

March 29, 2001

Mr. R. G. Lizotte  
Master Process Owner - Assessment  
c/o Mr. David A. Smith  
Northeast Nuclear Energy Company  
P. O. Box 128  
Waterford, CT 06385-0128

SUBJECT: MILLSTONE NUCLEAR POWER STATION, UNIT NO. 2 - ISSUANCE OF  
AMENDMENT RE: FUEL CENTERLINE MELT LINEAR HEAT RATE LIMIT  
(TAC NO. MA9646)

Dear Mr. Lizotte:

The Commission has issued the enclosed Amendment No. 255 to Facility Operating License No. DPR-65 for the Millstone Nuclear Power Station, Unit No. 2, in response to your application dated July 31, 2000, as supplemented January 4, 2001.

The amendment documents the staff's approval to use a new method to determine the fuel centerline melt linear heat rate limit (FCMLHRL) on a cycle-specific basis. The cycle-specific limit will be calculated using the U.S. Nuclear Regulatory Commission approved Siemens Power Corporation (SPC) methodology documented in SPC report XN-NF-82-06(P)(A). This amendment also authorizes you to incorporate changes to the description of the facility in the Final Safety Analysis Report, as described in your application dated July 31, 2000, and supplemented on January 4, 2001, and evaluated in the enclosed Safety Evaluation. Bases Section 2.1.1, "Reactor Core," has also been revised accordingly.

A copy of the related Safety Evaluation is also enclosed. Notice of Issuance will be included in the Commission's biweekly Federal Register notice.

Sincerely,

**/RA/**

Daniel S. Collins, Project Manager, Section 2  
Project Directorate I  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

Docket No. 50-336

Enclosures: 1. Amendment No. 255 to DPR-65  
2. Safety Evaluation

cc w/encls: See next page

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cc w/encls: See next page

**DISTRIBUTION:**

TClark	EAdensam	PUBLIC	JClifford	FAkstulewicz
OGC	ACRS	WBeckner	RSummers, RI	MO'Brien
PDI-2 R/F	GHill (2)	JZimmerman	LKopp	DCollins

Accession Number: ML010640160 \* SE input provided 01/11/01, no major changes made.

\*\* See previous concurrence

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Official Record Copy

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Unit 2

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Unit 2  
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NORTHEAST NUCLEAR ENERGY COMPANY, ET AL.

DOCKET NO. 50-336

MILLSTONE NUCLEAR POWER STATION, UNIT NO. 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 255  
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 July 31, 2000, as supplemented January 4, 2001, 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, changes to the Final Safety Analysis Report (FSAR) to reflect the new method to determine the fuel centerline melt linear heat rate limit (FCMLHRL) on a cycle-specific basis, as set forth in the application by the licensee dated July 31, 2000, and supplemented January 4, 2001, are authorized. The licensee shall submit an update to the FSAR reflecting the changes authorized by this amendment with the next update to the FSAR required under 10 CFR 50.71(e).
3. This license amendment is effective as of the date of issuance, and shall be implemented no later than the date of submission of the next update to the FSAR required under 10 CFR 50.71(e).

FOR THE NUCLEAR REGULATORY COMMISSION

**/RA/**

James W. Clifford, Chief, Section 2  
Project Directorate I  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical  
Specifications

Date of Issuance: March 29, 2001

ATTACHMENT TO LICENSE AMENDMENT NO. 255

FACILITY OPERATING LICENSE NO. DPR-65

DOCKET NO. 50-336

Replace the following page of the Appendix A, Technical Specifications, with the attached revised page. The revised page is identified by amendment number and contains marginal lines indicating the area of change.

Remove

B 2-1

Insert

B 2-1

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 255

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 letter dated July 31, 2000, as supplemented January 4, 2001, the Northeast Nuclear Energy Company, et al. (the licensee), submitted an amendment request to modify the Final Safety Analysis Report (FSAR) and associated technical specification (TS) bases for Millstone Nuclear Power Station, Unit No. 2 (MP2). The amendment would authorize changes to the MP2 FSAR to allow the use of a new method to determine the fuel centerline melt linear heat rate limit (FCMLHRL) on a cycle-specific basis. The cycle-specific limit would be calculated using the U.S. Nuclear Regulatory Commission (NRC) approved Siemens Power Corporation (SPC) methodology documented in SPC topical, "Qualification of Exxon Nuclear Fuel for Extended Burnup," XN-NF-82-06(P)(A), Revision 1 and Supplements 2, 4, and 5, October 1986. The January 4, 2001, letter provided clarifying information that did not change the initial proposed no significant hazards consideration determination.

2.0 BACKGROUND

The primary fuel design criteria were established to ensure that fuel rod integrity is maintained during normal operation and anticipated operational occurrences (AOOs). One of these criteria is that fuel centerline temperatures remain below the melting point of the fuel pellets. Although the minimum power level required to produce centerline melt in zircaloy clad uranium fuel rods is typically higher than 21 kilowatts per foot (kW/ft), the current MP2 licensing basis conservatively uses a FCMLHRL of 21 kW/ft. The licensee has proposed a change in the method used to determine the limiting FCMLHRL from the current fixed value of 21 kW/ft to a value that will be calculated on a cycle-by-cycle basis using the former Exxon Nuclear Company, now Siemens Power Corporation (SPC), NRC-approved methodology documented in XN-NF-82-06(P)(A).

The licensee evaluated the use of the new method for determining the FCMLHRL on a cycle-specific basis using the criteria of Title 10 of the Code of Federal Regulations (10 CFR), Section 50.59 and has determined that its implementation requires prior NRC approval. Therefore, by letter dated July 31, 2000, as supplemented January 4, 2001, the licensee requested that the staff review and approve the proposed changes to the FSAR and the bases to the TS.

### 3.0 Description of Changes

The following specific FSAR sections would be changed to remove reference to the FCMLHRL of 21 kW/ft and replace it with a reference to the cycle-specific FCMLHRL determined by the SPC approved methodology:

Sections	3.5.2.1.2, "Fuel Pellet Temperatures;"
	7.2.3.3.10, "High Local Power Density Trip;"
	14.0.7.2, "Specified Acceptable Fuel Design Limits;"
	14.0.7.3.1, "Local Power Density;"
	14.0.11, "Plant Licensing Basis and Single Failure Criteria;"
	14.1.3.6, "Analysis Results;"
	14.1.3.7, "Conclusion;"
	14.1.5.1.6.1.3, "Departure From Nucleate Boiling Ratio and Linear Heat Generation Rate Results;"
	14.1.5.1.6.2.3, "Departure From Nucleate Boiling Ratio and Linear Heat Generation Rate Results;"
	14.1.5.1.7, "Conclusions;"
	14.1.5.2.6.1.5, "Departure From Nucleate Boiling Ratio and Linear Heat Generation Rate Results;"
	14.1.5.2.6.2.5, "Departure From Nucleate Boiling Ratio and Linear Heat Generation Rate Results;"
	14.1.5.2.7, "Conclusions;"
	14.1.5.3, "Radiological Consequences of a Main Steam Line Break;"
	14.3.1.6, "Analysis Results;"
	14.3.1.7, "Conclusion;"
	14.3.3.6, "Analysis Results;"
	14.3.3.7, "Conclusion;"
	14.4.2.6, "Analysis Results;"
	14.4.2.7, "Conclusion;"
	14.6.1.6, "Analysis Results;" and
	14.6.1.7, "Conclusions."

In addition, the SPC topical report would be referenced in Sections 3.5, "REFERENCES," and 14.0, "REFERENCES."

The following FSAR tables would also be revised:

Tables	7.2-1, "Reactor Trip and Pretrip Set Points;"
	14.1.5.2-6, "Post-Scram Steam Line Break Analysis Summary;"
	14.1.5.3-1, "Assumptions Used in Main Steam Line Break Analysis [MSLB];" and
	14.1.5.3-2, "Summary of Millstone Unit 2 MSLB Accident Doses."

TS Bases 2.1.1, "Reactor Core," would be changed from a reference to a "steady state peak linear heat rate at or less than 21 kW/ft" to a "steady state peak linear heat rate at or less than the fuel centerline melt linear heat rate limit."

#### 4.0 EVALUATION

The proposed MP2 FSAR and TS Bases revisions are due to a change in the method used to determine the FCMLHRL. The change represents a departure from the current use of a fixed value of 21 kW/ft for the FCMLHRL to a value that will be calculated on a cycle-by-cycle basis using the referenced NRC-approved SPC methodology. The cycle-specific calculated FCMLHRL may be higher than 21 kW/ft and, therefore, may result in a reduction in the margin of safety as defined in the bases to the TS. For MP2 operating cycle 14, the SPC calculated FCMLHRL is 24.5 kW/ft. The value of the FCMLHRL is verified for each reloading of fuel in the reactor during a refueling outage, as part of the reload evaluation process. Therefore, in future applications of this methodology, the peak linear heat rates (LHR) calculated from transient analyses will be compared to the FCMLHRL for the cycle to verify that fuel centerline temperatures remain below the melting point for all AOOs.

In addition, a high local power density (LPD) trip is provided to prevent fuel centerline melting during AOOs. The LPD limiting safety system settings verification analysis will use the cycle-dependent FCMLHRL as the basis for the trip setpoints, thereby assuring that the melting point of the fuel will not be reached.

The proposed departure from using a fixed value of 21 kW/ft to the use of a cycle-specific calculated value represents a change in the method of setting the limiting FCMLHRL value and may result in a reduction in the difference between the FCMLHRL and the actual power level required to produce fuel centerline melt. However, the licensee will calculate the limit during each reload evaluation process and compare the limit to the MP2 safety analyses results to verify that the FCMLHRL remains bounding and that fuel centerline melt will not occur during any AOO. In addition, the licensee will verify that the LPD trip conservatively bounds any power level and power distribution condition that could exceed the cycle-specific FCMLHRL to ensure that a reactor trip would occur in sufficient time to prevent fuel centerline melt during any AOO. The licensee will calculate the cycle-specific limit using the NRC-approved SPC methodology given in Topical Report XN-NF-82-06(P)(A), which will be referenced in the FSAR. In addition, the NRC has approved use of this methodology as specified in TS 6.9.1.8. Therefore, we find the proposed change in the method used to determine the limiting FCMLHRL acceptable. In addition, the staff does not object to the proposed Bases changes.

#### 5.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Connecticut State official was notified of the proposed issuance of the amendment. The State official had no comments.

#### 6.0 ENVIRONMENTAL CONSIDERATION

The amendment changes a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The NRC 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 issued a proposed finding that the amendment involves no significant hazards consideration, and there has been no public comment on such finding (66 FR 7684). 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.

## 7.0 CONCLUSION

The Commission has 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, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: L. Kopp

Date: March 29, 2001