

# NORTHEAST UTILITIES



The Connecticut Light And Power Company  
Western Massachusetts Electric Company  
Holyoke Water Power Company  
Northeast Utilities Service Company  
Northeast Nuclear Energy Company

General Offices · Seiden Street · Berlin Connecticut

P. O. BOX 270  
HARTFORD, CONNECTICUT 06414-0270  
(203)665-5000

Re: 10CFR50.73(a)(2)(i)  
May 15, 1991  
MP-91-418

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

Reference: Facility Operating License No. NPF-49  
Docket No. 50-423  
Licensee Event Report 91-004-01


Gentlemen:

This letter forwards Licensee Event Report (LER) 91-004-01 which is being submitted as an update report by May 15, 1991, in accordance with LER 91-004-00. LER 91-004-00 was submitted pursuant to 10CFR50.73(a)(2)(i), any operation or condition prohibited by the plant's Technical Specifications.

Very truly yours,

NORTHEAST NUCLEAR ENERGY COMPANY

FOR: Stephen E. Scace  
Director, Millstone Station

  
BY: Carl H. Clement  
Millstone Unit 3 Director

SES/TGM:ljs

Attachment: LER 91-004-01

cc: T. T. Martin, Region I Administrator  
W. J. Raymond, Senior Resident Inspector, Millstone Unit Nos. 1, 2 and 3  
D. H. Jaffe, NRC Project Manager, Millstone Unit Nos. 1 and 3

*Cent No  
P264578670  
JEC*

9105290146 910515  
PDR AUDCK 05000423  
S PDR

LICENSEE EVENT REPORT (LER)

Estimated burden per response to comply with this information collection request: 50.0 hrs. Forward comments regarding burden estimate to the Records and Reports Management Branch (D-530), U.S. Nuclear Regulatory Commission, Washington, DC 20545, and to the Paperwork Reduction Project (315-0104), Office of Management and Budget, Washington, DC 20503.

FACILITY NAME (1): Millstone Nuclear Power Station Unit 3 DOCKET NUMBER (2): 0 5 0 0 0 4 2 1 3 PAGE (3): 1 OF 0 5

TITLE (4): Containment Leakage in Excess of Limits Due to Valve Leakage

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			
0 2	0 5	1 9	1 9	0 0 4	0 1	0 5	1 5	9 1	0 5 0 0 0 0 0 0 0 0			
THIS REPORT IS BEING SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5. (Check one or more of the following.)												

OPERATING MODE (9)	POWER LEVEL (10)	20.402(a)	20.402(b)	50.73(a)(2)(i)	73.71(b)
5	0 1 0 0	20.405(a)(1)(i)	20.405(a)(1)(ii)	50.73(a)(2)(ii)	73.71(c)
		20.405(a)(1)(iii)	20.405(a)(1)(iv)	50.73(a)(2)(iii)	OTHER (Specify in abstract below and in Text, NRC Form 366A)
		20.405(a)(1)(v)	20.405(a)(1)(vi)	50.73(a)(2)(iv)	
		20.405(a)(1)(vii)	20.405(a)(1)(viii)	50.73(a)(2)(v)	

LICENSEE CONTACT FOR THIS LER (12):  
 NAME: Terry G. McNatt, Engineer, Ext. 5592  
 TELEPHONE NUMBER: 2 0 1 3 4 4 7 - 1 7 9 1

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRRDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRRDS	
B	K	M	I	S	V	F	1	3	0	Y
B	B	P	I	S	V	P	3	4	0	Y

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):

While shutdown in Modes 5 (Cold Shutdown) and 6 (Refueling) during the performance of Local Leak Rate Testing (LLRT), the "as found" leak rates for four Containment Isolation Valves exceeded the Technical Specification Type C and Bypass leakage limits of 0.6 L<sub>a</sub> and 0.042 L<sub>a</sub>.

The LLRT failures occurred on February 5, 1991, at 1331 (for 3RHS\*MV8702A), February 7, 1991, at 2200 (for 3RSS\*V6), February 10, 1991, at 2200 (for 3CDS\*CTV91B), and February 19, 1991, at 1330 (for 3RSS\*MOV23B). No immediate action was required.

Leakage past 3RHS\*MV8702A is believed to be due to debris or boric acid crystals on the seating surface. The penetration was flushed with water and retested successfully. Leakage past 3RSS\*V6 was due to improper seating caused by boric acid crystal precipitation on the seating surface. The valve seat was cleaned and an "as-left" LLRT was satisfactorily performed. Leakage past 3CDS\*CTV91B was due to failure of an elastomer T-ring which had partially rolled out of its retaining groove. The T-ring was replaced and an as-left LLRT was satisfactorily performed prior to startup. Leakage past 3RSS\*MOV23B was caused by separation of the vulcanized rubber seat from the valve body mounting surface. The valve was removed from the system, sent to the manufacturer for overhaul, and was reinstalled and satisfactorily retested prior to startup.

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

Estimated burden per response to comply with this information collection request: 60.0 hrs. Forward comments regarding burden estimate to the Records and Reports Management Branch (p-530), U.S. Nuclear Regulatory Commission, Washington, DC 20555, and to the Paperwork Reduction Project (3150-0104), Office of Management and Budget, Washington, DC 20503.

FACILITY NAME (1)  Millstone Nuclear Power Station Unit 3	DOCKET NUMBER (2)  0   5   0   0   0   4   2   3	LER NUMBER (5)			PAGE (3)	
		YEAR 9   1	SEQUENTIAL NUMBER 0   0   4	REVISION NUMBER 0   1	OF	0   5

TEXT (if more space is required, use additional NRC Form 366A x) (17)

I. Description of Event

On February 5, 1991, at 1331, while at 0% power in Mode 5 (Cold Shutdown), during the third refueling outage, 40 psia and 95 degrees Fahrenheit, during the performance of Local Leak Rate Testing (LLRT), 3RHS\*MV8702A had excessive leakage which prevented the desired test pressure from being reached. This "as found" undetermined leak rate exceeded the Technical Specification limit of 0.6 L<sub>a</sub>. 3RHS\*MV8702A is the outside containment Reactor Coolant System recirculation suction isolation valve to the "B" Residual Heat Removal Pump. No immediate action was required since the plant was shutdown.

On February 7, 1991, at 2200, while in Mode 5, at atmospheric pressure and 101 degrees Fahrenheit, 3RSS\*V6 had excessive leakage which prevented the desired test pressure from being reached. This "as found" undetermined leak rate exceeded the Technical Specification limit of 0.6 L<sub>a</sub>. 3RSS\*V6 is the Containment Recirculation System (RSS) inside containment discharge check valve to the RSS Spray Header from the "B" RSS Pump. No immediate action was required since the plant was shutdown.

On February 10, 1991, at 2200, in Mode 5, at atmospheric pressure and 100 degrees Fahrenheit, 3CDS\*CTV91B had excessive leakage which prevented the desired test pressure from being reached. This "as found" undetermined leak rate exceeded the Technical Specification bypass leakage limit of 0.042 L<sub>a</sub>. 3CDS\*CTV91B is the inside containment Reactor Plant Chilled Water System "B" Train isolation valve. No immediate action was required since the plant was shutdown.

On February 19, 1991, at 1330, in Mode 6 (Refueling), at atmospheric pressure and 96 degrees Fahrenheit, 3RSS\*MOV23B had excessive leakage which prevented the desired test pressure from being reached. This "as found" undetermined leak rate exceeded the Technical Specification limit of 0.6 L<sub>a</sub>. 3RSS\*MOV23B is the outside containment suction valve to the "B" RSS Pump. No immediate action was required since the plant was shutdown.

II. Cause of Event

The root cause of the 3RHS\*MV8702A leakage was improper valve seating prior to the LLRT (possibly due to debris or boric acid crystals on the seating surface). 3RHS\*MV8702A is a 12 inch Westinghouse motor-operated gate valve.

The root cause of the 3RSS\*V6 leakage was improper valve seating prior to the LLRT (due to precipitation of boric acid crystals on the seating surface). The boric acid buildup was caused by slight valve seat leakage through the upstream isolation valve during surveillance testing. The leakage from the upstream valve was within allowable limits. 3RSS\*V6 is a 10 inch Walworth swing check valve.

The root cause of the leakage observed at 3CDS\*CTV91B was damage to the elastomer T-ring that occurred during valve operation. The T-ring was damaged because of excessive tightening of the T-ring adjusting set screws during valve seat adjustment. The procedure used in the seat adjustment was consistent with the vendor recommendations. 3CDS\*CTV91B is a 10 inch Fisher Controls air-operated butterfly valve.

The root cause of the 3RSS\*MOV23B leakage was failure of the elastomer valve seating surface. The vulcanized rubber seat separated from the valve body mounting surface. The failure mechanism for the separation could not be determined. 3RSS\*MOV23B is a 12 inch Henry Pratt motor-operated butterfly valve.

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

Estimated burden per response to comply with this information collection request: 50-6 hrs. Forward comments regarding burden estimate to the Records and Reports Management Branch (p-536), U.S. Nuclear Regulatory Commission, Washington, DC 20555, and to the Paperwork Reduction Project (3150-0104), Office of Management and Budget, Washington, DC 20503.

FACILITY NAME (1)  Millstone Nuclear Power Station Unit 3	DOCKET NUMBER (2)  0 5   0   0   0   4   2   3	LER NUMBER (6)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
		9 1	0 1 0 4	0 1	0 3	OF 0 5

TEXT (If more space is required, use additional NRC Form 366A (3/11/79))

III. Analysis of Event

These events are reportable under 10CFR50.73(a)(2)(i), as events or conditions prohibited by the Plant Technical Specifications. The undetermined leakage past the subject valves exceeded the limits allowed by plant Technical Specifications 3.6.1.2.b and c.

In the first event, containment integrity was maintained by verifying that the inside containment isolation valve, 3RHS\*MV8702B, was operable and leak tight as verified by a satisfactory LLRT.

In the second event, containment integrity was maintained by verifying that the outside containment isolation valve, 3RSS\*MOV20B, was operable and leak tight as verified by a satisfactory LLRT.

In the third event, containment integrity was maintained by verifying that the outside containment isolation valve, 3CDS\*CTV38A, was operable and leak tight as verified by a satisfactory LLRT.

In the fourth event, containment integrity was maintained by the RSS System piping. The RSS System is a closed loop in which the RSS Pump takes suction from the Containment Sump and discharges back to containment. 3RSS\*MOV23B, the "B" pump suction isolation valve, is a normally open valve which remains open during accident conditions. It does not serve as a containment boundary under accident conditions. The integrity of the RSS System piping was verified by conducting a satisfactory LLRT of the "B" RSS pump piping from the suction up to the discharge isolation valve, 3RSS\*MOV20B.

Based on the previous discussion, these events posed no significant safety considerations.

IV. Corrective Action

No immediate corrective action was required by plant operators since the plant was shutdown.

As corrective action for the 3RHS\*MV8702A leakage, the penetration was flushed with water and retested. This subsequent LLRT was successful. The flushing apparently dislodged the debris or boric acid which was preventing proper valve seating. Because of the satisfactory test, valve disassembly and inspection were deemed unnecessary. It should be noted that this piping had been drained, and that no problems were or have previously been identified on similar valves.

As corrective action for the 3RSS\*V6 leakage, the valve was opened and inspected. The inspection results showed a boric acid buildup on the valve seat which prevented full disc-to-seat contact. The seat was cleaned, the valve reassembled, and an "as-left" LLRT was satisfactorily performed. In order to minimize boric acid buildup, a procedure to periodically flush the valve (and similarly configured valves) with primary grade water, after "as found" testing, will be developed by the fourth refueling outage.

As corrective action for the 3CDS\*CTV91B leakage, the valve was opened and inspected. The inspection results showed a failure of an elastomer T-ring, which had been cut near the valve stem. The T-ring was replaced, the valve was reassembled, and was retested satisfactorily prior to startup. Based on the results of the investigation, the vendor has been contacted with a proposed procedure change to modify the tightening requirements.

As corrective action for the 3RSS\*MOV23B leakage, the valve was opened and inspected. The inspection results showed a detachment of the vulcanized rubber seat from the valve body mounting surface. The valve was removed from the system and sent to the manufacturer for overhaul. It was subsequently reinstalled and retested satisfactorily prior to startup. A new style valve with the elastomer seat on the disc will be installed in place of 3RSS\*MOV23C and D during the fourth refueling outage (RF04). The rubber seats of the valves removed will be inspected and any new information will be provided in a supplemental report.

There were no additional reportable RF03 LLRT failures. The attached Table 1 provides a summary of the leakage rates for the valves that failed and a comparison to the total allowed.

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 Records and Reports Management Branch (p-530), U.S. Nuclear Regulatory Commission, Washington, DC 20555, and to the Paperwork Reduction Project (3150-0104), Office of Management and Budget, Washington, DC 20503.

FACILITY NAME (1)  Millstone Nuclear Power Station Unit 3	DOCKET NUMBER (2)  0 5 0 0 0 4 2 3	LER NUMBER (6)			PAGE (3)	
		YEAR 9 1	SEQUENTIAL NUMBER 0 0 4	REVISION NUMBER 0 1	0 4	OF 0 5

TEXT (if more space is required, use additional NRC Form 306A's) (17)

V. Additional Information

LERs 87-043, 89-011, and 89-012 discussed similar events of containment leakage in excess of limits due to valve leakage.

LERs 87-043 and 89-011 involved failures of 3CDS\*CTV91B and 3CDS\*CTV40B (respectively). The previous event root causes were also identified as failure of elastomer T-rings which had rolled out of their retaining grooves. These events resulted in Maintenance procedure changes requiring detailed and exact installation procedures, bench stroking prior to installation, and valve cycling post-maintenance to ensure correct T-ring installation prior to retest. Neither of these previous failures exactly duplicated the mechanism of the current problem. The 87-043 event was the result of inadequate overhaul practices, and the 89-011 event was specifically attributed to a defect on the valve disc. The root cause of the current event is cutting of the T-ring due to overtightening of the adjusting screw.

LER 89-012 involved a failure of 3RSS\*MOV23A which is a sister valve to 3RSS\*MOV23B. The previous event root cause was also identified as a failure of the elastomer valve seating surface.

A review of the NPRDS data base identified eight other Fisher failures and five other Pratt failures similar to those in question.

EHS Codes

Systems

Chilled Water System - KM

Residual Heat Removal/Low Pressure Safety Injection System - BP

Containment Recirculation System - BE

Components

Isolation Valve - ISV

Check Valve - V

Vendors

Fisher Controls - F130

Henry Pratt - P340

Walworth Valves - W030

Westinghouse - W351

Estimated burden per response to comply with this information collection request: 50.0 hrs. Forward comments regarding burden estimate to the Records and Reports Management Branch (p-530), U.S. Nuclear Regulatory Commission, Washington, DC 20555, and to the Paperwork Reduction Project (3150-0104), Office of Management and Budget, Washington, DC 20503.

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

FACILITY NAME (1)

Millstone Nuclear Power Station  
Unit 3

DOCKET NUMBER (2)

0 | 5 | 0 | 0 | 0 | 4 | 2 | 3 | 9 | 1

LER NUMBER (6)

YEAR

SEQUENTIAL NUMBER

REVISION NUMBER

PAGE (3)

0 | 1 | 0 | 5 | 0 | F | 0 | 1 | 5

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

Table 1

Containment Unfiltered Leakage Data (in SCCM)

Valve	As-Left RFO2	As-Found (RFO3)	As-Left (RFO3)
3CDS*CTV91B <sup>1</sup>	616	Undetermined	241
Subtotal	1,785	21,929	17,569
(other penetrations)			
Total	2,401	21,929	17,810
Allowable Limit	13,690	43,716	43,716

(Containment Overall Leakage Data (in SCCM))

3RSS*V6 <sup>2</sup>	1,280	Undetermined	1,371
3RHS*MV8702A <sup>3</sup>	11,860	Undetermined	29,500
3RSS*MOV23B <sup>4</sup>	107	Undetermined	745
Subtotal	97,788	458,003	210,063
(other penetrations)			
Total	111,035	458,003	241,679
Allowable Limit (0.6 La)	898,200	624,490	624,490

Notes:

Containment integrity maintained by the following valves:

<sup>1</sup> 3CDS*CTV38B	20	709	709
(Containment Isolation Valve associated with 3CDS*CTV91B)			
<sup>2</sup> 3RSS*MOV20B	178	65	228
(Containment Isolation Valve associated with 3RHS*V6)			
<sup>3</sup> 3RHS*MV8702B	20	152	152
(Containment Isolation Valve associated with 3RHS*MV8702A)			
<sup>4</sup> Integrity maintained by RSS System piping up to 3RSS*MOV20B			

Undetermined Leak rates were greater than 400,000 sccm which is the maximum reading on the test gage.