



**Northeast
Nuclear Energy**

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The Northeast Utilities System

January 30, 1996

B15527

Re: 10CFR50.73(a)

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

Reference: Facility Operating License No. DPR-65
Docket No. 50-336
Licensee Event Report 96-001-00

This letter forwards Licensee Event Report 96-001-00 required to be submitted within thirty (30) days pursuant to 10CFR50.73(a).

Very truly yours,

NORTHEAST NUCLEAR ENERGY COMPANY

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

pjl

Attachment: LER 96-001-00

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 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 4
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TITLE (4)
Reactor Coolant System Heatup Rate Exceeded Technical Specification Limit

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
01	04	96	96	001	00	01	30	96	FACILITY NAME	DOCKET NUMBER

OPERATING MODE (9) 1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)									
POWER LEVEL (10) 100%	20.2201(b)	20.2203(a)(2)(v)	<input checked="" type="checkbox"/>	50.73(a)(2)(i)	50.73(a)(2)(viii)					
	20.2203(a)(1)	20.2203(a)(3)(i)		50.73(a)(2)(ii)	50.73(a)(2)(x)					
	20.2203(a)(2)(i)	20.2203(a)(3)(ii)		50.73(a)(2)(iii)	73.71					
	20.2203(a)(2)(ii)	20.2203(a)(4)		50.73(a)(2)(iv)	OTHER					
	20.2203(a)(2)(iii)	50.36(c)(1)		50.73(a)(2)(v)	Specify in Abstract below or in NRC Form 366A					
20.2203(a)(2)(iv)	50.36(c)(2)		50.73(a)(2)(vii)							

LICENSEE CONTACT FOR THIS LER (12)

NAME Philip J. Lutzi, Nuclear Licensing	TELEPHONE NUMBER (include Area Code) (860)440-2072
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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		
<input checked="" type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE).	NO		MONTH		DAY	YEAR
			04		02	96

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

On January 4, 1996 at 1815 hours, with the plant in Mode 1 at 100% power, an engineering review identified that the Reactor Coolant System (RCS) heatup rate requirements of Technical Specification 3.4.9.1(a) were not satisfied during an RCS heatup on December 17, 1995. The RCS heatup rate was determined to be 72°F in a one hour period, which was in excess of the Technical Specification limit of 50°F per hour, and the action statement requirement to perform an engineering evaluation of the structural integrity of the RCS and its acceptability for continued operation was not performed until January 4, 1996. LCO 3.0.4 was violated when the plant continued to change modes to full power operation while not having met the actions of LCO 3.4.9.1(a).

This event is being reported pursuant to the requirements of 10CFR50.73(a)(2)(i)(B), "reporting of any operation or condition prohibited by the plant's Technical Specifications."

An Event Review Team was established to review the circumstances concerning this event, and to review the adequacy of the corrective actions from the July 1995 RCS heatup event. Planned corrective actions include changes to the plant operating procedures, changes to the plant heatup/cooldown monitoring computer program, and operator training concerning this event and the July 1995 RCS heatup event.

There were no automatic or manually initiated safety responses resulting from this event.

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		96	--	001	--	

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

I. Description of Event

On January 4, 1996 at 1815 hours, with the plant in Mode 1 at 100% power, an engineering review concluded that the Reactor Coolant System (RCS) heatup rate requirements of the Technical Specifications Limiting Condition for Operation (LCO) 3.4.9.1(a) were not satisfied during an RCS heatup on December 17, 1995. The engineering review determined that the RCS heatup rate was 72°F in a one hour period, which exceeded the LCO limit of 50°F per hour.

During the December 17, 1995 RCS heatup, the operating shift noted that the RCS heatup rate was 49.5°F in the one hour period following the start of the Reactor Coolant Pumps (RCPs). An Adverse Condition Report (ACR) was initiated to document the high RCS heatup rate. Since the operating shift was in compliance with requirements of the surveillance procedure, they were not aware that RCS heatup rate had exceeded the LCO limit. As a result of the ACR, a subsequent engineering review of the RCS heatup data was performed on December 18, 1995, which concluded that the RCS heatup rate limit was not exceeded. However, this initial review did not consider the Shutdown Cooling (SDC) injection temperature at the time that the SDC system was secured. An additional engineering review of the RCS heatup data was performed in January 1996.

The January 1996 engineering review noted the following events of the RCS heatup on December 17, 1995:

- The SDC system was secured at 0425 in preparation to start RCPs
- At the time that SDC was secured, the SDC injection temperature was 155°F
- Shortly after securing SDC, the RCS loop 2 cold leg temperature was observed to increase from 155°F to 185°F
- The "B" RCP was started at 0448 and the "D" RCP was started at 0451
- At 0525, the RCS loop 2 cold leg temperature was 227°F (one hour after securing SDC)

II. Cause of Event

The causes of this event are described below.

- The surveillance procedure and the computer heatup/cool-down program used to monitor the RCS heatup and cool-down rates are inadequate for Technical Specification surveillance monitoring.
- The plant heatup procedure placed the plant into a configuration which created the conditions for an excessive RCS heatup rate

The surveillance procedure which is used to monitor RCS heatup and cool-down rates requires that the RCS heatup rate be calculated at least once every 30 minutes during a plant heatup. When SDC is in operation, this calculation uses the SDC suction temperature value (hot leg discharge from RCS). The SDC suction temperature instrument was selected since it provides a more stable (or smoother) temperature indication. When SDC is not operating, this calculation uses the average of the RCS loop 1 and loop 2 cold leg temperature values. The plant computer heatup/cool-down monitoring program was developed to be similar to the above procedure requirements, with one exception: the computer calculation uses a 30 minute

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averaged value to determine the RCS heatup rate. The specific method of computer time averaging of the data tends to "smooth" or decrease the magnitude of the calculated RCS heatup rate.

During the December 17, 1995 RCS heatup, the operators were using the computer heatup/cool-down monitoring program to satisfy the Technical Specification surveillance requirements. When SDC was secured, the SDC suction temperature was 181°F and the average of the RCS loop 1 and loop 2 temperatures was 170°F. Using the logic of the heatup/cool-down program, this change from SDC operating mode to loop operating mode appeared as a cool-down.

Thus, the magnitude of the RCS heatup rate was concealed from the operating shift by a combination of:

1. Switching from SDC operating mode to loop operating mode,
2. Using the wrong temperature instrument (SDC suction temperature) and the average of the loop cold leg temperatures (which is non-conservative, since one value was high and the other low) to monitor the RCS heatup rates, and
3. The method used to calculate time averaged RCS heatup rate values

The plant heatup procedure (OP 2201) does not provide adequate instructions for establishing system conditions prior to the termination of SDC and starting the RCPs. The heatup procedure was determined to be deficient in the following areas:

- There is no evaluation of the "thermal inventory" of the RCS to estimate the heatup rate prior to starting RCPs
- No guidance is provided to increase the SDC injection temperature to minimize the reactor vessel downcomer heatup rate when SDC is secured
- There is no guidance provided on controlling the heatup rate and sources of heat input at low temperatures

During the December 17, 1995 RCS heatup, there was a significant amount of core decay heat present since the reactor had been shutdown for approximately 4 days following 120 days of operation at full power. This decay heat, combined with the heat input from two operating RCPs, created a heatup rate condition which approached 50°F per hour. Additionally, since the heatup started near 185°F, the steam generators were ineffective in controlling the heatup rate until after they had begun to steam (i.e., at about 230°F).

III. Analysis of Event

This event is being reported pursuant to the requirements of 10CFR50.73(a)(2)(i)(B), "reporting of any operation or condition prohibited by the plant's Technical Specifications. LCO 3.4.9.1(a) was violated when the RCS heatup rate exceeded its limit and the corresponding actions were not completed. LCO 3.0.4 was violated when the plant continued to change modes to full power operation while not having met the actions of LCO 3.4.9.1(a).

LCO, TS section 3.4.9.1(a), requires that the RCS heatup rate be limited to "50°F in any one hour period with T_{avg} above 140°F." This limit was exceeded on December 17, 1995 at 0525 when the RCS heatup rate was 72°F in a one hour period.

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The required action when this LCO is not met, requires that "with any of the above limits exceeded, restore the temperature and/or pressure to within the limit within 30 minutes; perform an engineering evaluation to determine the effects of the out-of-limit condition on the structural integrity of the Reactor Coolant System; determine that the Reactor Coolant System remains acceptable for continued operations or be in at least HOT STANDBY within the next 6 hours and reduce the RCS T_{avg} and pressure to less than 200°F and 500 psia, respectively, within the following 30 hours."

Since the violation of the RCS heatup rate limit was not identified by the operating shift on December 17, 1995, the Limiting Condition for Operation (LCO) was not entered. The required action for this LCO, to perform an engineering evaluation of the structural integrity of the RCS and its acceptability for continued operation, was initiated and completed on January 4, 1996.

The requirements of TS LCO 3.0.4 were also violated when the plant continued to change modes to full power operation while not having met the actions of LCO 3.4.9.1(a).

IV. Corrective Action

An Event Review Team (ERT) has been formed to review this event. The ERT will establish the root cause of this event, and consider the adequacy of the corrective actions implemented following the July 1995 RCS heatup event (LER 50-336/95-030).

Changes to the plant operating and surveillance procedures, and operator training on these procedure changes and the RCS heatup event will be implemented to allow operators to properly monitor and control the RCS heatup rate. These changes will be completed prior to the next RCS heatup from an RCS temperature less than 230°F.

V. Additional Information

Similar Events

LER 95-030

Manufacturer Data

None