

January 9, 2002

Mr. J. A. Price
Vice President - Nuclear Technical Services - Millstone
c/o Mr. David A. Smith
Dominion Nuclear Connecticut, Inc.
Rope Ferry Road
Waterford, CT 06385

SUBJECT: MILLSTONE NUCLEAR POWER STATION, UNIT NO. 3 - ISSUANCE OF
AMENDMENT RE: REACTOR COOLANT SYSTEM - ISOLATED LOOP
STARTUP (TAC NO. MB1785)

Dear Mr. Price:

The Commission has issued the enclosed Amendment No. 202 to Facility Operating License No. NPF-49 for the Millstone Nuclear Power Station, Unit No. 3 (MP3), in response to your application dated April 23, 2001, as supplemented by letters dated June 29, July 19, and November 13, 2001.

The amendment changes Technical Specification (TS) 3.4.1.6, "Reactor Coolant System - Isolated Loop Startup" which includes revisions to the limiting condition for operation. Some of the changes to TS 3.4.1.6 affect restrictions that were included as part of the original MP3 licensing basis allowing power operation with one isolated reactor coolant system loop.

As an item of additional information, in your letter dated April 23, 2001, requesting a change to the MP3 TSs, the proposed changes were primarily associated with revised Reactor Coolant System pressure/temperature limit curves and cold over-pressure protection limit curves. The review of these proposed changes was documented in the staff's safety evaluation (SE) associated with Amendment No. 197 that was issued by letter dated August 27, 2001, (Accession No. ML012060343). At that time, the staff's review of the proposed revisions to TS 3.4.1.6 was not included in the SE because of time constraints, and we noted that the review of this remaining portion would be completed at a later date. This letter transmits the amendment and the associated SE that completes the remaining portion of the staff's review of your request in your April 23, 2001, letter.

J. Price

-2-

A copy of the related Safety Evaluation is also enclosed. Notice of Issuance will be included in the Commission's biweekly Federal Register notice. If you have any questions, please contact me at (301) 415-1484.

Sincerely,

/RA/

Victor Nerses, Sr. Project Manager, Section 2
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-423

Enclosures: 1. Amendment No. 202 to NPF-49
2. Safety Evaluation

cc w/encls: See next page

J. Price

- 2 -

A copy of the related Safety Evaluation is also enclosed. Notice of Issuance will be included in the Commission's biweekly Federal Register notice. If you have any questions, please contact me at (301) 415-1484.

Sincerely,

/RA/

Victor Nerses, Sr. Project Manager, Section 2
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-423

Enclosures: 1. Amendment No. 202 to NPF-49
2. Safety Evaluation

cc w/encls: See next page

DISTRIBUTION:

PUBLIC	OGC	PDI-2 R/F	ACRS
EAdensam	TClark	JClifford	VNerses
GHill (2)	WBeckner	KKavanagh	CCowgill, RI

Accession Number: ML013520174

*SE provided 12/07/01; no major changes made.

OFFICE	PDI-2/PM	PDI-2/LA	RTSB/BC*	OGC	PDI-2/SC
NAME	VNerses	TClark	WBeckner	RCummings	REnnis for JClifford
DATE	12-27-01	12-21-01	12-07-01	1-3-02	1-9-02

OFFICIAL RECORD COPY

Millstone Nuclear Power Station
Unit 3

cc:

Ms. L. M. Cuoco
Senior Nuclear Counsel
Dominion Nuclear Connecticut, Inc.
Rope Ferry Road
Waterford, CT 06385

Edward L. Wilds, Jr., Ph.D.
Director, Division of Radiation
Department of Environmental Protection
79 Elm Street
Hartford, CT 06106-5127

Regional Administrator, Region I
U.S. Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, PA 19406

First Selectmen
Town of Waterford
15 Rope Ferry Road
Waterford, CT 06385

Mr. P. J. Parulis
Process Owner - Oversight
Dominion Nuclear Connecticut, Inc.
Rope Ferry Road
Waterford, CT 06385

Mr. W. R. Matthews
Vice President and Senior
Nuclear Executive - Millstone
Dominion Nuclear Connecticut, Inc.
Rope Ferry Road
Waterford, CT 06385

Ernest C. Hadley, Esquire
P.O. Box 1104
West Falmouth, MA 02574-1104

Mr. John Markowicz
Co-Chair
Nuclear Energy Advisory Council
9 Susan Terrace
Waterford, CT 06385

Mr. Evan W. Woollacott
Co-Chair
Nuclear Energy Advisory Council
128 Terry's Plain Road
Simsbury, CT 06070

Mr. D. A. Christian
Senior Vice President - Nuclear Operations
and Chief Nuclear Officer
Innsbrook Technical Center - 2SW
5000 Dominion Boulevard
Waterford, CT 06385

Mr. C. J. Schwarz
Master Process Owner - Operate the Asset
Dominion Nuclear Connecticut, Inc.
Rope Ferry Road
Waterford, CT 06385

Senior Resident Inspector
Millstone Nuclear Power Station
c/o U.S. Nuclear Regulatory Commission
P. O. Box 513
Niantic, CT 06357

Mr. G. D. Hicks
Master Process Owner - Training
Dominion Nuclear Connecticut, Inc.
Rope Ferry Road
Waterford, CT 06385

Mr. R. P. Necci
Vice President - Nuclear Operations - Millstone
Dominion Nuclear Connecticut, Inc.
Rope Ferry Road
Waterford, CT 06385

Millstone Nuclear Power Station
Unit 3

cc:

Mr. D. A. Smith
Process Owner - Regulatory Affairs
Dominion Nuclear Connecticut, Inc.
Rope Ferry Road
Waterford, CT 06385

Ms. Nancy Burton
147 Cross Highway
Redding Ridge, CT 00870

Mr. William D. Meinert
Nuclear Engineer
Massachusetts Municipal Wholesale
Electric Company
P.O. Box 426
Ludlow, MA 01056

DOMINION NUCLEAR CONNECTICUT, INC., ET AL.

DOCKET NO. 50-423

MILLSTONE NUCLEAR POWER STATION, UNIT NO. 3

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 202
License No. NPF-49

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by the applicant dated April 23, 2001, as supplemented by letters dated June 29, July 19, and November 13, 2001, 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. 202, and the Environmental Protection Plan contained in Appendix B, both of which are attached hereto, are hereby incorporated in the license. Dominion Nuclear Connecticut, Inc. 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 issuance, and shall be implemented within 90 days. This amendment is contingent upon the following condition: Operation with one or more isolated Reactor Coolant System (RCS) loops in Modes 1 through 4 is prohibited, except for mitigation of abnormal or emergency events when operating in Modes 3 or 4. This condition will expire upon implementation of modifications to the Millstone Unit No. 3 Technical Specifications, Final Safety Analysis Report, and plant procedures to remove the option for power operation with one isolated RCS loop (N-1 operation).

FOR THE NUCLEAR REGULATORY COMMISSION

/RA Rennis for/

James W. Clifford, Chief, Section 2
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical
Specifications

Date of Issuance: January 9, 2002

ATTACHMENT TO LICENSE AMENDMENT NO. 202

FACILITY OPERATING LICENSE NO. NPF-49

DOCKET NO. 50-423

Replace the following page of the Appendix A Technical Specifications, with the attached revised page. The revised page is identified by amendment number and contains marginal lines indicating the areas of change.

Remove

3/4 4-8

Insert

3/4 4-8

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 202

TO FACILITY OPERATING LICENSE NO. NPF-49

DOMINION NUCLEAR CONNECTICUT, INC.

MILLSTONE NUCLEAR POWER STATION, UNIT NO. 3

DOCKET NO. 50-423

1.0 INTRODUCTION

By letter dated April 23, 2001 (Reference 8.1), as supplemented by letters dated June 29, July 19, and November 13, 2001 (References 8.2, 8.3, and 8.4), Dominion Nuclear Connecticut, Inc. (DNC/licensee) submitted a request to revise Technical Specification (TS) 3.4.1.6 for Millstone Nuclear Power Station, Unit No. 3 (MP3). The proposed changes to TS 3.4.1.6, "Reactor Coolant System - Isolated Loop Startup" include revisions to the limiting condition for operation (LCO) and surveillance requirement (SR) 4.4.1.6.2. The license amendment request also proposes to delete SR 4.4.1.6.3. Some of the proposed changes to TS 3.4.1.6 affect restrictions that were included as part of the original MP3 licensing basis allowing power operation with one isolated reactor coolant system (RCS) loop. As part of the proposed change to TS 3.4.1.6, DNC has requested a License Condition to the MP3 operating license. This License Condition supports the commitments made by DNC which state that MP3 will not be in power operation with one isolated RCS loop. The letters dated June 29, July 19, and November 13, 2001, provided clarifying information and did not change the staff's initial proposed no significant hazards consideration determination or expand the scope of the application as published in the *Federal Register*.

2.0 BACKGROUND

TS 3.4.1.6 addresses the requirements that must be met prior to opening reactor coolant system (RCS) loop isolation valves when the plant is in Modes 5 or 6. These requirements were first introduced and incorporated by Northeast Utilities (NU) by letter dated October 9, 1985 (Reference 8.5). In that letter, NU stated that the specification was being changed to incorporate a provision to address stratification concerns raised by the deletion of the recirculation requirement. Specifically, NU added the requirement to drain and refill a loop with a boric acid blend greater than that of the operating portion of the RCS to ensure that there would be no reactivity transient due to the restoration. Additionally, Northeast Utilities required that the loop stops be opened within 4 hours of completing the fill to ensure that stratification would not be a concern. These changes were accepted by the staff and are currently present in TS 3.4.1.6.

By letter dated November 16, 1987 (Reference 8.6), the NRC staff removed License Condition C.(4) which prohibited three loop operation until outstanding issues were resolved for MP3. These outstanding issues included startup of isolated loops and human factor concerns. The

staff was concerned that the information previously provided by NU was not sufficient to conclude that sufficient protection was provided to prevent the violation of fuel design limits as the result of a single operator error. In response to the staff's concerns, NU proposed the following interlocks and procedures:

- a. Restart of an isolated loop is permitted only during cold shutdown (Mode 5) or refueling (Mode 6). Interlocks prevent opening the cold leg stop valve if the RCS temperature is greater than 170 degrees Fahrenheit.
- b. Interlocks prevent the opening of the cold leg stop valve unless the hot leg isolation valve is open and the hot and cold leg temperature in the isolated loop are within 20 degrees Fahrenheit of those in the other loops.
- c. The isolated loop is drained and refilled prior to restart. Refill water is taken from the Volume Control Tank (VCT) which is part of the Chemical and Volume Control System (CVCS) and is the source of make up water to the RCS.
- d. Prior to refilling the loop, the boron concentrations in the VCT will be measured and confirmed to be greater than that in the RCS. Immediately upon completion of the refill, the boron concentration in the VCT will again be measured to confirm that it is still proper. If not, the loop will be drained and refilled.
- e. The shutdown margin is determined to be at least 0.016 $\Delta k/k$ prior to opening the cold leg valve.

Based on the proposed interlocks and procedures previously described, the staff concluded that there was adequate assurance that a single equipment failure or a single operator error would not produce unacceptable consequences. As a result of the review, the staff removed License Condition C.(4) from the MP3 operating license.

3.0 EVALUATION

3.1 Changes to LCO 3.4.1.6

The licensee has requested to make the following changes to TS LCO 3.4.1.6.

3.1.1 Add "and" at the end of TS 3.4.1.6.a.

This is a non-technical change and the staff finds it to be acceptable.

3.1.2 Delete the phrase "of the operating loops, or greater than 2600 ppm whichever is less" from TS 3.4.1.6.b. and delete the phrase "The reactor is subcritical by at least the value" from TS 3.4.1.6.e.

TS 3.9.1.1 requires that the boron concentration of all filled portions of the RCS and the refueling canal be uniformly maintained and sufficient to ensure that the more restrictive of the following reactivity conditions is met: either K_{eff} of 0.95 or less, or boron concentration of greater than or equal to 2,600 ppm. TS 3.9.1.1 is applicable in MODE 6 and is not being changed by this amendment request. The proposed deletion of the phrases "of the operating

loops, or greater than 2,600 ppm whichever is less” from TS 3.4.1.6.b and “the reactor is subcritical by at least the value” from TS 3.4.1.6.e is acceptable because these requirements are included in the requirements of TS 3.9.1.1.

3.1.3 Combine TS 3.4.1.6.b and TS 3.4.1.6.e such that TS 3.4.1.6.b would state “The boron concentration of the isolated loop is greater than or equal to the boron concentration required by Specifications 3.1.1.1.2 or 3.1.1.2 for Mode 5 or Specification 3.9.1.1 for Mode 6.”

TS 3.1.1.1.2 requires the Shutdown Margin (SDM) be greater than or equal to the limits shown in Figures 3.1-1, 3.1-3 and 3.1-4 for four loop operation and in Figure 3.1-2 for three loop operation in MODES 3, 4, and 5. TS 3.1.1.2 requires the SDM be greater than or equal to a) the limits shown in Figure 3.1-5 or b) the limits shown in Figure 3.1-4, with the CVCS aligned to preclude RCS boron concentration reduction in MODE 5 with loops not filled. TSs 3.1.1.1.2 and 3.1.1.2 are not revised by this amendment request. The revised TS 3.4.1.6.b will require the verification that the boron concentration of the isolated loop is greater than or equal to the SDM boron concentration requirements of TSs 3.1.1.1.2, 3.1.1.2, and 3.9.1.1 prior to opening the loop isolation valves. As such, the revised TS 3.4.1.6 b will ensure that the required SDM is maintained and, therefore, is acceptable.

3.1.4 Delete TS 3.4.1.6.c

TS 3.4.1.6.c requires that all reactor coolant pumps (RCPs) be de-energized prior to opening RCS loop isolation valves. The licensee stated that this requirement is not necessary because all RCPs are de-energized when opening RCS loop isolation valves to minimize the differential pressure across the loop isolation valves. Having the RCPs de-energized while opening the RCS isolation valves also eliminates the need to pressurize the isolated loop to match the higher RCS pressure required to operate an RCP. After the loop is unisolated, the RCP starting criteria contained in TSs 3.4.1.4.1 and 3.4.1.4.2 applies. Based on the above, the staff concludes that the deletion of TS 3.4.1.6.c is acceptable. This change is also consistent with NUREG-1431, Revision 2.

3.1.5 Delete TS 3.4.1.6.d

TS 3.4.1.6.d requires that the isolated portion of the loop be drained and refilled. This requirement is designed to ensure adequate mixing and to prevent boron stratification. The procedures followed to refill the loop ensure the boron concentration in the isolated loop is sufficient so that mixing is not a concern. The isolated loop is normally filled by charging with blended makeup set approximately 250 ppm above RCS boron concentration. Boron stratification will not occur at the normal operating RCS and makeup water source temperature and boron concentrations. Additionally, the boron concentration requirements contained in LCO 3.4.1.6.b and the associated sampling requirements contained in SR 4.4.1.6.2 (discussed below) provide reasonable assurance that the isolated loop boron concentration is adequate.

The licensee stated that the need to drain and refill an isolated loop prior to restoration should be dependent on the circumstances associated with the loop isolation. If the loop is not drained after isolation, there should not be a requirement to drain and refill the isolated loop prior to opening the isolation valves provided the boron concentration requirements are met. Complying with the temperature and boron concentration requirements in proposed TSs 3.4.1.6.a and 3.4.1.6.b is sufficient to ensure an excessive addition of positive reactivity

does not occur. Based on the above, the staff concludes that the deletion of TS 3.4.1.6.d is acceptable. This change is also consistent with NUREG-1431, Revision 2.

3.1.6 Change “Mode” to “MODE” in the new TS 3.4.1.6.b.

This is a non-technical change and the staff finds it acceptable.

3.2 Changes to TS 3.4.1.6 Surveillance Requirements

Similar changes are also requested for TS 3.4.1.6 SRs. Specifically, SR 4.4.1.6.2 is proposed to be revised to state that “The isolated loop boron concentration shall be determined to be greater than or equal to the boron concentration required by Specification 3.1.1.1.2 or 3.1.1.2 for Mode 5 or Specification 3.9.1.1 for Mode 6 within 2 hours prior to opening the hot or cold leg stop valve.” This change is acceptable because these requirements are included in the surveillance requirements of TS 3.1.1.1.2, 3.1.1.2, and 3.9.1.1. The revised SR 4.4.1.6.2 will require the verification that the boron concentration of the isolated loop is greater than or equal to the SDM boron concentration requirements of TSs 3.1.1.1.2, 3.1.1.2, and 3.9.1.1 prior to opening the loop isolation valves. As such, the revised SR 4.4.1.6.2 will ensure that the required SDM is maintained and, therefore, is acceptable.

The licensee has also proposed to modify the frequency of the SR 4.4.1.6.2 from 30 minutes to 2 hours. The increase in time will provide better control over the loop restoration activity by allowing the requirement to be satisfied earlier in the evolution. The additional 90 minutes is not a significant increase in time such that the boron sample would no longer represent the boron concentration of the isolated loop. Additionally, the increased time limit to 2 hours will not adversely impact the potential for an RCS boron reduction to below the required SDM concentration as a result of restoring the isolated RCS loop. Therefore, the staff concludes that the proposed change in frequency from 30 minutes to 2 hours for SR 4.4.1.6.2 is acceptable. This change is also consistent with NUREG-1431, Revision 2.

The licensee proposed to change “Mode” to “MODE” in SR 4.4.1.6.2. This is a non-technical change and the staff finds it acceptable.

Additionally, the licensee proposed to delete SR 4.4.1.6.3, which has two parts. The first part requires that within 4 hours prior to opening the isolated loop, the isolated loop will be drained and refilled, and have a boron concentration greater than or equal to the boron concentration of the operating loops, or greater than 2,600 ppm whichever is less. The second part of SR 4.4.1.6.3 is incorporated in the revised SR 4.4.1.6.2. This incorporation is an acceptable editorial change. Deletion of the first part of SR 4.4.1.6.3 is also acceptable based on compliance with the temperature and boron concentration requirements specified in SR 4.4.1.6.1 and 4.4.1.6.2.

3.3 License Condition

As stated above, the deletion of the requirement to drain and refill an isolated loop prior to opening the loop stop valves affects restrictions that were included as part of the original MP3 licensing basis allowing power operation with one isolated RCS loop. As part of the proposed change to TS 3.4.1.6, DNC has requested a License Condition to the MP3 operating license.

The proposed license condition shall state:

Operation with one or more isolated Reactor Coolant System (RCS) loops in Modes 1 through 4 is prohibited, except for mitigation of abnormal or emergency events when operating in Modes 3 or 4. This condition will expire upon implementation of modifications to the Millstone Unit No. 3 Technical Specifications, Final Safety Analysis Report, and plant procedures to remove the option for power operation with one isolated RCS loop (N-1 operation).

This license condition supports the commitments made by DNC in letters dated January 12, 1998, and June 19, 2000 (References 8.7 and 8.8) which state that MP3 will not be in power operation with one isolated RCS loop. The current completion date for removal of the option to operate in N-1 loop operation in the TSs, Final Safety Analysis Report, and plant procedures is December 15, 2002. Until the completion of the modifications to the licensing basis, the proposed license condition will prohibit N-1 loop operation at MP3 and, therefore, is acceptable.

The staff has reviewed the proposed changes to TS 3.4.1.6, as described above, and the proposed license condition and has concluded that the proposed changes are acceptable.

4.0 SUMMARY

The staff has reviewed the licensee's submittals and supporting documentation. Based on our review, the staff concludes that the proposed changes to TS 3.4.16 and the associated license condition to the MP3 operating license are acceptable.

5.0 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.

6.0 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 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 (66 FR 36340). 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.

7.0 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.

8.0 REFERENCES

- 8.1. Grecheck, E. S., Dominion Nuclear Connecticut, Inc., to USNRC, "Millstone Nuclear Power Station, Unit No. 3 Technical Specifications Change Request 3-11-00 Reactor Coolant System Heatup and Cooldown Curves," April 23, 2001.
- 8.2. Price, J. A., Dominion Nuclear Connecticut, Inc., to USNRC, "Millstone Nuclear Power Station, Unit No. 3 Second Response to a Request for Additional Information Technical Specifications Change Request 3-11-00 Reactor Coolant System Heatup and Cooldown Curves," June 29, 2001.
- 8.3. Price, J. A., Dominion Nuclear Connecticut, Inc., to USNRC, "Millstone Nuclear Power Station, Unit No. 3 Revised Implementation Schedule Technical Specifications Change Request 3-11-00 Reactor Coolant System Heatup and Cooldown Curves," July 19, 2001.
- 8.4. Price, J. A., Dominion Nuclear Connecticut, Inc., to USNRC, "Millstone Nuclear Power Station, Unit No. 3 License Condition - Isolated RCS Loop Operation Technical Specifications Change Request 3-11-00 Reactor Coolant System Heatup and Cooldown Curves," November 13, 2001.
- 8.5. Opeka, J. F., Northeast Nuclear Energy Company, to B. Youngblood, USNRC, "Millstone Nuclear Power Station, Unit No. 3 Technical Specification - Proof and Review," October 9, 1985.
- 8.6. Ferguson, R. L., USNRC, to E. J. Mroczka, Northeast Nuclear Energy Company, "Millstone Nuclear Power Station, Unit No. 3 - Three (N-1) Loop Operation (TAC No. 60387)," November 16, 1987.
- 8.7. McElwain, J. P., Northeast Nuclear Energy Company, to USNRC, "Millstone Nuclear Power Station, Unit No. 3 Modification of Licensing Bases for N-1 Loop Operation," January 12, 1998.
- 8.8. Scace, S. E., Northeast Nuclear Energy Company, to USNRC, "Millstone Nuclear Power Station, Unit No. 3 Revised Commitments for N-1 Loop Operation," June 12, 2000.

Principal Contributor: K. Kavanagh

Date: January 9, 2002