



Northeast
Utilities System

107 Selden Street, Berlin, CT 06037

Northeast Utilities Service Company
P.O. Box 270
Hartford, CT 06141-0270
(203) 665-5000

March 18, 1994

Docket No. 50-423
814789

Re: 10CFR2.201

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

Millstone Nuclear Power Station, Unit No. 3
Reply to a Notice of Violation
Inspection Report No. 50-423/93-81

In a letter dated February 16, 1994,⁽¹⁾ the NRC Staff transmitted the results of an electrical distribution system functional inspection conducted on October 18, 1993, through November 5, 1993, at Millstone Unit No. 3. The NRC identified one Severity Level IV violation and one non-cited violation, and requested that Northeast Nuclear Energy Company (NNECO) respond to the cited Notice of Violation (NOV) within 30 days of the date of the letter transmitting the notice. The cited violation involved two instances of inadequate corrective actions being taken in the surveillance testing area. Specifically, the NRC cited NNECO for an inadequate evaluation of battery capacity following a performance discharge test. The second instance involved failure to recognize and respond to three alarms indicating the failure of a battery charger to supply its required load.

In accordance with 10CFR2.201, enclosed as Attachment 1 is NNECO's reply to the subject NOV. A schedule for resolution of unresolved issues identified in the referenced report and any actions to enhance the functionality of the electrical distribution system will be provided by April 25, 1994.

(1) J. T. Wiggins letter to J. F. Opeka, "Notice of Violation, NRC Inspection Report 50-423/93-81," dated February 16, 1994.

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We trust that you will find this information satisfactory. We remain available to answer any questions you may have.

Very truly yours,

NORTHEAST NUCLEAR ENERGY COMPANY

FOR: J. F. Opeka
Executive Vice President

BY:



E. A. DeBarba
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
J. T. Wiggins, Acting Director, Division of Reactor Safety, Region I

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Attachment 1

Millstone Nuclear Power Station, Unit No. 3

Reply to a Notice of Violation

Inspection Report No. 50-423/93-81

March 1994

Millstone Nuclear Power Station, Unit No. 3

Reply to a Notice of Violation
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Statement of Violation

Part 50 of Title 10 of the Code of Federal Regulations, Appendix B, Criterion XVI, Corrective Action, requires, in part, that measures shall be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material, and equipment and nonconformances are promptly identified and corrected.

Contrary to the above, conditions adverse to quality were not promptly identified and corrected, as evidenced by the following two examples:

1. On or before November 5, 1993, NUSCo failed to evaluate the capability of station battery 301B-1 to supply accident loads for the next refueling outage. The performance discharge test performed during the current refueling outage showed that the battery capacity had dropped by more than thirty percent during the preceding six years and only a 0.4 percent capacity margin was available for the subsequent operation cycle. A capacity drop in excess of ten percent during test periods is indicative of a potentially degraded battery.
2. On or before August 20, 1993, NUSCo failed to recognize and respond to three alarms indicating the failure of battery charger No. 4 to supply its loads and to maintain the associated battery in a fully charged state. The loss of the charger was not recognized until two days later, when the vital bus inverter shutdown on low supply voltage.

Reason for the Violation

- a. Northeast Nuclear Energy Company (NNECO) performed an inadequate evaluation of battery capacity following the August 30, 1993, Station Battery 301B-1 performance discharge test. The capacity was above the minimum operable capacity of 80 percent and the battery was placed in the "degraded" category in accordance with the surveillance procedure and Technical Specification 3/4 8.2.1.f. Based on the performance test results, the battery was assessed for operability. Our operability review showed that the battery had sufficient capacity for its duty cycle over the next operating cycle. The analysis concluded that the battery had sustained a partial discharge prior to the performance test. Therefore, the actual battery capacity was much higher than the capacity test indicated. This led NNECO to the conclusion that no further action was required other than to place the battery in a degraded category in accordance with the technical specification. The operability review should have been formally documented and the performance test repeated to verify the analysis.

- b. On August 20, 1993, while preparing for refueling outage electrical bus maintenance, Battery Charger 4 was aligned to temporary power and placed on Battery 4. The charger DC output breaker opened soon thereafter. This was due to excessive current flow during the charger startup sequence while the DC output capacitors were charging. The fact that the output breaker had opened was not noted and the bus maintenance proceeded normally. On August 21, 1993, the normal AC source for Inverter 4 was de-energized for maintenance. This shifted the inverter to its DC source, resulting in two simultaneous alarms: Battery 4 Trouble and Inverter 4 Trouble. Both alarms were acknowledged by control room personnel who incorrectly attributed the alarms to the electrical train outage and ongoing maintenance. They did not realize that the Battery 4 Trouble alarm should not have been received if the charger was operating correctly from the temporary AC power. The DC Bus 301B-2 Volts Low alarm was also received prior to the loss of the Inverter 4 AC bus on August 22, 1993. This alarm was logged on the plant process computer printer but was missed by a control room operator reviewing the printout. The operators did not receive the subsequent Battery 4 Trouble alarm at the 109 VDC setpoint because it was masked by the earlier Battery 4 Trouble alarm. Once the Battery 4 Trouble is indicated, subsequent alarms do not reflash.

In summary, operators failed to recognize and respond to three alarms indicating the failure of Battery Charger No. 4 to supply its loads and to maintain the associated battery in a fully charged state.

Corrective Steps That Have Been Taken and Results Achieved

- a. In response to the NRC electrical distribution system function inspection (ESDFI) Team concern, a battery performance test was repeated on October 22, 1993, and established a capacity of 96.6 percent.

Subsequent analysis could not verify that the battery was partially discharged prior to the August 30, 1993, performance test. Therefore, the conservative approach was to designate Station Battery 301B-1 potentially degraded because of the significant drop in capacity measured on the August 30, 1993, performance test. In addition to the performance test repeated on October 22, 1993, a service test and performance discharge test have been scheduled for the next refueling outage (Technical Specifications "degraded" battery).

A change to the battery surveillance procedure, SP 3712NB, has been initiated which will require that a Plant Information Report (PIR) be generated when a battery is placed in a degraded category. This will result in plant management being informed in a timely manner and the performance of a root cause analysis.

Lessons learned from this issue have been incorporated in the system engineer file.

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- b. All control room operators involved have been counseled by their shift supervisor. The operators who received, but discounted, the alarms on August 21 received counseling on the importance of analyzing and understanding each and every alarm received. The operator who received the computer alarm on August 22, but missed it when reviewing the computer printout, has been counseled regarding the need for increased diligence and attention.

Corrective Steps That Will Be Taken to Avoid Further Violation

The system engineering program is being implemented at Millstone Unit No. 3. As the system engineering program implementation progresses, the reporting of deficiencies by system engineers and the attention focused on monitoring and improving system and equipment performance are expected to significantly improve system and equipment reliability. Battery capacity will be one of the many parameters trended by the system engineer.

Lessons learned regarding the events leading to the loss of the Inverter 4 AC bus will be discussed with all control room operators by the Operations Manager and will be completed by June 22, 1994.

The following design changes have been proposed to improve the Millstone Unit No. 3 design to avoid undetected loss of DC power:

- The DC panel breakers in series with battery charger output breakers will be replaced with larger rated circuit breakers. This will reduce the number of output breaker trips on startup and increase reliability. This design change will be completed by the end of the next refueling outage (approximately August 1995).
- Main board annunciation will be improved to aid operator decision making. The design will provide a reflash capability to each battery trouble alarm so the first alarm will not mask subsequent alarms, and the operator will be warned of a continued problem with the 125 VDC system. This design change will be completed by the end of the next refueling outage (approximately August 1995).

Changes to Operating Procedure OP 3345C, 125 Volt DC Operating Procedure, requiring verification of charger breaker position during batter charger startup, have been completed and will be implemented by May 2, 1994.

Date When Full Compliance Will Be Achieved

NNECO is presently in full compliance with all requirements pertinent to this violation.