U.S. NUCLEAR REGULATORY COMMISSION

REGION 1

DOCKET/REPORT NOS: 50-336/94-04; 50-423/94-04

LICENSEE: Northeast Nuclear Energy Company (NNECo)
P. O. Box 270
Hartford, Connecticut 06141-0270

FACILITIES: Millstone Units 2 and 3

LOCATION: Waterford, Connecticut

DATES: January 31 to February 11, 1994

INSPECTORS: James A. Prell — 3-10-94
James A. Prell, Sr Operations Engineer — Date
PWR Section, Operations Branch
Division of Reactor Safety

James S Stewart — 3-11-94
James S. Stewart, Reactor Engineer — Date
PWR Section, Operations Branch
Division of Reactor Safety

APPROVED BY: Glenn W. Meyer — 3-11-94
Glenn W. Meyer, Chief — Date
PWR Section, Operations Branch
Division of Reactor Safety

AREAS INSPECTED: An announced, regional initiative inspection was conducted of Millstone Units 2 and 3 operations and surveillance activities in accordance with inspection procedures 2515/71715 and 2515/61700. The inspection included an evaluation of the management programs used to ensure that work activities are conducted in a safe manner and that systems important to safety are maintained operable.

RESULTS: See Executive Summary

EXECUTIVE SUMMARY

Operations/Training

Training Facility - The training facility was in the process of developing and implementing new operator training programs. The inspector was not able to assess the effectiveness of these new programs but observed that communication channels and cooperation appeared to exist between the four units in the training facility and between the operating and training units. This cooperation has led to new initiatives in training that are innovative and should enable immediate identification of training deficiencies and their remediation.

Unit 3 - The Unit Director and Operations Manager have established and communicated clear objectives. Progress towards these objectives is closely monitored and controlled through several different programs such as the mini-department head meetings, the operations department work control meetings and the quality circle meetings. Shift Supervisor crew turnovers were very anticipatory in identifying and alerting crew members to potential problems caused by out of service equipment, mixed crews or planned tests.

Unit 2 - Improvement was noted in a more questioning attitude by the crews compared to the inspector's observations of two years ago. This more questioning attitude was observed during crew turnovers and testing of systems. The inspector identified programmatic weaknesses with the unit's work observation program and with the operations department management being in more of a reactive versus proactive mode of operation.

Although the four units in the training department have begun communicating and working together to better utilize effective training and administration methods, the same cannot be said of the site operating units. The inspector found a big disparity between Units 2 and 3 in the way in which they manage and control operations. Unit 3 exhibited better control over planned work activities and was very proactive in identifying and correcting problems.

Maintenance

Control room observations of surveillance testing revealed proper operator use and adherence to procedures, adequate independent verification of critical plant parameters, proper documentation of test results, and effective management oversight of activities. However, the inspectors determined that in one case at Unit 2, a surveillance malfunction was not adequately documented nor was timely and effective corrective action taken to preclude repetition. This failure has resulted in a violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action."

DETAILS

1.0 INSPECTION SCOPE AND OBJECTIVES

An announced control room and plant observation inspection was conducted of Units 2 and 3 in accordance with NRC inspection procedures 2515/71715 and 2515/61700. The object of this inspection was to make an evaluation of the management programs implemented by Northeast Nuclear Electric Company (NNECo) to assure that work activities are controlled and conducted in a safe manner and systems are maintained operable. The scope of the inspection included direct observation of plant operations and surveillance testing, review of records, and interviews with personnel. Among the programs that were evaluated were the licensed and nonlicensed operator training program, various management meetings, shift turnovers, and the work observation programs. In addition, the inspectors evaluated on-going work activities in the plant and control room such as valve lineups, tagging and operability testing.

2.0 MANAGEMENT CONTROL PROGRAMS

The inspector investigated programs used by Units 2 and 3 management for assuring that problems are identified and corrected, work is performed in a quality manner, and management expectations regarding quality and safety are clearly relayed to the operating crews. The inspector found weak implementation of the Unit 2 Work Observation Program. Unit 2 was also weak in anticipating potential operational and maintenance problems and in maintaining control over work activities.

2.1 Work Observation Program

The inspectors determined that Millstone Unit 3 has implemented an effective Work Observation Program, while the Millstone Unit 2 program has not been either fully developed or implemented. OA-5, Work Observation Program, is a station procedure that established a program for management observation of work activities at Millstone Station. Specifically the program provides management with a process for observing, reporting, evaluating, taking corrective action, and providing worker feedback on issues pertaining to work practices, and provides management with the information necessary to focus resources on priority issues. The inspector reviewed how this program was being implemented at the two units. This effort included observing a work observation in progress, reviewing completed work observation data sheets for both units for the month of November 1993 and interviewing the Unit 2 and Unit 3 work observation coordinators.

Unit 3 - Unit 3 Work Observation Program was well coordinated, monitored, and documented. The Unit Director has established a minimum number of work observations for each supervisor, including the operations manager. The Director monitored on a weekly basis the progress each supervisor was making towards meeting goals and the quality of each observation. A review of the records for November 1993 showed that each supervisor met or exceeded their goal. The majority of observations were conducted in the plant versus the control room, and procedural, safety, training, housekeeping, and other problems were

identified. Most of these identified problems were able to be corrected immediately. The work observation coordinator formalized follow-up of deficiencies identified by the supervisors in each department. The department manager then assigned people to complete the necessary corrective actions. In addition, the work observation coordinator has jointly participated in four work observations per week with the different departments.

Unit 2 - In the month of November 1993, 16 work observations had been conducted by eight different supervisors. Nine of these 16 observations were conducted by one individual, the majority were conducted in the control room, and the significance of the findings was minimal. In comparison, Unit 3 had performed over 50 work observations by 20 different individuals, including the Operations Manager, the majority were conducted in the plant, and the findings included identifying procedural inadequacies, training deficiencies, tagging problems and plant housekeeping and safety concerns. The inspector also determined that the Unit 2 plant and operations management had not closely monitored the program. The Unit 2 work observation coordinator performed a joint work observation with one of the departments about once every two weeks. The work observation coordinator had just begun formalizing the list of deficiencies.

The inspector observed a more questioning attitude by operating crew members in comparison to what was observed in an inspection two years ago. During shift turnovers and surveillance tests, the inspector noted crew members on a number of occasions, asking clarifying questions of shift management.

2.2 Other Management Programs

The inspector determined that Unit 3 had implemented several management programs that allowed for prompt identification of problems and effective corrective actions. Comparable programs could not be found at Unit 2. This finding was based primarily on the observation that Unit 3 shift turnovers were much more effective than those at Unit 2. Specifically at Unit 3, oncoming crews were not only made aware of equipment and operational problems but also were alerted to potential safety concerns associated with these problems. At Unit 2 the potential concerns were never addressed. A brief description of Unit 3's management programs follows.

2.2.1 Mini-Department Head Meeting

Unit 3 department head meetings are held twice weekly and have enabled management to closely monitor and maintain cognizance over corrective actions. During these meetings, the Unit 3 Director and his department managers reviewed the status of various programs being implemented. The inspector observed the meeting of February 9, 1994, which included discussions of the status of each department's procedure upgrade program, the status of all tagged out alarms in the control room and the status of all the systems tagged out of service. In addition, plant problems such as the corrective actions associated with the auxiliary boiler's ignition problems were discussed.

2.2.2 Operations Department Work Control Meetings

The inspector concluded that the Unit 3 daily operations department work control meeting provided a valuable exchange of information between the crew and operations management and allowed shift turnovers to be consistently proactive in alerting crews to potential problems. A similar exchange was not observed at Unit 2.

The daily operations department work control meeting was held to provide the shift supervisors with information regarding the activities of the unit and potential problems associated with those activities. The meeting allowed management to rank the work for the department's engineers and provided operating crews with information on operational concerns. The meeting also provided information to the planning group so that they could begin preparing for the next day's tagging, valve line-ups, and work orders. Each day's meeting included the shift supervisor, the operations department engineers, the operations representative to the Integrated Team Work Planning Meeting and both the Operations Manager and his assistant. The purpose of the meeting was to go over the day's activities based on the results of the unit's morning work planning meeting, try to plan for any activities that could be taken if the Unit experienced any unplanned downpower activities, and to plan for the next day's work activities. Potential coordination problems with other departments were identified and addressed.

2.2.3 Quality Circle Meetings

Unit 3 has recently instituted weekly quality circle meetings that provides the Operations Department management with information on potential personnel problems and contributes toward unit team building. These meetings are held in the control room and are attended by the operating crew, including the plant equipment operators (PEOs), the relief crew, and administrative personnel. During these meetings, concerns and problems outside the normal system concerns are discussed. During the meeting attended by the inspector, PEO qualification and training concerns were discussed, as well as some procedural problems. The meeting was run by the assistant operations manager who wrote down the concerns expressed and promised to get answers to the attenders by the next meeting.

2.2.4 Conclusion

The above programs at Unit 3 have been designed to identify potential plant problems and provide prompt and appropriate corrective actions. Management was involved in monitoring and maintaining these programs and making sure that identified problems are corrected. The inspector concluded that these programs were generally effective in controlling operational activities. Unit 2 had not instituted comparable programs, which appeared to be reflected in crew turnovers, acceptable but lower quality plant appearance, and fewer plant and procedural problems being identified and corrected.

3.0 TRAINING DEPARTMENT

3.1 Training Overview

The Millstone Nuclear Training facility has reorganized and standardized the operator training program for all four units. NNECo training management stated that the standardization of the training program and the development of new training initiatives would enable improved performance among the four units with regards to NRC-administered requalification and initial examinations. Millstone has developed several innovative programs for monitoring the effectiveness of the requalification training program. These programs are discussed below with the inspector's conclusions provided at the end.

3.2 Mentor Program

In this program, two instructors have been assigned to each crew. These instructors are responsible for identifying and correcting training problems with their assigned crew. They also provide any extra training requested by the crew, including simulator time. These instructors also spend some time with their crew while their crew is on shift in order to identify and correct any observed problems with the crew's performance. Motivation for making this program work is aided by tying 25% of the instructor's annual performance appraisal to how well their crew performs. Similarly, 25% of the crew's performance appraisal is determined by how well they perform in training.

3.3 Confidence-Weighted Testing Program

Each week the crew receives one 25 question written examination. The written examination uses a multiple answer format with three possible answers per question. The operators, however, must weigh their answer according to how much confidence they have in it. In reality there are about 13 choices available per question. To pass the test without any remediation requires the operator receive a grade of 90% or greater. An operator receiving a grade of less than 90% would require some form of remediation and reexamination - the worse the grade, the more stringent the remediation requirements.

3.4 Diagnostic Exams

Every crew has access to the computer exam bank and can generate an exam in any area where crew members want to strengthen their knowledge level.

3.5 Advanced Training Classrooms

In these classrooms, each student has an individual keypad that they use to answer instructor questions asked during lectures. On the instructor's desk is a monitor that immediately displays a summary of the student's responses. Thus, the instructor is provided immediate

feedback on the effectiveness of the training. Being required to answer questions asked during the lectures is intended to keep the students more involved in the classroom training.

3.6 Enhanced Simulator Critique Program

In this program, each crew has a weekly simulator examination that is video taped. After the examination, the crew reviews the video tape and then critiques itself. This is done under instructor supervision and is intended to motivate the students to be more self critical.

3.7 Management Training Program

Once per week, the shift supervisors and the senior control room operators from all four units meet together for management training techniques.

3.8 Conclusion

The inspector did not have the opportunity nor the expertise to assess the effectiveness of any of these programs. The inspector was, however, able to make the following assessment: Communication channels and cooperation appeared to exist between the four units in the training department and between the operating and training units. The cooperation now being exhibited between the units has led to new initiatives and training programs that are innovative and should enable the immediate identification of training deficiencies and their remediation.

4.0 SURVEILLANCE TESTS

The inspector directly observed numerous surveillance tests and found them to be done in an acceptable manner. Procedures were used and followed, briefings were held, and test results were correctly documented. However, during a review of past testing at Unit 2, problems were identified.

Unit 3

Surveillance test SP3646 A.7, Rev. 5, "AC Electrical Sources and Operability," which was related to the 'A' Emergency Diesel Generator (EDG) operability test, was properly conducted. During the test, plant equipment operators correctly used procedures during tagging and system alignment activities. The senior control room operator conducted a pre-test briefing of the test, including a review of the procedure steps. The control room operator displayed good knowledge of the procedure and the test he was performing.

The inspector witnessed surveillance test SP3606.1, Rev. 7, "Containment Recirculation Pump 3RSS.P1A Operation Readiness Test." The test was completed in a deliberate and controlled manner. In one instance, operating personnel clarified the procedure acceptably in that the control room operator asked a question to the senior control room operator who in

turn asked the shift supervisor. The shift supervisor then indicated that a clarifying change to the procedure would be made and authorized the test to continue. There were no problems noted by the inspector.

Unit 2

The following specific surveillance tests were observed:

SP2654 P, Rev. 0, "Weekly Inverter Ground Fault Surveillance,"

SP2613 B, Rev. 15, " 'B' Diesel Generator Operability Test,"

OP2346 A, Rev. 18, " 'A' Diesel Generator Operability Test,"

SP2610 A, Rev. 7, "Motor Driven Auxiliary Feedwater Pumps and Regulating Valves Operability Test,"

SP2610 B, Rev 10, "Turbine Driven Auxiliary Feedwater Pump Operability Test," and

SP21134, Rev 8, "Main Steam System Valves Operability Readiness Test."

Because of the auxiliary feedwater system importance to plant safety, records from surveillance testing SP2610 A and B, and SP21134 were reviewed for stroke time history, maintenance problems, and surveillance trending. There were no deficiencies identified.

Testing of Auxiliary Feedwater Valves

During review of plant incident reports, the inspector identified that a malfunction of auxiliary feedwater (AFW) valves 2-FW-43A and B, had been reported. On January 18, 1994, during operations monthly surveillance SP-2610-A, "Motor Driven Feedwater Pumps and Regulating Valves Operability Test," auxiliary feed regulating valve 2-FW-43A, failed to open for approximately 16 minutes following control switch positioning to the open position. Completing the procedure, the redundant valve, 2-FW-43B, was timed and opened in 60.3 seconds. The surveillance, which required only that the valves operate through one complete cycle, was signed as satisfactory without operator comment.

Engineering personnel normally involved in stroke time monitoring for safety related valves (i.e., inservice testing) were informed of the stroke times for the auxiliary feedwater regulating valves. For both valves, the normal stroke time was 45 to 55 seconds and the acceptable (Action) limit from the ASME, Section XI, inservice testing program was 60 seconds. The Millstone Unit 2 ASME program required that stroke times in excess of 60

seconds be resolved by declaration of valve inoperability, initiation of technical specification corrective actions, and documentation in a plant incident report. In this case, NNECo chose to complete only the last action.

Upon review, the inspector determined that the operating crews and management did not fully disposition the excessive stroke times for the valves. Work orders M2-094-0629 and M2-94-0630 were prepared and authorized to investigate and adjust valve settings as necessary to address the valve stroke times. This work, which involved repetitive valve cycling, was accomplished while the valves continued to be considered operable. Instrument air pressure applied to the controller was determined to be 100 psi. The valve manufacturer had suggested a maximum applied air pressure of 72 psig and stated that greater pressures could cause the valve disc to stick into the valve seat. NNECo investigation determined that the air pressure had been increased, in an uncontrolled change in plant configuration, sometime in 1992. The air pressure was reset within the 72 psig limit during the troubleshooting, both valves were then stroke tested, and normal stroke times were observed.

After reviewing the plant incident report and conducting interviews with station personnel, the following NRC concerns were identified:

1. Following the excessive stroke timing, the valves were not placed in a safe position to maintain the operable status of the auxiliary feedwater system and technical specification actions were not followed. The valves remained closed prior to and during troubleshooting;

2. The cause and extent of the malfunction was not determined prior to the conclusion of troubleshooting. Engineering personnel suspected that the malfunction was caused by creep of the valve disc into the seat or by air system debris or moisture. However, neither the valve disc nor the air controller were inspected. Also, accident positioning of the valve was not verified to ensure that suspected debris had not degraded the accident positioning of the valve. Diagnosis of the valve operation including spring tension, packing loading, and valve seat clearances while planned, had not been completed by February 11, more than three weeks later;

3. Surveillance Procedure SP2610A was signed as completed satisfactorily, without comment, following the excessive stroke times displayed by both regulating valves; and

4. Having found the operating air pressure of the tested valves above specification, and with suspected contamination of the instrument air system, no action was taken to assure the reliability of similar air controlled valves.

Station internal memorandum, EAD-93-083, NL-93-514, dated September 9, 1993, states, "Upon identification of a potential operability issue, we (NNECo) expect that a preliminary call on the issue will be made within 24 hours." On January 24, Unit 2 made a 50.72 report

stating that AFW may have been inoperable, but that an operability determination had not been made on January 18. On January 27, an update to the 50.72 report stated that the AFW valves would have responded to the accident signal. At the time of the inspection, an operability determination for the period of time following testing had not been conclusively made.

The failure of NNECo to assure that the cause of the malfunction was determined and corrective action taken to preclude repetition regarding the surveillance malfunction of 2FW-43A and B is a violation of NRC requirements stated in 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action." (VIO 50-336/94-04-01)

Resolution of the change in instrument air pressure applied to auxiliary feedwater valves, 2FW-43A and B, is unresolved pending further NRC inspection. This issue involves the 100 psi setting of instrument air applied to both AFW regulating valves, the change in configuration from the normal 72 psi, and the vendor's suggestion that pressure above 72 psi could cause a valve malfunction. (UNR 50-336/94-04-02)

4.0 EXIT MEETING

On February 10, 1994, an exit meeting was held with Mr. G. Bouchard and Mr. F. Dacimo and others of the Millstone staff. The above findings were discussed. The inspector noted that, since the four units at the training facility had begun communicating and working together, big improvements in the training program appeared to have been made. The inspector noted, however, that the large disparity in comparable management controls that exists between the on site operating units indicates a lack of communications and cooperation between the operating units. A list of key persons contacted during the inspection is provided below:

*	J. Becker	Operations Manager, Unit 2
*	G. Bouchard	Director, Unit 2
*	F. Dacimo	Director, Unit 3
	R. Heidecker	Manager, Operator Training, Units 1 & 2
*	F. Libby, Jr.	Supervisor, Assessment Services
*	D. Meekhoff	Supervisor. Operator Training, Unit 2
	D. Miller	Senior Vice President, Millstone Station
*	J. Ruttar	Operations Manager, Unit 3
*	J. Smith	Manager, Operator Training, Unit 3 & Haddam Neck

* Denotes those in attendance at the February 10, 1994, exit meeting held at Millstone Nuclear Power Station