NORTHEAST UTILITIES

THE CONNECTICUT LIGHT AND POWER COMPANY
WESTERN MASSACHUSETTS ELECTRIC COMPANY
HOLYOKE WATER POWER COMPANY
NORTHEAST UTILITIES SERVICE COMPANY
NORTHEAST NUCLEAR ENERGY COMPANY

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September 10, 1993

Docket No. 50-336
B 4601

Re: GL92-01, Rev. 1

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

Gentlemen:

Millstone Nuclear Power Station, Unit No. 2
Response to Request for Additional Information
Generic Letter 92-01, Revision 1

The NRC Staff's letter of July 7, 1993,[1] transmitted to Northeast Nuclear Energy Company (NNECO) a request for additional information which was generated based on the NRC Staff's review of our July 6, 1992,[2] and January 4, 1993,[3] submittals.

Included as Attachment 1 is NNECO's response to the NRC Staff's questions. Included as Attachment 2 is the reactor vessel upper shelf energy (USE) test report for the recently-completed test program. The purpose of this test program was to establish the unirradiated USE of the reactor vessel intermediate shell course plates in the transverse direction (i.e. transverse to the plate rolling direction). The testing program was initiated to address some of the concerns identified during verbal discussions with the NRC Staff during the review of the Millstone Unit No. 2 Generic Letter (GL) 92-01 submittals.

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(1) G. S. Vissing letter to J. F. Opeka, "Request for Additional Information Concerning Response to Generic Letter 92-01, Revision 1, 'Reactor Vessel Structural Integrity,' as Related to Millstone Unit No. 2 (TAC No. M83483)," dated July 7, 1993.

(2) J. F. Opeka letter to the U.S. Nuclear Regulatory Commission, "Reactor Vessel Structural Integrity, 10CFR50.54(f), (Generic Letter 92-01, Revision 1)," dated July 6, 1992.

(3) J. F. Opeka letter to the U.S. Nuclear Regulatory Commission, "Reactor Vessel Structural Integrity, 10CFR50.54(f), (Generic Letter 92-01, Revision 1), Response to Request for Additional Information," dated January 4, 1993.

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Based on the results of the testing, NNECO concludes that the USE of the reactor vessel intermediate course plates will remain above 50 ft-lbs as required by 10CFR50 Appendix G, through the remainder of the current Millstone Unit No. 2 design life.

NNECO believes that with the responses provided in Attachment 1, combined with the report contained in Attachment 2, the issues related to GL 92-01 are resolved and that Millstone Unit No. 2 should be removed from the NRC list of plants with "Future Potential USE Concerns."

If you have any questions, please contact my staff.

Very truly yours,

NORTHEAST NUCLEAR ENERGY COMPANY

FOR: J. F. Opeka
Executive Vice President

BY: W D Romberg
W. D. Romberg
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

Subscribed and sworn to before me

this 10th day of September, 1993

Barbara J. Dalton
Notary Public

Date Commission Expires: 3/31/95

Docket No. 50-213
B14601

Attachment 1

Millstone Nuclear Power Station, Unit No. 2

Response to Request for Additional Information

September 1993

MILLSTONE UNIT NO. 2
REQUEST FOR ADDITIONAL INFORMATION
RELATED TO GENERIC LETTER 92-01

QUESTION 2a in Generic Letter 92-01

The response to Generic Letter 92-01 indicates that the end-of-life (EOL) upper shelf energy (USE) values for three beltline plates would be below the 50 ft-lb screening criterion when regulatory Guide 1.99, Revision 2 was used. Either provide the Charpy USE for each beltline plate or provide the Charpy USE and analysis from plates that were fabricated using the same vendor, fabricator time frame, fabrication process, and material specification to demonstrate that all beltline plates will meet the USE requirements of Appendix G, 10 CFR 50. If this cannot be provided, then submit an analysis which demonstrates that lower values of upper-shelf energy will provide margins of safety against fracture equivalent to those required by Appendix G of the ASME Code.

RESPONSE TO QUESTION 2a in Generic Letter 92-01

Table I of the response to Generic Letter 92-01 provides the EOL USE for the intermediate course plates which was calculated by extrapolating the embrittlement measured in the first surveillance capsule to the EOL. This approach is conservative since the results of the second surveillance capsule analysis (i.e. W-104) showed a significantly lower embrittlement rate than the first surveillance capsule (i.e. W-97). Furthermore, method two of Table I in the response to Generic Letter 92-01 assumed that the worst embrittlement measured for plate C-506-1 was applicable to the intermediate course plates even though the copper content of the intermediate plates is lower than that of the surveillance plate. These two conservative assumptions coupled with the 65% longitudinal/transverse direction conversion factor, resulted in a calculated EOL, USE value which was lower than the 50 ft-lbs level required by 10CFR50, Appendix G.

As a result of the above finding, NNECO performed Charpy impact testing of archive material from the three plates in question to establish the transverse, unirradiated USE of the plates. The results of the testing, which are provided in Attachment 2 to this letter and summarized in Table I, confirmed that the 65% factor was indeed conservative for these plates. Using the measured values, the calculated EOL, USE will remain above 50 ft-lbs even when the above conservatisms are included in the calculation (see Table I).

QUESTION 2b in Generic Letter 92-01

The response to Generic Letter 92-01 reports two sets of chemical compositions for the upper circumferential weld, 8-203, and the mid circumferential weld, 9-203. Specify and provide justification for the selection of the chemical compositions, which will be used in future ΔRT_{NDT} and ΔUSE calculations, for these welds.

RESPONSE TO QUESTION 2b in Generic Letter 92-01

The upper circumferential weld, 8-203, was fabricated using single wire welding, but with two different heats of weld wire and two flux lots. One section of the weld was fabricated using wire heat No. 33A277 and flux lot No. 3922 while the remainder of the weld was fabricated with wire heat No. 10137 and flux lot No. 3999. The middle circumferential weld, 9-203, was fabricated similarly to the upper weld, with wire heat No. 90136 and flux lot No. 3998 used on one section of the weld and wire No. 10137 and flux lot No. 3999 used on the remainder of the weld. The chemical composition of the "as deposited" welds was provided in the response to Generic Letter 92-01, Table II and is restated in Table II, attached. In addition to differences in chemical composition, the above wire/flux combinations also showed differences in the initial RT_{NDT}. Since a review of the fabrication records did not conclusively identify which wire/flux combination was used on which section of each weld, each of the wire/flux combinations will be independently evaluated during future ΔRT_{NDT} and ΔUSE calculations and the worst case calculated value will be taken as the controlling value for the affected weld.

TABLE I

PLATE #	HEAT #	UNIRR. USE (ft-lbs)	EOL USE (ft-lbs)
C-505-1	C5843-1	88.4	54.8
C-505-2	C5843-2	89.3	55.4
C-505-3	C5843-3	94.6	57.8

TABLE II

WELD #	HEAT #	FLUX LOT	P	S	Cu	Ni
UPPER CIRCUMFERENTIAL WELD						
8-203	33A277	3922	0.013	0.009	0.30	0.18
	10137	3999	0.014	0.018	0.23	0.06
MID CIRCUMFERENTIAL WELD						
9-203	10137	3999	0.014	0.018	0.23	0.06
	90136	3998	0.015	0.013	0.30	0.06

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Attachment 2

Millstone Nuclear Power Station, Unit No. 2
Evaluation of the Unirradiated Charpy Upper Shelf
Energy of Millstone Unit No. 2
RPV Intermediate Shell Course Plates

September 1993