

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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April 19, 1984

Docket No. 50-423
B11137

Director of Nuclear Regulatory Commission
Mr. B. J. Youngblood, Chief
Licensing Branch No. 1
Division of Licensing
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Reference: (1) B. J. Youngblood letter to W. G. Counsil, Draft SER, dated
December 20, 1983.

Gentlemen:

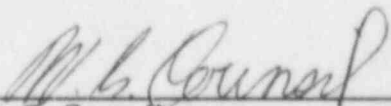
Millstone Nuclear Power Station, Unit No. 3
Response to Materials Engineering Branch DSER Open Items

Attached is the Northeast Nuclear Energy Company (NNECO) response to the Materials Engineering Branch, Materials Application Section DSER open item MTEB05 (192) concerning Millstone Unit No. 3 compliance with Regulatory Guide 1.65, "Materials and Inspection for Reactor Vessel Closure Studs." We expect the response will resolve the Staff's concerns regarding this open item.

If there are any questions, please contact our licensing representative.

Very truly yours,

NORTHEAST NUCLEAR ENERGY COMPANY, ET AL
By Northeast Nuclear Energy Company, Their Agent



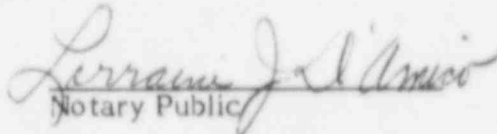
W. G. Counsil
Senior Vice President

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STATE OF CONNECTICUT)
) ss. Berlin
COUNTY OF HARTFORD)

Then personally appeared before me W. G. Counsil, who being duly sworn, did state that he is Senior Vice President of Northeast Nuclear Energy Company, an Applicant herein, that he is authorized to execute and file the foregoing information in the name and on behalf of the Applicants herein and that the statements contained in said information are true and correct to the best of his knowledge and belief.


Notary Public

My Commission Expires March 31, 1988

Millstone Nuclear Power Station, Unit No. 3
Open Item
Materials Engineering Branch
Materials Application

MTEB 05

Conformance to R. G. 1.65, Reactor Vessel Closure Studs
(Draft SER Section 5.3.1)

The applicant has not adequately addressed compliance with Regulatory Guide 1.65, "Materials and Inspections for Reactor Vessel Closure Studs." The applicant should specify compliance with the regulatory positions of the Regulatory Guide, or clearly state the alternative actions taken, with justifications.

Response:

Regulatory Guide 1.65, "Materials and Inspections for Reactor Vessel Closure Studs" is addressed in the Millstone Unit 3 FSAR, Section 1.8, Table 1.8N-1 (attached).

TABLE 1.65-1 (Cont.)

R.G. No.	Title	Degree of Compliance	FSAR Section Reference
1.65	Materials and Inspections for Reactor Vessel Closure Studs (Rev. 0, October 1973)	<p>Westinghouse is in agreement with Regulatory Guide 1.65 with the following exception for the material and tensile strength guidelines:</p> <p>1. Westinghouse has specified both 45 ft lb and 25 mils lateral expansion for control of fracture toughness determined by Charpy-V testing, required by the ASME Boiler and Pressure Vessel Code, Section III, Summer 1973 Addenda and 10CFR Part 50, Appendix G (July 17, 1973, Paragraph IV.A.4). These toughness requirements assure optimization of the stud bolt material tempering operation with the accompanying reduction of the tensile strength level when compared with previous ASME Boiler and Pressure Vessel Code requirements.</p> <p>The specification of both impact and maximum tensile strength as stated in the guide results in unnecessary hardship in procurement of material without any additional improvement in quality.</p> <p>The closure stud bolting material is procured to a minimum yield strength of 130,000 psi and a minimum tensile strength of 145,000 psi. This strength level is compatible with the fracture toughness requirements of 10CFR50, Appendix G (July 1973, Paragraph 1.C), although higher strength level bolting materials are permitted by the code. Stress corrosion has not been observed in reactor vessel closure stud bolting manufactured from material of this strength level. Accelerated stress corrosion test data do exist for materials of 170,000 psi minimum yield strength exposed to marine water environments stressed to 75 percent of the yield strength (given in Reference 2 of the Guide). These data are not considered applicable to Westinghouse reactor vessel closure stud bolting because of the specified yield strength differences and a less severe environment; this has been demonstrated by years of satisfactory service experience.</p>	5.3.1

TABLE 1.8A-1 (Cont)

R.G. No.	Title	Degree of Compliance	FSAR Section Reference
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The ASME Boiler and Pressure Vessel Code requirement for toughness for reactor vessel bolting has precluded the guide's additional recommendation for tensile strength limitation, since to obtain the required toughness levels, the tensile strength levels are reduced. Prior to 1972, the Code required a 35 ft lb toughness level which provided maximum tensile strength levels ranging from approximately 155 to 178 kpsi (Westinghouse review of limited data - 25 heats). After publication of the Summer 1973 Addenda to the Code and 10CFR Part 50, Appendix C, wherein the toughness requirements were modified to 45 ft lb with 25 mils lateral expansion, all bolt material data reviewed on Westinghouse plants showed tensile strengths of less than 170 kpsi.

Additional protection against the possibility of increasing corrosion effects is assured by:

1. Decrease in level of tensile strength comparable with the requirements of fracture toughness as described above.
2. Design of the reactor vessel studs, nuts, and washers allowing them to be completely removed during each refueling permitting visual and/or nondestructive inspection in parallel with refueling operations to assess protection against corrosion, as part of the inservice inspection program described in Chapter 5.
3. Design of the reactor vessel studs, nuts, and washers, providing protection against corrosion by allowing them to be completely removed during each refueling. The bolting materials are discussed in Chapter 5.
4. Use of manganese phosphate surface treatment
 - a. Use of Code Case 1605 does not constitute an issue between the NRC and Westinghouse inasmuch as use of this code case has been approved by the NRC via the guideline of Regulatory Guide 1.85 (see Revision 6, May 1976).