

January 20, 1998

Mr. Martin L. Bowling, Jr.
Recovery Officer - Technical Services
Northeast Nuclear Energy Company
c/o Ms. Patricia A. Loftus
Director - Regulatory Affairs
P. O. Box 128
Waterford, Connecticut 06385

SUBJECT: ISSUANCE OF AMENDMENT - MILLSTONE NUCLEAR POWER STATION, UNIT NO. 3 (TAC NO. MA1085)

Dear Mr. Bowling:

The Commission has issued the enclosed Amendment No. 165 to Facility Operating License No. NPF-49 for the Millstone Nuclear Power Station, Unit No. 3, in response to your application dated March 3, 1998, as supplemented May 7, 1998.

The amendment revises the Millstone Unit 3 licensing basis by eliminating the requirement to have the recirculation spray system directly inject into the reactor coolant system following a design-basis accident, with the exception of loss-of-coolant accident (LOCA) scenarios involving a long-term passive failure. The Millstone Unit 3 licensing basis maintains the direct injection requirement for scenarios, as a contingency, for situations where it may be needed - as in the case of a LOCA with a long-term passive failure or for beyond design-basis scenarios.

A copy of the related Safety Evaluation is also enclosed. Notice of Issuance will be included in the Commission's biweekly Federal Register notice.

Sincerely,

/s/
James W. Andersen, Project Manager
Millstone Project Directorate
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Docket No. 50-423

Enclosures: 1. Amendment No. 165 to NPF-49
2. Safety Evaluation

cc w/encls: See next page

DISTRIBUTION:	JAndersen	WBeckner, TSB	
Docket File	THarris (e-mail SE)	JDurr, RI	OGC
PUBLIC	WDean	DScrenci, RI	ACRS
MSPD RF	GHill (2)	LBerry	

DOCUMENT NAME: G:\ANDERSENA1085.WPD

To receive a copy of this document, indicate in the box: "C" = Copy without attachment/enclosure "E" = Copy with attachment/enclosure "N" = No copy

OFFICE	MSPD:PM	MSPD:LA	OGC	MSPD:DD	
NAME	J.ANDERSEN	L.BERRY	W.DEAN		
DATE	11/198	11/198	11/198	11/198	11/198

OFFICIAL RECORD COPY

9902040243 990120
PDR ADOCK 05000423
P PDR

Handwritten initials and stamps at the bottom right of the page.



UNITED STATES
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

January 20, 1999

Mr. Martin L. Bowling, Jr.
Recovery Officer - Technical Services
Northeast Nuclear Energy Company
c/o Ms. Patricia A. Loftus
Director - Regulatory Affairs
P. O. Box 128
Waterford, Connecticut 06385

SUBJECT: ISSUANCE OF AMENDMENT - MILLSTONE NUCLEAR POWER STATION, UNIT
NO. 3 (TAC NO. MA1085)

Dear Mr. Bowling:

The Commission has issued the enclosed Amendment No. 165 to Facility Operating License No. NPF-49 for the Millstone Nuclear Power Station, Unit No. 3, in response to your application dated March 3, 1998, as supplemented May 7, 1998.

The amendment revises the Millstone Unit 3 licensing basis by eliminating the requirement to have the recirculation spray system directly inject into the reactor coolant system following a design-basis accident, with the exception of loss-of-coolant accident (LOCA) scenarios involving a long-term passive failure. The Millstone Unit 3 licensing basis maintains the direct injection requirement for scenarios, as a contingency, for situations where it may be needed - as in the case of a LOCA with a long-term passive failure or for beyond design-basis scenarios.

A copy of the related Safety Evaluation is also enclosed. Notice of Issuance will be included in the Commission's biweekly Federal Register notice.

Sincerely,

A handwritten signature in black ink, appearing to read "JW Andersen", written over a horizontal line.

James W. Andersen, Project Manager
Millstone Project Directorate
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Docket No. 50-423

Enclosures: 1. Amendment No. 165 to NPF-49
2. Safety Evaluation

cc w/encls: See next page

**Millstone Nuclear Power Station
Unit 3**

cc:

**Lillian M. Cuoco, Esquire
Senior Nuclear Counsel
Northeast Utilities Service Company
P. O. Box 270
Hartford, CT 06141-0270**

**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. Wayne D. Lanning, Director
Millstone Inspections
Office of the Regional Administrator
475 Allendale Road
King of Prussia, PA 19406-1415**

**Mr. M. H. Brothers
Vice President - Millstone Operations
Northeast Nuclear Energy Company
P.O. Box 128
Waterford, CT 06385**

**Mr. M. R. Scully, Executive Director
Connecticut Municipal Electric
Energy Cooperative
30 Stott Avenue
Norwich, CT 06360**

**Mr. John Carlin
Vice President - Human Services
Northeast Utilities Service Company
P. O. Box 128
Waterford, CT 06385**

**Mr. F. C. Rothen
Vice President - Nuclear Work Services
Northeast Utilities Service Company
P. O. Box 128
Waterford, CT 06385**

**Ernest C. Hadley, Esquire
1040 B Main Street
P.O. Box 549
West Wareham, MA 02576**

**Mr. John Buckingham
Department of Public Utility Control
Electric Unit
10 Liberty Square
New Britain, CT 06051**

**Mr. James S. Robinson, Manager
Nuclear Investments and Administration
New England Power Company
25 Research Drive
Westborough, MA 01582**

**Mr. Raymond P. Necci
Vice President - Nuclear Oversight and
Regulatory Affairs
Northeast Utilities Service Company
P. O. Box 128
Waterford, CT 06385**

**Deborah Katz, President
Citizens Awareness Network
P.O. Box 83
Shelburne Falls, MA 03170**

**Mr. Allan Johanson, Assistant Director
Office of Policy and Management
Policy Development and Planning
Division
450 Capitol Avenue - MS# 52ERN
P. O. Box 341441
Hartford, CT 06134-1441**

Millstone Nuclear Power Station
Unit 3

cc:

Ms. Terry Concannon
Co-Chair
Nuclear Energy Advisory Council
Room 4100
Legislative Office Building
Capitol Avenue
Hartford, CT 06106

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

Mr. John W. Beck, President
Little Harbor Consultants, Inc.
Millstone - ITPOP Project Office
P.O. Box 0630
Niantic, CT 06357-0630

Mr. Leon J. Olivier
Chief Nuclear Officer - Millstone
Northeast Nuclear Energy Company
P.O. Box 128
Waterford, CT 06385

Mr. Chris Schwarz
Station Director
Northeast Nuclear Energy Company
P.O. Box 128
Waterford, CT 06385

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

Nicholas J. Scobbo, Jr., Esquire
Ferriter, Scobbo, Caruso, & Rodophele, P.C.
75 State Street, 7th Floor
Boston, MA 02110

Citizens Regulatory Commission
ATTN: Ms. Susan Perry Luxton
180 Great Neck Road
Waterford, CT 06385

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



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

NORTHEAST NUCLEAR ENERGY COMPANY, ET AL.

DOCKET NO. 50-423

MILLSTONE NUCLEAR POWER STATION, UNIT NO. 3

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 165
License No. NPF-49

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Northeast Nuclear Energy Company, et al. (the licensee) dated March 3, 1998, as supplemented May 7, 1998, 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.

9902040249 990120
PDR ADOCK 05000423
P PDR

2. Accordingly, the license is amended to authorize the elimination of the requirement to have the recirculation spray system directly inject into the reactor coolant system following a design-basis accident with the exception of loss-of-coolant accident (LOCA) scenarios involving a long-term passive failure, as set forth in the application for amendment by the licensee, dated March 3, 1998, as supplemented May 7, 1998. The Millstone Unit 3 licensing basis maintains the direct injection requirement for scenarios, as a contingency, for situations where it may be needed - as in the case of a LOCA with a long-term passive failure or for beyond design-basis scenarios. As discussed in the licensee's March 3, 1998, letter, since the Final Safety Analysis Report (FSAR) revision was implemented in 1986, no FSAR revision is necessary at this time.
3. This license amendment is effective as of the date of issuance, to be implemented within 60 days of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



William M. Dean, Director
Millstone Project Directorate
Division of Reactor Projects - II/I
Office of Nuclear Reactor Regulation

Date of Issuance: January 20, 1999



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 165

TO FACILITY OPERATING LICENSE NO. NPF-49

NORTHEAST NUCLEAR ENERGY COMPANY, ET AL.

MILLSTONE NUCLEAR POWER STATION, UNIT NO. 3

DOCKET NO. 50-423

1.0 INTRODUCTION

By letter dated March 3, 1998, as supplemented May 7, 1998, the Northeast Nuclear Energy Company, et al. (the licensee), submitted a request for changes to the Millstone Nuclear Power Station, Unit No. 3, licensing basis. The requested change would revise the Millstone Unit 3 licensing basis by eliminating the requirement to have the recirculation spray system (RSS) directly inject into the reactor coolant system following a design-basis accident, with the exception of loss-of-coolant accident (LOCA) scenarios involving a long-term passive failure. The Millstone Unit 3 licensing basis would maintain the direct injection requirement for scenarios, as a contingency, for situations where it may be needed - as in the case of a LOCA with a long-term passive failure or for beyond design basis scenarios. The May 7, 1998, letter provided clarifying information that did not change the initial proposed no significant hazards consideration determination.

2.0 BACKGROUND

The need for this change was identified in 1985 during preoperational testing of the RSS. During this testing, the licensee observed excessive tube vibration in the RSS heat exchangers for certain modes of operation. The licensee determined that the excessive vibration was caused by RSS heat exchanger flows in excess of 4600 gallons per minute (gpm) and implemented the change as a corrective measure to reduce the flow through the heat exchangers. This change was initially evaluated and implemented by the licensee in 1986 without prior NRC approval. However, recent reviews of the RSS and the 10 CFR 50.59 evaluation for this change identified that the 1986 10 CFR 50.59 evaluation had incorrectly concluded that this change did not involve an unreviewed safety question (USQ). Therefore, the licensee submitted the subject amendment request pursuant to 10 CFR 50.59 and 10 CFR 50.90.

3.0 EVALUATION

The RSS was originally designed to function with the quench spray system (QSS) to provide long-term cooling of the containment and core after a design-basis accident. As originally

designed, the RSS would initiate approximately 11 minutes following a containment depressurization actuation signal. All four RSS pumps would start and take suction from the containment sump. For the injection mode of operation, all four pumps would deliver water to the RSS spray headers. In this mode, the RSS functions to assist the QSS in the depressurization of the containment. Approximately 33 minutes following a design-basis large break LOCA (assuming all emergency core cooling system pumps running), the cold leg recirculation mode of RSS initiates on the low-low level signal for the refueling water storage tank. At this time, according to the original design of the RSS, two RSS pumps would be realigned to supply water to the suction of two charging (CHS) pumps, two intermediate head safety injection (SIH) pumps, and direct injection into all four cold legs. In this mode of operation, the CHS and SIH pumps inject into the cold leg. After several hours, the system is realigned into the hot leg recirculation mode during which two RSS pumps supply water to the suction of the two CHS pumps, two SIH pumps, and direct injection into two hot legs. In the hot leg recirculation mode of operation, the CHS pumps continue to inject into the cold legs while the SIH pumps are realigned to inject into the hot legs. In addition, in the hot leg recirculation mode direct injection of RSS into the cold legs is isolated.

The 1986 change, which was implemented due to heat exchanger tube vibration experienced during preoperational testing, eliminated the direct injection paths from the RSS to the reactor coolant system. This change included elimination of direct injection into the cold legs as well as the hot legs during the cold and hot leg recirculation modes, respectively. This change, however, did not affect the original design configuration of the RSS during the injection mode. The 1986 change was implemented by revising Emergency Operating Procedure (EOPs) 35 ES-1.3, "Transfer to Cold Leg Recirculation," and EOP 35 ES-1.4, "Transfer to Hot Leg Recirculation," to direct operators to terminate flow from the RSS pumps directly into the reactor coolant system immediately after transfer to cold leg recirculation. However, provisions in the EOPs to open the valves for direct cold-leg injection as a contingency action, should one be required, were retained. The evaluation performed by the licensee in 1986 assessed the effect of the change on the analyses for core cooling and containment pressure and found these acceptable. However, the licensee's evaluation did not address long-term passive failures which, when assumed, could result in reliance on direct injection from the RSS; nor did the evaluation address the effect of the change on the probability of a malfunction of the system as a result of the introduction of the manual operator action.

The licensee has evaluated the changes to the cold leg and hot leg recirculation modes and concluded that the flow provided by the two CHS and two SIH pumps was sufficient to assure the minimum flow for core cooling. The licensee further concluded that the results of the 1986 containment analysis showing that the design basis of maintaining a subatmospheric containment pressure was not changed. Furthermore, in the recent evaluation supporting the March 3, 1998, Final Safety Analysis Report (FSAR) amendment request, the licensee determined that the increase in probability of malfunction of equipment due to use of operator actions is acceptable based on the low likelihood of an occurrence of such a malfunction. The low likelihood is assured by the EOPs' clear guidance on the isolation and reestablishment of direct injection and the fact that operators have been fully trained on these procedures.

The 1986 change to the RSS resulted in a reduction of flow through the RSS heat exchanger, which consequently resulted in a reduction in the rate of heat transfer from the containment to the service water system. Therefore, in order to meet the 1986 licensing basis of the

containment heat removal system - to decrease the containment pressure to subatmospheric within 1 hour after the design-basis accident - a smaller allowable RSS pump degradation value had to be assumed in the revised containment analysis. The allowable pump degradation was reduced from a 10 percent reduction in developed head from the design curve to a 5 percent reduction. This change was incorporated in the licensee's surveillance procedures to verify that the pumps did not degrade beyond the flow assumed in the accident analysis.

The licensee also performed an integrated safety analysis on the RSS using the Millstone Unit 3 safety evaluation report (NUREG-1031) as the basis. This analysis was submitted to the staff by a letter dated February 16, 1998. This analysis evaluated modifications to the RSS (performed pursuant to 10 CFR 50.59) that have been implemented since issuance of the safety evaluation report. The modifications were evaluated on an individual as well as an integrated basis as they relate to the current configuration of the RSS. This analysis identified the USQ previously discussed, but, further concluded that the configuration of the RSS, past and present, had historically been operable despite the 1986 change. In Inspection Report 50-423/98-207 (IR 98-207), dated June 19, 1998, the staff reviewed the modifications made to the RSS pursuant to 10 CFR 50.59. The modifications included the installation of restricting orifices, capping spray nozzles, lowering the vortex suppression grating in the containment sump, and increasing the transition time between the injection and cold leg recirculation modes of operation. The staff determined that the physical modifications appeared appropriate. The staff further determined that the licensee provided adequate justification for the increase in the transition time by modifying procedures, training the operators, and demonstrating that the operators could perform the required actions within the specified time.

3.1 Conclusion

The NRC staff has reviewed the licensee's request to amend the FSAR to eliminate the requirement for direct injection from the RSS to the reactor coolant system, but maintain this function as a contingency for scenarios, such as those involving a long-term passive failure and beyond design basis, where such a path may be needed. The staff finds that the licensee has demonstrated that for the design-basis LOCA scenarios, excluding ones which include a long-term passive failure assumption, the RSS can perform its intended safety functions without direct injection into the reactor coolant system. The staff also finds that the licensee has demonstrated that for the design-basis LOCA scenarios with the assumption of long-term passive failure, operators have been trained and are capable of aligning the RSS to provide direct injection into the reactor coolant system. Therefore, based on these conclusions, the preceding evaluation, the staff's conclusions in IR 98-207, and the licensee's integrated safety assessment for all the RSS changes made pursuant to 10 CFR 50.59, the staff finds the licensee's proposed change acceptable.

4.0 REQUEST FOR INTERVENTION

A request for intervention was received from the Citizens Regulatory Commission (CRC). On August 25, 1998, the NRC Atomic Safety and Licensing Board (ASLB) ruled that the CRC had standing in its intervention request. On November 12, 1998, the ASLB ruled that CRC's

contentions were outside the scope of the license amendment and, in addition, failed to meet the regulatory requirements for admissibility. The CRC's intervention request was, therefore, dismissed and the proceeding terminated.

5.0 FINAL NO SIGNIFICANT HAZARDS CONSIDERATION DETERMINATION

The Commission's regulations in 10 CFR 50.92 state that the Commission may make a final determination that a license amendment involves no significant hazards consideration if operation of the facility, in accordance with the amendment, would not: (1) Involve a significant increase in the probability or consequences of an accident previously evaluated; or (2) Create the possibility of a new or different kind of accident from any accident previously evaluated; or (3) Involve a significant reduction in a margin of safety. As required by 10 CFR 50.91(a), the licensee has provided its analysis of the issue of no significant hazards consideration, which is presented below:

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

The change to the Emergency Operating Procedures (EOP) to eliminate the use of Recirculation Spray System (RSS) direct injection during cold and hot leg recirculation does not effect the probability of any accident. The elimination of the requirement to have RSS directly [inject] into the reactor coolant system did not increase the consequences of the previously evaluated accidents. These consequences were evaluated based on very conservative assumptions concerning the containment pressure after the design basis Loss of Coolant Accident (LOCA), containment integrated leakage rates, and the fraction of the sprayed volume. None of these assumptions were affected by the elimination of the direct cold-leg injection.

Therefore, the proposed revision does not involve a significant increase in the probability or consequence of an accident previously evaluated.

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

The modification to the RSS did not create the possibility of a new or different accident from those previously analyzed. The change involved elimination of the direct injection flow path from the design basis of the system but did not involve physical modifications to the system itself. The operability of the affected valves within the direct injection alignments remained unchanged and these paths were still available to the operators for contingencies beyond the design basis. The EOPs provided clear and explicit guidance to that effect.

Therefore, the proposed revision does not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

In considering the impact on the margin of safety as defined in the bases of the Technical Specifications, the impact of the change on the design basis analysis of the fission product barriers must be evaluated.

The minimum Emergency Core Cooling System flow requirement for long-term core cooling is that the modified alignment deliver sufficient flow to satisfy the inventory lost to the boil off in the vessel due to the decay heat and the extended boiling from hot metal in the downcomer and the lower plenum. The analysis determined that these requirements were being met.

The elimination of the direct injection resulted in a flow reduction through the RSS heat exchanger, from approximately 4000 gpm [gallons per minute] to 1200 gpm, thus reducing the rate of the heat transfer from the containment to the service water system. The design basis of the containment heat removal systems (circa 1986) is that the containment pressure will decrease to subatmospheric within one hour after the Design Basis Accident to compensate for the reduction in heat removal from the containment, a smaller allowable RSS pump degradation was assumed in the revised containment analysis. The original RSS pump performance curve was based on a 10 percent reduction in developed head from the design curve. For the modification, a 5 percent reduction was used. The results of the analysis show that with these changes the design basis of maintaining subatmospheric containment pressure was met.

Based on the above, elimination of the direct injection did not reduce the margin of safety because there was no violation of the acceptance limits and no weakening of the protective boundaries.

Therefore, the proposed revision does not involve a significant reduction in a margin of safety.

In conclusion, based on the information provided, it is determined that the proposed revision does not involve an SHC.

Based upon the above considerations, the NRC staff concludes that the amendment meets the three criteria of 10 CFR 50.92. Therefore, the staff has made a final determination that the proposed amendment does not involve a significant hazards consideration.

6.0 STATE CONSULTATION

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

7.0 ENVIRONMENTAL CONSIDERATION

The amendment changes a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The NRC staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has made a final finding that the amendment involves no significant hazards consideration. Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b) no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

8.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributors: M. Shuaibi
M. Snodderly
G. Galletti

Date: January 20, 1999