

LICENSEE EVENT REPORT (LER)(See reverse for required number of
digits/characters for each block)ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS MANDATORY
INFORMATION COLLECTION REQUEST: 50.0 HRS. REPORTED LESSONS
LEARNED ARE INCORPORATED INTO THE LICENSING PROCESS AND FED
BACK TO INDUSTRY. FORWARD COMMENTS REGARDING BURDEN
ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (T-
6 F33), 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 1

DOCKET NUMBER (2)

05000245

PAGE (3)

1 of 4

TITLE (4)

Seismic Qualification Deficiencies Found in Safety Related Piping

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
11	13	96	96	051	01	12	13	96	FACILITY NAME	DOCKET NUMBER
OPERATING MODE (9)		N	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)							
POWER LEVEL (10)		000	20.2201(b)		20.2203(a)(2)(v)		50.73(a)(2)(i)		50.73(a)(2)(viii)	
			20.2203(a)(1)		20.2203(a)(3)(i)		<input checked="" type="checkbox"/> 50.73(a)(2)(ii)		50.73(a)(2)(x)	
			20.2203(a)(2)(i)		20.2203(a)(3)(ii)		50.73(a)(2)(iii)		73.71	
			20.2203(a)(2)(ii)		20.2203(a)(4)		50.73(a)(2)(iv)		OTHER	
			20.2203(a)(2)(iii)		50.36(c)(1)		50.73(a)(2)(v)		Specify in Abstract below or in NRC Form 366A	
			20.2203(a)(2)(iv)		50.36(c)(2)		50.73(a)(2)(vii)			

LICENSEE CONTACT FOR THIS LER (12)

NAME

Robert W. Walpole, MP1 Nuclear Licensing Manager

TELEPHONE NUMBER (Include Area Code)

(860)440-2191

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**

MONTH

1

DAY

30

YEAR

97

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

On September 13, 1996, with the plant in the COLD SHUTDOWN condition, it was determined that several piping lines that form part of the Turbine Building Secondary Closed Cooling Water (TBSCCW) system and the Condensate system are not seismically qualified. Most of the associated lines were operable while a small number of the lines in question did not meet the operability guidelines established in Generic Letter 91-18. The lines ranged from 3/4 inch to 4 inches in diameter. On September 13, 1996, it was determined that the lack of seismic qualification for these lines which form part of the TBSCCW and Condensate systems resulted in the plant being outside of its design basis, and a prompt report was made pursuant to 10CFR50.72(b)(2)(i). On November 13, 1996, with the plant in the COLD SHUTDOWN condition, it was determined that several additional piping lines that form part of the Feedwater, Fuel Pool Cooling, Low Pressure Coolant Injection, Isolation Condenser, and Reactor Water Cleanup systems are not seismically qualified. A prompt report was made pursuant to 10CFR50.72(b)(2)(i). These events are reportable pursuant to 10CFR50.73(a)(2)(ii) as a condition outside the design basis of the plant.

The cause of these events is an original plant design deficiency. Corrective actions will include modifications to restore these lines to design basis, as well as a review of all safety related piping systems to identify any additional design deficiencies. There were no safety consequences as a result of this event.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)				PAGE (3)
		YEAR	SEQUENTIAL NUMBER		REVISION NUMBER	
		96	--	051	-- 01	

Millstone Nuclear Power Station Unit 1

05000245

2 of 4

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

I. Description of Event

On September 13, 1996, with the plant in the COLD SHUTDOWN condition, it was determined that several piping lines that form part of the TBSCCW system and the Condensate system are not seismically qualified. On November 13, 1996, with the plant in the COLD SHUTDOWN condition, it was discovered that several additional piping lines that form part of the Feedwater, Fuel Pool Cooling, Low Pressure Coolant Injection, Isolation Condenser, and Reactor Water Cleanup systems are not seismically qualified. Most of the associated lines were operable while a small number of the lines in question did not meet the operability guidelines established in Generic Letter 91-18. Specifically, the following are lines that do not meet the operability criteria: (1) TBSCCW system: 1" SC-107 piping that branches off 3" SC-19 near HVAC-1 and HVAC-2, 1" SC-108 piping that branches off 3" SC-20 near HVAC-1 and HVAC-2, two 1" lines that connect to the TBSCCW surge tank; (2) Condensate system: Condensate demineralizer piping connected to demineralizer tanks M2-8A,B,C,D,E,F, and G, 1/2" C-83 piping that extends from 3/4" C-50 to 16" C-82; (3) Isolation Condenser: 1" piping associated with level switches LS-1347A,B, and C, 3" IC-12 makeup water supply piping. The lines addressed by this LER range from 3/4 inch to 4 inches in diameter. All of these lines were identified under the Northeast Utilities Significant Operating Event Report (NUSOER) 92-02 Program for Millstone Unit No. 1, which is reviewing all safety related piping systems and evaluating any lines that were not previously qualified. The lines addressed by this LER are mostly small bore (2" nominal pipe size and under) branch lines which are connected to large-bore process pipes that have been seismically qualified. The deficiencies noted in the effected lines consist primarily of excessively long spans lacking adequate lateral support, and inadequate capacity in existing supports to resist predicted loads. These configurations result in piping stresses which exceed Code allowable limits for load combinations (deadweight, internal pressure, and seismic inertia) specified by the Millstone Unit No. 1 Updated Final Safety Analysis Report, Chapter 3.

The lack of seismic qualification for these lines which form part of the TBSCCW, Condensate, Feedwater, Fuel Pool Cooling, Low Pressure Coolant Injection, Isolation Condenser, and Reactor Water Cleanup systems resulted in the plant being outside of its design basis. A prompt report was made pursuant to 10CFR50.72(b)(2)(i) on September 13, 1996, and November 13, 1996.

There were no safety consequences as a result of this event.

II. Cause of Event

The cause of this event is twofold, insufficient scope and inadequate design. Insufficient scoping at the time of implementing IEB 79-14 is the result of the lack of a clear definition of seismic class I system boundaries at the time the IEB 79-14 scope was established. This work was initiated prior to the existence of QA boundaries such as are currently depicted in the MEPL for Millstone Unit No. 1. The absence of this information resulted in the IEB 79-14 scope falling short of what we currently define as a QA boundary. In addition to this, the IEB 79-14 specifically excluded most small bore piping thus the field verification conducted on large bore piping was not completed for small bore piping.

Secondly, the inadequate design issue is associated with original plant construction. Most safety-related small bore piping at Millstone Unit No. 1 was "field run" without drawings, using span charts to locate standard support designs. This resulted in the field condition lacking the design and installation controls afforded large bore piping and supports. This method of design, while an accepted industry practice, resulted in installations which were not fully in compliance with the units design basis.

LICENSEE EVENT REPORT (LER)

TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)				PAGE (3)
		YEAR	SEQUENTIAL NUMBER		REVISION NUMBER	
		96	--	051	-- 01	
Millstone Nuclear Power Station Unit 1	05000245					3 of 4

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

iii. Analysis of Event

The lack of seismic qualification for the lines addressed by this LER, which form part of the TBSCCW, Condensate, Feedwater, Fuel Pool Cooling, Low Pressure Coolant Injection, Isolation Condenser, and Reactor Water Cleanup systems, results in the plant being outside of its design basis and is reportable pursuant to 10CFR50.73(a)(2)(ii). The piping lines addressed by this LER are distributed throughout these systems and could effect their operability, via loss of pressure boundary integrity during a seismic event. Since there have been no seismic events, the safety consequence of this event is low.

The Millstone Unit No. 1 TBSCCW system is a closed loop system providing cooling to various equipment located in the reactor and turbine building. The safety significance of the TBSCCW system is related to the dependency of both the plant's ventilation and Feedwater Coolant Injection (FWCI) system on it's operation. Certain turbine building area coolers are required to maintain area temperatures for operability of FWCI components, and the emergency diesel generator. The Condensate system's safety related functions include supply of make-up water to the reactor vessel as part of the FWCI system, and make-up water to the spent fuel pool via the skimmer surge tanks. The Feedwater system also serves as part of the FWCI system. The portion of the Fuel Pool Cooling system addressed in this LER is the reactor cavity drain line. Low Pressure Coolant Injection, Isolation Condenser and FWCI are ECCS systems. Portions of the Reactor Water Cleanup system provide primary coolant and containment boundary. The lines addressed by this LER are inadequately supported to meet design basis seismic requirements, and in several cases, cannot meet operability requirements. Specifically, the following are lines that do not meet the operability criteria: (1) TBSCCW system: 1" SC-107 piping that branches off 3" SC-19 near HVAC-1 and HVAC-2, 1" SC-108 piping that branches off 3" SC-20 near HVAC-1 and HVAC-2, two 1" lines that connect to the TBSCCW surge tank; (2) Condensate system: Condensate demineralizer piping connected to demineralizer tanks M2-8A,B,C,D,E and G, 1/2" C-83 piping that extends from 3/4" C-50 to 16" C-82; (3) Isolation Condenser: 1" pip associated with level switches LS-1347A,B, and C, 3" IC-12 makeup water supply piping. Thus, their loss function could impair the ability of the TBSCCW, Condensate, and Isolation Condenser systems from performing their safety-related functions.

The effect of these inoperable lines on the function of these systems will first be addressed individually. Failure of the identified small-bore lines which form part of the TBSCCW pressure boundary could result in loss of sufficient inventory to render the system inoperable. This could result in the loss of the emergency diesel generator and the FWCI systems. Failure of the identified lines which form part of the Condensate system pressure boundary could result in loss of sufficient inventory to render the FWCI system inoperable. The Millstone Unit No. 1 Final Safety Analysis Report, Chapter 15 analysis does not credit the FWCI system. Failure of the identified lines which form part of the Isolation Condenser shell side pressure boundary could result in loss of sufficient inventory to render the Isolation Condenser system inoperable. Although the Isolation Condenser system is credited for Loss of Coolant Accident (LOCA) mitigation, the single failure assumed in the analysis disabled it along with the emergency diesel generator. Thus, acceptable results of LOCA analysis have been demonstrated without the benefit of the Isolation Condenser system.

Evaluations are ongoing as to the seismic adequacy of Gas Turbine and ECCS system associated components. Additionally, these systems (TBSCCW, Condensate, and Isolation Condenser) are credited as forming part of safe shutdown methods in other plant programs. Therefore, upon completion of the reviews associated with the NUSOER 92-02 program, and other ongoing seismic evaluation programs, an analysis of

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)				PAGE (3)
		YEAR	SEQUENTIAL NUMBER		REVISION NUMBER	
		96	--	051	-- 01	

Millstone Nuclear Power Station Unit 1

05000245

4 of 4

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

the seismic adequacy of Millstone Unit No. 1 safe shutdown methods will be performed, considering the cumulative effect of the resultant findings.

IV. Corrective Action

As committed to in LER 96-040-00, Commitment No. B15757-2, in order to ensure that all safety related piping systems meet design basis seismic requirements, the NUSOER 92-02 program will verify that existing piping evaluation programs such as IEB 79-14 have fully addressed the applicable scope.

Northeast Nuclear Energy Company (NNECO) will implement modifications to restore each identified piping system to design basis requirements prior to startup for operating cycle 16. NNECO will supplement this LER with the results of the ongoing NUSOER 92-01 Program review by January 30, 1997.

NNECO will perform an analysis of the cumulative effects of the results of efforts which are reviewing the seismic adequacy of Millstone Unit No. 1 systems and components on credited safe shutdown methods. This review will be initiated upon completion of seismic evaluation programs, and will be completed by June 30, 1997.

V. Additional Information

Similar Events

LER 92-004, "Diesel Generator Air Start and Wall Seismic Modifications," addressed the lack of seismic qualification for the Millstone Unit No. 1 Emergency Diesel Generator Air Start Piping.

LER 93-004, "Improperly Restrained Main Steam Venturi Instrument Lines", discussed inadequate seismic supports on a small bore line inside the drywell. The corrective actions included an inspection of additional pipe supports on similar small bore lines in the drywell.

LER 96-040, "Control Rod Drive System Seismic Inadequacy Caused Plant to be Outside of its Design Basis", discussed the seismic design inadequacy of the Control Rod Drive system insert and withdrawal piping. Corrective actions included restoration of the system to design basis, and review of all safety related piping under NUSOER 92-02.

Manufacturer Data

None