NORTHEAST UTILITIES

THE CONNECTICUT LIGHT AND POWER COMPANY
WESTERN MASSACHUSETTS ELECTRIC COMPANY
HOLYOKE WATER POWER COMPANY
NORTHEAST UTILITIES SERVICE COMPANY
NORTHEAST NUCLEAR ENERGY COMPANY

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December 12, 1990

Docket No. 50-336
A09140
Re: 10CFR2.201

Mr. Thomas T. Martin
Regional Administrator, Region I
U.S. Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, PA 19406

Dear Mr. Martin:

Millstone Nuclear Power Station, Unit No. 2
NRC Region I Inspection No. 50-336/90-18
Response to a Notice of Violation and a Notice of Deviation

By letter dated November 5, 1990,(1) the NRC transmitted its Inspection Report No. 50-336/90-18 and associated Notice of Violation and Notice of Deviation. The violation involves the unavailability of the reactor vessel level monitoring system during reduced inventory operation, and the deviation involves a failure to implement a commitment for the spent fuel pool boraflex coupon surveillance program at Millstone Unit No. 2. The Staff requested that Northeast Nuclear Energy Company (NNECO) respond to the Notice of Violation and the Notice of Deviation within 30 days of receipt of the letter which transmitted these notices. NNECO hereby submits its response to the Notice of Violation and the Notice of Deviation as Attachments 1 and 2, respectively.

In addition, the NRC noted concern in its Inspection Report that Millstone Unit No. 2 has recently experienced a number of personnel performance-related problems. The NRC Staff also requested that NNECO respond to this matter addressing specific noted examples of personnel performance problems and describe the actions taken individually and collectively to prevent recurrence. NNECO's response to this issue is provided as Attachment 3 to this letter.

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(1) E. C. Wenzinger letter to E. J. Mroczka, "NRC Region I Inspection No. 50-336/90-18," dated November 5, 1990.

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NNECO trusts that the information provided herein fully addresses the NRC Staff's concerns regarding these issues. Please contact us if you have any questions.

Very truly yours,

NORTHEAST NUCLEAR ENERGY COMPANY

FOR: E. J. Mroczka
Senior Vice President

BY: W D Romberg
W. D. Romberg
Vice President

Attachments
cc: T. T. Martin, Region I Administrator
G. S. Vissing, NRC Project Manager, Millstone Unit No. 2
W. J. Raymond, Senior Resident Inspector, Millstone Unit Nos. 1, 2, and 3

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

STATE OF CONNECTICUT)
) ss. Berlin
COUNTY OF HARTFORD)

Then personally appeared before me, ~~E. J. Mroczka~~ W. D. ROMBERG, who being duly sworn, did state that he is ~~Senior~~ Vice President of Northeast Nuclear Energy Company. a Licensee herein, that he is authorized to execute and file the foregoing information in the name and on behalf of the Licensee herein, and that the statements contained in said information are true and correct to the best of his knowledge and belief.

Lorraine J. D'Amico
Notary Public

My Commission Expires March 31, 1993

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Attachment No. 1

Millstone Nuclear Power Station, Unit No. 2

NRC Region I Inspection No. 50-336/90-18
Response to Notice of Violation

December 1990

Millstone Nuclear Power Station, Unit No. 2
NRC Region I Inspection No. 50-336/90-18
Response to Notice of Violation

I. Staff Statement of the Violation

"Millstone Unit 2 Technical Specification 6.8.1 requires, in part, that written procedures be established, implemented and maintained as recommended in Appendix A of Regulatory Guide 1.33, February 1978.

"Millstone Unit 2 reactor coolant system draindown procedure OP-2301E, a procedure recommended by Regulatory Guide 1.33, requires one reactor vessel level monitoring system to be operable in reduced inventory operations.

"Millstone Nuclear Power Station Administrative Control Procedure ACP-QA-2.06C, a procedure recommended by Regulatory Guide 1.33, step 6.2.3.2 requires recording the date of each lifted lead and initials of persons performing the task on station form (SF)-235.

"Contrary to the above, on September 17, 1990 between [illegible] p.m. and 9:50 p.m., no operable reactor vessel level monitoring system, as required per OP-2301E, was available during reduced inventory operations. Further, no SF-235 was completed for the bypass jumper authorized in work order M2-89-05450 and used to install channel 'B' of the vessel level monitoring system.

"This is a Severity Level IV Violation (Supplement I)."

II. Discussion

The Notice of Violation is inaccurate with respect to the date that the event occurred. On September 19, 1990, between 4:00 and 9:50 p.m., no operable reactor vessel level monitoring system, as required by OP-2301E, was available during reduced inventory operations. Further, No. SF-235 was completed for the bypass jumper authorized in work order M2-89-05450 and used to install Channel 'B' of the vessel leveling monitoring system.

During the refueling activity, the normal cabling for the heated junction thermocouple (HJTC) system is disconnected and removed. Jumper cables are required to be installed to allow operation of the HJTC system. In preparation for the RCS draindown during this outage, jumpers had been installed after the normal head area cabling had been removed. This work was addressed by Automated Work Order (AWO) M2-89-05450 which included the instruction to document the installation on an SF-235 form. The 'A' channel of HJTC was considered out of service for troubleshooting a problem unrelated to the jumper installation. During the draindown the improper response was noted and reported by operations.

III. Root Cause

The root cause of the event was that the worker incorrectly installed the jumper cables for Sensors 1 and 8 at the field end of the cable. This work was performed under the AWO but the instructions were not followed. The AWO clearly states the need to use the SF-235 form to document verification of the jumper installation. This activity was not performed.

Contributing Causes:

An inadequate retest was specified. The specified retest could not have identified the problem before the system was to be relied upon.

Procedural guidance lacked the necessary detail to ensure the job was done in a manner that assured success. No procedural instructions on how to install the jumpers existed.

There was also a lack of adequate labeling in that not having the No. 3 jumper cable properly identified increased the potential for confusion.

IV. Corrective Actions

This situation was temporarily resolved by reversing the head end of the cable connections. The label for the No. 3 jumper cable was noted to be missing. New labels were installed on the jumper cables in a permanent fashion.

V. Corrective Actions to Prevent Recurrence

The job supervisor of this activity has been counseled with respect to following AWO instructions.

The appropriate procedure been revised to include a section specific to the task of installing jumpers. The section added specifies a method that forces the retest activity to be performed in sequence as the jumpers are installed. This method provides the necessary verification that the system is properly connected prior to draindown activities. Revision 6 to Procedure IC 2421C was implemented on October 10, 1990. This installation process forces the retest to be done as part of the work activity.

VI. Date When Full Compliance Was Achieved

The proper system operation was achieved on September 20, 1990, when the jumper installation was corrected.

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Attachment No. 2

Millstone Nuclear Power Station, Unit No. 2

NRC Region I Inspection No. 50-336/90-18
Response to Notice of Deviation

December 1990

Millstone Nuclear Power Station, Unit No. 2
NRC Region I Inspection No. 50-336/90-18
Response to Notice of Deviation

I. Staff Statement of Deviation

"Licensee technical specification amendment submittals on June 24, 1985, and May 21, 1986, committed to provide direct dosimetry measurements of cumulative gamma exposure as part of the spent fuel pool boraflex coupon surveillance program. The proposed submittals were approved by the NRC staff as issued in technical specification amendments 109 (January 15, 1986) and 117 (June 2, 1987).

"Contrary to the above, since the start of the boraflex surveillance program on May 6, 1987, per surveillance procedure SP 21026 "Spent Fuel Pool Poison Coupon Surveillance System," direct dosimetry measurements were not used to establish an accurate record of cumulative gamma exposure to the spent fuel pool boraflex coupons."

II. Discussion

The overall objective of monitoring exposure indicated by the NNECO amendment request dated July 24, 1985, was to establish an accurate record of the cumulative exposure.

The submittal detailed the fact that the manufacturers' qualification of the boraflex was 1.0×10^{11} rads gamma, and calculations have shown this to be equivalent to at least 5 years in the pool environment. The recording of the cumulative exposure would confirm the time frame wherein the in-pool exposure approached the vendor's qualification.

Periodic testing and examination of poison specimens would take place beyond the point at which the cumulative exposure exceed those of the documented tests. The surveillance program would officially commence after approximately 5 years of exposure in the pool environment (approximately May 28, 1991).

NNECO believes the overall objective to establish an accurate record of the exposure history as discussed above has been satisfied. This information has been provided to the resident inspector. In addition, the NNECO commitment as referenced in letters dated July 24, 1985, Attachment 2, page 25, Section 4.7, and May 21, 1986, Attachment 2, page 4-44, Section 4.7 has the surveillance program commencing in 1991. This program was accepted by the NRC Staff in a letter dated January 15, 1986.

Furthermore, NNECO considered it to be prudent to institute an accelerated surveillance program to evaluate the poison coupons at 9-, 18-, 36-, 48-, and 60-month intervals. This intelligence would serve to enhance

the boraflex data base, provide insight into the long-term qualification of the poison material beyond the vendor qualification, and be utilized to develop an acceptance criteria for when the NNECO program becomes the docketed commitment in 1991.

With respect to "direct dosimetry," NNECO intended (at the time of the submittal) to utilize direct measurement of the gamma exposure as a means to collect data for input to the determination of the cumulative exposure of the boraflex. An attempt to take direct measurements in 1990 was not sufficiently reliable to establish an accurate record of exposure. It was therefore decided that the calculational approach would provide a more accurate record of the cumulative exposure history. These calculations were performed using standard industry codes (Origen II and QAD-p5f) and actual fuel assembly irradiation history. These facts were made known to the NRC resident inspector during the discussions of the boraflex degradation.

III. NNECO Conclusion

NNECO believes that Millstone Unit No. 2, with respect to NRC Amendment Approval No. 109, has not failed to implement any of the overall objectives associated with the boraflex coupon surveillance program. In fact, NNECO's diligence in developing and implementing an ongoing program five years in advance of the amendment commitment, serves to illustrate NNECO's dedication to safety and excellence.

NNECO now believes it would have been prudent to officially notify the NRC Staff of our plans to proceed with the analytic approach in lieu of an attempt at direct measurement. This would have clarified our intent for satisfying the cumulative exposure objective.

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Attachment No. 3

Millstone Nuclear Power Station, Unit No. 2

NRC Region I Inspection No. 50-336/90-18
Response to NRC's Concern Regarding Personnel Performance Issues

December 1990

Millstone Nuclear Power Station, Unit No. 2
NRC Region I Inspection No. 50-336/90-18
Response to NRC's Concern Regarding Personnel Performance Issues

We recognize that a number of operational events have occurred during and shortly after this inspection. The events have their root cause in lack of personnel attention to detail and procedural adherence. Taken singularly, the events are indicative of situations which can occur while performing surveillance, maintenance, and testing activities associated with the operation of a complex nuclear power facility. Taken collectively, the events might lead to a concern that the frequency of operational events may be increasing at Millstone Unit No. 2.

While the combination of these events is unfortunate, we have assessed the cause of each and have concluded that there is no cause for a heightened level of concern on the part of the NRC as these events are not an indication of any programmatic weaknesses, nor are they an indication of a significant change in the level of personnel performance.

It is our assessment that the reactor trip on August 27, 1990 was caused by a moment of lack of attention to detail on the part of the operator. It should be noted that this trip occurred after almost 2 years without an automatic reactor trip. The surveillance procedure being conducted which caused the trip is performed daily. The procedures are clear, and there are no identified human factor deficiencies which would contribute to less than desired optimum human performance. In fact, the same operator successfully performed the procedure the previous night. We concluded that this event is truly an isolated event caused by a momentary lack of operator attention to detail.

Nonetheless, to further enhance the surveillance procedure to ensure against inadvertent reactor trips, the procedure for conducting the power range safety channel and Delta T power channel calibration has been revised in format to incorporate a separate section on performing the calibrations with one reactor protection system (RPS) channel inoperable, including a signature requirement for verification that the bypass lights are energized on the channel to be tested. This change will further enhance the procedure and provide an additional level of assurance against inadvertent trips.

The events which took place during the outage have also been addressed on both a singular and collective basis for any negative performance trends which may be developing. The following are individual assessments of each of these events.

Engineered Safety Feature Actuation of September 19, 1990 and September 20, 1990 (LER 90-015)

The September 19 event is the result of a lack of attention to detail. The operator who conducted the tag-out clearance on September 19, 1990, was

counseled to be more attentive to detail while tagging and restoring equipment to service. Operations personnel are keenly aware of their responsibilities in this regard.

The root cause for the event which occurred on September 20, 1990, was electromechanical interference (EMI) resulting from the collapsing magnetic field of the relay in the trip isolation module. This relay de-energizes when the inhibit key switch is placed in the "inhibit" position. Failure to follow the proper procedure step sequence also contributed to the conditions that caused the actuation.

The technician has also been counseled to follow procedural sequences and the engineered safety actuation signal calibration procedure has been revised to limit the calibration of one channel of one parameter at any given time.

The troubleshooting results are being evaluated with the vendor to consider the use of noise suppression devices and circuitry modifications that would then allow multiple calibration activities without an increased risk of inadvertent trips.

Main Steam Isolation (MSI) Actuation of September 27, 1990 (PIR 90-101)

This event was not personnel error-related. Procedures were properly followed and the actuation occurred as a result of electrically-generated noise spike when test switches were positioned. One technician was performing calibration activities on RPS Channel 'A' of pressurizer pressure, and one technician a calibration on Channel 'C' of MSI. No safety significance can be attributed to this actuation. The system was not required to be operable in Mode 6 and had been properly removed from service per the Technical Specifications. The event is not reportable per 10CFR50.72 and 10CFR50.73. Corrective action implemented restricts calibration activities to one channel at a time until equipment modifications can be designed and implemented.

Loss of Containment Integrity During Refuel Operations (October 2, 1990) (LER 90-018)

In order to prevent a future recurrence, an existing caution in OP 2316A has been relocated to a more appropriate location in the procedure. This caution reads: "The ADV's cannot be opened with the Steam Generator Secondary Manways or Handholes removed while performing core alterations or moving fuel inside Containment per Technical Specification 3.9.4.2." Operations Department supervisors have been counseled on their key role in ensuring that attention to detail does not lapse during periods of extensive maintenance work and frequently changing plant conditions.

Missed Surveillance (LER 90-07)

This event occurred on July 10, 1990, outside of the time period of this specific inspection report. The NRC inspector has previously verified

licensee corrective actions, actions to prevent recurrence and determined the actions sufficient based on the follow-up of LER 90-07. He further concluded the actions by the operator and licensee were not willful or recurrent.

Inadvertent Actuation of EBFS (LER 90-009)

A followup to this LER is in the process of issuance. Preliminary indications are that the even was not personnel error related. The root cause was electromagnetic interference (EMI) in conjunction with a ground within the SFP areas pushbutton.

In-Core Instrumentation (ICI) Support Plate Drop (PIR 90-119)

The ICI plate dropped due to a cross-threaded connection between the lift lug and plate. This condition prevented complete thread engagement between the two components. During manipulation of the ICI plate bullet noses, the engaged threads sheared, causing the ICI plate to fall 13 feet to its normally installed position on the control element assembly extension shaft guide cans.

Three fully qualified, experienced mechanics were assigned to this task. The most experienced of the three [for this particular task] became ill. He therefore left containment for relief after verifying the other two less experienced mechanics were confident in completing the remainder of the task. The job progressed to the point of connection between the lift lug and plate. Because the tool scribe mark was used as verification of proper fit up and was not specifically referenced to the engaged location in the installation procedure, the lifting lug was left in an improperly engaged position.

The procedure did not adequately specify what the tool scribe mark was to be aligned with as a confirmation of full engagement. The mechanic believed that the scribe mark should be aligned with the top of the kick plate instead of the proper alignment point at the floor platform. A measurement of the engaged thread travel was not performed during installation nor required by procedure, but would have been an appropriate verification of proper thread engagement. Contributing to the event was a lack of adequate lighting at the ICI plate which prevented visual verification of tool engagement. The root cause of this event was a combination of ambiguous procedural verification requirements and limited direct experience on this task. Had the procedure been clearer for the connection verification, the less experienced mechanics would not have erred.

The procedure for installing the ICI plate lifting fixture was revised to require a measurement of the engaged thread length and visual inspection of the engaged ICI plate lifting tool. These human factor enhancements are considered adequate to prevent a recurrence of this event.

NNECO Conclusions

We have evaluated the nuclear safety significance of these events and concluded that none has occurred. The events are troublesome to us both singularly and in the aggregate. We have addressed each and initiated corrective actions to prevent recurrence.

The need for attention to detail is continually reinforced at department meetings and in management interactions with plant personnel. The level of performance exhibited by our personnel during these events was not to the level that we expect of our personnel.

To place this issue in further perspective, we note that the 1990 refuel outage work activity was a significant challenge. Almost 4200 work activities were completed in one of the shortest critical path refuel outages experienced to date by Millstone Unit No. 2. The shorter critical path sequence which Millstone Unit No. 2 has experienced over the last several outages is a direct result of increased efficiencies in equipment, personnel familiarity with the outage sequence, and our desire to maintain all radiological tasks as low as reasonably achievable. This progression to shorter critical path outages has therefore been a natural evolution over time. While a similar activity level existed in past outages, the work was completed over a longer time period.

In the 1990 refuel outage, critical path activity shifted from service water, main turbine, steam generators, refueling operations, and the moisture separator reheaters. The fact that safety is the top priority, with the outage schedule secondary, is reinforced on a routine basis with plant personnel.

During the outage, management continued to emphasize to all Millstone Unit No. 2 personnel through daily department meetings, turnovers, and morning meeting notes the philosophy of error-free operations, attention to detail, and dual verification of activities where appropriate. In fact, we believe the smooth start-up of Millstone Unit No. 2 following a complex refuel outage in which over 4200 work activities were successfully accomplished is a credit to the high quality of work and the attention to detail normally demonstrated by our employees.

Millstone Unit No. 2 management has expended considerable effort reviewing and analyzing these events and is confident that the actions taken to date, which will be continually reinforced in the future, will minimize recurrence of similar events.