

NORTHEAST UTILITIES



THE CONNECTICUT LIGHT AND POWER COMPANY
WESTERN MASSACHUSETTS ELECTRIC COMPANY
NEW YORK WATER POWER COMPANY
NORTHEAST UTILITIES SERVICE COMPANY
NORTHEAST NUCLEAR ENERGY COMPANY

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October 5, 1988

Docket No. 50-423

B13051

Re: 10CFR50.90

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

Reference: (1) Safety Evaluation Supporting a More Negative EOL Moderator Temperature Coefficient Technical Specification for the Millstone Nuclear Power Station, Unit No. 3, WCAP-11946 (Proprietary), WCAP-11951 (Nonproprietary), September 1988.

Gentlemen:

Millstone Nuclear Power Station, Unit No. 3
Proposed Revision to Technical Specifications
A More Negative End-of-Life
Moderator Temperature Coefficient

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 1 into the Technical Specifications of Millstone Unit No. 3.

The proposed Technical Specification changes will revise the limit for the end-of-life (EOL) most negative moderator temperature coefficient (MTC). Specifically, the proposed changes will:

- o Change the most negative MTC limit from $-4.0 \times 10^{-4} \Delta K/K/^{\circ}F$ to $-4.75 \times 10^{-4} \Delta K/K/^{\circ}F$ (Technical Specification Section 3.1.1.3b).
- o Change the associated surveillance requirement MTC from $-3.1 \times 10^{-4} \Delta K/K/^{\circ}F$ to $-4.0 \times 10^{-4} \Delta K/K/^{\circ}F$ (Technical Specification Section 4.1.1.3b).
- o Revise the Bases Section 3/4.1.1.3 to account for these changes.

Discussion

The limitations on MTC are provided in Technical Specification Section 3.1.1.3 to ensure that the value of this coefficient remains within the limiting condition assumed in the Final Safety Analysis Report (FSAR) accident and transient analyses. The Technical Specification surveillance requirements call for measurement of the MTC at beginning-of-life (BOL) of each cycle, prior to initial operation above 5 percent rated thermal power, in order to demonstrate compliance with the most positive MTC limiting condition for operation (LCO). Similarly, to demonstrate compliance with the most negative MTC LCO, Technical Specification Surveillance Requirement (SR) 4.1.1.3b calls for measurement of the MTC prior to EOL (near 300 ppm equilibrium boron

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concentration). However, unlike the BOL situation, this 300 ppm surveillance requirement MTC value differs from the EOL LCO limit value. Because the hot full power (HFP) MTC value will gradually become more negative with further core depletion and boron concentration reduction, the 300 ppm surveillance requirement value of MTC should necessarily be less negative than the EOL LCO limit. The 300 ppm surveillance requirement value is selected to provide assurance that the EOL LCO limit will be met when the 300 ppm surveillance criterion is met. However, the current limits are overly conservative when compared to the analysis assumption.

Millstone Unit No. 3 will be required to perform the 300 ppm MTC measurement in the middle of January 1989. The current and planned fuel management strategy is expected to yield MTC values which will be more negative than the existing 300 ppm surveillance criterion. Thus, the overly conservative limit would force NNECO to repeat the MTC measurement every 14 effective full-power days (EFPD). These repeated measurements are undesirable in that they entail perturbations to normal reactor operation. These repeated measurements may also require load swings which in turn will increase the likelihood of system upsets including plant trips that might occur during load swings.

Safety Significance

Accident analyses do not explicitly input an MTC, but rather a constant moderator density coefficient (MDC). Converting the MDC used in the accident analyses to an MTC is a simple calculation which accounts for the rate of change of moderator density with temperature at the conditions of interest; namely, HFP.

For those non-LOCA transients where analysis results are made more severe by assuming maximum moderator feedback, a constant MDC of 0.43 $\Delta K/\text{gm/cc}$ has been assumed to exist throughout the transient. Converting this to a limiting MTC at HFP conditions gives about $-5.5 \times 10^{-4} \Delta K/K/^\circ F$ for four-loop and $-5.2 \times 10^{-4} \Delta K/K/^\circ F$ for three-loop. The proposed Technical Specification most negative MTC value of $-4.75 \times 10^{-4} \Delta K/K/^\circ F$ conservatively assures that the actual MTC will not exceed the analysis value. Hence, there is no effect on any design-basis accident and no increases in consequences associated with this Technical Specification change.

For LOCA analyses (large and small break), the only significance of a change in MTC would be to the extent that it may affect generated decay heat. The reactivity assumptions in the large break and small break LOCA accident analyses assume a maximum decay heat generation according to the requirements of Appendix K. Consequently, any changes to the MTC would show no effect for the large and small break LOCA analyses.

The report specified in Reference (1) provides a detailed explanation of both the previous methodology for determining the margin between the "accident analysis MTC" and the LCO and SR values as well as the new methodology. The new methodology for determining the margin to the LCO identifies all core operational parameters that directly affect MTC and calculates the magnitude of each based on the current reload core as well as anticipated reload cores. The margin to the SR was calculated using the same reload cores to determine the difference in HFP MTC at 300 ppm and EOL. The validity of these margins will be examined for each reload cycle as part of the normal reload design process. An additional conservatism has been included in the proposed LCO and

SR values to reduce the possibility of future changes. Since the report specified in Reference (1) contains information proprietary to Westinghouse Electric Corporation, it will be submitted under a separate cover.

Significant Hazards Consideration

In accordance with 10CFR50.92, NNECO has reviewed the proposed changes and concluded that they do not involve a significant hazards consideration. The basis for this conclusion is that the three criteria of 10CFR50.92(c) are not compromised. The proposed changes do not involve a significant hazards consideration because the changes would not:

1. Involve a significant increase in the probability or consequences of an accident previously analyzed. As stated above, the safety analysis assumption remains conservative with respect to the proposed LCO limit value of $-4.75 \times 10^{-4} \Delta K/K/^{\circ}F$. Therefore, the proposed change in the LCO limit from $-4.0 \times 10^{-4} \Delta K/K/^{\circ}F$ to $-4.75 \times 10^{-4} \Delta K/K/^{\circ}F$ still assures that the accident analyses moderator temperature coefficient is not exceeded. In addition, the surveillance limit value conservatively assures that the LCO limit will not be exceeded. The proposed changes do not impact the consequences of any design basis accident. Also, there are no failure modes associated with the proposed changes; therefore, there is no increase in the probability or consequences of any accident previously analyzed.
2. Create the possibility of a new or different kind of accident. There is no change in the plant design or in operating procedures. Additionally, there are no new failure modes introduced by the proposed changes; therefore, there can be no impact on plant response to the point where a different accident is created.
3. Involve a significant reduction in a margin of safety. The proposed changes have no impact on the consequences of an accident or on any of the protective boundaries; therefore, there is no reduction in any margin of safety.

Moreover, the Commission has provided guidance concerning the application of standards set forth in 10CFR50.92 by providing certain examples (March 6, 1986, FR7751) of amendments that are considered not likely to involve a significant hazards consideration. Although the proposed changes herein are not enveloped by a specific example, the proposed changes would not involve a significant increase in the probability or consequences of an accident previously analyzed. As stated earlier, the proposed Technical Specification LCO MTC limit conservatively bounds the moderator density coefficient used in design basis analyses, and there are no failure modes associated with the proposed changes; therefore, it is concluded that the previously analyzed accidents are not affected.

Based upon the information contained in this submittal, there are no significant radiological or nonradiological impacts associated with the proposed action, and the proposed license amendment will not have a significant impact on the quality of the human environment.

Millstone Unit No. 3 will perform the MTC measurement required per Surveillance Requirement 4.1.1.3b in the middle of January 1989 at which time a core

condition of 300 ppm equilibrium boron concentration will be reached. As stated earlier, it is probable that the Cycle 2 core will fail to meet this surveillance requirement associated with the EOL LCO limit. Failure to meet the surveillance criterion does not by itself imply a failure to meet the actual EOL MTC limit stated in the LCO, but does involve a requirement to measure the MTC at least once per 14 EFPD during the remainder of the cycle. As indicated earlier, these repeated measurements will require load swings causing temperature to deviate from the programmed referenced temperature. This situation is not preferable to nominal steady state operation; therefore, we respectfully request NRC Staff approval of the proposed license amendment by January 15, 1989.

The Millstone Unit No. 3 Nuclear Review Board had reviewed and approved the proposed changes and concurred with the above determinations.

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

Pursuant to the requirements of 10CFR170.12(c), enclosed with this amendment request is the application fee of \$150.

Very truly yours,

NORTHEAST NUCLEAR ENERGY COMPANY

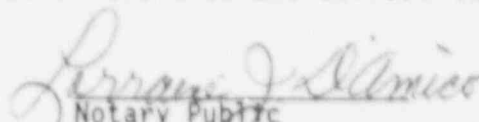

E. J. Mroczka
Senior Vice President

cc: W. T. Russell, Region I Administrator
D. H. Jaffe, NRC Project Manager, Millstone Unit No. 3
W. J. Raymond, Senior Resident Inspector, Millstone Unit Nos. 1, 2, and 3

Mr. Kevin McCarthy, Director
Radiation Control Unit
Department of Environmental Protection
Hartford, CT 06116

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.


Notary Public
My Commission Expires March 31, 1993