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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July 11, 1985

Docket No. 50-423
B11607

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

Reference: B. J. Youngblood letter to J. F. Opeka, Request for Additional Information, dated June 6, 1985.

Gentlemen:

Millstone Nuclear Power Station, Unit No. 3
Response to Materials Engineering Questions

Attached is the response of Northeast Nuclear Energy Company (NNECO) to the Materials Engineering Branch, Materials Application Section, request for additional information regarding fracture prevention of containment pressure boundary. We trust the response will resolve the Staff's concerns regarding this issue.

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

J. F. Opeka
Senior Vice President

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

Then personally appeared before me J. F. Opeka, 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.

Jennifer V. Powers
Notary Public
My Commission Expires March 31, 1989

Millstone Nuclear Power Station, Unit No. 3
Material Engineering Branch
Fracture Prevention Containment Pressure Boundary

2.5.2.2 Indicate the lowest service temperature for the following components:

a. 8 inch thick, SA 508 C1.1 feedwater system flued heads
b. 20 inch schedule 100, SA 106 GR B feedwater piping (by Cameron)
c. 18 inch x 20 inch SA 234 WPB feedwater reducers
d. 18 inch SA 106 GR.B feedwater piping (by USS - Lorain)
e. SA 216 GR WCB feedwater isolation valve body and bonnet
f. SA 515 GR 70 feedwater isolation valve disc

The lowest service temperature is defined in the ASME Code as "the minimum temperature of the fluid retained by the component or alternatively the calculated minimum metal temperature whenever the pressure within the component exceeds 20% of the preoperational system hydrostatic test pressure." This temperature is the minimum design temperature and should include the worst possible operating conditions (i.e., loss of heating) and the heat input contribution from the plant lighting and the filtration, recirculation and ventilation system (FRVS) equipment. It is not the 90% confidence minimum value, which was reported in the applicant's submittal.

Response:

The lowest service temperature for the feedwater system components listed has been estimated to be 74°F.

As described in NNECO's submittal of December 21, 1984 the estimate is a 90% confidence lower bound of a normal distribution fitted to the applicable building minimum (30) and mean ambient temperatures. This estimating technique was suggested to NNECO by Mr. J. Halapatz of the NRC in lieu of a complex and time consuming heat balance. NNECO supports the use of this technique as a reasonable approach to estimating the lowest service temperature for these components.

252.3 Indicate the nil-ductility transition temperature, source of data, the thickness correction temperatures (per Summer 1977 Addenda to the ASME Code, Figure NC-2311 (a)-1), and the allowable lowest service temperature for the following components

a. 18 inch x 20 inch SA 234 WPB feedwater reducers
b. 18 inch SA 106 GRB feedwater piping (by USS - Lorain)
c. SA 216 GR WCB feedwater isolation valve body and bonnet
d. SA 515 GR 70 feedwater isolation valve disc

These components were not discussed in the applicant's submittal.

Response:

None of the feedwater system components were impact tested (which is in accordance with the 1974 edition of the ASME Code). After agreement from Mr. J. Halapatz of NRC, NNECO selected a sample of the limiting component for testing.

The feedwater isolation valve disc was not considered as a potentially limiting location since it is not part of the containment pressure boundary at Millstone Unit No. 3. This is because the feedwater lines are redundantly isolated, as discussed in FSAR Section 6.2 (Page 6.2-16).

Of the remaining components, the 20 inch piping was identified as the most limiting. Thus only this component was impact tested as reported in Appendix F of NNECO's submittal (W. G. Counsil to B. J. Youngblood, dated December 21, 1984). This testing is considered bounding for the other feedwater system components.

2.5.2.4 Provide justification for considering the nil-ductility transition temperature (NDTT) of 28°F for the 20 inch sch 100, SA 106 GR.B feedwater piping (supplied by Cameron). The applicant indicates that the 20 inch schedule 100, SA 106 GR B feedwater piping (supplied by Cameron) will have a NDTT of 28°F. The Charpy impact data provided by the applicant indicate that the NDTT for this piping will be higher than 28°F. This piping was fabricated without a grain refinement heat treatment. NUREG 0577 Table 4.4 assigns a NDTT of 77°F for this component in this condition. If the applicant can not provide adequate justification for an NDTT of 28°F, the NDTT for this piping should be considered 77°F.

Response:

As reported in Appendix F of NNECO's submittal (W. G. Counsil to B. J. Youngblood, dated December 21, 1984), the 20 inch feedwater piping was impact tested to allow a determination of NDTT. Two bounding heats were tested over a range of temperatures. In accordance with NUREG 0577 Revision 1 (USNRC, October 1983), the minimum NDTT was estimated to be 28°F.

252.5 If the lowest service temperature is determined to be less than the material allowable lowest service temperature, provide a replacement or augmented inservice program to ensure that no cracks of sufficient sizes exist in the components.

Response:

As reported in our submittal of December 21, 1984, the actual lowest service temperatures are greater than the allowable minimums. Thus the requirements of General Design Criterion 51 are met in accordance with the Standard Review Plan, Section 6.2.7, Revision 0.

In the case of the feedwater system, applicable ASME Code requirements did not include impact testing. After agreement with Mr. J. Halapatz of the NRC,

testing was performed on samples from the limiting component. The testing showed that the materials used at Millstone Unit No. 3 are acceptable.

As part of the preservice inspection, all of the welds in the feedwater lines between containment and the first isolation valve have been ultrasonically inspected and found acceptable per ASME Section XI.

In conclusion, no changes to the inservice inspection program are required.