October 30, 2000

EA 00-236

Mr. R. G. Lizotte, Master Process Owner - Assessment
C/O Mr. D. A. Smith, Process Owner - Regulatory Affairs
Northeast Nuclear Energy Company
P.O. Box 128
Waterford, Connecticut 06385

SUBJECT: NRC's INSPECTION REPORT NOS. 05000336/2000-011 AND 05000423/2000-011

Dear Mr. Lizotte:

On September 30, 2000, the NRC completed inspections at your Millstone Units 2 & 3 reactor facilities. The enclosed reports present the results of these inspections. The results were discussed on October 20, 2000, with Messrs. E. Grecheck and R. Necci and other members of your staff.

These inspections were an examination of activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. Within these areas, the inspections consisted of a selected examination of procedures and representative records, observations of activities, and interviews with personnel.

This report discusses one preliminary finding of low to moderate safety significance (white) at Millstone Unit 2. This finding involves the identified degradation of the turbine-driven auxiliary feedwater pump during a routine surveillance test on August 23, 2000, and the failure of that pump during its next routine surveillance on September 20, 2000. This finding was also determined to be an apparent violation of NRC requirements because you failed to implement timely corrective actions to address the degraded condition, as required by Criterion XVI, "Corrective Action," of 10 CFR Part 50, Appendix B.

We understand that you would like us to hold a Regulatory Conference on this matter to discuss your evaluation and any differences with the NRC evaluation. This Regulatory Conference will be open for public observation and has been tentatively scheduled for November 28, 2000. Accordingly, no enforcement is presently being issued for this inspection finding at this time. You will be advised by separate correspondence of the results of our deliberation on this matter.

Also, based on the results of this inspection, the NRC identified two findings describing adverse performance trends at Unit 2 related to the cross-cutting issues of corrective action implementation and human performance in post-maintenance restoration and testing activities. Further, the NRC identified two issues at Unit 2 that were evaluated under the significance determination process and were determined to be of very low safety significance (green).

These issues have been entered into your corrective action program and are discussed in the summary of findings and in the body of the attached inspection reports. Both of these issues were determined to involve violations of NRC requirements, but because of their very low safety significance the violations are not cited. If you contest these noncited violations, you should provide a response within 30 days of the date of these inspection reports, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington DC 20555-0001; with copies to the Regional Administrator, Region I; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the Millstone facility.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosures will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/NRC/ADAMS/index.html (the Public Electronic Reading Room).

Sincerely,

/RA/

A. Randolph Blough, Director
Division of Reactor Projects

Docket Nos.: 05000336, 05000423
License Nos.: DPR-65, NPF-49

Enclosures:
(1) NRC Inspection Report 05000336/2000-011
(2) NRC Inspection Report 05000423/2000-011
(3) NRC's Revised Reactor Oversight Process

cc w/encl:
B. D. Kenyon, President and Chief Executive Officer - NNECO
R. P. Necci, Vice President - Nuclear Technical Services
L. J. Olivier, Senior Vice President and Chief Nuclear Officer - Millstone
E. S. Grecheck, Vice President - Generation
F. C. Rothen, Vice President - Nuclear Work Services
J. T. Carlin, Vice President - Human Services - Nuclear
G. D. Hicks, Master Process Owner - Training
C. J. Schwarz, Master Process Owner - Operate the Asset
D. A. Smith, Process Owner - Regulatory Affairs
L. M. Cuoco, Senior Nuclear Counsel
J. R. Egan, Esquire
N. Burton, Esquire
V. Juliano, Waterford Library
J. Buckingham, Department of Public Utility Control
State of Connecticut SLO Designee
First Selectmen, Town of Waterford
D. Katz, Citizens Awareness Network (CAN)
T. Concannon, Co-Chair, NEAC
R. Bassilakis, CAN
J. M. Block, Attorney, CAN
G. Winslow, Citizens Regulatory Commission (CRC)
E. Woollacott, Co-Chair, NEAC

Distribution w/encl: **<VIA E-MAIL>**:
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T. Madden, OCA
D. Thatcher, NRR
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J. Zimmerman, PM, NRR
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J. Linville, DRP
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NAME	SJones/ by phone		JLinville/JL		RUrban/RJU		ABlough/AB	
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ENCLOSURE 1

U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Docket No.:	05000336
License No.:	DPR-65
Report No.:	05000336/2000-011
Licensee:	Northeast Nuclear Energy Company
Facility:	Millstone Nuclear Power Station, Unit 2
Location:	P. O. Box 128 Waterford, CT 06385
Dates:	August 13, 2000 - September 30, 2000
Inspectors:	P. C. Cataldo, Resident Inspector, Unit 2 S. R. Jones, Senior Resident Inspector, Unit 2 T. A. Moslak, Health Physicist, Division of Reactor Safety G. C. Smith, Senior Physical Security Inspector, DRS
Approved by:	James C. Linville, Chief Projects Branch 6 Division of Reactor Projects Region I

SUMMARY OF FINDINGS

IR 05000336/2000-011; on 08/13-09/30/00; Millstone Nuclear Power Station; Unit 2. Operability Evaluations, Post Maintenance Testing, Identification and Resolution of Problems, Human Performance Issues, Other.

The inspection report covered a seven-week period conducted by resident and regional inspectors per the NRC's revised reactor oversight process (see Attachment 1). This inspection identified two green issues, which were non-cited violations, and one white issue, which was an apparent violation. The inspection also identified two findings which were characterized as no color. The significance of the issues is indicated by their color (green, white, yellow, red) and was determined by the Significance Determination Process.

Cornerstone: Mitigating Systems

- **White.** Following operator identification that the speed control for the turbine-driven auxiliary feedwater (TDAFW) pump was at times unresponsive and erratic during surveillance testing, the licensee failed to take prompt corrective action, consistent with the pump's importance to safety, to address the degraded condition. Consequently, during the subsequent surveillance test 28 days later, operators were unable to increase the speed of the TDAFW pump from its starting speed. At its starting speed, the pump can not develop sufficient discharge pressure to provide feedwater to the steam generators. The NRC considered the failure to take prompt corrective actions an apparent violation of Criterion XVI, "Corrective Actions," of 10 CFR Part 50, Appendix B. The inability to increase pump speed was a condition of apparent low to moderate safety significance (White) because, although the exposure time was moderate, the TDAFW pump is an important accident mitigation component and prompt operator recovery of the pump was not credible. (Section 1R15.1)

- **Green.** During routine surveillance on the "C" high pressure safety injection (HPSI) pump, a plant equipment operator identified that the outboard bearing housing lacked adequate oil to maintain the bearing coated with oil. The licensee concluded that pump operation for greater than 4 hours with the available oil inventory was questionable. The NRC concluded that the lack of adequate oil resulted from a combination of inadequate maintenance procedures, which failed to ensure the automatic oil makeup bubbler was functioning properly following maintenance to address oil leaks, and the design of the bubbler, which allowed an internal component to block makeup flow to the bearing. Although the pump was not available to perform its long-term cooling function for a moderately long period, the condition was found to be of very low safety significance due to the availability of a spare pump that could be easily placed in service. The failure to implement and maintain adequate procedural guidance was considered a violation of Technical Specification 6.8.1.a., and is being treated as a Non-Cited Violation. The NRC also found that the licensee failed to extend the corrective action plan to other safety-related pumps in both

Millstone Units 2 and 3, in that the proposed corrective action for verification of oil flow from the oil bubbler to the bearing housings following maintenance addressed the Unit 2 HPSI pumps only. (Section 1R19.1)

- **Green.** On April 22, 2000, the licensee identified that the closing capability for valve 2-SI-651, the outboard shutdown cooling system suction isolation valve, had not been disabled with the plant in Modes 1, 2, and 3, as required by the licensee's Appendix R Compliance Report. The valve closing capability is disabled by removing the closing coils from the motor controller for this valve to ensure that a fire-induced hot-short would not cause the valve to fail in the closed position. The licensee implemented a design change in early 1999 that relocated the valve motor controller, but the modification had not resulted in corresponding changes to equipment labels and operating procedures. As a result, from March 1999 to April 2000, electricians had been removing coils from the abandoned motor controller, which failed to disable the closing capability of the valve. This failure to translate design changes into appropriate procedures is considered a violation of Criterion III, "Design Control," of 10 CFR Part 50, Appendix B. The inspector evaluated this condition using the significance determination process and found the condition to be of very low safety significance (Green) in that it would not prevent the plant from being maintained indefinitely in hot shutdown. This violation is being treated as a Non-Cited Violation. (40A5.1)

Cornerstone: Cross cutting Issues

- **No Color.** The inspector noted development of an apparent trend related to untimely or incomplete measures to address known conditions affecting the operability of essential mitigation equipment. The following specific deficiencies have been noted within the last six months:

  (1) In May 2000, the NRC identified that the licensee's took incomplete corrective actions when multiple reactor building closed cooling water system relief valves lifted during pump starts under conditions simulating a loss of normal power in that the licensee failed to address the increased probability of system failure created by lifting relief valves (NCV 50-336/2000-008-04).

  (2) In August 2000, the NRC identified that the licensee had failed to implement timely corrective actions to ensure correct emergency diesel generator voltage regulator settings, which resulted in a second occurrence of low output voltage one year after the first occurrence (NCV 50-336/2000-009-03).

  (3) In September 2000, the NRC identified that the licensee had not implemented timely corrective actions in response to operator

identification that the turbine-driven auxiliary feedwater pump speed control was unresponsive and erratic (Section 1R15.1).

(4) In September 2000, the NRC identified that the licensee had not implemented complete corrective actions to ensure proper operation of safety related pump bearing oiler bubblers. Although the oil bubblers affect numerous safety related pumps, measures to address proper operation of oil bubblers following maintenance were limited to the HPSI pump bearing housings (Section 1R19.1).

These issues have a related cause in that they represent known degraded conditions that were addressed incompletely or in an untimely manner. They also have a direct impact on safety because of the increased potential for or actual failure of important event mitigation equipment. This performance trend is considered a substantive cross-cutting issue, separate from the individual issues, and is considered a finding. (4OA2)

- **No Color.** The inspector noted development of an apparent trend related to inadequate post-maintenance restoration and testing activities. The following specific deficiencies have been noted within the last six months:

  (1) In May 2000, the NRC identified that inadequate post-maintenance restoration and testing activities resulted in the subsequent common cause failure of both vital DC switchgear cooling trains (NCV 50-336/2000-008-02).

  (2) In May 2000, the NRC identified that appropriate post-maintenance and periodic tests had not been developed to ensure adequate train independence for the reactor building closed cooling water system (NCV 50-336/2000-008-05).

  (3) In September 2000, the NRC identified that inadequate post-maintenance restoration and testing activities resulted in the "C" high pressure safety injection pump being in an undetected degraded state for 28 days, in that the outboard bearing of the pump lacked adequate oil for long-term operation (Section 1R19.1).

  These issues have a related cause in that they represent inadequate human performance in identifying and implementing necessary measures to ensure equipment will perform acceptably in service. They also have a direct impact on safety because of the potential or actual existence of undetected conditions that could prevent satisfactory performance of necessary event mitigation functions. This performance trend is considered a substantive cross-cutting issue, separate from the individual issues, and is considered a finding. (4OA4)

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Report Details

SUMMARY OF UNIT 2 STATUS

The plant operated at essentially 100 percent power throughout the inspection period, with the exception of an unplanned, short-term power reduction to approximately 80 percent power on September 29, 2000. Operators initiated the power reduction in response to a feedwater heater transient initiated by routine turbine combined intermediate valve testing.

1. REACTOR SAFETY
(Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity)

1R01 Adverse Weather

a. Inspection Scope

The inspector reviewed the licensee's preparation for adverse weather, which included the potential for hurricanes, using procedure AOP 2560, "Storms, High Winds and High Tides," for various safety-related structures, systems and components. The inspector also reviewed the licensee's actions and contingencies to address the unavailability of heating steam, which is normally used to maintain the refueling water storage tank temperature above the technical specification minimum temperature of 50°F during periods of colder weather, while modifications to the heating steam system were ongoing to remove the original steam supply from Unit 1 and install the new supply from Unit 3.

b. Findings

There were no findings identified during this inspection.

1R04 Equipment Alignments

.1 Partial System Alignment Checks

a. Inspection Scope

Inspectors performed the following partial system alignment checks:

- Following surveillance testing that realigned important auxiliary feedwater (AFW) system valves, the inspector verified that the "A" train AFW system was correctly aligned in accordance with Surveillance Procedure (SP) 2612C-2, "Auxiliary Feedwater System Lineup Verification," and system piping and instrumentation diagram 25203-26005.

- While the "C" channel of the reactor protection system (RPS) was removed from service for modifications to the calibration indication panel drawer, the inspector verified that the remaining three RPS channels were correctly aligned in accordance with Operating Procedure 2380, "RPS and NI Safety Channel Operation," and Unit 2 Technical Specification 3.3.1.1.

b. Findings

There were no findings identified during this inspection.

.2 Full High Pressure Safety Injection System Alignment Check

a. Inspection Scope

The inspectors verified that the accessible portions of the high pressure safety injection (HPSI) system were correctly aligned in accordance with SP 2604E-1, “HPSI System Electrical Alignment Check, Facility 1,” SP 2604E-2, “HPSI System Valve Alignment Check, Facility 1,” SP 2604F-1, “HPSI System Electrical Alignment Check, Facility 2,” SP 2604F-2, “HPSI System Valve Alignment Check, Facility 2,” and system piping and instrumentation diagram 25203-26015. The inspectors also verified that outstanding trouble reports and condition reports generated to address deficiencies and adverse conditions associated with the HPSI system did not impact the system’s ability to perform its required safety functions.

b. Findings

There were no findings identified during this inspection.

1R05 Fire Protection

a. Inspection Scope

The inspector reviewed the licensee’s fire hazard analysis for the following plant areas: (1) Lower 4160 VAC Switchgear Room, Fire Area T-7; (2) Turbine Building West Cable Vault, Fire Area T-8; (3) Turbine Building East Cable Vault, Fire Area T-9; and (4) Upper 4160 VAC Switchgear Room, Fire Area T-10. The inspector toured these areas to verify the correct operational alignment of the wet-pipe fire suppression sprinkler systems protecting these areas, the integrity of penetration seals and other fire barriers, and the adequate control of transient combustible materials located in these areas.

b. Findings

There were no findings identified during this inspection.

1R06 Flood Protection Measures

a. Inspection Scope

The inspector reviewed various documents and inspected various structures and components relative to the adequacy of flood protection measures for safety-related and risk significant systems and components. The document review included abnormal operating procedures (AOPs), surveillance procedures, technical specifications, technical requirements manual, and the final safety analysis report. The inspector performed a walkdown of Unit 2 areas to verify the adequacy of flood gates and other equipment utilized by operators during implementation of AOP 2560, “Storms, High

Winds and High Tides," and to ensure adequate measures existed to mitigate the design basis external flood.

b. Findings

There were no findings identified during this inspection.

1R11 Licensed Operator Requalification

a. Inspection Scope

On September 19, 2000, the inspector observed the conduct of an evaluated licensed operator requalification simulator exercise. The inspector assessed licensed operator performance in areas such as: communications, implementation of normal and emergency procedures, command and control, and technical specification compliance. The inspector verified that the evaluators addressed operator performance issues that were identified during the exercise, and that applicable exercise objectives had been achieved.

b. Findings

There were no findings identified during this inspection.

1R12 Maintenance Rule Implementation

.1 Inadequate Oil in the "C" High Pressure Safety Injection (HPSI) Pump

a. Inspection Scope

The inspector reviewed the licensee's implementation of the maintenance rule (10 CFR 50.65) regarding the discovery of inadequate oil in the "C" HPSI pump outboard bearing housing (Section 1R19.1). Specifically, the inspector verified that the licensee appropriately classified the condition as a maintenance rule functional failure and accrued unavailability hours beginning with the work activity that created the condition to the time the pump was restored to an available status, consistent with the licensee's maintenance rule implementing procedures. The inspector also reviewed condition report M2-00-2513, which documented that, based on the inadequate oil in the "C" HPSI pump bearing, the "B" HPSI train had exceeded its maintenance rule performance criterion for unavailability.

b. Findings

There were no findings identified during this inspection.

.2 Turbine-Driven Auxiliary Feedwater Pump Failure

a. Inspection Scope

The inspector reviewed the maintenance rule implementation associated with condition report M2-00-2545, which documented the inability of operators to increase speed of the turbine-driven auxiliary feedwater (TDAFW) pump above its minimum starting speed. The licensee correctly classified the condition as a maintenance rule functional failure, consistent with Engineering Department Instruction 30710, "Maintenance Rule Functional Failures." The inspector verified that the performance criterion for the feedwater injection function of less than 2 functional failures per 24 months for the system was consistent with the failure-to-run frequency and the failure-to-start probability used in the licensee's safety assessment model for the TDAFW pump. The inspector confirmed that inconsistencies between the maintenance rule unavailability performance criterion of 300 hours per 24 month period and the assumed maintenance unavailability used in the licensee's safety assessment model of 115 hours per 24 month period for the TDAFW pump were documented in condition report M2-00-2856.

b. Findings

There were no findings identified during this inspection.

.3 Recurrent Transfer of Regulated 120 VAC Panel to its Emergency Supply

a. Inspection Scope

The inspector reviewed maintenance rule implementation associated with the recurrent transfer of regulated 120 VAC Panel VR-21 to its emergency supply during plant electrical transients (e.g., two reactor trips and a lightning strike documented in condition report M2-00-2429) and the consequential trip of all pressurizer heaters and isolation of steam generator blowdown flow. The inspector verified that the panel was correctly classified as a maintenance rule system, the performance criterion was acceptable, the recurrent transfers were correctly classified, and appropriate corrective actions were identified to correct the condition.

b. Findings

There were no findings identified during this inspection.

1R13 Maintenance Risk Assessment and Emergent Work Evaluation

.1 Emergent Work on the Turbine-Driven Auxiliary Feedwater Pump

a. Inspection Scope

The inspector reviewed the licensee's control of work activities during emergent work to repair the turbine-driven auxiliary feedwater pump (TDAFP) governor (Section 1R15.1). The inspector verified that the licensee minimized the performance of risk-significant

activities while the TDAFP was out of service, and appropriately minimized potential challenges to the remaining accident mitigation equipment.

b. Findings

There were no findings identified during this inspection

.2 Troubleshooting of “B” Charging Pump Discharge Relief Valve Lifts

a. Inspection Scope

The inspector reviewed work controls implemented to manage risk when troubleshooting spurious “B” charging pump discharge relief valve lifts, scheduled on an emergent basis on September 26, 2000, during the same period when the “B” auxiliary feedwater (AFW) pump and the “B” containment air recirculation fan were scheduled to be removed from service for planned maintenance. The inspector verified that the control room shift manager deferred the troubleshooting based on the other scheduled work. This was due to the “B” AFW pump work being classified as higher risk work and the potential for the troubleshooting to adversely affect the “A” train of charging during a work week when the “A” train was protected.

b. Findings

There were no findings identified during this inspection.

.3 Modification to “C” Reactor Protection System Calibration Indication Panel Drawer

a. Inspection Scope

The inspector reviewed work controls implemented to manage risk when scheduled modifications to the “C” reactor protection system (RPS) calibration indication panel drawer would remove one of the four RPS channels from service for an extended period. The inspector verified that the licensee managed risk to an acceptable level in accordance with their on-line maintenance procedures.

b. Findings

There were no findings identified during this inspection.

1R15 Operability Evaluations

.1 Failure of the Turbine-Driven Auxiliary Feedwater Pump

a. Inspection Scope

The inspector reviewed the licensee's assessment of operability and subsequent corrective actions associated with degraded performance of the turbine speed control mechanism for the turbine-driven auxiliary feedwater (TDAFW) pump, which was documented in condition report (CR) M2-00-2347.

b. Issues and Findings

Following operator identification that the speed control for the TDAFW pump was at times unresponsive and erratic during surveillance testing, the licensee failed to take prompt corrective action, consistent with the pump's importance to safety, to address the degraded condition. During the subsequent surveillance test 28 days later, operators were unable to increase the speed of the TDAFW pump from its starting speed. As a result, the pump failed to develop sufficient discharge pressure to provide feedwater to the steam generators. This failure was found to be of low to moderate safety significance (White) because, although the exposure time was moderate, the TDAFW pump is an important accident mitigation component and prompt operator recovery of the pump was not credible.

On August 23, 2000, while raising the TDAFW pump speed from approximately 1400 rpm to its rated speed of 4400 rpm, the control room operator noted that the turbine speed would at times not respond to motion of the speed control switch and at other times raise in spurts. Also during the start, a senior reactor operator in the pump room noted that at times the speed control servo motor was turning without any corresponding motion of the turbine governor steam valve. These observations were documented in CR M2-00-2347. Engineering personnel and the Shift Manager evaluated the condition and concluded that the observed governor valve response was consistent with expected response in that, at certain points, substantial motion of the speed control servo motor is necessary to cause a perceptible change in governor steam valve position. The corrective action assignment for CR M2-00-2347 was to have the system engineer observe the next two periods of pump operation.

The next operation of the TDAFW pump was a regularly scheduled surveillance test performed on September 20, 2000. During the test, the turbine was started and warmed at its minimum operating speed of approximately 1400 rpm. Following the warm-up, control room operators were unable to increase turbine speed above its starting speed through operation of the TDAFW pump speed control switch. The discharge pressure of the pump at that speed was less than 200 psig, which was insufficient pressure for the pump to provide feedwater to the steam generators. The licensee declared the pump inoperable and documented the surveillance test failure in CR M2-00-2595.

The TDAFW pump speed control switch in the control room operates a speed control servo motor mounted on the turbine governor. The servo motor is connected through

reduction gears and a mechanical coupling to the manual speed control knob on the Woodward PG-PL governor, which positions the governor steam valve. The manual speed control knob is held on the governor shaft by a self-locking nut and Belleville washers. The knob is keyed to the shaft through an outward bend in the clutch spring that engages a groove on the inner surface of the knob.

Following the surveillance test failure, the licensee disassembled the speed control servo motor and the associated coupling under work order M2-00-16776. The mechanic performing the disassembly found the self-locking nut loose and the outward bend in the clutch spring sheared off. Because of the lack of engagement between the manual speed control knob and the governor shaft, the servo motor could not turn the governor shaft. The inspector concluded that this failure mechanism would not readily allow recovery of the pump by local manipulation of the speed control knob.

Criterion XVI "Corrective Action," of 10 CFR 50, Appendix B, requires, in part, that conditions adverse to quality be promptly identified and corrected. The cause of significant conditions adverse to quality must be identified and corrective actions taken to preclude recurrence.

Contrary to the above, between August 23, 2000, and September 20, 2000, with the plant in Mode 1, the licensee failed to promptly correct a significant condition adverse to quality involving failure of the speed control mechanism for the TDAFW pump. The licensee failed to take prompt corrective action to identify the cause of the unresponsive speed control mechanism consistent with the component's importance to safety, as evidenced by the lack of troubleshooting or additional testing between a regularly scheduled surveillance test on August 23, 2000, and the next regularly scheduled surveillance test performed on September 20, 2000.

Consequently, on September 20, 2000, the TDAFW pump failed to respond to demand for an increase in speed from its starting speed of about 1400 rpm. The discharge pressure of the pump operating at its starting speed was insufficient to provide feedwater to the steam generators and operators were unable to raise turbine speed. This failure to take prompt corrective action is an apparent violation of Criterion XVI, "Corrective Action," of 10 CFR Part 50, Appendix B **(AV 50-336/2000-011-01)**.

The inspector and a Region I Senior Reactor Analyst (SRA) evaluated this condition using the NRC's Significance Determination Process (SDP). The inspector assumed that the exposure time was equal to one-half the time from the last successful surveillance test, 14 days. Based on the location of the speed control mechanism failure, the TDAFW pump was not considered recoverable. For a transient with a loss of main feedwater, the Phase 2 SDP classified this condition as one of low to moderate safety significance (White). The SRA performed a confirmatory Phase 3 analysis that also classified the condition as one of low to moderate safety significance. In the Phase 3 analysis, sequences initiated by a loss of a DC bus, a transient with a loss of main feedwater, and a loss of off-site power were identified as dominant contributors.

.2 <u>Common Switchgear Cooling System for Redundant Trains</u>

a. Inspection Scope

The inspector reviewed Operability Determination M2-023-00, which evaluated a possible single failure condition where two trains of vital switchgear may become inoperable when the "swing" 4160 VAC bus, Bus 24E is aligned to the "B" train 4160 VAC bus, Bus 24D. A failure of the lower 4160 VAC switchgear room cooling system could cause a loss of both trains because the "A" train 4160 VAC bus, Bus 24C, and Bus 24E are both located in the lower switchgear room. The inspector also reviewed supporting technical evaluation M2-EV-99-0093, Rev. 2, "Compensatory Measures to Use during Loss of Cooling/Ventilation Systems Supporting Vital Switchgear Rooms." The inspector verified that the licensee had an adequate basis for continued operability of the affected switchgear in that:

(1) With complete implementation of compensatory measures, an evaluation of room temperature changes following the limiting postulated high-energy line break event indicated that the lower switchgear room would remain below the switchgear design temperature.

(2) Although the compensatory actions included manual actions in response to a high-energy line break, the manual actions were not found to increase the probability of switchgear failure because the operation of components supplied by Bus 24E is limited to infrequent maintenance activities.

b. Findings

There were no findings identified during this inspection.

.3 "A" Charging Pump Water Hammer

a. Inspection Scope

The inspector reviewed Operability Determination MP2-030-00, which addressed continued operability of the "A" charging pump after it had experienced intermittent water hammer and indications of degraded discharge pressure and flow. The inspector verified that the licensee had an adequate basis for the continued operability of the "A" charging pump in that:

(1) The licensee identified a loosely seated internal suction check valve in the positive displacement pump block and reseated the valve.

(2) Following the reinstallation of the internal suction check valve, the pump was operated for two days, including heatup and cooldown cycles, without recurrence of the water hammer noise or the pressure and flow degradation.

b. Findings

There were no findings identified during this inspection.

1R17 Permanent Plant Modifications

Modification to “C” Reactor Protection System Calibration Indication Panel Drawer

a. Inspection Scope

The inspector reviewed design change notice DM2-00-0967-99 and associated circuit diagrams with the cognizant system engineer. The inspector verified the modification retained the correct circuit configuration, provided updated circuit drawings, and was consistent with the plant licensing basis. The inspector confirmed that on-line implementation of the modification would not adversely affect operations and was consistent with Unit 2 Technical Specifications.

b. Findings

There were no findings identified during this inspection.

1R19 Post Maintenance Testing

.1 (Closed) LER 50-336/2000-014-00: Inadequate Oil Level in “C” HPSI Outboard Bearing

a. Inspection Scope

The inspector reviewed the events surrounding the licensee’s discovery that the “C” High Pressure Safety Injection (HPSI) Pump had little or no oil in the outboard bearing. The inspection included a review of the HPSI pump oil issues as detailed in LER 50-336/2000-014-00, “Low Oil Level in “C” HPSI Outboard Bearing,” and a review of maintenance activities and post-maintenance testing involving the “C” HPSI pump bearings.

The inspector reviewed the referenced LER which described the event of August 3, 2000, in which a plant equipment operator identified that the outboard bearing housing lacked adequate oil to maintain the bearing coated with oil during routine surveillance on the “C” HPSI Pump. The licensee concluded that pump operation for greater than 4 hours with the available oil inventory was questionable. The lack of adequate oil resulted from a combination of inadequate maintenance procedures to ensure the automatic oil makeup bubbler was functioning properly following maintenance to address oil leaks and the design of the bubbler, which allowed an internal component to block makeup flow to the bearing. Although the pump was not available to perform its long-term cooling function for a moderately long period, the condition was found to be of very low safety significance due to the availability of a spare pump that could be easily placed in service.

The inspector reviewed work orders implemented on the “C” HPSI pump since January, 2000, to identify work activities that could have contributed to the lack of adequate oil.

Corrective maintenance work order M2-99-08720, conducted July 6, 2000, which addressed oil leaks associated with the outboard bearing oil bubbler was reviewed. The work order completion notes state that, after draining the bearing housing, the oil bubbler fittings were checked for tightness and the outboard bearing housing was refilled using Maintenance Form 2701F-P41, “Lubrication Information Sheet (High Pressure Safety Injection Pumps).” This procedure required the bearing oil to be added via the bubbler housing and relied on the position of the glass bulb on the oil bubbler to establish an adequate oil inventory in the bearing housing. However, neither the work order nor the maintenance form provided specific instructions verifying that the position of the oil bubbler was representative of the actual oil level in the bearing housing or that oil had actually flowed from the bubbler into the bearing housing. Also, the associated post-maintenance testing did not identify the lack of adequate oil inventory due to adequate residual lubrication being available for short-term operation of the pump.

The inspector reviewed condition report (CR) M2-00-2207 that described the inadequate oil condition, the associated root cause investigation report, and LER 2000-014-00. The licensee’s investigation identified that the root cause was inadequate design of the oil bubbler assembly in that the pipe entering the bottom of the bubbler extended beyond the threaded fitting such that the pipe made contact with a flat disc associated with the bubbler internal height adjustment mechanism. The contact between the disc and the oil feed pipe blocked oil flow to the bearing. The licensee implemented comprehensive corrective action to address this particular condition by inspecting all pumps to ensure the oil feed pipe was not obstructed and replacing the flat disc with a concave design where the oil feed pipe enters the bottom of the bubbler.

b. Findings

The licensee initiated condition report CR M2-00-2701 when the inspector identified that the corrective actions to ensure proper operation of the oil bubbler following maintenance was narrowly focused. The inspector observed that the licensee’s corrective actions only addressed verifying oil flow during filling of the HPSI pump bearing housings. Although proper operation of the oil bubblers affect numerous safety related pumps, specific measures to ensure proper operation of these other oil bubblers following maintenance were not provided.

The inspector and a Region I Senior Reactor Analyst (SRA) evaluated the event involving the "C" HPSI pump utilizing the NRC's Significance Determination Process (SDP). The licensee determined that operation of the “C” HPSI pump for greater than 4 hours was uncertain. Therefore, the “C” HPSI Pump would have been unable to perform its high pressure recirculation safety function for the period from July 6, 2000, to August 3, 2000, during which the plant was operating at 100 percent power. The inspector found that recovery of a failed HPSI pump by control room operators’ actions to place the spare HPSI pump in service was credible. The evaluation revealed that, with credit for recovery of a failed pump, the condition was of very low safety significance (Green).

Unit 2 Technical Specification 6.8.1.a requires that written procedures be established, implemented, and maintained for the activities described in Appendix A of RG 1.33, “Quality Assurance Program Requirements (Operation).” Section 9 of RG 1.33,

Appendix A, “Procedures for Performing Maintenance,” specifies that maintenance that can affect the performance of safety-related equipment be performed in accordance with written procedures or documented instructions appropriate to the circumstances. Maintenance procedure MP 2701F, “Lubrication,” along with Maintenance Form 2701F-P41, “Lubrication Information Sheet (High Pressure Safety Injection Pumps),” were inadequately implemented and maintained in that, following the performance of maintenance activities affecting the oil bubbler, the licensee did not verify oil flow from the oil bubbler reservoir into the bearing housing. This violation of Technical Specification 6.8.1.a. is being treated as a Non-Cited Violation **(NCV 50-336/2000-011-02)**, consistent with Section VI.A of the Enforcement Policy, issued on May 1, 2000 (65 FR 25368), in that the associated condition was of very low safety significance and was entered in the licensee’s corrective action program.

.2 Turbine-Driven Auxiliary Feedwater Pump

a. Inspection Scope

The inspector reviewed the post maintenance testing associated with work order M2-00-16676, which involved repairs to the turbine-driven auxiliary feedwater (TDAFW) pump governor speed control knob. Also, the inspector reviewed work order M2-00-16847, which involved an internal inspection of the governor after binding of the speed control coupling was experienced during testing associated with work order M2-00-16676. The inspector verified that the post-maintenance testing associated with the work orders, in conjunction with the internal inspection of the governor, provided adequate assurance that the governor speed control mechanism would perform its design function.

b. Findings

There were no findings identified during this inspection.

.3 Modification to “C” Reactor Protection System Calibration Indication Panel Drawer

a. Inspection Scope

The inspector reviewed the post maintenance testing associated with work order M2-00-07460, which involved a modification to remove the flow dependent setpoint selector switch from the “C” reactor protection system calibration indication panel drawer. The inspector reviewed design change notice DM2-00-0967-99 and verified that the operability of the affected circuits was adequately demonstrated by performance of selected portions of the following surveillance tests:

Procedure SP 2401FC	“RPS Channel “C” High Power Trip Test”
Procedure SP 2401GC	“RPS Channel “C” Bistable Trip Test”
Procedure SP 2401J	“Thermal Margin/Low Pressure Calculator Test”
Procedure SP 2601D	“Power Range Safety Channel and Delta T Power Channel Calibration”

b. Findings

There were no findings identified during this inspection.

.4 "A" Service Water (SW) Backflush Valve Incorrect Installation

a. Inspection Scope

The inspector reviewed the licensee's actions following the identification that the "A" service water strainer had been returned to service following maintenance with the ball valve for strainer backwash, valve 2-SW-90A, installed incorrectly such that it was providing continuous backwash of the strainer. The inspector reviewed work order M2-98-06788, which included the associated post-maintenance tests. The inspector reviewed condition report M2-00-2318 and the associated corrective actions and verified that the corrective actions were adequate to prevent recurrence.

b. Findings

There were no findings identified during this inspection.

1R22 Surveillance Testing

.1 "A" Auxiliary Feedwater Pump Testing

a. Inspection Scope

The inspector reviewed the results from a surveillance test conducted on the "A" auxiliary feedwater pump (AFP), performed in accordance with SP 2610A, "Motor Driven AFP Tests," and recorded on OPS Form 2610A-1, "Motor Driven AFP Operability Test, Facility 1." The inspector verified that test results were in compliance with the applicable technical specification acceptance criteria and equipment design bases, and verified that equipment operability was adequately demonstrated through performance of the test.

b. Findings

There were no findings identified during this inspection.

.2 Actuation Tests For Engineered Safety Features

a. Inspection Scope

The inspector reviewed the surveillance test results for engineered safety features (ESF) actuation modules identified in surveillance procedure SP 2604T, and recorded on OPS Form 2604T-1, "Actuation Tests of Various ESF Components, Facility 1." The inspector verified that the test results were consistent with the applicable technical specification acceptance criteria and that equipment operability was adequately demonstrated through performance of the test. The inspector also verified that the licensee's corrective actions were acceptable following their identification that specific conditions necessary for literal compliance with applicable acceptance criteria for actuation module AM520 were not met during past surveillance tests.

b. Findings

There were no findings identified during this inspection.

.3 Reactor Protection System High Power Trip Test

a. Inspection Scope

The inspector reviewed the surveillance test results for surveillance procedure SP 2401FC, “Reactor Protection System Channel ‘C’ High Power Trip Test.” The inspector verified that the test results satisfied the applicable acceptance criteria and that the test satisfied the requirements of Technical Specification 4.3.1.1.1 for a channel functional test.

b. Findings

There were no findings identified during this inspection.

2. RADIATION SAFETY
Occupational Radiation Safety [OS]

2OS1 Access Control to Radiological Significant Areas

a. Inspection Scope

During the period August 21-25, 2000, the inspector conducted the following activities to evaluate the operability and accuracy of radiation monitoring instrumentation that is used for the protection of workers.

The inspector reviewed the associated procedures and observed the calibration of a neutron survey instrument (REM 500), beta/gamma survey instrument (RO-20), high range underwater survey instrument (PR-2), and a high volume air sampler.

The inspector observed technicians performing radioactive source checks on a variety of instrumentation including a high range gamma survey meter (teletector), personnel contamination monitors (CM-11 & PCM-1B), contamination survey instruments (RM-14 and E-140N), beta/gamma survey instruments (RO-2 and RO-2a), an alpha contamination counter (SAC-4), a Unit-2 small article monitor, a Unit-2 germanium counting system, and a Unit-3 control room area monitor. The inspector performed independent operability checks of selected survey instruments staged for use in Units 2 and 3.

The inspector reviewed the calibration records for selected area monitors installed at various locations in Units 2 and 3. Included in this review were the Unit 3 control room area monitor, the Units 2 and 3 sampling room radiation monitors, and Unit 2 area monitors installed in the containment building, auxiliary building, and control room.

Additionally, the inspector evaluated the adequacy of the licensee's respiratory protection program regarding the issuance of self-contained breathing apparatus (SCBA) to licensed operators. Training and qualification records for operators authorized to wear SCBAs were reviewed. SCBAs staged for use at various locations in Units 2 and 3 were physically checked and the maintenance/surveillance records of selected SCBAs were reviewed.

The inspector reviewed radiological incidents documented in the following licensee condition reports, relating to the monitoring of plant radiation levels to determine if the issue was identified in a timely manner and that appropriate corrective actions were taken to address the issue:

M3-00-1666	Self-Assessment (MP-SA-00-099) identified areas for improvement in the radiation monitoring program.
M2-00-2182	Cross-contamination of Unit 2 nitrogen supply system
M2-00-1793	High radiation levels from solid radwaste and aerated liquid radwaste piping and components due to a recent resin transfer.
M2-00-2019	Radiation levels > 1R/hr found behind the -5' primary wall during the pre-job survey

b. Findings

There were no findings identified during this inspection.

Public Radiation Safety [PS]

2PS2 Radioactive Material Processing and Transportation

Background

In order to support the transfer of ownership of the Millstone facilities in accordance with various business-related commitments, the licensee is engaged in a process to assess the condition of the affected property relative to environmentally hazardous contaminants. The assessment effort included a physical survey of the property; and sampling and analysis of soils, water, and sediments for various environmental contaminants, including radioactive licensed materials.

[Note: This facility assessment effort was initiated by the licensee only to facilitate the transfer of the property to another qualified NRC reactor licensee, and was not specifically required by NRC regulatory requirements. Title 10 Code of Regulation, Subpart E–Radiological Criteria for License Termination, would require formal radiological characterization of the affected site in the case of license termination. However, since this property transfer does not involve license termination, this requirement is not applicable, at this time. Notwithstanding, the licensee is responsible to effectively control all licensed materials throughout the duration of licensed activities.]

On or about June 29, 2000, during the conduct of this environmental assessment, two sealed 55-gallon drums were found on the licensee's owner-controlled property. Upon

laboratory analysis of the contents, trace concentrations of cobalt-60 were detected in the material that was contained in the drums. The licensee documented the finding in their Condition Report system as CR M3-00-1737. Subsequently, this matter became a subject of public interest and concern; and was reported on by local and regional media.

The drums were found within the owner-controlled property, in the vicinity of a landfill that was previously used to support Millstone Unit 3 construction activities, and in a location that was overgrown with thick vegetation that would have made visibility of, and access to, the containers difficult. Subsequently, the drums were removed to an on-site waste processing and handling facility for content analysis, temporary storage, and preparation for eventual disposal in accordance with NRC regulatory requirements.

The drums contained what appeared to be dirt and various other types of debris, and weighed 286 and 370 pounds, respectively. Embossed markings on the drums indicated that they were manufactured in 1986. Such indication was considered by the licensee to bound the maximum amount of time that the drums could have been on the owner-controlled property, i.e., about 14 years.

Although there is no direct indication of where the material originated, the licensee suspects the material is ground sweepings or storm drain debris. Samples of the material were analyzed for radioactivity by the licensee. The laboratory analysis identified 0.24 picoCurie/gram (pCi/gm) and 0.07 pCi/gm of Co-60 in each drum, respectively. These concentrations are slightly above the licensee's lower limit of detection for soil and sediment of 0.04 pCi/gm, for Co-60. The total current radioactivity of both drums was determined to be about 0.04 microCuries (uCi).

Upon determining that the drums contained trace concentrations of licensed materials, the licensee and the Connecticut Department of Environmental Protection conducted extensive water and soil sampling of areas adjacent to where the drums were found, including soil, sediment and water from nearby creeks and wells. No radioactivity, distinguishable from normal background, was found in any of the samples. Other surveying of the property, which included core boring and well water sampling, did not indicate the presence of any detectable licensed materials.

a. Inspection Scope:

The inspector reviewed the licensee's and the State's analytical results of samples taken from the drums and the surrounding area, made independent confirmatory measurements from samples of soil and sediment taken in the affected areas, examined the licensee's data and analysis against current regulatory requirements, and reviewed the licensee's activities following the discovery of the drums.

b. Issues and Findings:

Independent NRC sampling and analysis of soil and sediment, and the results of radiological surveys did not detect any plant-related radioactivity in the areas immediate or adjacent to where the barrels were found. Though the drums were found on the licensee's owner-controlled property, considering the sealed condition of the drums, and the maximum total radioactivity that could have been present in the drums in 1986 (i.e., about 0.30 uCi, assuming a 14 year decay of cobalt-60), there is no reasonable manner in which the condition could have the potential to result in any significant public health and safety consequence. When found, the licensee appropriately responded to the condition by promptly and effectively controlling the material, analyzing the contents, and arranging for proper disposition. Appropriate authorities were notified.

Excepting the 1986 manufacture date of the drums, it remains unknown as to the origin of the material, and how and when the drums were initially deposited on the licensee's owner-controlled property. Notwithstanding, the inspector confirmed that the licensee's current practice and process requires laboratory analysis and characterization of all volumetric materials that have the potential of being contaminated with licensed materials.

Contrary to the requirements of 10 CFR 20.1802, the licensee did not control and maintain constant surveillance of licensed material that was in a controlled area (i.e., owner-controlled property) and not in storage. Notwithstanding, this condition did not have an actual or credible impact on safety, it was an isolated instance, and did not appear to be a programmatic defect. Considering the negligible health and safety significance associated with this finding, this failure constitutes a violation of minor significance and is not subject to formal enforcement action in accordance with Section IV of the NRC's current Enforcement Policy (NUREG-1600). This matter was documented in the licensee's problem identification and corrective action system as Condition Report number M3-00-1737.

Though no other items or conditions involving licensed materials were determined as of this inspection, the inspector confirmed that the licensee is continuing extensive efforts to assess the property for environmentally hazardous contaminants. These efforts will continue to be monitored by the licensee for radiological considerations.

3. SAFEGUARDS

Physical Protection [PP]

3PP4 Security Plan Changes

a. Inspection Scope (711130.04)

An in-office review was conducted of changes to the Millstone Physical Security Plan, identified as Revisions 36 and 37, submitted to the NRC on February 14 and May 22, 2000, in accordance with the provisions of 10 CFR 50.54(p). Based on the licensee's determination that the change did not decrease the overall effectiveness of the security plan and after limited review, no NRC approval was determined to be required.

b. Findings

There were no findings identified during this inspection.

4. OTHER ACTIVITIES [OA]

4OA1 Performance Indicator Verification

High Pressure Injection System and Residual Heat Removal System Unavailability

a. Inspection Scope

The inspector reviewed shift manager logs, system engineer unavailability data, and various corrective action program records related to the high pressure safety injection system and the shutdown cooling system, which performs the residual heat removal function, to determine the accuracy and completeness of the performance indicator (PI) data. The inspector verified the licensee's PI data relative to the reported values submitted to the NRC for the second calendar quarter of year 2000.

b. Findings

There were no findings identified during this inspection.

4OA2 Identification and Resolution of Problems

a. Inspection Scope

The inspector reviewed engineering action plans and condition reports to verify that problems requiring corrective actions were captured at an appropriate threshold and identified corrective actions were commensurate with the significance of the problem.

b. Findings

The NRC found that the licensee did not implement timely corrective actions in that, after operators initiated a condition report documenting that the speed control for the turbine-driven auxiliary feedwater (TDAFW) pump was unresponsive and erratic during routine surveillance testing, the licensee did not perform any troubleshooting or additional testing prior to the next scheduled surveillance test 28 days later. During that next scheduled surveillance test, control room operators were unable to increase the speed of the TDAFW pump above the its starting speed, which was insufficient for the pump to perform its design function. (Section 1R15.1)

The inspector noted development of an apparent trend related to untimely or incomplete measures to address known conditions affecting the operability of essential mitigation equipment. The following specific deficiencies have been noted within the last six months:

(1) In May 2000, the NRC identified that the licensee's took incomplete corrective actions when multiple reactor building closed cooling water system relief valves lifted during pump starts under conditions simulating a loss of normal power in that the licensee failed to address the increased probability of system failure created by lifting relief valves (NCV 50-336/2000-008-04).

(2) In August 2000, the NRC identified that the licensee had failed to implement timely corrective actions to ensure correct emergency diesel generator voltage regulator settings, which resulted in a second occurrence of low output voltage one year after the first occurrence (NCV 50-336/2000-009-03).

(3) In September 2000, the NRC identified that the licensee had not implemented timely corrective actions in response to operator identification that the turbine-driven auxiliary feedwater pump speed control was unresponsive and erratic (Section 1R15.1).

(4) In September 2000, the NRC identified that the licensee had not implemented complete corrective actions to ensure proper operation of safety related pump bearing oiler bubblers. Although the oil bubblers affect numerous safety related pumps, measures to address proper operation of oil bubblers following maintenance were limited to the HPSI pump bearing housings (Section 1R19.1).

These issues have a related cause in that they represent known degraded conditions that were addressed incompletely or in an untimely manner. They also have a direct impact on safety because of the increased potential for or actual failure of important event mitigation equipment. This performance trend is considered a substantive cross-cutting issue, separate from the individual issues, and is considered a finding (FIN 50-336/2000-011-03).

4OA4 Cross-cutting Issues

Human Performance Issues Related to Post-Maintenance Restoration and Testing

a. Inspection Scope

The inspector reviewed human performance issues related to the restoration of equipment to service following maintenance.

b. Findings

During routine surveillance on the “C” high pressure safety injection (HPSI) pump, a plant equipment operator identified that the outboard bearing housing lacked adequate oil to maintain the bearing coated with oil. The licensee concluded that pump operation for greater than 4 hours with the available oil inventory was questionable. The NRC concluded that the lack of adequate oil resulted from a combination of inadequate maintenance procedures, which failed to ensure the automatic oil makeup bubbler was functioning properly following maintenance to address oil leaks, and the design of the bubbler, which allowed an internal component to block makeup flow to the bearing. (Section 1R19.1)

The inspector noted development of an apparent trend related to inadequate post-maintenance restoration and testing activities. The following specific deficiencies have been noted within the last six months:

(1) In May 2000, the NRC identified that inadequate post-maintenance restoration and testing activities resulted in the subsequent common cause failure of both vital DC switchgear cooling trains (NCV 50-336/2000-008-02).

(2) In May 2000, the NRC identified that appropriate post-maintenance and periodic tests had not been developed to ensure adequate train independence for the reactor building closed cooling water system (NCV 50-336/2000-008-05).

(3) In September 2000, the NRC identified that inadequate post-maintenance restoration and testing activities resulted in the “C” high pressure safety injection pump being in an undetected degraded state for 28 days, in that the outboard bearing of the pump lacked adequate oil for long-term operation (Section 1R19.1).

These issues have a related cause in that they represent inadequate human performance in identifying and implementing necessary measures to ensure equipment will perform acceptably in service. They also have a direct impact on safety because of the potential or actual existence of undetected conditions that could prevent satisfactory performance of necessary event mitigation functions. This performance trend is considered a substantive cross-cutting issue, separate from the individual issues, and is considered a finding (FIN 50-336/2000-011-04).

4OA5 Other

.1 (Closed) LER 50-336/2000-007-00: On April 22, 2000, the licensee identified that the closing capability for valve 2-SI-651, the outboard shutdown cooling system suction isolation valve, had not been disabled with the plant in Modes 1, 2, and 3, as required by the licensee's Appendix R Compliance Report. The valve closing capability is disabled by removing the closing coils from the motor controller for this valve to ensure a fire-induced hot-short would not cause the valve to fail in the closed position. The licensee implemented a design change in early 1999 that relocated the valve motor controller, but the modification had not resulted in corresponding changes to equipment labels and operating procedures. As a result, from March 1999 to April 2000, electricians had been removing coils from the abandoned motor controller, which failed to disable the closing capability of the valve. This failure to translate design changes into appropriate procedures is considered a violation of Criterion III, "Design Control," of 10 CFR Part 50, Appendix B. The inspector evaluated this condition using the significance determination process and found the condition to be of very low safety significance (Green) in that it would not prevent the plant from being maintained indefinitely in hot shutdown. This violation is being treated as a Non-Cited Violation **(NCV 50-336/2000-011-05)**, consistent with Section VI.A of the Enforcement Policy, issued on May 1, 2000 (65 FR 25368), in that the associated condition was of very low safety significance and was entered in the licensee's corrective action program as condition report M2-00-0939.

.2 (Closed) LER 50-336/2000-008-00, 01: On May 7, 2000, during restoration from a loss of normal power (LNP) test with the unit shutdown in Mode 6 (refueling), an inadvertent auto start of the 'A' emergency diesel generator (EDG) occurred. The EDG start occurred when the EDG local alarm reset button was pushed after normal offsite power was restored to the 4160 VAC bus. The licensee determined that the EDG started per its design and system alignment. The cause of the EDG start was an inappropriate switch alignment that occurred during the resetting of the EDG local alarm reset button. There was no safety significant impact on the operation of the EDG, the unit, normal offsite power sources, or emergency power sources. Corrective measures were addressed in condition report (CR) M2-00-1235, which included general operator training upgrades, a procedure change and other specific remediation measures. Because of successful surveillance results prior to and after this event, the failure to establish and implement an adequate technical specification (TS) required surveillance procedure was considered a violation of minor significance and is not subject to formal enforcement action.

.3 (Closed) LER 50-336/2000-009-00: On May 31, 2000, with the unit in Mode 2 (critical at 0 percent power), two enclosure building boundary doors located between an auxiliary building stair well and the main area of the auxiliary building were blocked open in support of plant painting activities. Operators did not recognize that the blocked open doors placed the enclosure building in an untested configuration and that they should enter TS limiting condition for operation (LCO) 3.6.5.2., Enclosure Building Integrity. While in this configuration, the plant was shutdown to Mode 3 and reentered Mode 2 for reactor startup. However, TS 3.0.4 prohibits entry into an operational mode when the conditions for the associated LCOs are not met. Corrective measures were addressed in condition report (CR) M2-00-1669, which included general operator training, work control procedure changes, and other specific remediation measures. Because of the short duration of the untested configuration, the presence of a set of closed doors that

maintained a barrier between the enclosure building and the auxiliary building stair well, and the ability to close the blocked open doors if required, the failure to meet TS 3.0.4 was considered a minor violation not subject to formal enforcement action.

.4 (Closed) LER 50-336/2000-012-00: This licensee event report (LER) relates to the common cause failure of both trains of vital DC switchgear cooling that the NRC has previously addressed in Section 1R12.1 of NRC Inspection Report 50-336/2000-008. Therefore, this LER is administratively closed.

.5 (Closed) LER 50-336/2000-013-00: On July 31, 2000, with the unit at 100% power in mode 1, the licensee identified two historical failures of the automated incore monitoring computer software program (INPAX) to perform TS required calculations of azimuthal power tilt (Tq). The failure to perform the TS 4.2.4.2 required surveillance existed for a total of approximately three days. The root cause of the event was a fault in the INPAX compiler program that was introduced during a software maintenance activity. Corrective measures were addressed in condition report (CR) M2-00-2173, which corrected the software deficiency, upgraded surveillance test procedures and verified that Tq met TS requirements immediately before and after the periods of interest. Because of successful surveillance results and the short time during which the surveillance was not implemented, the failure to perform the required TS surveillance was considered a minor violation not subject to formal enforcement action.

4OA6 Meetings, including Exit

.1 Resident Inspector Exit Meeting

The inspectors presented the inspection results to the Vice President - Generation and the Vice President - Nuclear Technical Services and other members of the licensee management at the conclusion of the inspection. The licensee acknowledged the findings presented.

ITEMS OPENED AND CLOSED

LIST OF ACRONYMS USED

AFP	auxiliary feedwater pump
AFW	auxiliary feedwater
AOPs	abnormal operating procedures
CR	condition report
EDG	emergency diesel generator
ESF	engineered safety features
HPSI	high pressure safety injection
LCO	limiting condition for operation
LNP	loss of normal power
INPAX	automated incore monitoring computer software program
OP	operating procedure
pCi/gr	picoCuries/gram
RPS	reactor protection system
SCBA	self contained breathing apparatus
SDP	significant determination process
SRA	senior reactor analyst
SP	surveillance procedure
SRA	senior reactor analyst
SW	service water
TDAFW	turbine driven auxiliary feedwater
Tq	azimuthal power tilt
TS	technical specification
uCi	microCuries

ENCLOSURE 2

U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Docket No.:	05000423
License No.:	NPF-49
Report No.:	05000423/2000-011
Licensee:	Northeast Nuclear Energy Company
Facility:	Millstone Nuclear Power Station, Unit 3
Location:	P. O. Box 128 Waterford, CT 06385
Dates:	August 13, 2000 - September 30, 2000
Inspectors:	A. C. Cerne, Senior Resident Inspector, Unit 3 B. E. Sienel, Resident Inspector, Unit 3 T. A. Moslak, Health Physicist, Division of Reactor Safety (DRS) G. C. Smith, Senior Physical Security Inspector, DRS E. W. Lawrence, Reactor Inspector, DRS [in training]
Approved by:	James C. Linville, Chief Projects Branch 6 Division of Reactor Projects

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SUMMARY OF FINDINGS

IR 05000423/2000-011; on 08/13-09/30/00; Millstone Nuclear Power Station; Unit 3.

The inspection covered a seven-week period conducted by both resident and regional inspectors per the NRC's revised reactor oversight process (see Attachment 1). The significance of an issue or finding is indicated by its color (green, white, yellow, red) which is determined by the Significance Determination Process.

There were no significant findings identified during this inspection.

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SUMMARY OF UNIT 3 STATUS

The plant operated at approximately 100 percent power throughout the inspection period.

1. REACTOR SAFETY (Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity)

1R04 Equipment Alignments

a. Inspection Scope

During planned maintenance on the “A” train of the quench spray system, the inspector verified the correct alignment of the “B” train equipment. In addition, the inspector verified the “A” train was restored properly following maintenance. The inspector performed the partial walkdowns by comparing actual equipment alignment to approved licensee piping and instrumentation diagrams to confirm correct system lineup.

The inspector also performed partial system walkdowns of both trains of the emergency core cooling system (ECCS) safety injection and charging system equipment alignments. These equipment alignment walkdowns were accomplished considering the emergency operating procedure (EOP) directions for aligning components to a “piggy-back” mode of operation during the recirculation phase of a postulated loss of cooling accident (LOCA). This system alignment inspection was performed, coincident with a review of EOP 35 ES-1.3, Transfer to Cold Leg Recirculation, Revision 8, because the establishment of ECCS sump recirculation following a LOCA is ranked from a risk perspective as the top operator action in mitigating core damage at Millstone Unit 3.

b. Findings

There were no findings identified during this inspection of equipment alignment.

1R05 Fire Protection

a. Inspection Scope

The inspector performed walkdowns of the areas of the engineered safety features (ESF) building housing the “A” quench spray, safety injection, and residual heat removal pumps and associated valves and heat exchangers (collectively Fire Area ESF-6) and the areas containing the complementary “B” train equipment (collectively Fire Area ESF-3). The inspector confirmed that fire detection and suppression equipment located in the areas were as specified in the Millstone 3 Fire Protection Evaluation Report (FPER). The inspector noted no compensatory measures (i.e. hourly fire roves) were required to be implemented, in accordance with the Unit 3 Technical Requirements Manual, for degraded or out of service equipment in these areas.

Additionally, in conjunction with the inspection of the equipment used in the EOP response to LOCA conditions, documented above, the inspector performed walkdowns of fire areas in the auxiliary building. In particular, Fire Area AB-1, Zone D, was inspected because it contains both safety trains of charging pumps and reactor plant component cooling (CCP) pumps. This equipment collectively provides cooling protection for the reactor coolant pump (RCP) seals, the failure of which is a major contributor to the potential core damage frequency caused by consequential small-break LOCA events. Fire Area AB-6, Zone A, was also inspected because the third (i.e., spare) centrifugal charging pump can only be aligned with a safety-related electrical train using equipment in this zone. In accordance with the Unit 3 FPER, the inspector confirmed the availability of a closed head, wet pipe sprinkler system within area AB-1, Zone D, for establishing a water curtain between the charging and CCP pumps, thus providing a fire protection capability designed to prevent a RCP seal LOCA event.

During a self assessment of the fire protection program for Fire Area AB-1, Zone D, the licensee identified a section of train "B" charging pump power cable routed through conduit on the reactor plant component cooling water (CCP) side of the water curtain. This was documented in condition report, CR M3-00-2723, with compensatory measures implemented in accordance with Unit 3 Technical Requirements Manual. Notification of this condition outside the plant's design basis was made to the NRC, in accordance with 10 CFR 50.72, on September 28, 2000. Further evaluation of this item is planned upon issuance of the licensee event report.

b. Findings

There were no findings identified during this inspection.

1R07 Heat Sink Performance

a. Inspection Scope

Based upon a recent history of maintenance problems with the control building chilled water (HVK) system (i.e., ventilation cooling) and the importance of this safety-related support system to the operability of vital electrical supply and instrumentation in the control building complex, the inspector witnessed the conduct of the train "A" HVK condenser thermal performance test. This test collects the necessary data for the evaluation of the air conditioning unit condenser heat transfer capability under design basis conditions, and is performed in accordance with the licensee program implemented in response to NRC Generic Letter (GL) 89-13. The inspector confirmed test conduct in accordance with both the governing special procedure, SPROC EN98-3-06 (Revision 20), and the normal HVK operating procedures. The test results (Technical Evaluation M3-EV-00-0045) were reviewed to verify data supporting both the system design performance criteria and the conclusion, consistent with GL 89-13 guidance, that the train "A" HVK condenser is capable of meeting heat removal requirements over the unit's next operating cycle.

b. Findings

There were no findings identified during this inspection.

1R11 Licensed Operator Requalification

a. Inspection Scope

The inspector observed a simulator session conducted as part of licensed operator requalification training. The inspector observed operator use of emergency and abnormal operating procedures in response to a failed circulating water pump followed by a loss of offsite power which occurred during a storm. The integration of plant equipment operator task assignments into this training session was noted. The inspector discussed the scenario and training objectives with training personnel and attended the trainees' critique following the scenario. Additionally, observation of a different operating shift crew participating in simulator training later in the inspection period was noted to include rotation of the crew members during different scenarios.

b. Findings

There were no findings identified during this inspection.

1R12 Maintenance Rule Implementation

a. Inspection Scope

The inspector reviewed licensee actions taken in response to the following condition reports (CRs). The CRs for the 125 Volt DC and the station blackout (SBO) diesel generator (DG) systems resulted in the systems being placed in a(1) status. The others required evaluation of a control building chilled water (HVK) chiller trip and reactor plant ventilation (HVR) dampers failing to close during a fire suppression system surveillance.

- M3-00-1455 The MRFF Criteria for the 125 Volt DC System Has Been Exceeded
- M3-00-1520 SBO Diesel Generator Exceeded Performance Criteria Due to Failure of SBO DG Ventilation Air Conditioning Unit
- M3-00-1568 Two Reactor Plant Ventilation Fire Dampers Did Not Close During CO2 Puff Test of West MCC/Rod Control Area (RCA)
- M3-00-1613 HVK Chiller 1A Tripped on Low Refrigerant Temperature

For each CR identified, the inspector reviewed the applicable system's maintenance rule scoping document, corrective actions taken in response to the equipment problem, and maintenance rule functional failure (MRFF) determination. The inspector confirmed that the licensee appropriately tracked the occurrences against the systems' performance criteria, both for functional failures and unavailability time.

In addition, the inspector attended the licensee's maintenance rule expert panel meetings where the cause determinations for the 125 Volt DC and SBO DG were discussed to confirm licensee determinations were consistent with maintenance rule requirements. The inspector reviewed the approved a(1) action plans and discussed them with the responsible system engineers to confirm appropriate goals were set.

The inspector determined the licensee's MRFF determination for CR M3-00-1568 was incorrect. During a fire suppression surveillance on the East MCC/RCA on June 14, 2000, two HVR fire dampers were tested and successfully closed. The following day a similar surveillance, which also tested the same two dampers, was performed on the West MCC/RCA. During this test both dampers failed to fully close and therefore would not have performed their intended function. The licensee had originally determined that the failure was not a MRFF because the fire suppression system had been out of service between the two tests. However, since the system was not out of service for maintenance which would have affected the dampers, the failure was a MRFF. The licensee subsequently changed their determination and documented the issue in CR M3-00-2716. This issue does not constitute a violation of the maintenance rule since no change in the system's status will occur as a result of the additional MRFF, i.e., the system remains classified as a(2).

The inspector also examined the maintenance rule status of two additional systems: (1) the 120 volt vital instrument AC (VIAC) system, nearing the end of a two-year period in a(1) status, and (2) the hydrogen recombiner system (HCS), for which several CRs have documented assessments of whether the identified events constituted maintenance rule functional failures. For the VIAC system, the inspector reviewed the "system engineer system health report", noting event free operation of the four vital inverters and their associated alternate sources since October 1998. With respect to the HCS system, the inspector evaluated fifteen CRs to assess the licensee's determination of MRFF applicability. The HCS maintenance rule system basis document was also reviewed to determine whether an "in-scope" system function had been compromised by the specific problems documented in the applicable CRs.

b. Findings

There were no findings identified during this inspection.

1R13 Maintenance Risk Assessment and Emergent Work Evaluation

a. Inspection Scope

The inspector reviewed the licensee's corrective actions taken in response to CR M3-00-2244, which documented the potential to render both trains of emergency core cooling systems inoperable by working on a refueling water storage tank suction valve. This CR was selected based on the degradation of safety systems which would have resulted had the valve been worked and rendered inoperable.

During the review the inspector noted the CR had been closed without an investigation into the apparent cause of the issue, as required by the corrective action assignment. The licensee subsequently initiated CR M3-00-2742 to document the poor investigation and the licensee-identified fact that the initiator had not been provided feedback as requested.

The inspector also evaluated the immediate licensee corrective actions taken with respect to a spurious actuation of the "B" main transformer deluge system. At the time of this event, which was documented in CR M3-00-2251, surveillance testing of the "B"

reserve station service transformer was in progress. While the licensee's initial corrective measures precluded an immediate recurrence of the problem and provided adequate compensatory measures in accordance with the Unit 3 Technical Requirements Manual, such an event had the potential to trip the unit. In viewing this as a precursor to the initiation of an unplanned plant transient, the inspector noted plant management's prompt formation of an Event Review Team (ERT) to determine the causes of this event and develop corrective actions consistent with the team's investigation results. The final report of the ERT in response to this event was issued on August 31, 2000, and was subsequently reviewed by the inspector.

b. Findings

There were no findings identified during this inspection.

1R15 Operability Evaluations

a. Inspection Scope

Operability Determination (OD) MP3-017-00, Repeat Failures of Load Center UC Fuses Blowing, was initiated by the licensee this inspection period. The inspector verified that the engineering justification for operability was adequate and the subject fuses were replaced in a timely manner, thereby closing the OD.

b. Findings

There were no findings identified during this inspection.

1R19 Post Maintenance Testing

a. Inspection Scope

The inspector reviewed the completed documentation for post maintenance testing (PMT) performed on the "A" emergency diesel generator (EDG) C1A air compressor, worked under automated work order (AWO) M3-99-15787. The inspector reviewed the scope of the work activities and verified that the PMT planned and performed was appropriate to restore the operability of the air compressor.

The inspector also witnessed in-progress PMT activities associated with the following corrective maintenance/design change work order assignments:

- AWO M3-00-16736, addressing a failed hydrogen recombiner surveillance, documented in CR M3-00-2394,

- AWO M3-00-00839, involving a special flow and leakage test (SPROC EN00-3-02), associated with a design change (DCR M3-00-004) for groundwater removal in the containment recirculation system vaults.

Upon completion of the testing, the inspector examined the work areas to verify restoration of the affected systems to their full safety-related functionality. As

necessary, the completed status of the reviewed AWO work was discussed with the cognizant maintenance supervisors.

b. Findings

There were no findings identified during this inspection.

1R22 Surveillance Testing

a. Inspection Scope

The inspector reviewed licensee performance related to the following surveillance tests. The containment recirculation, quench spray, and service water systems were selected for review because they rank amongst the most significant contributors to the prevention of core damage for design-basis accident scenarios.

- SP 3606.1 & 3606.2 Containment Recirculation Pumps 3RSS*P1A & P1B Operational Readiness Tests in MODE 1, 2, 3, or 4
- SP 3609.9 Quench Spray Valve Operability
- SP 3626.4 Service Water Pump 3SWP*P1A Operational Readiness Test

Surveillance inspection activities included the observation of communications between the control room and field personnel and a sample review of the surveillance test results. Where applicable, design and licensing basis documents, such as FSAR change requests, calculation change notices, and safety evaluations in support of design changes, were reviewed to verify the test acceptance criteria in accordance with the design and in-service testing (IST) limits. The inspector also discussed the documented test results with system, design, and IST engineering personnel where necessary, to validate that the test objectives had been met.

b. Findings

There were no findings identified during this inspection.

a. Inspection Scope

The inspector reviewed the implementation details and controls for two temporary modifications (TM); one installed during the current inspection period and the other having remained actively in place since installation in 1996. The more recent TM is one of two similar modifications to the interlocks on the new fuel handling crane, which allowed fourteen additional spent fuel racks to be installed in the Unit 3 spent fuel pool. The inspector reviewed TM3-00-009 and its associated safety evaluation screening documentation, confirming the existence of positive means for preventing heavy loads from being carried over the in-place spent fuel. Field inspections and interviews with the cognizant engineering personnel were conducted to verify that the controls implemented with this TM were consistent with the special procedure (SPROC ENG00-3-03) used for the re-rack installation activities and were adequately assessed in the applicable safety evaluation (S3-EV-00-0066).

The inspector also reviewed TM 3-96-069, which authorized the acceptability of a nonconforming condition (NCR 396-318) for a valve in the service water system outlet piping of the cooling water supply to the train “A” emergency diesel generator. The inspector examined the field condition of the valve, reviewed the TM technical evaluation and safety screening documents, and assessed the engineering rationale for the continued functionality of the valve. Also, because of the lead time for a replacement valve delivery and the length of time this TM had been effective, the inspector confirmed the proper use of administrative controls in extending this TM until the next plant refueling outage.

b. Findings

There were no findings identified during this inspection.

2. RADIATION SAFETY

Occupational Radiation Safety [OS]

2OS1 Access Control to Radiological Significant Areas

Refer to NRC Inspection Report 05000336/2000-011, Section 2OS1 for specific details.

Public Radiation Safety [PS]

2PS2 Radioactive Material Processing and Transportation

Refer to NRC Inspection Report 05000336/2000-011, Section 2PS2 for specific details.

3. SAFEGUARDS

Physical Protection [PP]

3PP4 Security Plan Changes

Refer to NRC Inspection Report 05000336/2000-011, Section 3PP4 for specific details.

4. OTHER ACTIVITIES [OA]

4OA2 Identification and Resolution of Problems

Inspection activities in previous sections of this report had implications regarding the licensee's evaluation of problems, as follows:

- Section 1R12 - The licensee failed to identify a maintenance rule functional failure during their evaluation of the failure of reactor plant ventilation fire dampers to close during a surveillance. This demonstrated weak problem evaluation.

- Section 1R13 - The licensee did not evaluate the cause of a potential near miss during planned maintenance as assigned in their corrective action process. This demonstrated weak problem evaluation.

4OA5 Other

.1 (Closed) LER 50-423/2000-002: Technical Specification (TS) 3.0.3 Entry With Both Hydrogen Recombiner Trains Inoperable Due to a Radiation Monitor Failure. This event was discussed in Section 1R14.1 of NRC Inspection Report 050-423/2000-009. No new issues were revealed by the LER.

The inspectors determined that this condition was not the result of a performance issue. The licensee took appropriate actions and was able to restore the "B" train to an operable status within approximately 82 minutes, minimizing the significance of this condition, as well as allowing the operators to exit TS 3.0.3 and terminate the plant shutdown. This event and associated corrective actions are documented in the licensee's corrective action process as condition report (CR) M3-00-1860. No violation of NRC requirements was identified.

4OA6 Meetings, including Exit

.1 Resident Inspector Exit Meeting

The inspectors presented the inspection results to the Vice President - Generation and the Vice President - Nuclear Technical Services and other members of the licensee management at the conclusion of the inspection. The licensee acknowledged the findings presented.

ITEMS OPENED AND CLOSED

Opened

None

Opened and Closed During this Inspection

None

Previous Items Closed

50-423/2000-002	LER	Technical Specification 3.0.3 Entry With Both Hydrogen Recombiner Trains Inoperable Due to a Radiation Monitor Failure (4OA5)

LIST OF ACRONYMS USED

AWO	automated work order
CCP	reactor plant component cooling water
CR	condition report
DG	diesel generator
ECCS	emergency core cooling system
EDG	emergency diesel generator
EOP	emergency operating procedure
ERT	event review team
ESF	engineered safety features
FPER	fire protection evaluation report
GL	generic letter
HCS	hydrogen recombiner system
HVK	control building chilled water
HVR	reactor plant ventilation
IST	inservice testing
LOCA	loss of cooling accident
MRFF	maintenance rule functional failure
OD	operability determination
PMT	post maintenance testing
RCA	rod control area
RCP	reactor coolant pump
SBO	station blackout
TM	temporary modifications
TS	technical specification
VIAC	vital instrument AC

ATTACHMENT 1
NRC's REVISED REACTOR OVERSIGHT PROCESS

The federal Nuclear Regulatory Commission (NRC) revamped its inspection, assessment, and enforcement programs for commercial nuclear power plants. The new process takes into account improvements in the performance of the nuclear industry over the past 25 years and improved approaches of inspecting safety performance at NRC licensed plants.

The federal Nuclear Regulatory Commission (NRC) recently revamped its inspection, assessment, and enforcement programs for commercial nuclear power plants. The new process takes into account improvements in the performance of the nuclear industry over the past 25 years and improved approaches of inspecting and assessing safety performance at NRC licensed plants.

The new process monitors licensee performance in three broad areas (called strategic performance areas): reactor safety (avoiding accidents and reducing the consequences of accidents if they occur), radiation safety (protecting plant employees and the public during routine operations), and safeguards (protecting the plant against sabotage or other security threats). The process focuses on licensee performance within each of seven cornerstones of safety in the three areas:

Reactor Safety	Radiation Safety	Safeguards
● Initiating Events	● Occupational	● Physical Protection
● Mitigating Systems	● Public	
● Barrier Integrity		
● Emergency Preparedness		

To monitor these seven cornerstones of safety, the NRC uses two processes that generate information about the safety significance of plant operations: inspections and performance indicators. Inspection findings will be evaluated according to their potential significance for safety, using the Significance Determination Process, and assigned colors of GREEN, WHITE, YELLOW or RED. GREEN findings are indicative of issues that, while they may not be desirable, represent very low safety significance. WHITE findings indicate issues that are of low to moderate safety significance. YELLOW findings are issues that are of substantial safety significance. RED findings represent issues that are of high safety significance with a significant reduction in safety margin.

Performance indicator data will be compared to established criteria for measuring licensee performance in terms of potential safety. Based on prescribed thresholds, the indicators will be classified by color representing varying levels of performance and incremental degradation in safety: GREEN, WHITE, YELLOW, and RED. GREEN indicators represent performance at a level requiring no additional NRC oversight beyond the baseline inspections. WHITE corresponds to performance that may result in increased NRC oversight. YELLOW represents performance that minimally reduces safety margin and requires even more NRC oversight. And RED indicates performance that represents a significant reduction in safety margin but still provides adequate protection to public health and safety.

The assessment process integrates performance indicators and inspection so the agency can reach objective conclusions regarding overall plant performance. The agency will use an Action Matrix to determine in a systematic, predictable manner which regulatory actions should be taken based on a licensee's performance. The NRC's actions in response to the significance (as represented by the color) of issues will be the same for performance indicators as for inspection findings. As a licensee's safety performance degrades, the NRC will take more and increasingly significant action, which can include shutting down a plant, as described in the Action Matrix.