October 7, 1999

Mr. R. P. Necci - Vice President
Nuclear Oversight and Regulatory Affairs
c/o Mr. David A. Smith
Northeast Nuclear Energy Company
P. O. Box 128
Waterford, CT 06385-0128

SUBJECT: MILLSTONE NUCLEAR POWER STATION, UNIT NO. 3 - REQUEST FOR ADDITIONAL INFORMATION ON FULL CORE OFFLOAD LICENSE AMENDMENT REQUEST (TAC NO. MA4586)

Dear Mr. Necci:

By letter dated January 18, 1999, Northeast Nuclear Energy Company requested an amendment to Operating License NPF-49 for Millstone Nuclear Power Station, Unit No. 3. The amendment proposed changes to the Technical Specifications (TS) and Final Safety Analysis Report (FSAR) to allow full-core offloads to the spent fuel pool during core offload events.

Enclosed is a request for additional information regarding your amendment request. The enclosed request for additional information was discussed with Mr. David Dodson, et. al.. of your staff during a teleconference on October 5, 1999. As mutually agreed to during the teleconference, we requested that you provide this information within 60 days from the date of this letter. If circumstances result in the need to revise this target, please call me at (301) 415-1278 at the earliest opportunity.

Sincerely,
Original signed by:
John A. Nakoski, Sr. Project Manager, Section 2
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-423

DFO1

Enclosure: Request for Additional Information

NRC FILE CENTER COPY

cc w/encl: See next page

DISTRIBUTION:

Docket File	PUBLIC	J. Linville, RI	J. Clifford	J. Nakoski	T. Clark
S. Black	OGC	PDI-2 Reading	ACRS	D. Shum	E. Adensam (EGA1)

DOCUMENT NAME: G:\PDI-2\millstone3\raia4586.wpd

To receive a copy of this document, indicate in the box: "C" = Copy w/o attachment/enclosure "E" = Copy w/ attachment/enclosure "N" = No copy

OFFICE	PM:PDI-2	E	LA:PDI-2	E	SC:PDI-2			
NAME	JNakoski		TClark		JClifford			
DATE	10/7/1999		10/7/1999		10/7/1999			

Official Record Copy

9910150111 991007
PDR ADOCK 05000423
P PDR

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

October 7, 1999

Mr. R. P. Necci - Vice President
Nuclear Oversight and Regulatory Affairs
c/o Mr. David A. Smith
Northeast Nuclear Energy Company
P. O. Box 128
Waterford, CT 06385-0128

SUBJECT: MILLSTONE NUCLEAR POWER STATION, UNIT NO. 3 - REQUEST FOR ADDITIONAL INFORMATION ON FULL CORE OFFLOAD LICENSE AMENDMENT REQUEST (TAC NO. MA4586)

Dear Mr. Necci:

By letter dated January 18, 1999, Northeast Nuclear Energy Company requested an amendment to Operating License NPF-49 for Millstone Nuclear Power Station, Unit No. 3. The amendment proposed changes to the Technical Specifications (TS) and Final Safety Analysis Report (FSAR) to allow full-core offloads to the spent fuel pool during core offload events.

Enclosed is a request for additional information regarding your amendment request. The enclosed request for additional information was discussed with Mr. David Dodson, et. al., of your staff during a teleconference on October 5, 1999. As mutually agreed to during the teleconference, we requested that you provide this information within 60 days from the date of this letter. If circumstances result in the need to revise this target, please call me at (301) 415-1278 at the earliest opportunity.

Sincerely,

John A. Nakoski, Sr. Project Manager, Section 2
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-423

Enclosure: Request for Additional Information

cc w/encl: See next page

cc:
Ms. L. M. Cuoco
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. M. H. Brothers
Vice President - Nuclear 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. J. T. Carlin
Vice President - Human Services
Northeast Nuclear Energy Company
P. O. Box 128
Waterford, CT 06385

Mr. F. C. Rothen
Vice President - Nuclear Operations
Northeast Nuclear Energy 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. James S. Robinson, Manager
Nuclear Investments and Administration
New England Power Company
25 Research Drive
Westborough, MA 01582

Mr. R. P. Necci
Vice President - Nuclear Oversight and
Regulatory Affairs
Northeast Nuclear Energy 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 & Planning Division
450 Capitol Avenue - MS# 52ERN
P. O. Box 341441
Hartford, CT 06134-1441

Ms. Terry Concannon
Co-Chair
Nuclear Energy Advisory Council
415 Buckboard Lane
Marlborro, CT 06447

cc:

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. L. J. Olivier
Senior Vice President and
Chief Nuclear Officer - Millstone
Northeast Nuclear Energy Company
P.O. Box 128
Waterford, CT 06385

Mr. C. J. 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 02108-1807

Mr. G. D. Hicks
Director - Nuclear Training Services
Northeast Nuclear Energy Company
P.O. Box 128
Waterford, CT 06385

Citizens Regulatory Commission
ATTN: Ms. Geri Winslow
P. O. Box 199
Waterford, CT 06385

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

Mr. B. D. Kenyon
President and Chief Executive Officer-
NNECO
Northeast Nuclear Energy Company
P.O. Box 128
Waterford, CT 06385

Mr. D. B. Amerine
Vice President - Engineering Services
Northeast Nuclear Energy Company
P. O. Box 128
Waterford, CT 06385

Mr. D. A. Smith
Manager - Regulatory Affairs
Northeast Nuclear Energy Company
P. O. Box 128
Waterford, CT 06385

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

Request for Additional Information Related to
Full Core Offload Amendment
For Millstone Unit No. 3

1. With regard to the thermal hydraulic analyses for the spent fuel pool (SFP), for the case with component cooling water (CCP) temperature of 95 °F, provide the decay heat loads in the SFP. The information should clearly show the decay heat generated from each batch of the previously discharged spent fuel assemblies (SFAs) and from the freshly discharged full core in the SFP. This information is necessary to allow the NRC staff to determine whether the analyses is consistent with the guidance described in Standard Review Plan, Section 9.1.2, "Spent Fuel Pool Cooling and Cleanup System."

2. With regard to the decay heat calculation, on Page 8 of the Holtec report, Holtec stated that fuel burnup for freshly discharged SFAs is assumed to be consistent with a 24-month operating cycle. On Page 13, Holtec stated that 1 year operation at full power is assumed before a scheduled full-core discharge. Please provide clarification of this apparent discrepancy.

3. Please provide information for each CCP temperature, preferably in a revision to Table 5.4 of the Holtec report, on the calculated peak temperature and its associated coincident time after the reactor shutdown. This information is necessary to allow the NRC staff to determine whether the results are consistent with the guidance described in Standard Review Plan, Section 9.1.2, "Spent Fuel Pool Cooling and Cleanup System."

4. In the thermal hydraulic analyses for the SFP, Holtec took into account that the heat removal capability of the SFP cooling system heat exchanger is a function of the CCP temperature. In order to maintain the SFP water below the SFP temperature limit of 150 °F, the SFAs "in-reactor" decay time (hold time) required prior to discharge of any SFAs to the SFP varies as the CCP temperature varies. Holtec calculated the following SFA "in-reactor" hold times required prior to a planned full-core offload operation at four CCP temperatures (80 °F, 85 °F, 90 °F and 95 °F):

CCP Temperature, °F	SFAs In Reactor Hold Time Required, Hrs.
80	101
85	142
90	200
95	285

Also, Northeast Nuclear Energy Company (NNECo) proposed to add a new figure (Figure 9.1-20, "Fuel Assembly Transfer Limit Verses CCP Temperature") to the Final Safety Analysis Report (FSAR). This new figure shows SFA discharge limits[1] verses SFA "in-reactor" hold times and CCP temperatures.

---

[1] The number of SFAs allowed to be discharged to the SFP at CCP temperatures of 80 °F, 85 °F, 90 °F and 95 °F.

Enclosure

In order to determine whether adequate controls exist to ensure the guidance of Standard Review Plan, Section 9.1.2, "Spent Fuel Pool Cooling and Cleanup System," are met, the NRC staff needs to understand the provisions established or to be established in the plant operating procedure to ensure that these SFA discharge limits will not be exceeded.

5. On Page 6 of Attachment 2 to the January 18, 1999, submittal, NNECo stated that two additional criteria control the minimum SFA "in-reactor" hold time. One is the Millstone 3 Technical Specifications (TS) which require a minimum SFA "in-reactor" hold time of 100 hours. The other is the thermal and stress analysis of the existing Westinghouse storage racks which require a minimum SFA in reactor hold time of 132[2] hours. NNECo further stated that the minimum SFAs "in-reactor" hold time for CCP temperatures in the range of 80 ^{0}F to 95 ^{0}F are from 132 to 285 hours respectively. The results of the Holtec analysis (as indicated in the above Q-4) show that the corresponding minimum SFA "in-reactor" hold time for CCP temperature at 80 ^{0}F is 101 hours. Please clarify which of the these three "minimum" SFA "in-reactor" hold times will be incorporated in the TS or operating procedures as an SFA discharge constraint. Also, clarify how the minimum SFA "in-reactor" hold time of 132 hours was derived.

6. On Page 8 of Attachment 2 to the January 18, 1999 submittal, NNECo stated that during shutdown (i.e. Modes 5, 6, and with the reactor defueled) SFP cooling system availability may be limited to a single train. Under these circumstances, NNECo relied on the large passive water volume contained in the SFP to protect against single failures. NNECo's rationale is that Holtec's thermal hydraulic analysis for this design change was performed with the assumption that only a single SFP cooling train was operating and that a single SFP cooling train has sufficient heat removal capacity to maintain the SFP during normal operation at or below 150 ^{0}F. This is not consistent with the guidance in Standard Review Plan, Section 9.1.3, "Spent Fuel Pool Cooling And Cleanup System," and does not satisfy the requirement described in General Design Criterion 44, "Cooling Water." In order to determine whether adequate controls exist to ensure the guidance of Standard Review Plan, Section 9.1.3 is met, the NRC staff needs to understand the provisions established or to be established in plant operating procedures to ensure that prior to a planned offload (partial or full-core) event, both trains of the SFP cooling system are operable and available for SFP cooling.

7. In the unlikely event that there is a complete loss of cooling following an unplanned full-core offload event, the SFP water temperature will begin to rise and eventually will reach the boiling temperature. In order for the staff to determine whether the guidance in Standard Review Plan Section, 9.1.2, "Spent Fuel Pool Cooling and Cleanup System," is met the staff needs information on the calculated minimum time-to-boil (hours) and its corresponding boil-off rate (gpm) for the case with maximum decay heat input as presented in Holtec report Table 5.4, "Minimum Hold Time Results", and the available make-up rate.

---

[2] The proposed FSAR Figure 9.1-20 also shows that with CCP temperature at 80 ^{0}F, the minimum SFA in reactor hold time is 132 hours.

8. In order to determine whether adequate controls exist to ensure the guidance of Standard Review Plan, Section, 9.1.2, "Spent Fuel Pool Cooling and Cleanup System," is met, the NRC staff needs to understand the provisions established or to be established in plant operating procedures to monitor and control the SFP water temperature during full-core offload events. Information should include:

   (A) How often the local temperature indicators for SFP water temperature will be monitored.

   (B) The set-point of the high water temperature alarm for the SFP.

   (C) Information supporting a determination that there is sufficient time for operators to intervene in order to ensure that the temperature limit of 150 °F will not be exceeded.

   (D) The mitigative actions (i.e. prohibit fuel handing, aligning other systems to provide SFP cooling, etc.) to be taken in the event of a high SFP water temperature alarm.