



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

April 15, 2010

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
REQUESTS IR-3-13 REGARDING USE OF AMERICAN SOCIETY OF
MECHANICAL ENGINEERING CODE, SECTION XI, 2004 EDITION
(TAC NO. ME2125)

Dear Mr. Heacock:

By letter dated August 19, 2009, and supplemented by letter dated February 1, 2010 (Agencywide Documents Access and Management System (ADAMS) Accession Nos. ML092370296 and ML100330149, respectively), Dominion Nuclear Connecticut, Inc. (DNC or the licensee) requested relief from certain examination requirements of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), Section XI, 2004 Edition, no Addenda. The February 1, 2010, letter contained Revision 1 to Relief Request IR-3-13, which superseded IR-3-13 in its entirety. IR-3-13, Revision 1, proposes the use of alternative dissimilar metal weld examination depth-sizing requirements at Millstone Power Station, Unit No. 3 (MPS3).

The results of the Nuclear Regulatory Commission (NRC) staff's review, as contained in the enclosed safety evaluation, indicate that the use of alternative dissimilar metal weld examination depth-sizing requirements provide an acceptable level of quality and safety.

Therefore, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR), Part 50, Section 50.55a(a)(3)(ii), the NRC authorizes the use of alternate dissimilar metal weld examination depth-sizing requirements for the remainder of the third 10-year inservice inspection (ISI) interval at MPS3. The third 10-year ISI interval for MPS3 began on April 23, 2009, and is scheduled to be completed on April 22, 2019.

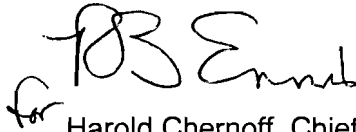
All other ASME Code, Section XI requirements for which relief has not been specifically requested and approved remain applicable, including a third party review by the Authorized Nuclear Inservice Inspector.

D. Heacock

- 2 -

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 "H. Chernoff". The signature is written in a cursive, flowing style.

for 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

cc w/ encl: Distribution via Listserv



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELIEF REQUEST IR-3-13

FOR THE THIRD 10-YEAR INSERVICE INSPECTION INTERVAL

DOMINION NUCLEAR CONNECTICUT, INC.

MILLSTONE POWER STATION, UNIT NO. 3

DOCKET NUMBER 50-423

1.0 INTRODUCTION

By letter dated August 19, 2009, and supplemented by letter dated February 1, 2010 (Agencywide Documents Access and Management System (ADAMS) Accession Nos. ML092370296 and ML100330149, respectively), Dominion Nuclear Connecticut, Inc. (DNC or the licensee) requested relief from certain examination requirements of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), Section XI, 2004 Edition, no addenda. The February 1, 2010, letter contained Revision 1 to Relief Request IR-3-13, which supersedes IR-3-13 in its entirety. IR-3-13, Revision 1, proposes the use of alternative dissimilar metal weld examination depth-sizing requirements at Millstone Power Station, Unit No. 3 (MPS3). This 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 inservice inspection (ISI) interval began on April 23, 2009 and ends on April 22, 2019.

2.0 REGULATORY REQUIREMENTS

The 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.

Enclosure

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 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 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, as required by 10 CFR 50.55a(b)(2)(xv), ASME Code, Section XI, 2001 Edition with no Addenda is used for Appendix VIII, Performance Demonstration for Ultrasonic Examination Systems.

The regulatory requirements in 10 CFR 50.55a(g)(6)(ii)(E) define the requirements for reactor coolant pressure boundary bare metal visual inspections. All licensees of pressurized water reactors (PWR) plants shall augment their ISI program by implementing ASME Code Case N-722 subject to the conditions specified in paragraphs 10 CFR 50.55a(g)(6)(ii)(E)(2) through (4).

3.0 TECHNICAL EVALUATION

3.1 Applicable Code Edition and Addenda

The Code of Record for the third 10-year ISI program at MPS3 is the ASME Code, Section XI, 2004 Edition with no Addenda. In addition, volumetric examinations are to be conducted in accordance with the 2001 Edition with no Addenda of the ASME Code, Section XI, Appendix VIII, Supplement 10.

3.2 Components for Which Relief is Requested

Code Class: Class 1

System: Reactor Coolant System

Examination Categories: N/A

Code Item Numbers: ASME Code, Section XI, Code Case N-722

B15.90 for Hot Leg Nozzle Welds

B15.95 for Cold Leg Nozzle Welds

Weld Identification Number	Internal Diameter (inches)	Wall Thickness (inches)
301-121-A Inlet Nozzle-to-Safe End (RC Loop 3)	27.5	2.32
301-121-B Inlet Nozzle-to-Safe End (RC Loop 4)	27.5	2.32
301-121-C Inlet Nozzle-to-Safe End (RC Loop 1)	27.5	2.32
301-121-D Inlet Nozzle-to-Safe End (RC Loop 2)	27.5	2.32
302-121-A Outlet Nozzle-to-Safe End (RC Loop 3)	29	2.45
302-121-B Outlet Nozzle-to-Safe End (RC Loop 4)	29	2.45
302-121-C Outlet Nozzle-to-Safe End (RC Loop 1)	29	2.45
302-121-D Outlet Nozzle-to-Safe End (RC Loop 2)	29	2.45
Materials: Nozzle is SA508 Class 2, Safe End is SA 182 F316, and weld metal is Alloy 82/182		

3.3 Applicable Code Requirement

10 CFR 50.55a mandates the use of Code Case N-722, "Additional Examinations for Pressure Retaining Welds in Class 1 Components Fabricated with Alloy 600/82/182 Materials Section XI, Division 1." Code Case N-722 requires bare metal visual examinations of the welds on the outside surface at varying frequencies. Code Case N-722, Table 1, Note 5 allows ultrasonic examination, performed from the inside or outside surface, in lieu of the visual examination. For MPS3, bare metal visual examination of the welds is extremely difficult to perform, therefore, MPS3 will volumetrically examine these welds with ultrasonic testing (UT). The UT examinations of the welds will be performed from the inside surface in accordance with the performance demonstration requirements of the ASME Code, 2001 Edition with no Addenda, Section XI, Appendix VIII, Supplement 10 as they pertain to Table IWB-2500-1, Examination Category B-F welds. Application of UT requirements specifies a demonstrated Root Mean Square Error (RMSE) of 0.125 inches if depth sizing is used. Code Case N-722, Table 1, Note 5 requires the hot leg nozzle-to-safe end welds are be examined every refueling outage. MPS3 relief request IR-3-10 authorizes an alternate examination frequency for these welds of every other refueling outage.

Code Case N-695, "Qualification Requirements for Dissimilar Metal Piping Welds, Section XI, Division I," which has been approved by the NRC staff in Regulatory Guide 1.147, "Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1," Revision 15, provides an alternative to the Appendix VIII, Supplement 10 qualification requirements for dissimilar metal piping welds. Paragraph 3.3(c) indicates that "[e]xamination procedures, equipment, and personnel are qualified for depth-sizing when the RMSE of the flaw depth measurements, as compared to the true flaw depths, does not exceed 0.125 in. [inches] (3 mm)."

3.4 DNC Proposed Alternative and Basis for Use

The licensee stated that a request for relief from the required RMSE in depth sizing is needed because, to date, although qualified for detection and length sizing on these welds, examination vendors have not been able to meet the established RMSE of 0.125 inch for depth sizing when ultrasonic examinations are performed from the inside surface of the pipe. To date, the licensee has not chosen an examination vendor for the UT of the reactor vessel dissimilar metal nozzle-to-safe end welds. However, the licensee's examination vendor will be chosen from the available vendors that have demonstrated their ability to meet the depth-sizing qualification requirement with a RMSE of no greater than 0.224 inches.

The licensee proposes to use the maximum RMSE values that have been demonstrated and approved previously for other licensees. The licensee states that in the event an indication is detected that requires depth sizing, the difference between the required RMSE and the demonstrated RMSE of the selected vendor will be added to the measured through-wall extent for comparison with applicable acceptance criteria.

3.5 Duration of Proposed Alternative

The proposed alternative is requested for the remainder of the third 10-year ISI interval for MPS3, which began on April 23, 2009, and ends on April 22, 2019.

4.0 STAFF EVALUATION

ASME Code, Section XI, Code Case N-695 is referenced in the licensee's ISI program and has been approved by the NRC staff per Regulatory Guide 1.147, Revision 15. ASME Code, Section XI, Appendix VIII, Supplement 10 and Code Case N-695 require that examination procedures, equipment, and personnel be qualified for depth-sizing such that the RMSE of the flaw depth measurements, as compared to true depths, do not exceed 0.125 inch.

The nuclear industry is in the process of qualifying personnel to Appendix VIII, Supplement 10/Code Case N-695 requirements, as implemented through industry's Performance Demonstration Initiative (PDI) Program which is managed by the Electric Power Research Institute (EPRI). However, for ultrasonic examinations performed from the inside surface of a pipe weld, personnel have been unsuccessful at achieving the ASME Code-required 0.125 inch RMSE flaw depth sizing criterion. The NRC staff acknowledges that achieving the 0.125 inch RMSE is not feasible at this time. Although the licensee has not chosen an examination vendor, they propose to choose an examination vendor from the available vendors that have demonstrated their ability to meet the depth-sizing qualification requirement with an RMSE of no greater than 0.224 inches instead of the required 0.125 inches. In the event an indication is detected that requires depth sizing, the difference between the required RMSE and the demonstrated RMSE will be added to the measured through-wall extent. The maximum possible difference between the required RMSE and the demonstrated RMSE is $0.224 \text{ inches} - 0.125 \text{ inches} = 0.099 \text{ inches}$. This total flaw depth will then be assessed against the applicable acceptance criteria specified in Section IWB-3600 of the ASME Code for flaw evaluation.

The NRC staff finds that compliance with the ASME Code-required RMSE value is not feasible at this time. Also, the NRC staff finds that the licensee's proposed alternative of adding the difference between the ASME Code-required RMSE and the demonstrated RMSE to the measured through-wall extent, in addition to the use of the acceptance standards specified in Section IWB-3600 of the ASME Code, provide an acceptable level of quality and safety.

5.0 CONCLUSION

Based on the above review, the NRC staff has determined that requiring the licensee to qualify procedures, personnel, and equipment to meet the maximum error of 0.125 inch RMSE for crack depth sizing is not feasible at the present time. The licensee's proposal of adding the difference between the ASME Code-required RMSE and the demonstrated RMSE to the measured through-wall extent, in addition to the use of the acceptance standards specified in Section IWB-3600 of the ASME Code, provides an acceptable level of quality and safety. Therefore, pursuant to 10 CFR 50.55a(a)(3)(i), the proposed alternative is authorized for the remainder of the MPS3 third 10-year ISI interval.

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

Principal Contributor: C. Nove

Date: April 15, 2010

D. Heacock

- 2 -

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

Sincerely,

/ra/ (REnnis for)

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

cc w/ encl: Distribution via Listserv

Distribution:

PUBLIC

Branch Reading

RidsAcrsAcnw_MailCTR Resource

RidsNrrDorLpl1-2 Resource

RidsNrrDciCsgbResource

RidsNrrLAABaxter Resource

RidsNrrPMMillstone Resource

RidsOgcRp Resource

RidsRgn1MailCenter Resource

LTrocine, EDO R-1

C. Nove, NRR

A. Rezai, NRR

ADAMS Accession No.: ML100840738

***By Memo Dated**

OFFICE	LPL1-2/PM	LPL1-2/LA	DCI/CPNB	LPL1-2/BC
NAME	CSanders	ABaxter (w/comments)	TLupold	HChernoff (REnnis for)
DATE	4/12/10	4/7/10	03/01/2010	4/15/10

OFFICAL RECORD COPY