October 25, 1993

Docket No. 50-423

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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. M87712)

The Commission has issued the enclosed Amendment No. 85 to Facility Operating License No. NPF-49 for Millstone Nuclear Power Station, Unit No. 3, in response to your application dated September 14, 1993.

The amendment changes the setpoints for the reactor trip system interlock P-10.

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. 85 to NPF-49
2. Safety Evaluation

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

October 25, 1993

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Executive Vice President, Nuclear
Connecticut Yankee Atomic Power Company
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See next page

Mr. John F. Opeka
Northeast Nuclear Energy Company

Millstone Nuclear Power Station
Unit 3

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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. 85
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 September 14, 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. 85 , 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.

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: October 25, 1993

ATTACHMENT TO LICENSE AMENDMENT NO. 85

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 |
|---|---|
| 2-7 | 2-7 |
| 2-8 | 2-8 |
| 2-12 | 2-12 |
| B 2-8 | B 2-8 |

TABLE 2.2-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION TRIP SETPOINTS

| FUNCTIONAL UNIT | TOTAL ALLOWANCE (TA) | Z | SENSOR ERROR (S) | TRIP SETPOINT | ALLOWABLE VALUE |
|---|---|---|---|---|---|
| 16. Turbine Trip | | | | | |
| a. Low Fluid Oil Pressure | N.A. | N.A. | N.A. | $\geq$ 500 psig | $\geq$ 450 psig |
| b. Turbine Stop Valve Closure | N.A. | N.A. | N.A. | $\geq$ 1% open | $\geq$ 1% open |
| 17. Safety Injection Input from ESF | N.A. | N.A. | N.A. | N.A. | N.A. |
| 18. Reactor Trip System Interlocks | | | | | |
| a. Intermediate Range Neutron Flux, P-6 | N.A. | N.A. | N.A. | $\geq 1 \times 10^{-10}$ amp | $\geq 6 \times 10^{-11}$ amp |
| b. Low Power Reactor Trips Block, P-7 | | | | | |
| 1) P-10 input (Note 5) | N.A. | N.A. | N.A. | $\leq$ 11% of RTP** | $\leq$ 12.1% of RTP** |
| 2) P-13 input | N.A. | N.A. | N.A. | $\leq$ 10% RTP** Turbine Impulse Pressure Equivalent | $\leq$ 12.1% RTP** Turbine Impulse Pressure Equivalent |
| c. Power Range Neutron Flux, P-8 | | | | | |
| 1) Four Loops Operating | N.A. | N.A. | N.A. | $\leq$ 37.5% of RTP** | $\leq$ 39.6% of RTP** |
| 2) Three Loops Operating | N.A. | N.A. | N.A. | $\leq$ 37.5% of RTP** | $\leq$ 39.6% of RTP** |

**RTP = RATED THERMAL POWER

TABLE 2.2-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION TRIP SETPOINTS

| FUNCTIONAL UNIT | TOTAL ALLOWANCE (TA) | Z | SENSOR ERROR (S) | TRIP SETPOINT | ALLOWABLE VALUE |
|---|---|---|---|---|---|
| d. Power Range Neutron Flux, P-9 | N.A. | N.A. | N.A. | ≤ 51% of RTP** | ≤ 53.1% of RTP** |
| e. Power Range Neutron Flux, P-10 (Note 6) | N.A. | N.A. | N.A | ≥ 9% of RTP** | ≥ 7.9% of RTP** |
| 19. Reactor Trip Breakers | N.A. | N.A. | N.A | N.A. | N.A. |
| 20. Automatic Trip and Interlock Logic | N.A. | N.A. | N.A. | N.A. | N.A. |
| 21. Three Loop Operation Bypass Circuitry | N.A. | N.A. | N.A. | N.A. | N.A |

**RTP = RATED THERMAL POWER

NOTE 3: (Continued)

$K_6$ = 0.00180/°F for T > T" and $K_6$ = 0 for T ≤ T",

T = As defined in Note 1,

T" = Indicated $T_{avg}$ at RATED THERMAL POWER (Calibration temperature for ΔT instrumentation, ≤ 587.1°F),

S = As defined in Note 1, and

$f_2(\Delta I)$ = 0 for all ΔI.

NOTE 4: The channel's maximum Trip Setpoint shall not exceed its computed Trip Setpoint by more than 2.7% ΔT span.

NOTE 5: Setpoint is for increasing power.

NOTE 6: Setpoint is for decreasing power.

Reactor Trip System Interlocks (Continued)

P-8 On increasing power, P-8 automatically enables Reactor trips on low flow in one or more reactor coolant loops. On decreasing power, the P-8 automatically blocks the above listed trips.

P-9 On increasing power, P-9 automatically enables Reactor trip on Turbine trip. On decreasing power, P-9 automatically blocks Reactor trip on Turbine trip.

P-10 On increasing power, P-10 provides input to P-7 to ensure that Reactor Trips on low flow in more than one reactor coolant loop, reactor coolant pump low shaft speed, pressurizer low pressure and pressurizer high level are active when power reaches 11%. It also allows the manual block of the Intermediate Range trip and the Low Setpoint Power Range trip; and automatically blocks the Source Range trip and deenergizes the Source Range high voltage power.

On decreasing power, P-10 resets to automatically reactivate the Intermediate Range trip and the Low Setpoint Power Range trip before power drops below 9%. It also provides input to reset P-7.

P-13 Provides input to P-7.

Three Loop Operation Bypass Circuitry

The Three Loop Operation Bypass Circuitry reactor trip ensures that a sufficient number and the correct combination of trip circuits remain available to provide necessary protection and mitigation capability during three loop operation. Should more than two channels in one train or two dissimilar channels in two trains be bypassed, a reactor trip will occur. In this manner, it is ensured that sufficient protective features remain to mitigate the consequences of analyzed transients.

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 85

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 a letter dated September 14, 1993, Northeast Nuclear Energy Company (NNECO), the licensee for the Millstone Nuclear Power Station, Unit 3 requested NRC's approval to implement amendments to Facility Operating License NPF-49 by incorporating changes to the Technical Specifications (TS). The proposed TS changes will support the revision of trip and reset setpoints of P-10 interlock (power range neutron flux interlock) of the reactor trip system (RTS). The amendment will also include a clarification to a paragraph in the section for the BASES, and add two footnotes to Table 2.2-1.

## 2.0 BACKGROUND AND DISCUSSION

On September 1, 1993, an engineer at the plant determined that the P-10 interlock's bistable reset function had been improperly calibrated since the last plant start-up. The reset was set too low. Further investigation indicated that the reset function was actually in error. The bistable of P-10 interlock has setpoints for both the trip and reset functions. The existing TS requires that the P-10 trip occur at a reactor thermal power (RTP) greater than or equal to 10%, and that the reset occur at a RTP less than or equal to 10% of the RTP.

On increasing power, before the RTP reaches 10%, the P-10 trip provides input to the P-7 interlock to ensure that the reactor trips for the following conditions are activated: low flow in more than one loop of the reactor coolant system (RCS), reactor coolant pump (RCP) low shaft speed, pressurizer low pressure and pressurizer high level. In addition, at this RTP, the P-10 trip automatically blocks the Source Range (SR) trip, de-energizes the SR high voltage power and allows manual blocking of the Intermediate Range (IR) and Low Setpoint Power Range (LSPR) trips.

On decreasing power, P-10 resets to automatically reactivate the IR and LSPR trips before the power drops to less than or equal to 10%. In addition, P-10 reset initiates the P-7 interlock to block the reactor trips associated with pressurizer low pressure and high level, RCS low flow and RCP low shaft speed

conditions(s). For RTP below this setpoint these trips are not required because the reactor coolant system is capable of providing sufficient natural circulation without any reactor coolant pump running.

## 3.0 EVALUATION

### 3.1 Reactor Systems Considerations

Assurance of safe plant operation relies in part on the results of analysis of plant operation and response to a variety of conditions. Operation of the plant outside of the envelope that has been analyzed and found acceptable is not allowed. Trip setpoints associated with the reactor trip system are established to require that process variables remain within allowable values.

Excessive reactor power levels are prevented by high trips from the power range flux monitor channels. If a reactor power excursion began at too low a reactor power, the peak reactor power may overshoot acceptable peak power values. For this reason high flux trips with lower setpoints protect against excursions that start at lower power levels. Above a certain reactor power level these trips are not needed and may be blocked.

Unstable boiling that threatens adequate heat transfer from fuel assemblies is, in part, avoided by various reactor trips that protect against loss of forced cooling of the reactor core. Natural convection cooling, rather than forced circulation is adequate below a certain reactor power level, therefore, trips that protect the loss of forced cooling are not needed, and may be blocked.

The reactor power levels below which forced cooling is not required in order to be within the operational envelope that has been analyzed and found acceptable overlaps the region of reactor power levels above which low level flux channel trips are not required. Thus there is a band of reactor power levels for which neither forced cooling trips nor low level flux trips are needed. The P-10 interlock is the reactor power level interlock used to permit the blocking of unneeded reactor trips, and assure the reenablement of needed reactor trips as the reactor changes power. Because the P-10 interlock is provided with two trips it is able to function as a permissive interlock for both of the above functions.

In order to assure that either of the two trips is always set so that reactor power is always within the region which has been found acceptable, the trip must be set within the boundary of the acceptable range of reactor power sufficiently that setpoint measurement and test error and setting tolerance cannot combine to allow reactor operation outside of acceptable values. If one of the P-10 trips is thus set, it determines the closest setting of the other P-10 trip that can be achieved. This is because the design of the P-10 interlock requires a certain separation between the two trips. With the existing Technical Specifications the required trip setpoints for the two P-10 trips prevent both P-10 trips from simultaneously being within their respective allowable values with enough margin to assure that setting

tolerance and setpoint measurement and test errors cannot combine to result in actual reactor operation at a power level and protective circuitry condition that has not been analyzed and found acceptable. The existing Technical Specifications prevent such operation by requiring readjustment of any setpoint found during calibration to be less conservative than the TS setpoint value, so that it is no longer less conservative. For example, if the forced convection setpoint were found to be set at 11 during calibration, the setting would be less than 12.1, and thus within the range of allowable values, but would, nevertheless, require readjustment to 10 (TS 2.2.1 a). If this is done, of course the other P-10 setpoint moves also, requiring its readjustment, ad infinitum. Thus, in preventing reactor operation at a power level and protective circuitry condition that has not been analyzed, the existing TS preclude reactor operation under any condition. For this reason the licensee requested in the September 14, 1993, letter, exigency approval of the proposed license amendment.

The reactor power levels and setpoints for which approved analysis exists is specified in TS Table 2.2-1 in the column headed "Approved Values." The proposed trip setpoints are within the range of allowed values, and thus are acceptable as values which are acceptable because plant operation with these values has been analyzed and approved. The following section considers the acceptability of the proposed setpoints to assure that the proposed changes preserve sufficient margin to assure that reactor operation always remains within analyzed and approved conditions.

3.2 Instrumentation and Control Considerations

The P-10 interlock bistable has a reset-adjustment to adjust the deadband between trip and reset settings. The minimum deadband achievable using this adjustment is 2% of full power. The existing TS requires the trip and reset setpoints of the P-10 bistable to be the same, i.e., equal to 10% of RTP, but depending on increasing or decreasing direction of power. This situation has created compliance problems. Therefore, the licensee has proposed to revise the trip setpoint of P-10 interlock to P-7 (Table 2.2-1, Functional Unit 18 b.1) on increasing power to be less than or equal to 11% RTP and its reset setpoint (Table 2.2-1, Functional Unit 18 e) to greater than or equal to 9% RTP on decreasing power, thus separating trip and reset settings by a 2% deadband. For each of the new settings a margin of 1.1% exists between the setpoint and the allowable value of the process variable. During a conference call between the staff and the licensee on October 5, 1993, the licensee confirmed that the 1.1% margin is adequate to address the total of all the uncertainty of the instrument loop including drift. The licensee further confirmed that, considering the rate of increase and decrease of power, the 1.1% margin is adequate to address the response time of the loop components and that of the follow-up equipment which will be activated by the trip and reset signals from the P-10 bistable. Therefore, allowable values of the process variable for each of the revised setpoints are not required to be changed. Since the allowable values for the revised setpoints are not changing, and adequate margin exists between the setpoint and its allowable value, the revised setpoints are acceptable to the staff.

In addition to a revision of setpoints, the licensee has added editorial clarification to a paragraph P-10 on page B 2-8 of the BASES section of the TS, and also added the following footnotes to Table 2.2-1:

Note 5: Setpoint is for increasing power.
Note 6: Setpoint is for decreasing power.

These changes are editorial and are necessary to avoid confusion in describing the function of the setpoints. These changes are acceptable to the staff.

## 4.0 EXIGENT CIRCUMSTANCES

On September 2, 1993, the licensee determined that the TS as presently written cannot be complied with. Table 2.2-1 requires mutually exclusive setpoint values for the two setpoints for the P-10 interlock. Section 3.1 explains the reason that the two setpoint values in the existing TS are mutually exclusive. On September 14, 1993, the licensee proposed a license amendment which changes the existing TS to permit plant operation, and asked for exigency processing of the amendment request. At the time of the request the plant was shutdown for a refueling outage and was expected to resume operations by October 3, 1993. The change in TS is not needed until the plant changes operating modes to enter the startup mode to resume operation. The licensee currently expects the plant to resume operations by October 25, 1993.

The NRC staff does not believe that the licensee has abused the exigency provisions of 10 CFR 50.91 in this instance. Accordingly, the Commission has determined that exigent circumstances existed warranting prompt action, the situation could not have been avoided, and the amendment as discussed in Section 5.0 does not involve a significant hazards consideration,

## 5.0 FINAL NO SIGNIFICANT HAZARDS CONSIDERATION DETERMINATION

The Commission has made a final determination that the amendment involves no significant hazards consideration. Under the Commission's regulations in 10 CFR 50.92(c), this means that the operation of the facility in accordance with the proposed amendment would not (1) Involve a significant increase in the probability or consequences of an accident previously evaluated; or (2) Create the possibility of a new or different kind of accident from any accident previously evaluated; or (3) Involve a significant reduction in a margin of safety.

The Commission has evaluated the proposed changes against the above standards as required by 10 CFR 50.91(a) and has concluded that:

A. The proposed changes do not involve a significant increase in the probability or consequences of an accident previously evaluated (10 CFR 50.92(c)(1) because they do not involve a change in the design or operation of the facility, nor do they affect the response of the facility to an accident.

Accidents previously evaluated assumed "allowable values" which are less conservative settings than the setpoint values changed in this revision. The "allowable values" of the limiting safety system settings are the values that assure that the associated design basis assumptions are valid. Since the "allowable values" are not changed, the proposed changes have no impact or effect on the accident previously evaluated.

B. Create the possibility of a new or different kind of accident from any previously evaluated.

The proposed changes do not affect the plant operation or introduce any new failure mechanisms. Therefore, the proposed changes will not create the possibility of a new or different kind of accident from any previously evaluated.

C. Involve a significant reduction in a margin of safety.

The allowable values in the TS are the values that assure the validity of the design basis assumptions. The trip setpoint provides a value that limits the potential for exceeding the allowable value and thereby limits the potential for exceeding any design basis assumption. Based on this, the design basis assumptions are not impacted. Since the allowable values are not changing, the changes do not have any impact on the design basis analyses. Therefore, the proposed changes will not involve a significant reduction in a margin of safety.

## 6.0 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.

## 7.0 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 49333). The staff has made a final determination that the amendment involves no significant hazards consideration. 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.

## 8.0 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 Contributors: S.V. Athavale
V.L. Rooney

Date: October 25, 1993