Northeast
Nuclear Energy

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The Northeast Utilities System

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

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

June 8, 1994
MP-94-393

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

Reference: Facility Operating License No. DPR-65
             Docket No. 50-336
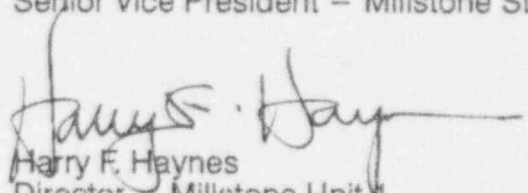   Licensee Event Report 94-010-00

Gentlemen:

This letter forwards Licensee Event Report 94-010-00 required to be submitted within thirty (30) days pursuant to the requirements of 10CFR50.73(a)(2)(iv), reporting a condition which resulted in an automatic actuation of an Engineered Safety Feature.

Very truly yours,

NORTHEAST NUCLEAR ENERGY COMPANY

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

BY: Harry F. Haynes
      Director — Millstone Unit 1

DBM/TA:dlr

Attachment: LER 94-010-00

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

LICENSEE EVENT REPORT (LER)

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

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Millstone Nuclear Power Station Unit 2	05000336	1 OF 3

TITLE (4)

Inadvertant Actuation of ESAS Equipment

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 05000
05	13	94	94	010	00	06	08	94	FACILITY NAME	DOCKET NUMBER 05000

OPERATING MODE (9)	5	THIS REPORT IS BEING SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)			
		20.402(b)	20.405(c)	X 50.73(a)(2)(iv)	73.71(b)
POWER LEVEL (10)	0	20.405(a)(1)(i)	50.36(c)(1)	50.73(a)(2)(v)	73.71(c)
		20.405(a)(1)(ii)	50.36(c)(2)	50.73(a)(2)(vii)	OTHER
		20.405(a)(1)(iii)	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)(x)	

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (Include Area Code)
Philip J. Lutzi, Site Licensing	(203) 447–1791 Ext. 6585

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)

On May 13, 1994 at 0700 hours, with the plant shutdown in mode 5, an inadvertant actuation of the Engineered Safety Features Actuation System (ESAS) took place. The actuation resulted in the starting of the Facility II Charging pump, both Boric Acid pumps, and opening of the Charging Pump Make–Up Bypass Valve 2–CH–514.

The cause of the inadvertant actuation was believed to be Electromotive Force (EMF) noise generated by the resetting action of the actuation relays. This noise was of sufficient level to cause the Diesel Generator load sequencer to resequence which resulted in the starting of the A&B Boric Acid and B Charging pumps and opening of 2–CH–514.

This is being reported pursuant to requirements of paragraph 50.73(a)(2)(iv) reporting any event or condition that resulted in a manual or automatic actuation of any engineered safety feature.

NRC Form 366A
(5-92)

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104
EXPIRES: 5/31/95

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)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Millstone Nuclear Power Station Unit 2	05000336	94 —	010 —	00	02 OF 03

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

I.   Description of Event

On May 13, 1994 at 0700 hours with the plant shutdown in mode 5, while resetting from a Loss of Normal Power/Safety Injection Actuation Signal (LNP/SIAS) test, a spurious actuation of the Facility II Engineered Safety Features Actuation Systems (ESAS) Diesel Generator load sequencer caused the inadvertant start of, the A&B Boric Acid pumps, the B Charging pump, and the opening of the Charging Pump Make-Up Bypass Valve, 2-CH-514.

The control room operators noticed that the Boric Acid and Charging pumps had started and that 2-CH-514 had opened. The ESAS instrumentation and indicating lights were reviewed and it was determined that none of the bistables had reached their setpoints and that none of the actuation modules had tripped and latched. The B Charging and A&B Boric Acid pumps were secured and 2-CH-514 was closed. Resetting from the LNP/SIAS test was completed with no further complications.

II.   Cause of Event

The root cause of the starting of the Boric Acid and Charging pumps and opening of 2-CH-514 was believed to be the spurious actuation of the Diesel Generator load sequencer. This spurious actuation was caused by Electromotive Force (EMF) noise generated by the resetting action of the SIAS actuation relays. This noise was of sufficient level to cause the Diesel Generator load sequencer to resequence which resulted in the starting of the A&B Boric Acid and B Charging pumps and opening of 2-CH-514.

An Automated Work Order (AWO) and trouble shooting plan were developed in order to confirm the noise and determine its source. The conclusion reached after Trouble Shooting and Engineering review of the ESAS circuitry was that a noise spike caused the sequencer to reset and resequence.

Resetting a SIAS or Containment Isolation Actuation Signal (CIAS) actuation signal results in a noise spike that finds its way to the ESAS sequencer module inputs and may cause re-sequencing. Testing has shown that this problem is limited to situations with the ESAS in a Under Voltage condition and a subsequent SIAS actuation. Therefore, resetting any other functions besides SIAS or CIAS in an Under Voltage condition will not create spurious signals.

This spike is developed from the collapsing magnetic field of the ESAS actuation relays as they change state from the energized to deenergized condition from a reset. When several actuation modules are reset simultaneously, enough signal noise is developed to produce a noise event spike on the sequencer module input such that a reset input signal to the sequencer may be triggered.

If the sequencer is not in a reset state following an Under Voltage actuation, the condition which existed when it has completed a sequence and is waiting to be reset, noise on a SIAS or Diesel Generator Breaker input may cause the sequencer to reset and start a new sequence. Noise on the SIAS or any of the breaker input refers to a spurious signal applied to the sequencer input terminals. These terminals normally receive the signals that cause the sequencer to start the sequencing function after the closure of the Diesel Generator output breaker, or a SIAS actuation. If the sequencer is in a reset state (no Under Voltage actuation has taken place), the signal spike generated from resetting actuation modules will have no ill effect on the operation of the sequencer or any other ESAS equipment.

III.   Analysis of Event

This event was reported pursuant to the requirements of 10CFR50.73(a)(2)(iv), a condition which resulted in manual or automatic actuation of any Engineered Safety Feature.

NRC Form 366A
(5-92)

U.S. NUCLEAR REGULATORY COMMISSION

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

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

An assessment of the Safety Consequences of this event was made. It was determined that the design functions of the ESAS, including sensing system failures and actuation of equipment capable of mitigating the consequences of an event, are not affected by the sequencer being subjected to spurious noise signals applied to its input terminals.

The resetting function that can generate spurious signals and reactivate the sequencer, cannot generate new load shed signals and thus will not cause an unwanted shedding of loads from the diesel after, for example, safety injection pumps had been started in response to a Loss of Coolant Accident (LOCA) event.

The ESAS and those actuation modules that control load shed functions are not controlled by the sequencer and hence are not affected by any resequencing however generated.

A review of all Emergency Operating Procedures (EOP's) has been performed. This review determined that only Emergency Operating Procedures 2532, Loss Of Coolant (LOCA) and 2536, Excess Steam Demand have the potential to be affected by the resetting action. The potential impact for the performance of these procedures was determined to be during the resetting steps. When the pushbuttons are depressed while loads are powered from the diesel, a momentary de-energization of these components may occur followed by their re-energization due to the sequencing logic.

If the charging pump stopped and then restarted, when it was required to be running, the brief interruption of charging flow at this point in the accident is of no consequence, based on adequate RCS pressure and volume. This step would occur when SIAS resetting was permitted in the EOP.

IV. Corrective Action

The input signal noise problem had been previously identified and will be resolved with design modifications during the next refueling outage (PDCR 2-026-93). Specifically, signal noise spikes will be quenched with shunting resistor/diodes placed across the relay coils. A low-pass filter network will be added to the sequencer inputs to prevent noise from causing further spurious sequencing.

A Caution Tag has been placed on the Facility 2 Reset push buttons for SIAS and CIAS to inform the operator that resetting the ESAS following a Under Voltage actuation may cause the sequencer to resequence.

V. Additional Information

Similar LER's: There are no other LER's associated with spurious ESAS actuations due to noise.

EIIS Code JE;C560;XC — Engineered Safety Features Actuation System

Diesel Generator Load Sequencer