



**Northeast  
Nuclear Energy**

Rope Ferry Rd. (Route 156), Waterford, CT 06385

Millstone Nuclear Power Station  
Northeast Nuclear Energy Company  
P.O. Box 128  
Waterford, CT 06385-0128  
(860) 447-1791  
Fax (860) 444-4277

The Northeast Utilities System

AUG 29 2000

Docket No. 50-336  
B18207

Re: 10 CFR 50.73(a)(2)(i)(B)

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

Millstone Nuclear Power Station, Unit No. 2  
Licensee Event Report 2000-013-00  
Failure To Calculate Azimuthal Power Tilt  
As Required By Technical Specifications

This letter forwards Licensee Event Report (LER) 2000-013-00 (Attachment 1), documenting an event that was determined reportable at Millstone Unit No. 2 on July 31, 2000, pursuant to 10 CFR 50.73(a)(2)(i)(B).

There are no regulatory commitments contained within this letter.

Should you have any questions regarding this submittal, please contact Mr. David W. Dodson at (860) 447-1791, extension 2346.

Very truly yours,

NORTHEAST NUCLEAR ENERGY COMPANY

  
E. J. Schwarz  
Station Director

Attachment (1): LER 2000-013-00

cc: H. J. Miller, Region I Administrator  
J. I. Zimmerman, NRC Project Manager, Millstone Unit No. 2  
S. R. Jones, Senior Resident Inspector, Millstone Unit No. 2

IE22

Docket No. 50-336  
B18207

Attachment 1

Millstone Nuclear Power Station, Unit No. 2

LER 2000-013-00

# 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 (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. 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) <p style="text-align:center">Millstone Nuclear Power Station Unit 2</p>	DOCKET NUMBER (2) <p style="text-align:center">05000336</p>	PAGE (3) <p style="text-align:center">1 OF 5</p>
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TITLE (4)  
**Failure To Calculate Azimuthal Power Tilt As Required By Technical Specifications.**

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
07	31	00	2000	013	-- 00	08	29	00	FACILITY NAME	DOCKET NUMBER

OPERATING MODE (9) <p style="text-align:center">1</p>	POWER LEVEL (10) <p style="text-align:center">100</p>	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)									
		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 of NRC Form 366A
20.2203(a)(2)(iv)			50.36(c)(2)					50.73(a)(2)(vii)			

**LICENSEE CONTACT FOR THIS LER (12)**

NAME <p style="text-align:center">David W Dodson, Regulatory Compliance Supervisor</p>	TELEPHONE NUMBER (Include Area Code) <p style="text-align:center">(860) 447-1791 ext. 2346</p>
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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

<b>SUPPLEMENTAL REPORT EXPECTED (14)</b>				<b>EXPECTED SUBMISSION DATE (15)</b>		
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 July 31, 2000, at 0800, with the plant in Mode 1 at 100 percent (%) power, it was determined that the incore monitoring computer software program (INPAX) had not automatically run the required calculation for Azimuthal Power Tilt (T<sub>q</sub>) for a period exceeding 12 hours during the period from July 1 to July 2, 2000, and again during the period from July 29 to July 31, 2000.

The surveillance requirement to calculate the tilt at least once per 12 hours was not met and this condition existed for a period of time that exceeded the allowed timeframe. Therefore, this event is being reported pursuant to 10 CFR 50.73(a)(2)(i)(B), "Any operation or condition prohibited by the plant's Technical Specifications".

The root cause of this event was historically inadequate expectations by the management of the Information Technology (IT) group for use of procedures when working on critical software.

Upon discovery, the affected subroutine of the INPAX program was recompiled, thereby eliminating the condition which caused the INPAX program to fail to run. Subsequently, the INPAX program was run successfully and all required core parameters were determined to be within TS required limits. Additionally, a review of the data confirmed that core parameters remained within acceptable limits.

**LICENSEE EVENT REPORT (LER)**  
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TEXT (If more space is required, use additional copies of NRC Form 366A) (17)

I. Description of Event

On July 31, 2000, at 0800, with the plant in Mode 1 at 100 percent (%) power, it was determined that the incore monitoring computer software program (INPAX) had not automatically run the required calculation for Azimuthal Power Tilt ( $T_q$ ) for a period exceeding 12 hours.

Technical Specification (TS) 3.2.4 requires that  $T_q$  shall not exceed 0.02 when the plant is in Mode 1 above 50 % of Rated Thermal Power and is required to be calculated, at least once per seven (7) days when the Channel High Deviation Alarm is Operable or at least once per twelve (12) hours when the Channel High Deviation Alarm is inoperable, to determine that  $T_q$  is within the TS limit (TS surveillance 4.2.4).

In November 1995, it was identified that the Channel High Deviation alarm setpoint (0.06) had been set, from the time of the initial plant startup, inconsistent with the TS requirement of 0.02 for azimuthal power tilt. Therefore the plant operated for the period of time from initial startup until November 1995 without being in compliance with this TS surveillance requirement. The problem was addressed informally at that time by declaring the alarm to be inoperable. The possibility of reducing the setpoint of the High Deviation alarm to 0.019 had been considered and rejected. Setting the alarm to this low value would have lead to numerous spurious alarms during plant power maneuvers which was deemed to be undesirable. The corrective action taken was to not credit the Channel High Deviation Alarm and to perform TS 4.2.4.2.b on a once per shift basis, thus treating the Channel High Deviation Alarm as inoperable. This condition existed from that time until this event. Because of this condition,  $T_q$  was required to be calculated once per 12 hours, using the incore monitoring computer software program.

The core monitoring program runs in two modes on the Plant Process Computer (PPC). The "Full" mode executes INPAX and PRISM. A "Mini" mode executes INPAX only using the latest PRISM results. INPAX is automatically executed in the "Mini" mode at eight hour intervals (at 0730, 1530 and 2330). The INPAX program (full or mini) calculates incore flux tilt and stores the value in a variable called "Calculated Value-Incore Flux Tilt" (CVINTILT). Operators use the value of CVINTILT to perform the azimuthal power tilt surveillance.

The INPAX program will automatically run in the "Full" mode if a trigger condition exists. A trigger to run INPAX in the "Full" mode is initiated whenever a power change of greater than 2.5% or a change in Group 7 Control Element Assembly (CEA) position of greater than 5 steps from the CEA position of the last previous running of the INPAX program in the "Full" mode. The triggered execution of INPAX in the "Full" mode has a higher priority than the periodic execution of INPAX in the "Mini" mode. Therefore, the INPAX program in the "Mini" mode will not execute until all triggered demands to execute INPAX in the "Full" mode are complete.

During a down power for turbine control valve testing on July 1, 2000, a trigger to execute INPAX in the "Full" mode was initiated. An error in the program, that had been inadvertently introduced during an upgrade to the INPAX program in June 2000, blocked the successful completion of the triggered case but this failure to execute was not observed or identified at the time. This program error was introduced by failing to re-compile the program in accordance with procedure following completion of the code modifications. The triggered execution of INPAX in the "Full" mode attempted to run, and thereby prevented the execution of INPAX in the "Mini" mode at 1530 on July 1, 2330 on July 1 and 0730 on July 2 and as a result, the value for CVINTILT did not update. The end result was that neither mode of the core monitoring program was executed, no new value of the CVINTILT was generated and the Control Room Operators continued to use the previously stored value of CVINTILT in determining  $T_q$ . This also occurred following a plant down power during the period from July 29 to July 31.

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

Although all required core parameters were subsequently determined to be within TS required limits, the surveillance requirement to calculate the tilt at least once per 12 hours was not met and this condition existed for a period of time that exceeded the most restrictive surveillance timeframe. Therefore, this event is being reported pursuant to 10 CFR 50.73(a)(2)(i)(B) "Any operation or condition prohibited by the plant's Technical Specifications".

**II. Cause of Event**

The root cause of this event was historically inadequate expectations by the management of the Information Technology (IT) group for use of procedures when working on critical software. A contributing cause was the failure to use the required checklist when working on critical software. An additional factor which contributed to the occurrence of this event was the failure of the plant process computer alarm to alarm when the INPAX program failed to run.

**III. Analysis of Event**

The condition created by the down power for turbine control valve testing on July 1, 2000 proved to be self correcting in that when the original 100% power level was again reached, the trigger to execute INPAX in the "Full" mode was removed, allowing the execution of INPAX in the "Mini" mode to occur and allowing the value for CVINTILT to be updated.

The subsequent review by Reactor Engineering of the data collected and stored by the Plant Process Computer confirmed that core parameters remained within acceptable limits during the period of time from inadvertent error introduction into the program to the time of discovery. Thus, at no time was the reactor core operated in a condition that would have significantly impacted the safety of the core.

**IV. Corrective Action**

As a result of this event, the following actions have been, or will be, implemented:

1. Upon discovery, the affected subroutine of the INPAX program was recompiled, thereby eliminating the condition which caused the INPAX program to fail to run and subsequently the INPAX program was run successfully and all required core parameters were determined to be within TS required limits.
2. Reactor Engineering reviewed stored data and confirmed that core parameters remained within acceptable limits during the period of time from when the error in the program was inadvertently introduced to the time of discovery.
3. The logic for the PPC alarm "INPAX run failed" (CVFRPTIM) will be revised to ensure that it alarms when INPAX fails to run.
4. IT management will develop a statement of expectations for the use of procedures and department instructions when working on software within the power block or on equipment that affects plant operation. These expectations will be conveyed to NU staff who work on these computers.

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5. IT management will make clear to their personnel the expectation for meeting the Work Control Procedure requirement: "MAINTAIN AWO package OR sufficient information from AWO package to perform task at the job site."

Other corrective actions are being addressed via the Millstone Corrective Action Program.

V. Additional Information

Energy Industry Identification System (EIS) codes:

System Code : ID (Computer System)  
Component Code: CPU (Computer)

Similar Events

Previous similar events involving failure to perform TS surveillance include:

LER 2000-004-00: This LER identified that the Technical Specification Surveillance Requirement (SR) to perform a channel check for the Wide Range Logarithmic Neutron Flux Monitors was not performed on February 14, 2000 as required by the facility Technical Specifications (TS). The cause of this event was a misjudgment by Operations shift personnel. This was caused by the Control Operators (CO) and the Shift Manager (SM) misinterpreting the TS mode applicability and failing to perform the required surveillance. The wording of the TS mode applicability contributed to the CO and SM reaching their conclusion. To correct this deficiency, a briefing was performed on Technical Specification Limiting Condition for Operation (LCO) applicability and applying "Not Applicable" in procedural steps. Additional corrective action included revising the applicable surveillance procedure to clarify when a channel check is required.

LER 2000-002-00: This LER identified that the Technical Specification Surveillance Requirement (SR) for TS 3.9.7, "Crane Travel - Spent Fuel Storage Pool Building," was not performed during fuel handling operations. A prerequisite of the Spent Fuel Pool Handling Operations procedure called out testing of Cask Crane Interlocks within 72 hours prior to initiation of irradiated fuel handling operations. This prerequisite was not performed. The cause of the event was a deficiency in the facility Technical Specifications. The TS Applicability and SR did not meet the intent of the TS. As a result of this event, the conflict between the applicability and the SR will be resolved. Additionally, an interim administrative control was implemented to ensure that the Technical Requirement is satisfied.

LER 1999-007-00: This LER identified that on March 19, 1999 the Reactor Coolant System pressure was increased to greater than 200 psig with Reactor Coolant System Average Temperature (Tavg) less than 200 degrees Fahrenheit (F), at which time Technical Specification Surveillance Requirements (TSSRs) to verify primary and secondary coolant temperatures were not performed. TSSR 4.7.2.1 requires that, at least once an hour, verification of the steam generators primary and secondary coolant temperatures be conducted in order to ensure that steam generator pressure induced stresses remain below a maximum allowable fracture toughness stress limit (RTNDT) of 50 degrees F.

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

On March 20, it was discovered that the initial verification had not been conducted within 1-hour, as required, which constitutes a missed surveillance. The cause of this event was attributed to procedural inadequacies and operator inattention to detail. As corrective actions, appropriate Operations personnel were provided with briefings on applicable Mode 4 and 3 Condition Based Surveillance and as necessary, procedures will be revised to assure compliance with TSSR 4.7.2.1 criteria.