Northeast
Utilities System

107 Selden Street, Berlin, CT 06037

Northeast Utilities Service Company
P.O. Box 270
Hartford, CT 06141-0270
(203) 665-5000

April 25, 1994

Docket No. 50-336
B14559

Re: 10CFR50.90

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

Millstone Nuclear Power Station, Unit No. 2
Proposed Revision to Technical Specifications
Generic Letter 90-06

Pursuant to 10CFR50.90, Northeast Nuclear Energy Company (NNECO) hereby proposes to amend Facility Operating License DPR-65 by incorporating the changes identified in the Attachments into the Technical Specifications of Millstone Unit No. 2. The technical specification changes proposed combine four related issues: (1) power-operated relief valve (PORV) and block valve reliability; (2) low-temperature overpressure protection (LTOP); (3) boron dilution; and (4) shutdown risk management.

Background

On June 25, 1990, the Staff issued Generic Letter (GL) 90-06,[1] "Resolution of Generic Issue 70, 'Power-Operated Relief Valve and Block Valve Reliability,' and Generic Issue 94, 'Additional Low-Temperature Overpressure Protection for Light-Water Reactors,' Pursuant to 10 CFR 50.54(f)." Generic Issue 70, involves the evaluation of the reliability of pressurizer PORVs and block valves and their safety significance in pressurized water reactor plants. The GL discussed how PORVs are increasingly being relied upon to perform safety-related functions, and the corresponding need to improve the reliability of both PORVs and their associated block valves. Proposed NRC Staff positions and improvements to plant technical specifications were recommended to be implemented at affected facilities. This issue is applicable to Westinghouse, Babcock & Wilcox, and Combustion Engineering design facilities with PORVs.

---

(1) J. G. Partlow letter to All Pressurized Water Reactor Licensees and Construction Permit Holders, "Generic Letter 90-06," dated June 25, 1990.

Generic Issue 94 addresses concerns with the implementation of the guidance set forth in the resolution of Unresolved Safety Issue A-26, "Reactor Vessel Pressure Transient Protection (Overpressure Protection)." The GL discussed the continuing occurrence of overpressure events and the need to further restrict the allowed outage time for a LTOP channel in operating Modes 4, 5, and 6. This issue is applicable to Westinghouse and Combustion Engineering facilities.

By letters dated December 21, 1990,[2] March 21, 1991,[3] August 20, 1992,[4] and January 11, 1993,[5] NNECO, on behalf of Millstone Unit No. 2, submitted initial and revised responses regarding GL 90-06 to the NRC Staff. In those responses, NNECO indicated that the proposed technical specification changes regarding PORV operability would be based on the model technical specification provided as Attachment A-1 of Enclosure A to GL 90-06. The proposed technical specification changes regarding LTOP would be based on the model technical specification provided as Attachment B-1 to Enclosure B of GL 90-06.

As a result of a Westinghouse 10 CFR 21 notification and a subsequent NRC Information Notice on cold overpressure mitigation concerns,[6] NNECO has modified the acceptable cooldown rate and limited reactor coolant pump operation to ensure that an LTOP condition does not occur.

---

(2) E. J. Mroczka letter to the U. S. Nuclear Regulatory Commission, "Haddam Neck Plant, Millstone Nuclear Power Station Unit Nos. 2 and 3, Generic Letter 90-06, Resolution of Generic Issue 70, 'Power-Operated Relief Valve and Block Valve Operability,' and Generic Issue 94, 'Additional Low-Temperature Overpressure Protection for Light-Water Reactors,' Pursuant to 10CFR50.54(f)," dated December 21, 1990.

(3) E. J. Mroczka letter to the U.S. Nuclear Regulatory Commission, "Generic Letter 90-06," dated March 21, 1991.

(4) J. F. Opeka letter to the U.S. Nuclear Regulatory Commission, "Generic Letter 90-06," dated August 20, 1992.

(5) J. F. Opeka letter to the U.S. Nuclear Regulatory Commission, "Generic Letter 90-06," dated January 11, 1993.

(6) B. K. Grimes letter to All Holders of Operating Licenses or Construction Permits for Pressurized-Water Reactors, "NRC Information Notice 93-58: Nonconservatism in Low-Temperature Overpressure Protection for Pressurized-Water Reactors," dated July 26, 1993.

On August 27, 1993[7], NNECO submitted a Licensee Event Report (LER) concerning the analysis for the boron dilution event. The result of this analysis and plant operating procedures placed conflicting requirements on the operation of the shutdown cooling system. The inconsistencies between the boron dilution event analysis and the plant operating procedures were discovered during a general review of the Final Safety Analysis Report. The events discussed in the LER resulted in changes to the technical specifications. The boron dilution changes have been made to limit charging pump operation in Modes 4, 5 and 6, which will reduce the dilution flow rate during an inadvertent boron dilution event. The minimum acceptable flow for the shutdown cooling system (SDCS) has also been decreased to be consistent with the boron dilution analysis and the shutdown margin has increased.

Finally, NNECO has reviewed the changes above considering shutdown risk management philosophy. The shutdown risk management program at Millstone Unit No. 2 implements the recommendations of NUMARC 91-06, "Guidelines for Industry Actions to Assess Shutdown Management," and Millstone's self-assessments of unit practices with respect to minimizing shutdown risks. It provides a consistent means to minimize risks during a unit shutdown. It is designed to: (1) Enhance management and worker awareness regarding precautions to take and inform them that unit shutdowns are not inherently "low risk" times; (2) Stress the steps necessary to protect the five key safety functions during unit shutdown (i.e., decay heat removal, reactor coolant system inventory control, electrical power availability, reactivity control, and primary and secondary containment integrity); (3) Focus attention on integrating outage planning and work control to minimize core melt frequency risks; (4) Ensure that outage schedules receive a safety review prior to the start of scheduled outage activities; (5) Ensure adequate defense in depth of key safety functions during outages; (6) Ensure that the schedule implemented for outages incorporates the results of a safety review; (7) Highlight actions necessary to reduce the consequences of events occurring during shutdown; and (8) Increase management and worker focus on outage planning and work control.

The changes proposed herein to the technical specifications have considered the above principles. As a result, NNECO has attempted to maximize pumping capacity with operable and rapidly recoverable pumps, while at the same time addressing LTOP and

---

(7) S. E. Scace letter to the U.S. Nuclear Regulatory Commission, "Licensee Event Report 93-016-00," dated August 27, 1993.

boron dilution considerations. This submittal has integrated the analysis of these events together for an optimum overall result.

The proposed enhancements to the GL 90-06 portion of this submittal are similar to the technical specifications approved by the NRC Staff via letters dated July 12, 1993,[8] July 30, 1993,[9] and December 16, 1993,[10] for Millstone Unit No. 3 and letter dated September 2, 1993,[11] for the Haddam Neck Plant.

Description of the Proposed Changes

The proposed amendment will revise Technical Specifications 3.4.3 and 3.4.9.3 to address the issues specifically raised in GL 90-06. Technical Specifications 3.1.1.3, 3.1.2.1, 3.1.2.2, 3.1.2.3, 3.1.2.4, 3.1.2.8, 3.4.1.4, 3.4.2.1, 3.4.9.1, 3.5.3, 4.1.1.3, 4.1.2.3, 4.1.2.4, 4.4.1.4, 4.4.3.1, 4.4.3.2, 4.4.9.3.1, 4.4.9.3.2, 4.5.3.2, and 4.9.8.1 will be revised to provide consistency with the proposed changes in GL 90-06 or are related to boron dilution issue or shutdown risk management philosophies. Attachment 1 provides a markup of the proposed changes and Attachment 2 provides retyped pages of the Millstone Unit No. 2 Technical Specifications. The proposed technical specification changes are described below:

A. Sections 3.1.1.3 and 4.1.1.3, Boron Dilution

The following changes are proposed to Technical Specification Sections 3.1.1.3 and 4.1.1.3. The proposed modification will reduce the minimum reactor coolant system (RCS) flow rate (from 3000 gpm to 1000 gpm) that must be present whenever a reduction in boron concentration is made. These proposed changes ensure consistency with the boron dilution analysis. Bases Section 3/4.1.1.3 is modified accordingly. The Table of Contents is modified to reflect

---

(8) V. L. Rooney letter to J. F. Opeka, "Issuance of Amendment (TAC NO. M77362 and 77432)," dated July 12, 1993.

(9) V. L. Rooney letter to J. F. Opeka, "Millstone Nuclear Power Station, Unit 3 - Correction to Amendment NO. 80 (TAC NOS. M77362 AND M77432)," dated July 30, 1993.

(10) V. L. Rooney letter to J. F. Opeka, "Issuance of Amendment (TAC NO. M77362)," dated December 16, 1993.

(11) A. B. Wang letter to J. F. Opeka, "Issuance of Amendment (TAC NOS. M77353 AND M77423)," dated September 2, 1993.

the new bases page number and to correct a previous typographical error.

B. Section 3.1.2.1, Flow Paths — Shutdown

The following change is proposed to Technical Specification Section 3.1.2.1. The Limiting Condition for Operation (LCO) has been modified to indicate that the minimum boron injection flow path from the refueling water storage tank (RWST) requires an operating charging pump "and" a high pressure safety injection (HPSI) pump. This proposed change will minimize shutdown risk issues. It is consistent with the changes proposed for Technical Specification 3.1.2.3.

C. Section 3.1.2.2, Flow Paths — Operating

The following change is proposed to Technical Specification 3.1.2.2. The Action Statement has been revised so that when less than the required boron injection flow paths are operable, the reactor will be made sub-critical and the unit will borate to a shutdown margin of 3.6% $\Delta k/k$. This proposed change will increase the shutdown margin from its current value of 1%$\Delta k/k$. It will provide additional margin to criticality.

D. Sections 3.1.2.3 and 4.1.2.3, Charging Pump—Shutdown

The following changes are proposed to Technical Specification Section 3.1.2.3. Although not specifically requested by GL 90-06, these changes are proposed to ensure that this technical specification is consistent with the guidance provided in GL 90-06 and the Millstone Unit No. 2 boron dilution analysis while minimizing shutdown risk. The proposed changes:

1. Will clarify the LCO by removing the words "As a minimum" to indicate that only one charging pump "and" one HPSI pump should be operable in Modes 5 or 6 with the reactor vessel head on. When the reactor vessel head is removed, only one charging pump is required, since the HPSI source of water, the RWST, will be unavailable since it is in the reactor cavity.

   In addition, the LCO allows one additional charging pump and HPSI pump to be operable, provided the RCS has a passive vent open of at least 2.8 square inches. These proposed changes address shutdown risk concerns, while ensuring an LTOP condition does not occur.

2. Will modify Action Statement 'a' to reflect that a charging pump and HPSI pump must be operable. It will add Action 'b' so that if additional pumps are operable, appropriate action may be taken to provide a passive vent path.

3. Will modify Surveillance Requirement 4.1.2.3 to require that a charging "and" a HPSI pump be demonstrated operable. Also, the surveillance has been renumbered and three surveillances have been added. Surveillance Requirement 4.1.2.3.2 has been proposed to ensure that the inoperable charging pump motor circuit breakers are opened. Surveillance Requirement 4.1.2.3.3 has been proposed to ensure that the inoperable HPSI pump has power disconnected from the breakers or is isolated by shutting and tagging the discharge valve with the key lock. These restrictions will prevent overpressurization of the RCS in this low-temperature condition. This is consistent with GL 90-06 and the Emergency Core Cooling System (ECCS) Technical Specification. This method of isolation will allow the inoperable pump to be made quickly operable from the control room for shutdown risk concerns. Surveillance 4.1.2.3.4 has been proposed to ensure that the passive vent is verified to be open when it is required to be operational.

4. Changes to Bases Section 3/4.1.2 have also been proposed to reflect the new operational philosophy.

5. A change to the table of contents has also been proposed to reflect the proposed modifications made to Technical Specification 3/4.1.2.

These proposed changes address boron dilution concerns by minimizing the boron dilution flow rate to a maximum of two charging pumps. These changes also address shutdown risk concerns by maximizing the pumping capacity which can be operable or made operable rapidly by allowing the operators the ability to restore flow quickly and safely from the control room.

E. <u>Sections 3.1.2.4 and 4.1.2.4, Charging Pumps — Operating</u>

The following changes are proposed to Technical Specification Section 3.1.2.4. These changes are proposed to address concerns dealing with an inadvertent boron dilution event and are consistent with the technical specification changes proposed as a result of Generic Letter 90-06 and shutdown risk management:

1. A note has been added to the LCO that indicates that with the RCS cold leg temperature less than 300°F (Mode 4), a maximum of two charging pumps shall be operable.

2. Surveillance Requirement 4.1.2.4 has been renumbered 4.1.2.4.1, and another surveillance requirement added. Surveillance Requirement 4.1.2.4.2 has been added such that one charging pump is verified inoperable whenever one or more of the RCS cold legs is less than 300°F by assuring the motor circuit breaker has been placed in the open position.

3. Changes to Bases Section 3/4.1.2 have been proposed to reflect these changes.

F. Section 3.1.2.8, Borated Water Sources — Operating

The following change is proposed to Technical Specification Section 3.1.2.8. This change relates to boron dilution and will revise the action statement so that when there is only one borated water source operable, the reactor will be made sub-critical and the unit will borate to a shutdown margin of 3.6% $\Delta k/k$. This revision will change the shutdown margin from 1% $\Delta k/k$ to 3.6% $\Delta k/k$ in Mode 5. This change will provide additional margin to criticality.

G. Sections 3.4.1.4 and 4.4.1.4, Reactor Coolant Pumps — Shutdown

A new technical specification has been developed to address NRC Information Notice 93-58 on cold overpressure mitigation. The new Technical Specification is proposed to be numbered 3.4.1.4, and titled "Reactor Coolant System, Reactor Coolant Pumps — Shutdown." The new technical specification will provide for a maximum of two operable reactor coolant pumps when the plant is in Mode 5. This limit is in place to address the differential pressure across the reactor vessel and is consistent with the recommendations provided in NRC Information Notice 93-58. This change will reduce the possibility of a cold overpressurization event. The table of contents is proposed to be revised to reflect this change.

H. Section 3.4.2.1, Safety Valves

The following change is proposed to Technical Specification Section 3.4.2.1. These changes have been proposed to ensure consistency between the proposed change made as a result of GL 90-06 and the existing Technical Specifications.

1. The applicability statement is modified to allow coordination between this specification and Technical Specification 3.4.9.3. Safety valves are not used for LTOP mitigation and do not require technical specification controls in Mode 5. Therefore, NNECO proposes to remove the Mode 5 applicability.

I. Sections 3.4.3 and 4.4.3, Relief Valves

The following changes are proposed to Technical Specification Section 3.4.3. These changes are consistent with GL 90-06. Additional changes have been proposed to Action Statements 'a,' 'b,' and 'c' which are consistent with the Improved Standard Technical Specification (NUREG-1432)[12]. The proposed changes are described below.

1. The LCO and Action Statements will be clarified by replacing "two" and "one or more" with "both" to reflect the Millstone Unit No. 2 design.

2. Action statement 'a' will be added, per the guidance of GL 90-06, but the phrase "because of excessive seat leakage" suggested by the Generic Letter in Attachment A-1 will be replaced with the phrase "and capable of being manually cycled." This phrase is consistent with NUREG-1432 which states that although a PORV may be designated inoperable, it may be able to be manually opened and closed, and therefore, able to contribute to the performance of a safety-related function. PORV inoperability may be due to seat leakage, instrumentation, automatic control, or other causes that do not prevent manual use and do not create a possibility for a small break loss-of-coolant accident (LOCA).

3. Action Statement 'b' will be added per the guidance of GL 90-06, but the phrase "due to causes other than excessive seat leakage," suggested by GL 90-06 in Attachment A-1, will be replaced with the phrase "and not capable of being manually cycled." This will differentiate this Action statement from Action 'a' and is consistent with NUREG-1432.

4. Action Statement 'c' will be rewritten based on the guidance contained in Attachment A-1 of GL 90-06. The

---

(12) U.S. Nuclear Regulatory Commission, "NUREG-1432 Standard Technical Specifications-Combustion Engineering Plants", dated September 1992.

clarifier "and not capable of being manually cycled" is added to differentiate this Action from Action 'a'. This clarifier is consistent with NUREG-1432.

5. Action Statement 'd' will modify the technical specification based on the guidance provided in Attachment A-1 of GL 90-06. The guidance in GL 90-06 will be modified to replace the phrase "in manual control" with the phrase "in the 'close' position." This clarifies the hand switch position to which the valves will be switched (i.e., open, auto, close).

6. Action Statement 'e' will denote that the provisions of Specification 3.0.4 are not applicable. This proposal is consistent with the guidance provided in GL 90-06.

7. Changes to Surveillance 4.4.3.1 are proposed to make it consistent with GL 90-06. We have left in place the additional surveillances that Millstone Unit No. 2 performs on channel functional test and channel calibration. As stated in our letter dated January 11, 1993, Millstone Unit No. 2 will bench test PORVs every 18 months at conditions representative of Mode 3 or 4 conditions in lieu of the guidance contained in GL 90-06.

8. NNECO proposes to modify Surveillance 4.4.3.2 by incorporating an editorial change. It will refer to Action Statements 'b', 'c', or 'd' as opposed to 'a' or 'b.' This was done since Action Statements 'a' and 'b' were renumbered as Action Statements 'c' and 'd' and a new Action Statement 'b' was added which meets the requirements of this surveillance.

9. NNECO proposes to modify Bases Section 3.4.3 to reflect changes to the Action Statements. The added discussion will provide the operators with additional information on acceptable plant configurations and actions required to be taken when an inoperable PORV or block valve is discovered. This wording is consistent with the guidance contained in NUREG-1432

10. NNECO proposes to modify the Table of Contents to reflect the changes that the addition to the bases had on the page numbering. A typographical error has also been corrected.

J. Section 3.4.9.1, Pressure/Temperature Limits

The following change is proposed to Technical Specification Section 3.4.9.1. NNECO proposes to modify LCO 'b' to reflect a new maximum cooldown rate of 5°F per hour when the RCS is less than or equal to 120°F. This new limitation addresses a cold overpressure mitigation concern and is a derivative of a recommendation of Information Notice 93-58. This proposed change will help prevent an LTOP condition from occurring.

K. Sections 3.4.9.3, 4.4.9.3.1, and 4.4.9.3.2, Overpressure Protection Systems

Millstone Unit No. 2 Technical Specification 3.4.9.3 will be modified to reflect the recommendations of GL 90-06. The proposed changes are:

1. Revise the LCO to be consistent with GL 90-06, except that the word "both" is used in lieu of two. "both" is a more definitive description of the number of PORVs available at Millstone Unit No. 2.

2. Refine the applicability requirements, as recommended in GL 90-06.

3. Modify Action Statement 'a' to state it is only valid for a Mode 4 condition. This is consistent with GL 90-06.

4. Add a new Action Statement to address an inoperable PORV in a Mode 5 or 6 condition. It will be labeled Action Statement 'b'. Shutdown requirements are more stringent than Action Statement 'a' above. The new Action Statement was added to address NRC concerns as stated in GL 90-06.

5. Clarify the wording of Action Statement 'b' to be consistent with GL 90-06. Action Statement 'b' will be relabeled Action Statement 'c'.

6. Add a new Action Statement in accordance with the recommendation found in GL 90-06. The Action Statement will be labeled Action Statement 'd.'

7. Provide minor editorial refinements of Action Statement 'd' in accordance with GL 90-06. Action Statement 'd' will be relabeled Action Statement 'e.'

8. Add Action Statement 'f' per the guidance of GL 90-06.

9. Revise Surveillance Requirement 4.4.9.3.1.c to clarify that a PORV block valve is used versus an isolation valve.

10 Delete Surveillance Requirement 4.4.9.3.2 and incorporate it as part of the new Action Statement 'd' per GL 90-06.

L. Sections 3.5.3 and 4.5.3, ECCS Subsystems $T_{avg} < 300°F$

The following changes are proposed to Technical Specification Section 3.5.3. To address shutdown risk concerns, an additional method to secure an inoperable HPSI pump has been added whereby it can now be accomplished from the control room, as well as by disconnecting the breaker from the power supply. A new action statement was added to specify the action necessary should too many pumps be operating. Surveillance Requirement 4.5.3.2 is proposed to be modified to allow the operator the ability to isolate the inoperable HPSI pumps from the control room to address shutdown risk concerns. NNECO proposes to modify Bases Section 3/4.5.3 to delete a redundant paragraph inserted in Amendment No. 159 and to incorporate additional information on HPSI isolation.

M. Section 4.9.8.1, SDC and Coolant Circulation

The following changes are proposed to Technical Specification Section 4.9.8. The proposed modification will require a minimum RCS flow of ≥ 1000 gpm be present whenever a reduction in boron concentration is made. This was done to be consistent with the assumptions used in the boron dilution accident analysis. NNECO proposes to modify Bases Section 3/4.9.8 to be consistent with the change to the section. NNECO also proposes to modify the Table of Contents due to the proposed incorporation of additional material which will result in the run-over of two sections to a new page.

Safety Assessment

Sections 3.1.1.3 and 4.1.1.3, Boron Dilution

The minimum RCS flow rate is being reduced from 3000 gpm to 1000 gpm in order to minimize the potential for a loss of shutdown cooling due to air entrainment. This is particularly important at mid-loop operation where vortexing can lead to air

entrainment. By reducing the minimum flow requirement, operation at lower flow rates will be allowed where vortexing is a concern at mid-loop operation. The lower flow rate, however, does reduce the mixing that would occur in a boron dilution event. The boron dilution analysis has been revised to reflect the lower flow rate. The results show that the required operator action time of 15 minutes for Modes 1-5 and 30 minutes for Mode 6 are still satisfied for both mid-loop and RCS filled scenarios.

Section 3.1.2.1, Flow Paths — Shutdown

For the option where the borated water source is the RWST, a flow path for charging and HPSI is being required. This change is consistent with the change proposed to Section 3.1.2.3 where a requirement is being added to provide an additional injection source. This requirement will reduce the risk from loss of shutdown cooling and other shutdown risk scenarios.

Section 3.1.2.2, Flow Paths — Operating

The required shutdown margin is being increased to be consistent with the Mode 5 shutdown requirement of the Core Operating Limits Report. This will provide additional margin in a boron dilution event.

Sections 3.1.2.3 and 4.1.2.3, Charging Pump Shutdown

The LTOP analysis has shown that one PORV is sufficient to mitigate an inadvertent start of one charging and one HPSI pump. To take into account single failures, two operable PORVs are required to meet the LTOP analysis requirements. However, if a passive vent that is single failure proof of equivalent area to one PORV is established, then no operable PORVs are required and sufficient relief capacity is provided to mitigate the inadvertent start of one charging and one HPSI pump. Similarly, if the passive vent area is at least equivalent to two PORVs, then sufficient relief capacity is provided to mitigate the start of two charging pumps and two HPSI pumps.

The boron dilution analysis considers a maximum dilution based upon the operation of two charging pumps when RCS temperature is below 300°F.

The operability requirements for charging and HPSI are being changed to allow the maximum number of operable pumps while still meeting the LTOP and boron dilution requirements. Having more pumps available in the shutdown modes increases the available options to mitigate a loss of shutdown cooling and other shutdown risk scenarios.

Similarly, the changes to the surveillance requirements are being proposed to be consistent with the LTOP and boron dilution analysis, while maximizing the availability of equipment to mitigate shutdown risk scenarios.

When HPSI is made inoperable to assure LTOP requirements, two options are being proposed. The preferred option is to close the discharge valve via the keylock on the control panel and safety tagging the valve in the closed position. This provides multiple layers of protection for an operator error and minimizes the time in which the pump can be made operable to mitigate shutdown risk scenarios. If this option is not available, the alternative is to disconnect the breakers from the power supply circuits.

In the case of the charging system, the option of closing the discharge valve is not desirable since the pumps are positive displacement pumps. In this case, inoperable charging pumps are assured by opening the motor circuit breakers.

These changes assure that the LTOP and boron dilution analysis remain bounding while providing the maximum capability to mitigate shutdown risk scenarios. The surveillance requirements assure that there is no increase in the likelihood of an LTOP or boron dilution event.

Sections 3.1.2.4 and 4.1.2.4, Charging Pumps — Operating

As stated in the discussion of Specifications 3.1.2.3 and 4.1.2.4, the boron dilution analysis covers a maximum dilution resulting from the operation of two charging pumps when RCS temperature is below 300°F.

The proposed changes provide additional assurance that the boron dilution analysis will be bounding.

Section 3.1.2.8, Borated Water Sources — Operating

The required shutdown margin is being increased to be consistent with the Mode 5 shutdown requirement of the Core Operating Limits Report. This will provide additional margin in a boron dilution event.

Sections 3.4.1.4 and 4.4.1.4, Reactor Coolant Pumps — Shutdown

Section 3.4.1.4 will be added to limit the number of reactor coolant pumps that may be operational during Mode 5. This will limit the pressure drop across the core when the pumps are operated during low-temperature conditions. Controlling the pressure drop across the core will maintain maximum RCS pressure within the maximum allowable pressure as calculated in Code Case

No. N-514. Limiting two reactor coolant pumps to operate when the RCS cold leg temperature is less than 120°F, will ensure that the requirements of 10CFR50 Appendix G are not exceeded. Surveillance 4.4.1.4 will be added to support this requirement. This change is being implemented to address concerns identified in NRC Information Notice 93-58. This change does not impact the boron dilution accident analysis since it will improve mixing and reduce the impact of unborated water addition.

Section 3.4.2.1, Safety Valves

Section 3.4.2.1 provides requirements for the RCS safety valves. The applicability mode for this section will be changed to eliminate Mode 5, and to provide consistency with Section 3.4.9.3 of the Technical Specifications. Safety valves are not used to mitigate LTOP events, therefore, the reference to Mode 5 does not apply. This action will be accomplished by the PORV(s). This change provides consistency with other changes being made in response to GL 90-06.

Sections 3.4.3 and 4.4.3, Relief Valves

The proposed changes to specification 3.4.3 increases the availability of the PORVs for the RCS pressure transient mitigation. Action Statements 'a,' 'b,' and 'c' distinguish various types of inoperability of the PORV. Action Statement 'd' distinguishes the various types of block valve inoperability. Specifically, a PORV(s) may be designated inoperable, but they may be able to be manually opened and closed. Therefore, they may be able to contribute to the performance of the safety function. PORV inoperability may be due to seat leakage, instrumentation problems, automatic control problems, or other causes that do not prevent manual use and do not create a possibility of a small break LOCA. For these reasons, the block valve should be closed but power should be maintained to the block valve. This allows quick manual access to the PORV for pressure control. On the other hand, if a PORV is inoperable and not capable of being manually cycled, it must be either restored or isolated by closing the associated block valve and removing power from the block valve. This will prevent the uncontrolled loss of fluid should the block valve fail open. If the block valves are inoperable, the proposed changes preclude the potential for having a stuck-open PORV that could not be isolated because of an inoperable block valve, yet maintains the ability to use the PORVs for RCS pressure transient control by placing the associated PORV in manual control (i.e., the control switch in the 'CLOSE' position as opposed to 'OPEN' or 'AUTO').

A review of the accident analysis has been conducted and the following has been found: 1) No credit for automatic PORV

operation is taken in the safety analysis for a Mode 1, 2, or 3 transient; 2) Safety-related overpressure protection for the RCS in Modes 1, 2, and 3 is provided by the pressurizer code safety valves. However, the PORVs reduce the potential challenges to the pressurizer safety valves. Further, the PORVs can be useful in mitigating accidents. The PORVs can be used for RCS depressurization and bleed-and-feed cooling. By separating the action statements by the cause of the inoperability, the maximum availability of the PORVs is addressed while still assuring the capability to isolate a leaking or stuck open PORV. This modification will not modify the PORV and block valve actuation circuitry or the PORV or block valve power supply configuration. Therefore, the PORVs will not be affected. The proposed changes will increase the availability of the PORVs to mitigate an RCS pressure transient, thus, enhancing safe operation.

The proposed changes to the surveillance requirements require that PORVs be bench tested at a qualified facility at conditions representative of Mode 3 or 4 conditions. This will help to assure that the PORV(s) will function as designed at the system temperatures they will be exposed to during operation.

Section 3.4.9.1, Pressure/Temperature Limits

Section 3.4.9.1 will be modified to limit the cooldown rate of the RCS when RCS temperature is at or less than 120°F to a cooldown rate of 5°F per hour. A cooldown rate of 5°F per hour is considered to be an isothermal condition. Limiting the RCS cooldown rate to 5°F per hour when RCS temperature is equal to or less than 120°F will provide negligible thermal stress at the reactor vessel wall. Restricting the cooldown rate to 5°F per hour will eliminate the need for providing an open and continuous RCS vent. This change is being implemented to address concerns identified in NRC Information Notice 93-58.

Sections 3.4.9.3, 4.4.9.3.1, and 4.4.9.3.2, Overpressure Protection System

Specification 3.4.9.3 provides requirements for the LTOP system. The LCO and applicability statement are nearly identical to the guidance contained in GL 90-06, with the only difference being an editorial enhancement.

The LTOP analysis requirements are stated in the discussion of Section 3.1.2.3. The changes proposed will require the establishment of a comparable passive vent area if one or more PORVs are inoperable. These new requirements provide added assurance that the LTOP analysis will remain bounding.

Action Statement 'a' will be modified to make it applicable for Mode 4 only, versus the present applicability in Modes 4, 5, and 6. New Action Statement 'b' for one train of LTOP inoperable in Modes 5 and 6 is more restrictive than present requirements since its allowable time for corrective action is considerably shorter. These changes are safe and conservative since the time permitted in Modes 5 and 6 with only one train of LTOP protection is significantly reduced. Action Statements 'a' and 'b' are identical to the guidance contained in GL 90-06.

A new Action Statement 'd' will be added which requires periodic surveillance of the vent path opened in response to Action Statement 'a,' 'b,' or 'c'. Surveillance Requirement 4.4.9.3.2 will be deleted since this surveillance is now covered in Action Statement 'd'. This editorial change is considered safe.

Action Statements 'c,' 'd,' and 'f' will have editorial enhancements performed which are consistent with the guidance provided in GL 90-06. These changes are editorial in nature and, therefore, will not affect plant operation.

Sections 3.5.3 and 4.5.3, ECCS Subsystem — T_{avg} 300°F

To address shutdown risk issues, the method to secure an inoperable HPSI pump has been modified. Previously, disconnecting the motor circuit breaker was the only acceptable method of isolating this pump. An additional method of isolating the pump has been added with the key locking of a discharge valve downstream of the HPSI pump and the tagging of the valve in the closed position. This action from the control room will allow the operator the ability to quickly restore water flow and reduce the risk associated with being shutdown. Inadvertent actuation is prevented by requiring the operator to obtain the key to open this discharge valve from the shift supervisor. The opening of this valve would, therefore, require the actions of two knowledgeable individuals, the operator, and the shift supervisor. The limitation on the amount of pumps available is as a direct result of LTOP concerns. This provides assurance that the LTOP requirements are met while maintaining the maximum available equipment to mitigate shutdown risk concerns.

Section 4.9.8.1, SDC and Coolant Circulation

Reducing the minimum SDCS flow will prevent vortexing from occurring in the intake line and will, therefore, prevent a loss of SDC event from occurring.

Significant Hazards Consideration

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

1. Involve a significant increase in the probability or consequence of an accident previously evaluated.

   The proposed changes address the operability and surveillance requirements for the charging pump, HPSI pumps, reactor coolant pumps, safety valves, PORVs, block valves, and the LTOP, boron dilution and SDC systems. These changes were proposed to address four main issues: to reflect the guidance of GL 90-06 with respect to PORV and cold overpressure; to address boron dilution concerns; to address shutdown risk management lessons learned; and to address recent information on cold overpressure mitigation concerns. Generally, the changes are more restrictive than present requirements and are consistent with the recommendations of GL 90-06. Also, the changes provide the operator with additional guidance that was not previously available. Therefore, the changes will not impact the probability of occurrence or consequences of an LTOP event, boron dilution event, loss of shutdown cooling, or other event requiring emergency core cooling which has been previously analyzed.

   PORV Requirements

   The proposed changes to Technical Specification 3.4.3 have been made to be consistent with GL 90-06. One enhancement has been made to the guidance contained in GL 90-06 and that was to replace the phrase "because of excessive seat leakage" with the phrase "and capable of being manually cycled." Although the PORV may be designated inoperable, it may be able to be manually opened and closed and in this manner can be used to mitigate transients. For example, PORV inoperability may be due to seat leakage, instrumentation problems, automatic control problems, or other causes that do not prevent manual use and do not create a possibility for a small break LOCA. The wording changes are meant to be more specific while meeting the intent of GL 90-06. The additional enhancement to GL 90-06 includes Surveillance Requirement 4.4.3.1c whereby Millstone Unit No. 2 proposed to bench test the PORVs at a qualified laboratory under conditions representative of Mode 3 or 4 conditions. We believe this off site test will result in

safer plant conditions than the in situ test proposed in the generic letter. The remaining changes to Technical Specification 3.4.3 incorporate the guidance contained in GL 90-06 and do not significantly increase the probability or consequence of an LTOP event or the failure of the PORV to operate as required.

Cold Overpressurization Protection

Changes are being proposed to Technical Specification sections 3.1.2.1, 3.1.2.3, 3.4.1.4, 3.4.2.1, 3.4.3, 3.4.9.1, 3.4.9.3, 3.5.3, 4.1.2.3, 4.4.1.4, 4.4.3.1, 4.4.3.2, 4.4.9.3.1, 4.4.9.3.2, and 4.5.3.2 to incorporate the guidance of GL 90-06 as well as enhance the availability of equipment to reduce the shutdown risk while still satisfying the cold overpressure requirements.

The proposed changes to Technical Specifications 3.1.2.1 and 3.1.2.3 will ensure only one charging pump and one HPSI pump are operable in Mode 5 or 6 with the reactor vessel head on with an available vent of less than 2.8 square inches. The remaining pumps will be secured. These proposed changes have been made to ensure Millstone Unit No. 2 does not create an LTOP condition by the operation of too many pumps injecting fluid, thereby increasing pressure in a low-temperature condition. These proposed modifications are consistent with Technical Specification 3.5.3 which has also been modified and will decrease the possibility of an LTOP condition from occurring.

The proposed change to Technical Specification 3.4.2.1 will ensure consistency between this technical specification and Technical Specification 3.4.9.3. The safety valves at Millstone Unit No. 2 are not used for LTOP mitigation. The PORVs, or RCS vent at Millstone Unit No. 2 are used to mitigate an LTOP condition. Safety valves are required to be operable during operating conditions to automatically reduce system pressures. The use of the PORV, which allows manual control, for mitigation of an LTOP event, reduces the severity and consequence of a potential overpressure event by giving the operators more control.

The proposed changes to Technical Specification 3/4.9.3 provide enhanced operational flexibility through the use of a PORV or RCS vent. The APPLICABILITY statement has been changed for clarification purposes with no change in intent and no safety implications. The ACTION requirements for the LTOP system include a 7-day allowable outage time (AOT) to restore an inoperable LTOP channel to operable status before other remedial measures would have to be taken. In

addition, new Action Statement 'f' states that the provisions of Specification 3.0.4 are not applicable. Therefore, the unit may enter the Modes for which the LCO apply, during a unit shutdown or placement of the head on the reactor vessel following refueling, when an LTOP channel is inoperable. In this situation, the 7-day AOT applies for restoring the channel to operable status before other remedial measures would have to be taken. This is the same manner in which the ACTION requirements apply when an LTOP channel is determined to be inoperable while the plant is in a Mode for which the LTOP system is required to be operable.

Specifications 3.4.1.4 and 3.4.9.1 have been revised to address concerns identified in an NRC Information Notice regarding previously unconsidered pressure drops across the reactor. The modifications to these two technical specifications will ensure that unanticipated pressure rises do not occur and that there will be no increase in the probability or consequences of an LTOP event.

Based on the evaluation done in support of resolution to GL 90-06 regarding the LTOP system unavailability, NNECO concludes that additional restrictions on operation with an inoperable LTOP channel are warranted when the potential for a low-temperature overpressure event is the highest, and especially when the unit is in a water-solid condition. It is also concluded that these additional measures emphasize the importance of the LTOP system, especially while operating in a water-solid condition as the primary success path for the mitigation of overpressure transients during low-temperature operation. Therefore, these enhancements will not involve a significant increase in the probability or consequence of an accident previously evaluated.

Boron Dilution

Changes are being proposed to Technical Specifications 3.1.1.3, 3.1.2.2, 3.1.2.3, 3.1.2.4, 3.1.2.8, 4.1.1.3, 4.1.2.3, and 4.1.2.4 to provide added assurance that the boron dilution analysis remains bounding while allowing lower flow rates to reduce the potential of a loss of shutdown cooling due to vortexing at mid-loop operation.

The changes to Technical Specifications 3.1.1.3, 3.1.2.2, 3.1.2.3, 3.1.2.4, 3.1.2.8, 4.1.1.3, 4.1.2.3, 4.1.2.4, and 4.9.8.1 will not significantly increase the probability or consequences of an accident. Tagging out of a charging pump, increasing shutdown margin, and reducing SDC flow will impact results of the boron dilution accident, but will not increase the probability of initiating events.

An increase in the shutdown margin requirement as was done in Technical Specifications 3.1.2.2 and 3.1.2.8 will assure consistency with the Core Operating Limits Report which provided additional margin in a boron dilution event.

Shutdown Risk

The changes proposed to Technical Specifications 3.1.1.3, 3.1.2.1, 3.1.2.3, 3.5.3, 4.1.1.3, 4.1.2.3, 4.5.3.2 and 4.9.8.1 have been optimized to take into account shutdown risk concerns. Lower shutdown cooling flow rates are allowed to minimize the potential of a loss of shutdown cooling due to vortexing during RCS mid-loop operation.

The availability of injection sources in the shutdown modes have been optimized while still meeting the cold overpressurization requirements.

To address shutdown risk issues, the method to secure an inoperable HPSI pump has been modified. Previously, disconnecting the motor circuit breaker from its electrical power circuit was the only acceptable method of isolating this pump. Additional methods of isolating the pump have been added with the key locking of a discharge valve downstream of the HPSI pump and the tagging the valve. These actions from the control room will allow the operator the ability to quickly restore water flow and reduce the risk associated with having equipment out of service while shutdown. Inadvertent actuation is prevented by requiring the operator to obtain the key to open this discharge valve from the shift supervisor. The opening of this valve would, therefore, require the actions of two knowledgeable individuals, the operator, and the shift supervisor. The limitation on the amount of pumps available is as a direct result of LTOP concerns. This provides assurance that the LTOP requirements are met while maintaining the maximum available equipment to mitigate shutdown risk concerns.

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

The proposed changes to Technical Specifications 3.1.1.3, 3.1.2.1, 3.1.2.2, 3.1.2.4, 3.1.2.8, 3.4.1.4, 3.4.2.1, 3.4.9.1, 4.1.1.3, 4.1.2.4, and 4.9.8.1 do not create the possibility of a new or different kind of accident from any previously analyzed. The proposed changes provide clarification or additional restrictions for plant personnel concerning the operation of charging pumps, HPSI pumps, PORVs, blocking valves, and the SDC, boron dilution, and LTOP systems. The proposed technical specification changes

do not introduce significant changes in the manner in which the plant is being operated. Therefore, no new failure modes are being introduced, and the potential for an unanalyzed accident is not created.

The proposed changes to Technical Specifications 3.4.3 do not create the possibility of an accident of a different type than previously evaluated, since there is no change to the design of the plant. In addition, plant operations are only being altered enough to allow a block valve and PORV to be placed in conditions which allow them to better perform their safety functions.

The proposed changes to Technical Specification 3.4.9.3 do not create the possibility of an accident of a different type than previously evaluated, since there is no change to the design of the plant and the way the plant is operated.

The proposed changes to Technical Specification 3.1.2.3 and 3.5.3 allow for the isolation of an inoperable HPSI pump by the key lock closing of a valve at the discharge of the HPSI pump and the safety tagging in the closed position. This isolation is required so that a LTOP condition does not occur. This method of isolation is acceptable and will not create a new or different kind of accident since it is not possible to inadvertently open this valve. A deliberate action is required by the operator, with the concurrence of the shift supervisor, to obtain the key and open the valve.

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

The proposed changes will not have an adverse impact on the protection boundaries.

With regard to the GL 90-06 modifications, there is no degradation in the operability and surveillance requirements for the PORVs and block valves and the LTOP systems. There will be no change in actual practice for, or resulting performance of, these systems. All other changes are proposed mainly to clarify each requirement. For Modes 1, 2, and 3, safety-related overpressure protection is provided by the pressurizer code safety relief valves. Therefore, there will be no adverse impact on the margin of safety as defined in the bases of any technical specification. Although any two charging pumps are allowed to be operable in a shutdown condition, the flow of these pumps is consistent with the assumptions of the boron dilution analysis. Additional pumping capability is being provided to address shutdown risk concerns, however the limitation on

pumping is tied to the vent path that is available. This will ensure that the margin of safety is not impacted.

The combined effects of reducing SDC flow, tagging out a charging pump, and increasing shutdown margin is that the required operator response times of 15 minutes in Modes 4 and 5, and 30 minutes in Mode 6 are maintained.

By reducing the allowed SDC flow rate to less than that where vortexing can occur, the potential for a loss of SDC event is being reduced. Therefore, there is no decrease in the margin of safety for the boron dilution and shutdown cooling events.

The proposed changes associated with the cold overpressure mitigation system will ensure the appropriate margin of safety is maintained by limiting RCP operation in Mode 5 and limit RCS cooldown rates. These actions will ensure an LTOP condition does not occur.

Moreover, the Commission has provided guidance concerning the application of standards in 10CFR50.92 by providing certain examples (March 6, 1986, 51FR7751) of amendments that are considered not likely to involve an SHC. The proposed changes to Technical Specifications 3/4.1.1.3, 3.1.2.2, 3.1.2.8, 3/4.4.1.4, 3/4.4.3, 3.4.9.1, 3/4.4.9.3 and 4.9.8.1 are similar to example (ii); a change which constitutes an additional limitation, restriction, or control not presently included in the technical specifications. The proposed changes will restrict the unit operators from creating an LTOP condition, or boron dilution event, or impacting SDC by clarifying equipment available and clarifying proper equipment usage. The proposed changes to the Index and Bases are similar to example (i) a purely administrative change to technical specifications: for example, a change to achieve consistency throughout the technical specifications, correction of an error, or a change in nomenclature. The other proposed changes are not covered by a specific example but are considered safe.

NNECO has reviewed the proposed license amendment against the criteria of 10CFR51.22 for environmental considerations. The proposed changes do not involve a SHC, nor increase the types and amounts of effluents that may be released off site, nor significantly increase individual or cumulative occupational radiation exposures. Based on the foregoing, NNECO concludes that the proposed changes meet the criteria delineated in 10CFR51.22(c)(9) for a categorical exclusion from the requirements for an environmental impact statement.

Attachment 1 presents the marked-up version of the technical specifications. The retype of the proposed changes to the technical specifications in Attachment 2 reflects the currently issued version of the technical specifications. The enclosed retype should be checked for continuity with technical specifications prior to issuance.

Revision bars are provided in the right-hand margin to indicate a revision to the text. No revision bars are utilized when the page is changed solely to accommodate the shifting of text due to additions or deletions.

The Millstone Unit No. 2 Nuclear Review Board has reviewed and concurred with this proposed amendment.

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

Regarding our proposed schedule for this amendment, we request issuance at your earliest convenience with the amendment effective as of the date of issuance, to be implemented within 30 days of issuance. Due to the complexity and comprehensive nature of this package, we are available to assist the NRC Staff as required.

Please contact Mr. R. H. Young, Jr., at (203) 665-3717, if you should have any questions.

Very truly yours,

NORTHEAST NUCLEAR ENERGY COMPANY

J. F. Opeka
Executive Vice President

cc: T. T. Martin, Region I Administrator
G. S. Vissing, NRC Project Manager, Millstone Unit No. 2
P. D. Swetland, Senior Resident Inspector, Millstone Unit Nos. 1, 2, and 3

Mr. Kevin T.A. McCarthy, Director
Monitoring and Radiation Division
Department of Environmental Protection
79 Elm Street
P.O. Box 5066
Hartford, CT 06102-5066

Subscribed and sworn to before me

this 25th day of April, 1994

Ruth J. Dietrich

Date Commission Expires: 3/31/95