North Atlantic

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The Northeast Utilities System

November 20, 1995

NYN- 95094

U. S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Attention: Document Control Desk

References: (a) Facility Operating License NPF-86, Docket No. 50-443

(b) NRC Generic Letter 92-01, Revision 1, Supplement 1, "Reactor Vessel Structural Integrity," dated May 19, 1995

(c) NU Letter B15330, dated August 21, 1995, "Haddam Neck Plant, Millstone Nuclear Power Station, Units Nos. 1, 2, and 3, Seabrook Station Response to Generic Letter 92-01, Revision 1, Supplement 1, Reactor Vessel Structural Integrity," J.F. Opeka to NRC

(d) North Atlantic Letter NYN-92093, dated July 2, 1992, "Response to Generic Letter 92-01" T.C. Feigenbaum to NRC

(e) North Atlantic Letter NYN-94087, dated July 29, 1994, "Generic Letter 92-01, Rev 1, Reactor Vessel Structural Integrity (TAC No. M83512)" T.C. Feigenbaum to NRC

Subject: Response to Generic Letter 92-01, Revision 1, Supplement 1, Reactor Vessel Structural Integrity (TAC No. M83512)

Gentlemen:

North Atlantic Energy Service Corporation (North Atlantic) hereby responds to items (2), (3), and (4) of Generic Letter 92-01, Revision 1, Supplement 1, Reactor Vessel Structural Integrity [Reference (b)].

Supplement 1 to Revision 1 of Generic Letter 92-01 (hereafter Supplement 1) requested that licensees identify, collect and report any new data pertinent to the analysis of the structural integrity of their reactor pressure vessels (RPVs) and to assess the impact of that data on RPV integrity analyses relative to the requirements of 10CFR50.60, 10CFR50.61, Appendices G and H to 10CFR50 (which encompass pressurized thermal shock (PTS) and upper shelf energy (USE) evaluations) and any potential impact on low temperature overpressure (LTOP) limits or pressure-temperature (P-T) limits. Item (1) of Supplement 1 required that licensees respond to the NRC within 90 days describing "*... those actions taken or planned to locate all data relevant to the determination of RPV integrity, or an explanation of why the existing data base is considered complete as previously submitted.*" This information was provided to the NRC on August 21, 1995 [Reference(c)] for the five Northeast Utilities nuclear units. Supplement 1, required that licensees respond to items (2), (3), and (4), described below, within 6 months of the date of the letter:

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(2) an assessment of any change in best-estimate chemistry based on consideration of all relevant data;

(3) a determination of the need for use of the ratio procedure in accordance with the established Position 2.1 of Regulatory Guide 1.99, Revision 2, for those licensees that use surveillance data to provide a basis for the RPV integrity evaluation; and

(4) a written report providing any newly acquired data as specified above and (1) the results of any necessary revisions to the evaluation of RPV integrity in accordance with the requirements of 10 CFR 50.60, 10 CFR 50.61, Appendices G and H to 10 CFR Part 50, and any potential impact on the LTOP or P-T limits in the technical specifications or (2) a certification that previously submitted evaluations remain valid. Revised evaluations and certifications should include consideration of Position 2.1 of Regulatory Guide 1.99, Revision 2, as applicable, and any new data.

The enclosure to this letter provides responses to the above items for Seabrook Station. The Seabrook Station RPV chemistry data provided in the enclosure incorporates RPV weld chemistry for those "sister" plants with RPVs fabricated from common weld heats. North Atlantic initially responded to Generic Letter 92-01 Revision 1 on July 2, 1992, [Reference (d)]. North Atlantic subsequently submitted an update on July 29, 1994, [Reference (e)] to the NRC Summary File for Pressurized Thermal Shock containing mean chemistry values for the Seabrook Station RPV plate material. The mean chemistry values for the RPV plate material are reiterated in the enclosure for completeness.

In summary, North Atlantic believes that the chemistry and material property data currently used to establish the structural integrity of the Seabrook Station RPV, and to demonstrate compliance with the requirements of 10CFR50.60, 10CFR50.61 and Appendices G and H to 10CFR50 remain conservative.

There are no new or additional commitments contained within this letter.

Should you have any questions regarding this letter please contact Mr. James M. Peschel at (603) 474-9521 extension 3772.

Very truly yours,

Bruce L. Drawbridge
Executive Director - Nuclear Production

TCF:ALL/sm
Enclosure

Sworn and Subscribed to before me this 20th day of November, 1995

BY: _____
Notary Public

cc: Mr. Thomas T. Martin
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North Atlantic
November 20, 1995

ENCLOSURE TO NYN-95094

Seabrook Station
Response to Items 2, 3, and 4
Generic Letter 92-01, Revision 1, Supplement 1
Reactor Vessel Structural Integrity

On May 19, 1995, the NRC issued Supplement 1 to Generic Letter 92-01, Revision 1 (hereafter Supplement 1) requesting that licensees identify, collect and report any new data pertinent to the analysis of structural integrity of their reactor pressure vessels (RPVs) and to assess the impact of that data on their RPV integrity analyses relative to the requirements of 10CFR50.60, 10CFR50.61, Appendices G and H to 10CFR50 (which encompass pressurized thermal shock (PTS) and upper shelf energy (USE) evaluations) and any potential impact on low temperature overpressure (LTOP) limits or pressure-temperature (P-T) limits. Supplement 1 requested that licensees respond to four items identified therein. On August 21, 1995, [Reference (c)], Northeast Utilities responded to item (1) for its five nuclear units and indicated that it would collect and analyze any new data identified since the initial response to GL 92-01 was submitted and it would assess the impact of any changes on the structural integrity of the RPVs to ensure continued compliance with applicable regulatory requirements. The purpose of this report is to document the results of these evaluations.

The following paragraphs describe the activities completed by North Atlantic to address items (2), (3) and (4) of Supplement 1.

(2) an assessment of any change in best-estimate chemistry based on consideration of all relevant data;

North Atlantic initially responded to Generic Letter 92-01, Revision 1, on July 2, 1992 [Reference (d)]. North Atlantic subsequently submitted an update on July 29, 1994, [Reference (e)] to the NRC Summary File for Pressurized Thermal Shock containing mean chemistry values for the Seabrook Station RPV plate material. The mean chemistry values for the RPV plate material are reiterated in the enclosed tables for completeness. Additionally, "sister" plant RPV weld chemistry data has been obtained and is incorporated herein. The new data documented in the enclosed tables affects the initial RT_{NDT}, the initial Upper Shelf Energy (USE), and the Ni and Cu content of the RPV beltline materials .

Table 1, enclosed, provides a summary of the results of the RPV chemistry data review performed for the Seabrook Station RPV. The Ni and Cu contents were obtained by calculating the mean values of all relevant data identified to date for each of the beltline materials. Tables 2 and 3, enclosed, update all pertinent data relevant to the structural integrity of the Seabrook Station RPV and incorporate information previously submitted on July 29, 1994, [Reference (e)] .

(3) **a determination of the need for use of the ratio procedure in accordance with the established Position 2.1 of Regulatory Guide 1.99, Revision 2, for those licensees that use surveillance data to provide a basis for the RPV integrity evaluation; and**

To date, one capsule has been withdrawn from the Seabrook Station RPV and evaluated. Since Position 2.1 requires that at least two surveillance capsules be evaluated to establish credible surveillance data, the Seabrook Station surveillance data is not considered credible data and therefore Position 2.1 can not be applied to Seabrook Station at this time.

The surveillance data is also not considered credible for application of Position 2.2. However, as demonstrated in Table 3, the expected end of life USE for the Seabrook Station RPV beltline materials is expected to remain well above the 50 Ft-Lb criteria when Position 1.2 is applied.

(4) **a written report providing any newly acquired data as specified above and (1) the results of any necessary revisions to the evaluation of RPV integrity in accordance with the requirements of 10CFR50.60, 10CFR50.61, Appendices G and H to 10CFR50, and any potential impact on the LTOP or P-T limits in the technical specifications or (2) a certification that previously submitted evaluations remain valid. Revised evaluations and certifications should include consideration of Position 2.1 of Regulatory Guide 1.99, Revision 2, as applicable, and any new data.**

As a result of incorporating the new chemistry and the material property data into the above calculations, the new values of RT_{NDT} and USE differed from those previously used in establishing compliance with the above requirements. In some cases, the new values were more restrictive while in other cases the new values were less restrictive. The following is a summary of the evaluations performed to assess the impact of the new values on Seabrook Station's compliance with each of the above requirements:

(a) **10CFR50.60** - 10CFR50.60 requires that licensees demonstrate the structural integrity of their RPVs in accordance with the requirements set forth in Appendices G and H. Since the impact of the newly calculated values on compliance with these appendices is addressed below, and no other specific requirements are imposed under 10CFR50.60, it is concluded that the Seabrook Station RPV continues to comply with 10CFR50.60.

(b) **10CFR50.61** - The new RPV chemistry values resulted in some changes to the previously calculated RT_{PTS} for the Seabrook Station RPV. Although none of the changes were considered significant, new values of RT_{PTS} were calculated for all of the beltline materials and are provided in Table 2. Since all of these values are well under the 270^0F screening criteria provided in 10CFR50.61, it is concluded that the Seabrook Station RPV continues to meet the requirements of 10CFR50.61 even when the newly acquired data is considered in the calculations.

(c) **10CFR50, Appendix H** - The Seabrook Station surveillance program consists of 6 capsules to be withdrawn during the life of the RPV. To date, one capsule has been withdrawn and 5 capsules remain in the RPV. The original number of capsules and the withdrawal schedule was established in accordance with the requirements of ASTM E-185-79 and are based on the expected increase in RT_{NDT} during the life of the RPV. When the new end of life RT_{NDT} values were factored into the requirements of ASTM E-185-79, it was concluded that the previously established capsule withdrawal schedule remains in compliance with the requirements of ASTM E-185-79 and also in compliance with the requirements of 10CFR50, Appendix H.

(d) **10CFR50, Appendix G** - This Appendix establishes the structural requirements for RPV operation to ensure that the probability of non-ductile failure is maintained within acceptable levels. The results of the evaluations described above can impact compliance with three requirements provided in Appendix G. These are end of life USE, Pressure Temperature limit curves, and LTOP valve setpoints. The following is a summary of the results of the review performed to ensure continued compliance with these three requirements:

(i) **End of life USE** - As described in the response to item (3) above, the end of life USE values for the Seabrook Station RPV were recalculated using the new data obtained under this review and using Position 1.2 of Regulatory Guide 1.99, Revision 2. Based on the results of this calculation, which are provided in Table 3, it is concluded that USE of all of the beltline materials in the Seabrook Station RPV are expected to remain above 50 Ft-Lbs through the end of the current RPV design life as required by paragraph IV.A.1 of Appendix G.

(ii) **Normal Operating P/T Limit Curves** - It has been determined that the new RPV chemistry data will affect the P/T limit curves and the RCS cold overpressure protection setpoints currently included in the Seabrook Station Technical Specifications. These Technical Specifications are expected to require revision subsequent to the withdrawal and analysis of the second RPV surveillance capsule which is scheduled after approximately 5 EFPY of operation which is projected to occur before the 1997 refueling outage. Currently, the Technical Specifications identify the applicability of the P/T limit curves and the RCS cold overpressure protection setpoint curve as 11.1 EFPY and 16 EFPY respectively. Application of the conservative calculational methodologies of Regulatory Guide 1.99 Revision 2 to the new RPV chemistry factors results in a reduction in the applicability of the P/T limit curves and the RCS cold overpressure protection setpoint curve to 7.3 EFPY. There is no impact on the shape of these curves. The withdrawal and analysis of the second surveillance capsule will be completed prior to accumulating 7.3 EFPY of operation. Technical Specification changes, if required, will be submitted with appropriate adjustments to the applicability of the P/T limit curves and the RCS cold overpressure protection setpoint curve based on the analysis of the second surveillance capsule.

(iii) **LTOP Valve Setpoints** - See item (ii) above.

Table 1
Seabrook Station

SEABROOK STATION CHEMISTRY DATA					
	Ni	Cu	Reference	Mean Ni	Mean Cu
4P6052	0.03	0.070	WCAP-10732 (pg A-4)		
	0.15	0.020	WCAP-10732 (pg A-4)		
	0.06	0.038	WCAP-10732 (pg A-4)		
	0.04	0.060	RVG-9440		
	0.02	0.070	RVG-6192		
		0.050	RVG-6192		
		0.010	RVG-6192		
	0.10	0.020	WCAP-10110		
	0.05	0.020	WCAP-10110	0.06	0.04
R1808-1*			WCAP 10110 & Lukens MCR	.58	.06
R1808-2*			WCAP 10110 & Lukens MCR	.58	.06
R1808-3*			WCAP 10110 & Lukens MCR	.59	.07
R1806-1*			WCAP 10110 & Lukens MCR	.61	.045
R1806-2*			WCAP 10110 & Lukens MCR	.64	.06
R1806-3*			WCAP 10110 & Lukens MCR	.63	.075

*Plate data previously submitted to NRC on July 29, 1994, Letter NYN-94087

Table 2

Seabrook Station

	RTpts@ EOL	ID Fluence @ EOL	IRTndt	Method Determ IRTndt	ΔRTndt @ EOL	FF @ EOL	CF	Method Determ CF	Margin	Method Determ Margin	Cu%	Ni%
R1808-1	122	3.17 E19	40	Plant Specific	48	1.304	37	Table	34.0	Measured Values	.06	.58
R1808-2	92	3.17 E19	10	Plant Specific	48	1.304	37	Table	34.0	Measured Values	.06	.58
R1808-3	131	3.17 E19	40	Plant Specific	57	1.304	44	Table	34.0	Measured Values	.07	.59
R1806-1	111	3.17 E19	40	Plant Specific	37	1.304	28.5	Table	34.0	Measured Values	.045	.61
R1806-2	82	3.17 E19	0	Plant Specific	48	1.304	37.0	Table	34.0	Measured Values	.06	.64
R1806-3	106	3.17 E19	10	Plant Specific	62	1.304	47.5	Table	34.0	Measured Values	.075	.63
4P6052 Welds	35	3.17 E19	-60	Plant Specific	39	1.304	29.7	Table	56.0	Measured Values	0.04	0.06

Table 3

Seabrook Station

	USE @ EOL	t/4 Fluence @ EOL	Unirr. USE	Method Determ: Unirr. USE	% Drop USE @ EOL	Method Determ % Drop	Cu
R1808-1	60.8	1.85	78	Direct	22.0	Position 1.2 of RG 1.99 Rev 2	0.06
R1808-2	60.1	1.85	77	Direct	22.0	Position 1.2 of RG 1.99 Rev 2	0.06
R1808-3	60.8	1.85	78	Direct	22.0	Position 1.2 of RG 1.99 Rev 2	0.07
R1806-1	64.0	1.85	82	Direct	22.0	Position 1.2 of RG 1.99 Rev 2	0.045
R1806-2	79.6	1.85	102	Direct	22.0	Position 1.2 of RG 1.99 Rev 2	0.06
R1806-3	89.7	1.85	115	Direct	22.0	Position 1.2 of RG 1.99 Rev 2	0.075
4P6052 Welds	121.7	1.85	156	Direct	22.0	Position 1.2 of RG 1.99 Rev 2	0.04