



Northeast  
Nuclear Energy

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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)(ii)  
March 18, 1994  
MP-94-188

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 94-003-00

Gentlemen:

This letter forwards Licensee Event Report 94-003-00 required to be submitted within thirty (30) days pursuant to 10CFR50.73(a)(2)(ii), as an event or condition outside the design basis of the plant.

Very truly yours,

NORTHEAST NUCLEAR ENERGY COMPANY

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

DBM/dlr

Attachment: LER 94-003-00

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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PDR ADDCK 05000336  
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# 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 (MNB 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 3
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TITLE (4)  
Degraded Inverter Synchronizing Circuit Effect on Main Steam Line Break Analysis Assumptions

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
02	18	94	94	003	00	03	18	94		05000
									FACILITY NAME	DOCKET NUMBER
										05000

OPERATING MODE (9) 1	THIS REPORT IS BEING SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5: (Check one or more) (11)									
	20.402(b)		20.405(c)		50.73(a)(2)(iv)		73.71(b)			
POWER LEVEL (10) 100	20.405(a)(1)(i)		50.56(c)(1)		50.73(a)(2)(iv)		73.71(c)			
	20.405(a)(1)(ii)		50.56(c)(2)		50.73(a)(2)(vi)		OTHER			
	20.405(a)(1)(iii)		50.73(a)(2)(i)		50.73(a)(2)(iii)(A)		(Specify in Abstract below and in Text, NRC Form 366A)			
	20.405(a)(1)(iv)		X 50.73(a)(2)(ii)		50.73(a)(2)(iii)(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
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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)				EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
YES (If yes, complete EXPECTED SUBMISSION DATE)	X	NO					

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

At approximately 0700 hours, on February 18, 1994, an engineering review revealed that degradation of the synchronizing capability between inverters providing normal and alternate 120 VAC to a vital instrument bus had the potential to invalidate an assumption for the main steam line break scenario in containment. The event was determined to be a condition outside the design basis of the plant. Specifically for a main steam line break (MSLB) in containment with loss of a DC bus, credit is taken for transfer between inverters to isolate feedwater flow to a faulted steam generator to limit containment pressure. Degradation of the synchronizing capability between inverters had the potential to inhibit the transfer between inverters if this design basis accident were to occur coincident with sync failure.

A reactor downpower was commenced to allow isolation of Main Feedwater. Inverter testing identified setpoint drift of the alternate source underfrequency circuit as the cause of intermittent sync failure alarms. An adjustment was made and the synchronizing circuit was declared operational at 1548 hours. Reactor downpower was halted.

The root cause of the event was the failure to completely incorporate administrative restrictions into procedures or Unit Technical Specifications to encompass the assumptions made in the analysis for the main steam line break in containment event.

## 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 (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 2	DOCKET NUMBER (2)  05000336	LER NUMBER (6) <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 15%;">YEAR</th> <th style="width: 15%;">SEQUENTIAL NUMBER</th> <th style="width: 15%;">REVISION NUMBER</th> </tr> <tr> <td style="text-align: center;">94</td> <td style="text-align: center;">— 003 —</td> <td style="text-align: center;">00</td> </tr> </table>	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	94	— 003 —	00	PAGE (3)  02 OF 03
YEAR	SEQUENTIAL NUMBER	REVISION NUMBER							
94	— 003 —	00							

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

I. Description of Event

At approximately 0700 hours, on February 18, 1994, while in mode 1 at 100% power, an engineering review of degradation of the synchronizing capability between vital 120 VAC Inverter-1 (Inv-1) and non-vital 120 VAC Inverter-5 (Inv-5) revealed the potential to invalidate an assumption for a main steam line break (MSLB) scenario in containment. The event was determined to be a condition outside the design basis of the plant. Inv-1 and Inv-5 are the normal and alternate sources respectively to a static switch powering vital 120VAC instrument bus VA-10. For an MSLB from Steam Generator 1 (SG1) in containment and the assumed loss of the Division 1 DC bus, which also powers Inv-1, credit is taken for the transfer of VA-10 to Inv-5. VA-10 powers the control circuit for the main feedwater regulating valve to SG1 which must be powered to isolate feedwater flow to SG1 to limit containment pressure. Alternate means of isolating feedwater flow to the faulted steam generator are assumed to be lost as a consequence of the lack of transfer capability from the Normal Station Service Transformer (NSST) to the Reserve Station Service Transformer (RSST) due to the assumed loss of the Division 1 DC bus. Transfer of the static switch is inhibited if Inv-1 is not in synchronism with Inv-5. Using the Limiting Condition for Operation for vital power as guidance since there is no specification for main feedwater isolation, the decision was made to correct the Inv-1 Sync Failure alarms or commence downpowering within 8 hours. Reactor downpower commenced at 1406 hours as preparation for inverter testing took place. Inverter testing showed that intermittent Sync Failure alarms, which inhibit transfer capability of the static switch to Inv-5, were caused by setpoint drift of an alternate source underfrequency limiter circuit. Drift from a setting of 59.4 Hertz to nearly 60 Hertz made the Inv-5 frequency appear to be unacceptably low when in fact it was not. The limiter circuit was adjusted and synchronizing capability was declared operational after a 1 hour period free of Sync Failure alarms had elapsed. The reactor downpower was halted. There were no automatic or manually initiated safety actuations as a result of this event.

II. Cause of Event

The root cause of the event was the failure to incorporate administrative restrictions into procedures or Unit Technical Specifications to encompass the assumptions made in the analysis for the MSLB in containment event. This is classified as a program failure caused by administrative error, since the assumptions used in the event analysis were not completely translated into operating procedures that would permit these assumptions to be satisfied. A contributing cause to this event was the drift of the underfrequency limiter circuit setpoint.

III. Analysis of Event

The event is reportable pursuant to 10CFR50.73(a)(2)(ii), as a condition outside the design basis of the plant. An immediate notification was performed pursuant to 10CFR50.72(b)(1)(ii). The potential safety consequence of this event is failure to be able to isolate main feedwater to SG1 if the Division 1 DC bus were to fail, and Inv-1 were to fail to transfer to its alternate source due to synchronizing failure, with an MSLB in containment from SG1. The actual safety consequence of this event was minimized since the synchronizing circuit had not failed and the degraded condition was immediately corrected.

**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 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.

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		YEAR 94	SEQUENTIAL NUMBER -- 003 --	REVISION NUMBER 00	

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

Corrective Action

Upon the discovery that the MSLB analysis assumed transfer capabilities to alternate non-vital electrical sources, administrative controls in the form of a night order to the operations department personnel was immediately issued. This night order provides the guidance to be taken in the event of the inability of an inverter to automatically transfer to its alternate source. Changes to the Unit Technical Specifications will be proposed to provide appropriate restrictions to reflect the assumptions for inverter alternate power supply availability. Compliance with the latest revision of Nuclear Engineering and Operations Procedure NEO 3.03 Plant Design Change Records (PDCRs) provides the means to prevent future administrative oversight. Additionally, Northeast Utilities Safety Analysis Branch is in the final stages of the development of a Design Basis Document Package which would identify all equipment which is credited in any safety analysis. When generated, this list will be reviewed to ensure proper administrative controls are in effect. Adjustments were made to the underfrequency limiter circuit to fully restore the synchronizing circuit. Should additional adjustments become necessary again, a periodic surveillance and adjustment program will be established to preclude similar problems.

Additional Information

EIS Codes

Inverter -- EF -- INVT -- C782

Feedwater Regulating Valve -- JF -- FCV -- C635

Similar LER's

93-016 concerned an inconsistency between the boron dilution event analysis assumptions and plant operating procedures. The corrective actions associated with this event remain valid.