Northeast
Utilities System

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Northeast Utilities Service Company
P.O. Box 270
Hartford, CT 06141-0270
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March 30, 1994

Docket No. 50-423
B14793

Re: 10CFR2.201

Mr. J. Lieberman
Director, Office of Enforcement
U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555

Dear Mr. Lieberman:

Millstone Nuclear Power Station, Unit No. 3
Reply to a Notice of Violation (EA 93-237)

In a letter dated December 15, 1993,(1) the NRC transmitted the results of the special inspection conducted at Millstone Unit No. 3 from August 28, 1993, to November 8, 1993. The inspection was conducted to review the circumstances surrounding our identification of auxiliary building filter system (ABFS) design deficiencies. The inspection report cited two apparent violations involving the ABFS.

On January 11, 1994, an enforcement conference was held to discuss the apparent violations, their root cause, and Northeast Nuclear Energy Company's (NNECO's) corrective actions. By letter dated March 11, 1994,(2) the NRC transmitted a Notice of Violation (NOV) and Proposed Imposition of Civil Penalty relating to that inspection. The NOV cites inoperability of the supplementary leak collection and release system (SLCRS)/ABFS, as well as the lack of appropriate testing of the SLCRS/ABFS of the previous system modifications. Pursuant to the provisions of 10CFR2.201, NNECO is providing our response to the NOV in Attachment 1. Also enclosed is a check for the full amount of the civil penalty proposed for this violation.

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(1) R. W. Cooper letter to J. F. Opeka, "NRC Inspection 50-423/93-24," dated December 15, 1993.

(2) T. T. Martin letter to J. F. Opeka, "Notice of Violation and Proposed Imposition of Civil Penalty — $50,000," dated March 11, 1993.

IE14 w/ check $50,000 #555628

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As the NRC's Inspection Report points out, NNECO identified the condition which led to the apparent violations. The NRC recognizes our staff's alertness and close scrutiny during the loss of power (LOP) test; i.e., the August 28, 1993, test which helped identify the deficiency. Once identified, NNECO promptly reported the potential violation pursuant to the provisions of 10 CFR, Sections 50.72 and 50.73. NNECO's corrective actions following the August 28, 1993, test failure were again prompt and comprehensive. In addition, NNECO created a Task Force to promptly resolve other single failure vulnerabilities.

Attachment 1 documents details of corrective actions implemented. In addition, NNECO has taken several initiatives in the area of testing. For example, at the end of the 1993 outage, NNECO re-performed engineered safety feature (ESF)/LOP tests to increase our confidence in system performance and to verify modifications made during the last half of the outage. In addition, steps have been taken to improve retest requirements associated with design changes and to sensitize plant and design engineers on retest issues.

If you have any questions regarding the information contained in this letter, please contact us.

Very truly yours,

NORTHEAST NUCLEAR ENERGY COMPANY

J. F. Opeka
Executive Vice President

cc: T. T. Martin, Region I Administrator
V. L. Rooney, NRC Project Manager, Millstone Unit No. 3
P. D. Swetland, Senior Resident Inspector, Millstone Unit Nos. 1, 2, and 3
R. W. Cooper, Director, Division of Reactor Projects, Region I

Subscribed and sworn to before me

this 30 day of March, 1994

Lorraine L. D'Amico

Date Commission Expires: 3/31/98

Docket No. 50-423
B14793

Attachment 1

Millstone Nuclear Power Station, Unit No. 3

Reply to a Notice of Violation (EA 93-237)

March 1994

Attachment 1

Millstone Nuclear Power Station, Unit No. 3
Reply to a Notice of Violation (EA 93-237)

I. Restatement of Violation

Violation A

"Technical Specification (TS) 3.7.9 requires that, when the plant is in operational modes 1 through 4, two independent auxiliary building filter system (ABFS) trains must be operable. With one train inoperable, the system must be returned to service within seven days or the unit must be placed in hot standby within six hours and cold shutdown within the following 30 hours."

"Prior to Amendment No. 87 issued on December 8, 1993, TS 3.6.6.1 required two operable and independent supplementary leak collection and release systems (SLCRS). As part of the surveillance test criteria to demonstrate SLCRS operability, TS 4.6.6.1.d.3 requires that each system produce a negative pressure of greater than or equal to 0.25 inch water gauge in the annulus within 50 seconds after a start signal."

"TS 3.0.3 requires that, when a limiting condition for operation is not met, within one hour actions must be initiated to place the unit in a mode in which the specification does not apply."

"Contrary to the above, on numerous occasions following modifications to the ABFS in October 1992 through August 1, 1993, when the plant was in operational modes 1 through 4, the ABFS was not capable of supporting the SLCRS to meet its design drawdown time requirement of producing a negative pressure of greater than or equal to 0.25 inch water gauge in the annulus within 50 seconds. Specifically, any time train B was inoperable (due to surveillance tests, maintenance, or any other reason), train A of the ABFS was also inoperable due to a design deficiency rendering the SLCRS inoperable. Actions were not initiated within one hour to place the unit in a mode in which the specification did not apply."

Violation B

"10 CFR Part 50, Appendix B, Criterion XVI, Corrective Action requires, in part, that measures be established to assure that conditions adverse to quality such as failure, malfunctions, deficiencies and nonconformances are promptly identified and corrected. In the case of significant conditions adverse to quality, the measures shall assure

that the cause of the conditions is determined and corrective actions taken to preclude repetition."

"Contrary to the above, adequate measures were not established to assure that conditions adverse to quality such as failures, malfunctions, deficiencies and nonconformances were promptly identified and corrected. Specifically, inadequate ABFS testing prior to August 1992 failed to promptly identify various deficiencies associated with the ABFS which were identified in August 1992 and subsequently corrected. However, the corrective actions taken did not preclude repetition of the violation as these actions did not include comprehensive testing of the system to identify the ABFS design deficiencies found on August 28, 1993."

II. Admission or Denial of Violation

With respect to the conditions related to the inoperability of the SLCRS/ABFS from October 1992 through August 1, 1993, and with respect to the adequacy of the 1992 corrective actions related to the ABFS testing, Northeast Nuclear Energy Company (NNECO) acknowledges that the violations occurred as stated. However, NNECO notes that a reference in Violation 'B' to inadequate testing prior to August 1992 should more correctly refer to October 1992.

III. Reasons for Violation

A. Operability Issues

The root cause of the August 28, 1993 event, a loss of power (LOP) test failure, involving the delayed start of Fan 6A, was the slow flow switch circuit response following a LOP event, and re-establishment of ac power. The design characteristics of the flow switch circuit affected operability following a LOP.

The root cause of the single failure vulnerability/operability issue, subsequently identified by NNECO, was deficiencies in the design of the ABFS. The ABFS was not designed to SLCRS drawdown criteria for all possible power source failures. All possible fan failure modes were not considered and the impact of the mode of fan operation on train failure was not fully analyzed.

B. Identification/Testing Issues

The failure to identify the effect of the flow switch on Fan 6A was due to a lack of understanding of switch response to a LOP. This can be attributed to insufficient testing.

Several factors may have contributed to the failure to earlier identify this issue. These contributing factors include incomplete design information from the flow switch manufacturer in the operations and instruction manual (OIM) and the intricacy and complexity of the ABFS and SLCRS system design. Moreover, the flow switch issue might have been identified at the time of the 1992 design modifications had there been greater independence between design and testing teams.

IV. The Corrective Steps That Have Been Taken and The Results Achieved

A. Operability Issues

1. NNECO took immediate and effective action after the late start of Fan 6A during the August 28, 1993, LOP test. Engineering investigation of the problem began at once, and the cause was identified within days. The Operations Department issued a Plant Information Report 3 days after the event. After the flow switch was determined to be the cause of slow system response, testing of the flow switch began. The results of the report revealed the inherent design characteristic of the flow switch, which requires a continuous uninterruptible supply of power or the allowance for a "warmup" period following restoration of power.

2. A full investigation to determine the impact of the flow switch design on safety-related ventilation systems was undertaken. Five switch circuits were repowered by an uninterruptible power source to eliminate the delay encountered when the flow switch heater probe reheats to indicate a low flow condition, and the circuitry was modified for one other flow switch.

3. NNECO performed an inservice test (IST) on October 13, 1993, to determine the effectiveness

of powering the ABFS flow switches with uninterruptible power supplies. This test indicated the separate problems with the design of the ABFS which rendered the SLCRS train inoperable. A Task Force was assembled to address the cause of the deficiencies in the system. The Task Force's review of this failure revealed the additional single failure vulnerability within the SLCRS/ABFS instrumentation and controls.

4. The Task Force performed a failure mode and effects analysis (FMEA) of proposed modifications and recommended changes to correct the identified system deficiencies.

5. The results of the Task Force's failure mode effects analysis were incorporated in system operating procedures and did not require specific hardware repairs. For example, to preclude more than one train operating at the same, both trains of the charging pump and reactor plant component cooling water pump area ventilation system (ABVS) were placed in the automatic mode of operation. This puts the flow switch in control of which fans are running.

6. NNECO submitted an application for a license amendment to modify the Technical Specifications for Millstone Unit No. 3 to change the drawdown time to 2 minutes. The Staff approved the license amendment on December 8, 1993.

7. An independent team from Yankee Atomic Electric Company was retained to conduct an independent assessment of NU's review and corrective actions associated with the Millstone Unit No. 3 SLCRS and ABFS design and operational problems. The team has completed its review and provided recommendation for future consideration.

8. The previous backlog and open items related to the ABFS and SLCRS were reviewed to determine if there were any outstanding issues which would pose any nuclear safety or operability concerns with the SLCRS and ABFS. It was determined that none of the backlog items affect the operability of the SLCRS and ABFS.

9. The information regarding testing for design modifications completed during the 4th refueling outage was reviewed for its adequacy.

B. Identification and Testing Issues

1. NNECO completed, prior to restart, a performance assurance program comprised of analysis and test activities.

2. NNECO has adopted, as an interim measure, an expanded joint review of test plans, procedures, and results by design and system engineers and supervisors.

3. The existing design documentation for the flow switch has been updated to include a discussion of the flow switch response to a loss of power.

V. The Corrective Steps That Will Be Taken To Avoid Further Violations

To further address the root cause for both aspects of the violation, the following actions are planned:

1. The scope and frequency of SLCRS/ABFS testing/trending will be revised to address component timing and stability.

2. An independent review of the ABFS FMEA completed under the 1993 Task Force effort is nearing completion. The ABFS FMEA will be expanded to include additional factors.

3. Thirteen engineering work requests (EWRs) arising from the 1993 Task Force efforts are being considered for implementation as follows. NNECO plans to implement modifications identified in the nine EWRs under the auspices of design consolidation during the fifth refueling outage. The remaining four EWRs have been consolidated to a single project assignment and any modifications related to this project assignment are targeted for completion by the end of the sixth refueling outage. NNECO is also pursuing several options that are aimed at restoring containment leak rate allowances and gaining greater SLCRS/ABFS drawdown time.

4. A training module will be developed to address test plan and test procedure development, and test conduct and review of test results for design changes. This will be utilized for training design and system engineering personnel.

5. An improved SLCRS/ABFS system description will be generated to improve operator/technician/engineer knowledge base.

VI. Date When Full Compliance Achieved

NNECO is presently in full compliance with all requirements pertinent to this violation. Full compliance was achieved when the SLCRS and ABFS were declared operable and operational on November 5, 1993.

VII. Generic Implications

1. The impact of the flow switch on ABFS and SLCRS is a Millstone Unit No 3-specific issue.

2. A memorandum has been sent to other NU nuclear units describing the flow switch design characteristic and potential implications.

3. The lessons learned from the incident regarding testing were communicated to the NU nuclear units.

4. The flow switch vendor has been advised of this issue.

As the NRC's Inspection Report points out, NNECO identified the condition which led to the apparent violations. The NRC recognizes our staff's alertness and close scrutiny during the loss of power (LOP) test; i.e., the August 28, 1993, test which helped identify the deficiency. Once identified, NNECO promptly reported the potential violation pursuant to the provisions of 10 CFR, Sections 50.72 and 50.73. NNECO's corrective actions following the August 28, 1993, test failure were again prompt and comprehensive. In addition, NNECO created a Task Force to promptly resolve other single failure vulnerabilities.

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