

July 24, 1991

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. 4 TO FACILITY OPERATING LICENSE NO.  
NPF-86 - SEABROOK STATION, UNIT NO. 1 (TAC NO. 79114)

The Commission has issued the enclosed Amendment No. 4 to Facility Operating License No. NPF-86 for the Seabrook Station Unit 1. This amendment is in response to your application dated November 13, 1990.

This amendment revises the Technical Specifications for Seabrook Station Unit 1 involving testing of high pressure turbine control valves.

A copy of our Safety Evaluation is also enclosed and a notice of issuance which will be included in the Commission's biweekly Federal Register notice.

Sincerely,

Original signed by Gordon 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. 4 to License No. NPF-86
- 2. Safety Evaluation

cc w/enclosures:  
See next page

OFC	:PDI-3/LA	:PDI-3/PM	:OGC	:PDI-3/DIR
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Document Name: SEABROOK AMEND.PKG.TAC 79114



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

July 24, 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

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Sincerely,

A handwritten signature in cursive script that reads "Gordon 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. 4 to License No. NPF-86
2. Safety Evaluation

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Mr. Ted C. Feigenbaum

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Mr. Ted C. Feigenbaum

Seabrook

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AMENDMENT NO. 4 TO NPF-86 SEABROOK STATION DATED July 24, 1991

DISTRIBUTION:

Docket File 50-443 ←

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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. 4  
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 November 13, 1990, 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 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.

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P PDR

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2C.(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. 4, 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.

FOR THE NUCLEAR REGULATORY COMMISSION

*Morton B. Faircliff for*

Richard H. Wessman, 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: July 24, 1991

ATTACHMENT TO LICENSE AMENDMENT NO. 4

FACILITY OPERATING LICENSE NO. NPF-86

DOCKET NO. 50-443

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

Remove

3/4 3-67

Insert

3/4 3-67

## INSTRUMENTATION

### 3/4.3.4 TURBINE OVERSPEED PROTECTION

#### LIMITING CONDITION FOR OPERATION

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3.3.4 At least one Turbine Overspeed Protection System shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTION:

- a. With one stop valve or one control valve per high pressure turbine steam line inoperable and/or with one intermediate stop valve or one intercept valve per low pressure turbine steam line inoperable, restore the inoperable valve(s) to OPERABLE status within 72 hours, or close at least one valve in the affected steam line(s) or isolate the turbine from the steam supply within the next 6 hours.
- b. With the above required Turbine Overspeed Protection System otherwise inoperable, within 6 hours isolate the turbine from the steam supply.

#### SURVEILLANCE REQUIREMENTS

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4.3.4.1 The provisions of Specification 4.0.4 are not applicable.

4.3.4.2 The above required Turbine Overspeed Protection System shall be demonstrated OPERABLE:

- a. At least once per 7 days by cycling each of the following valves through at least one complete cycle from the running position:
  - 1) Four high pressure turbine stop valves, and
  - 2) Six low pressure combined intermediate valves.
- b. At least once per 31 days by direct observation of the movement of each of the above valves and the four high pressure turbine control valves through one complete cycle from the running position,
- c. At least once per 18 months by performance of a CHANNEL CALIBRATION on the Turbine Overspeed Protection Systems, and
- d. At least once per 40 months by disassembling at least one of each of the above valves and performing a visual and surface inspection of valve seats, disks, and stems and verifying no unacceptable flaws or excessive corrosion. If unacceptable flaws or excessive corrosion are found, all other valves of that type shall be inspected.



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
RELATED TO AMENDMENT NO. 4 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 November 13, 1990, New Hampshire Yankee (the licensee) requested an amendment to the Seabrook Station Operating License incorporating a change to the Seabrook Station Technical Specifications (TSs). The proposed TS changes would delete the existing requirement to perform a weekly stroke test of the high pressure turbine control valves. The surveillance requirements for the high pressure turbine stop valves and the combined intermediate valves are unchanged, as is the monthly stroke test requirement for the high pressure turbine control valves. Additionally, editorial changes with respect to valve nomenclature have been submitted to provide consistency throughout the TS.

The turbine generator is controlled and protected by an electro-hydraulic control (EHC) system that combines solid state electronic and high pressure hydraulic components to control the steam flow through the turbine. The four high pressure turbine control valves are automatically positioned by the EHC system to control turbine speed and/or load. The high pressure turbine control valves combined with the four high pressure turbine stop valves provide a redundant means of isolating the high pressure turbine from the main steam supply in the event of an overspeed condition. The six combined intermediate valves provide a means of isolating the low pressure turbines from their steam supply, the moisture separator-reheater. A single failure of any one component would not lead to destructive overspeed.

2.0 EVALUATION

The test frequency of the high pressure turbine control valves was originally based on the recommendation of the turbine manufacturer (General Electric). These test frequencies were derived from the test frequencies established for fossil-fuel turbines. Fossil-fuel turbines typically operate at higher temperatures and pressures than nuclear plant turbines. As a result, fossil-fuel turbines are more susceptible to oxidation and sticking of control valve stems. Operating experience at nuclear power plants has indicated significantly lower failure rates than those from which the recommended test intervals were derived. Based upon these findings, General Electric Company issued Technical Information Letter (TIL) No. 969, dated May 22, 1984. The test frequency specified in this TIL is monthly testing of the control valves, and weekly testing for all other turbine steam valves.

The probability of multiple failures involving undetected electronic faults and/or stuck valves at the instant of load loss is extremely low due to the demonstrated high reliability of the control system components, and periodic in-service testing and inspection. General Electric Company states in TIL No. 969 that, based on past in-service experience with nuclear turbine steam valves, turbine steam inlet valve reliability and testing intervals are no longer the major contributing factors in determining hypothetical turbine missiles.

The current Seabrook Station TSs require cycling of the four high pressure turbine stop valves, four high pressure turbine control valves and six low pressure combined intermediate valves at least once every seven days. The Seabrook Station Probabilistic Safety Assessment (SSPSA), dated January 30, 1984, provided estimates of the mean annual frequency of turbine missile generation based on the weekly test intervals. This analysis yielded estimates of  $2.0 \times 10^{-5}$  for the mean annual frequency of turbine missile generation due to turbine overspeed and  $8.3 \times 10^{-5}$  for the total mean annual frequency of turbine missile generation. The staff considers these estimates to be conservative.

In the request for license amendment, the licensee addressed the significance of turbine missile generation with regard to public risk. The SSPSA estimates the likelihood of generating turbine missiles and analyzes the most probable consequences. The results indicate that the contribution from turbine missile generation to public risk is negligible. The staff accepts this analysis in the context that small changes in the probability of turbine missile generation are unlikely to involve a significant increase in the probability of an accident or a significant reduction in the margin of safety.

The extended recommended testing interval for the control valves is also based on a reduction in the number of plant transients caused by the test. In order to perform the control valve test, turbine output must be reduced below 93 percent of full power. Reducing the frequency of this power reduction decreases the probability of an inadvertent turbine trip (and reactor trip) caused by testing.

The General Electric Company provided comparative values for increased turbine overspeed probabilities due to increased test intervals in Nuclear Wheel Information Letter No. 2 dated November 8, 1982. Applying these values to the situation where the control valve test frequency is changed from weekly to monthly increases the turbine overspeed probability by a factor of 3.3. The staff utilized this information to quantitatively evaluate the effect of the proposed change on the probability of turbine missile generation. This evaluation yielded an overspeed<sub>5</sub> and total mean<sub>4</sub> annual frequency of turbine missile generation of  $6.6 \times 10^{-5}$  and  $1.3 \times 10^{-4}$ , respectively.

The staff does not consider the change in total mean annual frequency of turbine missile generation resulting from the proposed change in high pressure turbine control valve testing interval to be significant based on: the conservative approach of the licensee, the uncertainties inherent in estimates of the probability of turbine missile generation, and the turbine manufacturer's

position that turbine steam inlet valve reliability and testing are no longer major contributing factors in determining the probability of generating turbine missiles. Additionally, the decrease in the frequency of power transients which will result from the proposed change in testing interval will provide an improved level of safety. The proposed editorial changes improve the consistency of valve nomenclature. Based on the above, the staff finds the proposed TS amendment acceptable.

Based on information available from the licensee and the turbine manufacturer, an extension of the control valve testing interval from weekly to monthly will not significantly increase the probability of turbine missile generation, the probability of accidents initiated by such an event, or the consequences of these postulated accidents. Moreover, the extended test interval reduces the probability of inadvertent plant trips which challenge safety systems. Therefore, the staff finds the proposed TS amendment acceptable.

### 3.0 STATE CONSULTATION

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

### 4.0 ENVIRONMENTAL CONSIDERATION

The amendment changes an inspection or surveillance requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and changes surveillance requirements. 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 24216). 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. Jones, SPLB

Date: July 24, 1991