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**May 11, 2006**

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
One White Flint North
11555 Rockville Pike
Rockville, MD 20852-2738

Serial No. 06-226
NLOS/PRW R0
Docket Nos. 50-336
50-423
License Nos. DPR-65
NPF-49

**DOMINION NUCLEAR CONNECTICUT, INC.**
**MILLSTONE POWER STATION UNITS 2 AND 3**
**10-YEAR REACTOR VESSEL EXAMINATIONS**
**10 CFR 50.55a ALTERNATIVE REQUESTS FROM ASME SECTION XI**

Dominion Nuclear Connecticut, Inc. (DNC) hereby submits requests for the use of alternatives to the examination requirements of ASME Code, Section XI, at Millstone Power Station Units 2 and 3 (MPS2&3). These requests support the examination of components during the scheduled 10-year reactor vessel examinations. DNC has determined the proposed alternatives provide for an acceptable level of quality and safety, consistent with 10 CFR 50.55a(a)(3)(i).

The proposed alternatives to the ASME Code are contained in attachments to this letter, in requests RR-89-58, RR-89-59 and RR-89-60, for the third 10-year inservice inspection (ISI) interval at MPS2, and in requests IR-2-42, IR-2-43 and IR-2-44, for the second 10-year ISI interval at MPS3. DNC requests NRC review and approval of these requests by March 1, 2007.

If you should have any questions regarding this submittal, please contact Mr. Paul R. Willoughby at (804) 273-3572.

Very truly yours,

Eugene S. Grecheck
Vice President – Nuclear Support Services

Attachments: (1)

1. Alternative Sizing Criteria
2. Use of ASME Code Case N-696, Examination Qualification Requirements
3. Reactor Pressure Vessel Shell-to-Flange Weld Examination Requirements

Commitments made in this letter: None

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**ATTACHMENT 1**

# ALTERNATIVE SIZING CRITERIA (RR-89-58 and IR-2-42)

**DOMINION NUCLEAR CONNECTICUT, INC.**
**MILLSTONE POWER STATION UNITS 2 AND 3**

# ALTERNATIVE SIZING CRITERIA (RR-89-58 and IR-2-42)

*Proposed Alternative*
*In Accordance with 10 CFR 50.55a(a)(3)(i)*

*- Alternative Provides Acceptable Level of Quality and Safety -*

## Background

Dominion Nuclear Connecticut, Inc. (DNC) is submitting requests for the use of alternatives to the examination requirements of ASME Code, Section XI, at Millstone Power Station Units 2 and 3 (MPS2&3). These requests support the examination of components during the scheduled 10-year reactor vessel examinations. DNC has determined the proposed alternatives provide for an acceptable level of quality and safety, consistent with 10 CFR 50.55a(a)(3)(i).

## 1.0 Reason for Request

The DNC inservice inspection (ISI) examination vendor has only demonstrated an ability to meet the depth sizing qualification requirement using a root mean square error (RMSE) of 0.224 inches in lieu of the required 0.125 inches. Consequently, DNC proposes to use an alternative through wall depth sizing criteria for ASME Code, Section XI, Appendix VIII, Supplements 2, 3, and 10, components that are performed from the inside surface. Examinations of these components will be performed during the scheduled 10-year ISI reactor vessel examinations at MPS2&3.

## 2.0 ASME Code Components Affected

a) Name of Component:

Millstone Unit 2: Nozzle-to-Transition Piece Welds

| Weld Identification Number | Internal Diameter (inches) | Wall Thickness (inches) |
|---|---|---|
| P-5-C-1-A Inlet Nozzle to Transition Piece (RC Loop 1A) | 30 | 3.6 |
| P-3-C-1-A Inlet Nozzle to Transition Piece (RC Loop 1B) | 30 | 3.6 |
| P-14-C-1-A Inlet Nozzle to Transition Piece (RC Loop 2A) | 30 | 3.6 |
| P-18-C-1-A Inlet Nozzle to Transition Piece (RC Loop 2B) | 30 | 3.6 |
| P-1-C-1-A Outlet Nozzle to Transition Piece (RC Loop 1) | 42 | 3.6 |
| P-10-C-1-A Outlet Nozzle to Transition Piece (RC Loop 2) | 42 | 3.6 |
| Materials: Base metal is SA-533-65, GR. B, CL. 1/SA 515 GR 70 C/S (w/ cladding). Weld is ferritic carbon steel (w/ cladding) | | |

Millstone Unit 3: Nozzle-to-Safe-End 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: Base metal is SA508 Class 2 / SA 182 F316. Weld metal is austenitic stainless steel. | | |

b) ASME Code Class:

Millstone Unit 2, ASME Code Class 1, Similar Metal Welds
Millstone Unit 3, ASME Code Class 1, Dissimilar Metal Welds

c) System:

Millstone Units 2 and 3, Reactor Coolant Systems

d) Code Category:

Millstone Units 2 and 3, Category R-A, Risk Informed Piping Examinations

e) Code Item Nos.:

Millstone Unit 2 - R1.20, Elements not Subject to a Damage Mechanism

Millstone Unit 3 - R1.15, Elements Subject to Primary Water Stress Corrosion Cracking (PWSCC), and R1.20, Elements not Subject to a Damage Mechanism

3.0 Applicable Code Edition and Addenda

MPS2 is currently in the third 10-year ISI interval that began on April 1, 1999, and is scheduled to end on March 31, 2009. MPS3 is in the second 10-year ISI interval that began on April 23, 1999, and is scheduled to end October 23, 2008. The ASME Boiler and Pressure Vessel Code (ASME Code) of record for the current 10-year ISI intervals at both Millstone Units 2 and 3 is the 1989 Edition of Section XI of the ASME Code.

4.0 Applicable Code Requirement

Alternatives are requested to the examination requirements for through wall sizing as specified in ASME Code, Section XI, Appendix VIII, Supplements 2, 3, and 10, in the 1995 Edition with 1996 Addenda. These items are selected portions of the qualification requirements for performance demonstration of ultrasonic examination systems for wrought austenitic, ferritic and dissimilar metal piping welds.

- Supplement 2, Section 3.2, Sizing Acceptance Criteria:

  "(b) The RMS error of the flaw depths estimated by ultrasonics, as compared with the true depths, shall not exceed 0.125 in."

- Supplement 3, Section 3.2, Sizing Acceptance Criteria:

  "Qualification of examination procedures, equipment, and personnel for ferritic pipe examination shall be accomplished by satisfying the requirements of Supplement 2..."

- Supplement 10, Section 3.2, Sizing Acceptance Criteria:

  "(b) Examination procedures, equipment, and personnel are qualified for depth sizing when the RMS error of the flaw depth measurements as compared to the true flaw depths, is less than or equal to 0.125 in."

5.0 Proposed Alternative and Basis for Use

To date, although qualified for detection and length sizing on these welds, the examination vendors have not met the established root mean square error (RMSE) requirement for depth sizing (0.125 inches). DNC's examination vendor has demonstrated ability to meet the depth sizing qualification requirement with an RMSE of 0.224 inches instead of the required 0.125 inches.

DNC proposes to use the demonstrated 0.224 inches instead of the 0.125 inches specified for depth sizing. In the event an indication is detected that requires depth sizing, the 0.099-inch difference between the required RMSE and the demonstrated RMSE (0.224 inches - 0.125 inches = 0.099 inches) will be added to the measured

through-wall extent for comparison with applicable acceptance criteria. If the examination vendor demonstrates an improved depth sizing RMSE prior to the examination, the excess of that improved RMSE over the 0.125 inch RMSE requirement, if any, will be added to the measured value for comparison with applicable acceptance criteria.

Addition of the difference in allowable depth sizing tolerance from that actually demonstrated to the estimated flaw depths measured will compensate for the variance in the depth measured.

The examination vendors are qualified for detecting axial flaws on surfaces that are machined or ground smooth with no root reinforcement or counterbore. Experiencing surface roughness during the examination could affect qualified detection of axial flaws in the volume immediately under the surface. Therefore, ultrasonic profilometry will be used to assess surface areas, if any, where roughness may limit the ability of the ultrasonic examination to be applied as qualified through performance demonstration in any areas where roughness is determined to limit the ability of the ultrasonic examination to detect axial flaws in the volume immediately under the surface. DNC will supplement the ultrasonic examinations with eddy current examination.

Use of profilometry and eddy current techniques will assure that any axial flaws in the near surface volume that could be missed by ultrasonic examination due to potential surface roughness are detected and sized in accordance with the proposed alternative.

DNC has determined that the alternative in this request will result in an acceptable level of quality and safety, pursuant to the provisions of 10 CFR 50.55a(a)(3)(i). The proposed alternative assures that the subject welds will be fully examined by procedures, personnel and equipment qualified by demonstration in all aspects except depth sizing. When supplemented by profilometry and eddy current examination, the detection of axial flaws is appropriately assured. For depth sizing, the proposed addition of the difference between the qualified and demonstrated sizing tolerance to any flaw that is required to be sized compensates for the potential variation and likewise assures an acceptable level of quality and safety.

6.0 Duration of Proposed Alternative

The proposed alternative to the ASME Code is applicable for the remainder of the third 10-year inservice inspection (ISI) interval at MPS2 (RR-89-58) and the second 10-year ISI interval at MPS3 (IR-2-42).

## 7.0 Precedents

A similar alternative request has been approved for use at the V.C. Summer Station in an NRC letter, dated February 3, 2004 (ADAMS Accession No. ML040340450).

## 8.0 References

(1) 1989 Edition, ASME Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," no Addenda.

(2) 1995 Edition, ASME Code, Section XI, with the 1996 Addenda, Appendix VIII, Supplements 2, 3, and 10.

(3) Code Case N-a696, "Qualification Requirements for Appendix VIII Piping Examinations Conducted From the Inside Surface, Section XI, Division 1.

**ATTACHMENT 2**

**USE OF ASME CODE CASE N-696**
**(RR-89-59 and IR-2-43)**

**DOMINION NUCLEAR CONNECTICUT, INC.**
**MILLSTONE POWER STATION UNITS 2 AND 3**

# USE OF ASME CODE CASE N-696
# (RR-89-59 and IR-2-43)

*Proposed Alternative*
*In Accordance with 10 CFR 50.55a(a)(3)(i)*

*- Alternative Provides Acceptable Level of Quality and Safety -*

## Background

Dominion Nuclear Connecticut, Inc. (DNC) is submitting requests for the use of alternatives to the examination requirements of ASME Code, Section XI, at Millstone Power Station Units 2 and 3 (MPS2&3). These requests support the examination of components during the scheduled 10-year reactor vessel examinations. DNC has determined the proposed alternatives provide for an acceptable level of quality and safety, consistent with 10 CFR 50.55a(a)(3)(i).

## 1.0 Reason for Request

This request is for the use Code Case N-696 as an alternative to the requirements of ASME Boiler and Pressure Vessel Code (ASME Code), Section XI, 1995 Edition, 1996 Addenda, Appendix VIII, to complete Supplements 2, 3, and 10, qualifications for piping examinations that are conducted from the inside surface. Specifically, it is requested to use the ASME Code Case N-696, as administered through the Performance Demonstration Initiative (PDI) Program for the coordinated implementation of Appendix VIII, Supplements 2, 3, and 10, for the 10-year reactor pressure vessel (RPV) examinations at MPS2&3.

## 2.0 ASME Code Components Affected

a) Name of Component:

Millstone Unit 2: Nozzle-to-Transition Piece Welds

| Weld Identification Number | Internal Diameter (inches) | Wall Thickness (inches) |
|---|---|---|
| P-5-C-1-A Inlet Nozzle to Transition Piece (RC Loop 1A) | 30 | 3.6 |
| P-3-C-1-A Inlet Nozzle to Transition Piece (RC Loop 1B) | 30 | 3.6 |
| P-14-C-1-A Inlet Nozzle to Transition Piece (RC Loop 2A) | 30 | 3.6 |
| P-18-C-1-A Inlet Nozzle to Transition Piece (RC Loop 2B) | 30 | 3.6 |
| P-1-C-1-A Outlet Nozzle to Transition Piece (RC Loop 1) | 42 | 3.6 |
| P-10-C-1-A Outlet Nozzle to Transition Piece (RC Loop 2) | 42 | 3.6 |

| | |
|---|---|
| Materials: | Base metal is SA-533-65, GR. B, CL. 1/SA 515 GR 70 C/S (w/ cladding). Weld is ferritic carbon steel (w/ cladding) |

Millstone Unit 3: Nozzle-to-Safe-End 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: Base metal is SA508 Class 2 / SA 182 F316. Weld metal is austenitic stainless steel. | | |

b) ASME Code Class:

Millstone Unit 2, ASME Code Class 1, Similar Metal Welds.
Millstone Unit 3, ASME Code Class 1, Dissimilar Metal Welds.

c) System:

Millstone Units 2 and 3, Reactor Coolant Systems.

d) Code Category:

Millstone Units 2 and 3, Category R-A, Risk Informed Piping Examinations.

e) Code Item Nos.:

Millstone Unit 2 - R1.20, Elements not Subject to a Damage Mechanism.

Millstone Unit 3 - R1.15, Elements Subject to Primary Water Stress Corrosion Cracking (PWSCC), and R1.20, Elements not Subject to a Damage Mechanism.

3.0 Applicable Code Edition and Addenda

MPS2 is currently in the third 10-year ISI interval that began on April 1, 1999, and is scheduled to end on March 31, 2009. MPS3 is in the second 10-year ISI interval that began on April 23, 1999, and is scheduled to end October 23, 2008. The ASME Boiler and Pressure Vessel Code (ASME Code) of record for the current 10-year ISI intervals at both MPS2&3 is the 1989 Edition of Section XI of the ASME Code.

4.0 Applicable Code Requirement

Relief is requested from performance demonstration requirements as specified in the 1989 Edition with no Addenda of the ASME Code Section XI, (Reference 1), and the 1995 Edition with the 1996 Addenda, of the ASME Code, Section XI, Appendix VIII, Table VIII-3110-1, and Supplements 2, 3, and 10, (Reference 2). Specifically, relief is requested from qualification requirements for performance demonstration of ultrasonic examination systems for wrought austenitic, ferritic and dissimilar metal piping welds, and Table VIII-3110-1, which identifies the component qualification supplements required.

5.0 Proposed Alternative and Basis for Use

DNC requests that as an alternative, Code Case N-696, "Qualification Requirements for Appendix VIII Piping Examinations Conducted From the Inside Surface Section XI, Division 1", be used for implementation coordination of Supplements 2, 3, and 10, during the MPS2&3 10-year reactor pressure vessel (RPV) examinations. This code case is included in Enclosure 1 of this attachment, and has been adopted into the 2004 Edition of ASME Section XI as Supplement 14 "Qualification Requirements for Coordinated Implementation of Supplements 10, 2, and 3, for Piping Examination Performed From the Inside Surface" (Reference 4).

Depending upon the particular design, the reactor pressure vessel nozzle to main coolant piping may be fabricated using ferritic, austenitic, or cast stainless components and assembled using ferritic, austenitic, or dissimilar metal welds. Additionally, differing combinations of these assemblies may be in close proximity, which typically means the same ultrasonic essential variables are used for each weld, and the most challenging ultrasonic examination process is employed (e.g., the ultrasonic examination process associated with a dissimilar metal weld would be applied to a ferritic or austenitic weld.)

At MPS2 the applicable weld joint is the nozzle to transition weld, which is a ferritic reactor vessel nozzle to a ferritic transition piece assembled with ferritic weld metal, and an internal diameter (ID) clad. At MPS3 the applicable weld joint is the reactor vessel nozzle to safe-end dissimilar metal weld, which is a combination of ferritic and austenitic components assembled with Alloy 82 / 182 weld metal.

Separate qualifications to Supplements 2, 3, and 10, are redundant when done in accordance with the industry's PDI Program. For example, during a personnel qualification to the PDI Program, the candidate would be exposed to a minimum of ten flawed grading units for each individual supplement. Personnel qualification to Supplements 2, 3, and 10, would therefore require a total of 30 flawed grading units. Test sets this large and tests of this duration are impractical. Additionally, a full procedure qualification (i.e., 3 personnel qualifications) to the PDI Program requirements would require 90 flawed grading units. This is particularly burdensome for a procedure that will use the same essential variables or the same criteria for selecting essential variables for all three supplements.

To resolve these issues, the PDI Program recognizes the Supplement 10 qualification as the most stringent and technically challenging ultrasonic application. The essential variables used for the examination of Supplements 2, 3, and 10, are the same. A coordinated add-on implementation would be sufficiently stringent to qualify Supplements 2 and 3 if the requirements used to qualify Supplement 10 are satisfied as a prerequisite. The basis for this conclusion is the fact that the majority of the flaws in Supplement 10 are located wholly in austenitic weld material. This configuration is known to be challenging for ultrasonic techniques due to the variable dendritic structure of the weld material. Conversely, flaws in Supplements 2 and 3 initiate in fine-grained base materials.

Additionally, the proposed alternative is more stringent than current ASME Code requirements for a detection and length sizing qualification. For example, the current ASME Code would allow a detection procedure, personnel, and equipment to be qualified to Supplement 10 with five flaws, Supplement 2 with five flaws, and Supplement 3 with five flaws, yielding a total of only 15 flaws. The proposed alternative of qualifying Supplement 10 using ten flaws and adding on Supplement 2 with five flaws and Supplement 3 with three flaws results in a total of 18 flaws which will be multiplied by a factor of three for the procedure qualification.

Based on the above, the use of a limited number of Supplement 2 or 3 flaws is sufficient to assess the capabilities of procedures and personnel who have already satisfied Supplement 10 requirements. The statistical basis used for screening personnel and procedures is still maintained at the same level with competent personnel being successful and less skilled personnel being unsuccessful. The proposed alternative is consistent with other coordinated qualifications currently contained in Appendix VIII. Consequently, DNC has determined that the alternative will result in an acceptable level of quality and safety, pursuant to the provisions of 10 CFR 50.55a(a)(3)(i).

6.0 Duration of Proposed Alternative

The proposed alternative is applicable for the remainder of the third 10-year ISI interval at MPS2 (RR-89-59) and the second 10-year ISI interval at MPS3 (IR-2-43).

7.0 Precedents

A similar alternative request has been approved for use at the V.C. Summer Station in an NRC letter, dated February 3, 2004 (ADAMS Accession No. ML040340450).

8.0 References

(1) 1989 Edition, ASME Code, Section XI, no Addenda.

(2) 1995 Edition, ASME Code, Section XI, with the 1996 Addenda, Appendix VIII, Performance Demonstration for Ultrasonic Examination Systems.

Supplement 2 - Qualification Requirements for Wrought Austenitic Piping Welds.
Supplement 3 - Qualification Requirements for Ferritic Piping Welds.
Supplement 10 – Qualification Requirements for Cast Austenitic Piping Welds.

(3) Code Case N-696, "Qualification Requirements for Appendix VIII Piping Examinations Conducted From the Inside Surface Section XI, Division 1." (Enclosure 1 to Attachment 2 of this letter)

(4) 2004 Edition, ASME Code, Section XI, no Addenda, Appendix VIII, Supplement 14, "Qualification Requirements for Coordinated Implementation of Supplements 10, 2, and 3, for Piping Examination Performed From the Inside Surface".

**ENCLOSURE 1 TO ATTACHMENT 2**

# CASE N-696
# QUALIFICATION REQUIREMENTS FOR APPENDIX VIII PIPING EXAMINATIONS CONDUCTED FROM THE INSIDE SURFACE SECTION XI, DIVISION 1*

**DOMINION NUCLEAR CONNECTICUT, INC.**
**MILLSTONE POWER STATION UNITS 2 AND 3**

# CASE N-696

**Approval Date: May 21, 2003**

*See Numeric Index for expiration and any reaffirmation dates.*

## Case N-696
## Qualification Requirements for Appendix VIII Piping Examinations Conducted From the Inside Surface
## Section XI, Division 1

*Inquiry:* What alternatives to the requirements of Appendix VIII, may be used to complete Supplements 2, 3, and 10 qualifications for piping examinations that are conducted from the inside surface?

*Reply:* It is the opinion of the Committee that as an alternative to the requirements of Appendix VIII, Supplements 2, 3, and 10, performed from the inside surface the following requirements may be used to expand successful Supplement 10 qualifications in conjunction with selected aspects of Supplements 2 and 3.

### 1 SCOPE

This Case is applicable to wrought austenitic, ferritic and dissimilar metal piping welds examined from the inside surface. This Case provides for expansion of Supplement 10 qualifications to permit coordinated qualification for Supplements 2 and 3.

### 2 SPECIMEN REQUIREMENTS

Qualification test specimens shall meet the requirements listed herein, unless a set of specimens is designed to accommodate specific limitations stated in the scope of the examination procedure (e.g., pipe size, access limitations). The same specimens may be used to demonstrate both detection and sizing qualification.

#### 2.1 General

The specimen set shall conform to the following requirements.

*(a)* Specimens shall have sufficient volume to minimize spurious reflections that may interfere with the interpretation process.

*(b)* The specimen set shall include the minimum and maximum pipe diameters and thicknesses for which the examination procedure is applicable. Applicable tolerances are provided in Supplements 2, 3, and 10.

*(c)* The specimen set shall include examples of the following fabrication conditions:

*(1)* geometric and material conditions that normally require discrimination from flaws (e.g., counterbore or weld root conditions, cladding, weld buttering, remnants of previous welds, adjacent welds in close proximity, and weld repair areas);

*(2)* typical limited scanning surface conditions (e.g., internal tapers, exposed weld roots, and cladding conditions).

#### 2.2 Supplement 2 Flaws

*(a)* At least 70% of the flaws shall be cracks, and the remainder shall be alternative flaws.

*(b)* Specimens with IGSCC shall be used when available.

*(c)* Alternative flaws, if used, shall provide crack-like reflective characteristics and shall comply with the following:

*(1)* Alternative flaws shall be used only when implantation of cracks produces spurious reflectors that are uncharacteristic of service-induced flaws.

*(2)* Alternative flaws shall have a tip width of no more than 0.002 in. (0.05 mm).

#### 2.3 Supplement 3 Flaws

Supplement 3 flaws shall be mechanical or thermal fatigue cracks.

#### 2.4 Distribution

The specimen set shall contain a representative distribution of flaws. Flawed and unflawed grading units shall be randomly mixed.

# ATTACHMENT 3

## USE OF PDI QUALIFIED PROCEDURES, PERSONNEL AND EQUIPMENT FOR NON-APPENDIX VIII REACTOR PRESSURE VESSEL SHELL-TO-FLANGE WELD (RR-89-60 and IR-2-44)

**DOMINION NUCLEAR CONNECTICUT, INC.**
**MILLSTONE POWER STATION UNITS 2 AND 3**

**USE OF PDI QUALIFIED PROCEDURES, PERSONNEL AND EQUIPMENT FOR NON-APPENDIX VIII REACTOR PRESSURE VESSEL SHELL-TO- FLANGE WELD (RR-89-60 and IR-2-44)**

*Proposed Alternative*
*In Accordance with 10 CFR 50.55a(a)(3)(i)*

*- Alternative Provides Acceptable Level of Quality and Safety -*

Background

Dominion Nuclear Connecticut, Inc. (DNC) is submitting requests for the use of alternatives to the examination requirements of ASME Code, Section XI, at Millstone Power Station Units 2 and 3 (MPS2&3). These requests support the examination of components during the scheduled 10-year reactor vessel examinations. DNC has determined the proposed alternatives provide for an acceptable level of quality and safety, consistent with 10 CFR 50.55a(a)(3)(i).

1.0 Reason for Request

The use of this alternative will allow the use of Performance Demonstration Initiative (PDI) qualified procedures for the performance of the ultrasonic testing (UT) 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, 1995 Edition, 1996 Addenda, Appendix VIII, Supplements 4 and 6. This alternative would be used in lieu of Article 4 of Section V and RG 1.150 requirements during the 10-year inservice inspection (ISI) examination utilizing a mechanized delivery system.

2.0 ASME Code Components Affected

a) Name of Component:

Reactor pressure vessel (PRV) shell-to-flange weld
Millstone Unit 2: Weld FS-1
Millstone Unit 3: Weld 101-121

b) ASME Code Class:

The welds are ASME Code Class 1 welds that are located in the RPV upper shell-to-flange weld from the flange Inside Diameter (ID).

c) System:

Millstone Units 2 and 3, Reactor Coolant Systems.

d) Code Category:

Millstone Units 2 and 3, Category B-A, RPV shell-to-flange weld.

e) Code Item Nos.:

Millstone Units 2 and 3, B1.30, Shell-to-Flange Weld.

3.0 Applicable Code Edition and Addenda

MPS2 is currently in the third 10-year ISI interval that began on April 1, 1999, and is scheduled to end on March 31, 2009. MPS3 is in the second 10-year ISI interval that began on April 23, 1999, and is scheduled to end October 23, 2008. The ASME Boiler and Pressure Vessel Code (ASME Code) of record for the current 10-year ISI intervals at both MPS&3 is the 1989 Edition of Section XI of the ASME Code.

4.0 Applicable Code Requirement

The 1989 Edition with no Addenda of the American Society of Mechanical Engineers (ASME Code) Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," Subsection IWA-2232, requires UT examination of the RPV shell-to-flange weld to be in accordance with ASME Code, Section V, Article 4. In addition, Regulatory Guide (RG) 1.150, Revision 1, "Ultrasonic Testing of Reactor Vessel Welds During Preservice and Inservice Examinations," serves as regulatory guidance for the UT examination of RPV welds.

5.0 Proposed Alternative and Basis for Use

During the upcoming 10-Year RPV Vessel examinations, 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 Section XI, 1995 Edition with 1996 Addenda, Appendix VIII, Supplements 4 and 6 as amended by 10 CFR 50.55a. The examination will be performed automated as qualified in accordance with ASME Section XI, 1995 Edition with 1996 Addenda, Appendix VIII, Supplements 4 and 6 as amended by 10 CFR 50.55a and the PDI 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.

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 Section V, Article 4 ultrasonic examination requirements.

Though Appendix VIII is not required for the RPV shell-to-flange weld examination, the use of 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 Section V, Article 4 and the guidance in RG 1.150. 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).

6.0 Duration of Proposed Alternative

The proposed alternative is applicable for the remainder of the current MPS3 second 10-year ISI interval that started on April 23, 1999 and for the remainder of the current MPS2 third ISI interval that started on April 1, 1999.

7.0 Precedents

A similar relief request (RR ISI-30) has been previously approved for Union Electric Company for its Callaway Plant, Unit 1 on April 7, 2004 (ADAMS Accession Nos. ML032340608 and ML041000516).

8.0 References

(1) 1989 Edition, ASME Code, Section XI, no Addenda.

(2) 1995 Edition, ASME Code, Section XI, with the 1996 Addenda, Appendix VIII, Supplements 4 and 6.

(3) Regulatory Guide (RG) 1.150, Revision 1, "Ultrasonic Testing of Reactor Vessel Welds During Preservice and Inservice Examinations."