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U.S. Nuclear Regulatory Commission
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Washington, DC 20555

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NLOS/WDC R0
Docket No. 50-336
License No. DPR-65

DOMINION NUCLEAR CONNECTICUT, INC.
MILLSTONE POWER STATION UNIT 2
ALTERNATIVE REQUEST RR-89-68 FOR USE OF CODE CASE N-722-1 FOR BARE METAL VISUAL EXAMINATION OF THE RPV FLANGE SEAL LEAK-OFF LINE WELDS MADE OF ALLOY 600/82/182 MATERIALS

The Reactor Pressure Vessel (RPV) Flange Seal Leak-Off Line at Millstone Power Station Unit 2 (MPS2) contains welds of Alloy 600/82/182 materials that currently require bare metal visual examination in accordance with 10 CFR 50.55a(g)(6)(ii)(E)(1) through (4) using the American Society of Mechanical Engineers (ASME) Code Case N-722. The welds in this line are inaccessible for direct visual examination and ASME has revised this Code Case to no longer require the examination of these welds. Dominion Nuclear Connecticut, Inc. (DNC) is requesting to use the revised Code Case N-722-1 based on the information contained in Attachment 1.

Specifically, DNC submits alternative request RR-89-68 to use Code Case N-722-1 in lieu of Code Case N-722 under the provisions of 10 CFR 50.55a(a)(3)(i). This proposed request provides an acceptable level of quality and safety. DNC requests approval of the alternative by March 31, 2010.

If you have any questions regarding this submittal, please contact Ms. Wanda D. Craft at (804) 273-4687.

Sincerely,

J. A. Price
Vice President – Nuclear Engineering

Attachments: (1)

1. Alternative Request RR-89-68 for the use of Code Case N-722-1 for the Bare Metal Visual Examination of the RPV Flange Seal Leak-Off Line Welds Made of Alloy 600/82/182 Materials

Commitments made in this letter: None

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ATTACHMENT 1

ALTERNATIVE REQUEST RR-89-68 FOR USE OF CODE CASE N-722-1 FOR BARE METAL VISUAL EXAMINATION OF THE RPV FLANGE SEAL LEAK-OFF LINE WELDS MADE OF ALLOY 600/82/182 MATERIALS

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FIGURES

Figure 1 – Typical Sketch of RPV Flange Seal Leak-Off Line 2

SUPPLEMENT TO ATTACHMENT 1

Code Case N-722-1, "Additional Examinations for PWR Pressure Retaining Welds In Class 1 Components Fabricated With Alloy 600/82/182 Section XI, Division 1," Approval Date: January 26, 2009

ALTERNATIVE REQUEST RR-89-68 FOR USE OF CODE CASE N-722-1 FOR BARE METAL VISUAL EXAMINATION OF THE RPV FLANGE SEAL LEAK-OFF LINE WELDS MADE OF ALLOY 600/82/182 MATERIALS

Proposed Alternative in Accordance with 10 CFR 50.55a(a)(3)(i)
-- Alternative Provides Acceptable Level of Quality And Safety --

1.0 ASME CODE COMPONENT(S) AFFECTED

Code Class: 1

Category: Class 1 PWR Components Containing Alloy 600/82/182 Materials

Reactor Vessel Item No.: B15.100 Instrument connections

Description: Millstone Power Station Unit 2 (MPS2) – ¾ inch schedule 80 piping made of SB-167 material inside the Reactor Pressure Vessel (RPV) flange.

At MPS2, three welds are located on the RPV Flange Seal Leak-Off Line monitor tube, which is made of Alloy 600/82/182 materials. The location of the three welds, using the typical sketch in Figure 1 below are:

1) the weld at the top of the flange described in (b),
2) a butt weld between the upper manufactured ¾ inch SB-166 Alloy 600 tube and lower SB-167 Alloy 600 pipe (e), (the weld is not shown in the Figure 1), and
3) the socket welded SB-167 Alloy 600 pipe to the 316 stainless steel elbow weld made of Alloy 82 material (c).

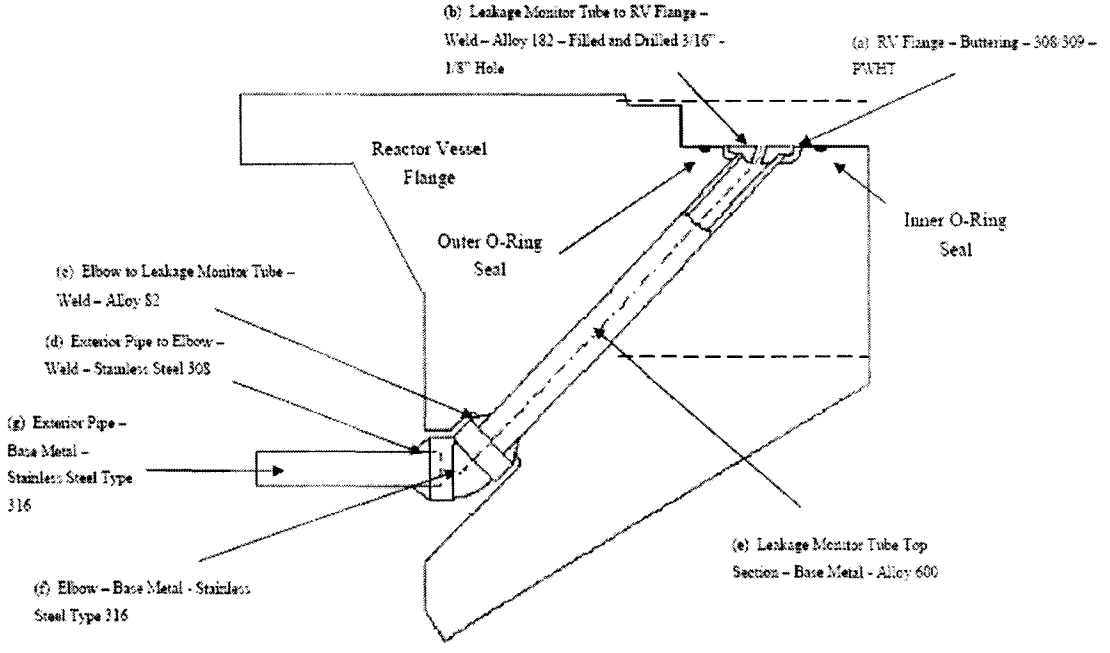

Figure 1 – Typical Sketch of RPV Flange Seal Leak-Off Line

2.0 APPLICABLE CODE EDITION AND ADDENDA

MPS2 is in the third 10-year inservice inspection (ISI) interval and the ISI program is in accordance with the 1989 Edition of Section XI with No Addenda (Reference 1). However, the requirement to perform the examination of the Alloy 600/82/182 welds in the RPV Flange Seal Leak-Off Line is in accordance with 10 CFR 50.55a(g)(6)(ii)(E)(1) through (4). This provision of the regulation requires implementation of the augmented inspections required by Code Case N-722 (Reference 2). Code Case N-722 requires bare metal visual examinations of Class 1 welds in Alloy 600/82/182 materials.

3.0 APPLICABLE CODE REQUIREMENT

The subject of this request involves requirements of 10 CFR 50.55a(g)(6)(ii)(E)(1) through (4), which require examinations of the Class 1 welds made of Alloy 600/82/182 materials. The requirements also have criteria for when these examinations need to be performed in Footnote 1 to the regulation.

> *Footnote 1:* *"For inspections to be conducted every refueling outage and inspections conducted every other refueling outage, the initial inspection shall be performed at the next refueling outage after January 1, 2009. For inspections to be conducted once per interval, the inspections shall begin in the interval in effect on January 1, 2009, and shall be prorated over the remaining periods and refueling outages in this interval."*

Examinations are required to be performed once per interval for the Class 1 welds associated with Code Case N-722, Table 1, and Item No. B15.100, Instrument connections. With the second sentence in Footnote 1, MPS2 is required to perform the bare metal visual examination of the Class 1 welds in the RPV Flange Seal Leak-Off line that are made of Alloy 600/82/182 materials by the end of the current 10 year interval. Thus, the only opportunity to meet this requirement is during the MPS2 fall 2009 (2R19) refueling outage, which will take place in October 2009.

4.0 REASON FOR THE REQUEST

The RPV head and flange leakage detection system has elements with Alloy 600/82/182 materials, but they are not accessible for visual examination, and the welds are not normally subject to continuous contact with reactor coolant. Consequently, the welds are not subject to Primary Water Stress Corrosion Cracking (PWSCC) concerns. ASME revised Code Case N-722 to N-722-1 (Reference 3) and added a Footnote (8) in Table 1 related to Item No. B15.100, Instrument connections, in the revised Code Case N-722-1 that states,

> *"This Case does not require visual examination of Alloy 600/82/182 materials in flange seal leak-off lines."*

5.0 PROPOSED ALTERNATIVE AND BASIS FOR USE

5.1 ALTERNATIVE:

The alternative proposed in this request is to use the ASME approved Code Case N-722-1 in lieu of Code Case N-722 for the requirements associated with the Class 1 welds made of Alloy 600/82/182 materials in the RPV Flange Seal Leak-Off Line at MPS2.

5.2 BASIS:

A typical section of piping in the RPV head and flange leakage detection system (i.e., the monitor tube) is shown in Figure 1. This system is used to support the identification of inner O-ring seal leakage. This system is essentially a drain system and reasonably does not belong in the same scope of piping and components that are included in Code Case N-722.

The RPV head and flange leakage detection system operates in the following manner. During operation, an increase in temperature above ambient temperature indicates inner O-ring seal leakage. High temperature actuates an alarm in the control room. The seal leakage would be identified by temperature alarm or by reactor coolant system (RCS) inventory balance calculations and addressed by procedures. On the indication of inner O-ring leakage, the isolation valve in the leak-off line can be closed to place the outer O-ring into the pressure retention mode, and the inner O-ring leak detection system piping would then be pressurized to RCS pressure, up to the closed isolation valve. This would be a temporary condition until the next outage when the head O-rings are replaced. Seal leakage would be closely monitored and procedurally controlled by operator actions allowing identification of any further compensatory actions required. If an inner O-ring seal leak occurs and the isolation valve is not closed, the inner O-ring seal leakage would be directed to the primary system drains tank. If an inner O-ring seal leak occurs and the isolation valve was not closed, full rupture is not credible because the primary drains tank has a relief valve system that would relieve the pressure in the line. If an inner O-ring seal leak were to occur and the isolation valve was closed, given the short exposure time to RCS water, leakage at welds in the monitoring tube from PWSCC would be highly unlikely.

The alternative to use Code Case N-722-1 does not require visual examinations of the welds in the RPV flange seal leak-off line. The welds are not accessible for direct bare metal visual examination. This alternative has an acceptable level of quality and safety because the welds in the RPV flange seal leak-off line are;

1) not normally subject to continuous contact with reactor coolant during normal operation, and
2) not subject to PWSCC concerns.

Although the welds of the RPV flange seal leak-off line are made of Alloy 600/82/182 materials, the required examination of the welds cannot be achieved to the intended purpose of the Code Case N-722. The ASME approved Code Case N-722-1 eliminates the requirement. This alternative provides an acceptable level of quality and safety equal to what can be gained by performing examinations of these welds to the current Code Case N-722 requirements. Therefore, it is requested that the NRC approve this alternative request under the provisions of 10 CFR 50.55a(a)(3)(i).

6.0 DURATION OF PROPOSED ALTERNATIVE

This proposed alternative in this request if approved will be applicable to the end of the current 10 year ISI interval which is scheduled for March 31, 2010.

7.0 PRECEDENTS

No precedent similar to this alternative request is known.

8.0 REFERENCES

1. ASME Code Section XI, 1989 Edition with No Addenda.
2. ASME Code Case N-722, " Additional Examinations for PWR Pressure Retaining Welds in Class 1 Components Fabricated With Alloy 600/82/182 Materials Section XI, Division 1, Approval Date: July 5, 2005.
3. ASME Code Case N-722-1, " Additional Examinations for PWR Pressure Retaining Welds in Class 1 Components Fabricated With Alloy 600/82/182 Materials Section XI, Division 1, Approval Date: January 26, 2009.

SUPPLEMENT TO ATTACHMENT 1

CODE CASE N-722-1, "ADDITIONAL EXAMINATIONS FOR PWR PRESSURE RETAINING WELDS IN CLASS 1 COMPONENTS FABRICATED WITH ALLOY 600/82/182 MATERIALS SECTION XI, DIVISION 1"

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CASE N-722-1

Approval Date: January 26, 2009

The ASME Boiler and Pressure Vessel Standards Committee took action to eliminate Code Case expiration dates effective March 11, 2005. This means that all Code Cases listed in this Supplement and beyond will remain available for use until annulled by the ASME Boiler and Pressure Vessel Standards Committee.

Case N-722-1
Additional Examinations for PWR Pressure Retaining Welds in Class 1 Components Fabricated With Alloy 600/82/182 Materials
Section XI, Division 1

Inquiry: What examinations, in addition to those of Table IWB-2500-1, may be performed to provide additional detection capability for pressure boundary leakage in pressurized water reactor plants having pressure retaining partial or full penetration welds in Class 1 components fabricated with Alloy 600/82/182 material?

Reply: It is the opinion of the Committee that in addition to the examination requirements of Table IWB-2500-1 the additional examinations of Table 1 shall be performed for pressurized water reactor plants having partial or full penetration welds in Class 1 components fabricated with Alloy 600/82/182 material.

The Committee's function is to establish rules of safety, relating only to pressure integrity, governing the construction of boilers, pressure vessels, transport tanks and nuclear components, and inservice inspection for pressure integrity of nuclear components and transport tanks, and to interpret these rules when questions arise regarding their intent. This Code does not address other safety issues relating to the construction of boilers, pressure vessels, transport tanks and nuclear components, and the inservice inspection of nuclear components and transport tanks. The user of the Code should refer to other pertinent codes, standards, laws, regulations or other relevant documents.

TABLE 1
EXAMINATION CATEGORIES

CLASS 1 PWR COMPONENTS CONTAINING ALLOY 600/82/182[1]

Item No.	Parts Examined[2]	Examination Requirements	Examination Method[3, 4, 5]	Acceptance Standard	Extent and Frequency of Examination: First Inspection Interval	Extent and Frequency of Examination: Successive Inspection Intervals	Deferral of Inspection to End of Interval
Reactor Vessel[2]							
B15.80	RPV bottom-mounted instrument penetrations	All penetrations	Visual, VE	IWB-3522	Every other refueling outage	Same as for 1st interval	Not permissible
B15.90	Hot leg nozzle-to-pipe connections	All connections	Visual, VE	IWB-3522	Each refueling outage	Same as for 1st interval	Not permissible
B15.95	Cold leg nozzle-to-pipe connections	All connections	Visual, VE	IWB-3522	Once per interval[6, 7]	Same as for 1st interval	Not permissible
B15.100	Instrument connections[8]	All connections	Visual, VE	IWB-3522	Once per interval[6, 7]	Same as for 1st interval	Not permissible
Steam Generators							
B15.110	Hot leg nozzle-to-pipe connections	All connections	Visual, VE	IWB-3522	Each refueling outage	Same as for 1st interval	Not permissible
B15.115	Cold leg nozzle-to-pipe connections	All connections	Visual, VE	IWB-3522	Once per interval[6, 7]	Same as for 1st interval	Not permissible
B15.120	Bottom channel head drain tube penetration	All penetrations	Visual, VE	IWB-3522	Once per interval[6, 7]	Same as for 1st interval	Not permissible
B15.130	Primary side hot leg instrument connections	All connections	Visual, VE	IWB-3522	Each refueling outage	Same as for 1st interval	Not permissible
B15.135	Primary side cold leg instrument connections	All connections	Visual, VE	IWB-3522	Once per interval[6, 7]	Same as for 1st interval	Not permissible
Pressurizer							
B15.140	Heater penetrations	All penetrations	Visual, VE	IWB-3522	Each refueling outage	Same as for 1st interval	Not permissible
B15.150	Spray nozzle-to-pipe connections	All connections	Visual, VE	IWB-3522	Each refueling outage	Same as for 1st interval	Not permissible
B15.160	Safety and relief nozzle-to-pipe connections	All connections	Visual, VE	IWB-3522	Each refueling outage	Same as for 1st interval	Not permissible
B15.170	Surge nozzle-to-pipe connections	All connections	Visual, VE	IWB-3522	Each refueling outage	Same as for 1st interval	Not permissible
B15.180	Instrument connections	All connections	Visual, VE	IWB-3522	Each refueling outage	Same as for 1st interval	Not permissible
B15.190	Drain nozzle-to-pipe connections	All connections	Visual, VE	IWB-3522	Each refueling outage	Same as for 1st interval	Not permissible
Piping							
B15.200	Hot leg instrument connections	All connections	Visual, VE	IWB-3522	Each refueling outage	Same as for 1st interval	Not permissible
B15.205	Cold leg instrument connections	All connections	Visual, VE	IWB-3522	Once per interval[6, 7]	Same as for 1st interval	Not permissible
B15.210	Hot leg full penetration welds	All welds	Visual, VE	IWB-3522	Each refueling outage	Same as for 1st interval	Not permissible
B15.215	Cold leg full penetration welds	All welds	Visual, VE	IWB-3522	Once per interval[6, 7]	Same as for 1st interval	Not permissible

TABLE 1
EXAMINATION CATEGORIES (CONT'D)

NOTES:

(1) Alloy 600/82/182 are equivalent to UNS N06600 (SB-163, SB-166, SB-167, SB-168 and SB-564), UNS N06082 (SFA 5.14 ERNiCr-3) and UNS W86182 (SFA 5.11 ENiCrFe-3).

(2) The reactor vessel closure head is not addressed in this Case.

(3) The Visual Examination (VE) performed on Alloy 600/82/182 components for evidence of pressure boundary leakage and corrosion on adjacent ferritic steel components shall consist of the following:

(a) A direct VE of the bare-metal surface performed with the insulation removed. Alternatively, the VE may be performed with insulation in place using remote visual inspection equipment that provides resolution of the component metal surface equivalent to a bare-metal direct VE.

(b) The VE may be performed when the system or component is depressurized.

(c) The direct VE shall be performed at a distance not greater than 4 ft (1.2 m) from the component and with a demonstrated illumination level sufficient to allow resolution of lower case characters having a height of not greater than 0.105 in (2.7 mm).

(4) Personnel performing the VE shall be qualified as VT-2 visual examiners and shall have completed a minimum of four (4) hours of additional training in detection of borated water leakage from Alloy 600/82/182 components and the resulting boric acid corrosion of adjacent ferritic steel components.

(5) An ultrasonic examination, performed from the component inside or outside surface in accordance with the requirements of Table IWB-2500-1 and Appendix VIII (1995 Edition with the 1996 Addenda or later) shall be acceptable in lieu of the VE requirement of this table.

(6) VE shall be performed in accordance with the schedule in IWB-2400.

(7) The detection of evidence of pressure leakage at a VE location shall require the VE of all components within the Examination Item No. prior to reactor startup. These additional VEs shall not affect the original VE schedule of the components within the Examination Item No.

(8) This Case does not require visual examination of Alloy 600/82/182 materials in flange seal leak-off lines.