December 19, 1988

Docket No. 50-336

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

Dear Mr. Mroczka:

SUBJECT: ISSUANCE OF AMENDMENT (TAC NO. 69568)

The Commission has issued the enclosed Amendment No.137 to Facility Operating License No. DPR-65 for Millstone Nuclear Power Station, Unit No. 2, in response to your application dated September 20, 1988.

The change modifies the Technical Specifications (TS) as follows: (1) the maximum linear heat rate shown in TS Figure 3.2.1 is reduced from 15.6 to 14.0 kw/ft, and (2) a factor of 1.115 is applied to the total planar radial peaking factor for reactor operation during Cycle 9 beyond a core average burnup of 10,000 MWD/MTU.

A copy of the related Safety Evaluation is also enclosed. The notice of issuance will be included in the Commission's bi-weekly Federal Register notice.

Sincerely,

/s/

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

Enclosures:
1. Amendment No.137 to DPR-65
2. Safety Evaluation

cc w/enclosures:
See next page

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

NORTHEAST NUCLEAR ENERGY COMPANY

THE CONNECTICUT LIGHT AND POWER COMPANY

THE WESTERN MASSACHUSETTS ELECTRIC COMPANY

DOCKET NO. 50-336

MILLSTONE NUCLEAR POWER STATION, UNIT NO. 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 137
License No. DPR-65

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by Northeast Nuclear Energy Company, et al. (the licensee), dated September 20, 1988 complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Facility Operating License No. DPR-65 is hereby amended to read as follows:

   (2) Technical Specifications

   The Technical Specifications contained in Appendix A, as revised through Amendment No. 137, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of the date of issuance, to be implemented within 30 days of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

John F. Stolz

John F. Stolz, Director
Project Directorate I-4
Division of Reactor Projects I/II
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical Specifications

Date of Issuance: December 19, 1988

ATTACHMENT TO LICENSE AMENDMENT NO. 137

FACILITY OPERATING LICENSE NO. DPR-65

DOCKET NO. 50-336

Replace the following pages of the Appendix A Technical Specifications with the enclosed pages. The revised pages are identified by amendment number and contain vertical lines indicating the areas of change. The corresponding overleaf pages are provided to maintain document completeness.

Remove	Insert
3/4 2-3	3/4 2-3
3/4 2-5	3/4 2-5
3/4 2-6	3/4 2-6
B 3/4 2-1	B 3/4 2-1
B 3/4 2-2	B 3/4 2-2

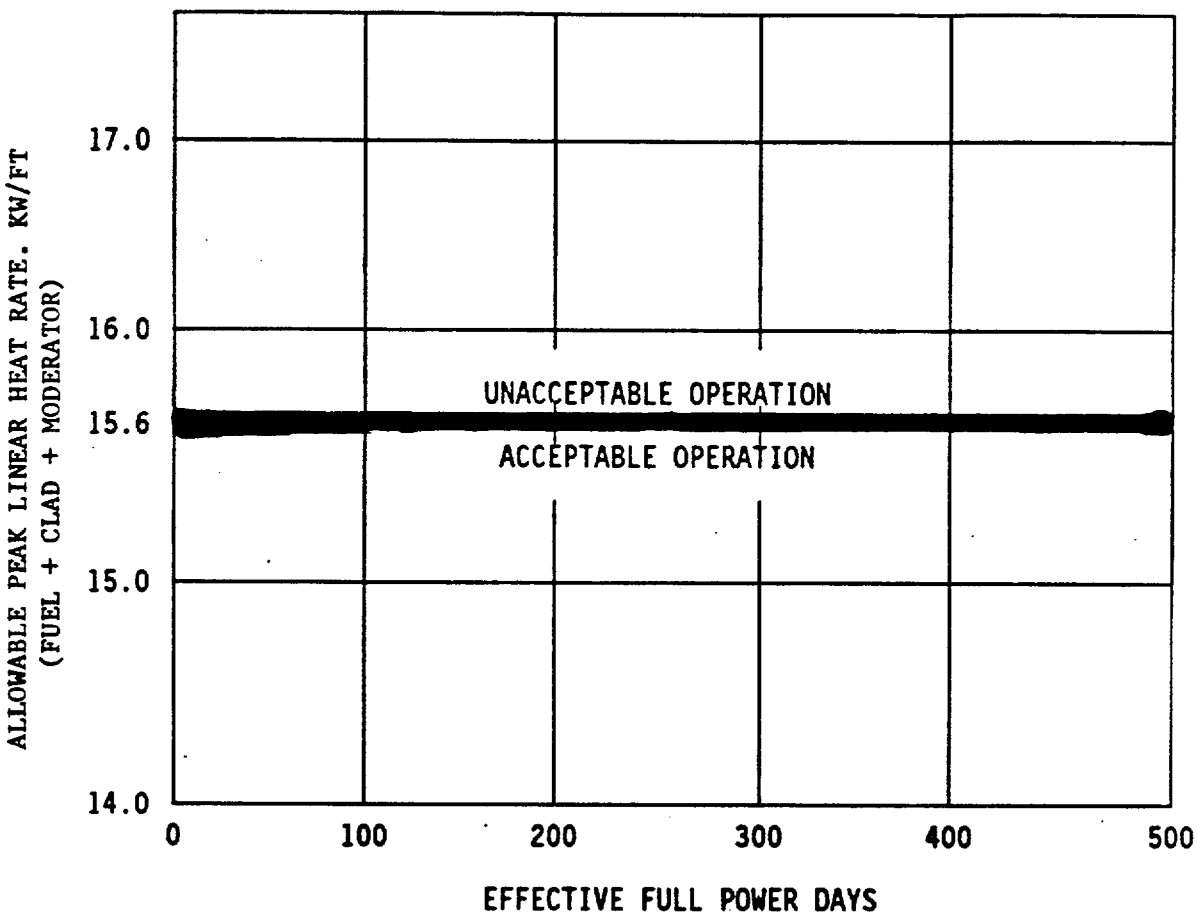

Figure 3.2.1 Allowable Peak Linear Heat Rate vs. Burnup

* A limit of 14.0 KW/FT is required for Cycle 9 only whenever the cycle average burnup is ≥ 10,000 MWD/MTU

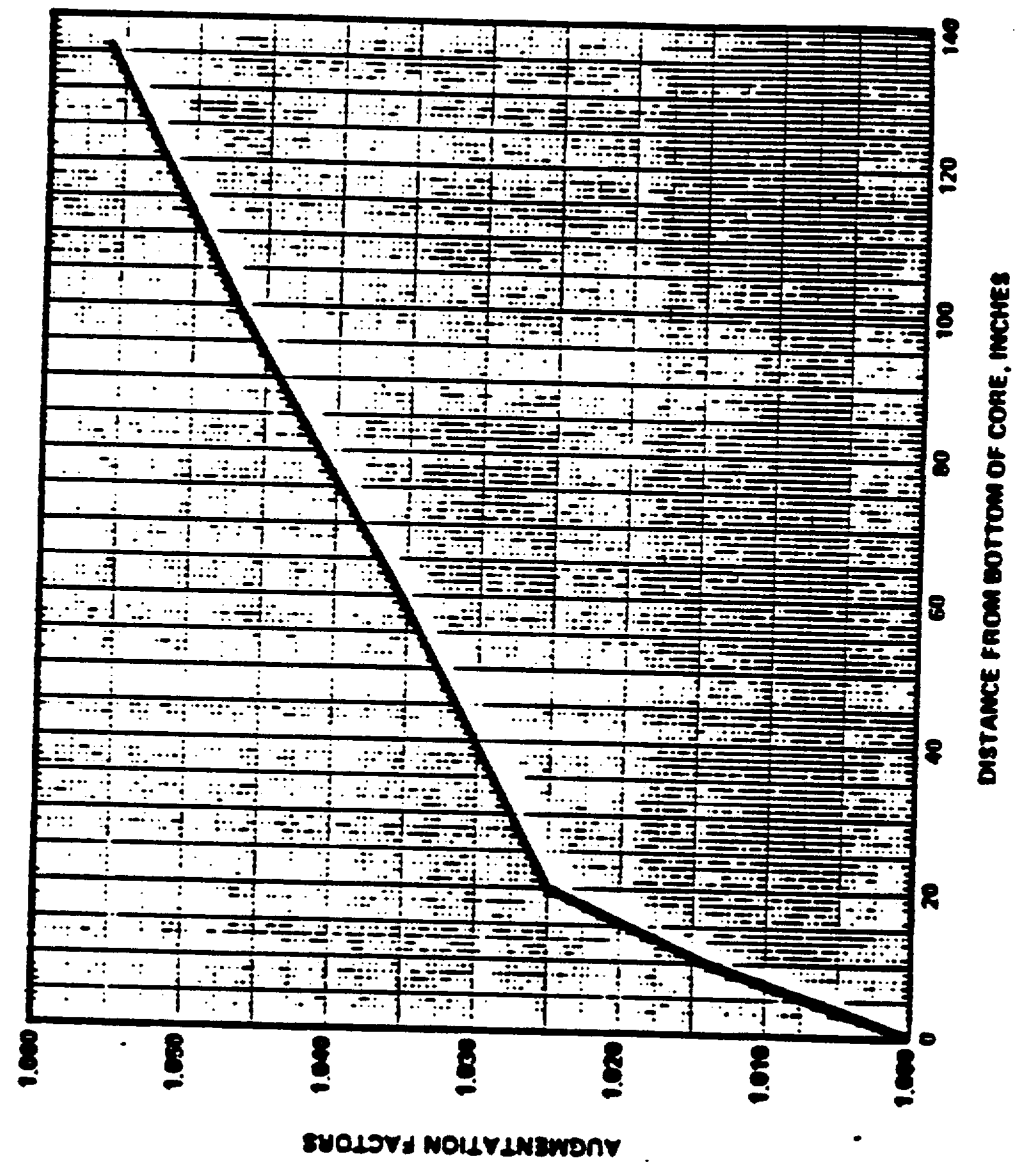

FIGURE 4.2-1 Augmentation Factors vs Distance From Bottom of Core

TOTAL PLANAR RADIAL PEAKING FACTOR - F^T_{xy}

LIMITING CONDITION FOR OPERATION

3.2.2 Meet either of 3.2.2.1 or 3.2.2.2.

3.2.2.1 The calculated value of F^T_{xy}, defined as F^T_{xy} ** = F_{xy} (1+Tq), shall be limited to ≤ 1.62 with the AXIAL SHAPE INDEX alarm setpoints adjusted consistent with the limits shown on Figure 3.2-2a, or

3.2.2.2 The calculated value of F^T_{xy}, defined as F^T_{xy} ** = F_{xy} (1+Tq), shall be limited to ≤ 1.719 with the AXIAL SHAPE INDEX alarm setpoints adjusted consistent with the limits shown on Figure 3.2-2b.

APPLICABILITY: MODE 1.*

ACTION:

a. With F^T_{xy} > 1.62 and the AXIAL SHAPE INDEX alarm setpoints adjusted consistent with the limits shown on Figure 3.2-2a, within 6 hours either:

   1) Reduce THERMAL POWER to bring the combination of THERMAL POWER and F^T_{xy} to within the limits of Figure 3.2-3a and withdraw the full length CEAs to or beyond the Long Term Steady State Insertion Limit of Specification 3.1.3.6, or

   2) Apply the limits of Specification 3.2.2.2 and Figure 3.2-3b and within 72 hours adjust the AXIAL SHAPE INDEX alarm setpoints consistent with the limits shown on Figure 3.2-2b, or

   3) Be in at least HOT STANDBY.

b. With F^T_{xy} > 1.719 and the AXIAL SHAPE INDEX alarm setpoints adjusted consistent with the limits shown on Figure 3.2-2b, within 6 hours either:

   1) Reduce THERMAL POWER to bring the combination of THERMAL POWER and F^T_{xy} to within the limits of Figure 3.2-3b and withdraw the full length CEAs to or beyond the Long Term Steady State Insertion Limit of Specification 3.1.3.6, or

   2) Be in at least HOT STANDBY.

---

* See Special Test Exception 3.10.2

** For Cycle 9 only, whenever the cycle average burn-up is ≥ 10,000 MWD/MTU, an additional multiplier of 1.115 shall be used in the calculation. Therefore, for these conditions, $F^T_{xy} = 1.115\ F_{xy}\ (1+T_q)$.

SURVEILLANCE REQUIREMENT

4.2.2.1 The provisions of Specification 4.0.4 are not applicable.

4.2.2.2 F^T_{xy} shall be calculated by the expression F^T_{xy}* = F_{xy} (1+Tq) and F^T_{xy} shall be determined to be within its limit at the following intervals:

a. Prior to operation above 70 percent of RATED THERMAL POWER after each fuel loading,

b. At least once per 31 days of accumulated operation in MODE 1, and

c. Within four hours if the AZIMUTHAL POWER TILT (T_q) is > 0.02.

4.2.2.3 F_{xy} shall be determined each time a calculation of F^T_{xy} is required by using the incore detectors to obtain a power distribution map with all full length CEAs at or above the Long Term Steady State Insertion Limit for the existing Reactor Coolant Pump combination. This determination shall be limited to core planes between 15% and 85% of full core height inclusive and shall exclude regions influenced by grid effects.

4.2.2.4 T_q shall be determined each time a calculation of F^T_{xy} is required and the value of T_q used to determine F^T_{xy} shall be measured value of T_q.

* For Cycle 9 only, whenever the cycle average burn-up is ≥ 10,000 MWD/MTU, an additional multiplier of 1.115 shall be used in the calculation. Therefore, for these conditions, F_{xy}^T = 1.115 F_{xy} (1 + T_q).

3/4.2.1 LINEAR HEAT RATE

The limitation on linear heat rate ensures that in the event of a LOCA, the peak temperature of the fuel cladding will not exceed 2200°F.

Either of the two core power distribution monitoring systems, the Excore Detector Monitoring System and the Incore Detector Monitoring System, provide adequate monitoring of the core power distribution and are capable of verifying that the linear heat rate does not exceed its limits. The Excore Detector Monitoring System performs this function by continuously monitoring the AXIAL SHAPE INDEX with two OPERABLE excore neutron flux detectors and verifying that the AXIAL SHAPE INDEX is maintained within the allowable limits of Figure 3.2-2. In conjunction with the use of the excore monitoring system and in establishing the AXIAL SHAPE INDEX limits, the following assumptions are made: 1) the CEA insertion limits of Specifications 3.1.3.2, 3.1.3.5 and 3.1.3.6 are satisfied, 2) the flux peaking augmentation factors are as shown in Figure 4.2-1, 3) the AZIMUTHAL POWER TILT restrictions of Specification 3.2.4 are satisfied, and 4) the TOTAL PLANAR RADIAL PEAKING FACTOR does not exceed the limits of Specification 3.2.2.

The Incore Detector Monitoring System continuously provides a direct measure of the peaking factors and the alarms which have been established for the individual incore detector segments ensure that the peak linear heat rates will be maintained within the allowable limits of Figure 3.2-1. The setpoints for these alarms include allowances, set in the conservative directions, for 1) flux peaking augmentation factors as shown in Figure 4.2-1, 2) a measurement-calculational uncertainty factor of 1.07, 3) an engineering uncertainty factor of 1.03, 4) an allowance of 1.01 for axial fuel densification and thermal expansion, and 5) a THERMAL POWER measurement uncertainty factor of 1.02.

A reduced linear heat rate limit of 14.0 kW/ft for Cycle 9 operation beyond a cycle average burn-up of 10,000 MWD/MTU ensures that the 2200°F peak fuel cladding temperature limit will not be exceeded in the event of a LOCA. The value of 10,000 MWD/MTU is the predicted end-of-cycle for Cycle 9. Operation beyond the predicted end-of-cycle may require reductions in the reactor coolant temperatures which can increase the calculated peak clad temperatures. The reduction in the linear heat rate limit will more than compensate for the effect of the reduction in the reactor coolant temperatures on the LOCA analysis.

3/4.2.2, 3/4.2.3 and 3/4.2.4 TOTAL PLANAR AND INTEGRATED RADIAL PEAKING FACTORS - F^T_{xy} AND F^T_r AND AZIMUTHAL POWER TILT - T_q

The limitations on F^T_{xy} and T_q are provided to ensure that the assumptions used in the analysis for establishing the Linear Heat Rate and Local power Density - High LCOs and LSSS setpoints remain valid during operation at the various allowable CEA group insertion limits.

BASES

The limitations on Ft_r and T_q are provided to ensure that the assumptions used in the analysis establishing the DNB Margin LCO, and Thermal Margin/Low Pressure LSSS setpoints remain valid during operation at the various allowable CEA group insertion limits. If FT_{xy}, FT_r or T_q exceed their basic limitations, operation may continue under the additional restrictions imposed by the ACTION statements since these additional restrictions provide adequate provisions to assure that the assumptions used in establishing the Linear Heat Rate, Thermal Margin/Low Pressure and Local Power Density - High LCOs and LSSS setpoints remain valid. An AZIMUTHAL POWER TILT > 0.10 is not expected and if it should occur, subsequent operation would be restricted to only those operations required to identify the cause of this unexpected tilt.

The value of T_q that must be used in the equation $FT_{xy} = F_{xy} (1 + T_q)$ and $FT_r = F_r (1 + T_q)$ is the measured tilt.

The surveillance requirements for verifying that FT_{xy}, FT_r and T_q are within their limits provide assurance that the actual values of FT_{xy}, FT_r and T_q do not exceed the assumed values. Verifying FT_{xy} and FT_r after each fuel loading prior to exceeding 75% of RATED THERMAL POWER provides additional assurance that the core was properly loaded.

For Cycle 9 operation beyond a cycle average burn-up of 10,000 MWD/MTU, an additional multiplier of 1.115 is used in the calculation of F_{xy}. This value is proportional to the reduction in the maximum linear heat rate. The value of 10,000 MWD/MTU is the predicted end-of-cycle for Cycle 9.

3/4.2.6 DNB MARGIN

The limitations provided in this specification ensure that the assumed margins to DNB are maintained. The limiting values of the parameters in this specification are those assumed as the initial conditions in the accident and transient analyses; therefore, operation must be maintained within the specified limits for the accident and transient analyses to remain valid.

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 137

TO FACILITY OPERATING LICENSE NO. DPR-65

NORTHEAST NUCLEAR ENERGY COMPANY, ET AL.

MILLSTONE NUCLEAR POWER STATION, UNIT NO. 2

DOCKET NO. 50-336

1.0 INTRODUCTION

By application for license amendment dated September 20, 1988, Northeast Nuclear Energy Company, et al. (the licensee), requested changes to the Technical Specification (TS) for Millstone Unit 2. The proposed change to the TS involves the maximum linear heat rate shown in TS Figure 3.2.1 which would be reduced from 15.6 to 14.0 kw/ft, and a factor of 1.115 would be applied to the total planar radial peaking factor for reactor operation during Cycle 9 beyond a core average burnup of 10,000 MWD/MTU.

2.0 EVALUATION

Coastdown operation of a reactor involves decreasing the average reactor coolant temperature in order to increase reactivity. This mode of operation is used to extend the length of the fuel cycle beyond what would be considered end-of-cycle. Operation of Millstone Unit 2, beyond the end of Cycle 8 (Cycle 8 coastdown), was approved with issuance of Amendment No. 122 on November 18, 1987. The licensee's evaluation supporting Cycle 8 coastdown involved addressing the applicability of the Millstone Unit 2 Loss of Coolant Accident (LOCA) analysis for Cycle 8 coastdown conditions.

Westinghouse has evaluated the Millstone Unit 2 LOCA analysis and found that Cylce 9 coastdown operation is acceptable provided that: (1) The maximum linear heat rate is reduced from 15.6 Kw/ft to 14.0 Kw/ft. (2) An additional multiplier of 1.115 (equal to 15.6/14.0, the ratio of the maximum linear heat rates) is included in the total planar radial peaking factor.

These additional restrictions apply only for operation past a core average burnup of 10,000 MWD/MTU, the predicted full power end of life for Cycle 9. The restriction on maximum linear heat rate would be incorporated in proposed TS Figure 3.2-1 while the multiplier for the total planar radial peaking factor would be incorporated into proposed TS 3/4.2.2. The proposed changes to the TS are identical to those incorporated in the TS for Cycle 8 coastdown. A change to the TS is needed to make these values specific for Cycle 9 coastdown.

The licensee has proposed to reduce the allowable maximum linear heat rate (LHR) and total planar radial peaking factor (F_{xy} T) by 11.5% for extended operation, as reflected in proposed TS Figure 3.2.1, "Allowable Peak Linear Rate vs. Burnup." The licensee has also proposed the use of a multiplying factor of 1.115 on F_{xy} T in TS 3/4.2.2, "Total Planar Radial Peaking Factor -F_{xy} T, for operation beyond 10,000 MWD/MTU. These reductions allow the average LHR to remain unchanged while increasing restrictions on boundary conditions during extended operation. Using known sensitivities of the LHR that have been used in previous Millstone 2 operating cycles, the proposed maximum allowable values for LHR and F_{xy} T would compensate for the effect of extended operation on the bounding LOCA transients. These sensitivities were determined using NRC staff-approved, ECCS evaluation models. Therefore, the results of the evaluation ensure a PCT, local cladding oxidation rate, and whole-core hydrogen generation level that remain within the values for Cycle 9, which satisfy the requirement of 10 CFR 50.46. Accordingly, the proposed changes to the TS are acceptable.

3.0 ENVIRONMENTAL CONSIDERATION

This amendment changes a requirement with respect to the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously published a proposed finding that the amendment involves no significant hazards consideration and there has been no public comment on such finding. Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR §51.22(c)(9). Pursuant to 10 CFR §51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

4.0 CONCLUSION

We have concluded, based on the considerations discussed above, that (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (2) such activities will be conducted in compliance with the Commission's regulations, and the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

Dated: December 19, 1988

Principal Contributor: D. H. Jaffe