Docket No. 50-423

July 26, 1993

Mr. John F. Opeka
Executive Vice President, Nuclear
Connecticut Yankee Atomic Power Company
Northeast Nuclear Energy Company
Post Office Box 270
Hartford, Connecticut 06141-0270

Dear Mr. Opeka:

SUBJECT: ISSUANCE OF AMENDMENT (TAC NO. M86072)

The Commission has issued the enclosed Amendment No. 81 to Facility Operating License No. NPF-49 for Millstone Nuclear Power Station, Unit No. 3, in response to your application dated March 15, 1993.

The amendment allows: (1) the use of ZIRLO fuel, (2) limited substitution of zirconium alloy or stainless steel filler rods for fuel rods, and (3) the use of three new approved analytical methods for Millstone 3.

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

Sincerely,

Original signed by

Vernon L. Rooney, Senior Project Manager
Project Directorate I-4
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Enclosures:
1. Amendment No. 81 to NPF-49
2. Safety Evaluation

cc w/enclosures:
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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

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cc w/enclosures:
See next page

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

NORTHEAST NUCLEAR ENERGY COMPANY, ET AL.

DOCKET NO. 50-423

MILLSTONE NUCLEAR POWER STATION, UNIT NO. 3

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 81
License No. NPF-49

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 March 15, 1993, 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. NPF-49 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 81 , and the Environmental Protection Plan contained in Appendix B, both of which are attached hereto are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

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

FOR THE NUCLEAR REGULATORY COMMISSION

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: July 26, 1993

ATTACHMENT TO LICENSE AMENDMENT NO. 81

FACILITY OPERATING LICENSE NO. NPF-49

DOCKET NO. 50-423

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.

Remove	Insert
5-5	5-5
6-20	6-20
	6-20A

5.3 REACTOR CORE

FUEL ASSEMBLIES

5.3.1 The core shall contain 193 fuel assemblies. Each fuel assembly shall consist of 264 zircaloy-4 or ZIRLO clad fuel rods with an initial composition of natural uranium dioxide or a maximum nominal enrichment of 5.0 weight percent U-235 as fuel material. Limited substitutions of zircaloy-4, ZIRLO or stainless steel filler rods for fuel rods, in accordance with NRC-approved applications of fuel rod configurations, may be used. Fuel assembly configurations shall be limited to those fuel designs that have been analyzed with applicable NRC staff-approved codes and methods, and shown by test or cycle-specific reload analyses to comply with all fuel safety design bases. Each fuel rod shall have a nominal active fuel length of 144 inches. A limited number of lead test assemblies that have not completed representative testing may be placed in nonlimiting core regions.

CONTROL ROD ASSEMBLIES

5.3.2 The core shall contain 61 full-length control rod assemblies. The full-length control rod assemblies shall contain a nominal 142 inches of absorber material. The nominal values of absorber material shall be 95.3% hafnium and 4.5% natural zirconium or 80% silver, 15% indium, and 5% cadmium. All control rods shall be clad with stainless steel.

5.4 REACTOR COOLANT SYSTEM

DESIGN PRESSURE AND TEMPERATURE

5.4.1 The Reactor Coolant System is designed and shall be maintained:

a. In accordance with the Code requirements specified in Section 5.2 of the FSAR, with allowance for normal degradation pursuant to the applicable Surveillance Requirements,

b. For a pressure of 2500 psia, and

c. For a temperature of 650°F, except for the pressurizer which is 680°F.

VOLUME

5.4.2 The total water and steam volume of the Reactor Coolant System is 12,240 cubic feet at a nominal T_{avg} of 587°F.

5.5 METEOROLOGICAL TOWER LOCATION

5.5.1 The meteorological tower shall be located as shown on Figure 5.1-3.

CORE OPERATING LIMITS REPORT (Cont.)

2. Shutdown Rod Insertion Limit for Specification 3/4.1.3.5,

3. Control Rod Insertion Limits for Specification 3/4.1.3.6,

4. Axial Flux Difference Limits, target band, and APL^{ND} for Specifications 3/4.2.1.1 and 3/4.2.1.2,

5. Heat Flux Hot Channel Factor, K(z), W(z), APL^{ND}, and $W(z)_{BL}$ for Specifications 3/4.2.2.1 and 3/4.2.2.2.

6. Nuclear Enthalpy Rise Hot Channel Factor, Power Factor Multiplier for Specification 3/4.2.3.

6.9.1.6.b The analytical methods used to determine the core operating limits shall be those previously reviewed and approved by the NRC in:

1. WCAP-9272-P-A, "WESTINGHOUSE RELOAD SAFETY EVALUATION METHODOLOGY," July 1985 (W Proprietary). (Methodology for Specifications 3.1.1.3--Moderator Temperature Coefficient, 3.1.3.5--Shutdown Bank Insertion Limit, 3.1.3.6--Control Bank Insertion Limits, 3.2.1--Axial Flux Difference, 3.2.2--Heat Flux Hot Channel Factor, 3.2.3--Nuclear Enthalpy Rise Hot Channel Factor.)

2. WCAP-8385, "Power Distribution Control and Load Following Procedures - Topical Report," September 1981 (W Proprietary).

3. T. M. Anderson to K. Kniel (Chief of Core Performance Branch, NRC), January 31, 1980--Attachment: Operation and Safety-Analysis Aspects of an Improved Load Follow Package.

4. NUREG-800, Standard Review Plan, U.S. Nuclear Regulatory Commission, Section 4.3, Nuclear Design, July 1981 Branch Technical Position CPB 4.3-1, Westinghouse Constant Axial Offset Control (CAOC), Revision 2, July 1981.

5. WCAP-10216-P-A, "RELAXATION OF CONSTANT AXIAL OFFSET CONTROL FQ SURVEILLANCE TECHNICAL SPECIFICATION," June 1983 (W Proprietary). (Methodology for Specifications 3.2.1--Axial Flux Difference [Relaxed Axial Offset Control] and 3.2.2--Heat Flux Hot Channel Factor [W(z) surveillance requirements for F_Q Methodology].)

6. WCAP-9561-P-A, ADD. 3, Rev. 1, "BART A-1: A COMPUTER CODE FOR THE BEST ESTIMATE ANALYSIS OE REFLOOD TRANSIENTS--SPECIAL REPORT: THIMBLE MODELING W ECCS EVALUATION MODEL," July 1986 (W Proprietary). (Methodology for Specification 3.2.2--Heat Flux Hot Channel Factor.)

7. WCAP-10266-P-A, Rev. 2, "THE 1981 VERSION OF WESTINGHOUSE EVALUATION MODEL USING BASH CODE," March 1987 (W Proprietary). (Methodology for Specification 3.2.2--Heat Flux Hot Channel Factor.)

CORE OPERATING LIMITS REPORT (Cont.)

8. WCAP-11946, "Safety Evaluation Supporting a More Negative EOL Moderator Temperature Coefficient Technical Specification for the Millstone Nuclear Power Station Unit 3," September 1988 (W Proprietary).

9. WCAP-10054-P-A, "WESTINGHOUSE SMALL BREAK ECCS EVALUATION MODEL USING THE NOTRUMP CODE," August 1985 (W Proprietary). (Methodology for Specification 3.2.2 - Heat Flux Hot Channel Factor.)

10. WCAP-10079-P-A, "NOTRUMP - A NODAL TRANSIENT SMALL BREAK AND GENERAL NETWORK CODE," August 1985 (W Proprietary). (Methodology for Specification 3.2.2 - Heat Flux Hot Channel Factor.)

11. WCAP-12610, "VANTAGE+ Fuel Assembly Report," June 1990 (W Proprietary). (Methodology for Specification 3.2.2 - Heat Flux Hot Channel Factor.)

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 81

TO FACILITY OPERATING LICENSE NO. NPF-49

NORTHEAST NUCLEAR ENERGY COMPANY, ET AL.

MILLSTONE NUCLEAR POWER STATION, UNIT NO. 3

DOCKET NO. 50-423

1.0 INTRODUCTION

By letter dated March 15, 1993, the Northeast Nuclear Energy Company, submitted a request for changes to the Millstone Nuclear Power Station, Unit No. 3 Technical Specifications (TS). The requested changes would allow (1) the use of ZIRLO fuel, (2) limited substitution of zirconium alloy or stainless steel filler rods for fuel rods, and (3) the use of three new approved analytical methods for Millstone 3.

The Westinghouse ZIRLO fuel was described in the topical report WCAP-12610 "VANTAGE+ Fuel Assembly Reference Core Report," and was approved by the staff for irradiation up to 60,000 MWd/MTU rod average burnup. The Millstone 3 reload fuel design will allow removal of individual fuel rods from the assemblies that are found to be damaged or have the potential of cladding breach to be replaced by filler rods. The reconstitution permits these fuel assemblies to be reused without the radiological consequences from the failed fuel rods.

The revised Technical Specification recognizes the acceptability of the use of reconstituted fuel assemblies provided that NRC-approved methodologies are used for safety analyses. The licensee also proposed the use of lead test assemblies in non-limiting core positions. Our evaluation follows.

2.0 EVALUATION

The staff approved the ZIRLO fuel design in a safety evaluation to the Westinghouse topical report WCAP-12610 "VANTAGE+ Fuel Assembly Reference Core Report." Thus, the staff concludes that the use of ZIRLO fuel is acceptable for Millstone 3.

The licensee proposed filler rods of Zircaloy 4, ZIRLO, or stainless steel to replace damaged or failed fuel rods for reconstituting the fuel assemblies. The licensee safety analyses of reconstitution will be performed according to the NRC-approved methodologies to comply with all safety design bases. The licensee also proposed the use of a limited number of lead test assemblies in non-limiting core positions for the purpose of completing representative testing of a new fuel design. The licensee proposed Technical Specification

changes are consistent with the requirements described in the Supplement 1 to Generic Letter (GL) 90-02, "Alternative Requirements for Fuel Assemblies in the Design Features Section of Technical Specifications," and therefore are acceptable.

The licensee has proposed to revise Section 5.3.1 of the Technical Specifications by the following new paragraph:

> The core shall contain 193 fuel assemblies. Each fuel assembly shall consist of 264 zircaloy-4 or ZIRLO clad fuel rods with an initial composition of natural uranium dioxide or a maximum nominal enrichment of 5.0 weight percent U-235 as fuel material. Limited substitutions of zircaloy-4, ZIRLO or stainless steel filler rods for fuel rods, in accordance with NRC-approved applications of fuel rod configurations, may be used. Fuel assembly configurations shall be limited to those fuel designs that have been analyzed with applicable NRC staff-approved codes and methods, and shown by test or cycle-specific reload analyses to comply with all fuel safety design bases. Each fuel rod shall have a nominal active fuel length of 144 inches. A limited number of lead test assemblies that have not completed representative testing may be placed in nonlimiting core regions.

Based on staff evaluation, we conclude that the above change is consistent with Supplement 1 to GL 90-02 and therefore the changes are acceptable.

The licensee has proposed to add the following three approved analytical methods to Section 6.9.1.6.b of the Technical Specifications:

9. WCAP-10054-P-A, "Westinghouse Small Break ECCS Evaluation Model Using The NOTRUMP Code," August 1985 (W Proprietary). (Methodology for Specification 3.2.2 - Heat Flux Hot Channel Factor.)

10. WCAP-10079-P-A, "NOTRUMP - A Nodal Transient Small Break and General Network Code," August 1985 (W Proprietary). (Methodology for Specification 3.2.2 - Heat Flux Hot Channel Factor.)

11. WCAP-12610, "VANTAGE+ Fuel Assembly Report," June 1990 (W Proprietary.) (Methodology for Specification 3.2.2 - Heat Flux Hot Channel Factor.)

Since these three analytical methods have been approved by the staff, we conclude that these additions are acceptable.

3.0 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.

4.0 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 (58 FR 19485). 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.

5.0 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: S. Wu

Date: July 26, 1993