



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

December 24, 2009

Mr. David A. Heacock
President and Chief Nuclear Officer
Dominion Nuclear Connecticut, Inc.
Innsbrook Technical Center
5000 Dominion Boulevard
Glen Allen, VA 23060-6711

SUBJECT: MILLSTONE POWER STATION, UNIT NO. 3 – ISSUANCE OF RELIEF
REQUEST IR-3-08 REGARDING USE OF AMERICAN SOCIETY OF
MECHANICAL ENGINEERING CODE, SECTION XI, APPENDIX VIII (TAC NO.
ME1260)

Dear Mr. Heacock:

By letter dated April 28, 2009 (Agencywide Documents Access and Management System Accession No. ML091310666), Dominion Nuclear Connecticut, Inc. (DNC or the licensee) submitted relief requests for the third 10-year inservice inspection (ISI) interval program at Millstone Power Station, Unit No. 3 (MPS3). DNC requested the use of alternatives to certain American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), Section XI requirements. Specifically Relief Request IR-3-08 proposed using the ASME Code, Section XI, Appendix VIII requirements as an alternative to the ASME Code, Section V, Article 4 requirements to examine the reactor pressure vessel (RPV) shell-to-flange weld.

The Nuclear Regulatory Commission (NRC) staff has reviewed the subject request and concludes, as set forth in the enclosed safety evaluation, that the use of ASME Code, Section XI, Appendix VIII requirements provides an acceptable level of quality and safety.

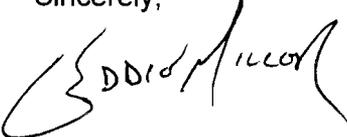
Therefore, pursuant to Title 10 of the *Code of Federal Regulations*, Part 50, Section 50.55a(a)(3)(i), the NRC authorizes the use of ASME Code, Section XI, Appendix VIII requirements as an alternative to the ASME Code, Section V, Article 4 requirements to examine the RPV shell-to-flange weld for the remainder of the third 10-year ISI interval for MPS3. The third 10-year ISI interval began on April 23, 2009, and is scheduled to be completed on April 22, 2019.

D. Heacock

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If you have any questions, please contact the Project Manager, Carleen Sanders,
at 301-415-1603.

Sincerely,

A handwritten signature in black ink, appearing to read "Harold Chernoff". The signature is stylized and cursive. To the right of the signature, the word "FOR" is written in a simple, uppercase, sans-serif font.

Harold Chernoff, Chief
Plant Licensing Branch 1-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-423

Enclosure:
As stated

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION

THIRD 10-YEAR INSERVICE INSPECTION INTERVAL

REQUEST FOR RELIEF NO. IR-3-08

MILLSTONE POWER STATION, UNIT NO. 3

DOMINON NUCLEAR CONNECTICUT, INC.

DOCKET NUMBER 50-423

1.0 INTRODUCTION

By letter dated April 28, 2009 (Agencywide Documents Access and Management System Accession No. ML091310666), Dominion Nuclear Connecticut, Inc. (DNC or the licensee) submitted relief requests for the third 10-year in-service inspection (ISI) interval program at Millstone Power Station, Unit No. 3 (MPS3). DNC requested the use of alternatives to certain American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), Section XI requirements. Specifically Relief Request IR-3-08 proposed using the ASME Code, Section XI, Appendix VIII requirements as an alternative to the ASME Code, Section V, Article 4 requirements to examine the reactor pressure vessel (RPV) shell-to-flange weld. The relief is requested pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, Section 50.55a(a)(3)(i).

The third 10-year ISI interval at MPS3 began on April 23, 2009, and is scheduled to end on April 22, 2019.

2.0 REGULATORY REQUIREMENTS

The in-service inspection (ISI) of the ASME Code Class 1, 2, and 3 components is performed in accordance with Section XI of the ASME Code and applicable addenda as required by 10 CFR 50.55a(g), except where specific relief has been granted by the Nuclear Regulatory Commission (NRC) pursuant to 10 CFR 50.55a(g)(6)(i). 10 CFR 50.55a(a)(3) states that alternatives to the requirements of paragraph (g) may be used, when authorized by the NRC, if the licensee demonstrates that: (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 pre-service 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 in-service 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

Enclosure

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 ASME Code of record for the MPS3 third 10-year ISI interval is the 2004 Edition with no Addenda of Section XI of the ASME Code.

In addition, 10 CFR 50.55a(b)(2)(xv) requires that licensees using a later edition and addenda than the 2001 Edition of the ASME Code shall use the 2001 Edition of Appendix VIII. The licensee is using the 2001 Edition of the ASME Code, Section XI for Appendix VIII requirements as described in 10 CFR 50.55a(g)(6)(ii)(C).

3.0 TECHNICAL EVALUATION

3.1 Components for Which Relief is Requested

ASME Code Class: 1
Examination Category: B-A
Item No.: ASME Code, Section XI, Item B1.30
ISI Component ID: RPV Shell-to-Flange Weld No. 101-121

3.2 Code Requirements

The 2001 Edition with No Addenda of the ASME Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," Subsection IWA-2232, requires ultrasonic (UT) examinations be performed in accordance with Mandatory Appendix I. Paragraph I-2110(b) of Mandatory Appendix I requires that examination of the RPV shell-to-flange weld to be in accordance with ASME Code, Section V, Article 4.

3.3 Licensee's Proposed Alternative and Basis for Use

As stated in the April 28, 2009, letter:

DNC proposes to perform ultrasonic examinations of the RPV shell-to-flange weld using procedures, personnel, and equipment that have been demonstrated and qualified in accordance with ASME [Code,] Section XI, 2001 Edition, No Addenda, Appendix VIII, Supplements 4 and 6 as amended by 10 CFR 50.55a and the PDI [Performance Demonstration Initiative] Program. Since the examination will be performed from a single side due to the weld configuration, all procedures, personnel, and equipment will be qualified for single-sided access for examination of this weld.

[ASME Code, Section XI,] Appendix VIII requirements were developed and adopted to ensure the effectiveness of ultrasonic examinations within the nuclear industry by means of a rigorous, item-specific performance demonstration containing flaws of various sizes, locations, and orientations. The performance demonstration process has established with a high degree of confidence, the capability of personnel, procedures, and equipment to detect and characterize flaws that could be detrimental to the structural integrity of the RPV. The PDI approach has demonstrated that for detection and characterization of flaws in the

RPV the ultrasonic examination techniques are equal to or surpass the requirements of the ASME [Code,] Section V, Article 4 ultrasonic examination requirements. Though [ASME Code, Section XI,] Appendix VIII is not required for the RPV shell-to-flange weld examination, the use of [ASME Code, Section XI,] Appendix VIII, Supplements 4 and 6 criteria for detection and sizing of flaws in this weld will be equal to or exceed the requirements of ASME [Code,] Section V, Article 4. Therefore, the use of the proposed alternative will continue to provide an acceptable level of quality and safety, and approval is requested pursuant to 10 CFR 50.55a(a)(3)(i).

As stated in the April 28, 2009, letter:

The use of this alternative will allow the use of Performance Demonstration Initiative (PDI) qualified procedures for the performance of the ultrasonic examination of the reactor pressure vessel (RPV) shell-to-flange weld from the vessel side of the weld in accordance with ASME Code, Section XI, Division 1, 2001 Edition, No Addenda, Appendix VIII, Supplements 4 and 6. This alternative would be used in lieu of [ASME Code,] Article 4 of Section V requirements.

3.4 Nuclear Regulatory Commission Staff's Evaluation

The 2001 Edition of ASME Code with no Addenda, Section XI, IWA-2232 states, "Ultrasonic examination shall be conducted in accordance with Appendix I." ASME Code, Section V, Article 4 provides a prescriptive process for qualifying UT of procedures and the scanning requirements for examinations. The UT performed to ASME Code, Section V, Article 4 uses detailed criteria for setting up and calibrating equipment, calculating coverage, and detecting indications. The capability of an ASME Code, Section V, Article 4 UT examination is demonstrated with calibration blocks made from representative material containing holes and notches.

The licensee proposes, in lieu of the ASME Code, Section V, Article 4 angle beam examination to use an examination that will be performed using examination procedures, personnel, and equipment qualified in accordance with ASME Code, Section XI, Appendix VIII, Supplements 4 and 6, as modified by 10 CFR 50.55a. 10 CFR 50.55a limits the use of ASME Code, Section XI, Appendix VIII to the 2001 Edition of the ASME Code with no Addenda. ASME Code, Section XI, Appendix VIII is a performance-based UT method.

Performance-based UT requires that detailed criteria be used for performance demonstration tests. The results for the tests are compared against statistically developed screening criteria. The tests are performed on representative mockups containing flaws similar to those found in operating plants. The performance-based tests demonstrate the effectiveness of UT personnel and procedures. Examinations are performed with the scanning requirements for ASME Code, Section XI, Appendix VIII, Supplements 4 and 6 that are provided in 10 CFR 50.55a(b)(2)(xv)(G), and the scanning volume identified in the ASME Code, Section XI, Figure IWB-2500-4 for the shell-to-flange weld. The scanning requirements are: (1) for the examination of the inner 15 percent of the through-wall volume, scanning will be performed in four orthogonal directions to the maximum extent possible with procedures and personnel qualified to with ASME Code, Section XI, Appendix VIII, Supplement 4; or (2) if the inner 15

percent of the through-wall volume examination is not possible as required above, the inner 15 percent of the through-wall volume is considered fully examined if coverage is obtained in at least one parallel and one perpendicular direction using personnel and procedures qualified for single side examination in accordance with ASME Code, Section XI, Appendix VIII, Supplement 4 and Supplement 6; and (3) the remaining 85 percent of the through-wall volume is considered fully examined if coverage is obtained in one parallel and one perpendicular direction using procedures and personnel qualified for single side examination. Single side qualification criteria are provided in 10 CFR 50.55a(b)(2)(xv)(G)(2) and 10 CFR 50.55a(b)(2)(xvi).

The procedures, equipment, and personnel qualified to ASME Code, Section XI, Appendix VIII have shown a high probability of flaw detection and have increased the reliability of examinations of weld configurations within the scope of the PDI program. Therefore, the licensee's proposed alternative will provide an acceptable level of quality and safety.

4.0 CONCLUSION

The NRC staff has reviewed the licensee's proposed alternative to apply ASME Code, Section XI, Appendix VIII examination requirements when volumetrically examining RPV Shell-to-Flange Weld No. 101-121 by UT, and concludes that the procedures, equipment, and personnel qualified to ASME Code, Section XI, Appendix VIII have shown a high probability of flaw detection and have increased the reliability of examinations of weld configurations within the scope of the PDI program. Therefore, the proposed alternative will provide an acceptable level of quality and safety and is authorized pursuant to 10 CFR 50.55a(a)(3)(i) for the third 10-year ISI interval at MPS3.

All other ASME Code, Section XI, requirements for which relief was not specifically requested and approved remain applicable, including third-party review by the authorized Nuclear Inservice Inspector.

Principal Contributor: T. McLellan

Date: December 24, 2009

D. Heacock

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If you have any questions, please contact the Project Manager, Carleen Sanders, at 301-415-1603.

Sincerely,

/ra/ (Ed Miller for)

Harold Chernoff, Chief
Plant Licensing Branch 1-2
Division of Operating Reactor
Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-423

Enclosure:

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*By Memo Dated

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DATE	12/11/2009	12/17/09	12/09/2009	7/8/09	12/24/09

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