NORTHEAST UTILITIES
THE CONNECTICUT LIGHT AND POWER COMPANY
WESTERN MASSACHUSETTS ELECTRIC COMPANY
HOLYOKE WATER POWER COMPANY
NORTHEAST UTILITIES SERVICE COMPANY
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December 11, 1989

Docket No. 50-423
B13110

Re: 10CFR50.90

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

Gentlemen:

Millstone Nuclear Power Station, Unit No. 3
Proposed Revision to Technical Specifications
Accumulators

Pursuant to 10CFR50.90, Northeast Nuclear Energy Company (NNECO) hereby proposes to amend its operating license, NPF-49, by incorporating the changes identified in Attachment I into the Technical Specifications of Millstone Unit No. 3.

Description of Change

The proposed technical specification change extends the interval that an accumulator can be inoperable due to boron concentration outside the required limit or for a reason other than a closed isolation valve. A potential probable cause of accumulator inoperability is boron dilution due to inleakage of the accumulator discharge check valves. The current Technical Specification Section 3.5.1 does not distinguish inoperable status of an accumulator due to reduced boron concentration from other inoperable conditions. The changes proposed herein to the ACTION statement (proposed ACTION statement 'c') would reflect this distinction. The completion time for restoring boron concentration has been changed from 1 hour to 72 hours. Also, if the boron content of the accumulators is out of specification, it is not possible to change boron concentration and confirm that the new concentration meets the limiting condition for operation (LCO) in one hour. Therefore, the allowed outage time for this condition has been extended from one hour to 72 hours. It is noted that technical specification requirements for restoration of boron concentration similar to those proposed herein have been accepted by the NRC on the South Texas Project (Docket No. 50-498).

In addition, the proposed Technical Specification change (proposed ACTION statement 'a') extends the interval that an accumulator can be inoperable for a reason other than boron concentration or a closed isolation valve. As currently specified, the one-hour restoration interval does not allow sufficient time to restore the inoperable accumulator to operable and therefore, could result in a plant shutdown. It is noted that technical specification

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requirements for the restoration of an inoperable accumulator, except as a result of a closed isolation valve or boron concentration, similar to those proposed herein have been accepted by the NRC on Seabrook 1 (Docket No. 50-443).

Following a design basis loss-of-coolant-accident (LOCA), borated water injection provides for heat transfer from the core and prevents excessive clad temperatures. The accumulators begin to inject borated water into the reactor coolant loops when the reactor coolant system (RCS) depressurizes to 615 psia. The final safety analysis report (FSAR) analysis assumes three of the four accumulators are needed along with the other emergency core cooling system components in the event of a design basis LOCA.

By extending the restoration interval from 1 hour to 8 hours (or 72 hours if the boron concentration is beyond the limits), the accumulator unavailability due to restoration is increased. Therefore, the frequency of a LOCA which requires accumulator discharge and the concurrent unavailability of an accumulator due to restoration (1 hour vs. 8 or 72 hours) was examined. This results in a slight increase in the frequency of accident sequences involving a LOCA with the concurrent unavailability of an accumulator due to the extended restoration interval as follows,

$$R = \text{Frequency of LOCA} \times Q_{\text{acc. repair}} \qquad \text{(Equation 1)}$$

To determine $Q_{acc.}$ repair, the unavailability of accumulators due to the extended restoration interval, different failure modes were examined such as premature opening of a relief valve, tank rupture and reverse leakage of check valves. These failure rates were used to calculate $Q_{acc.}$ repair.

For a 1 hour restoration period,

$$R_{1\ \text{hour}} = 9.99\text{E-}4/\text{yr} \times 3.75\text{E-}5$$

$$= 3.75\text{E-}8/\text{yr}$$

For an 8 hour restoration period,

$$R_{8\ \text{hour}} = 9.99\text{E-}4/\text{yr} \times 3.00\text{E-}4$$

$$= 3.00\text{E-}7/\text{yr}$$

The core melt frequency contribution due to a LOCA with concurrent maintenance unavailability of the accumulator increases by 2.63 E-7/yr. when the repair interval is extended to 8 hours. This increase is negligible (e.g., < .5%) when compared to the overall core melt frequency due to internally initiated events of 6.34E-5/yr.

Another change to the Technical Specifications involves extending the 1 hour restoration interval to 72 hours when the boron concentration is outside its

required limit. A potential cause of this condition is dilution of the accumulator water by inleakage of RCS water through the accumulator discharge check valves. In this case, reverse leakage of the check valves was assumed to be the dominant failure mode used to determine $Q_{acc.}$ repair. As was quantified using Equation 1,

For a 1 hour restoration period,

$$R_{1\ hour} = 9.99E\text{-}4/yr \times 1.12E\text{-}6 = 1.12E\text{-}9/yr$$

For a 72 hour restoration period,

$$R_{72\ hours} = 9.99E\text{-}4/yr \times 8.10E\text{-}5 = 8.09E\text{-}8/yr$$

The increase of 8.00E-8/yr to the overall core melt frequency of Millstone Unit No. 3 would be insignificant.

As previously discussed, the key safety importance of the accumulators is their ability to discharge water to the RCS following a LOCA. The unavailability of an accumulator due to the extended restoration intervals is insignificant compared to the dominant mechanism of accumulator unavailability (i.e., discharge check valves fail to open). The most likely failure to result in a loss of accumulator injection is failure of one of the two check valves to open in the discharge line. The contribution to the core melt frequency due to a large LOCA and accumulator check valve failure to open is 5.2% or 3.30E-6/yr. The unavailability of an accumulator due to the extended restoration interval is negligible compared with the unavailability due to check valve failure and therefore, it is insignificant. By the quantitative results above, it was determined that the extended restoration intervals have a negligible impact on the overall probability of accident sequences involving a large LOCA with failures of the accumulator function.

Significant Hazards Consideration

NNECO has reviewed the proposed changes in accordance with 10CFR50.92 and has concluded that they do not involve a significant hazards consideration in that the changes would not:

1. Involve a significant increase in the probability or consequences of an accident previously analyzed. The frequency of a LOCA, which requires accumulator discharge, accompanied by the simultaneous unavailability of an accumulator due to restoration was reviewed. As discussed above, it was determined that the extended restoration interval has a negligible effect on the overall probability of a LOCA.

2. Create the possibility of a new or different kind of accident from any previously analyzed. As previously discussed, the proposed changes would not impact the plant response to the point where a new

accident is created. The basis for this determination is that an accumulator failure currently has some finite probability and the incremental increase resulting from the proposed changes would be insignificantly small. There are no new failure modes associated with this change.

3. Involve a significant reduction in a margin of safety. The changes do not impact any of the protective boundaries, nor do they impact the safety limits for the protective boundaries. The changes to the Technical Specifications allow for extended surveillance intervals and extended restoration intervals on the accumulators. As previously discussed, the extended restoration interval has a negligible effect on the overall probability of a LOCA. Therefore, there is no impact on the basis of the Technical Specifications and the proposed changes do not involve a significant reduction in a margin of safety.

Moreover, the Commission has provided guidance concerning the application of standards in 10CFR50.92 by providing certain examples (March 6, 1986, 51FR7751) of amendments that are considered not likely to involve a significant hazards consideration. Example (vi) provides that a significant hazards consideration finding is unlikely for a change which either may result in some increase to the probability or consequences of a previously-analyzed accident or may reduce in some way a safety margin, but where the results of the change are clearly within all acceptable criteria with respect to the system or component specific in the Standard Review Plan; for example, a change resulting from a small refinement of a previously used calculational model or design method. This example appears applicable to the proposed changes. The proposed changes result in a slight increase in the frequency of accident sequences involving a LOCA. However, as stated above, the extended restoration interval has a negligible effect on the overall consequences of a LOCA. The unavailability of an accumulator due to the extended restoration interval is insignificant compared with the unavailability of an accumulator due to check valve failure.

Conclusion

Based on the information contained in this submittal and the environmental assessment for Millstone Unit No. 3, there are no significant radiological or nonradiological impacts associated with the proposed change and the proposed license amendment will not have a significant effect on the quality of the human environment.

The Millstone Unit No. 3 Nuclear Review Board has reviewed and approved the attached proposed revisions and has concurred with the above determinations.

Regarding our proposed schedule for this amendment, we request issuance at your earliest convenience with the amendment effective within 30 days of issuance.

In accordance with 10CFR50.91(b) we are providing the State of Connecticut with a copy of this proposed amendment.

Very truly yours,

NORTHEAST NUCLEAR ENERGY COMPANY

E. J. Mroczka
Senior Vice President

cc: Mr. Kevin McCarthy
Director, Radiation Control Unit
Department of Environmental Protection
Hartford, Connecticut 06116

W. T. Russell, Region I Administrator
D. H. Jaffe, NRC Project Manager, Millstone Unit No. 3
W. J. Raymond, Senior Resident Inspector, Millstone Unit No. 3

STATE OF CONNECTICUT)
) ss. Berlin
COUNTY OF HARTFORD)

Then personally appeared before me, E. J. Mroczka, who being duly sworn, did state that he is Senior Vice President of Northeast Nuclear Energy Company, a Licensee herein, that he is authorized to execute and file the foregoing information in the name and on behalf of the Licensees herein, and that the statements contained in said information are true and correct to the best of his knowledge and belief.

Lorraine J. D'Amico
Notary Public
My Commission Expires March 31, 1993