May 23, 1989

Docket No. 50-423

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Plant File

Mr. Edward J. Mroczka
Senior Vice President
Nuclear Engineering and Operations
Northeast Nuclear Energy Company
Post Office Box 270
Hartford, Connecticut 06141-0270

Dear Mr. Mroczka:

SUBJECT: COMMENTS ON THE NORTHEAST NUCLEAR ENERGY COMPANY RESPONSE TO GENERIC LETTER 88-17 WITH RESPECT TO EXPEDITIOUS ACTIONS FOR LOSS OF DECAY HEAT REMOVAL FOR MILLSTONE NUCLEAR POWER STATION, UNIT 3 (TAC NO. 69755)

Generic Letter (GL) 88-17 was issued on October 17, 1988 to address the potential for loss of decay heat removal (DHR) during nonpower operation. In the GL, we requested (1) a description of your efforts to implement the eight recommended expeditious actions of the GL and (2) a description of the enhancements, specific plans and a schedule for implementation of the six recommended program enhancements.

The NRC staff has reviewed your response to Generic Letter 88-17 on expeditious actions in the letter of December 23, 1988. We find that it appears to meet the intent of the GL but lacks some of the details represented in Enclosure 2 of GL 88-17. Your responses were for the most part complete but brief for some items and therefore did not allow us to fully understand your actions taken in response to GL 88-17. You may wish to consider several observations in order to assure yourselves that the actions are adequately addressed:

1. You have provided an extensive list of training related to reduced RCS inventory operation, where lowered loop operations are anticipated, with licensed and unlicensed personnel of your staff. In the GL this item was intended to include all personnel who can affect reduced inventory operation including maintenance personnel. Although you state that maintenance personnel do not receive NSSS classroom system training, you have indicated that avoidance of maintenance-related NSSS perturbation is achieved by supervisory control of maintenance activities. You have further stated that during plant outages, daily meetings are conducted among the various maintenance and operations activities. At these meetings the supervisor should inform the maintenance personnel of their possible harmful interaction with mid-loop operation. Precautions for avoidance of harmful interaction should be explained, including a background of past problems experienced at other plants and at Millstone Unit 3 if any.

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2. You state that a "... new general operating procedure on mid-loop operations will provide instructions on mid-loop containment closure. This procedure will require full mid-loop containment closure when the RCS is in reduced inventory until enough time after shutdown has elapsed to permit opening of the equipment hatch and working on containment penetrations. This time after shutdown will be based on the time needed to reestablish containment closure, decay heat generation and engineering calculations for the time to onset of core boiling and core uncovery. Should a mid-loop loss of residual heat removal (RHR) occur, the reestablishment of containment closure is covered in a revised emergency operating procedure." It is not stated if you have completed the necessary analysis yet. You have not presented any times for closure in the meantime. Generic Letter 88-17 states that "... containment penetrations including the equipment hatch, may remain open provided closure is reasonably assured within 2.5 hours of initial loss of DHR." This time will be less if there are vent areas totaling greater than one square inch in the cold leg (see Enclosure 2 Section 2.2.2 of GL 88-17).

3. In some plants, the quick closure of the equipment hatch is achieved by the installation of a reduced number of bolts. If you plan to use less than the full complement of bolts for sealing the equipment hatch then you should first verify that you can make a proper seal of the periphery mating surfaces to meet the closure criteria.

4. For the monitoring of core temperature conditions, you state that with the reactor vessel head in place, at least two independent core exit thermocouples (CETs) will be operational. You indicate that a process computer or alternate personal computer will communicate with both the inadequate core cooling (ICC) cabinets or the operator will be stationed at the ICC cabinet to monitor the CET temperature. No mention was made if the ICC will have alarm functions for the CETs.

5. For level measurement, you state that at least two-thirds of the following RCS level indications will be used: (1) a temporary level detection system monitored by a closed circuit TV located outside the control room, (2) a single channel of the reactor vessel level monitoring system (RVLMS) with eight discrete points above the core as shown in your Figure 1, and (3) a transmitter located off either the residual heat removal (RHR) or charging letdown line with a measurement range of 4 feet up from near the bottom of the hot leg as shown on your Figure 1.

   You state that the RVLMS provides continuous display and has three discrete measurement points corresponding to the top, centerline and bottom of the hot leg. The usefulness of the RVLMS for mid-loop operation is limited because of the wide spread of the discrete level points. The most useful RVLMS point for mid-loop operations is the one at the hot leg centerline level. This would be helpful for checking accuracy of the other two level system readings. You have not indicated if the RVLMS system has alarm capability or if the readings are periodically recorded if no alarm.

You have not indicated if the level system using a transmitter is automatically and continuously monitored and alarmed in the control room. If not, the level indications should be periodically checked and recorded by an operator.

6. You have not fully described the temporary level detection system with gauge glass and TV monitor. If it is a tygon tube installation, then walking the tygon tube following installation to verify lack of kinks or loop seals is necessary. Experience shows that periodic walkdowns are needed after installation. We recommend daily walkdowns when the tygon tube is in use, with an additional walkdown immediately prior to its being placed in use.

   When two instruments are in place, care should be taken to resolve any discrepancy between the two measurement systems. Also, the pressure of the reference leg should approximate the pressure in the void in the hot leg or be compensated to obtain a correct value.

7. For the expeditious action regarding provision of at least two available or operable means of adding inventory to the RCS that are in addition to pumps that are a part of the normal DHR systems, you have provided information on four means. Three of these means involve pumps; a charging pump, a safety injection pump and a dedicated containment recirculation pump, all taking suction from the refueling water storage tank (RWST). The fourth means is gravity feed from the RWST. For the charging pump, you indicate that it is to be lined up to discharge to the normal cold leg injection point. As alluded to in Enclosure 2, Section 2.2.2 of GL 88-17, if openings totaling greater than 1 square inch exist in the cold legs, reactor coolant pumps and crossover piping of the RCS, the core can uncover quickly when pressurized under loss of RHR conditions. If this situation should arise, it is generally more effective to inject makeup water into the hot leg rather than the cold leg. For the other pumps and gravity feed, you indicate that hot leg or cold leg injection is possible. When using gravity drain from the RWST a proper means for venting must be in place and verified by calculations (see next item).

8. You indicate that gravity feed from the refueling water storage tank (RWST) is a possible source for makeup to the RCS. You have not stated any specific opening to relieve pressure. The removal of a pressurizer manway or steam generator manway for example, is a means to provide RCS venting. Calculations need to be performed to verify the effectiveness of RCS openings, however, because even for relatively large hot side openings in the RCS, pressurization to several psi can still result. For example, with removal of a pressurizer manway, large steam flows in combination with flow restrictions in the surge line and lower pressurizer hardware may still lead to pressurization.

There is no need to respond to the above observations.

As you are aware, the expeditious actions you have briefly described are an interim measure to achieve an immediate reduction in risk associated with reduced inventory operation, and these will be supplemented and in some cases replaced by programmed enhancements. We intend to audit both your response to the expeditious actions and your programmed enhancement program. The areas where we do not fully understand your responses as indicated above may be covered in the audit of expeditious actions.

This closes out the staff review of your responses to the expeditious actions listed in the GL. The area of programmed enhancements will be addressed in a separate letter.

Sincerely,

for David H. Jaffe, Project Manager
Project Directorate I-4
Division of Reactor Projects I/II
Office of Nuclear Reactor Regulation

cc: See next page

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