



Northeast
Nuclear Energy

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Millstone Nuclear Power Station
Northeast Nuclear Energy Company

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The Northeast Utilities System

Donald B. Miller Jr.,
Senior Vice President - Millstone

Re: 10CFR50.73(a)(2)(v)

February 24, 1995

MP-95-067

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

Reference: Facility Operating License No. DPR-65
Docket No. 50-336
Licensee Event Report 95-002-00

This letter forwards Licensee Event Report 95-002-00 required to be submitted within thirty (30) days pursuant to 10CFR50.73(a)(2)(v).

Very truly yours,

NORTHEAST NUCLEAR ENERGY COMPANY

Donald B. Miller, Jr.
Senior Vice President - Millstone Station

DBM/JB:dlr

Attachment: LER 95-002-00

cc: T. T. Martin, Region I Administrator
P. D. Swetland, Senior Resident Inspector, Millstone Unit Nos. 1, 2, and 3
G. S. Vissing, NRC Project Manager, Millstone Unit No. 2

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ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION
COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING
BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT
BRANCH (MNNB 7714). U.S. NUCLEAR REGULATORY COMMISSION,
WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION
PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET,
WASHINGTON, DC 20503.

FACILITY NAME (1)

Millstone Nuclear Power Station Unit 2

DOCKET NUMBER (2)

05000336

PAGE (3)

1 OF 4

TITLE (4)

Containment Sump Isolation Valves -- Potentially subject to Pressure Locking

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 NAME	DOCKET NUMBER
										05000
01	25	95	95	— 002 —	00	02	24	95	FACILITY NAME	DOCKET NUMBER
										05000
OPERATING MODE (9)		N/A		THIS REPORT IS BEING SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)						
				20.402(b)		20.405(c)		50.73(a)(2)(iv)		73.71(b)
POWER LEVEL (10)		0		20.405(a)(1)(i)		50.36(c)(1)		X 50.73(a)(2)(v)		73.71(c)
				20.405(a)(1)(ii)		50.36(c)(2)		50.73(a)(2)(vi)		OTHER
				20.405(a)(1)(iii)		50.73(a)(2)(i)		50.73(a)(2)(vii)(A)		(Specify in Abstract below and in Text, NRC Form 366A)
				20.405(a)(1)(iv)		50.73(a)(2)(ii)		50.73(a)(2)(vii)(B)		
				20.405(a)(1)(v)		50.73(a)(2)(iii)		50.73(a)(2)(x)		

LICENSEE CONTACT FOR THIS LER (12)

NAME _____

Philip J. Lutzi, Nuclear Licensing

TELEPHONE NUMBER (Include Area Code)

(203) 440-2072

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

[illegible]

SUPPLEMENTAL REPORT EXPECTED (14)

X	YES (If yes, complete EXPECTED SUBMISSION DATE)	NO	EXPECTED SUBMISSION DATE (15)	06	01	95
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ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

On January 25, 1995, at 1430 hours with the plant defueled, an engineering evaluation confirmed that the assumptions made for the original design basis analysis for Containment Sump Isolation Valves (CIV), 2-CS-16.1A & B, were non-conservative with respect to the maximum calculated forces that would be required to open these valves. This evaluation was based on a report, completed by Raytheon in October of 1994, which determined that the potential existed for these valves to be susceptible to a pressure locking phenomenon that might preclude them from performing their safety related function during a postulated design basis accident condition. The root cause is attributed to an inadequate engineering evaluation, initially performed by NNECo's contractor, Stone & Webster Engineering Corp. (SWEC). It was this initial evaluation, completed in December of 1989, which failed to recognize the CIV's susceptibility to pressure locking. As part of NNECO's corrective action, due to concerns with the SWEC report, Raytheon was subsequently contracted to review SWEC's findings. Additional corrective action to preclude a pressure locking condition will be taken prior to start up from the current refueling outage. A supplemental report will be submitted to address the specifics of the proposed corrective action, which will be tracked by Millstone Unit 2 Internal Tracking System as an "open" start up item.

This report is being submitted pursuant to the requirements of 10CFR50.73(a)(2)(v), as an event or condition that alone could have prevented the fulfillment of the safety function of structures or system that are needed to:
(B) Remove residual heat; and (D) Mitigate the consequences of an accident.

EXPIRES: 5/31/95

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MINBB 7714), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)		PAGE (3)
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Millstone Nuclear Power Station Unit 2	05000336	95	— 002 —	00
				02 OF 04

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

I. Description of Event

The initial evaluation of safety related gate Containment Sump Isolation Valves, 2-CS-16.1A & B, was conducted as part of a pressure locking and thermal binding (PL/TB) review, in December of 1989. This review was in response to a reissued report of INPO's SOER 84-7, describing a number of events involving gate valves that failed to open due to disc binding. Stone and Webster Engineering Corp. (SWEC) was contracted in May, 1990 to review Millstone Unit 2 safety related MOV's to determine if the consequences from PL/TB impacted these MOV's. No major findings resulted from these reviews, furthermore, SWEC's report listed 2-CS-16.1A & B as not susceptible to PL/TB.

In February of 1994 the NRC performed an inspection of the Millstone Unit I MOV Program to verify its compliance with NRC's Generic Letter 89-10 requirements. As a result of this inspection, and in order to address the planned NRC Generic Letter on the PL/TB issue, it was recommended that a more detailed analysis, based on the latest information available on the PL/TB phenomenon, should be considered by each Northeast Utilities (NU) Unit to encompass the functions of all safety related motor operated valves.

Raytheon was contracted to perform a second analysis of all safety related GL 89-10 MOV valves, and a final report, completed in October of 1994, concluded that 2-CS-16.1A & B were in fact susceptible to pressure locking. Subsequently, the valve manufacture was consulted to verify these findings and to provide the most effective modification to prevent pressure locking of the CIV's.

On January 25, 1995, at 1430 hours, with the plant defueled, a reportability evaluation was made concerning the conditions under which the Containment Sump Isolation Valves, 2-CS-16.1A & B, would perform their safety related function. This evaluation confirmed that the earlier assumptions made were non-conservative with respect to the maximum forces that these gate valves could overcome during a postulated design basis accident condition, and in addition, may preclude them from performing their safety related function.

II. Cause of Event

The root cause is attributed to an inadequate engineering evaluation initially performed by NNECo's contractor, Stone & Webster Engineering Corp. (SWEC). It was this initial evaluation, completed in December of 1989 which failed to recognize the CIV's susceptibility to pressure locking.

III. Analysis of Event

This report is being submitted pursuant to the requirements of 10CFR50.73(a)(2)(v) as an event or condition that alone could have prevented the fulfillment of the safety function of structures or systems that are needed to: (B) Remove residual heat; and (D) Mitigate the consequences of an accident.

According to the NRC Symposium: NUREG-1275, Vol. 9, dated March 1993, the two necessary features required to develop gate valve pressure locking in fluid systems are 1) fluid in the valve bonnet cavity, including the volume between the disc, and 2) a mechanism to cause the bonnet cavity fluid pressure to be greater than considered in the sizing of the valve operator for design basis conditions. The fluid may enter the bonnet cavity via mechanisms as follows: (a) during normal open and close valve cycling at what ever line pressure exists at the time and (b) a fluid differential pressure across a disc that causes the disc to move slightly away from the seat, creating a path to either increase the fluid pressure or fill the bonnet, if it had been empty, with high pressure fluid. In addition, a subsequent temperature increase of the bonnet fluid will cause an increase in bonnet cavity pressure due to thermal expansion of the fluid.

EXPIRES: 5/31/95

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TEXT CONTINUATION**

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FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)	PAGE (3)						
Millstone Nuclear Power Station Unit 2	05000336	<table border="1"><tr><th data-bbox="1004 329 1073 372">YEAR</th><th data-bbox="1073 329 1239 372">SEQUENTIAL NUMBER</th><th data-bbox="1239 329 1346 372">REVISION NUMBER</th></tr><tr><td data-bbox="1004 372 1073 438">95</td><td data-bbox="1073 372 1239 438">- 002 -</td><td data-bbox="1239 372 1346 438">00</td></tr></table>	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	95	- 002 -	00	03 OF 04
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An Anchor Darling analysis, determined that the maximum pressure lock that 2-CS-16.1A & B could overcome and still open is approximately 150 psi. Evaluations performed on other plant valves have demonstrated that a valve of this type exposed to an increase in bonnet temperatures, would in all probability, providing the valve bonnet and packing are leak tight above 150 psi, develop a pressure locking condition.

Designated as safety related system valves, 2-CS-16.1A & B are not considered Appendix J valves and therefore, are not required to be tested under the Local Leak Rate Testing (LLRT) Program. However, they are demonstrated operable by periodic surveillance testing, and are designated as Containment Sump Isolation Valves. It should also be noted, that due to the performance of the quarterly surveillance on the downstream check valves, 2-CS-15A & B, that valves 2-CS-16.1A & B may not be at the same level of risk to a pressure locking condition as previously determined. Quarterly Surveillance, SP21136, Safety Injection and Containment Spray System Valve Operational Readiness Test, performs a forward flow verification on check valves 2-CS-15A & B. Within the same time requirements, but not necessarily sequenced, a stroke test of 2-CS-16.1A & B is performed. It is evident by the existing level of water in the 'A' containment side suction piping and from the apparent evidence of water in the 'B' side, having just been opened for inspection, that the combination of these two surveillance tests tends to maintain a level of water in the piping on the containment side of the isolation valves. The height of this water is at least level with the top of the isolation valve disc and could fill the pipe, depending on check valve leakage. Furthermore, based on an additional analysis performed by Raytheon, Calculation No. ME-TH-001, it was determined that with this containment piping full of water the LOCA temperature increase occurs only along the first foot of the filled pipe on the containment side. In addition these CIV's provide a redundant function in that either valve, when required by a Sump Recirculation Actuation Signal (SRAS), is capable of supplying containment sump water for Recirculation and cooling.

Due to the periodic leakage demonstrated by these upstream check valves, 2-CS-15A, Containment Sump Outlet Header "A" Check Valve, is being overhauled during RFO-12 because the containment sump piping was found to be full of water, prior to October 1, 1994 shutdown, for RFO-12. However assuming the piping is empty during a LOCA condition, the containment sump water, at a conservative temperature of 300 degrees F, will fill the sump piping up to the closed isolation valve and remain in this static condition for a minimum of 44 minutes transferring heat to the valve's bonnet(s). Vendor analysis shows that this condition could potentially cause pressure locking of the valve(s). This would preclude opening if water was trapped in the bonnet, and prevent the valve from performing its safety related function, i.e., making containment sump water available for cooling and recirculation back to the reactor vessel.

The potential failure of both Containment Sump Isolation Valves to open as required, during a design basis accident, would constitute a common mode failure that would prevent the entry into the Containment Sump Recirculation Mode. The ramifications of both Containment Sump Isolation Valves failing to open during a SRAS would be severe due to the loss of core cooling following the depletion of the RWST inventory.

IV. Corrective Action

A review of all GL 89-10 safety related MOV valves for PL/TB considerations, including a second independent review by Raytheon, contracted to clarify concerns NNECO had with SWEC's findings, has been satisfactorily completed. Furthermore, corrective action to preclude a pressure locking condition with these CIV's will be taken prior to start up from the current refueling outage. A supplemental report will be submitted to address the specifics of the proposed corrective action, which will be tracked by the Millstone Unit 2 Internal Tracking System as an "open" start up item.

EXPIRES: 5/31/95

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TEXT (If more space is required, use additional copies of NRC Form 366A) (17)V. Additional InformationActuator Data

Manufacturer — Limitorque Corp.
Model — SMB-1
Spring Pack No. 60-600-0007
Overall Ratio 072.42/1
EIS No. — BP-20-L200

Valve Data

Manufacturer — Anchor Darling
Drawing No. — A/D-94-13187/MP2-25203-29050, Sh. 15
Nominal Size — 24.00 inch
Pressure Rating — 150 psi
Type — Double Disc Gate Valve
Design Valve Factor — 0.4
EIS No. — BP-ISV-A391

System Drawing: 25203-26015, Sh. 2 of 3, High Pressure Safety Injection Pumps

Similar Licensee Event Reports

None