



Northeast  
Nuclear Energy

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The Northeast Utilities System

April 25, 1996

Docket No. 50-336  
B15666

Re: 10 CFR 50.73

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

This letter forwards Licensee Event Report (LER) 96-019-00 documenting an event that occurred at Millstone Nuclear Power Station, Unit No. 2 on March 26, 1996. This LER is being submitted pursuant to 10 CFR 50.73(a)(2)(v).

Very truly yours,

NORTHEAST NUCLEAR ENERGY COMPANY

P. M. Richardson  
Director - Millstone Unit No. 2

Attachment: LER 96-019-00

cc: T. T. Martin, Region I Administrator  
P. D. Swetland, Senior Resident Inspector, Millstone Unit No. 2  
G. S. Vissing, NRC Project Manager, Millstone Unit No. 2

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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 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 20585-0001, 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 4
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TITLE (4)  
EEQ SOV Circuits in Containment Not Fully Qualified

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
03	26	96	96	019	00	04	25	96	FACILITY NAME	DOCKET NUMBER

OPERATING MODE (9) 5	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)									
POWER LEVEL (10) 0%	<input type="checkbox"/>	20.2201(b)	<input type="checkbox"/>	20.2203(a)(2)(v)	<input type="checkbox"/>	50.73(a)(2)(i)	<input type="checkbox"/>	50.73(a)(2)(viii)		
	<input type="checkbox"/>	20.2203(a)(1)	<input type="checkbox"/>	20.2203(a)(3)(i)	<input type="checkbox"/>	50.73(a)(2)(ii)	<input type="checkbox"/>	50.73(a)(2)(x)		
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	<input type="checkbox"/>	20.2203(a)(2)(ii)	<input type="checkbox"/>	20.2203(a)(4)	<input type="checkbox"/>	50.73(a)(2)(iv)	<input type="checkbox"/>	OTHER		
	<input type="checkbox"/>	20.2203(a)(2)(iii)	<input type="checkbox"/>	50.36(c)(1)	<input checked="" type="checkbox"/>	50.73(a)(2)(v)	<input type="checkbox"/>	Specify in Abstract below or in NRC Form 366A		
<input type="checkbox"/>	20.2203(a)(2)(iv)	<input type="checkbox"/>	50.36(c)(2)	<input type="checkbox"/>	50.73(a)(2)(vii)					

LICENSEE CONTACT FOR THIS LER (12)

NAME G. P. van Noordennen, Nuclear Licensing Supervisor	TELEPHONE NUMBER (include Area Code) (860)440-2084
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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		
YES (If yes, complete EXPECTED SUBMISSION DATE).	<input checked="" type="checkbox"/>	NO		MONTH	DAY	YEAR

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

On March 26, 1996, at 1315 hours, with the plant in Mode 5, while reviewing safety functional requirements (SFRs) for Electrical Equipment Qualification (EEQ) solenoid operated valves (SOVs), it was discovered that qualification of certain SOVs could not be demonstrated. The EEQ Program assumed these SOV circuit function for containment isolation only. The SFRs indicate that these SOVs are required for containment isolation and subsequent post-accident operation. Consequently, this results in an unqualified configuration of the SOV circuits, since they lack a qualified environmental seal and pigtail to field cable termination for energized operation in the accident environment.

No automatic or manually initiated safety systems were activated as a result of this event and no manual operator action was required.

The cause of this event was a programmatic failure to identify the complete SFRs, including post accident operating requirements, and their impact on full EEQ qualification.

The affected SOV circuits will be modified with qualified pigtail to field cable terminations and qualified seals.

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		96	--	019	--	

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

I. Description of Event

On March 26, 1996, at 1315 hours, with the plant in Mode 5, it was determined that full qualification could not be demonstrated for 7 containment EEQ SOVs based on an engineering review of the SFRs. The SOV qualifications conflict with the SFRs because: 1) in the absence of well defined SOV SFRs, the program did not consider post-accident operating requirements, and 2) the program relied upon a 1988 EEQ enforcement conference report<sup>(1)</sup> that stated these SOVs function for containment isolation only.

This report also identified the use of unqualified wire nuts in SOV circuits. NU previously replaced the unqualified wire nuts with qualified terminations in 1986 as part of an EEQ program reverification effort.

The unqualified SOV configurations currently have or at one time had Ideal set screw connectors in the circuit. Some of the SOV circuits have been upgraded with qualified Raychem splices. The Ideal set screws were credited to perform the same passive function as the wire nut. As the circuit de-energizes, failure of the set screw would not impact the safety function of the SOV. Therefore, they were not considered to require qualification under 10CFR50.49.

Currently, the EEQ program documentation does not demonstrate that the Ideal set screw connectors are qualified to the requirements of 10CFR50.49 in circuits where the SOV is required to energize post-accident. Further, a qualified environmental seal is required for SOVs that cycle in a LOCA environment. Therefore, the SOV circuit configurations without a qualified seal and with unqualified set screw connectors cannot be shown to be operable where post-accident energization is required.

An immediate report was made on March 26, 1996 at 1800 hours pursuant to the requirements of 10CFR50.72 (b)(2)(iii), "Any event or condition that alone could have prevented the fulfillment of the safety function of structures or systems that are needed to mitigate the consequences of an accident." This report is being submitted pursuant to the requirements of 10CFR50.73(a)(2)(v).

Since the plant was in Mode 5, EEQ components would not be required to operate for design basis events. There were no immediate operator actions required in response to this event. Additionally, there were no automatic or manually initiated safety systems activated as a result of this event.

II. Cause of Event

The cause of this event was a programmatic failure to identify complete SFRs, including post accident operating requirements, and their impact on full EEQ qualification.

III. Analysis of Event

In accordance with 10CFR50.49, the Millstone Unit 2 Environmental Qualification Master List (EQML) was issued in 1985. In order to demonstrate qualification of SOVs identified on the EQML, EEQ engineering used

<sup>(1)</sup>

U.S Nuclear Regulatory Commission letter to E. J. Mroczka, "Environmental Qualification (EQ) Enforcement Conference for Millstone 1 and 2," dated November 16, 1988, with attached report.

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what was believed to be a conservative approach to demonstrate compliance with post-accident operating times. For example, the SOVs, regardless of safety function were qualified for 1 year post-accident in a de-energized state. This approach was taken without fully understanding all operability requirements. The dual requirement of the SOV to de-energize during the accident and energize post-accident was not assessed.

Subsequent efforts to improve the EEQ Program resulted in an EEQ program manual that was issued in April 1, 1993. This manual superseded an NU procedure that was implemented by department instructions. The Program manual formally delineated the responsibilities of key groups that input to the EEQ Program. Safety Integration and Analysis (SI&A) was the key group responsible for providing the SFRs and operating durations of EEQ equipment. SI&A transmitted the SFRs to EEQ Engineering for several SOVs on February 23, 1995 followed by the remaining SOV SFRs on October 24, 1995.

Upon review of the SFR document, EEQ Engineering began preparing revised documentation for SOVs in accordance with the EEQ program manual. During this effort, it was noted that EEQ documentation crediting certain valves to function for containment isolation only, differ from the SFRs information transmitted by SI&A. It was determined that 7 SOV circuits located in containment are required to operate post-accident. Also, 4 of these circuits were previously addressed at an NRC enforcement conference that was held to discuss a potential MP2 EEQ violation associated with deficiencies identified in 1986 by NU during an EQ re-verification effort.

The enforcement conference concerned unqualified wire nuts used in 10 SOV circuits previously terminated with unqualified wire nuts. Only one SOV located outside containment actually required a qualified termination because it was required to energize to perform its safety function. The 9 remaining SOVs, were identified as isolation valves only that would fail in the safe condition when de-energized. Therefore, they would perform the safety function regardless of any wire nut failure due to a harsh environment. Upon discovering the unqualified wire nuts, NU replaced the terminations outside containment with qualified tape and lugs and the terminations inside containment were replaced with Ideal set screws. The Ideal set screws were not credited for qualification.

The 7 SOV circuits recently identified with post-accident operating requirements are listed below. SOVs 1 through 4 were addressed at the 1988 NRC enforcement conference as requiring to function for containment isolation only. SOVs 5 through 7 are additional circuits identified with Ideal set screw terminations. These circuits were also previously identified to function for containment isolation only.

No.	SOV ID	EQML ID	Description	Location
1	2-EB-88S	HV8150	Containment Air Monitor Isolation Valve	Containment
2	2-EB-89S	HV8151	Containment Air Monitor Isolation Valve	Containment
3	2-EB-91S	HV8380	Hydrogen Purge Valve Inside Containment	Containment
4	2-EB-100S	HV8378	Hydrogen Purge Valve Inside Containment	Containment
5	2-CH-517S	HV517	Pressurizer Auxiliary Spray Valve	Containment
6	2-CH-518S	HV518	RCS Loop 2A Charging Supply Isolation Valve	Containment
7	2-CH-519S	HV519	RCS Loop 1A Charging Supply Isolation Valve	Containment

The set screws were replaced with a qualified Raychem termination for 2-CH-519S, 2-EB-88S and 2-EB-89S. Qualification of the remaining 4 circuits with Ideal set screws cannot be demonstrated. Further, a qualified environmental seal is required for the SOVs to operate in a LOCA environment. Therefore, each circuit above lacks full qualification to function during post-accident conditions. This is a violation of the requirements of 10CFR50.49.

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The actual safety significance is low, since the SOVs have never been subjected to a harsh environment. The event is potentially safety significant since EEQ deficiencies were in existence while the plant was operating. Consequently, we cannot demonstrate reasonable assurance that the 7 listed EEQ valves would have performed their safety function on demand post-accident.

IV. Corrective Action

The following corrective actions will be completed prior to entering mode 4:

1. The affected SOV circuits will be modified with qualified SOV pigtail to field cable terminations and sealing connectors.
2. The EEQ documentation will be updated to demonstrate full qualification of each SOV circuit configured as required with qualified seals and terminations.
3. A full review of remaining SOV circuit configurations will be performed to identify whether additional deficiencies exist.

The following corrective actions will be completed prior to entering mode 2:

1. The corrective actions associated with item 3 above will be completed.
2. The SFRs for all EEQ components will be completed by SI&A and transmitted to EEQ engineering. EEQ Engineering will review this information for program impact and resolve any deficiencies.

V. Additional Information

None.

Similar Events

None.

Manufacturer Data

None