Docket file

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

March 30, 1994

Docket No. 50-245

Mr. John F. Opeka
Executive Vice President, Nuclear
Connecticut Yankee Atomic Power Company
Northeast Nuclear Energy Company
Post Office Box 270
Hartford, Connecticut 06141-0270

Dear Mr. Opeka:

SUBJECT: GENERIC LETTER (GL) 92-01, REVISION 1, "REACTOR VESSEL STRUCTURAL INTEGRITY," MILLSTONE NUCLEAR POWER STATION, UNIT 1 (TAC NO. M83482)

By letters dated July 6, 1992, July 19,1993, October 15, 1993, and December 7, 1993, the Northeast Nuclear Energy Company (NNECO) provided its response to GL 92-01, Revision 1. The NRC staff has completed its review of NNECO's responses. Based on its review, the staff has determined that NNECO has provided the information requested in GL 92-01.

The GL is part of the staff's program to evaluate reactor vessel integrity for Pressurized Water Reactors (PWRs) and Boiling Water Reactors (BWRs). The information provided in response to GL 92-01, including previously docketed information, is being used to confirm that licensees satisfy the requirements and commitments necessary to ensure reactor vessel integrity for their facilities.

A substantial amount of information was provided in response to GL 92-01, Revision 1. These data have been entered into a computerized data base designated Reactor Vessel Integrity Database (RVID). The RVID contains the following tables: (1) a pressurized thermal shock table for PWRs, (2) a pressure-temperature limit table for BWRs, and (3) an upper-shelf energy (USE) table for PWRs and BWRs. Enclosure 1 provides the pressure temperature table for Millstone Unit 1, Enclosure 2 provides the USE table for Millstone Unit 1, and Enclosure 3 provides a key for the nomenclature used in the tables. The tables include the data necessary to perform USE, pressure-temperature limit, and RT_{pts} evaluations. These data were taken from NNECO responses to GL 92-01 and previously docketed information. The information in the RVID for Millstone Unit 1 will be considered accurate at this point in time and will be used in the staff's assessments related to vessel structural integrity. References to the specific source of the data are provided in the tables.

The NRC staff requests that NNECO verify that the information, for Millstone Unit 1, has been accurately entered in the data base. No response is necessary unless an inconsistency is identified. If no comments are received within 30 days from the date of this letter, the staff will consider your actions related to GL 92-01, Revision 1, to be complete.

The information requested by this letter is within the scope of the overall burden estimated in GL 92-01, Revision 1, "Reactor Vessel Structural Integrity, 10 CFR 50.54(f)." The estimated average number of burden hours is 200 person hours for each addressee's response. This estimate pertains only to the identified response-related matters and does not include the time required to implement actions required by the regulations. This action is covered by the Office of Management and Budget Clearance Number 3150-0011, which expires June 30, 1994.

Sincerely,

Original signed by:

James W. Andersen, Acting Project Manager
Project Directorate I-4
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Enclosures:
1. Pressure-Temperature Limit Table
2. Upper-Shelf Energy Table
3. Nomenclature Key

cc w/enclosures:
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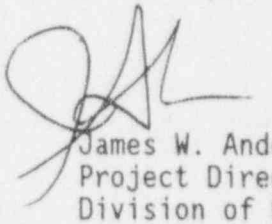
Sincerely,



James W. Andersen, Acting Project Manager
Project Directorate I-4
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Enclosures:
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3. Nomenclature Key

cc w/enclosures:
See next page

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Summary File for Pressure-Temperature Limits

Plant Name	Beltline Ident.	Heat No. Ident.	ID Neut. Fluence at EOL/EFPY	IRT_{NDT}	Method of Determin. IRT_{NDT}	Chemistry Factor	Method of Determin. CF	%Cu	%Ni
Millstone 1 EOL: 10/6/2010	Lower Shell G2001-1	C1359-1	1.29E18	6°F	Plant specific	146.15	Table	0.22	0.49
	Lower Shell G2001-3	B4928-1	1.29E18	10°F	Plant specific	155.4	Table	0.23	0.52
	Lower Shell G2001-5	C1140-2	1.29E18	22°F	Plant specific	143.8	Table	0.23	0.44
	Lower-int. Shell G2002-4	B5013-2	1.29E18	-4°F	Plant specific	160.7	Table	0.21	0.49
	Lower-int. Shell G2002-5	C1079-1	1.29E18	26°F	Plant specific	236.43	Calculated	0.19	0.51
	Lower-int. Shell G2002-6	C1140-1	1.29E18	20°F	Plant specific	135.5	Table	0.21	0.45
	Axial Welds 1-073A/C	W5214	1.29E18	-20°F	Plant specific	252	Table	0.21	1.20
	Axial Welds 2-073A/C	W5214	1.29E18	-20°F	Plant specific	252	Table	0.21	1.20
	Lower to Lower-int. Circ. Weld	348009	1.29E18	-50°F	Plant specific	200.78	Calculated	0.21	1.03

Reference for Millstone 1

Fluence, chemical composition, and IRT_{NDT} data are from July 6, 1992, letter from J. F. Opeka (NNECo) to USNRC Document Control Desk, subject: Haddam Neck Plant; Millstone Power Station, Units 1, 2, and 3: Reactor Vessel Structural Integrity, 10CFR50.54(f), (Generic Letter 92-01, Revision 1)

Summary File for Upper Shelf Energy

Plant Name	Beltline Ident.	Heat No.	Material Type	1/4T USE at EOL/EFPY	1/4T Neutron Fluence at EOL/EFPY	Unirrad. USE	Method of Determin. Unirrad. USE
Millstone 1 EOL: 10/6/2010	Lower Shell G2001-1	C1359-1	A 302B	55	9.0E17	67	65%
	Lower Shell G2001-3	B4928-1	A 302B	55	9.0E17 *	67	65%
	Lower Shell G2001-5	C1140-2	A 302B	61	9.0E17	75	65%
	Lower-int. Shell G2002-4	B5013-2	A 302B	60	9.0E17	72	65%
	Lower-int. Shell G2002-5	C1079-1	A 302B	51	9.0E17	65	65%
	Lower-int. Shell G2002-6	C1140-1	A 302B	57	9.0E17	68	65%
	Axial Welds 1-073A/C	W5214	Linde 1092, SAW	90	9.0E17	112	Sister plant
	Axial Welds 2-073A/C	W5214	Linde 1092, SAW	90	9.0E17	112	Sister plant
	Lower to Lower-int. Circ. Weld 3-073	348009	Linde 1092, SAW	73	9.0E17	98	Surv. Weld

Reference for Millstone 1

The UUSE data for plate G2002-5 was determined by the staff based on data reported in October 15, 1993 letter to NRC (Response to GL 92-01 RAI).

Fluence, chemical composition, and UUSE data are from July 6, 1992, letter from J. F. Opeka (NNECo) to USNRC Document Control Desk, subject: Haddam Neck Plant; Millstone Power Station, Units 1, 2, and 3: Reactor Vessel Structural Integrity, 10CFR50.54(f), (Generic Letter 92-01, Revision 1)

NOMENCLATURE FOR

PRESSURE-TEMPERATURE LIMIT TABLES AND USE TABLES

FOR ALL BWR PLANTS

Pressure-Temperature Limits Table

Column 1: Plant name and date of expiration of license.
Column 2: Beltline material location identification.
Column 3: Beltline material heat number; for some welds that a single-wire or tandem-wire process has been reported, (S) indicates single wire was used in the SAW process, (T) indicates tandem wire was used in the SAW process.
Column 4: End-of-life (EOL) neutron fluence at vessel inner wall; cited directly from inner diameter (ID) value or calculated by using Regulatory Guide (RG) 1.99, Revision 2 neutron fluence attenuation methodology from the quarter thickness (T/4) value reported in the latest submittal (GL 92-01, PTS, or P/T limits submittals).
Column 5: Unirradiated reference temperature.
Column 6: Method of determining unirradiated reference temperature (IRT).

Plant-Specific
This indicates that the IRT was determined from tests on material removed from the same heat of the beltline material.

MTEB 5-2
This indicates that the unirradiated reference temperature was determined from following MTEB 5-2 guidelines for cases where the IRT was not determined using American Society of Mechanical Engineers Boiler and Pressure Vessel Code, Section III, NB-2331, methodology.

Generic
This indicates that the unirradiated reference temperature was determined from the mean value of tests on material of similar types.

Column 7: Chemistry factor for irradiated reference temperature evaluation.
Column 8: Method of determining chemistry factor

Table
This indicates that the chemistry factor was determined from the chemistry factor tables in RG 1.99, Revision 2.

Calculated
This indicates that the chemistry factor was determined from surveillance data via procedures described in RG 1.99, Revision 2.

Column 9: Copper content; cited directly from licensee value except when more than one value was reported. (Staff used the average value in the latter case.)

No Data
This indicates that no copper data has been reported and the default value in RG 1.99, Revision 2, will be used by the staff.

Column 10: Nickel content; cited directly from licensee value except when more than one value was reported. (Staff used the average value in the latter case.)

No Data

This indicates that no nickel data has been reported and the default value in RG 1.99, Revision 2, will be used by the staff.

Upper Shelf Energy Table

Column 1: Plant name and date of expiration of license.
Column 2: Beltline material location identification.
Column 3: Beltline material heat number; for some welds that a single-wire or tandem-wire process has been reported, (S) indicates single wire was used in the SAW process. (T) indicates tandem wire was used in the SAW process.
Column 4: Material type; plate types include A 533B-1, A 302B, A 302B Mod., and forging A 508-2; weld types include SAW welds using Linde 80, 0091, 124, 1092, ARCOS-B5 flux, Rotterdam welds using Graw Lo, SMIT 89, LW 320, and SAF 89 flux, and SMAW welds using no flux.
Column 5: EOL upper-shelf energy (USE) at T/4; calculated by using the EOL fluence and either the cooper value or the surveillance data. (Both methods are described in RG 1.99, Revision 2.)

EMA
This indicates that the USE issue may be covered by the approved equivalent margins analysis in the BWR Owners Group Topical Report: NEDO-32205, Revision 1.

Column 6: EOL neutron fluence at T/4 from vessel inner wall; cited directly from T/4 value or calculated by using RG 1.99, Revision 2 neutron fluence attenuation methodology from the ID value reported in the latest submittal (GL 92-01, PTS, or P/T limits submittals).

Column 7: Unirradiated USE.

EMA
This indicates that the USE issue may be covered by the approved equivalent margins analysis in the BWR Owners Group Topical Report: NEDO-32205, Revision 1.

Column 8: Method of determining unirradiated USE

Direct
For plates, this indicates that the unirradiated USE was from a transverse specimen. For welds, this indicates that the unirradiated USE was from test date.

65%
This indicates that the unirradiated USE was 65% of the USE from a longitudinal specimen.

Generic
This indicates that the unirradiated USE was reported by the licensee from other plants with similar materials to the beltline material.

NRC generic
This indicates that the unirradiated USE was derived by the staff from other plants with similar materials to the beltline material.

10, 30, 40, or 50 °F
This indicates that the unirradiated USE was derived from Charpy test conducted at 10, 30, 40, or 50 °F.

Surv. Weld
This indicates that the unirradiated USE was from the surveillance weld having the same weld wire heat number.

Equiv. to Surv. Weld
This indicates that the unirradiated USE was from the surveillance weld having different weld wire heat number.

Sister Plant
This indicates that the unirradiated USE was derived by using the reported value from other plants with the same weld wire heat number.

Blank
indicates that there is insufficient data to determine the unirradiated USE. These licensees will utilize Topical Report NEDO-32205, Revision 1 to demonstrate USE compliance to Appendix G, 10 CFR Part 50.