



**Northeast
Nuclear Energy**

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The Northeast Utilities System

MAY 19 2000

Docket No. 50-336
B18121

Re: 10 CFR 50.73(a)(2)(ii)

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

Millstone Nuclear Power Station, Unit No. 2
Licensee Event Report 2000-007-00
Shutdown Cooling System Isolation Valve Does Not Comply With
Appendix R Requirements Due To Error In Configuration Management

This letter forwards Licensee Event Report (LER) 2000-007-00, documenting a condition that was discovered at Millstone Nuclear Power Station, Unit No. 2, on April 22, 2000. This LER is being submitted pursuant to 10 CFR 50.73(a)(2)(ii).

Northeast Nuclear Energy Company (NNECO) regulatory commitments contained in this letter are located in Attachment 1.

Very truly yours,

NORTHEAST NUCLEAR ENERGY COMPANY


C. J. Schwarz
Station Director

Attachments (2): List of Regulatory Commitments
LER 2000-007-00

cc: H. J. Miller, Region I Administrator
J. I. Zimmerman, NRC Project Manager, Millstone Unit No. 2
D. P. Beaulieu, Senior Resident Inspector, Millstone Unit No. 2

Attachment 1

Millstone Nuclear Power Station, Unit No. 2

List of Regulatory Commitments

List of Regulatory Commitments

The following table identifies actions committed to by NNECO in this document.

| Number | Commitments | Due |
|---------------|---|--|
| B18121-01 | The heatup and cooldown procedures shall be revised to 1) add steps that validate that 2-SI-651 will not operate from the Control Room after the opening and closing coils are removed and 2) ensure that the procedures contain proper validation that any other equipment required to be electrically disabled has been accomplished. | Prior to entering Mode 3 from the present refueling outage |

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Attachment 2

Millstone Nuclear Power Station, Unit No. 2

LER 2000-007-00

May 2000

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 hrs. Reported lessons learned are incorporated into the licensing process and fed back to industry. Forward comments regarding burden estimate to the Records Management Branch (1-6 F33), 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. If an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

| | | |
|--|--------------------------------------|---------------------------|
| FACILITY NAME (1) Millstone Nuclear Power Station Unit 2 | DOCKET NUMBER (2) 05000336 | PAGE (3) 1 OF 4 |
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TITLE (4)
Shutdown Cooling System Isolation Valve Does Not Comply With Appendix R Requirements Due To Error In Configuration Management

| 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 | 22 | 2000 | 2000 | -- 007 -- | 00 | 05 | 19 | 2000 | FACILITY NAME | DOCKET NUMBER |

| | | | | | | | | | | |
|--------------------------|-------------------|---|--------------------|--------------------------|-------------------|-------------------------------------|------------------|---|-------------------|--|
| OPERATING MODE (9) | 3 | THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11) | | | | | | | | |
| POWER LEVEL (10) | 000 | <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 checked="" type="checkbox"/> | 20.2203(a)(1) | <input type="checkbox"/> | 20.2203(a)(3)(i) | <input checked="" type="checkbox"/> | 50.73(a)(2)(ii) | <input type="checkbox"/> | 50.73(a)(2)(x) | |
| | | <input type="checkbox"/> | 20.2203(a)(2)(i) | <input type="checkbox"/> | 20.2203(a)(3)(ii) | <input type="checkbox"/> | 50.73(a)(2)(iii) | <input type="checkbox"/> | 73.71 | |
| | | <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 type="checkbox"/> | 50.73(a)(2)(v) | 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 R. Joshi, MP2 Acting Regulatory Compliance Supervisor | TELEPHONE NUMBER (Include Area Code) (860) 440-2080 |
|--|---|

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

| CAUSE | SYSTEM | COMPONENT | MANUFACTURER | REPORTABLE TO EPIX | CAUSE | SYSTEM | COMPONENT | MANUFACTURER | REPORTABLE TO EPIX |
|-------|--------|-----------|--------------|--------------------|-------|--------|-----------|--------------|--------------------|
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|---|--|--|--|--|--------------------------------------|----|--|-------|-----|------|--|
| SUPPLEMENTAL REPORT EXPECTED (14) | | | | | EXPECTED SUBMISSION DATE (15) | | | MONTH | DAY | YEAR | |
| YES (If yes, complete EXPECTED SUBMISSION DATE). | | | | | <input checked="" type="checkbox"/> | NO | | | | | |

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

On April 22, 2000, while shutting down in Mode 3 for a planned refueling outage, it was discovered that a shutdown cooling system isolation valve, 2-SI-651, was not disabled as required by the facility Appendix R Compliance Report for Modes 1, 2, and 3. It was determined on April 28, 2000, that this condition could have resulted in an inability to achieve and maintain cold shutdown per the requirements of Appendix R if a design basis fire-induced hot short of this valve had occurred. The Appendix R Compliance Report credits disabling this valve to ensure that a fire-induced hot short would not result in the valve damaging itself such that it could not be opened as needed to initiate Shut Down Cooling in the event of certain postulated fires.

The cause of this event is that the operating procedures lacked sufficient verification to ensure that the desired outcome of disabling 2-SI-651 had been accomplished.

The corrective action to prevent reoccurrence is to revise the heatup and cooldown procedures to 1) add steps that validate that 2-SI-651 will not operate from the Control Room after the opening and closing coils are removed and 2) ensure that the procedures contain proper validation that any other equipment required to be electrically disabled has been accomplished.

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

I. Description of Event

On April 22, 2000, while shutting down in Mode 3 for a planned refueling outage, it was discovered that a shutdown cooling system isolation valve, 2-SI-651, was not disabled as required by the facility Appendix R Compliance Report for Modes 1, 2, and 3. It was determined on April 28, 2000, that this condition could have resulted in an inability to achieve and maintain cold shutdown per the requirements of Appendix R if a design basis fire-induced hot short of this valve had occurred. The Appendix R Compliance Report credits disabling this valve to ensure that a fire-induced hot short would not result in the valve damaging itself such that it could not be opened as needed to initiate Shut Down Cooling [BP] in the event of certain postulated fires.

A design modification was made in early 1999 which changed the location of the coils which are removed in Modes 1, 2, and 3 to ensure the valve is disabled. On March 31, 1999, when instructed by operators to remove the coils for 2-SI-651, plant personnel removed the abandoned coils from their historical location and reported completion of the step to remove the coils for 2-SI-651 to the plant operators. The coils for 2-SI-651 remained installed until April 29, 2000.

This condition is being reported in accordance with 10 CFR 50.73(a)(2)(ii)(B), a condition that was outside the design basis of the plant.

II. Cause of Event

The cause of this condition is that the operations procedures lacked sufficient verification to ensure that the desired outcome of disabling 2-SI-651 had been accomplished.

There was no validation of the completed procedure step. The heatup and cooldown procedures (OP-2201 and OP-2207) do not validate that a critical plant configuration, electrically disabling 2-SI-651, has been achieved before making Mode changes. Had the steps been validated, it would have become clear that the wrong coils were removed.

III. Analysis of Event

The fire protection program at nuclear power plants, including Millstone, is based on the defense in depth concept. This concept (design bases) is comprised of three barriers:

Fire prevention.

Rapid detection, control, and suppression.

Protection of structures, systems, and components, such that a fire which is not promptly extinguished will not prevent safe shutdown of the plant.

The defense in depth concept recognizes that while no one barrier can be perfect, maintaining multiple barriers ensures that a fire at a plant will not endanger the general public.

For the deficiency identified, two of the three barriers were unaffected while the third line of defense to protect structures, systems, and components necessary to the safe shutdown of the plant in the event of a fire was compromised.

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

Appendix R requires that the plant achieve and maintain safe shutdown in the event of a fire. Shutdown Cooling Suction Isolation motor operated valve, 2-SI-651, is maintained closed during Modes 1, 2, and 3. The closing coils of this valve are removed during Modes 1, 2, and 3 to prevent spurious operation and subsequent damage to this valve due to postulated hot shorts in the event of certain fire scenarios. 2-SI-651 is located inside containment in the common suction piping to the Low Pressure Safety Injection pumps which are used during shutdown cooling operations.

Should a fire occur in Fire Area R-1 (Control Room, Cable Vault, Fuel Handling, Maintenance Shop Areas, Enclosure Building, HVAC/Sample Area, New Computer Room, Coolant Tank Area, Boric Acid Recovery Area, and Reactor Building Closed Cooling Water Pump Area), a hot short can be postulated which will energize the close contactor of the valve and bypass operation of the close torque and limit switch contacts. The thermal overload circuits for this valve are used only for indication and annunciation. This postulated hot short would result in the failure of the valve motor. The closing coils are removed during Modes 1, 2, and 3 to prevent damage to the motor operator of this valve.

The safe shutdown strategy is to operate this valve remotely after effecting repairs to cables and controllers. These actions are performed outside containment. With the closing coil of 2-SI-651 installed, the valve motor could be subject to the failure stated above, resulting in a loss of the ability to operate the valve remotely. Manual operation of 2-SI-651 would then be required for bringing shutdown cooling into operation. Manual operation of 2-SI-651 for a Control room fire is not part of the shutdown strategy because this requires entry into containment.

Decay heat is being removed initially from the Steam Generator #2 and Atmospheric Steam Dump Valve, 2-MS-190B. Reactor Coolant System (RCS) [AB] makeup will be from the Boric Acid Storage Tanks and then the Refueling Water Storage Tank (RWST) [BP] using the charging pumps [CB]. When the plant achieves hot shutdown conditions, shutdown cooling is established to bring the plant to cold shutdown in accordance with Appendix R requirements.

The safe shutdown strategy for a fire in Fire Area R-1 does not include operations inside containment. The Appendix R analysis for Fire Area R-1 assumes the loss of the service water system and the cabling to all four Containment Air Recirculation (CAR) [BK] fans. The loss of service water results in the loss of the Reactor Building Closed Cooling Water (RBCCW) [CC] system which cools the CAR fans. The resulting containment heatup transient is very rapid; 140°F could be exceeded within approximately 20 minutes.

For this condition in which the closing coils were left installed, due to the postulated inability to open 2-SI-651 remotely, shutdown cooling can not be established until 2-SI-651 can be opened manually inside containment. This condition is beyond the design basis of the plant to achieve and maintain cold shutdown within 72 hours in the event of a fire. The Site Emergency Response Organization would be activated and provide the means to establish cold shutdown.

The safety significance of this condition is low. Although the plant would be beyond the design and licensing basis of Appendix R to achieve and maintain cold shutdown within 72 hours, the plant would achieve and maintain hot standby and/or hot shutdown conditions. Core cooling and RCS inventory would be maintained throughout the event.

IV. Corrective Action

The heatup and cooldown procedures shall be revised to 1) add steps that validate that 2-SI-651 will not operate from the Control Room after the opening and closing coils are removed and 2) ensure that the procedures

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

contain proper validation that any other equipment required to be electrically disabled has been accomplished. These procedure changes will be completed prior to entering Mode 3 from the present refueling outage.

In addition, other corrective actions are being addressed via the Millstone Corrective Action Program.

V. Additional Information

Similar Events

A previous LER was issued which related to the Appendix R safe shutdown capability of the shutdown cooling system.

LER 1997-035: Shutdown Cooling System Isolation Valve Does Not Comply With Appendix R Requirements

Energy Industry Identification System (EIIIS) codes are identified in the text as [XX].