

Northeast  
Utilities System

107 Selden Street, Berlin, CT 06037

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

May 26, 1994

Docket No. 50-336  
B14855

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

Millstone Nuclear Power Station, Unit No. 2  
Operational Events and Classification  
Informational Letter

Purpose

The purpose of this letter is to inform the NRC Staff of the results of Northeast Nuclear Energy Company's (NNECO) critical self-assessment of the operational and classification issues resulting from the April 20-23, 1994, Unusual Events (UE) at Millstone Unit No. 2. The corrective actions taken to date and those planned to be taken are presented. We believe that these actions demonstrate our commitment to the continued safe operation of Millstone Unit No. 2 and are sufficient to support such operation.

Summary

From April 20, 1994 through April 23, 1994, operational events occurred at Millstone Unit No. 2 which involved failure to properly implement the requirements of the Millstone Unit No. 2 technical specifications and the use of the emergency action level (EAL) tables to classify events. Difficulty in effectively referring to or applying these tables led to the failure to declare UEs as required by the Millstone Station Emergency Plan.

Our investigations, including a formal root cause evaluation, have identified two global root causes and a number of associated conclusions.

The root cause evaluation team (RCET) determined that the global root causes for the events of April 20 - 23, 1994, were: (1) failure to recognize the significance of safety related events, and (2) failure to perform a comprehensive review of the Emergency Plan Emergency Action Level (EAL) tables and perform the associated followup training.

Aool  
11

We believe that the actions taken to date and planned, including the implementation of the RCET's recommended short-term corrective actions as described in this letter, are sufficient to provide increased assurance of a conservative operational philosophy at Millstone Unit No. 2. The RCET's recommended long-term actions are being evaluated for implementation.

### Evaluations and Actions

In response to these events, NNECO implemented a number of actions to address and evaluate the performance issues associated with these events.

#### **Personnel Interviews:**

On April 25, 1994, investigation and fact-finding activities were initiated in response to the classification events. Because both events were related to EAL event classification, our emergency preparedness (EP) personnel were involved in the investigation activities. Personnel interviews were conducted with a number of Millstone Unit No. 2 Supervising Control Operators (SCO), Shift Supervisors (SS), Duty Officers (DO), and On-Site Directors of Station Emergency Operations (ODSEO) to determine their understanding of the operational events of April 20 - 23, 1994. A series of structured questions were utilized during these interviews to determine the adequacy of previous training and provide insight toward any necessary future changes. This effort was considered by the RCET.

#### **Human Performance Evaluation:**

A Human Performance Enhancement System (HPES) analysis was performed by a member of the Nuclear Safety Engineering Group. The HPES report was developed from personnel interviews, event and causal factor analysis, barrier analysis, procedure reviews, and event task analysis. The report to the Unit Director was divided into three sections: (1) the RCS leak, (2) the immovable CEA, and (3) Opportunities for Consideration. The HPES Coordinator was interviewed by the RCET and the results of this interview were incorporated, as appropriate, into their recommendations.

#### **EAL Training:**

Four EAL refresher training sessions were conducted on April 28 and April 29, 1994, to review the events which led to the difficulty in classifying the three UEs and to review and reinforce the proper use of the UE portion of the EAL tables. The Millstone Unit No. 2 personnel who attended the

training were SSs, SCOs, and DOs. After a discussion of the UE portion of the tables, the students completed a worksheet of five classification scenarios. A number of questions and suggestions were provided by those who attended these sessions. The answers to these questions will be provided to all Operations Department SROs prior to them taking the watch in Modes 1 or 2. Several EAL table changes have also been initiated to provide greater clarity. These activities were reviewed by the RCET and incorporated into their recommendations to the Unit Director.

The Millstone Unit No. 2 Operator Training staff has assessed the emphasis placed on event classification during simulator training sessions. Where appropriate, additional emphasis will be placed on the emergency preparedness aspects of the simulated events, regardless of the objectives of the simulator training session. Additionally, the simulator lesson plans will be reviewed to ensure that within the contents of the lesson plan is guidance to the instructor to ensure that the correct emphasis is placed on EP activities.

**Independent EP Assessment:**

At the request of the Director of EP, a staff member of the North Atlantic Energy Service Corporation provided independent assessment assistance in analyzing the Millstone Unit No. 2 events of April 20 - 23, 1994. He offered observations and recommendations for consideration. The RCET reviewed his report and incorporated the information, as appropriate, into their recommendations to the Unit Director.

**Reactor Theory/Technical Specification Knowledge:**

In light of the actions associated with the inoperable CEA, the need to assess the reactor theory and technical specification knowledge of Millstone Unit No. 2 SRO license holders was identified. Accordingly, a reactor theory examination was administered to Millstone Unit No. 2 Operations Department Senior Reactor Operator (SRO) license holders. The results of this examination identified the need for additional training in selected reactor theory areas. This training will be provided to all Millstone Unit No. 2 Operations Department SRO license holders prior to their assuming on-shift duties in operating Modes 1 or 2. An examination will be administered to determine the effectiveness of the training and successful completion of the examination will be required.

An additional diagnostic evaluation focusing on technical specification application, event classification, and reportability is being administered. The results of this examination will be factored into future training cycles.

In an effort to improve the overall performance of Operations Department on-shift personnel, a three-week Advanced Requalification Training (ART) program was developed and implemented. This was done prior to the events of April 20 - 23, 1994, in recognition of the need to provide additional, concentrated training to the operating shifts. This three-week program includes training on communications, integrated plant operations, mental data processing, procedure effectiveness, self-verification, and team work. The implementation of the ART program will continue until all operating crews have completed the program.

**Root Cause Evaluation Team:**

On May 10, 1994, the Unit Director formally established the root cause evaluation team. The RCET was tasked with reviewing or assessing the:

- operational aspects of the events,
- emergency preparedness aspects of the events,
- adequacy of Millstone Unit No. 2's root cause evaluation capability, and
- recurring Emergency Planning problems at Millstone dealing with event classification.

Attachment 1 contains the Root Cause Evaluation Team's Plan.

**Root Cause Evaluation Team Conclusions:**

The conclusions reached by the RCET are included in the RCET report provided as Attachment 2. The conclusions are segregated according to functional and departmental implications and relate to Operations, Emergency Planning, Training, and Management/Culture. These conclusions are based on the events, observations, and evaluations, described more fully within the body of the RCET report.

**RCET Recommended Corrective Actions:**

The Root Cause Evaluation Team has recommended that the short-term actions listed below be performed prior to

reactor startup. The actions taken or planned in response to each recommendation is indicated.

1. The Operations Manager should require all SRO licensed personnel to individually study the EAL tables to ensure that they understand the types of events which constitute a UE classification.

ACTIONS TAKEN/PLANNED: A comprehensive review of the EAL tables by all Operations Department SROs will be conducted prior to reactor startup.

2. The I&C department should develop a troubleshooting procedure for control rods that addresses how to determine whether a CEA is moving or not.

ACTIONS TAKEN/PLANNED: A troubleshooting plan has been developed for I&C personnel for use in troubleshooting CEA position problems.

3. The Technical Specifications should be completely reviewed by an Operations Department SRO to find any other technical specification action statements (TSAS) or surveillance activities that have insufficient procedures.

ACTIONS TAKEN/PLANNED: A review of the Section 3.0 Technical Specification Action Statements, to identify that adequate procedural guidance exists, is ongoing and will be completed prior to startup. A review of all Section 4.0 Technical Specification Surveillance Requirements was in progress for reasons unrelated to these events. This will continue as previously planned and is scheduled to be completed prior to startup from the 1994 refueling outage.

4. Procedural guidance should be developed which describes expected operator response when an inoperable CEA is found.

ACTIONS TAKEN/PLANNED: Abnormal Operating Procedure AOP-2556 has been revised to provide actions to be taken for CEA malfunctions, including immovable and untrippable CEAs.

5. The EAL tables should undergo a multidisciplinary review to find classification problems similar to the RCS leakage EAL problem.



ACTIONS TAKEN/PLANNED: NNECO will perform a review of the Millstone Unit No. 2 EAL tables, as recommended, prior to reactor startup.

6. Training and a written exercise should be conducted to ensure that all Shift Supervisors:
  - can correctly and conservatively classify a UE and make timely notifications;
  - will conservatively classify border-line reportable/not reportable events; and
  - can correctly apply entry into TS 3.0.3.

ACTIONS TAKEN/PLANNED: In addition to the EAL training previously discussed, NNECO is developing a number of classification scenarios to be administered to meet this recommendation. The scenarios will be administered, prior to reactor startup, as an examination to all on-shift Operations Department SROs. Individual failures will result in remediation prior to assuming on-shift SRO duties in Modes 1 or 2. Also, any generic weaknesses will be addressed via training conducted prior to reactor startup. As stated previously, a diagnostic evaluation regarding technical specification implementation, event classification, and reportability is being conducted. The results of this evaluation will be factored into future training cycles.

7. SRO knowledge of shutdown margin (SDM) should be tested with appropriate remediation provided.

ACTIONS TAKEN/PLANNED: A reactor theory examination was administered to all Operations Department SROs. This examination included questions regarding SDM. Based on the results of the examination, training was developed and administered to all Operations Department SROs, including training focused on SDM.

8. Management should request external support to provide an industry perspective to assist facility management in establishing a safe, prudent course of action for Millstone Unit No. 2 prior to startup.

ACTIONS TAKEN/PLANNED: As discussed in greater detail in the next section, additional resources

are being made available to each shift operating crew and a number of management personnel.

9. The Unit Director should make his expectations clear that the Shift Supervisor shall make all event classification decisions.

ACTIONS TAKEN/PLANNED: Meetings between the Unit Director and the Shift Supervisors are planned for May 27, 1994. During these meetings, the Unit Director's expectations with regard to classifications will be made clear. All Shift Supervisors will meet with the Unit Director for this purpose prior to assuming on shift responsibilities in Modes 1 or 2.

10. The failure mechanism for CEA #65 should be determined to ensure that a similar failure mechanism is not possible for other CEAs.

ACTIONS TAKEN/PLANNED: NNECO has determined that the failure of CEA #65 was due to the failure of a silicon control rectifier (SCR) in the power switch in the coil power programmer. Discussions with the NSSS vendor indicate that this failure is of extremely low probability. Accordingly, we plan no actions beyond normally scheduled maintenance and surveillance.

The RCET had long-term recommendations which are included in the RCET Report. The long-term recommendations will be evaluated for implementation. As part of this effort, we will evaluate the implementation of previously identified corrective actions stemming from the 1992 event classification difficulties.

#### **Management Actions:**

The Unit Director has reviewed the RCET Report and has decided to implement all of the recommended short-term actions, as described above, prior to unit entry into Mode 2. Note that the schedule for actions described in response to short-term recommendation number 3 differs, in part, from that recommended.

We recognize that the performance of Millstone Unit No. 2 is less than desired. In light of this, and recognizing that several managers have recently been appointed to their current positions, Millstone Station management is providing

additional resources to key areas within Millstone Unit No. 2. These resources are in the form of additional personnel who are assigned to assist both the on-shift crews (one advisor per shift crew) and key Millstone Unit No. 2 management personnel. These personnel have been obtained from other Northeast Utilities' nuclear units or departments and other utilities. It is important to note that these individuals are not being assigned responsibilities for the proper conduct of shift activities, or the proper management of department activities. As such, they have no authority regarding unit operations. These experienced individuals are being provided as an additional resource to the management personnel who are currently in key positions and will provide assistance and feedback based on their observations of activities and practices. Our current plans are to maintain these personnel in their advisory positions through the duration of the upcoming refueling outage. The on-shift advisors and the assistant for the Operations Manager will be in place prior to operations in Mode 2.

Millstone Unit No. 2 personnel were advised of these additional resources and other corrective actions, in meetings held on May 20, 1994. The meetings were conducted by the Millstone Unit No. 2 Director and the Senior Vice President, Millstone Station. At the meetings, it was made clear to all personnel that Northeast Utilities is committed to the safe operation of Millstone Unit No. 2. The assignment of personnel to assist in key areas is an example of that commitment. It is noteworthy that the decision to provide these additional personnel to Millstone Unit No. 2 management was made by the Unit Director before the RCET report was drafted. This action parallels one of the RCET recommendations, as do other actions taken by unit management independent of the RCET recommendations.

**Generic Implications:**

To help ensure similar misclassifications do not occur at Millstone Unit Nos. 1 and 3 and the Haddam Neck Plant, the lessons learned from the Millstone Unit No. 2 experiences have been shared with these other units.

In consideration of the Millstone Unit No. 2 stuck rod event, we identified the need to correct the previously-existing classification guidance at the Haddam Neck Plant.

Regarding the classification of the reactor coolant system leak, revisions are planned to the Millstone Unit Nos. 2 and 3 EALs to align the classification symptom/condition consistent with the technical specification actions.



U.S. Nuclear Regulatory Commission  
B14855/Page 9  
May 26, 1994

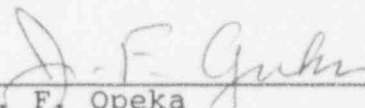
Conclusion

This letter has presented the results of our very critical self-assessment activities, short-term corrective actions, and long-term actions being considered. NNECO believes that the issues associated with the operational events and classification difficulties have been determined and that appropriate corrective actions have been taken to allow Millstone Unit No. 2 to safely return to power operation. We will remain vigilant to verify the effectiveness of our corrective actions and will take any additional corrective actions that are deemed necessary.

If you have any questions regarding these issues, please contact Mr. M. J. Wilson at (203) 665-3684.

Very truly yours,

NORTHEAST NUCLEAR ENERGY COMPANY

  
\_\_\_\_\_  
J. F. Opeka  
Executive Vice President

cc: T. T. Martin, Region I Administrator  
G. S. Vissing, NRC Project Manager, Millstone Unit No. 2  
P. D. Swetland, Senior Resident Inspector, Millstone Unit  
Nos. 1, 2, and 3