Dominion Nuclear Connecticut, Inc.
Millstone Power Station
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Waterford, CT 06385

Dominion

MAR 21 2002

Docket No. 50-336
B18623

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

Millstone Nuclear Power Station, Unit No. 2
Relief Request RR-89-34, Revision 1
Response to Request for Additional Information

On March 21, 2002,[1] the Nuclear Regulatory Commission submitted to Dominion Nuclear Connecticut, Inc. (DNC), a request for additional information in regards to a relief request submitted by DNC on February 25, 2002,[2] for alternatives to weld repair requirements on the Millstone Unit No. 2 reactor vessel head. Included as Attachment 1 are the DNC responses to the questions received in the request for additional information.

There are no regulatory commitments contained within this letter.

Should there be any additional questions regarding this submittal, please contact Mr. Ravi G. Joshi at (860) 440-2080.

Very truly yours,

DOMINION NUCLEAR CONNECTICUT, INC.

J. Alan Price
Site Vice President - Millstone

Attachment (1)

cc: H. J. Miller, Region I, Administrator
R. B. Ennis, NRC Senior Project Manager, Millstone Unit No. 2
NRC Senior Resident Inspector, Millstone Unit No. 2

(1) D. Starkey, U.S. Nuclear Regulatory Commission, facsimile to R. Joshi, "Request for Additional Information, Millstone Nuclear Power Station, Unit No. 2, Relief Request RR-89-34, Revision 1," dated March 21, 2002.

(2) J. Alan Price letter to U.S. Nuclear Regulatory Commission, "Millstone Nuclear Power Station, Unit No. 2, Request to Use an Alternative to ASME Code Section XI Repair Welding Requirements by Employing Temper Bead Techniques," dated February 25, 2002.

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Attachment 1

Millstone Nuclear Power Station, Unit No. 2

Response to Request for Additional Information

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Question 1

1. On page 22 of Relief Request RR-89-34, Rev. 1, Paragraphs 2.1(h) and (i) do not conform to the Procedure Qualification requirements in N-638. What paragraphs in ASME Section XI or Section III is relief being requested from in these two paragraphs.

Answer to Question 1

Enclosure (1) provides a comprehensive summary of both the code and alternative requirements to qualify and perform the weld repairs. The subject paragraphs are not requesting relief from the applicable code, but reiterate the requirements of ASME Section III, Div 1, 1992 edition, subparagraph NB-4335.2, Impact Tests of Heat Affected Zone sub-subparagraphs (b)(2) and (b)(3).

Paragraph 2.1(h) represents word for word the text of NB-4335.2(b)(2) except for paragraph numbers which were edited to reflect the appropriate numbering in the Enclosure (1) document. Both are provided below for comparison:

(b)(2) If the average Charpy V-notch lateral expansion for the heat affected zone of (b)(1) above is less than that for the unaffected base material, and the qualification test meets the other criteria of acceptance, the Charpy V-notch test results may be recorded on the Welding Procedure Qualification Record. Data shall then be obtained as specified in (b)(3) below to provide an additive temperature for any base material for which the welding procedure is being qualified, and shall be included. Alternatively, the welding procedure qualification may be re-welded and re-tested.

2.1(h) If the average Charpy V-notch lateral expansion for the heat affected zone of 2.1(g) above is less than that for the unaffected base material, and the qualification test meets the other criteria of acceptance, the Charpy V-notch test results may be recorded on the Welding Procedure Qualification Record. Data shall then be obtained as specified in 2.1(i) below to provide an additive temperature for any base material for which the welding procedure is being qualified, and shall be included. Alternatively, the welding procedure qualification may be re-welded and re-tested.

Paragraph 2.1(i) represents those portions of sub-subparagraph NB-4335.2(b)(3) which apply to this application. NB-4335.2(b)(3) is presented below in its entirety with paragraph 2.1(h) for comparison.

(b)(3) The data for use in (b)(2) above shall be developed by performing additional Charpy V-notch tests on either the welding procedure qualification heat affected zone or the unaffected base material, or both, at temperatures which provide lateral expansion values equal to or greater than 35 mils. The average lateral expansion data for the heat affected zone and the unaffected base material shall be plotted on a lateral expansion-temperature chart. The temperatures at which these two sets of data exhibit a common lateral expansion value equal to or greater than 35 mils shall be determined. The determined temperature for the unaffected base material shall be subtracted from the similarly determined temperature for the heat affected zone. This difference shall be used in (b)(2) above as the adjustment temperature. The adjustment temperature shall be added to the highest RT_{NDT} temperature established by the tests of NB-2331 and NB-2332(b) for all of the base material to be welded by this procedure in production. If the temperature difference is zero or is a negative number, no adjustment is required for the base material to be welded in production, and the minimum temperature established by the tests for NB-2331 and NB-2332(b) will still apply as stated in (b)(1) above. Where the actual RT_{NDT} is not required for the production material to be welded, for example, where a testing temperature is established by the Design Specification to determine that the RT_{NDT} is at or below the specified temperature, the adjustment temperature determined by the curves shall be used to establish a reduction in the specified testing temperature for the production material. The adjustment temperature shall be used to lower the specified testing temperature for any production material on which the procedure will be used.

2.1(i) The data for use in 2.1(h) above shall be developed by performing additional Charpy V-notch tests on either the welding procedure qualification heat affected zone or the unaffected base material, or both, at temperatures which provide lateral expansion values equal to or greater than 35 mils. The average lateral expansion data for the heat affected zone and the unaffected base material may be plotted on a lateral expansion-temperature chart. The temperatures at which these two sets of data exhibit a common lateral expansion value equal to or greater than 35 mils shall be determined. The determined temperature for the unaffected base material shall be subtracted from the similarly determined temperature for the heat affected zone. This difference shall be used in 2.1(h) above as the adjustment temperature. The adjustment temperature shall be added to the nil ductility temperature (RT_{NDT}) of each piece separately or collectively to the highest nil ductility temperature (RT_{NDT}) for all of the base material(s) to be repair welded by this procedure. If the temperature difference is zero or is a negative number, no adjustment is required for the base material to be repair welded.

For the sake of clarity and brevity the following editorial changes were made to the original code text to remove those portions which were not applicable to the actual repair welding;

- The applicable requirements of the code were maintained with the exception that the word "shall" was inadvertently changed to "may". The lateral expansion temperature chart was plotted and the HAZ Charpy V-notch tests performed at 35°F provided an average value which was exactly equal to that of the unaffected base material tested at 30°F.
- The phrase, "welded by this procedure in production" was replaced with, "repair welded by this procedure," in two places,
- Direct reference to paragraphs NB-2331 and NB-2332(b) was deleted to prevent any inconsistency with the actual base material procurement requirements and CMTRs,
- The last few lines of NB-4335.2(b)(3) address, "Where the actual RT_{NDT} is not required for the production material to be welded...", and do not apply to our situation. These lines were not included.

The intent and requirements of ASME Section III, Div 1, 1992 edition, subparagraph NB-4335.2, Impact Tests of Heat Affected Zone, sub-subparagraphs (b)(2) and (b)(3) will be maintained and relief is neither required nor requested.

Question 2

2. In our March 18, 2002, conference call, for question 5 you provided a discussion on your thoughts about the triple point. Your written response, dated March 19, 2002, to the questions discussed in the March 18 conference call, stated that there are no recordable indications.

   Please provide a description of what was discussed during the March 18, 2002, conference call and explain how you determined it was not a reportable indication.

Answer to Question 2

Based upon industry experience with the triple point anomaly, Millstone Unit No. 2 submitted relief request RR-89-34 with the expectation of finding similar indications after repair welding. These indications were expected to be greater than 100% Distance Amplitude Correction (DAC) and possibly not meet the acceptance criteria of NB-5330.

After repair welding of nozzles 21, 34 and 50 at Millstone Unit No. 2, an ultrasonic examination was performed. On the morning of March 18, 2002, the analysis of these examinations had begun. We asked the analysts that were performing the analysis if they detected the triple point weld anomaly, and they stated that they had detected them. We communicated this information to the NRC in the conference call.

After the conference call, the analysis of the ultrasonic examination was completed and there were no indications greater than 100% of DAC. Indications at the triple point anomaly with low amplitudes were observed in all three nozzles intermittently, for essentially 360°. Indications in two nozzles required interrogation ($\geq$20% DAC) to determine their shape size and identity as required by NB-5330.

No indications were interpreted to be a crack, lack of fusion, or lack of penetration.

As the indications were less than 100% DAC, they did not meet the recording threshold of NB-5330 and do not require evaluation to the acceptance criteria.