UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

May 8, 1989

Docket No. 50-336

Mr. E. J. Mroczka
Senior Vice President
Northeast Nuclear Energy Company
Connecticut Yankee Atomic Power Company
P. O. 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 2 (TAC NO. 69754)

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 dated December 23, 1988. We find that it appears to meet the staff's intent 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 should be explained, including a background of past problems experienced at other plants and for Millstone Unit 2, if any.

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2. You indicate that analyses are currently ongoing to clarify NSSS transient response information and that procedures and administrative controls will be revised to address containment closure requirements. Your current estimated time for containment closure of 122 minutes was calculated with input that included a decay heat rate conservatively predicted assuming a decay time of 72 hours. As noted in GL 88-17, shorter closure times may be necessary if there are openings in the cold leg totaling greater than 1 square inch (see Enclosure 2, Section 2.2.2 of GL 88-17). Your analyses should be careful to include consideration of such potential openings.

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. In your addressing of containment closure, no information is provided regarding how you will keep track of and control the many potential openings which may have to be closed simultaneously. We assume your procedures and administrative controls will address this topic.

5. You have identified penetrations of concern as those "providing a direct path from the containment atmosphere to the outside atmosphere ...." However, we are concerned with all containment penetrations that could cause a release (e.g., penetrations from the containment into a fuel handling or auxiliary building).

6. In regards to temperature measurement, you have indicated that four of the eight heated and unheated pairs of thermocouples from each of the two channels (probe A and probe B) of the reactor vessel level monitoring systems (RVLMS) are in contact with the RCS inventory when drained to mid-loop conditions. According to Figure 2, these are located at four discrete locations in the core. These include heights equivalent to the centerline of the hot and cold legs to a location approximately 40 inches below. You plan to use at least one unheated thermocouple in each channel of the RVLMS to provide a representative core exit temperature. You indicate that the RVLMS readings are continuously displayed in the control room. However, you did not indicate if they also have continuous alarm capability or periodic recording if no continuous alarm. Also, the accuracy of the RVLMS thermocouples was not mentioned. It is not clear from your presentation if crosschecks against RVLMS thermocouples would be feasible with the shutdown cooling (SDC) system and core exit thermocouples.

7. You have indicated that two independent, continuous RCS water level indications are to be used for the reduced inventory condition. These are a RVLMS and a temporary tygon tube system. The RVLMS level measurement uses a single channel of the RVLMS and provides a continuous display of reactor vessel level at eight discrete points above the core.

As shown on your Figure 2, three of the discrete points correspond to the top, centerline and bottom of the hot leg. The lowest height that can be measured is approximately 40 inches below hot leg centerline. The accuracy of the RVLMS is not provided. Its usefulness for mid-loop operation is limited because of the wide spread of the discrete level points. The most useful point for mid-loop operation is the one at the hot leg centerline level which would be helpful for comparison against the tygon tube reading. You have not indicated if this system has alarm capability or if readings are periodically recorded if no alarm.

You indicate that the tygon tube level detection system will be monitored by closed circuit TV to provide continuous level indication in the control room. This system does not appear to be capable for alarms and you have not indicated the frequency of recording the readings in the control room. As shown in your Figure 1, the taps are located at the bottom of the hot leg and at a point in the piping interconnecting the top of reactor vessel head and the top of the pressurizer. From the diagram in your Figure 1, it cannot be determined if there are any problems related to the slopes of the vent piping. The pressure in the reference leg should approximate the pressure of the void in the hot leg or be compensated to obtain the correct value. From the gauge shown in Figure 1 and the span for the tygon tube reading shown in your Figure 2, it can be seen that the lower range of level reading extends only the limited amount of 15 inches below the centerline of the hot leg. Because the tap is shown to be at the bottom of the hot leg on Figure 1, it appears that the tygon tubing lower range could be extended further, if helpful. You have not indicated what the accuracy of the system is. When two instruments are in place, another precaution is to resolve any discrepancy in level between the two measurement systems.

8. 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.

9. You have indicated that your backup means for adding inventory to the RCS include using a HPSI pump and charging pumps. You state that these can be aligned for hot leg injection via auxiliary spray in the pressurizer surge line. Also, you are performing analyses to quantify the amount of makeup rate. If you plan to use a vent in the pressurizer for the operation, your calculation should include an analysis to check on the effect of countercurrent steam flow from the reactor through the hot leg into the pressurizer surge line. This steam flow could be sufficiently great to prevent any injected makeup water from downflowing from the pressurizer spray.

cc:

Gerald Garfield, Esquire
Day, Berry and Howard
Counselors at Law
City Place
Hartford, Connecticut 06103-3499

W. D. Romberg, Vice President
Nuclear Operations
Northeast Utilities Service Company
Post Office Box 270
Hartford, Connecticut 06141-0270

Kevin McCarthy, Director
Radiation Control Unit
Department of Environmental Protection
State Office Building
Hartford, Connecticut 06106

Bradford S. Chase, Under Secretary
Energy Division
Office of Policy and Management
80 Washington Street
Hartford, Connecticut 06106

S. E. Scace, Station Superintendent
Millstone Nuclear Power Station
Northeast Nuclear Energy Company
Post Office Box 128
Waterford, Connecticut 06385

J. S. Keenan, Unit Superintendent
Millstone Unit No. 2
Northeast Nuclear Energy Company
Post Office Box 128
Waterford. Connecticut 06385

R. M. Kacich, Manager
Generation Facilities Licensing
Northeast Utilities Service Company
Post Office Box 270
Hartford, Connecticut 06141-0270

D. O. Nordquist
Manager of Quality Assurance
Northeast Nuclear Energy Company
Post Office Box 270
Hartford, Connecticut 06141-0270

Regional Administrator
Region I
U. S. Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, Pennsylvania 19406

First Selectmen
Town of Waterford
Hall of Records
200 Boston Post Road
Waterford, Connecticut 06385

W. J. Raymond, Resident Inspector
Millstone Nuclear Power Station
c/o U. S. Nuclear Regulatory Commission
Post Office Box 811
Niantic, Connecticut 06357

Charles Brinkman, Manager
Washington Nuclear Operations
C-E Power Systems
Combustion Engineering, Inc.
12300 Twinbrook Pkwy
Suite 330
Rockville, Maryland 20852

10. You have not stated the use of any specific vent opening on the hot side of the RCS to relieve RCS pressurization. The removal of a pressurizer manway or steam generator manway, for example, are 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,

original signed by

Guy S. Vissing, 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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