

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: Selden Street, Berlin, Connecticut

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

May 8, 1991

MP-91-381

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

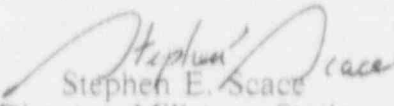
Reference: Facility Operating License No. NPF-49
Docket No. 50-423
Licensee Event Report 91-009-00

Gentlemen:

This letter forwards Licensee Event Report 91-009-00 required to be submitted within thirty (30) days pursuant to 10CFR50.73(a)(2)(i), any event or condition prohibited by the plant's Technical Specifications.

Very truly yours,

NORTHEAST NUCLEAR ENERGY COMPANY


Stephen E. Scace
Director, Millstone Station

SES/BWN:ljs

Attachment: LER 91-009-00

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

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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 (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 1 OF 0 3				PAGE (3) 1 OF 0 3				
TITLE (4) "A" Train Service Water Inoperable Due to Pipe Erosion																		
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 4	0 8	9 1	9 1	0 0 9	0 0	0 5	0 8	9 1	0 5 0 0 0 0 1 1									
OPERATING MODE (9) 4			THIS REPORT IS BEING SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5. (Check one or more of the following) (11)															
POWER LEVEL (10) 0 1 0 0			20.402(b)				20.402(c)				50.73(a)(2)(iv)				72.71(b)			
			20.405(a)(1)(i)				50.36(a)(1)				50.73(a)(2)(v)				72.71(c)			
			20.405(a)(1)(ii)				50.36(a)(2)				50.73(a)(2)(vi)				OTHER (Specify in Abstract below and in Test. NRC Form 366A)			
			20.405(a)(1)(iii)				50.73(a)(2)(i)				50.73(a)(2)(vii)(A)							
			20.405(a)(1)(iv)				50.73(a)(2)(ii)				50.73(a)(2)(viii)(B)							
			20.405(a)(1)(v)				50.73(a)(2)(iii)				50.73(a)(2)(ix)							
			20.405(a)(1)(vi)				50.73(a)(2)(iv)				50.73(a)(2)(x)							
LICENSEE CONTACT FOR THIS LER (12)																		
NAME Barrett W. Nichols, Senior Engineer, Ext. 5493										TELEPHONE NUMBER AREA CODE 2 0 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 NRC		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC								
SUPPLEMENTAL REPORT EXPECTED (14)										EXPECTED SUBMISSION DATE (15)		MONTH DAY YEAR						
YES (if yes, complete EXPECTED SUBMISSION DATE) <input checked="" type="checkbox"/> NO <input type="checkbox"/>																		
ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)																		
<p>On April 5, 1991, at approximately 1500 hours, with the plant in Mode 4 (Hot Shutdown), an engineering evaluation concluded that a portion of the Service Water (SWP) system had been inoperable due to pipe wall thinning caused by erosion. As a result of the erosion generated wall thinning, the "A" train SWP system may not have been capable of performing its intended safety function during a seismic event. The piping is concluded to have been inoperable from November 6, 1990, to March 8, 1991.</p> <p>The root cause of the event is program inadequacy. The applicable engineering procedure did not require that a map of the nondestructive examination measurements be made and that all of the examination data obtained on the thinned section of pipe be transmitted to the support Engineering group performing the evaluation. A contributing cause is inadequate design verification due to a cognitive failure during the original design reconciliation of the affected piping section. The checklist used for this process required that the pipe wall thickness shown on the design drawings be checked against that used in the design calculations. This was not done.</p> <p>There was no immediate corrective action as the affected section of piping had been previously replaced. The eroded section of piping has been replaced with erosion resistant piping. Procedural guidance on pipe leak data transmittal and evaluation was strengthened.</p>																		

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

Estimated burden per response to comply with this information collection request: 50 minutes. Forward comments regarding burden estimate to the Records and Reports Management Branch (2-530), U.S. Nuclear Regulatory Commission, Washington, DC 20555, and to the Paperwork Reduction Project (2150-0106), Office of Management and Budget, Washington, DC 20503.

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

TEXT: If more space is required, use additional NRC Form 300A, 6/1/77.

I. Description of Event

On April 8, 1991, at approximately 1500 hours, with the plant in Mode 4 (Hot Shutdown), an engineering evaluation concluded that a portion of the Service Water (SWP) system had been inoperable due to pipe wall thinning caused by erosion. As a result of the erosion generated wall thinning, the "A" train SWP system may not have been capable of performing its intended safety function during a seismic event. The piping is concluded to have been inoperable from November 6, 1990, (i.e., time of discovery) to March 8, 1991, (i.e., point of repair).

On November 6, 1990, a pinhole leak was identified on the discharge piping of the A Train Control Room Air Conditioning Service Water Booster pump. The system engineer contacted the support engineering group with information on the leak. Normal practice was to verbally transmit information on the size of the hole and wall thickness of the surrounding piping. In this case, the system engineer indicated that a hole and some erosion existed in the piping. An initial engineering review of the design calculations determined that substantial margin still existed for all design conditions. This conclusion was based on the wall (0.219 inches) thickness used in the piping design qualification calculations. Based on this evaluation, the Service Water System was still considered operable and a leak prevention patch installed. An ASME Section XI (Rules for Inservice Inspection of Nuclear Power Plant Components) relief request was initiated and the degraded section of pipe scheduled for replacement during the upcoming outage.

During a review for other design changes to the system, engineering personnel discovered that the wall thickness for the 3-inch SWP booster pump discharge piping shown on the as-built piping isometrics was significantly less than the pipe wall thickness used in the original piping design qualification calculations (0.095 inches vs. 0.219 inches).

During the design reconciliation which took place prior to operation of the unit, the design calculations were reviewed against the as-built piping isometric (PLI) drawings. This reconciliation required that all of the critical parameters for the design calculations be reviewed against PLI drawings. One of these parameters is pipe wall thickness. Typically, the pipe wall thickness is listed directly on the PLI drawing. The opposite ("B") train piping had its (0.219 inches) wall thickness listed on the PLI. For this train, the PLI referenced a vendor drawing. The vendor drawing correctly listed the pipe wall thickness (of 0.095 inches). Based on the information available, it is concluded that the person performing the design reconciliation assumed that the wall thickness for the two SWP piping trains were the same and did not consult the vendor drawing.

There were no immediate corrective actions required by plant operators since replacement of the aforementioned SWP piping was completed on March 8, 1991, during the refueling outage.

II. Cause of Event

The pin hole leak was caused by erosion resulting from high velocity, turbulent flow at the pump discharge.

The root cause of the event is program inadequacy. The plant engineering procedure for evaluating piping leaks did not require that a map of the nondestructive examination results be made and that all of the examination data obtained be transmitted to the support Engineering group which performs the evaluation. If this had been done, the discrepancy between the as-built drawings and the design calculation would have been identified shortly after the piping leak was discovered. That portion of the system would have been declared inoperable and appropriate actions taken.

A contributing cause is inadequate design verification due to a cognitive failure. Although it was procedurally required, piping engineering personnel for the architect engineer did not correctly verify the as-built pipe wall thickness information against the value used in the associated design calculation during the design reconciliation which occurred prior to plant startup.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

Estimated burden per response to comply with this information collection request: 30.0 hrs. Forward comments regarding burden estimate to the Records and Reports Management Branch (2-530), U.S. Nuclear Regulatory Commission, Washington, DC 20545, 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) 0 5 0 0 0 4 2 3 9 1	LER NUMBER (3)			PAGE (3) 0 3 OF 0 3
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
		0 1 9	0 1 0		

TEXT (If more space is required, use additional NRC Form 3066, 4-117.)

III. Analysis of Event

This event is reportable per 10CFR50.73(a)(2)(3), as an event or condition prohibited by the plant Technical Specifications. The "A" train of the SWP system is concluded to have been inoperable from November 6, 1990, to March 8, 1991. This duration exceeded the 72 hour time limit allowed by the applicable Technical Specification.

The safety significance of this event is minimal due to the low failure probability of this low operating pressure (60 PSIG) and temperature (75 degrees F) piping and the various means of minimizing the leakage rate if a rupture were to actually occur.

The probability of occurrence of a design basis accident concurrent with a design basis earthquake which causes a complete rupture of the eroded 3-inch SW booster pump piping is small. If this event were to occur, a low flow alarm for the affected portion of the system would annunciate in the control room. The flow through the ruptured piping would be reduced by turning off the booster pump. The degraded section of piping is isolable via a manual isolation valve. Additional loads cooled by the "A" train SWP system are postulated to be minimally affected due to reduced flow rates as a result of the flow diversion after the booster pump is turned off. Once the degraded portion of the system is isolated, there would be no adverse effect on the remainder of the system. The "B" train SWP system would not be affected. If the "B" train Control Building Air Conditioning system were affected alternate means of cooling the Control Room could be employed which would not be affected by the flooding.

IV. Corrective Action

Because the event is historical, no immediate actions were required by plant operators. The eroded SWP piping replacement was completed on March 8, 1991, while the plant was shutdown for refueling. The replacement piping, although of the same wall thickness as the eroded piping is made with Monel, which has greater erosion resistant properties.

The engineering procedure governing the transmittal of data used for analysis of leaks was enhanced to ensure that a map of nondestructive examination results be made and that all pertinent data is forwarded in writing to the engineering group performing the analysis.

A review of similar piping areas and extensive work performed on the Service Water System since startup has shown that the error in the design reconciliation is an isolated event.

V. Additional Information

There have been no similar events with the same root cause and underlying concerns.

EHS CODES

SYSTEMS

Service Water System - B1

COMPONENTS

Piping - PSP