

March 15, 2000

Mr. S. E. Scace - Director
Nuclear Oversight and Regulatory Affairs
c/o Mr. David A. Smith
Northeast Nuclear Energy Company
P. O. Box 128
Waterford, CT 06385-0128

SUBJECT: SAFETY EVALUATION OF RELIEF REQUEST RR-89-24 ASSOCIATED WITH
ASME SECTION XI INSERVICE INSPECTION, MILLSTONE NUCLEAR
POWER STATION, UNIT NO. 2 (TAC NO. MA6916)

Dear Mr. Scace:

By letter dated October 18, 1999, you requested permission to use an alternative to the ASME Boiler and Pressure Vessel Code, Section XI, 1989 Edition, pursuant to the provisions of 10 CFR 50.55a(a)(3)(i). Specifically, you requested to utilize Code Case N-623, "Deferral of Inspections of Shell-to-Flange and Head-to-Flange Welds of a Reactor Vessel, Section XI, Division 1," for Millstone Unit 2.

The staff has reviewed your alternative proposed in relief request RR-89-24 and determined that you meet the requirements listed in Code Case N-623 and that deferral of the weld examinations to the end of the inspection interval is supported by the operating history of the industry. Therefore, the staff concludes that your proposed alternative provides an acceptable level of quality and safety and is authorized pursuant to 10 CFR 50.55a(a)(3)(i).

Our detailed evaluation and conclusions are documented in the enclosed safety evaluation.

Sincerely,

/RA/

James W. Clifford, Chief, Section 2
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-336

Enclosure: Safety Evaluation

cc w/encl: See next page

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO THE THIRD INSERVICE INSPECTION PROGRAM

RELIEF REQUEST NO. RR-89-24

NORTHEAST NUCLEAR ENERGY COMPANY ET AL.

MILLSTONE NUCLEAR POWER STATION, UNIT NO. 2

DOCKET NO. 50-336

1.0 INTRODUCTION

By letter dated October 18, 1999, Northeast Nuclear Energy Company (NNECO/licensee) submitted a request for relief from the American Society of Mechanical Engineers Code (ASME Code) Section XI nondestructive examination requirements.

2.0 BACKGROUND

Inservice inspection of the ASME Code Class 1, 2, and 3 components shall be performed in accordance with Section XI of the ASME Boiler and Pressure Vessel (B&PV) Code and applicable addenda as required by 10 CFR 50.55a(g), except where specific written relief has been granted by the Nuclear Regulatory Commission (NRC) pursuant to 10 CFR 50.55a(6)(g)(i). Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.55a(a)(3) states that alternatives to the requirements of paragraph (g) may be used, when authorized by the NRC, if (i) the proposed alternatives would provide an acceptable level of quality and safety or (ii) compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

Pursuant to 10 CFR 50.55a(g)(4), ASME Code Class 1, 2, and 3 components (including supports) shall meet the requirements, except the design and access provisions and the preservice examination requirements, set forth in the ASME Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," to the extent practical within the limitations of design, geometry, and materials of construction of the components. The regulations require that inservice examination of components and system pressure tests conducted during the first 10-year interval and subsequent intervals comply with the requirements in the latest edition and addenda of Section XI of the ASME Code incorporated by reference in 10 CFR 50.55a(b) 12 months prior to the start of the 120-month interval, subject to the limitations and modifications listed therein. The Code of record for Millstone Nuclear Power Station Unit 2's third 10-year inservice inspection interval is the 1989 Edition of Section XI of the ASME Boiler and Pressure Vessel Code.

3.0 LICENSEE'S RELIEF REQUEST RR-89-24

Components for which relief is requested

Code Class 1, Category B-A, Pressure Retaining Welds in Reactor Vessel, Item Nos. B1.30, Shell-to-Flange Weld and B1.40, Head-to-Flange Weld.

Applicable Code requirement from which relief is requested (as stated by the licensee)

Section XI of the ASME B&PV Code, 1989 Edition, Table IWB-2500-1, requires that the RPV shell-to-flange weld be volumetrically examined once each inspection interval and the RPV head-to-flange weld be surface and volumetrically examined once each inspection interval. The footnotes to the Table provide partial deferrals for both of these welds, but in no case are they allowed to be totally deferred to the end of the interval.

Pursuant to the provisions of 10 CFR 50.55a(a)(3)(i), relief is requested to utilize the alternative requirements of Code Case N-623, "Deferral of Inspections of Shell-to-Flange and Head-to-Flange Welds of a Reactor Vessel, Section XI, Division 1," for the Millstone Unit No. 2 Third 10-year Interval Inservice Inspection (ISI) Program Plan.

Licensee's Proposed Alternative Examination (as stated)

During the Third 10-year Interval, NNECO plans to use Code Case N-623.

Licensee's Basis for Relief Request (as stated)

Code Case N-623 provides an alternative to the examination scheduling requirements for the reactor pressure vessel (RPV) shell-to-flange and head-to-flange welds contained in Examination Category B-A, "Pressure Retaining Welds in Reactor Vessel," of the 1989 Edition of ASME Section XI. These examinations currently may be partially deferred to the end of a 10-year Inservice Inspection (ISI) interval, but total deferral is not allowed. Code Case N-623 provides an option to the Owner for total deferral of these weld examinations provided three basic conditions are met:

- (1) no welded repair/replacement activities have ever been performed on these welds;
- (2) the welds do not contain identified flaws or relevant conditions that currently require successive inspections in accordance with IWB-2420(b); and
- (3) the RPV is not in the first inspection interval.

NNECO meets these conditions for the Millstone Unit No. 2 RPV. Total Deferral of these examinations to the end of the inspection interval would allow the RPV ultrasonic examinations to be scheduled, in aggregate, at the same time and would result in a significant burden reduction with no change to the examination methods or techniques required under the 1989 Edition of Section XI.

Deferral of these shell-to-flange and head-to-flange weld examinations to the end of a specific plant's 10-year ISI interval is supported by the present large population of operating reactors. Each reactor is representative of the operating conditions throughout the population of reactors for a particular Nuclear Steam Supply System (NSSS) design. The volume and number of RPV welds inspected within successive 10-year intervals among these various operating reactors are essentially uniformly distributed. This being the case, examining the shell-to-flange and head-to-flange welds within the population of operating reactors, sequentially for the period of a plant specific 10-year interval, or all at the end of that interval provides the necessary assurance that any industry wide degrading condition will be detected. Additionally, performing ultrasonic examination of the RPV welds at one time, on a specific RPV, will improve the reliability and reproducibility of the ultrasonic examinations since the procedures and techniques utilized on the population of the welds will be at a uniform level of technology. The use of this Code Case will thus close the 10-year gap in technology between various examinations now being performed on a specific RPV. The experience to date indicates that examinations performed on these shell-to-flange and head-to-flange welds have not identified any detrimental flaws or relevant conditions and that changing the schedule for examining these welds in aggregate at the end of successive 10-year intervals should provide an equivalent indication of the RPV integrity for a specific RPV. Therefore, NNECO considers this request to meet the provisions of 10 CFR 50.55a(a)(3)(i) as providing an acceptable level of quality and safety.

4.0 STAFF EVALUATION AND CONCLUSION

Section XI of the ASME Code, 1989 Edition, Table IWB-2500-1, requires that the RPV shell-to-flange weld be volumetrically examined once each inspection interval and the RPV head-to-flange weld be surface and volumetrically examined once each inspection interval. The footnotes to Table IWB-2500-1 provide partial deferrals for both of these welds. Footnote three specifies that during the first and second period, the examination may be performed from the flange face, and the remaining volumetric examinations required to be conducted from vessel wall may be performed at or near the end of the inspection interval. Footnote four provides deferral of the shell-to-flange welds stating that the examinations may be performed during the first and third periods, provided at least 50% of the shell-to-flange welds be examined by the end of the first period, and the remainder by the end of the third inspection period.

The licensee proposes to follow the requirements of Code Case N-623. The staff finds that the licensee meets the requirements listed in Code Case N-623 and that deferral of the weld examinations to the end of the inspection interval is supported by the operating history of the industry. The industry experience to date indicates that examinations performed on the reactor

pressure vessels shell-to-flange and head-to-flange welds have not identified any detrimental flaws or relevant conditions and that changing the schedule for examining these welds to the end of the licensee's 10-year inservice inspection interval will provide a suitable frequency for verifying the integrity of the subject welds. The subject welds will still receive the same examinations that have been required by the ASME Code Section XI since the reactor was placed in commercial service. The only change is that the RPV shell-to-flange weld and the RPV head-to-flange weld examinations will be deferred to the end of the inspection interval without conducting partial examinations from the flange face earlier in the inspection interval. No changes are being made to the volumes or areas of material that are examined, nor to the nondestructive examination (NDE) personnel qualifications. This relief request does not involve changes to NDE methods or acceptance criteria.

The staff has determined that the licensee's proposed alternative to use Code Case N-623 provides an acceptable level of quality and safety. Therefore, the licensee's proposed alternative is authorized pursuant to 10 CFR 50.55a(a)(3)(i) for the third 10-year inservice inspection interval at Millstone Nuclear Power Station, Unit No. 2 until such time as Code Case N-623 is incorporated into a future revision of Regulatory Guide 1.147. Upon issuance of the regulatory guide, the licensee will follow all provisions in Code Case N-623, including any exceptions or limitations discussed in the regulatory guide.

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Date: March 15, 2000

Millstone Nuclear Power Station
Unit 2

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