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December 4, 1990

Docket No. 50-423
B13678
Re: 10CFR50.90

U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555

Reference: (1) E. J. Mroczka letter to the U.S. Nuclear Regulatory Commission, Proposed Revision to Technical Specifications, Cycle 4 Reload Submittal, dated November 1, 1990.

Gentlemen:

Millstone Nuclear Power Station, Unit No. 3
Proposed Changes to Technical Specifications
Cycle 4 Reload Submittal - Boron Dilution Analysis

On November 1, 1990, Northeast Nuclear Energy Company (NNECO) submitted a proposed amendment to Facility Operating License NPF-49 for Millstone Unit No. 3 (Reference (1)). The proposed amendment would revise several Technical Specifications in support of refueling and operation for Millstone Unit No. 3 with the VANTAGE 5 Hybrid (5H) improved fuel design. In Reference (1), NNECO also indicated that the boron dilution analysis was being finalized at that time and the results of the analysis and Technical Specification changes related to the analysis would be submitted in a future submittal. Therefore, pursuant to 10CFR50.90, NNECO hereby proposes to amend Operating License NPF-49 by incorporating the attached proposed changes into the Technical Specifications of Millstone Unit No. 3. A description of the proposed change is provided in Attachment 1. The revised pages of the Technical Specifications are provided in Attachment 2.

Discussion

The plant safety evaluation presented in Reference (1) includes all accident evaluations except an evaluation for uncontrolled boron dilution. Attachment 3 provides the results of the boron dilution analysis in Modes 1 through 6 performed for Millstone Unit No. 3 as part of the upgrade to VANTAGE 5H fuel. The analysis presented in Attachment 3 includes an identification of causes and a description of the accident, limiting dilution flow path description, safety functions and mitigating systems, safety analysis criteria & regulatory requirements, method of analysis, and relevant conclusions. For operating Modes 1 through 5, the results presented in Attachment 3 show that adequate time is available for the operator to manually terminate the source of dilution flow, assuming the specified shutdown margin requirements are met.

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Following termination of the dilution flow, the operator can initiate reboration to recover the shutdown margin. No analysis is presented for Mode 6 operation, since dilution during refueling is precluded by the indicated administrative controls, similar to those used for Technical Specification 3.6.1.1.

Significant Hazards Consideration

NNECO has reviewed the proposed changes in accordance with 10CFR50.92(c) and has concluded that the changes do not involve a significant hazards consideration. The basis for this conclusion is that the three criteria of 10CFR50.92(c) are not compromised. The proposed changes do not involve a significant hazards consideration because the changes would not:

1. Involve a significant increase in the probability or consequences of an accident previously analyzed.

   To determine any potential impact, the proposed changes can be grouped into two categories. These are:

   a. Changes to Technical Specifications due to boron dilution analysis performed as part of the upgrade to VANTAGE 5H fuel.

   b. Changes that are not related to the boron dilution analysis and are administrative in nature such as renumbering of pages from the existing Technical Specifications to accommodate a new Technical Specification and to allow removal of "intentionally blank" pages from Technical Specifications.

   Each of these groups of changes is discussed below:

   a. As discussed above and in Attachment 3, the boron dilution analysis was performed for Modes 1 through 6 for Millstone Unit No. 3 as part of the upgrade to VANTAGE 5H fuel. The boron dilution in the Modes 1 through 5 calculation determines the amount of time available for operator mitigation of the dilution prior to the loss of shutdown margin. Acceptable response time for the various modes must be greater than or equal to the following (as per Standard Review Plan 15.4.6):

Mode 6	Refueling	30 Minutes
Mode 5	Cold Shutdown	15 Minutes
Mode 4	Hot Shutdown	15 Minutes
Mode 3	Hot Standby	15 Minutes
Mode 2	Startup	15 Minutes
Mode 1	Power	15 Minutes

   For Operating Modes 1 through 5, the results presented in Attachment 3 show that adequate time is available for the

operator to manually terminate the source of dilution flow. Meeting these operator response times verifies that the condition of the plant at any point in the transient is within the bounds of those calculated for other Final Safety Analysis Report (FSAR) Condition II transients. No analysis is presented for Mode 6 operation, since dilution during refueling is precluded by the indicated administrative controls. Therefore, there is no increase in the consequences due to the boron dilution accident. The probability of occurrence is not affected since dilution sources are not changed. Moreover, in the cases of Mode 5 drained or Mode 6 where dilution source valves are secured, occurrence of a dilution event is precluded by the indicated administrative controls similar to those used for Technical Specification 3.6.1.1. As stated in Attachment 3, the existing design for the detection of an inadvertent boron dilution event is a temporary system that is set up within the control room. A new system will be provided as a permanent Class 1E installation. The failure of these monitors will not change the probability of the occurrence of the boron dilution accident. In fact, this system will improve the accuracy and reliability over the existing system.

b. The renumbering of pages and removal of blank pages do not reduce the effectiveness of the Technical Specifications. Also, these changes do not affect the existing or proposed limiting conditions for operation or surveillance requirements. Therefore, there is no impact on the design basis accidents.

On the basis of this review, NNECO concludes that there is no significant increase in the probability or consequences of an accident previously analyzed.

2. Create the possibility of a new or different kind of accident from any previously analyzed.

a. The failure modes associated with the new shutdown margin monitor cannot be an initiating event for the design basis accident. Therefore, the failure modes associated with the shutdown margin monitor do not represent a new unanalyzed accident. The existing boron dilution analysis fully covers all existing failure modes. There are no new failure modes introduced by these changes.

b. Since these changes do not affect plant operation, the potential for an unanalyzed accident is not created. No new failure modes are introduced. Based on the above, NNECO concludes that the proposed changes do not create any new or different kind of accident from those previously analyzed.

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

   a. No increase in consequences was identified above as a result of the proposed changes. Therefore, the impact of the consequences on the protective boundaries is unchanged. The boron dilution analysis included in Attachment 3 has confirmed that the operator has adequate time to manually terminate the source of dilution flow. Meeting these operator response times verifies that the condition of the plant at any point in the transient is within the bounds of those calculated for other FSAR Condition II transients. Therefore, verification of no change in margin of safety is encompassed in meeting the required operator response times.

   b. Since the proposed changes do not affect the consequences of any accident previously analyzed, there is no reduction in the margin of safety.

Moreover, the Commission has provided guidance concerning the application of the standards in 10CFR50.92 by providing certain examples (March 6, 1986, 51FR7751) of amendments that are considered not likely to involve a significant hazards consideration. Although the proposed changes are not enveloped by a specific example, the proposed changes related to the boron dilution analysis would not involve a significant increase in the probability or consequences of an accident previously analyzed. For operating Modes 1 through 5, the results presented in Attachment 3 show that adequate time is available for the operator to manually terminate the source of dilution flow. No specific analysis is presented for Mode 6 operation, since dilution during refueling is precluded by the indicated administrative controls similar to those used for Technical Specification 3.6.1.1. For other Technical Specification changes, there is no increase in the consequences of an accident previously analyzed. Therefore, based on the above, NNECO concludes that the proposed Technical Specification changes do not involve a significant hazards consideration.

Based upon the information contained in this submittal and the environmental assessment for Millstone Unit No. 3, there are no significant radiological or nonradiological impacts associated with the proposed action, and that the proposed license amendment will not have a significant affect on the quality of the human environment.

The Millstone Unit No. 3 Nuclear Review Board has reviewed and approved the attached proposed revisions and has concurred with the above determinations.

In accordance with 10CFR50.91(b), we are providing the State of Connecticut with a copy of the proposed amendment.

We believe the above information, coupled with the information provided in Reference (1), provides a complete basis for approval of the requested amendment. Of course, should the Staff have any additional questions, we remain available to discuss the Staff's concerns.

Very truly yours,

NORTHEAST NUCLEAR ENERGY COMPANY

E. J. Mroczka
Senior Vice President

cc: T. T. Martin, Region I Administrator
D. H. Jaffe, NRC Project Manager, Millstone Unit No. 3
W. J. Raymond, Senior Resident Inspector, Millstone Unit Nos. 1, 2, and 3

Mr. Kevin McCarthy
Director, Radiation Control Unit
Department of Environmental Protection
Hartford, CT 06116

STATE OF CONNECTICUT)
) ss. Berlin
COUNTY OF HARTFORD)

Then personally appeared before me, E. J. Mroczka, who being duly sworn, did state that he is Senior Vice President of Northeast Nuclear Energy Company, a Licensee herein, that he is authorized to execute and file the foregoing information in the name and on behalf of the Licensee herein, and that the statements contained in said information are true and correct to the best of his knowledge and belief.

Lorraine J. D'Amico
Notary Public
My Commission Expires March 31, 1993

Docket No. 50-423
B13678

Attachment 1

Millstone Nuclear Power Station, Unit No. 3

Description of Proposed Technical Specification Changes

Cycle 4

December 1990

Millstone Nuclear Power Station, Unit No. 3
Description of Proposed Technical Specification Changes, Cycle 4

In a letter dated November 1, 1990, Northeast Nuclear Energy Company (NNECO) submitted a proposed license amendment for Millstone Unit No. 3. The proposed amendment would revise several Technical Specifications in support of refueling and operation for Millstone Unit No. 3 with the VANTAGE 5 Hybrid (5H) improved fuel design. In that letter, NNECO indicated that the boron dilution analysis was being finalized and the results of the analysis and corresponding Technical Specification changes would be provided in a future submittal. Westinghouse under the contract of NNECO has completed the boron dilution analysis in Modes 1 through 6 for Millstone Unit No. 3 as part of the upgrade to VANTAGE 5H fuel. The proposed Technical Specification changes related to the boron dilution analysis are summarized below:

A. Technical Specification Changes Due to the Boron Dilution Analysis

1. Section 3.1.1.1.2, Shutdown Margin Modes 3, 4, and 5 Loops Filled

Section 3.1.1.1, Boration Control has been split into two; one for Modes 1 and 2 and the other for Modes 3, 4 and 5 with loops filled. The Technical Specification changes related to Modes 1 and 2 were described in Reference (1). For Modes 3, 4 and 5, the shutdown margin is provided in Figures 3.1-1 (four loops--Mode 3), 3.1-2 (three loops--Mode 3), 3.1-3 (Mode 4) and 3.1-4 (Mode 5 with Loops Filled). These figures show the required shutdown margin, as a function of critical boron concentration, to ensure at least 15 minutes from the time of the flux multiplication alarm to loss of shutdown margin. A 10-second response time is considered in the development of the shutdown margin requirements.

2. Section 3.1.1.2, Shutdown Margin--Cold Shutdown--Loops Not Filled

In Mode 5 drained (loops not filled) an option is available to either require a larger shutdown margin per Figure 3.1-5 (new figure) or preclude a boron dilution accident by securing dilution flow paths and maintaining the same shutdown margin as required for Mode 5 with loops filled per Figure 3.1-4.

3. Section 3.1.2.1, Boration Systems--Flow Path--Shutdown
Section 3.1.2.2, Boration Systems--Flow Paths--Operating

The proposed change of wording to Specifications 3.1.2.1.a and 3.1.2.2.a are necessary to make these specifications consistent with the Millstone Unit No. 3 design and the wording of specifications 3.1.2.5 and 3.1.2.6. This specification will allow the use of either one boric acid tank or two.

In addition, the Specification 3.1.2.2 ACTION statement has been revised to reflect the new Figure 3.1-4.

4. Section 3.1.2.4, Charging Pumps, Operating

The Specification 3.1.2.4 ACTION Statement has been revised to reflect the new Figure 3.1-4.

5. Section 3.1.2.6, Borated Water Sources, Operating

A revision to Section 3.1.2.6 was submitted in Reference (1). Additional changes are necessary as a result of the boron dilution analysis. The Specification 3.1.2.6 ACTION Statement has been revised to reflect the new Figure 3.1-4. A change of "contained volume" to "usable volume" is proposed in Specification 3.1.2.6.a to allow use of both tanks or one. The minimum volume required depends upon the usable volume in the boric acid storage tanks and the number of tanks in use. A usable volume of 21,020 gallons should be required in Modes 1, 2, 3 and 4 for Specification 3.6.1.2.a. The unusable volume in each boric acid storage tank is 1300 gallons.

6. Table 3.3-1, Reactor Trip Instrumentation
Table 4.3-1, Reactor Trip Instrumentation Surveillance Requirements

Millstone Unit No. 3 will be installing a new shutdown margin monitor which will be used in place of the existing (function unit 6b of Table 3.3-1) manual high flux monitor at shutdown. The new shutdown margin monitor has two channels for redundancy and provides an alarm which alerts the operator to a boron dilution. Therefore, Table 3.3-1 functional unit 6b has been deleted and functional unit 21 has been added to Table 3.3-1. Functional Unit 6C has been relabeled as 6b. In addition, ACTION statements are proposed for one less than minimum and for no channels operable. The proposed surveillance requirements for this new shutdown margin monitor in Table 4.3-1 are consistent with the general philosophy of the Westinghouse Standard Technical Specifications. In addition, the alarm setpoint for the shutdown margin monitor will be included in the Core Operating Limits Report (COLR). Note 9 to Table 4.3-1 has been revised to delete reference to the previous high flux at shutdown alarm and a new Note 19 to Table 4.3-1 has been added to reflect the surveillance requirement of a new shutdown margin monitor.

7. Section 3.4.1.4.2, Cold Shutdown--Loops Not Filled
Section 3.9.1.1, Refueling Operations--Boron Concentration

A revision to Section 3.9.1.1 was submitted in Reference (1). Additional changes are necessary as a result of the boron dilution analysis.

The limiting condition for operation has been revised that will require certain valves in the chemical and volume control system (CVCS) to be secured to preclude a boron dilution event. A list of the valves is included in this specification that requires verification at least once per 31 days that these valves are closed and locked or under administrative controls.

8. Section 3.4.1.6, Isolated Loop Startup

A revision to Section 3.4.1.6 was submitted in Reference (1). Additional changes are necessary as a result of the boron dilution analysis. Specification 3.4.1.6.d and Surveillance 4.4.1.6.2 have been revised to make this specification consistent with Specification 3.1.1.1.2 and 3.1.1.2 and 3.9.1.1.

9. Bases Sections 3/4.1.1.1 and 3/4.1.1.2, Shutdown Margin
Bases Section 3/4.1.2, Boration Systems
Bases Section 3/4.4.1, Reactor Coolant Loops and Coolant Circulation
Base Section 3/4.9.1 Boron Concentration

A revision to the above sections was submitted in Reference (1). Additional changes to these sections are being proposed to reflect the proposed Technical Specifications.

B. Other Technical Specification Changes

1. Renumbering of Technical Specification Pages

Pages 3/4 1-1 through 3/4 1-23 are being renumbered to accommodate the new Specification 3.1.1.1.2 and to delete the blank pages from Technical Specifications which were left by Amendment 50. As a result of the above, appropriate pages of the Technical Specification Index were also revised. Page 3/4 1-17 (Section 3.1.2.5), and Page 3/4 1-25 (Section 3.1.3.4) were submitted in Reference (1). These two pages are being resubmitted as a result of the renumbering of pages. In addition, Page 3/4 2-26 was also submitted in Reference (1) and is being resubmitted to reflect recently approved Amendment No. 57.

Reference: (1) E. J. Mroczka letter to the U.S. Nuclear Regulatory Commission, Cycle 4, Reload Submittal, dated November 1, 1990.