Dominion Nuclear Connecticut, Inc.
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Dominion®

July 30, 2015

U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555

Serial No.	15-309
NLOS/WDC	R0
Docket No.	50-336
License No.	DPR-65

DOMINION NUCLEAR CONNECTICUT, INC.
MILLSTONE POWER STATION UNIT 2
ASME SECTION XI INSERVICE INSPECTION PROGRAM
RELIEF REQUESTS FOR LIMITED COVERAGE EXAMINATIONS PERFORMED IN THE FOURTH 10-YEAR INSPECTION INTERVAL

The Millstone Power Station Unit 2 (MPS2) fourth 10-year interval for the inservice inspection program began on April 1, 2010. During the first inspection period of this interval, the components identified in Attachments 1 through 3 received less than the required examination coverage. Accordingly, pursuant to 10 CFR 50.55a(g)(5)(iii), Dominion Nuclear Connecticut, Inc. requests relief on the basis that the required examination coverage was impractical due to physical obstructions and limitations imposed by design, geometry and materials of construction of the subject components.

Attachments 1 through 3 contain the specific relief requests and the individual basis for each request. These relief requests have been reviewed and approved by the station's Facility Safety Review Committee.

If you have any questions or require additional information, please contact Wanda Craft at (804) 273-4687.

Sincerely,

Mark D. Sartain
Vice President – Nuclear Engineering

A047
NRR

Attachments:

1. Relief Request RR-04-17 - Examination Category B-D, Full Penetration Welded Nozzles in Vessels - Inspection Program B.
2. Relief Request RR-04-18, Examination Category C-A, Pressure Retaining Welds in Pressure Vessels.
3. Relief Request RR-04-19, Examination Category R-A, Risk Informed Piping Examinations.

Commitments made in this letter: None

cc: U.S. Nuclear Regulatory Commission
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Senior Project Manager
U.S. Nuclear Regulatory Commission
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11555 Rockville Pike
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NRC Senior Resident Inspector
Millstone Power Station

ATTACHMENT 1

RELIEF REQUEST RR-04-17
EXAMINATION CATEGORY B-D
FULL PENETRATION WELDED NOZZLES IN VESSELS
INSPECTION PROGRAM B

DOMINION NUCLEAR CONNECTICUT, INC.
MILLSTONE POWER STATION UNIT 2

Relief Requested
In Accordance with 10 CFR 50.55a(g)(5)(iii)

Inservice Inspection Impracticality

1. ASME Code Components Affected:

ASME Code Class:	Code Class 1
Examination Category:	B-D, Full Penetration Welded Nozzles in Vessels – Inspection Program B
Item Numbers:	B3.130, Steam Generator (Primary Side), Nozzle-To-Vessel Welds
Component Identification:	Listed in Table 1
Material:	SA508, CL3 Carbon Steel with Internal Stainless Steel Cladding

2. Applicable Code Addition and Addenda

ASME Section XI, 2004 Edition, No Addenda

3. Applicable Code Requirement

ASME Section XI, 2004 Edition, Examination Category B-D requires volumetric examination of 100 percent (%) of the weld volume as defined in Table IWB-2500-1 and shown in figure IWB-2500-7. The alternative requirements of ASME Section XI, Code Case N-460, approved for use in Regulatory Guide 1.147, Rev. 17, allows credit for essentially 100% coverage of the welds provided greater than 90% of the required volume has been examined.

4. Impracticality of Compliance

Pursuant to 10 CFR 50.55a(g)(5)(iii), relief is requested from the 100% volumetric examination coverage requirement of the subject welds due to the geometric configuration which limit the volumetric coverage that can be obtained.

The subject steam generator nozzle-to-vessel welds, were examined with a manual ultrasonic technique using pulse echo ultrasonic instruments and search units to achieve the maximum examination coverage practical. Limitations imposed by the nozzle configuration preclude obtaining 100% coverage. This configuration, with the

nozzle outside radius within close proximity of the weld, prevents complete scanning in these areas due to lift-off of the search unit that occurs causing a loss of contact between the search unit and the component.

No alternative techniques or advanced technologies were considered capable of obtaining complete coverage of the examination volume.

Isometric drawing and coverage calculations are provided in this attachment.

TABLE 1- Examination Category B-D Welds with Limited Volumetric Coverage

Weld Identification	Code Item #	Configuration	Examination Angle and Wave Mode	Limitations and Results	Examination Coverage (%)
SG-2-NH-2-A	B3.130	30" Cold Leg Nozzle to Hemisphere	0° Long Wave 30° Shear Wave 45° Shear Wave 60° Shear Wave	Scan limitations due to configuration of the nozzle. No recordable indications were detected.	73.3%
SG-2-NH-4-A	B3.130	42" Hot Leg Nozzle to Hemisphere	0° Long Wave 30° Shear Wave 45° Shear Wave 60° Shear Wave	Scan limitations due to configuration of the nozzle. No recordable indications were detected.	72.5%
SG-2-NH-5-A	B3.130	30" Cold Leg Nozzle to Hemisphere	0° Long Wave 30° Shear Wave 45° Shear Wave 60° Shear Wave	Scan limitations due to configuration of the nozzle. No recordable indications were detected.	72.4%

5. Burden Caused by Compliance

To increase examination coverage on the subject welds would require a significant design modification or replacement of components with a different design to eliminate the noted obstructions which is considered to be impractical due to the cost, additional radiation exposure and impact to plant equipment.

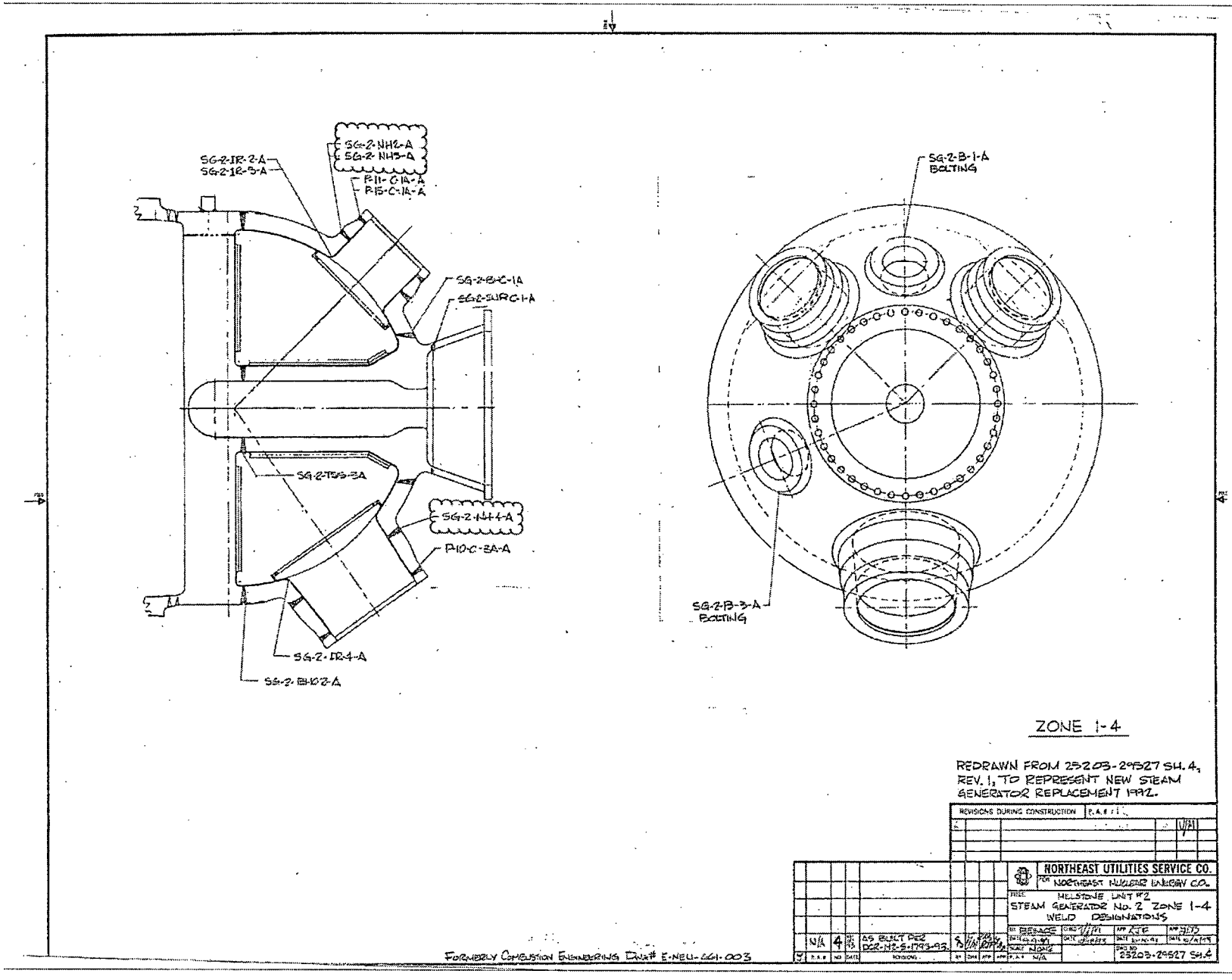
6. Proposed Alternative and Basis for Use

The subject welds received a volumetric examination using the best available techniques on the accessible portions of welds to the extent practical. Additionally, a visual (VT-2) examination is performed at the end of each refueling outage during the system leakage tests as required by Section XI, Table IWB-2500-1, Category B-P.

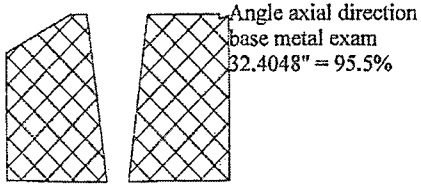
Based upon the examination volumes that were obtained with acceptable results and the visual (VT-2) examination performed each refueling outage, it is reasonable to conclude that service-induced degradation would be detected. Therefore, these proposed alternatives will provide an acceptable level of quality and safety by providing reasonable assurance of structural integrity of the subject welds.

7. Duration of Proposed Alternative

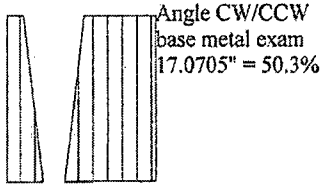
The relief is requested for the fourth ten-year inspection interval for Millstone Power Station Unit 2, which began on April 1, 2010 and will end March 31, 2020.


SG-2-NH2-A
SG-2-NH3-A
SG-2-IR-2-A
SG-2-IR-3-A
P11-C-1A-A
P15-C-1A-A
SG-2-B-C-1A
SG-2-SURC-1-A
SG-2-TS3-3A
SG-2-NH4-A
P10-C-2A-A
SG-2-IR4-A
SG-2-BH02-A
SG-2-B-1-A
BOLTING
SG-2-B-3-A
BOLTING
ZONE 1-4
REDRAWN FROM 25203-29527 SH. 4, REV. 1, TO REPRESENT NEW STEAM GENERATOR REPLACEMENT 1992.
REVISIONS DURING CONSTRUCTION
NORTHEAST UTILITIES SERVICE CO.
FOR NORTHEAST NUCLEAR ENERGY CO.
MILLSTONE UNIT #2
STEAM GENERATOR No. 2 ZONE 1-4
WELD DESIGNATIONS
AS BUILT PER D22-NE-S-1793-93
FORMERLY COMBUSTION ENGINEERING DWG# E-NEU-261-003
25203-29527 SH.4

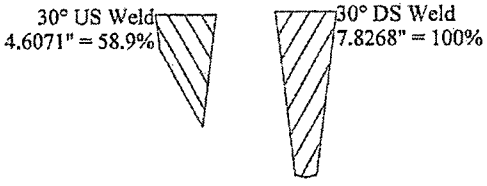
Weld ID: SG-2-NH-2-A



Angle axial direction
base metal exam
32.4048" = 95.5%

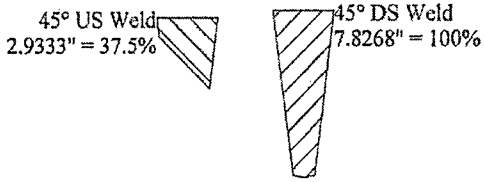


Angle CW/CCW
base metal exam
17.0705" = 50.3%



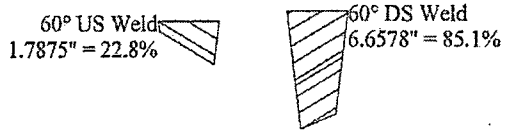
30° US Weld
4.6071" = 58.9%

30° DS Weld
7.8268" = 100%



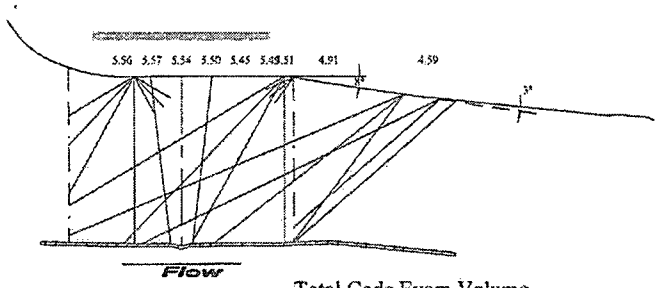
45° US Weld
2.9333" = 37.5%

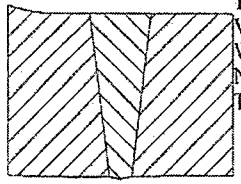
45° DS Weld
7.8268" = 100%



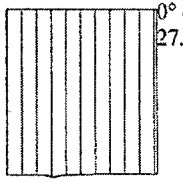
60° US Weld
1.7875" = 22.8%

60° DS Weld
6.6578" = 85.1%





Total Code Exam Volume
Vessel = 17.0618"
Weld = 7.8268"
Nozzle = 16.8720"
Total = 41.7606



0° exam area
27.8445" = 66.7%

30° CW Weld 100%
30° CCW Weld 100%
45° CW Weld 100%
45° CCW Weld 100%

Coverage Total:

0° Subtotal:
0° = 66.7%

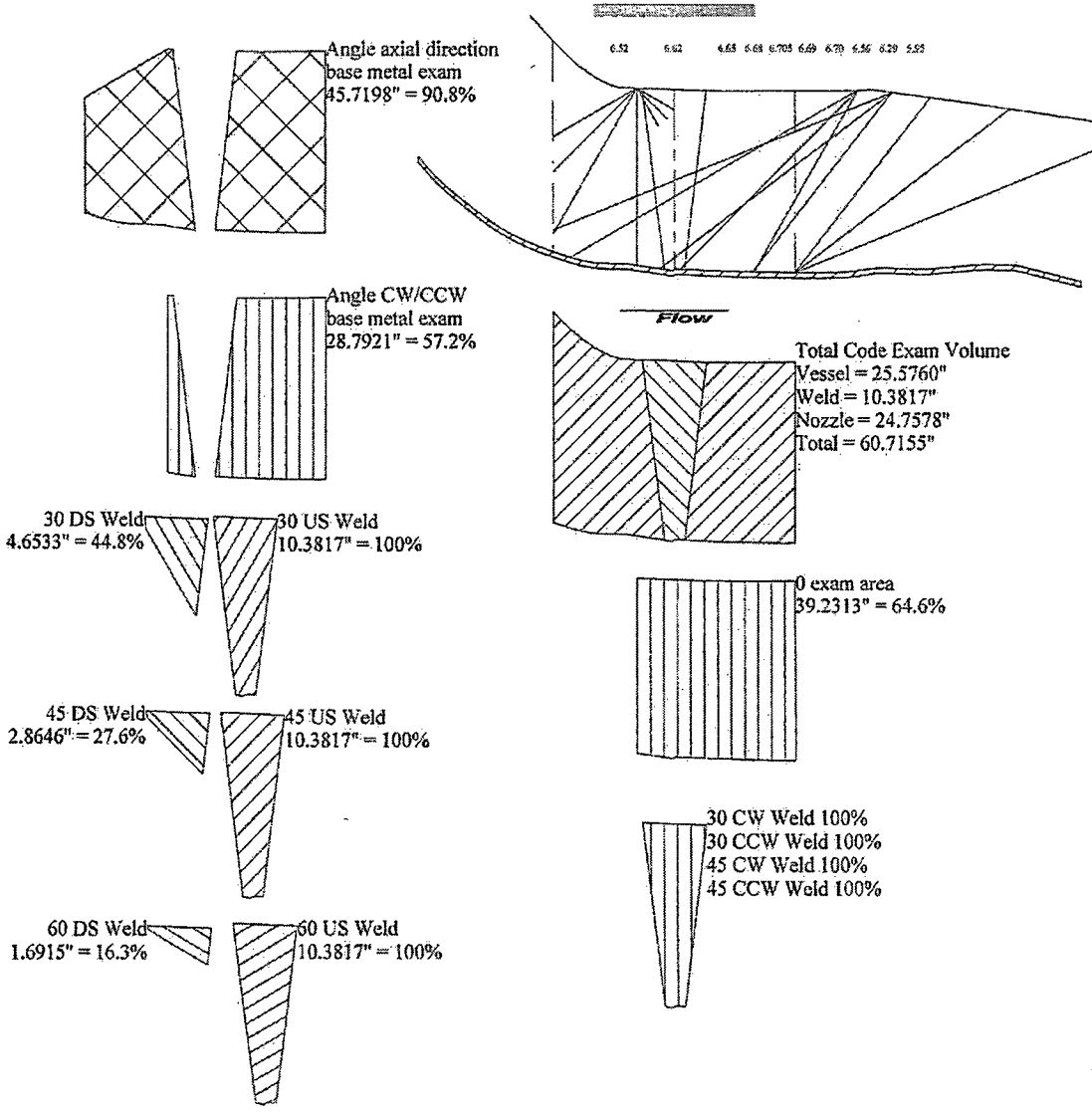
Weld Subtotal:
US 30° = 58.9%
DS 30° = 100%
US 45° = 37.5%
DS 45° = 100%
US 60° = 22.8%
DS 60° = 85.1%
30° CW = 100%
30° CCW = 100%
45° CW = 100%
45° CCW = 100%
Total = 804.3 / 10 = 80.4%

Base metal Subtotal:
Axial 30° / 45° / 60°= 95.5%
Circumferential 30° / 45° = 50.3%
Total = 145.8 / 2 = 72.9%

Coverage Total:
66.7 + 80.4 + 72.9 = 220.0 / 3 = 73.3%

Scale 1:6
Area dimensions determined
with TurboCad 19

Weld ID: SG-2-NH-4-A



Coverage Total:
0° Subtotal:
0° = 64.6%

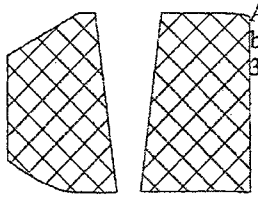
Weld Subtotal:
DS 30° = 44.8%
US 30° = 100%
DS 45° = 27.6%
US 45° = 100%
DS 60° = 16.3%
US 60° = 100%
CW 30° = 100%
CCW 30° = 100%
CW 45° = 100%
CCW 45° = 100%
Total = 788.7 / 10 = 78.9%

Base metal Subtotal:
Axial 30° / 45° / 60° = 90.8%
Circumferential 30° / 45° = 57.2%
Total = 148 / 2 = 74%

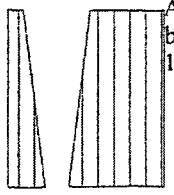
Coverage Total:
64.6 + 78.9 + 74 = 217.5 / 3 = 72.5%

Scale 1:6
Area dimensions determined
with TurboCad 19

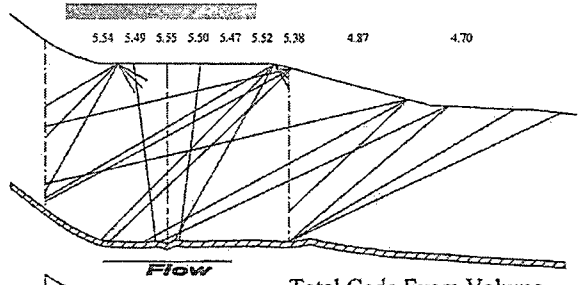
Weld ID: SG-2-NH-5-A



Angle axial direction
base metal exam
31.9103" = 94.1%



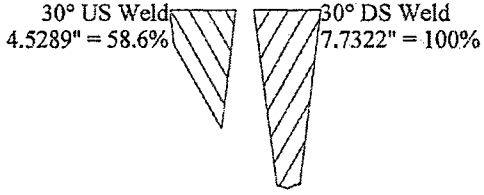
Angle CW/CCW
base metal exam
19.1707" = 56.5%



Coverage Total:

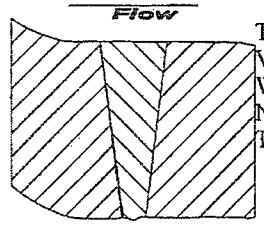
0° Subtotal:
0° = 64.8%

Weld Subtotal:
US 30° = 58.6%
DS 30° = 100%
US 45° = 36.8%
DS 45° = 97.4%
US 60° = 22.4%
DS 60° = 65.4%
30° CW = 100%
30° CCW = 100%
45° CW = 100%
45° CCW = 100%
Total = 780.6 / 10 = 78.1%

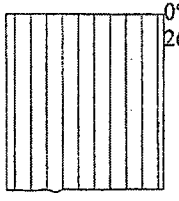


30° US Weld
4.5289" = 58.6%

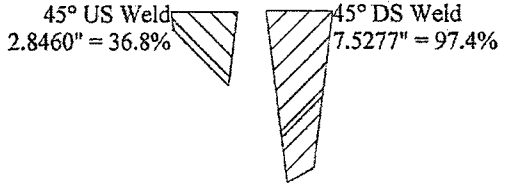
30° DS Weld
7.7322" = 100%



Total Code Exam Volume
Vessel = 16.9030"
Weld = 7.7322"
Nozzle = 17.0054"
Total = 41.6406"

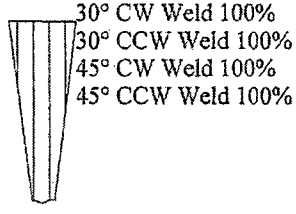


0° exam area
26.9827" = 64.8%



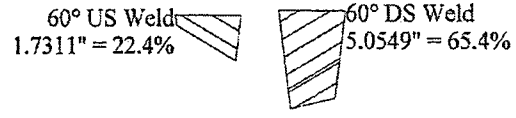
45° US Weld
2.8460" = 36.8%

45° DS Weld
7.5277" = 97.4%



30° CW Weld 100%
30° CCW Weld 100%
45° CW Weld 100%
45° CCW Weld 100%

Base metal Subtotal:
Axial 30° / 45° / 6 0° = 94.1%
Circumferential 30° / 45° = 56.5%
Total = 150.6 / 2 = 75.3%



60° US Weld
1.7311" = 22.4%

60° DS Weld
5.0549" = 65.4%

Coverage Total:
64.8 + 78.1 + 75.3 = 217.2 / 3 = 72.4%

Scale 1:6
Area dimensions determined
with TurboCad 19

ATTACHMENT 2

RELIEF REQUEST RR-04-18
EXAMINATION CATEGORY C-A
PRESSURE RETAINING WELDS IN PRESSURE VESSELS

DOMINION NUCLEAR CONNECTICUT, INC.
MILLSTONE POWER STATION UNIT 2

Relief Requested
In Accordance with 10 CFR 50.55a(g)(5)(iii)

Inservice Inspection Impracticality

1. ASME Code Components Affected:

ASME Code Class:	Code Class 2
Examination Category:	C-A, Pressure Retaining Welds in Pressure Vessels
Item Numbers:	C1.10, Shell Circumferential Welds C1.30, Tube Sheet-to-Shell Weld
Component Identification:	Listed in Table 1
Material:	SA 515, GR 70 Carbon Steel with Internal Stainless Steel Cladding

2. Applicable Code Addition and Addenda

ASME Section XI, 2004 Edition, No Addenda

3. Applicable Code Requirement

ASME Section XI, 2004 Edition, Category C-A requires volumetric examination of 100 percent (%) of the weld length as defined in Table IWC-2500-1 and shown in Figure IWC 2500-1 and IWC-2500-2. The alternative requirements of ASME Section XI, Code Case N-460, approved for use in Regulatory Guide 1.147, Rev. 17, allows credit for essentially 100% coverage of the welds provided greater than 90% of the required volume has been examined.

4. Impracticality of Compliance

Pursuant to 10 CFR 50.55a(g)(5)(iii), relief is requested from the 100% volumetric examination coverage requirement of the subject welds due to the geometric configuration and permanent obstructions which limit the volumetric coverage that can be obtained.

The Shutdown Cooling heat exchanger tube sheet-to-shell weld (SIAC-A1) and the flange-to-shell weld (SIAC-A2) were examined with a manual ultrasonic technique using the best technology available to achieve the maximum examination coverage practical. The examinations were performed using pulse echo ultrasonic instruments and transducers. No alternative techniques or advanced technologies

were considered capable of obtaining complete coverage of the examination volume.

The position of the heat exchanger tube sheet flange limits the examination coverage of the subject tube sheet-to-shell weld. The tube sheet flange is located within close proximity of the weld and there is not sufficient distance from the flange to the weld to allow complete scanning on that side of the weld. This restricts the axial scan coverage that can be obtained.

The position of the heat exchanger channel cover flange limits the examination of the subject flange-to-shell weld. The channel cover flange is located within close proximity of the weld and there is not sufficient distance between the flange and weld to allow complete scanning on that side of the weld. This restricts the axial and circumferential coverage that can be obtained.

Isometric drawing and coverage calculations are provided in this attachment.

TABLE 1- Examination Category C-A Welds with Limited Volumetric Coverage

Weld Identification	Code Item #	Configuration	Examination Angle and Wave Mode	Limitations and Results	Examination Coverage (%)
SIAC-A1	C1.30	Tube Sheet to Shell Weld	45° Shear Wave 60° Shear Wave	Limited examination due to the location of the tube sheet that obstructs the axial scans on that side of the weld. One recordable indication was detected that was evaluated as acceptable root geometry.	81.5%
SIAC-A2	C1.10	Flange to Shell Weld	45° Shear Wave 60° Shear Wave	Limited examination due to the location of the flange that obstructs axial and circumferential scans on that side of the weld. No recordable indications were detected.	63.8%

5. Burden Caused by Compliance

To increase examination coverage on the subject welds would require a significant design modification or replacement of the component with a different design to eliminate the noted obstructions. This option to meet the 100% Code examination requirement is considered impractical due to the cost, increased radiation exposure and impact to plant equipment.

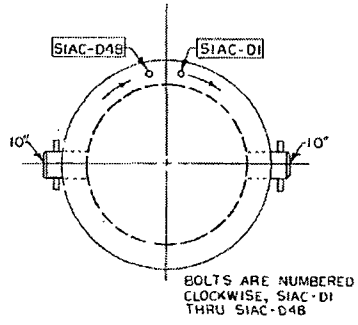
6. Proposed Alternative and Basis for Use

The subject welds received a volumetric ultrasonic examination using the best available techniques on the accessible portions of welds to the maximum extent practical. Additionally, a visual (VT-2) examination is performed during each inspection period during the system leakage tests as required by Section XI, Table IWC-2500-1, Category C-H.

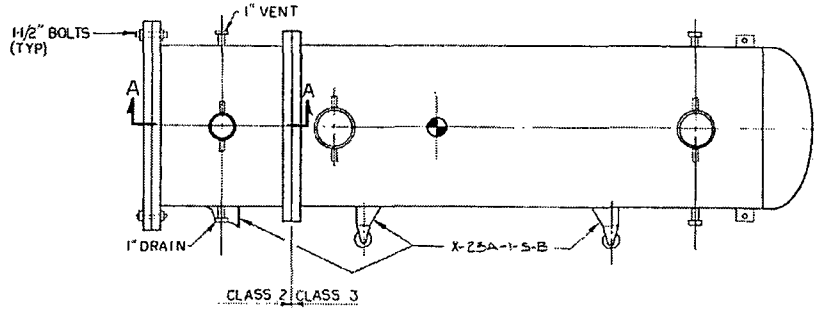
Based upon the examination volumes that were obtained with acceptable results and the visual (VT-2) examination performed each inspection period, it is reasonable to conclude that service induced degradation would be detected. Therefore, these proposed alternatives will provide an acceptable level of quality and safety by providing reasonable assurance of structural integrity of the subject welds.

7. Duration of Proposed Alternative

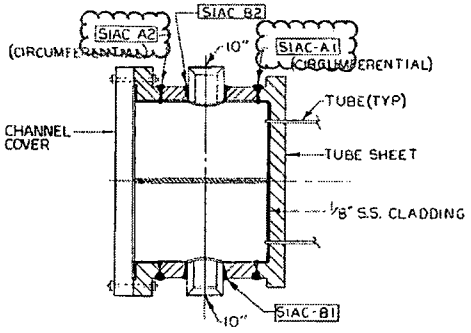
The relief is requested for the fourth ten-year inspection interval for Millstone Power Station Unit 2, which began on April 1, 2010 and will end March 31, 2020.



CHANNEL COVER BOLTING



ELEVATION



VIEW A-A

ZONE 2-03

Q.A.

CAD
NOTE: MANUAL REVISIONS TO THIS DOCUMENT WHEN AS-BUILT ARE PROHIBITED.

REVISIONS DURING CONSTRUCTION

NO.	REVISIONS	BY	CHK	APP	APP
N/A	3 PER DCN DM2-S-0425-98 & PER DCR M2-S-0140-98	MCR	FSD	RAS	RAS

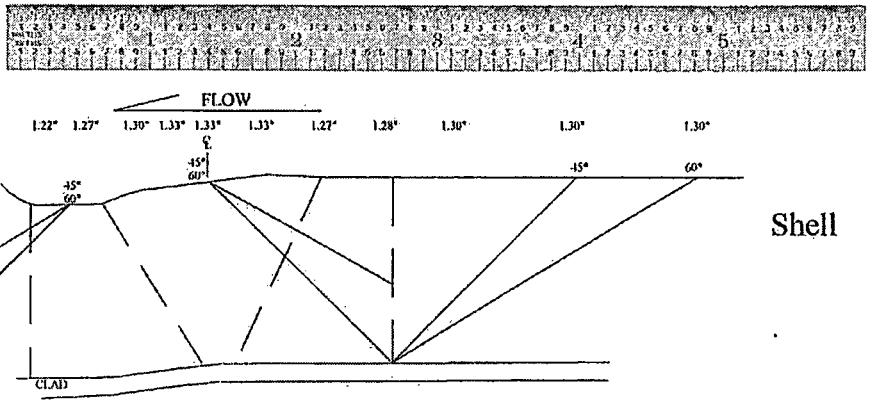
Dominion Nuclear Connecticut, Inc.
Millstone Power Station

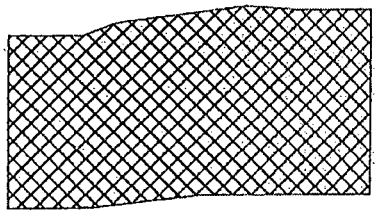
TITLE: MILLSTONE NUCLEAR POWER STATION - UNIT 2
SHUTDOWN HEAT EXCHANGER X-23A
INSERVICE INSPECTION PROGRAM
WATERFORD, CT.

BY	CHKD.	APP.	APP.
MCR	FSD	RAS	RAS
DATE 5/19/98	DATE 5/21/98	DATE 5-24-98	DATE 5-24-98

SCALE NONE | DWG. NO. 25203-20165 | N/A

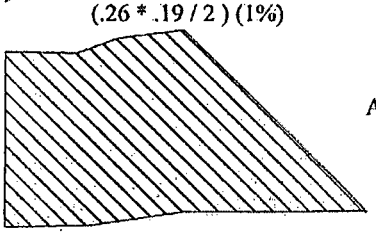
Scale 1" = 1.32"





Required Examination Volume-3.217 Sq. Inches

Axial Examination Downstream Area of No Coverage - .0215 Sq Inches. (.26 * .19 / 2) (1%)



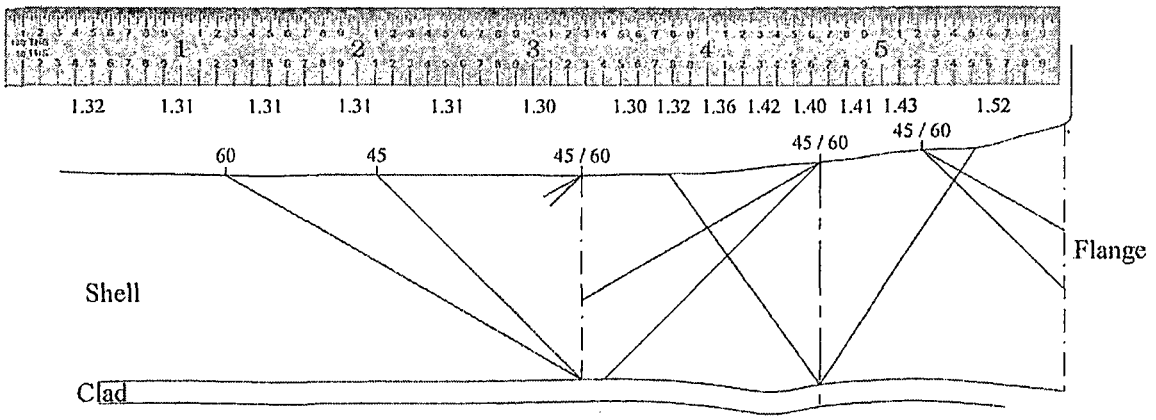
Axial Examination Upstream Area of No Coverage - 2.33 Sq Inches. (73%)

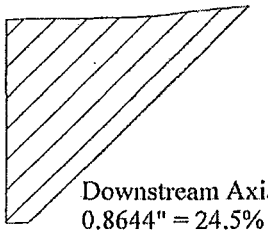
(Area dimensions determined with TurboCAD 19)

Examination Volume Dimensions: Length 140" x Width 2.55" x Height 1.33" Weld Thickness= 1.20" Weld Length= 140" Weld Width= 1.55"				
(US-27%+DS-99%+CW-100%+CCW-100%)/4=100%				
Coverage Summary- Weld # SIAC-A1				
	Required Scans- each has a weighing factor of 100% for complete coverage			
Angle	Upstream-Axial	Upstream- Circ.	Downstream Axial	Downstream Circ.
45/60	27%	100%	99%	100%
			Code Coverage Total	81.5%
		Best Effort Coverage (Max 25%) Total		

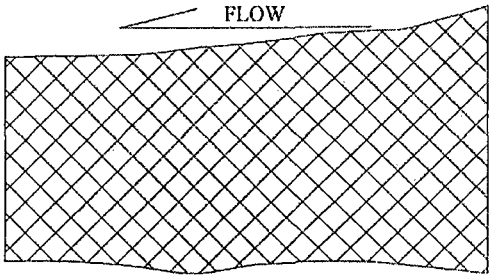
Notes:

1. Code Coverage refers to the maximum percentage of the required examination volume that is effectively examined with the qualified examination procedure

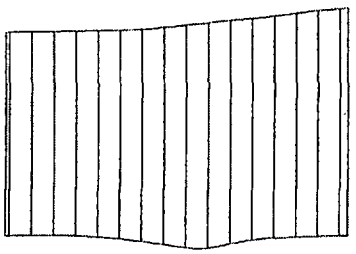




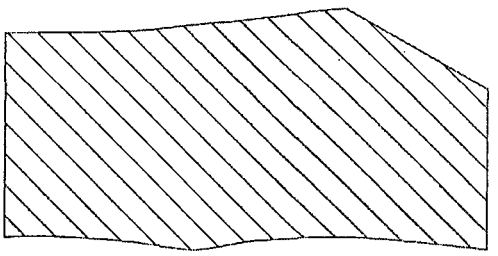
Downstream Axial Coverage
0.8644" = 24.5%



Code Examination Volume
3.5261"



CW / CCW Coverage
2.4145" = 68.5%



Upstream Axial Coverage
3.301" = 93.6%

Examination Volume Dimensions: Length 140" x Width 2.75" x Height 1.40"
Weld Thickness= 1.40" Weld Length= 140" Weld Width= 1.75"

(US-93.6%+DS-24.5%+CW-68.5%+CCW-68.5%) = 255.1/4=63.8%

Coverage Summary- Weld # SIAC-A2

	Required Scans- each has a weighing factor of 100% for complete coverage			
Angle	**Upstream-Axial**	**CW - Circ.**	**Downstream-Axial**	**CCW - Circ.**
45/60	93.6%	68.5%	24.5%	68.5%
			Code Coverage Total	**63.8%**
		Best Effort Coverage (Max 25%) Total		

Notes:

1. **Code Coverage refers to the maximum percentage of the required examination volume that is effectively examined with the qualified examination procedure**

ATTACHMENT 3

RELIEF REQUEST RR-04-19
EXAMINATION CATEGORY R-A
RISK INFORMED PIPING EXAMINATIONS

DOMINION NUCLEAR CONNECTICUT, INC.
MILLSTONE POWER STATION UNIT 2

Relief Requested
In Accordance with 10 CFR 50.55a(g)(5)(iii)

Inservice Inspection Impracticality

1. ASME Code Components Affected:

ASME Code Class:	Code Class 1
Examination Category:	R-A, Risk Informed Piping Examinations
Item Numbers:	R1.11, Elements Subject to Thermal Fatigue R1.20, Elements Not Subject to a Damage Mechanism
Component Identification:	Listed in Table 1
Material:	Listed in Table 1

2. Applicable Code Addition and Addenda

ASME Section XI, 2004 Edition, No Addenda

3. Applicable Code Requirement

The examination requirements for Class 1 and Class 2 piping welds are governed by the Risk Informed Inservice Inspection program that was approved by the NRC in a letter dated March 27, 2012 (Adams Accession Number ML120800433). The program was developed in accordance with ASME Code Case N-716, "Alternative Piping Classification and Examination Requirements." Code Case N-716, Table 1, Examination Category R-A, requires that essentially 100 percent (%) of the weld volume be examined. The alternative requirements of ASME Code Case N-460, approved for use in Regulatory Guide 1.147, Rev. 17, allows credit for essentially 100% coverage provided greater than 90% of the required volume has been examined.

4. Impracticality of Compliance

Pursuant to 10 CFR 50.55a(g)(5)(iii), relief is requested from the 100% volumetric examination coverage requirement for the subject austenitic welds due to the geometric configuration which limits the volumetric coverage that can be obtained.

The subject welds were examined with a manual ultrasonic technique using pulse echo ultrasonic instruments and search units to achieve the maximum examination

coverage practical. Examinations were performed using personnel, equipment and procedures qualified in accordance with ASME Section XI, Appendix VIII as implemented by the Performance Demonstration Initiative (PDI).

There are currently no PDI qualified single-side examination procedures that demonstrate equivalency to two-sided examination procedures on austenitic piping welds. Current technology is not capable of reliably detecting or sizing flaws on the far side of an austenitic weld for configurations common to U.S. nuclear applications.

PDI Performance Demonstration Qualification Summary (PDQS) certificates for austenitic piping list the limitation that single side examination is performed on a best effort basis. The best effort qualification is provided in place of a complete single side qualification to demonstrate that the examiners qualification and the subsequent weld examination is based on application of the best available technology.

When the examination area is limited to one side of an austenitic weld, examination coverage does not comply with 10 CFR 50.55a(b)(2)(xv)(A) and proficiency demonstrations do not comply with 10 CFR 50.55a(b)(2)(xvi)(B) and full coverage credit may not be claimed.

The ASME code required volume of these welds was interrogated ultrasonically to the maximum extent possible. No alternative techniques or advanced technologies were considered capable of obtaining complete coverage of the examination volume.

Subject welds BPY-C-1063-A, BPY-C-1065-A, BPY-C-3070-A, and BPY-C-3072-A were performed as pre-service examinations of new piping welds associated with valve replacements. These welds consist of pipe-to-valve configurations in which the taper of the valve is within close proximity of the weld and there is not sufficient distance between the weld and valve to perform any circumferential or axial scanning on that side of the weld. The examinations are limited to scanning from the pipe side only resulting in a total coverage of 50% for each weld. Supplemental scanning was performed to provide additional best effort (non-code) coverage using a 70 degree shear wave search unit as documented in the enclosed coverage calculation for each weld. Additionally, a liquid penetrant surface examination and radiographic examination was performed on these new welds where 100% coverage was obtained with acceptable results.

Subject weld BPY-C-5019-A consists of a pipe-to-tee where the radius of the tee is within close proximity of the weld and does not provide sufficient distance from the tee to the weld to perform complete axial scanning on this side of the weld. Examination in the area of the radius of the tee is limited to axial scanning from the pipe side only resulting in total code coverage of 82.5 %. Supplemental scanning was performed to provide additional best effort (non-code) coverage using a 70

degree shear wave search unit as documented in the enclosed coverage calculation for this weld. Additionally, there were six other selected welds within the charging system susceptible to the same degradation mechanism (R1.11, Elements Subject to Thermal Fatigue) for which examinations have been completed with essentially 100% coverage obtained. There were no unacceptable flaws detected during these examinations.

Subject weld BSI-C-3004 consists of a pipe-to-elbow configuration. There is a weld overlay on an adjacent weld that extends to within close proximity of the subject weld and there is not sufficient distance between the weld overlay and elbow side of the weld to perform complete axial scanning from the elbow side. Examination in the area of the elbow restricted by the adjacent weld overlay is limited to scanning from the pipe side only, resulting in a total code coverage of 90%. Supplemental scanning was performed to provide additional best effort (non-code) coverage using a 60 degree longitudinal wave search unit as documented in the enclosed coverage calculation for this weld. Additionally, there were four other selected welds within the safety injection system susceptible to the same degradation mechanism (R1.11, Elements Subject to Thermal Fatigue) for which examinations have been completed with essentially 100% coverage obtained. There were no unacceptable flaws detected during these examinations.

Since the configuration of the piping limits access to a single side, relief is requested for complying with the 100% required examination coverage for the piping welds listed in Table 1. Note that examination coverage listed in Table 1 is that which was obtained during examination with no credit taken for the far side of each weld.

Coverage calculations are provided in this attachment.

Table 1- Examination Category R-A Welds with Limited Volumetric Coverage					
Weld Identification	**Code Item #**	**System / Code Class Configuration Material**	**Examination Angle and Wave Mode**	**Limitations and Results**	**Examination Coverage (%)**
BPY-C-5019-A	R1.11	Charging / Class 1 4" Pipe-to-Tee Type 316 Stainless Steel, Schedule 120	45° Shear Wave 60° Shear Wave 70° Shear Wave	Examination limited on the downstream side due to obstruction of Tee. One recordable indication detected and evaluated as acceptable ID root geometry.	82.5%
BSI-C-3004	R1.11	Safety Injection / Class 1 12" Pipe-to-Elbow Type 316 Stainless Steel, Schedule 140	45° Shear Wave 60° Shear Wave 60° Long Wave	Examination limited on the downstream side due to close proximity of adjacent weld overlay. No recordable indications were detected.	90%
BPY-C-1063-A	R1.20	Reactor Coolant / Class 1 3" Pipe-to-Valve Type 316 Stainless Steel, Schedule 160	45° Shear Wave 60° Shear Wave 70° Shear Wave	This was a pre-service examination associated with a new weld. Examination limited to the pipe side due to the taper of the valve within close proximity of the weld. There is not sufficient distance between the weld and valve to perform any scanning on the valve side of the weld. No recordable indications were detected.	50%

Table 1- Examination Category R-A Welds with Limited Volumetric Coverage

Weld Identification	Code Item #	System / Code Class Configuration Material	Examination Angle and Wave Mode	Limitations and Results	Examination Coverage (%)
BPY-C-1065-A	R1.20	Reactor Coolant / Class 1 3" Valve-to-Pipe Type 316 Stainless Steel, Schedule 160	45° Shear Wave 60° Shear Wave 70° Shear Wave	This was a pre-service examination associated with a new weld. Examination limited to the pipe side due to the taper of the valve within close proximity of the weld. There is not sufficient distance between the weld and valve to perform any scanning on the valve side of the weld. No recordable indications were detected.	50%
BPY-C-3070-A	R1.20	Reactor Coolant / Class 1 3" Pipe-to-Valve Type 316 Stainless Steel, Schedule 160	45° Shear Wave 60° Shear Wave 70° Shear Wave	This was a pre-service examination associated with a new weld. Examination limited to the pipe side due to the taper of the valve within close proximity of the weld. There is not sufficient distance between the weld and valve to perform any scanning on the valve side of the weld. No recordable indications were detected.	50%

Table 1- Examination Category R-A Welds with Limited Volumetric Coverage					
Weld Identification	**Code Item #**	**System / Code Class Configuration Material**	**Examination Angle and Wave Mode**	**Limitations and Results**	**Examination Coverage (%)**
BPY-C-3072-A	R1.20	Reactor Coolant / Class 1 3" Pipe-to-Valve Type 316 Stainless Steel, Schedule 160	45° Shear Wave 60° Shear Wave 70° Shear Wave	This was a pre-service examination associated with a new weld. Examination limited to the pipe side due to the taper of the valve within close proximity of the weld. There is not sufficient distance between the weld and valve to perform any scanning on the valve side of the weld. No recordable indications were detected.	50%

5. Burden Caused by Compliance

Compliance with the Code requirements would require extensive modification or replacement of components with a design that would allow full examination from both sides of the weld which is considered to be impractical due to cost, additional radiation exposure and impact to plant equipment.

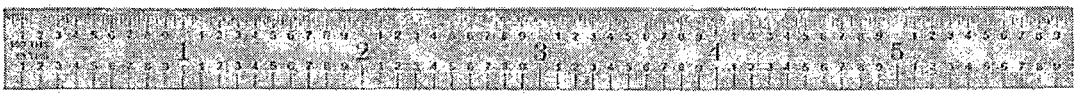
6. Proposed Alternative and Basis for Use

The subject welds received a volumetric examination to the maximum extent practical utilizing the best available techniques, as qualified through the Performance Demonstration Initiative (PDI) for Supplement 2 with demonstrated best effort for single-sided examination from the accessible side of the weld. Additionally, a visual (VT-2) examination is performed at the end of each refuel outage during the system leakage tests as required by Section XI, Table IWB-2500-1, Category B-P.

Based on the volumetric coverage that was obtained with acceptable results, and the visual (VT-2) examination performed each refueling outage, it is reasonable to conclude that service induced degradation would be detected. Therefore, these proposed alternatives will provide an acceptable level of quality and safety by providing reasonable assurance of structural integrity of the subject welds.

7. Duration of Proposed Alternative

Relief is requested for the fourth ten-year inspection interval for Millstone Power Station Unit 2, which began on April 1, 2010 and ends March 31, 2020.



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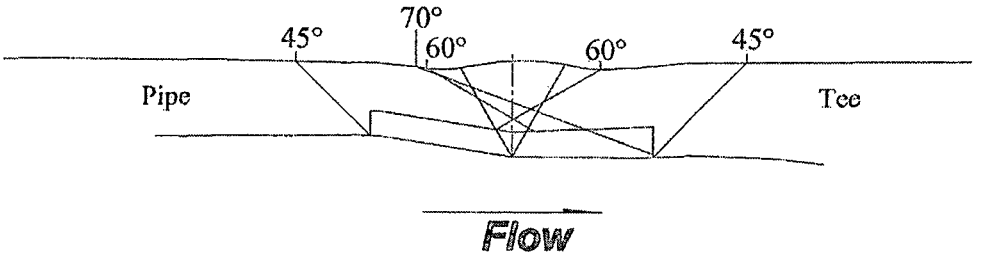


Required Exam Volume - 0.2334"
(1.6 * .155 = 0.248")

Far Side Required Exam Volume - 0.1235"
(0.8 * .155 = 0.124")

Volume Examined on Far Side - 0.094" (76.1%)
(Best Effort)

Far side exam volume limited for 10" due to tee configuration.
Limited area scanned with 2.25MHz 70° for best effort coverage
(Area dimensions determined with TurboCAD 19)

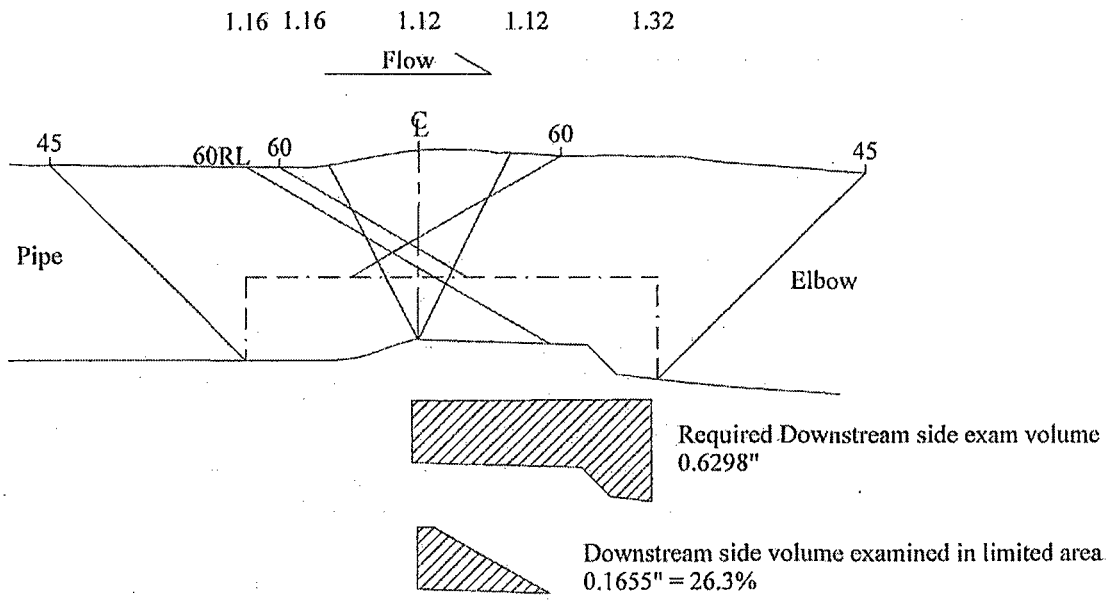
Examination Volume Dimensions: Length 14.25" x Width 1.6" x Height .155"
Weld Thickness= .54" Weld Length= 14.25" Weld Width= .6"

Coverage Summary- Weld # BPY-C-5019-A

	Required Scans- each has a weighing factor of 100% for complete coverage			
Angle	Upstream-Axial	Upstream- Circ.	Downstream Axial	Downstream Circ.
45/60	100%	100%	30%	100%
70			53.2% (best effort)	
			Code Coverage Total	**82.5%**
	100+100+30+100=330/4=82.5		**Best Effort Coverage (Max 25%) Total**	**13.3%**

Notes:

1. **Code Coverage refers to the maximum percentage of the required examination volume that is effectively examined with the qualified examination procedure**
2. **Best Effort Coverage refers to the required examination volume past the centerline that is examined in the axial beam direction with an Appendix VIII demonstrated procedure for single sided coverage**



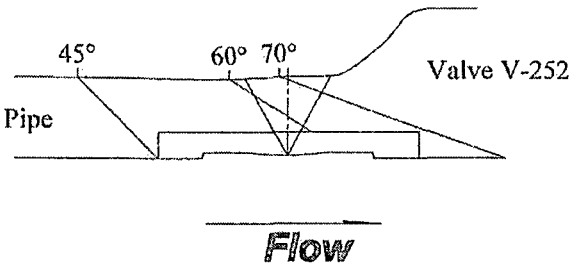
Downstream side exam volume limited for 8" due to Weld Overlay.
Limited area scanned with 60°RL for best effort coverage
(Area dimensions determined with TurboCAD 19)

Examination Volume Dimensions: Length 40.0" x Width 2.48" x Height .37" Weld Thickness= 1.12" Weld Length= 40.0" Weld Width= 1.1"				
Coverage Summary- Weld # BSI-C-3004				
	Required Scans- each has a weighing factor of 100% for complete coverage			
Angle	**Upstream-Axial**	**Upstream- Circ.**	**Downstream Axial**	**Downstream Circ.**
45	100%	100%	80%	80%
60 RL			5.26% (Best Effort)	
			Code Coverage Total	**90%**
	100+100+80+80=360/4=90%		**Best Effort Coverage (Max 25%) Total**	**1.3%**

Notes:

1. **Code Coverage refers to the maximum percentage of the required examination volume that is effectively examined with the qualified examination procedure**
2. **Best Effort Coverage refers to the required examination volume past the centerline that is examined in the axial beam direction with an Appendix VIII demonstrated procedure for single sided coverage**

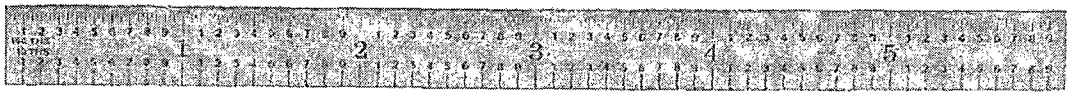
.45 .42 .45 NR



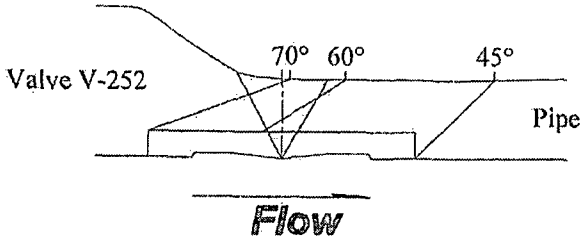
Examination Volume Dimensions: Length 11" x Width 1.5" x Height .15" Weld Thickness= .45" Weld Length= 11" Weld Width= .50"				
Coverage Summary- Weld # BPY-C-1063-A				
	Required Scans- each has a weighing factor of 100% for complete coverage			
Angle	**Upstream-Axial**	**Upstream- Circ.**	**Downstream Axial**	**Downstream Circ.**
45/60	100%	100%	0%	0%
70			100%(Best Effort)	
			Code Coverage Total	**50%**
	100+100+0+0=200/4=50%		**Best Effort Coverage (Max 25%) Total**	**25%**

Notes:

1. **Code Coverage refers to the maximum percentage of the required examination volume that is effectively examined with the qualified examination procedure**
2. **Best Effort Coverage refers to the required examination volume past the centerline that is examined in the axial beam direction with an Appendix VIII demonstrated procedure for single sided coverage**



NR .45 .417 .445



Examination Volume Dimensions: Length 11" x Width 1.5" x Height .15"
Weld Thickness= .45" Weld Length= 11" Weld Width= .50"

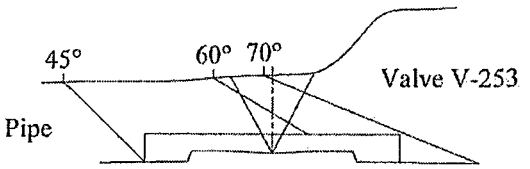
Coverage Summary- Weld # BPY-C-1065-A

	Required Scans- each has a weighing factor of 100% for complete coverage			
Angle	Upstream-Axial	Upstream- Circ.	Downstream Axial	Downstream Circ.
45/60	0%	0%	100%	100%
70	100%(Best Effort)			
			Code Coverage Total	50%
	100+100+0+0=200/4=50%		Best Effort Coverage (Max 25%) Total	25%

Notes:

1. **Code Coverage refers to the maximum percentage of the required examination volume that is effectively examined with the qualified examination procedure**
2. **Best Effort Coverage refers to the required examination volume past the centerline that is examined in the axial beam direction with an Appendix VIII demonstrated procedure for single sided coverage**

.47 .43 .45 NR

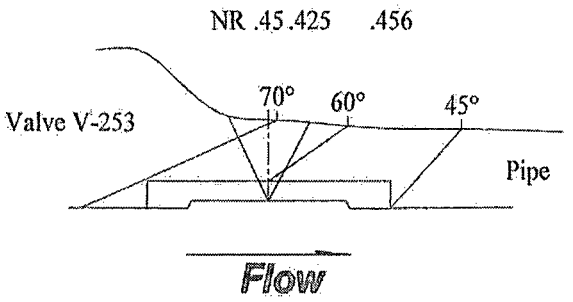


Flow

Examination Volume Dimensions: Length 11" x Width 1.5" x Height .15" Weld Thickness= .45" Weld Length= 11" Weld Width= .50"				
Coverage Summary- Weld # BPY-C-3070-A				
	Required Scans- each has a weighing factor of 100% for complete coverage			
Angle	Upstream-Axial	Upstream- Circ.	Downstream Axial	Downstream Circ.
45/60	100%	100%	0%	0%
70			100%(Best Effort)	
			Code Coverage Total	50%
	100+100+0+0=200/4=50%		Best Effort Coverage (Max 25%) Total	25%

Notes:

1. **Code Coverage refers to the maximum percentage of the required examination volume that is effectively examined with the qualified examination procedure**
2. **Best Effort Coverage refers to the required examination volume past the centerline that is examined in the axial beam direction with an Appendix VIII demonstrated procedure for single sided coverage**



Examination Volume Dimensions: Length 11" x Width 1.5" x Height .15" Weld Thickness= .45" Weld Length= 11" Weld Width= .50"				
Coverage Summary- Weld # BPY-C-3072-A				
	Required Scans- each has a weighing factor of 100% for complete coverage			
Angle	Upstream-Axial	Upstream- Circ.	Downstream Axial	Downstream Circ.
45/60	0%	0%	100%	100%
70	100%(Best Effort)			
			Code Coverage Total	50%
	0+0+100+100=200/4=50%		Best Effort Coverage (Max 25%) Total	25%

Notes:

1. **Code Coverage refers to the maximum percentage of the required examination volume that is effectively examined with the qualified examination procedure**
2. **Best Effort Coverage refers to the required examination volume past the centerline that is examined in the axial beam direction with an Appendix VIII demonstrated procedure for single sided coverage**