



Northeast  
Nuclear Energy

Rope Ferry Rd. (Route 156), Waterford, CT 06385

Millstone Nuclear Power Station  
Northeast Nuclear Energy Company  
P.O. Box 128  
Waterford, CT 06385-0128  
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The Northeast Utilities System

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

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

May 13, 1994  
MP-94-332

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 94-007-00

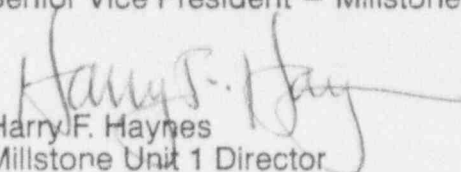
Gentlemen:

This letter forwards Licensee Event Report 94-007-00 required to be submitted within thirty (30) days pursuant to 10CFR50.73(a)(2)(i)(B).

Very truly yours,

NORTHEAST NUCLEAR ENERGY COMPANY

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

BY:   
Harry F. Haynes  
Millstone Unit 1 Director

DBM/RLM:ljs

Attachment: LER 94-007-00

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

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9405190038 940513  
FDR ADDCK 05000423  
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11

## LICENSEE EVENT REPORT (LER)

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

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 (MNBB 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 3

DOCKET NUMBER (2)

05000423

PAGE (3)

1 OF 04

TITLE (4)

Violation of Engineered Safety Feature Response Time for Quench Spray System

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	
04	14	94	94	007	00	05	13	94	FACILITY NAME	DOCKET NUMBER	
										05000	
OPERATING MODE (9)		1	THIS REPORT IS BEING SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)								
POWER LEVEL (10)		100	20.402(b)			20.405(c)			50.73(a)(2)(iv)		73.71(b)
			20.405(a)(1)(i)			50.36(c)(1)			50.73(a)(2)(vi)		73.71(c)
			20.405(a)(1)(ii)			50.36(c)(2)			50.73(a)(2)(vii)		OTHER
			20.405(a)(1)(iii)		X	50.73(a)(2)(i)			50.73(a)(2)(viii)(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)(viii)(B)		
			20.405(a)(1)(v)			50.73(a)(2)(iii)			50.73(a)(2)(ix)		

## LICENSEE CONTACT FOR THIS LER (12)

NAME

William J. Temple, Site Licensing

TELEPHONE NUMBER (Include Area Code)

(203) 437-5904

## 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)

X

NO

EXPECTED SUBMISSION DATE (15)

MONTH

DAY

YEAR

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

On April 14, 1994, with the plant in MODE 1 at 100% power, an engineering review determined that the valve stroke time acceptance criterion exceeded the system response time identified in Technical Specifications for Engineered Safety Features (ESF) actuation of the Quench Spray System (QSS).

Although, at the time of discovery, the required ESF response time was acceptable, a review of historical data identified that an unacceptable condition has sporadically existed since initial plant startup. Specifically, when the quarterly QSS header isolation valve actual stroke times are added to the instrument response times, two instances were identified that exceeded the Technical Specification (TS) surveillance acceptance criterion. Additionally, when the actual stroke times were added to the Loss of Normal Power (LNP) acceptance criterion, many instances occurred where the TS surveillance acceptance criterion was exceeded. This condition was not previously identified because an inadequate valve/stroke time was used in the surveillance. This is reported as a condition prohibited by the Technical Specifications.

The condition had low safety significance because the actual QSS actuation time met the response times that are used in the QSS design/safety analysis. The ESF system is fully operable to perform all credited safety functions.

The root cause of the condition was a programmatic error during initial startup. An unacceptable valve stroke time was identified. The disposition accepted the stroke time "as-is" based on the safety analysis. However, the disposition allowing the increased stroke time did not correct the TS acceptance criterion. As initial corrective action, the QSS valve stroke time acceptance criterion has been administratively reduced. A proposed change to the TS has been submitted to the NRC which would allow Northeast Nuclear Energy Company (NNECO) to change the ESF actuation acceptance criterion to be consistent with the design/safety analysis, to prevent recurrence.

EXPIRES: 5/31/95

**LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION**

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FOR: ID COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNBB 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)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Millstone Nuclear Power Station Unit 3	05000423	94	— 007 —	00	02 OF 04

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

**I. Description of Event**

On April 14, 1994, with the plant in MODE 1 at 100% power, an engineering review determined that adding the acceptance criterion for individual valve stroke time to the instrument response time, (and adding diesel start time for a Loss of Normal Power (LNP)), could exceed the allowable system response time identified in the Technical Specifications. A historical review of Engineered Safety Features (ESF) response times with the corresponding valve stroke time and diesel start time for a LNP event identified instances where Quench Spray System (QSS) train A exceeded the Technical Specification (TS) acceptance criterion. In all instances, the B-train was operable when the A-train exceeded the acceptance criterion.

This condition was self-identified as a result of an integrated safety evaluation (ISE) to review a valve stroke time acceptance criterion change. The ISE was performed to verify if an increase in the QSS header isolation valve stroke time would be acceptable. The ISE identified that the actual change would be safe. However, the allowable stroke time, when evaluated with the maximum allowable time for instrumentation response, could contribute to exceeding the maximum ESF system actuation time requirements in Technical Specification 3/4.3.2, Table 3.3-5, "Engineered Safety Features Response Times."

The ESF system actuation time requirements are based on the combination of instrument response times, component actuation times (valve stroke, pump acceleration) and, for LNP, Emergency Diesel Generator (EDG) start time. The surveillance test for the QSS header isolation valves ensures that the slowest valve stroke times do not exceed the allowable actuation time of 32 seconds for containment depressurization. When incorporating the LNP, the acceptance criterion is 42 seconds. By combining the TS allowable stroke time for the QSS header isolation valves (32 seconds) and TS allowable start time of the diesel generator (11 seconds), the potential exists for exceeding the maximum ESF actuation time (42 seconds). An administrative limit of 10 seconds exists for the diesel generator start to ensure ESF actuation time would not be exceeded.

The engineering review also determined that a nonconservative valve stroke time was used in the surveillance. The Chemical Addition Tank (CAT) isolation valve stroke time was used but the QSS header isolation valve was not included in the surveillance.

**II. Cause of Event**

The root cause of this condition was inadequate program controls. This occurred, prior to initial startup, with a disposition of an unacceptable valve stroke time. That evaluation resulted in the determination that the QSS header isolation valve stroke time was acceptable based on design calculations and required ESF response times in the Final Safety Analysis Report (FSAR) Chapter 15 Accident Analysis. There was an inadequate follow-up to the disposition which did not review and revise the Technical Specification ESF actuation table and the FSAR table for containment isolation valves. The containment isolation valve table identified the QSS header isolation valve stroke time as not exceeding 30 seconds to open. The inservice test program used QSS header isolation valve stroke times based on the original safety analysis and the disposition of the unacceptable valve stroke time.

**III. Analysis of Event**

This is a report of a condition that has historically and sporadically existed since the first cycle of plant operation. It is reported under 10CFR50.73(a)(2)(i)(B) as a deviation from the plant's Technical Specifications.

EXPIRES: 5/31/95

**LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION**

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

Each refueling outage, a comprehensive ESF test is performed to verify operability of the Solid State Protection System (SSPS), including individual components. The valve stroke times for the Quench Spray containment isolation valves are performed quarterly to verify their capability to open to perform their ESF function, and close to perform their containment isolation function. The acceptance criterion specified for the open valve stroke time was not conservative enough to meet the required actuation times for the ESF test. A review of previous ESF test results and subsequent stroke time tests identified that, in many instances, the QSS A-train did not meet the ESF actuation time acceptance criterion when the quarterly stroke times were substituted for those performed during the refueling outage ESF test.

During the initial startup testing, an unacceptable valve stroke time was identified. The QSS header isolation valve stroke times were greater than the 30-second design stroke time by two seconds in the worst case. The disposition of "Accept As Is" was based on calculations for Quench Spray header fill time which assumed that the valves opened only 60 percent, and assumed a 40 second actuation time. Additionally, the FSAR Chapter 15 accident analysis specifies that the quench spray system becomes effective in approximately 68.2 seconds. Therefore, the small increase in valve stroke time (two seconds) was well within the time credited for initiating the QSS safety function.

The condition had low safety significance because the actual QSS actuation time met the response times that are used in the QSS design/safety analysis. The currently tested ESF actuation times are within the TS acceptance criterion. The ESF system is fully operable to perform all credited safety functions.

**IV. Corrective Action**

As initial corrective action, the QSS header isolation valve acceptance criterion has been administratively reduced to 30 seconds. This includes a review of the ESF actuation acceptance criterion whenever the valve stroke time is exceeded. Also, an administrative limit of 10 seconds currently exists for the diesel generator start to ensure ESF actuation time would not be exceeded.

The surveillance procedures have been revised to incorporate the QSS header isolation valve stroke time. In addition, the ESF Response Time surveillance procedure will be revised prior to its next usage in the refueling outage. A review of valve stroke times identified no other cases which had a stroke time that exceeded the ESF actuation response acceptance criterion.

A proposed Technical Specification change has been submitted to the NRC that would remove the ESF actuation response times from the Technical Specifications and place them in the Technical Requirements Manual. That change, when approved, will allow Northeast Nuclear Energy Company (NNECO) to implement a permanent revision to the ESF actuation response times for the QSS header isolation valves, to be consistent with the current safety analysis calculations.

**V. Additional Information**

This condition was not identified in previous LERs related to response time testing, which include the following:

LER 93-017, "Inadequate Response Time Testing," discusses the inadequate integrated approach to testing during procedure development prior to plant startup.

LER 93-003, "Inadequate Testing of Slave Relays," discusses a deficiency in procedure development to ensure all circuits and components receiving actuation signals are tested.

LER 89-021, "Miscalculation of Engineered Safety Features Response Time Due to Procedural Inadequacy," discusses the inadequacy of the initial procedure to include the slave relay actuation times as part of the ESF response time test.

EXPIRES: 5/31/95

**LICENSEE EVENT REPORT (LER)**  
**TEXT CONTINUATION**

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LER 87-017, "Failure to Adequately Determine and Measure Response Times," discusses the inadequate response time testing by not accounting for valve interlocks.

ELIS CodesSystem

JE (Engineered Safeguards Actuation System)

BE (Containment Spray System)

Component

INV (Injection Valve)