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The Northeast Utilities System

MAR 30 2001

Docket No. 50-423
B18350

RE: 10 CFR 50.73(a)(2)(i)(B)
10 CFR 50.73(a)(2)(vii)

U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555

Millstone Nuclear Power Station, Unit No. 3
Licensee Event Report 2001-001-00
Quench Spray System Manual Valve Misalignment

This letter forwards Licensee Event Report (LER) 2001-001-00, documenting an event that was determined to be reportable at Millstone Nuclear Power Station, Unit No. 3, on February 1, 2001. This LER is being submitted to document a condition determined to be reportable is accordance with 10 CFR 50.73(a)(2)(i)(B) and 10 CFR 50.73(a)(2)(vii).

There are no regulatory commitments contained within this letter.

Should you have any questions regarding this submittal, please contact Mr. David W. Dodson at (860) 447-1791, extension 2346.

Very truly yours,

NORTHEAST NUCLEAR ENERGY COMPANY

C. J. Schwarz
Master Process ~~Owner~~ - Operate the Asset

Attachment (1): LER 2001-001-00

cc: H. J. Miller, Region I Administrator
V. Nerses, NRC Senior Project Manager, Millstone Unit No. 3
A. C. Cerne, Senior Resident Inspector, Millstone Unit No. 3

OS3422-5 REV. 12-95

IE22

Docket No. 50-423
B18350

Attachment 1

Millstone Nuclear Power Station, Unit No. 3

LER 2001-001-00

NRC FORM 366 (1-2001) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104 EXPIRES 6-30-2001

Estimated burden per response to comply with this mandatory information collection request: 50 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records Management Branch (T-6 E6), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to bjs1@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202 (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Millstone Nuclear Power Station - Unit 3	05000423	1 OF 4

TITLE (4)
Quench Spray System Manual Valve Misalignment

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MO	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO.	MO	DAY	YEAR	FACILITY NAME	DOCKET NUMBER 05000
02	01	2001	2001	– 001 –	00	03	30	2001	FACILITY NAME	DOCKET NUMBER 05000

		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply) (11)								
OPERATING MODE (9)	1	20.2201(b)		20.2203(a)(3)(ii)		50.73(a)(2)(ii)(B)		50.73(a)(2)(ix)(A)		
POWER LEVEL (10)	78	20.2201(d)		20.2203(a)(4)		50.73(a)(2)(iii)		50.73(a)(2)(x)		
		20.2203(a)(1)		50.36(c)(1)(i)(A)		50.73(a)(2)(iv)(A)		73.71(a)(4)		
		20.2203(a)(2)(i)		50.36(c)(1)(ii)(A)		50.73(a)(2)(v)(A)		73.71(a)(5)		
		20.2203(a)(2)(ii)		50.36(c)(2)		50.73(a)(2)(v)(B)		OTHER		
		20.2203(a)(2)(iii)		50.46(a)(3)(ii)		50.73(a)(2)(v)(C)		Specify in Abstract below or		
		20.2203(a)(2)(iv)		50.73(a)(2)(i)(A)		50.73(a)(2)(v)(D)		in NRC Form 366A		
		20.2203(a)(2)(v)	X	50.73(a)(2)(i)(B)	X	50.73(a)(2)(vii)				
		20.2203(a)(2)(vi)		50.73(a)(2)(i)(C)		50.73(a)(2)(viii)(A)				
		20.2203(a)(3)(i)		50.73(a)(2)(ii)(A)		50.73(a)(2)(viii)(B)				

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (Include Area Code)
David W. Dodson, Team Lead - Compliance	860-447-1791

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

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX

SUPPLEMENTAL REPORT EXPECTED (14)			EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
☐	YES (If yes, complete EXPECTED SUBMISSION DATE).	☒ NO				

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)(16)

On February 1, 2001, with the unit in Mode 1 at approximately 78% power, an operability test of the A Train Quench Spray System (QSS) pump, 3QSS*P3A, was performed. During test performance, personnel detected an abnormal noise near manual valve 3QSS*V945. The source of the abnormal noise could not readily be determined. On February 2, 2001, radiography was performed on 3QSS*V945 to aid in locating the source of the abnormal noise. 3QSS*V945, designated by plant configuration as a locked open valve in the discharge piping of 3QSS*P3A, was discovered to be locked closed. This condition was not previously detected because an unrestricted bypass line around 3QSS*V945 had allowed sufficient flow for 3QSS*P3A to successfully pass the current, as well as all previous operability tests. A subsequent review to determine the extent of condition revealed that the B Train QSS manual valve, 3QSS*V946, was also locked closed contrary to the established plant configuration designation as a locked open valve. 3QSS*V945 and 3QSS*V946 were opened to restore the QSS to the proper configuration.

This issue is reportable under both 10 CR 50.73(a)(2)(i)(B), as a condition prohibited by Technical Specifications, and 10 CFR 50.73(a)(2)(vii), for common-cause inoperability of independent trains.

The cause of this event, 3QSS*V945 and 3QSS*V946 in the closed position, was determined to be due to deficiencies in the initial plant startup program. Since this event did not result in a loss of any QSS safety function, and did not adversely impact accident dose consequences, it is of low safety significance.

FACILITY NAME (1)	DOCKET (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
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NARRATIVE *(If more space is required, use additional copies of NRC Form 366A)* **(17)**

1. Event Description

On February 1, 2001, with the unit in Mode 1 at approximately 78% power, an operability test of the A Train Quench Spray System (QSS) [BE] pump, 3QSS*P3A, was performed. During test performance, personnel detected an abnormal noise near manual valve 3QSS*V945 [V]. The source of the abnormal noise could not readily be determined. On February 2, 2001, radiography was performed on 3QSS*V945 to aid in locating the source of the abnormal noise. 3QSS*V945, designated by plant configuration as a locked open valve in the discharge piping of 3QSS*P3A, was discovered to be locked closed. An unrestricted bypass line around 3QSS*V945 had allowed sufficient flow for 3QSS*P3A to successfully pass the current, as well as all previous operability tests. A subsequent review to determine the extent of condition revealed that the B Train QSS manual valve, 3QSS*V946, was also locked closed contrary to the established plant configuration designation as a locked open valve. 3QSS*V945 and 3QSS*V946 were opened to restore the QSS to the proper configuration.

The required position of these valves is locked open. This supports the design configuration of the QSS and is consistent with the valve lineup requirements contained in system operating procedures. Subsequent investigation has determined that this condition had existed since initial plant startup (1986).

Technical Specification 3.6.2.1, "Containment Quench Spray System," Surveillance Requirement (SR) 4.6.2.1.a.1 requires verification every 31 days "that each valve (manual, power operated, or automatic) in the flow path that is not locked, sealed, or otherwise secured in position, is in its correct position." The purpose of this SR is to verify proper valve position of all QSS valves at least once per 31 days. The SR does allow the verification of valve position to be waived for valves that are locked, sealed, or otherwise secured in position since these additional administrative controls reduce the possibility of a mispositioned valve. It is assumed the valves that have been secured in position are in the correct position before the administrative control is established. However, since valves 3QSS*V945 and 3QSS*V946 were not locked in the correct position, the valves should have been verified in the correct position every 31 days.

In accordance with Technical Specification 4.0.3, "failure to perform a Surveillance Requirement within the allowed surveillance interval, defined by Specification 4.0.2, shall constitute noncompliance with the OPERABILITY requirements of the Limiting Condition for Operation." Therefore, failure to verify 3QSS*V945 in the correct position resulted in QSS Train A being inoperable, and failure to verify 3QSS*V946 in the correct position resulted in QSS Train B being inoperable.

This issue is reportable under 10 CR 50.73(a)(2)(i)(B) as "any operation or condition which was prohibited by the plant's Technical Specifications." In addition, this is reportable under 10 CR 50.73(a)(2)(vii) as "any event where a single cause or condition caused at least one independent train or channel to become inoperable in multiple systems or two independent trains or channels to become inoperable in a single system ..."

2. Cause

Valves 3QSS*V945 and 3QSS*V946 are twelve inch butterfly valves. These valves were initially installed in QSS trains A & B, respectively, as motor operated valves. The QSS original design included a flow reduction feature in each train. When the Refueling Water Storage Tank (RWST) reached a low-low-low water level, the motor operated valves would automatically close and an orifice plate in the 6 inch bypass lines around each valve would limit flow to approximately 2000 gpm. This was part of the original system design that included a sub-atmospheric containment and a small RWST. The QSS design was changed during construction by adding an automatic trip

function for the QSS pumps on a RWST empty signal. This change eliminated the need for the valve closure logic and the flow restricting orifices.

The motor operators were removed and replaced with manual operators. The replacement manual operators were capable of operating in either of two different configurations, Position A or B. When configured in Position A, a clockwise (CW) input from the handwheel will close the valve. In Position B, a CW handwheel input will open the valve. The manual operators installed on valves 3QSS*V945 and 3QSS*V946 were configured in the "B" Position. This configuration may have been chosen due to interference near valve 3QSS*V946, and used on valve 3QSS*V945 to maintain consistent operation between the valves.

A review of Millstone Unit No. 3 valve configurations has determined this was a unique arrangement. As a result, personnel operated the valve based on conventional valve operation (i.e., CW handwheel rotation to close the valve). Valves verified by operation in this manner as open, would actually be closed.

Valve manipulations by plant operators were reinforced by local position indicators provided on the top of the manual operators which were used as another check of the valve position. However, the position indicators were incorrectly set during initial manual valve operator installation.

Closure of the valves was not discovered during regular QSS pump surveillance testing because of a six inch bypass line around each of the valves. The QSS pump surveillance tests, performed to monitor QSS pump performance, recirculate water from the RWST back to that tank. Flow to the spray headers inside containment is isolated during test performance. The bypass lines, originally designed to contain flow restricting orifice plates, contain full port spacers. As a result, the bypass lines were able to pass sufficient flow to allow successful performance of the QSS pump surveillance tests.

During the pre-operational testing program, 3QSS*V945 and 3QSS*V946 were tested as manual valves, not motor operated valves. Without the flow restricting orifice plates, the valve bypass lines passed sufficient flow to meet surveillance testing criteria. As a result, there was no indication valves 3QSS*V945 and 3QSS*V946 were actually closed. Following initial testing, the valves were locked in the closed position with the local valve position indicator indicating the valves as open.

The cause of this event, valves 3QSS*V945 and 3QSS*V946 in the closed position, was determined to be due to deficiencies in the initial plant startup program. There was a failure in the design change process to document the fact that manual operators were installed in the reverse operating mode. The testing program was not adequate to detect a valve operator installation error under these unusual circumstances.

3. Assessment of Safety Consequences

Although sufficient pump flow through the bypass lines was obtained to allow successful performance of the surveillance tests, there would have been a reduction in QSS flow to containment below that which is assumed in the accident analysis. The accident analysis assumes the pump hydraulic performance of 3QSS*P3A and 3QSS*P3B has degraded by 10 percent. If this degraded pump hydraulic performance is assumed with 3QSS*V945 and 3QSS*V946 closed, the QSS flow would have been reduced to approximately 84 percent. However, a review of the historical pump hydraulic performance surveillance test results for 3QSS*P3A and 3QSS*P3B indicates that these pumps are operating near their original design pump hydraulic performance.

Using the original pump hydraulic performance design curves, the QSS flow reduction was calculated to be approximately 9 percent, 91 percent of the QSS flow assumed in the accident analyses.

An assessment of this 9 percent degraded QSS flow has concluded that this condition would not have prevented the fulfillment of the QSS safety functions. The QSS safety functions include containment heat removal (containment temperature and pressure), fission product cleanup (iodine removal), and establishing sufficient containment water sump level to support Containment Recirculation Spray System operation. The impact of the QSS flow reduction on the dose consequences of the limiting design basis accident was also evaluated. During 10 CFR 50.54(f) related recovery efforts, the limiting design basis accident was reviewed and the dose analysis was determined invalid. Consequently, a revised licensing analysis was submitted to the NRC for review. The dose consequences of this condition are bounded by the revised licensing analysis which is currently under review by the NRC. Since this event did not result in a loss of any QSS safety function, and did not adversely impact accident dose consequences, it is of low safety significance.

4. Corrective Action

As a result of this event, the following actions have been performed.

1. Review the design control process to determine if the administrative controls are adequate to ensure a design change error of this type could not occur today. This action is complete. The design control process is adequate to prevent this type of error.

2. Place warning labels on 3QSS*V945 and 3QSS*V946 indicating that the valves are reverse operating. This action is complete.

5. Previous Occurrences

No previous similar conditions were identified.

Energy Industry Identification System (EIIS) codes are identified in the text as [XX].