



Northeast
Nuclear Energy

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Millstone Nuclear Power Station
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)(v)(D)

September 22, 1994
MP-94-555

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 94-026-00

This letter forwards Licensee Event Report 94-0 required to be submitted within thirty (30) days pursuant to 10CFR50.73(a)(2)(v)(D)

Very truly yours,

NORTHEAST NUCLEAR ENERGY COMPANY

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

BY: 
Harry F. Haynes
Director - Millstone Unit One

DBM/JL:lfg

Attachment: LER 94-026-00

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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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 (MNIB 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)	PAGE (3)
Millstone Nuclear Power Station Unit 2	05000336	1 OF 3

OPERATING MODE (9)		THIS REPORT IS BEING SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)							
POWER LEVEL (10)	5		20.402(b)		20.405(c)		50.73(a)(2)(iv)		73.71(b)
			20.405(a)(1)(i)		50.36(c)(1)	X	50.73(a)(2)(v)		73.71(c)
			20.405(a)(1)(ii)		50.36(c)(2)		50.73(a)(2)(vi)		OTHER
			20.405(a)(1)(iii)		50.73(a)(2)(i)		50.73(a)(2)(vii)(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)(vii)(B)		
	20.405(a)(1)(v)		50.73(a)(2)(iii)		50.73(a)(2)(viii)				

NAME	TELEPHONE NUMBER (Include Area Code)
Philip J. Lutzi, Nuclear Licensing	(203) 447-1791 Ext. 2072

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS

YES (If yes, complete EXPECTED SUBMISSION DATE)	X	NO	EXPECTED SUBMISSION DATE (15)			
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At approximately 1622 hours on August 25, 1994, with the plant in Mode 5 at 0% power, an operability determination concluded that vital 120VAC buses VA10 and VA20 were inoperable with the Hydrogen Analyzers energized from their respective buses due to exposure to potential high energy line breaks (HELBs) from Auxiliary Steam lines in the same room. These HELBs could cause consequential short circuits which would adversely affect the vital buses due to the electrical characteristics of the inverters, static switches and circuit breakers. With the Auxiliary Steam System isolated, VA10 and VA20 were considered operable on August 26, 1994. On August 30, 1994, with the plant in Mode 3, VA10 and VA20 were again declared inoperable due to an additional HELB concern from a potential Main Steam line break scenario. A design change was implemented to install fuses which permanently protect the vital 120VAC buses from HELB induced short circuits in the energized Hydrogen Analyzers.

EXPIRES: 5/31/95

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

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FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
Millstone Nuclear Power Station Unit 2	05000336	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
		94	— 026 —	00	02 OF 03

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

I. Description of Event

At approximately 1622 hours on August 25, 1994, with the plant in Mode 5 at 0% power, an operability determination concluded that vital 120VAC buses VA10 and VA20 were inoperable. The operability determination resulted from an ongoing systematic study of the coordination of vital AC system protective devices which was initiated on February 17, 1994. Based on a preliminary determination that the Hydrogen Analyzers were vulnerable to the effects of a high energy line break (HELB), postulated short circuits were found to result in an unacceptable voltage transient on the vital 120VAC bus. An engineering evaluation for the room in which the Hydrogen Analyzers are located determined the limiting HELB would result from an auxiliary steam line break. VA10 and VA20 were declared operable on August 26, 1994, when the Auxiliary Steam System was isolated. VA10 and VA20 were again declared inoperable on August 30, 1994, with the plant in Mode 3, based on an additional HELB concern postulated from a Main Steam line break (MSLB). Power for the Hydrogen Analyzers was removed, buses VA10 and VA20 were declared operable, and the plant was maintained in Mode 3 in accordance with the Technical Specifications. There were no automatic or manually initiated safety system actuations as a result of this condition. A design change was completed on September 2, 1994, which installed fuses that provide the required isolation protection for the vital 12VAC buses from faults in the Hydrogen Analyzers.

II. Cause of Event

The root cause of this event was inadequate design in the coordination of the Hydrogen Analyzer power supply circuit breaker with the inverter and static switch under short circuit conditions. During the HELB evaluation, the effects on this circuit had not been adequately addressed.

III. Analysis of Event

This event is being reported pursuant to the requirements of 10CFR50.73(a)(2)(v)D, any event or condition that alone could have prevented the fulfillment of systems that are needed to mitigate the consequences of an accident. It was determined that the postulated short circuit would cause an instantaneous inverter transfer to the alternate source. The alternate sources for vital 120VAC buses VA10 and VA20 are similar non-vital inverters without static switches. Since the circuit breaker protecting the Hydrogen Analyzers would take approximately 6 seconds to trip at the maximum available inverter current limit of 156A, the inverter protective characteristic would cause the output voltage to drop to zero followed by a voltage buildup to the point at which the current limit is reached. Once the circuit breaker trips, the bus voltage would recover and after synchronism and voltage checks the static switch would retransfer to its normal source following a brief delay. Vital buses VA10 and VA20 were declared inoperable for this scenario due to the unacceptable nature of the voltage transient on vital 120VAC loads. These buses power plant vital control and instrumentation systems including both divisions of engineered safeguards actuation system (ESAS) actuation circuits. Included in these circuits are both trains of Main Steam isolation (MSI) and emergency diesel generator (EDG) start and sequencing logic.

In evaluating the Safety Consequences of this condition, it must be assumed that for a HELB (such as a MSLB) event which causes a plant trip, a LNP will occur. Since the MSI and EDG start and sequencing controls are powered by the ESAS, the event would degrade to an unisolated MSLB concurrent with a station blackout (SBO). This is beyond the MP2 current licensing basis.

IV. Corrective Action

To correct this concern design change was implemented to install fuses whose characteristic assures that an unacceptable voltage transient will not occur on the vital buses during a postulated short circuit in the Hydrogen Analyzers. This modification has been implemented and no further corrective action is required. The engineering study of the coordination of vital AC system protective devices will continue. Based on the analysis to date, there is a high confidence that no further inoperable circuits will be identified. All circuits have been examined. Remaining activities will validate key operability assumptions.

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V. Additional Information

Similar LERs — None

EIIS Codes

Inverter—EF—INVT—C782

Hydrogen Analyzer — IK — 45 — B202

VA10/VA20 Vital 120VAC System — EF