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

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January 25, 1984

Docket No. 50-336

B11013

Director of Nuclear Reactor Regulation
Attn: Mr. James R. Miller, Chief
Operating Reactors Branch #3
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

References: (1) W. G. Counsil letter to J. R. Miller, dated January 20, 1984.

(2) J. R. Miller letter to W. G. Counsil, dated December 30, 1983.

(3) W. G. Counsil letter to R. A. Clark, dated April 13, 1983.

(4) W. G. Counsil letter to J. R. Miller, dated November 17, 1983.

Gentlemen:

Millstone Nuclear Power Station, Unit No. 2
Proposed Technical Specification Changes
Power Distribution Limits

Pursuant to 10 CFR 50.90, Northeast Nuclear Energy Company (NNECO) hereby proposes to amend its operating license, DPR-65 for Millstone Unit No. 2, by incorporating the attached proposed changes into the plant Technical Specifications. The changes revise the total planar peaking factor limits between 80 and 100% power specified in Figure 3.2-3 of the Technical Specifications. The curve has also been extended to include a new operation point at 65% power. Figure 3.2-2, Axial Shape Index vs. Fraction of Allowable Power Level, has also been revised to accommodate the peaking factor change.

The attached proposed changes to the Technical Specifications supersede those docketed in Reference (1) and NNECO hereby withdraws the Reference (1) license amendment request. The information provided in Reference (1) supporting the changes remains applicable to the changes proposed herein and is reiterated and supplemented, where appropriate, as follows.

NNECO applied for and recently received a license amendment in Reference (2) authorizing Cycle 6 operation of Millstone Unit No. 2. The plant was made critical on January 5, 1984 and startup physics testing was initiated. At the completion of startup physics testing, core power level was increased but, due to steam generator chemistry controls, did not achieve levels at which power peaking factors could be measured until January 13, 1984.

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Extrapolating measurements of the total planar peaking factor, F_{xy}^T, taken at approximately 50% and 80% power, it is expected that full power operation will not be achievable due to the restrictions imposed by the current limits of Technical Specification Figure 3.2-3. The current figure was generated based on the results of analyses of the Cycle 6 core loading pattern. The curve is designed to bound as closely as possible actual plant operating characteristics as predicted by the reload analyses. Measurements of F_{xy}^T at current power levels indicate an underprediction in F_{xy}^T by the analyses and as noted above the present Figure 3.2-3 will limit the plant to less than full power.

To alleviate this derate, the fuel vendor has provided a revised total planar peaking factor curve as a function of allowable fraction of rated power. NNECO has evaluated the impact of this change in peaking factor limits and provides the following justification. The technical approach utilized involved a reevaluation of available margins using previously approved methodology to envelope the situation predicted to occur at levels approaching 100% power.

The total planar peaking factor (F_{xy}^T) is utilized in the determination of the local power density (kw/ft). The local power density is monitored to ensure that fuel centerline melting will not occur due to axial power maldistributions. Additionally, the local power density limit of 15.6 kw/ft is required to be maintained to ensure continued applicability of the large break loss-of-coolant accident analysis results.

In evaluating the bases for the current F_{xy}^T limit curve, it was determined that a 2% allowance for tilt (Tq) was incorporated into in the curve proposed for Cycle 6 operation in Reference (3) when the curve was used to evaluate the Local Power Density trip setpoints. In other words, the current Figure 3.2-3 for F_{xy}^T was increased by a 2% allowance for tilt at all power levels.

The Millstone Unit No. 2 incore neutron monitoring system, which measures power distributions and peaks, calculates the F_{xy}^T by measuring the F_{xy} and adjusting it in accordance with the equation:

$$F_{xy}^T = F_{xy} (1 + Tq).$$

The incore monitoring system measures an actual tilt. The F_{xy}^T is then compared to the limits of Figure 3.2-3 to ensure the Limiting Condition for Operation for planar radial peak is complied with. In utilizing the present Figure 3.2-3, NNECO is actually correcting the measured F_{xy} for tilt twice, once with the actual tilt from the incore monitoring system and then by the 2% tilt built into the current Figure 3.2-3.

As such, NNECO is proposing to eliminate the 2% allowance for tilt built into Figure 3.2-3 and will retain the tilt correction from the incore monitoring system. In addition, as was proposed in Reference (1), NNECO also proposes to revise the F_{xy}^T curve between 92.5 and 100% power and to include an operating point at 65% power.

There currently exists conservatism in the local power density trip setpoint to accommodate the actual increases in the F_{xy}^T limit curve. The local power density trip is unaffected by the deletion of the 2% tilt allowance. As such, no setpoint changes are required as a result of the proposed changes and the margin to the specified acceptable fuel design limits is maintained for the transients and accidents which this trip protects against.

The incore monitoring system is not impacted by these proposed changes since the incore monitoring program will continue to utilize the actual measured F_{xy}^T when performing surveillance monitoring for linear heat rate. It will also continue to measure tilt and correct the measured F_{xy} accordingly. The revision to the F_{xy}^T curve will impact the linear heat rate surveillance when the excore monitoring system is utilized. Typically, the excore monitoring system is utilized when the incore system is inoperable; historically this is most frequently attributable to a temporary computer failure. To compensate for the increase in allowable F_{xy}^T at all power levels, NNECO has revised the axial shape index (ASI) limits of Figure 3.2-2. Specifically, the increase in allowable F_{xy}^T at power has been more than offset by the decrease in the ASI limits of Figure 3.2-2. The more restrictive ASI limits are imposed when the excore monitoring system is utilized to perform the linear heat rate surveillance requirements. The revised ASI curve, or tent, continues to bound all conditions of power and shape index on which it was originally derived. This was ensured by a review of the tent and the inputs to it by our fuel vendor.

The F_{xy}^T is not input to any of the DNB limiting conditions for operation or DNB limiting safety system setpoints (Thermal Margin/Low Pressure Trip).

The extension of the F_{xy}^T curves to 65% power from the current cutoff at approximately 80% power is required in the event of higher F_{xy}^T peaks during low power operation with non-steady state conditions. This point is bounded by previous analyses performed to support Cycle 6 operation and is input to the safety analyses submitted in Reference (3) as updated in Reference (4).

NNECO has reviewed the attached proposed changes pursuant to 10 CFR 50.59 and has determined that they do not constitute an unreviewed safety question. Specifically, the margins of safety as defined in the technical specification bases are maintained. In addition, the probability of occurrence or the consequences of a previously analyzed accident have not been increased and the possibility for a new type of accident not previously evaluated has not been created.

In accordance with 10 CFR 50.92, NNECO has reviewed the attached proposed changes and has concluded that they do not involve a significant hazards consideration. The basis for this conclusion is that the three criteria of 50.92(c) are not compromised, a conclusion which is supported by our determination made pursuant to 10 CFR 50.59. Further, the changes fall within the envelope of Item (iii) in 48 FR 14870 of amendments that are considered not likely to involve a significant hazards consideration. The fuel assemblies are identical to those approved by the NRC in Reference (2), no significant changes to the acceptance criteria for the Technical Specifications are being proposed, and the analytical methods utilized are identical to those approved by the NRC in Reference (2). The principal change is the elimination of an analytical penalty associated with core power tilt.

NNECO respectfully requests that this amendment be processed in accordance with the procedures outlined in 10 CFR 50.91(a)(5). As previously discussed, NNECO made Millstone Unit No. 2 critical on January 5, 1984 following an extended refueling and maintenance outage. Revised technical specifications supporting Cycle 6 operations were applied for in Reference (3) and issued in Reference (2). These technical specifications are based on our fuel vendor's predictions of core physical parameters. The F_{xy}^T curve is typically designed to

bound as closely as possible the operating characteristics predicted by the reload analyses.

After completing startup testing and steam generator cleanup, power levels of 30% and greater were achieved on January 13, 1984. At that time, measurements of F_{xy}^T were possible and evidence of the underprediction in F_{xy}^T was identified. NNECO could not have identified this situation until power levels in excess of 20% were achieved. These facts explain why this matter was not formally brought to the attention of the NRC previously. During the past twelve days, NNECO accomplished such activities as evaluation of the power distribution data, obtaining and reviewing the revised analyses from our fuel vendor, and processing of this amendment request through our internal review committees.

It is estimated that a power level of approximately 90% of rated thermal power can be achieved with the current technical specification limits resulting in a derate on the order of 10%. Therefore, this amendment request is governed by the provisions of 50.91(a)(5), in that

> "failure to act in a timely way would result in derating ..... of a nuclear power plant,".

Hence, we request that the Commission dispense with notice and comment on the determination of no significant hazards consideration and publish a notice of issuance under 10 CFR 2.106. The emergency situation occurred due to an underprediction in F_{xy}^T in the analyses previously submitted to support cycle 6 operation coupled with an overly conservative treatment of core power tilt in the determination of the F_{xy}^T limit curve. The underprediction by our fuel vendor was of a magnitude that the margin available in the total planar peaking factor curve was not sufficient to allow 100% power operation. Reevaluations were performed on an expedited basis to accommodate the existing situation. This situation could not have been anticipated by NNECO since valid measurements of F_{xy}^T could not have been obtained prior to operation at 30% power level or higher. Hence, expedited processing of this license amendment is justified under 50.91(a)(5).

In accordance with 10 CFR 50.92(b), NNECO is providing the State of Connecticut with a copy of this proposed amendment.

The Millstone Unit No. 2 Nuclear Review Board has reviewed and approved this proposed amendment and has concurred with the above determinations.

NNECO has reviewed the attached proposed license amendment request pursuant to 10CFR170.22 and has determined that the request constitutes a Class III amendment. The basis for this determination is that the proposed changes to the technical specifications involve a single safety issue and do not involve a significant hazards consideration. As such, the appropriate Class III license amendment fee of $4000.00 is provided. We note that in our Reference (1) request we inadvertently neglected to address the provisions of 10CFR170. Since this letter supplements our Ref (1) proposal, the enclosed Class III fee covers both submittals.

We trust you find this information satisfactory and remain available to assist you in the expedited review of this matter. Current plant conditions indicate that the unit will be capable of escalating in power level above the authorized limit (estimated to be approximately 90%) late on Thursday, January 26, 1984. Therefore we request that the amendment be issued by close-of-business on January 26. We will keep the NRC Project Manager informed regarding actual plant status if conditions change.

Very truly yours,

NORTHEAST NUCLEAR ENERGY COMPANY

W. G. Counsil
Senior Vice President

cc: Mr. Arthur Heubner
Director, Radiation Control Unit
Department of Environmental Protection
State Office Building
Hartford, CT 06116

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

Then personally appeared before me W. G. Counsil, who being duly sworn, did state that he is Senior Vice President of Northeast Nuclear Energy Company, 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, 1988