November 18, 1991

Docket No. 50-443

Mr. Ted C. Feigenbaum, President
and Chief Executive Officer
New Hampshire Yankee Division
Public Service Company of New Hampshire
Post Office Box 300
Seabrook, New Hampshire 03874

Dear Mr. Feigenbaum:

SUBJECT: ISSUANCE OF AMENDMENT NO. 8 TO FACILITY OPERATING LICENSE NO. NPF-86 - SEABROOK STATION, UNIT NO. 1 (TAC NO. 81146)

The Commission has issued the enclosed Amendment No. 8 to Facility Operating License No. NPF-86 for the Seabrook Station. This amendment is in response to your application dated April 12, 1991 and supplemented July 12, 1991.

This amendment would change the Technical Specifications for the Seabrook Station to redefine the fully withdrawn position of all Rod Cluster Control Assembly (RCCA) banks to minimize localized RCCA wear.

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

Sincerely,
Original signed by
G. E. Edison

Gordon Edison, Senior Project Manager
Project Directorate I-3
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Enclosures:
1. Amendment No. 8 to License No. NPF-86
2. Safety Evaluation

cc w/enclosures:
See next page

*See previous concurrence

OFC	:LA:PDI-3	:PDI-3/PE *	:PDI-3/PM *	:OGC*	:PDI-3/DIR
NAME	:MRushbrook	:AChu	:GEdison:mw	:MYoung	:WButler
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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

November 18, 1991

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AMENDMENT NO. 8 TO NPF-86 SEABROOK STATION DATED November 18, 1991

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

PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE, ET AL.*

DOCKET NO. 50-443

SEABROOK STATION, UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 8
License No. NPF-86

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

   A. The application for amendment filed by the Public Service Company of New Hampshire (the licensee), acting for itself and as agent and representative of the 11 other utilities listed below and hereafter referred to as licensees, dated April 12, 1991, and supplemented July 12, 1991, comply 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 set forth in 10 CFR Chapter I;

   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.

*Public Service Company of New Hampshire is authorized to act as agent for the: Canal Electric Company, The Connecticut Light and Power Company, EUA Power Corporation, Hudson Light & Power Department, Massachusetts Municipal Wholesale Electric Company, Montaup Electric Company, New England Power Company, New Hampshire Electric Cooperative, Inc., Taunton Municipal Light Plant, The United Illuminating Company, and Vermont Electric Generation and Transmission Cooperative, Inc., and has exclusive responsibility and control over the physical construction, operation and maintenance of the facility.

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-86 is hereby amended to read as follows:

   (2) Technical Specifications

   The Technical Specifications contained in Appendix A, as revised through Amendment No. 8 , and the Environmental Protection Plan contained in Appendix B are incorporated into Facility License No. NPF-86. PSNH shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This license amendment is effective as of its date of issuance and shall be implemented within 60 days of receipt of this letter.

FOR THE NUCLEAR REGULATORY COMMISSION

Morton B. Fairtile for

Walter R. Butler, Director
Project Directorate I-3
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: November 18, 1991

ATTACHMENT TO LICENSE AMENDMENT NO. 8

FACILITY OPERATING LICENSE NO. NPF-86

DOCKET NO. 50-443

Replace the following pages of the Appendix A Technical Specifications with the attached pages. The revised pages are identified by Amendment number and contain vertical lines indicating the area of change. Overlap pages are provided for continuity.

Remove	Insert
3/4 1-20	3/4 1-20
3/4 1-21	3/4 1-21
3/4 1-23	3/4 1-23
B 3/4 1-4	B 3/4 1-4

MOVABLE CONTROL ASSEMBLIES

POSITION INDICATION SYSTEM - SHUTDOWN

LIMITING CONDITION FOR OPERATION

3.1.3.3 One digital rod position indicator (excluding demand position indication) shall be OPERABLE and capable of determining the control rod position within ± 12 steps for each shutdown or control rod not fully inserted.

APPLICABILITY: MODES 3* **, 4* **, and 5* **.

ACTION:

With less than the above required position indicator(s) OPERABLE, immediately open the Reactor Trip System breakers.

SURVEILLANCE REQUIREMENTS

4.1.3.3 Each of the above required digital rod position indicator(s) shall be determined to be OPERABLE by verifying that the digital rod position indicators agree with the demand position indicators within 12 steps when exercised over the full range of rod travel at least once per 18 months.

*With the Reactor Trip System breakers in the closed position.

**See Special Test Exceptions Specification 3.10.5.

MOVABLE CONTROL ASSEMBLIES

SHUTDOWN ROD INSERTION LIMIT

LIMITING CONDITION FOR OPERATION

3.1.3.5 All shutdown rods shall be fully withdrawn#.

APPLICABILITY: MODES 1* and 2* **.

ACTION:

With a maximum of one shutdown rod not fully withdrawn, except for surveillance testing pursuant to Specification 4.1.3.1.2, within 1 hour either:

a. Fully withdraw# the rod, or

b. Declare the rod to be inoperable and apply Specification 3.1.3.1.

SURVEILLANCE REQUIREMENTS

4.1.3.5 Each shutdown rod shall be determined to be fully withdrawn#:

a. Within 15 minutes prior to withdrawal of any rods in Control Bank A, B, C, or D during an approach to reactor criticality, and

b. At least once per 12 hours thereafter.

*See Special Test Exceptions Specifications 3.10.2 and 3.10.3.

**With k_{eff} greater than or equal to 1.

#The fully withdrawn position is defined as the interval within 225 to the mechanical fully withdrawn position, inclusive.

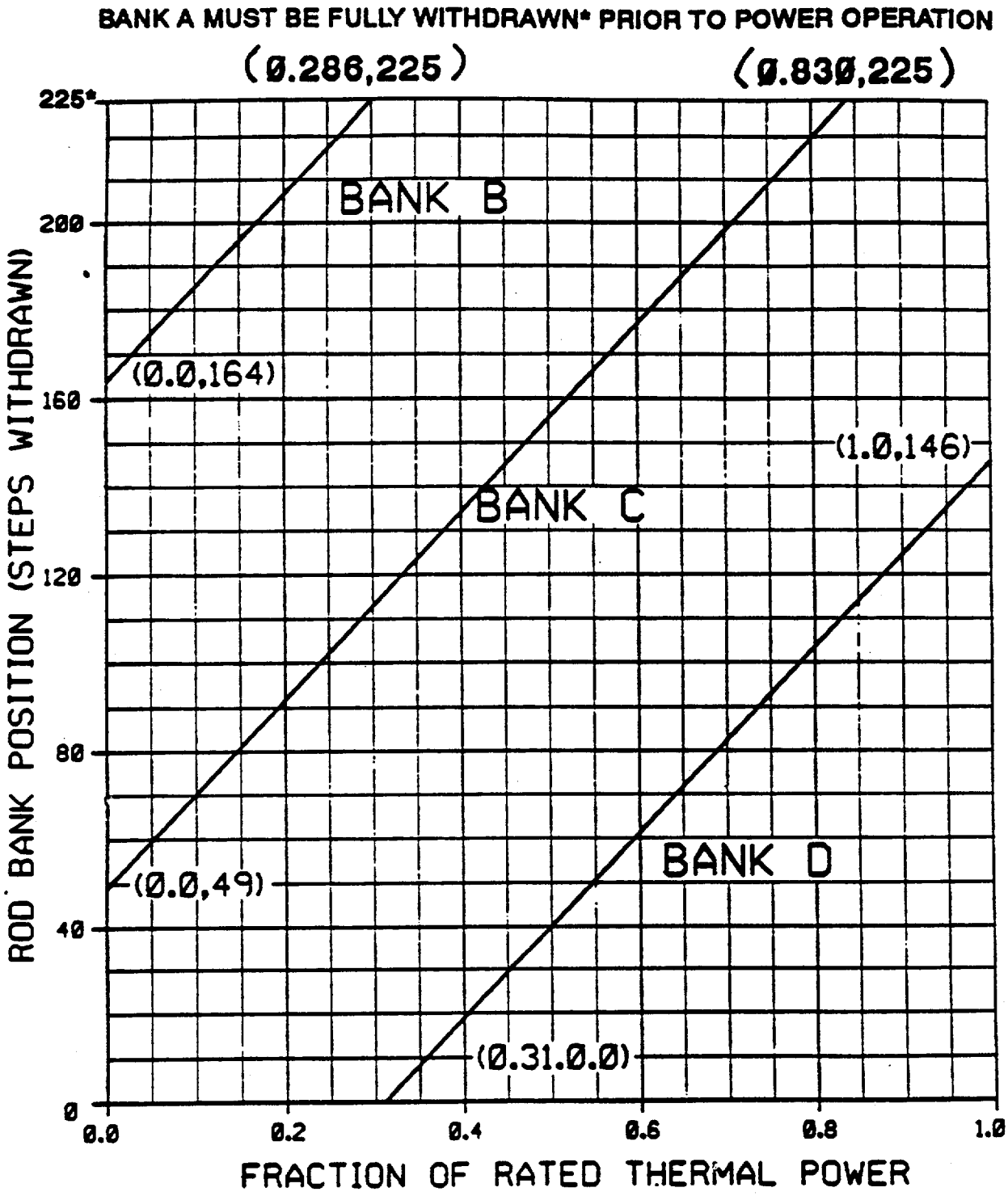

FIGURE 3.1-1

ROD BANK INSERTION LIMITS VERSUS THERMAL POWER
FOUR-LOOP OPERATION

*** Fully Withdrawn = 225 to the mechanical fully withdrawn position, inclusive**

3/4.1.2 BORATION SYSTEMS (Continued)

The boron capability required below 200°F is sufficient to provide a SHUTDOWN MARGIN of 1.2% Δk/k after xenon decay and cooldown from 200°F to 140°F. This condition requires a minimum contained volume of 6500 gallons of 7000 ppm borated water from the boric acid storage tanks or a minimum contained volume of 24,500 gallons of 2000 ppm borated water from the RWST.

The contained water volume limits include allowance for water not available because of discharge line location and other physical characteristics.

The limits on contained water volume and boron concentration of the RWST also ensure a pH value of between 8.5 and 11.0 for the solution recirculated within containment after a LOCA. This pH band minimizes the evolution of iodine and minimizes the effect of chloride and caustic stress corrosion on mechanical systems and components.

The OPERABILITY of one Boron Injection System during REFUELING ensures that this system is available for reactivity control while in MODE 6.

The limitations on OPERABILITY of isolation provisions for the Boron Thermal Regeneration System and the Reactor Water Makeup System in Modes 3, 4, 5, and 6 ensure that the boron dilution flow rates cannot exceed the value assumed in the transient analysis.

3/4.1.3 MOVABLE CONTROL ASSEMBLIES

The specifications of this section ensure that: (1) acceptable power distribution limits are maintained, (2) the minimum SHUTDOWN MARGIN is maintained, and (3) the potential effects of rod misalignment on associated accident analyses are limited. OPERABILITY of the control rod position indicators is required to determine control rod positions and thereby ensure compliance with the control rod alignment and insertion limits. Verification that the Digital Rod Position Indicator agrees with the demanded position within ± 12 steps at 24, 48, 120, and 228 steps withdrawn for the Control Banks and 18, 210, and 228 steps withdrawn for the Shutdown Banks provides assurances that the Digital Rod Position Indicator is operating correctly over the full range of indication. Since the Digital Rod Position Indication System does not indicate the actual shutdown rod position between 18 steps and 210 steps, only points in the indicated ranges are picked for verification of agreement with demanded position.

The ACTION statements which permit limited variations from the basic requirements are accompanied by additional restrictions which ensure that the original design criteria are met. Misalignment of a rod requires measurement of peaking factors and a restriction in THERMAL POWER. These restrictions provide assurance of fuel rod integrity during continued operation. In addition, those safety analyses affected by a misaligned rod are reevaluated to confirm that the results remain valid during future operation.

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 8 TO FACILITY OPERATING LICENSE NO. NPF-86

PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE

SEABROOK STATION, UNIT NO. 1

DOCKET NO. 50-443

1.0 INTRODUCTION

By letter dated April 12, 1991, New Hampshire Yankee requested changes to the technical specifications (TS) of the Seabrook Station. Additional information was submitted by letter dated July 12, 1991. The proposed changes redefine the fully withdrawn position of all Rod Cluster Control Assembly (RCCA) banks to minimize localized RCCA wear. Currently, the fully withdrawn position for the control and shutdown RCCA banks is defined as 228 steps above rod bottom. The proposed changes will allow the control and shutdown RCCA banks to be designated as fully withdrawn between steps 225 and 232, inclusive. These changes are consistent with those approved for other plants. The RCCA repositioning will axially reposition the RCCAs to distribute wear to several locations on the RCCA rodlets in order to extend rod life.

The RCCAs in Westinghouse PWRs were originally estimated to last for at least 15 years before the absorber cladding, a thin tube, would show excessive thinning as a result of sliding wear. In 1983, after 13 years of operation, the RCCAs were inspected at Point Beach Nuclear Plant, Unit 2. The results of this inspection showed that sliding wear was minor, but severe fretting wear had occurred on several tubes. Subsequent inspections at the Kewaunee and Haddam Neck plants which had been in operation for more than 12 years, also showed fretting wear. The marks of fretting wear were about 1 inch in length and were found adjacent to the guide blocks that position the rods when the RCCAs are in their withdrawn position.

The fretting resulted from flow-induced vibratory contact between the rods and the guide blocks during long periods of steady-state power operation. Vibration is hydraulically induced by flow of the reactor coolant; therefore it is a continuous process when the reactor coolant pumps are in operation.

More recently plants have experienced noticeable fretting wear after as little as one cycle of operation. As a result of this industry experience, Yankee Atomic Electric Company (YAEC) has advised New Hampshire Yankee to implement the RCCA repositioning program as soon as possible.

2.0 EVALUATION

Currently the fully withdrawn position for all of the Seabrook Station RCCAs is 228 steps above rod bottom. To avoid the fretting wear at the same location, it is recommended that the fully withdrawn parked position be changed periodically. In this way the wear will be spread over a greater surface area of the rodlet cladding.

The licensee proposed defining "fully withdrawn" to mean between 225 and 232 steps above reactor bottom for all RCCA banks. Between 228 and 232 steps, the RCCAs are withdrawn at least two steps above the active fuel. Thus with respect to core physics, the effects are equivalent. Also at 232 steps, the RCCAs will remain inserted in the guide thimbles of the fuel assemblies and thus will allow for a smooth rod drop. The rod drop time assumed in the safety analysis will still be bounding. When the RCCAs are withdrawn to 225 steps, they will be actually inserted approximately 0.4 inches into the active core region.

The RCCA repositioning program has been evaluated with respect to its effect on reactor physics, transient analysis, LOCA analysis, mechanical analysis and fuel management.

YAEC, using the SIMULATE-3 computer model, has determined that the repositioning to the 225th step will have an insignificant effect which is not quantifiable for both axial and radial power distributions, critical boron concentrations and temperature dependent shutdown margins during Cycles 1 and 2. The repositioning program will be taken into account in future core designs and safety analyses.

The RCCA repositioning program allows the rods to be withdrawn to 232 steps, four steps higher than the current TS limit. Conservative calculations show that the rod drop time will be well within the TS Rod Drop Time of 2.2 seconds. Furthermore, the repositioning will not be implemented until rod drop times have been measured at the new positions and shown to meet the TS values.

Because the proposed change involves small adjustments in the fully withdrawn position of RCCAs relative to the active core region, we would expect essentially negligible effects of the proposed change as reported in the licensee's evaluation.

3.0 STATE CONSULTATION

In accordance with the Commission's regulations, the New Hampshire and Massachusetts State officials were notified of the proposed issuance of the amendment. The State officials 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 (56 FR 51928). 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: M. Chatterton

Date: November 18, 1991