass valves. The reason the SM drain valves would not open is that gags used to hold the valves closed were left on the valves. The following events occurred, resulting in the gag being left on each of the SM drain valves.

The SM drain valves were red tagged gagged closed (to facilitate a turbine inspection) under removal checklist 5866. The built in gag was used by Operations personnel to gag the valves. The SM drain valves were red tagged closed a second time (for a hotwell inspection) twelve days later under removal checklist 6005. This time, Operations personnel did not realize that the built in gag existed and they wrote a work request (WR) to "place collars" on the valves. Maintenance personnel completed the work request as written and operators hung red tags on the valves. This left each SM drain valve with two red tags and two types of gags installed. The work request Operations personnel wrote to place collars on the SM drain valves was planned by a Maintenance supervisor on night shift. The procedure for using temporary modifications was not listed on the WR to be used. Temporary modification paperwork was not completed when the collars were installed on the valves. A Station Directive states that temporary modification paperwork shall be used for all safety related or QA condition systems and should be used for all other systems. It is normal practice for Maintenance to use this paperwork on gags used on non-safety related equipment. The collars installed were the gags that were not removed. The removal of a temporary modification would still depend on Operations requesting that it be removed. The WR was returned to Planning after the collars were installed. The work request was held by Planning pending notification by Operations to remove the collars.

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Temporary modification paperwork was not used when using the built in gag. This was justified because the built in gag is a design function of the valve. Operations personnel normally gag a valve if it has a built in gag. If a valve does not have a built in gag, Maintenance will gag the valve using temporary modification paperwork.

When the gags were removed, only the built in gag was placed in its normal position. When the operators cleared the red tags, they noticed another set of red tags (from checklist 5866) requiring the valves to be gagged closed. Because the other set of red tags documented the valves being gagged closed, the red tags from checklist 6005 were removed without removing the gags. (The operators thought that only the built in gag was being used). It is accepted practice to clear tags without actually placing the equipment in its normal position, as long as another set of tags and/or an R&R documents the out of normal alignment. This left each SM drain valve with two gags and one tag.

The restoration checklist of R&R 5866 was completed and the restored position for the SM drain valves was listed as "Ungagged". The operators placed the built in gags in their normal position and removed the red tags. The collars on the valve stems were not easily seen and the operators removing the red tags did not notice them. This left the SM drain valves with collars on their stems, gagging them closed without documentation.

CORRECTIVE ACTIONS:

**Immediate:** The MSIV bypass valves were closed. The collars were removed from the SM drain valves and the valves were opened.

**Subsequent:** Design Engineering personnel defined a boundary where hangers may have been affected by the water hammer. Quality Assurance personnel inspected hangers within the boundary. No hangers were visibly affected. Maintenance personnel inspected the snubbers within this boundary. One snubber was found to be difficult to stroke and was replaced.

Operations supervision discussed in a shift supervisors meeting that the restored position for valves that have been gagged should read "ungagged/valve position" on R&R restoration checklists.

**Planned:** Operations:

The labeling of the control switches for the SM drain valves will be corrected.

The opening of the steam line drain valves will be placed in the pre mode 4 checklist of the Controlling Procedure for Unit Startup.

This incident will be reviewed with Operations shift personnel to emphasize caution required when completing procedure steps out of order.

Operations shift personnel will be instructed to verify a built in gag does not exist before writing a work request to gag a valve.

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		8   5	-   0   0   9	-   0   0	0   4	OF 0   4

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

Appropriate operator training will include how to recognize and operate valve gags.

The Controlling Procedure for Unit Startup will be evaluated for possible changes to give guidance on when steps can be completed in checklist fashion and when steps must be completed in order.

Maintenance:

A memo will be sent to Maintenance supervisors with the following purposes:

- 1) To make them aware of the possibility of gagging a valve with more than one gag.
- 2) Instruct them to use temporary modification paperwork when gagging valves.
- 3) Instruct them that when they receive a work request to gag a valve and the valve has a built in gag, contact Operations. (Operations has responsibility for gagging valves with built in gags).

Safety Analysis: Unit 2 was in Mode 4 (hot shutdown, reactor at 0% rated thermal power) at the time of the event. All potentially affected snubbers and hangers were inspected for damage; only one snubber was found affected, it was replaced. The water hammer did not affect the health and safety of the public.

**DUKE POWER COMPANY**

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HAL B. TUCKER  
VICE PRESIDENT  
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June 20, 1985

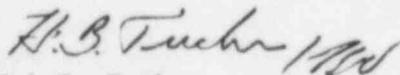
Document Control Desk  
U. S. Nuclear Regulatory Commission  
Washington, D. C. 20555

Subject: McGuire Nuclear Station, Unit 2  
Docket No. 50-370  
LER 370/85-09

Gentlemen:

Pursuant to 10 CFR 50.73 Sections (a)(1) and (d), attached is Licensee Event Report 370/85-09 concerning a water hammer that occurred on main steam line 2C. This is an informational (voluntary) LER. 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

JBD/mjf

Attachment

cc: Dr. J. Nelson Grace, Regional Administrator  
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