Dominion Nuclear Connecticut, Inc.
5000 Dominion Boulevard, Glen Allen, VA 23060
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Dominion®

July 30, 2015

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

Serial No. 15-313
NLOS/WDC R0
Docket No. 50-423
License No. NPF-49

DOMINION NUCLEAR CONNECTICUT, INC.
MILLSTONE POWER STATION UNIT 3
ASME SECTION XI INSERVICE INSPECTION PROGRAM
RELIEF REQUESTS FOR LIMITED COVERAGE EXAMINATIONS PERFORMED IN THE THIRD 10-YEAR INSPECTION INTERVAL

The Millstone Power Station Unit 3 (MPS3) third 10-year interval for the inservice inspection program began on April 23, 2009. During the first inspection period of this interval, the components identified in Attachments 1 through 5 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 5 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 IR-3-19 – Examination Category B-A, Pressure Retaining Welds in Reactor Vessel
2. Relief Request IR-3-20 - Examination Category B-D, Full Penetration Welded Nozzles in Vessels - Inspection Program B.
3. Relief Request IR-3-21, Examination Category C-A, Pressure Retaining Welds in Pressure Vessels.
4. Relief Request IR-3-22, Examination Category C-F-1, Pressure Retaining Welds in Austenitic Stainless Steel High Alloy Piping.
5. Relief Request IR-3-23, Examination Category C-F-2, Pressure Retaining Welds in Carbon or Low Alloy Steel Piping.

Commitments made in this letter: None

cc: U.S. Nuclear Regulatory Commission
Region I
2100 Renaissance Blvd, Suite 100
King of Prussia, PA 19406-2713

R. V. Guzman
Senior Project Manager
U.S. Nuclear Regulatory Commission
One White Flint North, Mail Stop 08-C 2
11555 Rockville Pike
Rockville, MD 20852-2738

NRC Senior Resident Inspector
Millstone Power Station

ATTACHMENT 1

RELIEF REQUEST IR-3-19
EXAMINATION CATEGORY B-A
PRESSURE RETAINING WELDS IN REACTOR VESSEL

DOMINION NUCLEAR CONNECTICUT, INC.
MILLSTONE POWER STATION UNIT 3

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-A, Pressure Retaining Welds in Reactor Vessel
Item Numbers:	B1.40, Head-to-Flange Weld
Component Identification:	Listed in Table 1
Material:	SA533, GR B, CL 1/SA508, CL 1

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-A requires volumetric examination of 100 percent (%) of the weld volume as defined in ASME Section XI Table IWB-2500-1 and shown in Figure IWB 2500-5. 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 weld 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 weld due to the design of the reactor vessel head with the geometric configuration and permanent obstructions which limit the volumetric coverage that can be obtained.

The reactor vessel head-to-flange weld was examined with a manual ultrasonic technique using pulse echo ultrasonic instruments and search units to achieve the maximum examination coverage practical. No alternative techniques or advanced technologies were considered capable of obtaining complete coverage of the examination volume.

The geometric configuration and permanent obstructions limit the volumetric examination of the subject weld to approximately 81.2 % coverage using the most current examination technology. Access to this weld is limited on one side due to the taper of the flange that is within close proximity to the weld. There is not sufficient distance from the weld to the flange to perform complete scanning on this side of the weld. Additionally, obstructions exist on the top side of the weld due to three permanently attached head lifting lugs that are 8.25 inches wide and located 10.75 inches from the centerline of the weld that restrict scanning on this side of the weld. Based on the configuration and the permanent obstructions, relief is requested from complying with 100% required examination coverage of this weld.

Additionally, a surface magnetic particle examination was performed. One hundred percent coverage was obtained with one recordable indication detected that was evaluated as acceptable in accordance with the acceptance standards of ASME Section XI, IWB-3510.3.

Isometric drawing(s) and coverage calculations are provided in this attachment.

TABLE 1- Examination Category B-A Weld with Limited Volumetric Coverage

Weld Identification	Code Item #	Configuration	Examination Angle and Wave Mode	Limitations and Results	Examination Coverage (%)	Surface Examination Results
101-101	B1.40	Closure Head-to-Flange Weld	0° Longitudinal Wave 45° Shear Wave 60° Shear Wave	Examination limited due to the flange taper and permanently attached lifting lugs that restrict scanning in these areas. No recordable indications were detected.	81.2%	Magnetic particle examination performed obtaining 100 percent coverage. One indication was detected that was evaluated as acceptable per ASME Section XI, IWB-3510.

5. Burden Caused by Compliance

To increase examination coverage on the subject weld 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.

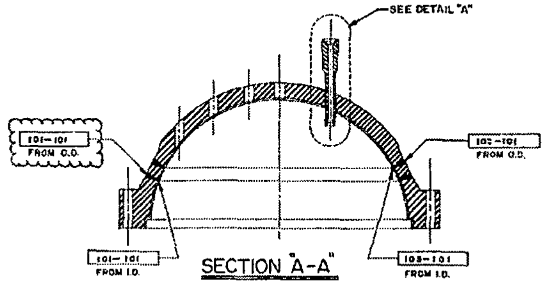
6. Proposed Alternative and Basis for Use

The subject weld received a volumetric examination on the accessible portions of the welds to the maximum extent practical given the limitations caused by the geometric configuration and permanent obstructions. Additionally, a surface examination was performed with 100% coverage obtained, and a visual (VT-2) examination is performed at the end of each refueling outage during the system leakage tests as required by Section XI, IWB-2500-1, Category B-P.

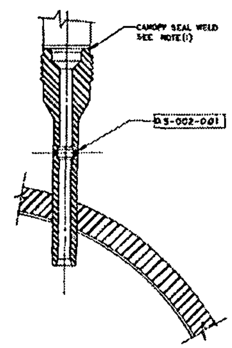
Based upon the examination volume that was obtained with acceptable results, a surface examination obtaining 100% coverage, and the visual (VT-2) examination performed each refueling outage, it is reasonable to conclude that service induced degradation would be detected. Therefore, these proposed alternatives will provide an acceptable level of quality and safety by providing reasonable assurance of structural integrity of the subject welds.

7. Period for Which Relief is Requested

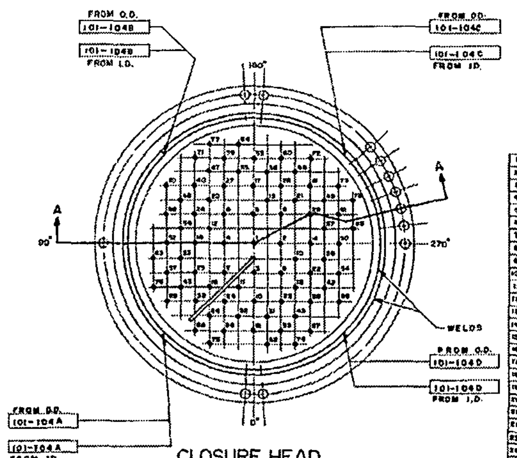
The relief is requested for the third ten-year inspection interval for Millstone Power Station Unit 3, which began on April 23, 2009 and will end April 22, 2019.



SECTION "A-A"



DETAIL "A-A"



CLOSURE HEAD
TOP VIEW

CRMH WELD DESIGNATIONS

	03-002-001		03-002-001		03-002-001
1	-1	27	-27	53	-53
2	-2	28	-28	54	-54
3	-3	29	-29	55	-55
4	-4	30	-30	56	-56
5	-5	31	-31	57	-57
6	-6	32	-32	58	-58
7	-7	33	-33	59	-59
8	-8	34	-34	60	-60
9	-9	35	-35	61	-61
10	-10	36	-36	62	-62
11	-11	37	-37	63	-63
12	-12	38	-38	64	-64
13	-13	39	-39	65	-65
14	-14	40	-40	66	-66
15	-15	41	-41	67	-67
16	-16	42	-42	68	-68
17	-17	43	-43	69	-69
18	-18	44	-44	70	-70
19	-19	45	-45	71	-71
20	-20	46	-46	72	-72
21	-21	47	-47	73	-73
22	-22	48	-48	74	-74
23	-23	49	-49	75	-75
24	-24	50	-50	76	-76
25	-25	51	-51	77	-77
26	-26	52	-52	78	-78

REFERENCE DRAWINGS:

REF. Nº	COMBUSTION ENGINEERING DWG. Nº
1	E-7272-101-001 REV. 01
2	E-7272-101-005 REV. 03
3	E-7272-113-002 REV. 02
4	E-7272-161-003 REV. 02

NOTES:
1. AUGMENTED ISI EXAMINATION PER IEN 86-108

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

Q.A.

REVISIONS DURING CONSTRUCTION

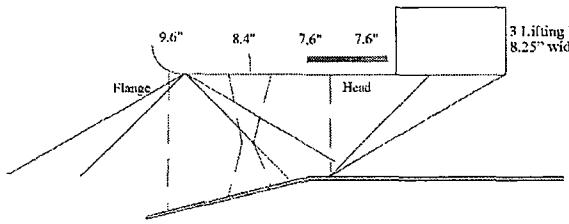
P.A.#	NO	DATE	REVISIONS	BY	CHK	APP	APP
N/A	3	10/90	AS BUILT PER DCR-M3-S-1444-89				
N/A	2		AS-BUILT PER DCR-M3-S-775-86				
79-236	1		AS-BUILT PER DCR-M3-S-091-86				

NORTHEAST UTILITIES SERVICE CO.
FOR NORTHEAST NUC. ENERGY CO.

TITLE MILLSTONE NUC. PWR. STA. UNIT 3
REACTOR VESSEL - ZONE 002
CLOSURE HEAD

DR L.E.LOPEZ | CHKD RFB | APP | APP
DATE 1/5/83 | DATE 3/7/83 | DATE 3/8/83 | DATE 2/8/83
SCALE NONE | AREA 1 | DWG NO 25212-20900 SH. 3 OF 3
P.A.# 79-236

Component ID: 101-101



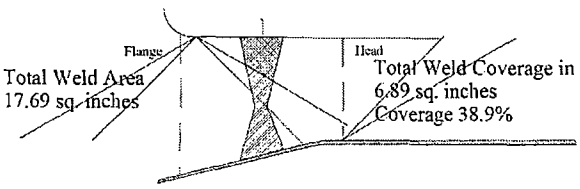
Weld Coverage

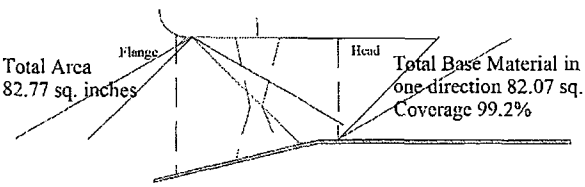
Head Side Weld
0 deg.=100%
45 deg.=100%
60 deg.=95.4%

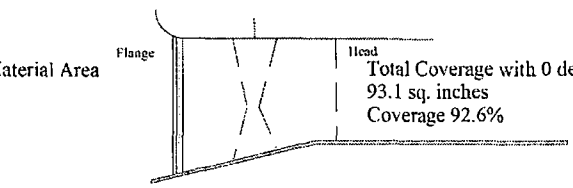
Flange Side Weld
0 deg.=100%
45 deg. =53.0%
60 deg.=38.9%

CW Weld
0 deg.=100%
45 deg.=100%
60 deg.=100%

CCW Weld
0 deg.=100%
45 deg.=100%
60 deg.=100%







0 deg. Weld and Base Material Area
100.46 sq. inches

Base Material Coverage

Head Side Base Material
0 deg.=92.6%
45 deg.=99.5%
60 deg.=93.6%

Flange Side Base Material
0 deg.=92.6%
45 deg.= 51.1%
60 deg.= 31.9%

CW Base Material
0 deg.=92.6%
45 deg.=92.6%
60 deg.=92.6%

CCW Base Material
0 deg.=92.6%
45 deg.=92.6%
60 deg.=92.6%

Examination Coverage Summary

Weld Volume =[38.9% (Perpendicular scan)+100% (Parallel scan)]/2=69.4%
Base Material Volume=[93.6%(Perpendicular scan)+92.6%(Parallel scan)]/2=93.1%
Total Coverage = 81.2%

ATTACHMENT 2

RELIEF REQUEST IR-3-20
EXAMINATION CATEGORY B-D
FULL PENETRATION WELDED NOZZLES IN VESSELS –
INSPECTION PROGRAM B

DOMINION NUCLEAR CONNECTICUT, INC.
MILLSTONE POWER STATION UNIT 3

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:	B3.110, Pressurizer, Nozzle-to-Vessel Welds B3.130, Steam Generator (Primary Side), Nozzle-to-Vessel Welds
Component Identification:	Listed in Table 1
Material:	Pressurizer: Head – SA533, GR A, CL2 Carbon Steel Nozzle – SA508, CL2 Carbon Steel Internal surface clad with stainless steel Steam Generator: Head – SA533, GR B, CL1 Carbon Steel Nozzle – SA508, CL2 Carbon Steel Internal surface clad with stainless steel

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 figures IWB-2500-7(a) – (d). 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 steam generator nozzle-to-head welds, and the pressurizer spray and safety nozzle-to-head welds were examined with a manual ultrasonic technique using pulse echo ultrasonic instruments and search units to achieve the maximum examination coverage practicable. 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 (%)
03-003-SW-U	B3.130	Steam Generator Outlet Nozzle-to-Head Weld	0° Longitudinal Wave 45° Shear Wave 60° Shear Wave	Scan limitations due to nozzle configuration restricting the scans from the nozzle side. No recordable indications were detected.	70.5%
03-003-SW-V	B3.130	Steam Generator Inlet Nozzle-to-Head Weld	0° Longitudinal Wave 45° Shear Wave 60° Shear Wave	Scan limitations due to nozzle configuration restricting the scans from the nozzle side. No recordable indications were detected.	70.5%
03-004-SW-U	B3.130	Steam Generator Outlet Nozzle-to-Head Weld	0° Longitudinal Wave 45° Shear Wave 60° Shear Wave	Scan limitations due to nozzle configuration restricting the scans from the nozzle side. No recordable indications were detected.	70.9%
03-004-SW-V	B3.130	Steam Generator Inlet Nozzle-to-Head Weld	0° Longitudinal Wave 45° Shear Wave 60° Shear Wave	Scan limitations due to nozzle configuration restricting the scans from the nozzle side. No recordable indications were detected.	70.9%
03-007-SW-A	B3.110	Pressurizer Safety Nozzle-to-Head Weld	0° Longitudinal Wave 45° Shear Wave 60° Shear Wave	Scan limitations due to nozzle configuration restricting the scans from the nozzle side. No recordable indications were detected.	82%

Weld Identification	Code Item #	Configuration	Examination Angle and Wave Mode	Limitations and Results	Examination Coverage (%)
03-007-SW-E	B3.110	Pressurizer Spray Nozzle-to-Head Weld	0° Longitudinal Wave 45° Shear Wave 60° Shear Wave	Scan limitations due to nozzle configuration restricting the scans from the nozzle side. No recordable indications were detected.	82%

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.

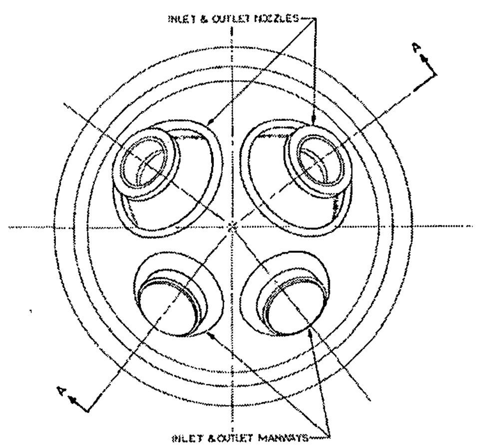
6. Proposed Alternative and Basis for Use

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.

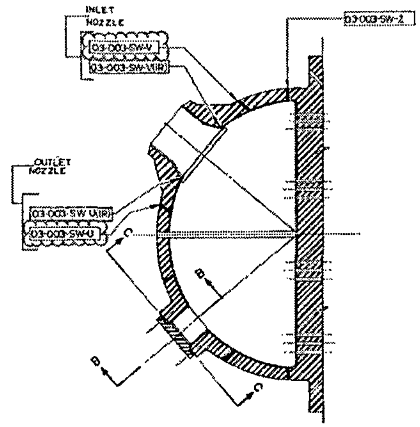
Based upon the examination volumes that were obtained with acceptable results and the visual (VT-2) examination performed each refueling outage, it is reasonable to conclude that service induced degradation would be detected. Therefore, these proposed alternatives will provide an acceptable level of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

7. Duration of Proposed Alternative

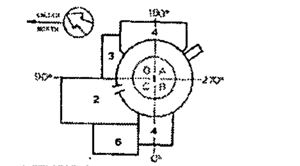
The relief is requested for the third ten-year inspection interval for Millstone Power Station Unit 3, which began on April 23, 2009 and will end April 22, 2019.



BOTTOM VIEW



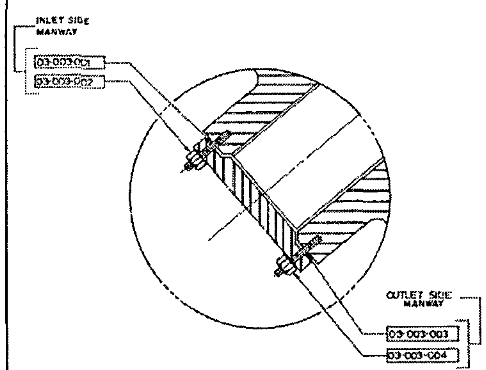
SECTIONAL ELEVATION
SECTION "A-A"



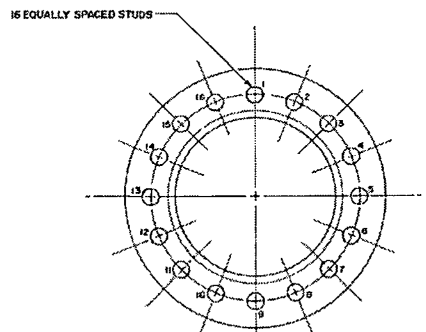
1 REACTOR CONTAINMENT
2 AUXILIARY BUILDING
3 FUEL BUILDING
4 ESF BUILDING & MAIN STEAM VALVE BLDG.
6 CONTROL & SERVICE BLDG.

REFERENCE DRAWINGS:

REF. Nº	WESTINGHOUSE DWG. Nº
1	1106J72 SBW FILE Nº 2221.20-001-005K
2	1182J08 SBW FILE Nº 2221.20-001-007K



MANWAY STUDS DETAIL
SECTION "B-B"



MANWAY STUDS LOCATION
SECTION "C-C"
(TYP.)

INLET SIDE
MANWAY DESIGNATION

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4	4	4
5	5	5
6	6	6
7	7	7
8	8	8
9	9	9
10	10	10
11	11	11
12	12	12
13	13	13
14	14	14
15	15	15
16	16	16

OULET SIDE
MANWAY DESIGNATION

NO	STUD	NUT
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5	5	5
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8	8	8
9	9	9
10	10	10
11	11	11
12	12	12
13	13	13
14	14	14
15	15	15
16	16	16

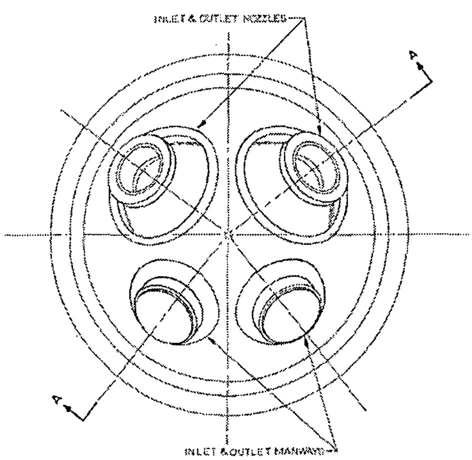
Q.A

NORTHEAST UTILITIES SERVICE CO.
FOR NORTHEAST NUC. ENERGY CO.
TITLE MILLSTONE NUC. PWR. STA. UNIT 3
STEAM GENERATOR 1A (LOOP 1)
ZONE 003

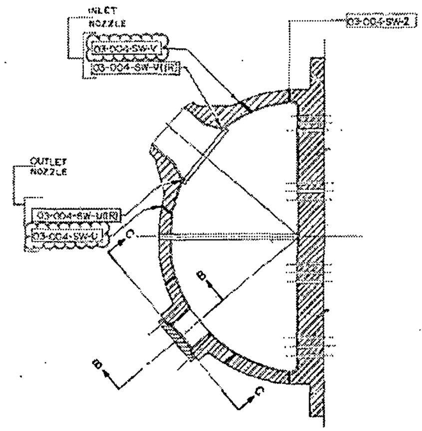
AS-BUILT PER DCR-M3-S-975-83
AS-BUILT PER DCR-M3-S-091-86
REVISIONS

L.E.LOPEZ
SCALE NONE
AREA 1
25212-20901

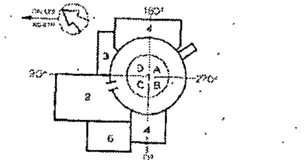
Serial No. 15-313
Docket No. 50-423
Attachment 2, Page 6 of 20



BOTTOM VIEW



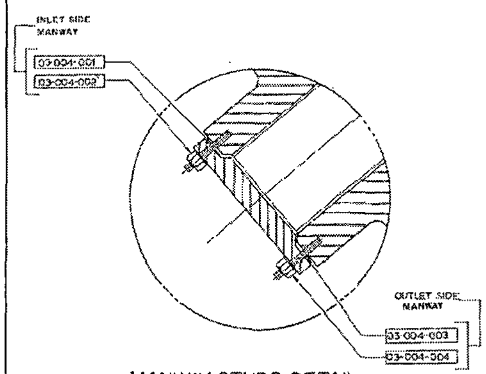
SECTIONAL ELEVATION
SECTION "A-A"



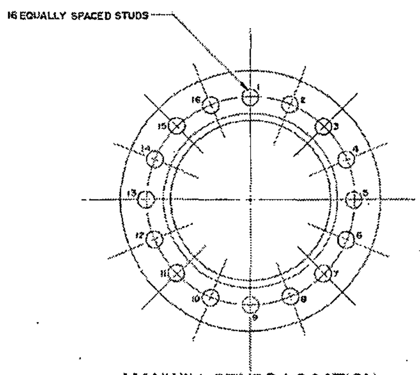
1 REACTOR CONTAINMENT
2 AUXILIARY BUILDING
3 FUEL BUILDING
4 ESF BUILDING & MAIN STEAM VALVE BLDG.
6 CONTROL & SERVICE BLDG.

REFERENCE DRAWINGS:

REF. Nº	WESTINGHOUSE DWG. Nº
1	1105J72 S&W FILE Nº 2221.210-001-005K
2	1182J08 S&W FILE Nº 2221.210-001-007K



MANWAY STUDS DETAIL
SECTION "B-B"



MANWAY STUDS LOCATION
SECTION "C-C"
(TYP.)

INLET SIDE
MANWAY DESIGNATION

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4	4	4
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6	6	6
7	7	7
8	8	8
9	9	9
10	10	10
11	11	11
12	12	12
13	13	13
14	14	14
15	15	15
16	16	16

OULET SIDE
MANWAY DESIGNATION

NO	STUD	NUT
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3	3	3
4	4	4
5	5	5
6	6	6
7	7	7
8	8	8
9	9	9
10	10	10
11	11	11
12	12	12
13	13	13
14	14	14
15	15	15
16	16	16

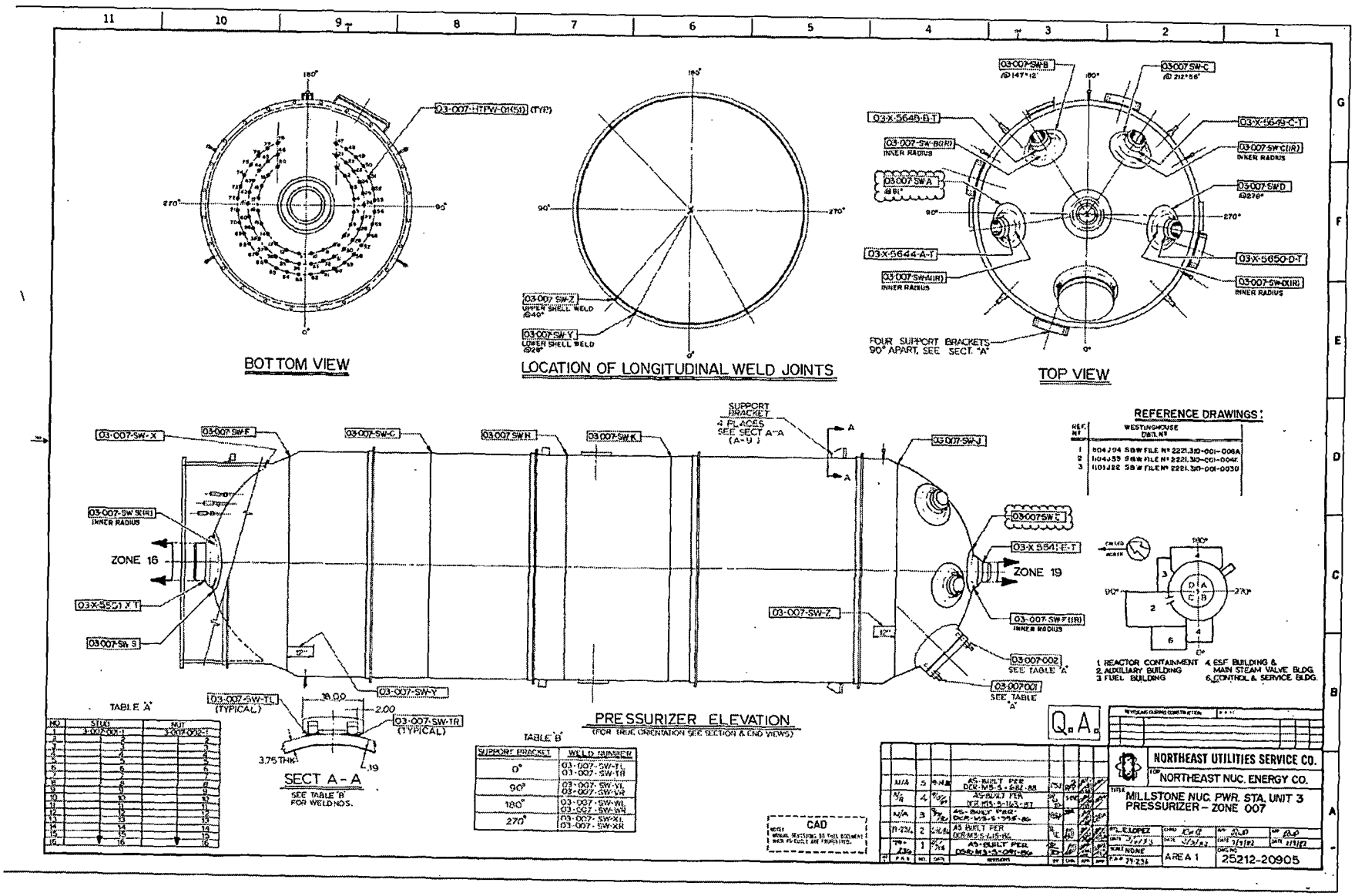
Q.A.

	NO.	DATE	REVISIONS
N/A	2	4/1/86	AS-BUILT PER DCR-M3-S-335-86
	1		AS-BUILT PER DCR-M3-S-091-86

NORTHEAST UTILITIES SERVICE CO.
FOR NORTHEAST NUC. ENERGY CO.
TITLE MILLSTONE NUC. PWR. STA. UNIT 3
STEAM GENERATOR 1B (LOOP2)
ZONE 004

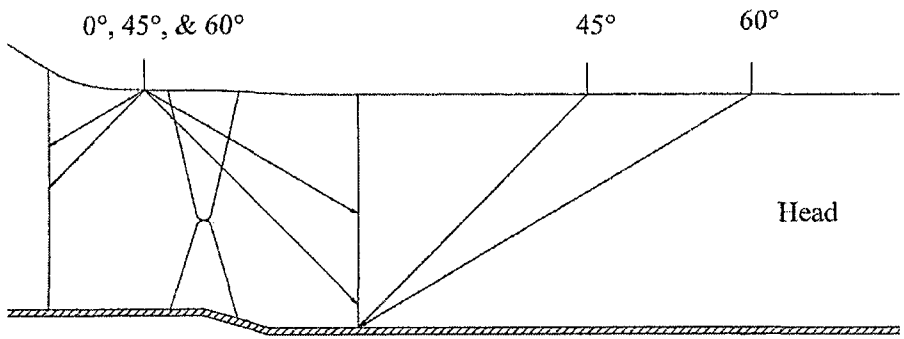
BY L.E. LOPEZ DATE 2-15-83 SCALE NONE
AREA 1
DWG NO 25212-20902

Serial No. 15-313
Docket No. 50-423
Attachment 2, Page 7 of 20



Serial No. 15-313
Docket No. 50-423
Attachment 2, Page 8 of 20

Weld ID: 03-003-SW-U



Weld Coverage

Head Side Weld
0° =100%
45° = 100%
60° = 100%

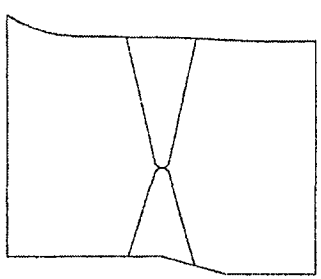
Nozzle Side Weld
0° = 100%
45° = 36.5% 1.4402 sq. in.
60° = 22.9% 0.9037 sq. in.

CW Weld
0° = 100%
45° = 100%
60° = 100%

CCW Weld
0° = 100%
45° = 100%
60° = 100%

Total Weld Examination
Area 3.9438 square inches

Total Weld Examination and Base Material Area
31.2987 sq. in.



Base Material Coverage

Head Side Base Material
0° = 64.5% 17.6404 sq. in
45° = 91.3% 24.9781 sq. in.
60° = 94.5% 25.8427 sq. in.

Nozzle Side Base Material
0° = 64.5% 17.6404 sq. in.
45° = 31.5 % 8.6319 sq. in.
60° = 17.2% 4.7133 sq. in.

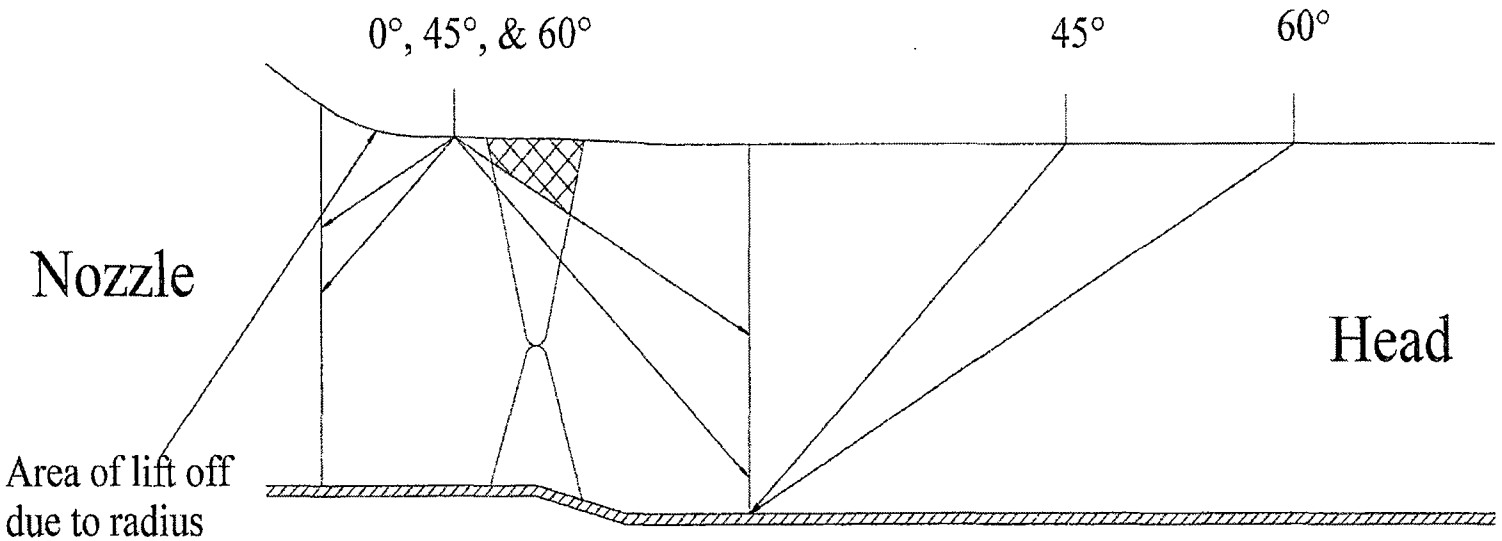
CW Base Material
0° = 64.5% 17.6404 sq. in.
45° = 64.5% 17.6404 sq. in.
60° = 64.5% 17.6404 sq. in.

CCW Base Material
0° = 64.5% 17.6404 sq. in.
45° = 64.5% 17.6404 sq. in.
60° = 64.5% 17.6404 sq. in.

Examination Coverage Summary:

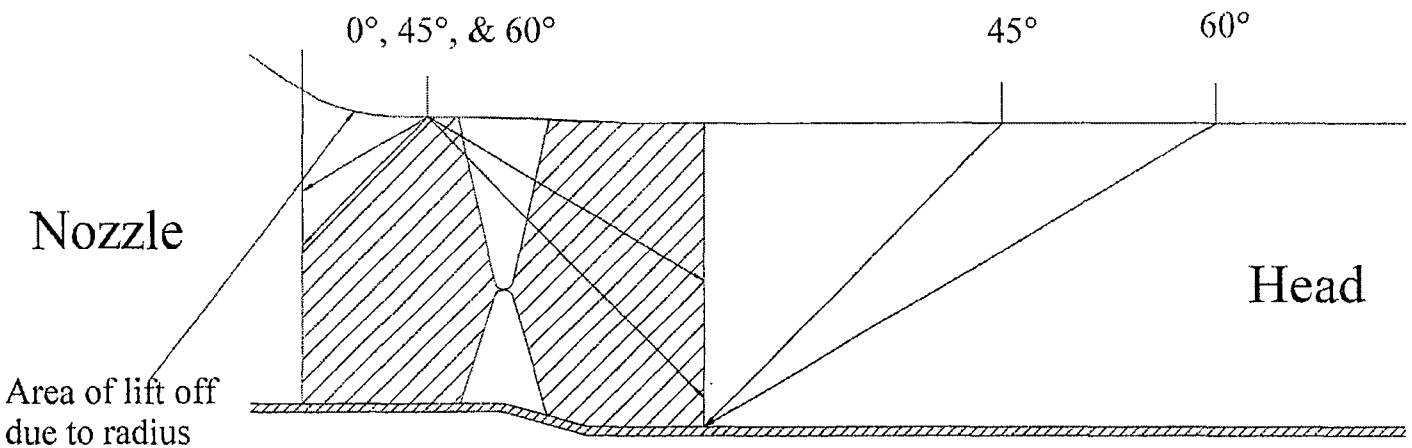
Weld Volume = [22.9% (Perpendicular scan) + 100% (Parallel scan)]/2=61.5%
Base Material Volume =[94.5% (Perpendicular scan) + 64.5% (Parallel scan)]/2=79.5%
Total Coverage = 70.5% Coverage

Weld ID: 03-003-SW-U



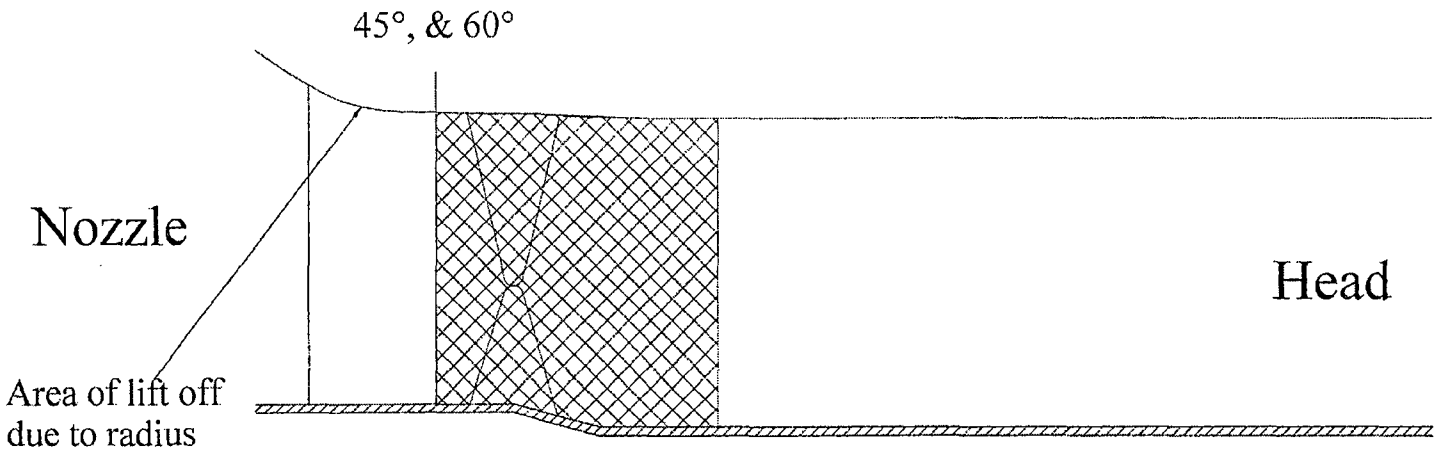
Weld metal examination coverage with the beam direction perpendicular to the weld axis.
Complete coverage is limited due to the nozzle radius.
Weld metal coverage requires the combination of two angles from two directions.
Total weld cross section examination area = 3.9438 sq. in.
Area effectivly examined with two angles in two directions = 0.9037 sq. in. = 22.9%

Weld ID: 03-003-SW-U



Base Material examination coverage with the beam direction perpendicular to the weld axis.
Base material coverage requires the combination of two angles.
Total base material cross section area. 27.3549 sq. in.
Percent of base material examined in the perpendicular beam direction = 25.8427 sq. in. =94.5%

Weld ID: 03-003-SW-U

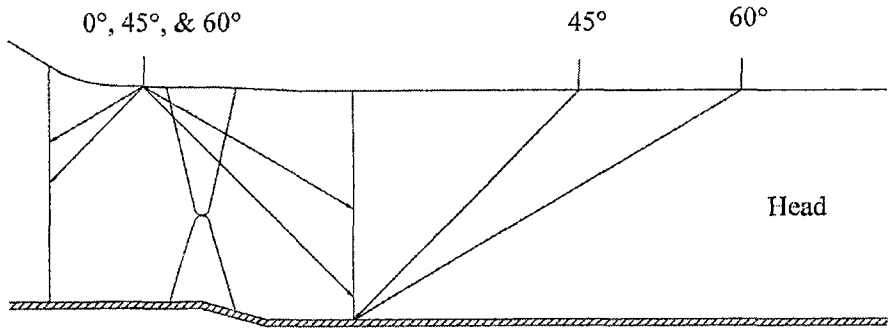


Examination coverage with the beam direction paralle to the weld axis.
Complete coverage is limited due to the nozzle radius.
Weld metal and base coverage requires the combination of two angles from two directions.

Total cross section examination area of weld = 3.9438 sq. in.
Weld volume effectivly examined with two angles in two directions = 3.9438 sq. in. = 100%

Total cross section examination area of base material = 27.3549 sq. in.
Base material effectivly examined with two angles in two directions = 17.6404 sq. in. = 64.5%

Weld ID: 03-003-SW-V



Weld Coverage

Head Side Weld
0° =100%
45° = 100%
60° = 100%

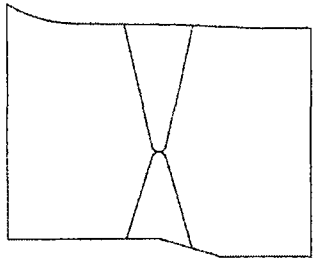
Nozzle Side Weld
0° = 100%
45° = 36.5% 1.4402 sq. in.
60° = 22.9% 0.9037 sq. in.

CW Weld
0° = 100%
45° = 100%
60° = 100%

CCW Weld
0° = 100%
45° = 100%
60° = 100%

Total Weld Examination
Area 3.9438 square inches

Total Weld Examination and Base Material Area
31.2987 sq. in.



Base Material Coverage

Head Side Base Material
0° = 64.5% 17.6404 sq. in
45° = 91.3% 24.9781 sq. in.
60° = 94.5% 25.8427 sq. in.

Nozzle Side Base Material
0° = 64.5% 17.6404 sq. in.
45° = 31.5 % 8.6319 sq. in.
60° = 17.2% 4.7133 sq. in.

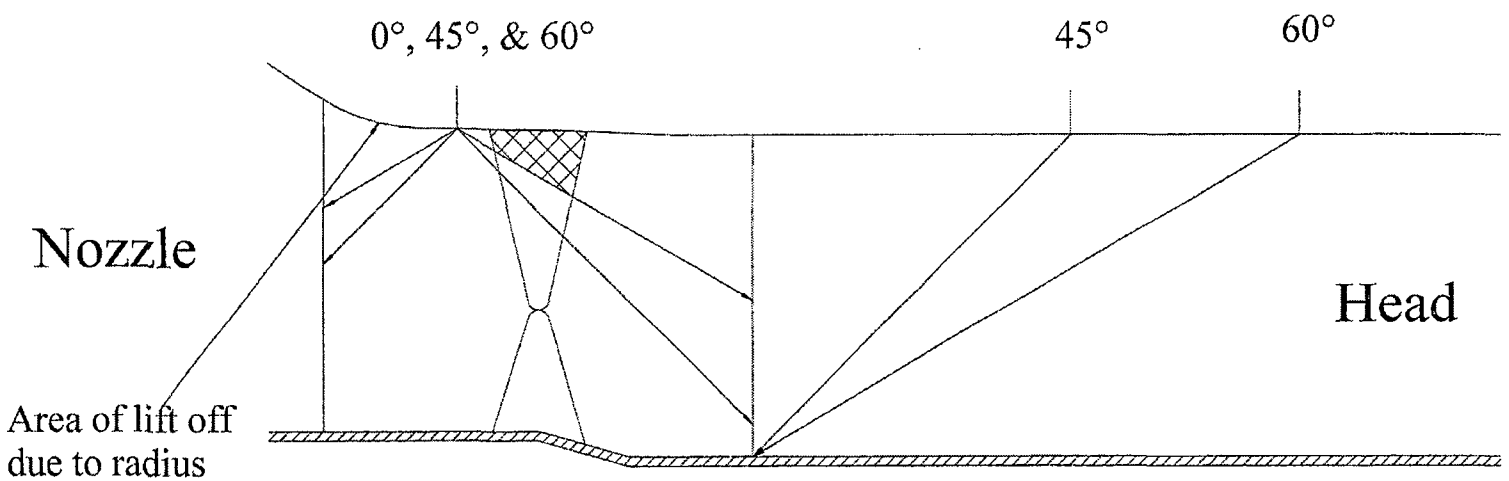
CW Base Material
0° = 64.5% 17.6404 sq. in.
45° = 64.5% 17.6404 sq. in.
60° = 64.5% 17.6404 sq. in.

CCW Base Material
0° = 64.5% 17.6404 sq. in.
45° = 64.5% 17.6404 sq. in.
60° = 64.5% 17.6404 sq. in.

Examination Coverage Summary:

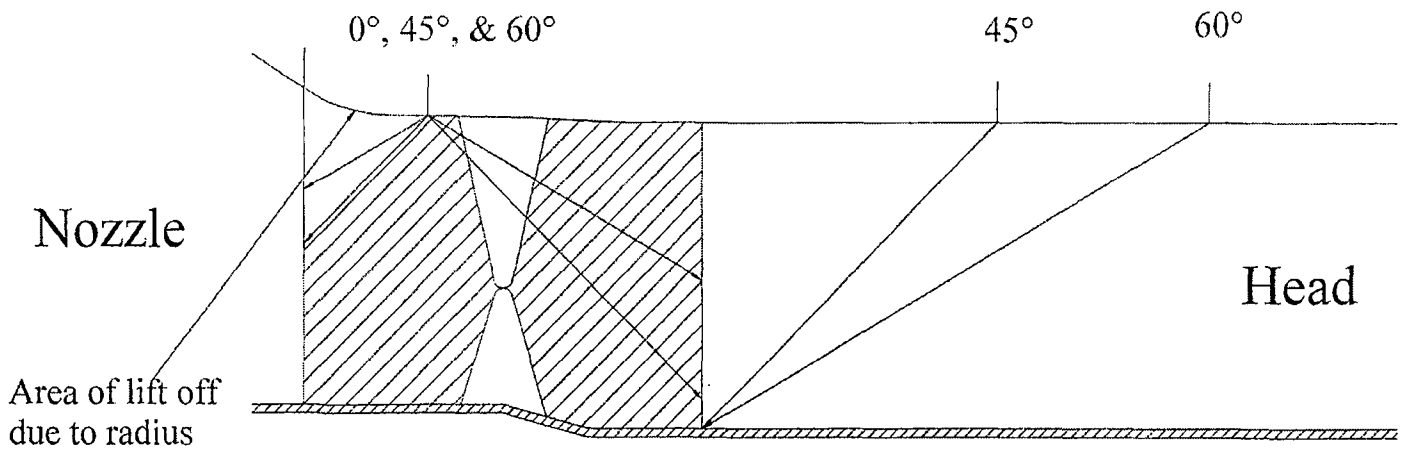
Weld Volume = [22.9% (Perpendicular scan) + 100% (Parallel scan)]/2=61.5%
Base Material Volume =[94.5% (Perpendicular scan) + 64.5% (Parallel scan)]/2=79.5%
Total Coverage = 70.5% Coverage

Weld ID: 03-003-SW-V



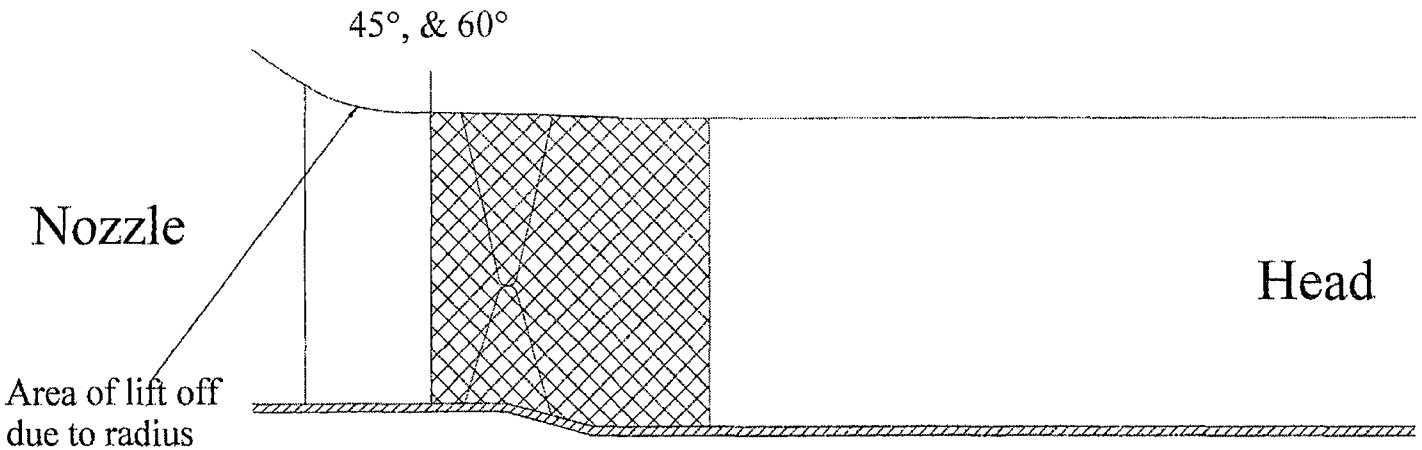
Weld metal examination coverage with the beam direction perpendicular to the weld axis.
Complete coverage is limited due to the nozzle radius.
Weld metal coverage requires the combination of two angles from two directions.
Total weld cross section examination area = 3.9438 sq. in.
Area effectivly examined with two angles in two directions = 0.9037 sq. in. = 22.9%

Weld ID: 03-003-SW-V



Base Material examination coverage with the beam direction perpendicular to the weld axis.
Base material coverage requires the combination of two angles.
Total base material cross section area. 27.3549 sq. in.
Percent of base material examined in the perpendicular beam direction = 25.8427 sq. in. =94.5%

Weld ID: 03-003-SW-V

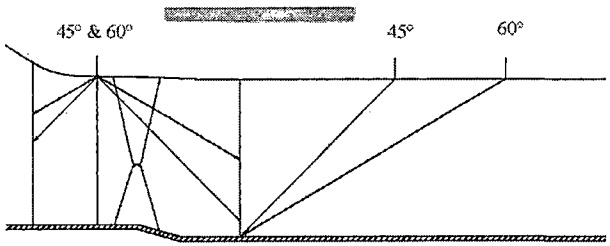


Examination coverage with the beam direction paralle to the weld axis.
Complete coverage is limited due to the nozzle radius.
Weld metal and base coverage requires the combination of two angles from two directions.

Total cross section examination area of weld = 3.9438 sq. in.
Weld volume effectivly examined with two angles in two directions = 3.9438 sq. in. = 100%

Total cross section examination area of base material = 27.3549 sq. in.
Base material effectivly examined with two angles in two directions = 17.6404 sq. in. = 64.5%

Weld ID: 03-004-SW-U



Weld Coverage

Head Side Weld
0 deg.=100%
45 deg.=100%
60 deg.=100%

Nozzle Side Weld
0 deg.=100%
45 deg. =36.5%
60 deg.=22.9%

CW Weld
0 deg.=100%
45 deg.=100%
60 deg.=100%

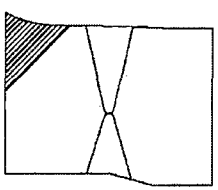
CCW Weld
0 deg.=100%
45 deg.=100%
60 deg.=100%

Total Weld Area
3.9438 square inches

Total Weld Coverage
in two directions
0.9061
square inches

Coverage 22.9%

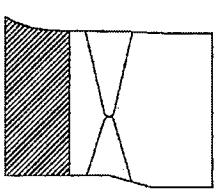
Total Area 27.68 sq. inches
missed coverage 2.33 sq. inches



Total Base Material Coverage
in one direction 25.35 sq. inches

91.5% Coverage

0 deg. Weld and Base Material Area
Total Area 31.62 sq. inches



Total Coverage with 0 deg.
21.94 sq. inches

69.3 % Coverage

Base Material Coverage

Head Side Base Material
0 deg.=69.3% 21.94 sq.in
45 deg.=91.5% 24.98 sq. in
60 deg.=94.5% 25.85 sq. in

Nozzle Side Base Material
0 deg.=69.3% 21.94 sq. in
45 deg.= 31.5% 8.63 sq. in
60 deg.= 17.2% 4.71 sq. in

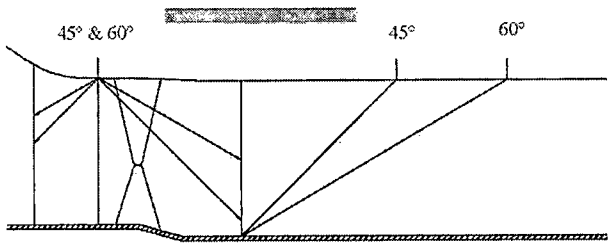
CW Base Material
0 deg.=69.3% 21.94 sq. in
45 deg.=69.3% 21.94 sq. in
60 deg.=69.3% 21.94 sq. in

CCW Base Material
0 deg.=69.3% 21.94 sq. in
45 deg.=69.3% 21.94 sq. in
60 deg.=69.3% 21.94 sq. in

Examination Coverage Summary

Weld Volume =[22.9% (Perpendicular scan)+100% (Parallel scan)]/2=61.5%
Base Material Volume=[91.5%(Perpendicular scan)+69.3%(Parallel scan)]/2=80.4%
Total Coverage = 70.9%

Weld ID: 03-004-SW-V



Weld Coverage

Head Side Weld
0 deg.=100%
45 deg.=100%
60 deg.=100%

Nozzle Side Weld
0 deg.=100%
45 deg. =36.5%
60 deg.=22.9%

CW Weld
0 deg.=100%
45 deg.=100%
60 deg.=100%

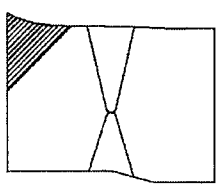
CCW Weld
0 deg.=100%
45 deg.=100%
60 deg.=100%

Total Weld Area
3.9438 square inches

Total Weld Coverage
in two directions
0.9061
square inches

Coverage 22.9%

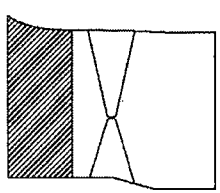
Total Area 27.68 sq. inches
missed coverage 2.33 sq. inches



Total Base Material Coverage
in one direction 25.35 sq. inches

91.5% Coverage

0 deg. Weld and Base Material Area
Total Area 31.62 sq. inches



Total Coverage with 0 deg.
21.94 sq. inches

69.3 % Coverage

Base Material Coverage

Head Side Base Material
0 deg.=69.3% 21.94 sq.in
45 deg.=91.5% 24.98 sq. in
60 deg.=94.5% 25.85 sq. in

Nozzle Side Base Material
0 deg.=69.3% 21.94 sq. in
45 deg.= 31.5% 8.63 sq. in
60 deg.= 17.2% 4.71 sq. in

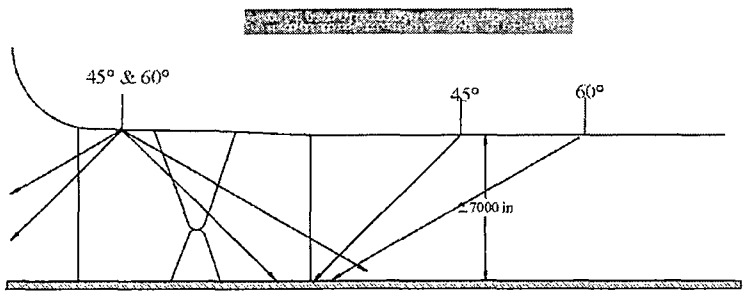
CW Base Material
0 deg.=69.3% 21.94 sq. in
45 deg.=69.3% 21.94 sq. in
60 deg.=69.3% 21.94 sq. in

CCW Base Material
0 deg.=69.3% 21.94 sq. in
45 deg.=69.3% 21.94 sq. in
60 deg.=69.3% 21.94 sq. in

Examination Coverage Summary

Weld Volume =[22.9% (Perpendicular scan)+100% (Parallel scan)]/2=61.5%
Base Material Volume=[91.5%(Perpendicular scan)+69.3%(Parallel scan)]/2=80.4%
Total Coverage = 70.9%

Weld ID: 03-007-SW-A



Weld Coverage

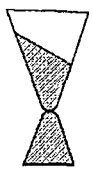
Head Side Weld
0 deg.=100%
45 deg.=100%
60 deg.=100%

Nozzle Side Weld
0 deg.=100%
45 deg. =58.5%
60 deg.=43.7%

CW Weld
0 deg.=100%
45 deg.=100%
60 deg.=100%

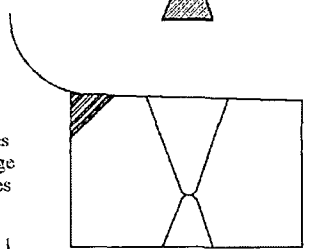
CCW Weld
0 deg.=100%
45 deg.=100%
60 deg.=100%

Total Weld Area 2.07 sq. Inches



Total Weld Coverage in two directions
.9059 sq. inches

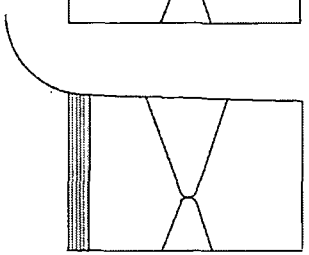
43.7% coverage



Total Area
9.58" sq. inches
missed coverage
.3685 sq. inches

Total Base Material Coverage in one direction
9.21 sq. inches

96.7% Coverage



Total Coverage with 0 deg.
8.79 sq. inches

88% Coverage

Base Material Coverage

Head Side Base Material
0 deg.=88.0% 8.79 sq.in
45 deg.=96.7% 9.58 sq. in
60 deg.=98.1% 9.72 sq. in

Nozzle Side Base Material
0 deg.=88.0% 8.79 sq. in
45 deg.= 55.4% 5.49 sq. in
60 deg.= 32.4% 3.21 sq. in

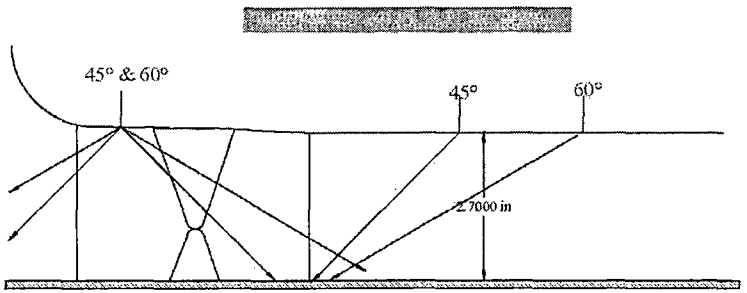
CW Base Material
0 deg.=88.0% 8.79 sq.in
45 deg.=88.0% 8.79 sq. in
60 deg.=88.0% 8.79 sq. in

CCW Base Material
0 deg.=88.0% 8.79 sq.in
45 deg.=88.0% 8.79 sq. in
60 deg.=88.0% 8.79 sq. in

Examination Coverage Summary

Weld Volume =[43.7% (Perpendicular scan)+100% (Parallel scan)]/2=71.8%
Base Material Volume=[96.7%(Perpendicular scan)+88.0%(Parallel scan)]/2=92.3%
Total Coverage = 82.0%

Weld ID: 03-007-SW-E



Weld Coverage

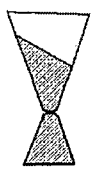
Head Side Weld
0 deg.=100%
45 deg.=100%
60 deg.=100%

Nozzle Side Weld
0 deg.=100%
45 deg. =58.5%
60 deg.=43.7%

CW Weld
0 deg.=100%
45 deg.=100%
60 deg.=100%

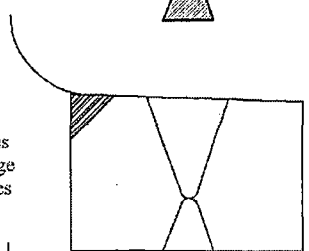
CCW Weld
0 deg.=100%
45 deg.=100%
60 deg.=100%

Total Weld Area 2.07 sq. Inches



Total Weld Coverage in two directions
.9059 sq. inches

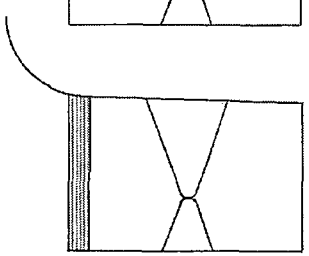
43.7% coverage



Total Area
9.58" sq. inches
missed coverage
.3685 sq. inches

Total Base Material Coverage in one direction
9.21 sq. inches

96.7% Coverage



Total Coverage with 0 deg.
8.79 sq. inches

88% Coverage

Base Material Coverage

Head Side Base Material
0 deg.=88.0% 8.79 sq.in
45 deg.=96.7% 9.58 sq. in
60 deg.=98.1% 9.72 sq. in

Nozzle Side Base Material
0 deg.=88.0% 8.79 sq. in
45 deg.= 55.4% 5.49 sq. in
60 deg.= 32.4% 3.21 sq. in

CW Base Material
0 deg.=88.0% 8.79 sq.in
45 deg.=88.0% 8.79 sq. in
60 deg.=88.0% 8.79 sq. in

CCW Base Material
0 deg.=88.0% 8.79 sq.in
45 deg.=88.0% 8.79 sq. in
60 deg.=88.0% 8.79 sq. in

Examination Coverage Summary

Weld Volume =[43.7% (Perpendicular scan)+100% (Parallel scan)]/2=71.8%
Base Material Volume=[96.7%(Perpendicular scan)+88.0%(Parallel scan)]/2=92.3%
Total Coverage = 82.0%

ATTACHMENT 3

RELIEF REQUEST IR-3-21
EXAMINATION CATEGORY C-A
PRESSURE RETAINING WELDS IN PRESSURE VESSELS

DOMINION NUCLEAR CONNECTICUT, INC.
MILLSTONE POWER STATION UNIT 3

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
Component Identification:	Listed in Table 1
Material:	SA 533, GR A, CL 2

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. 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 Steam Generator shell-to-transition cone weld 03-053-SW-G was examined with a manual ultrasonic technique using pulse echo ultrasonic instruments and search units to achieve the maximum examination coverage practical. No alternative techniques or advanced technologies were considered capable of obtaining complete coverage of the examination volume.

The configuration of the weld joint has an angular surface transition between the

shell and transition cone that limits the contact of the search unit in this area for the parallel scans, limiting coverage of the weld volume to 96.8% and base metal volume to 81.7% for a combined total examination coverage of 89.3%.

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 (%)
03-053-SW-G	C1.10	Shell-to-Transition Cone	0° Longitudinal Wave 45° Shear Wave 60° Shear Wave	Examination limited due to the angular transition of the weld joint. No recordable indications were detected.	89.3%

5. Burden Caused by Compliance

To increase examination coverage on the subject weld 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.

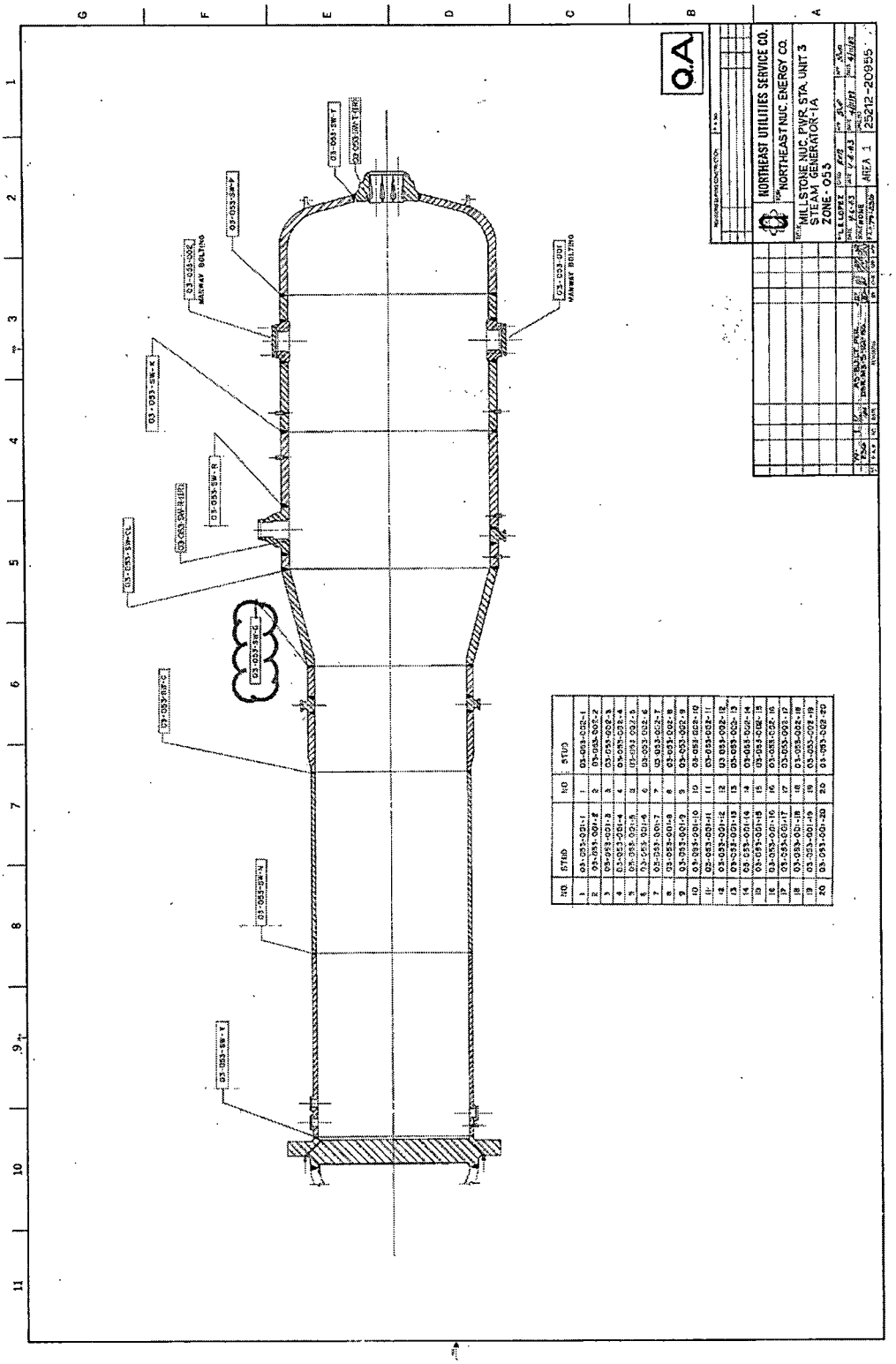
6. Proposed Alternative and Basis for Use

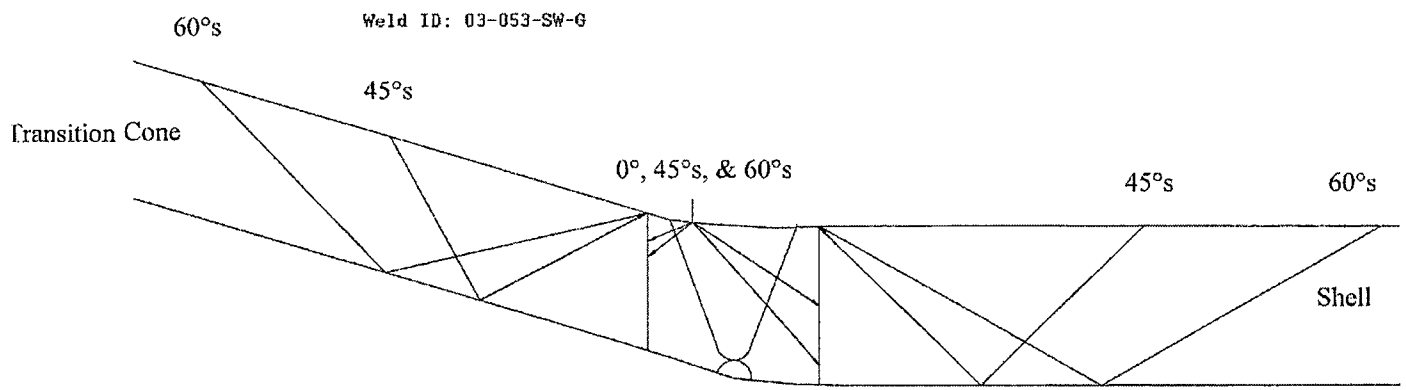
The subject weld received a volumetric ultrasonic examination using the best available techniques on the accessible portions of weld to the maximum extent practical. Additionally, a visual (VT-2) examination is performed during each inspection period during the system leakage tests as required by Section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

Based upon the examination volume that was obtained with acceptable results along with 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 weld.

7. Duration of Proposed Alternative

The relief is requested for the third ten-year inspection interval for Millstone Power Station Unit 3, which began on April 22, 2009 and will end April 23, 2019.


Q.A
NORTHEAST UTILITIES SERVICE CO.
NORTHEAST NUC. ENERGY CO.
MILLSTONE NUC. PWR. STA. UNIT 3
STEAM GENERATOR-1A
ZONE - 053
AREA 1
25212-20955
MANWAY BOLTING
MANWAY BOLTING



Weld Coverage

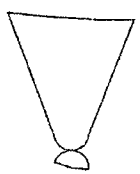
Transition Cone Side Weld
0° = 100%
45° = 100%
60° = 100%

Lower Cone Side Weld
0° = 100%
45° = 100%
60° = 100%

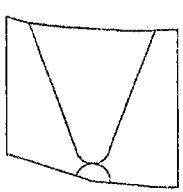
CW Weld
0° = 93.6% 4.7829 sq. in.
45° = 93.6% 4.7829 sq. in.
60° = 93.6% 4.7829 sq. in.

CCW Weld
0° = 93.6% 4.7829 sq. in.
45° = 93.6% 4.7829 sq. in.
60° = 93.6% 4.7829 sq. in.

Total Weld Examination
Area 5.1071 square inches



Total Weld Examination and Base Material Area
12.727 sq. in.



Base Material Coverage

Transition Cone Side Base Material
0° = 100%
45° = 100%
60° = 100%

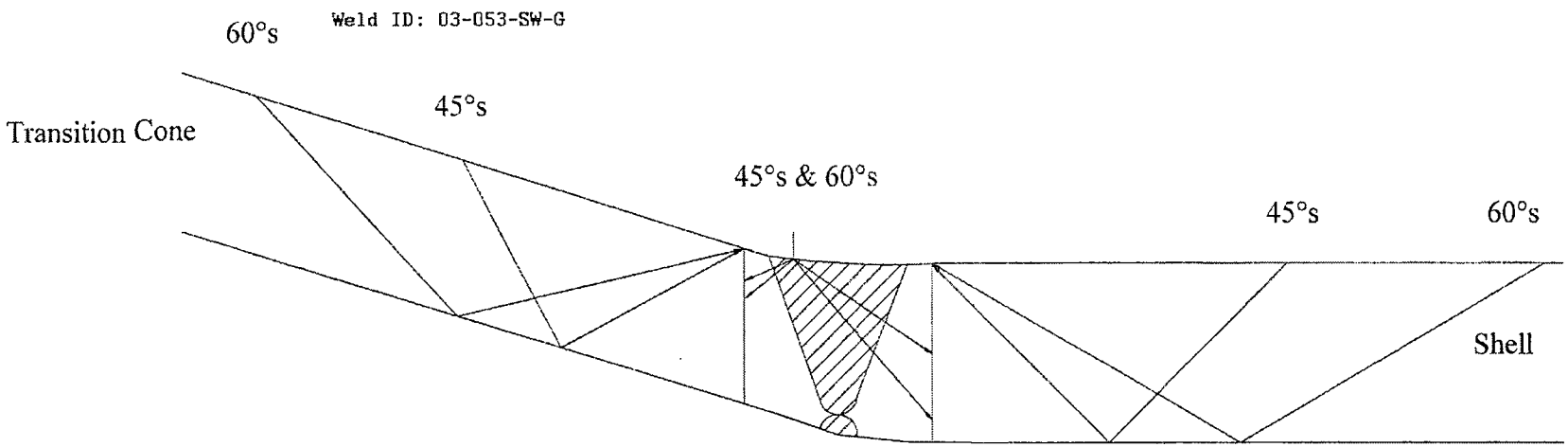
Lower Cone Side Base Material
0° = 100%
45° = 100%
60° = 100%

CW Base Material
0° = 63.4% 4.8355 sq. in.
45° = 63.4% 4.8355 sq. in.
60° = 63.4% 4.8355 sq. in.

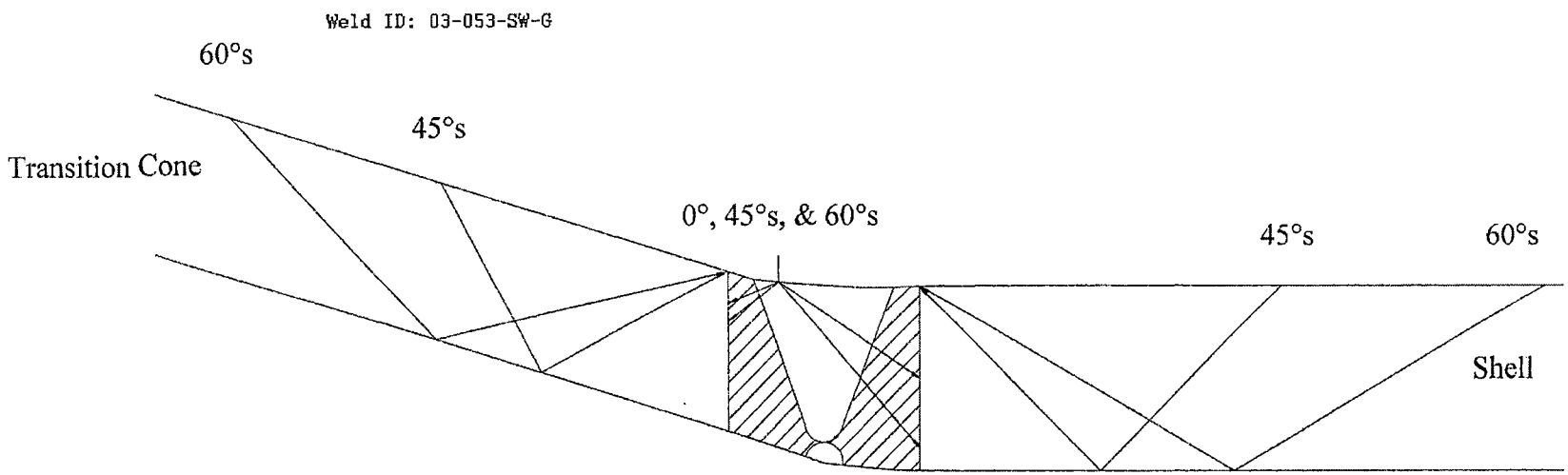
CCW Base Material
0° = 63.4% 4.8355 sq. in.
45° = 63.4% 4.8355 sq. in.
60° = 63.4% 4.8355 sq. in.

Examination Coverage Summary:

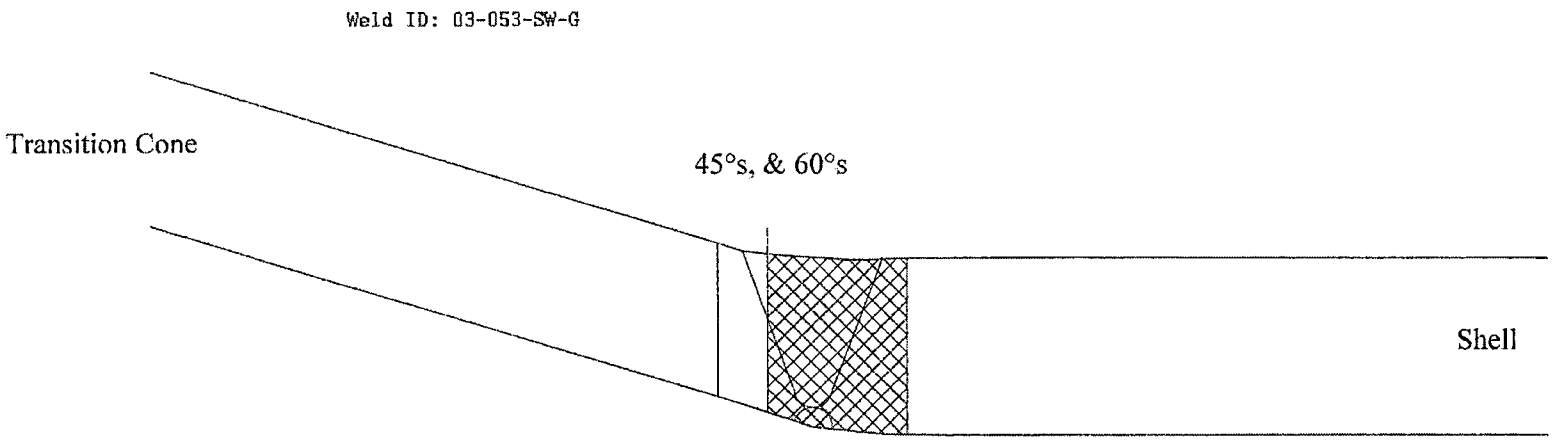
Weld Volume = [100% (Perpendicular scan) + 93.6% (Parallel scan)]/2=96.8%
Base Material Volume =[100% (Perpendicular scan) + 63.4% (Parallel scan)]/2=81.7%
Total Coverage = 89.3% Coverage



Weld metal examination coverage with the beam direction perpendicular to the weld axis.
Weld metal coverage requires the combination of two angles from two directions.
Total weld metal cross section examination area = 5.1071 sq. in.
Area effectivly examined with two angles in two directions = 5.1071 sq. in. = 100%



Base Material examination coverage with the beam direction perpendicular to the weld axis.
Base material coverage requires the combination of two angles.
Total base material cross section area. 7.6199 sq. in.
Percent of base material examined in the perpendicular beam direction = 7.6199 sq. in. = 100%



Examination coverage with the beam direction paralle to the weld axis.
Complete coverage is limited due to transition from shell to transition cone.
Weld metal and base coverage requires the combination of two angles from two directions.

Total cross section examination area of weld = 5.1071 sq. in.
Weld volume effectivly examined with two angles in two directions = 4.7829 sq. in. = 93.6%

Total cross section of base material = 7.6199 sq. in.
Base material effectivly examined with two angles in two directions = 4.8355 sq. in. = 63.4%

ATTACHMENT 4

RELIEF REQUEST IR-3-22
EXAMINATION CATEGORY C-F-1
PRESSURE RETAINING WELDS IN AUSTENITIC STAINLESS STEEL HIGH ALLOY PIPING

DOMINION NUCLEAR CONNECTICUT, INC.
MILLSTONE POWER STATION UNIT 3

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-F-1, Pressure Retaining Welds in Austenitic Stainless Steel High Alloy Piping
Item Numbers:	C5.11, Circumferential welds: Piping welds ≥3/8 in. (10mm) Nominal Wall Thickness for Piping >NPS 4 (DN 100) C5.21, Circumferential welds: Piping Welds >1/5 in. (5mm) Nominal Wall Thickness for Piping ≥ NPS 2 (DN 50) and ≤ NPS 4 (DN 100)
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

ASME Section XI, Examination Category C-F-1 requires 100 percent (%) volumetric examination coverage for circumferential piping welds. 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 weld provided greater than 90% of the required volume has been examined.

10 CFR 50.55a(b)(2)(xv)(A), requires the following examination coverage criteria when applying Supplement 2 to Appendix VIII:

(1) Piping must be examined in two axial directions and when examination in the circumferential direction is required, the circumferential examination must be performed in two directions, provided access is available.

(2) Where examination from both sides is not possible, full coverage credit may be claimed from a single-side for ferritic welds. Where examination from both sides is not possible on austenitic welds, full coverage credit from a single-side may be claimed only after completing a successful single sided Appendix VIII demonstration using flaws on the opposite side of the weld.

10 CFR 50.55a(b)(2)(xvi)(B) requires that examinations performed from one side of a ferritic or stainless steel pipe weld must be conducted with equipment, procedures, and personnel that have demonstrated proficiency with single-side examinations. To demonstrate equivalency to two-sided examinations, the demonstration must be performed to the requirements of Appendix VIII as modified by this paragraph and §50.55a(b)(2)(xv)(A).

4. Impracticality of Compliance

Pursuant to 10 CFR 50.55a(g)(5)(iii), relief is requested from the essentially 100% volumetric examination coverage requirement for austenitic piping welds with single-side access.

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 US 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 methods or advanced technologies were considered capable of obtaining complete coverage of the examination volume.

Since the configuration of the piping limits access to a single side, relief is requested on complying with the essentially 100% required examination coverage for the piping welds listed in Table 1. Note that the examination coverage listed is that which was obtained during the examination with no credit taken for the far side of each weld in which the examination from that side could not be performed.

Supplemental scanning was performed to provide additional best effort (non-code) coverage as documented on the enclosed coverage calculation for each weld.

Coverage calculations are provided in this attachment.

Table 1- Examination Category C-F-1 Welds with Limited Volumetric Coverage

Weld Number	Code Item #	System Configuration Material	Examination Angle and Wave Mode	Limitation and Results	Ultrasonic Examination Coverage (%)	Surface Examination Results
CHS-31-FW-1	C5.21	Chemical And Volume Control 4" Pipe-To-Valve Type 316 Stainless Steel, Schedule 160	45° Shear Wave 60° Shear Wave 60° Longitudinal Wave	Limited examination performed from the pipe side only due to 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%	Liquid penetrant examination performed obtaining 100 percent coverage. No recordable indications detected.
CHS-31-FW-3	C5.21	Chemical And Volume Control 3" Reducer-To-Valve Type 316 Stainless Steel, Schedule 160	45° Shear Wave 60° Shear Wave 60° Longitudinal Wave	Limited examination performed from the pipe side only due to taper of the reducer within close proximity of the weld. There is not sufficient distance between the weld and reducer to perform any scanning on the reducer side of the weld. No recordable indications were detected.	50%	Liquid penetrant examination performed obtaining 100 percent coverage. No recordable indications detected.

Weld Number	Code Item #	System Configuration Material	Examination Angle and Wave Mode	Limitation and Results	Ultrasonic Examination Coverage (%)	Surface Examination Results
CHS-32-1-SW-D	C5.21	Chemical And Volume Control 4" Pipe-To-Elbow Type 316 Stainless Steel, Schedule 160	45° Shear Wave 60° Shear Wave 60° Longitudinal Wave	Limited examination performed from the elbow side only due to the close proximity of an adjacent piping weld. There is not sufficient distance between the welds to perform any scanning on the pipe side of the weld. No recordable indications were detected.	50%	Liquid penetrant examination performed obtaining 100 percent coverage. No recordable indications detected.
CHS-32-FW-1	C5.21	Chemical And Volume Control 4" Pipe-To-Valve Type 316 Stainless Steel, Schedule 160	45° Shear Wave 60° Shear Wave 60° Longitudinal Wave	Limited examination performed from the pipe side only due to 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%	Liquid penetrant examination performed obtaining 100 percent coverage. No recordable indications detected.
CHS-33-1-SW-B	C5.21	Chemical And Volume Control 4" Flange-To-Pipe Type 316 Stainless Steel, Schedule 160	45° Shear Wave 60° Shear Wave 60° Longitudinal Wave	Limited examination performed from the pipe side only due to taper of the flange within close proximity of the weld. There is not sufficient distance between the weld and flange to perform any scanning on the flange side of the weld. No recordable indications were detected.	50%	Liquid penetrant examination performed obtaining 100 percent coverage. No recordable indications detected.

Weld Number	Code Item #	System Configuration Material	Examination Angle and Wave Mode	Limitation and Results	Ultrasonic Examination Coverage (%)	Surface Examination Results
CHS-33-FW-1	C5.21	Chemical And Volume Control 4" Pipe-To-Valve Type 316 Stainless Steel, Schedule 160	45° Shear Wave 60° Shear Wave 60° Longitudinal Wave	Limited examination performed from the pipe side only due to 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%	Liquid penetrant examination performed obtaining 100 percent coverage. No recordable indications detected.
CHS-33-FW-17	C5.21	Chemical And Volume Control 4" Flange-To-Pipe Type 316 Stainless Steel, Schedule 160	45° Shear Wave 60° Shear Wave 60° Longitudinal Wave	Limited examination performed from the pipe side only due to taper of the flange within close proximity of the weld. There is not sufficient distance between the weld and flange to perform any scanning on the flange side of the weld. No recordable indications were detected.	50%	Liquid penetrant examination performed obtaining 100 percent coverage. No recordable indications detected.
CHS-33-FW-4	C5.21	Chemical And Volume Control 3" Valve-To-Pipe Type 316 Stainless Steel, Schedule 160	45° Shear Wave 60° Shear Wave 70° Shear Wave	Limited examination performed from the pipe side only due to 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%	Liquid penetrant examination performed obtaining 100 percent coverage. No recordable indications detected.

Weld Number	Code Item #	System Configuration Material	Examination Angle and Wave Mode	Limitation and Results	Ultrasonic Examination Coverage (%)	Surface Examination Results
RHS-9-2-SW-K	C5.11	Residual Heat Removal 14" Pipe-To-Flange Type 304 Stainless Steel, Schedule 40	45° Shear Wave 70° Shear Wave	Limited examination performed from the pipe side only due to taper of the flange within close proximity of the weld. There is not sufficient distance between the weld and flange to perform any scanning on the flange side of the weld. No recordable indications were detected.	50%	Liquid penetrant examination performed obtaining 100 percent coverage. No recordable indications detected.
RHS-9-3-SW-B	C5.11	Residual Heat Removal 14" Flange-To-Pipe Type 304 Stainless Steel, Schedule 40	45° Shear Wave 70° Shear Wave	Limited examination performed from the pipe side only due to taper of the flange within close proximity of the weld. There is not sufficient distance between the weld and flange to perform any scanning on the flange side of the weld. No recordable indications were detected.	50%	Liquid penetrant examination performed obtaining 100 percent coverage. No recordable indications detected.
RHS-9-FW-2	C5.11	Residual Heat Removal 12" Pipe-To-Valve Type 316 Stainless Steel, Schedule 40	45° Shear Wave 70° Shear Wave	Limited examination performed from the pipe side only due to 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%	Liquid penetrant examination performed obtaining 100 percent coverage. No recordable indications detected.

Weld Number	Code Item #	System Configuration Material	Examination Angle and Wave Mode	Limitation and Results	Ultrasonic Examination Coverage (%)	Surface Examination Results
SIL-157-FW-3	C5.11	Safety Injection 10" Valve-To-Pipe Type 316 Stainless Steel, Schedule 140	45° Shear Wave 60° Shear Wave 70° Shear Wave 60° Longitudinal Wave	Limited examination performed from the pipe side only due to 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%	Liquid penetrant examination performed obtaining 100 percent coverage. No recordable indications detected.
SIL-43-FW-1	C5.11	Safety Injection 6" Valve-To-Pipe Type 316 Stainless Steel, Schedule 160	45° Shear Wave 60° Shear Wave 60° Longitudinal Wave	Limited examination performed from the pipe side only due to 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%	Liquid penetrant examination performed obtaining 100 percent coverage. No recordable indications detected.
SIL-43-FW-16	C5.11	Safety Injection 6" Pipe-To-Valve Type 316 Stainless Steel, Schedule 160	45° Shear Wave 60° Shear Wave 70° Shear Wave 60° Longitudinal Wave	Limited examination performed from the pipe side only due to 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. One indication was detected that was evaluated as acceptable root geometry.	50%	Liquid penetrant examination performed obtaining 100 percent coverage. No recordable indications detected.

Weld Number	Code Item #	System Configuration Material	Examination Angle and Wave Mode	Limitation and Results	Ultrasonic Examination Coverage (%)	Surface Examination Results
SIL-504-1-SW-7	C5.11	Safety Injection 6" Reducer-To-Pipe Type 316 Stainless Steel, Schedule 160	45° Shear Wave 60° Shear Wave 70° Shear Wave 60° Longitudinal Wave	Limited examination performed from the pipe side only due to taper of the reducer within close proximity of the weld. There is not sufficient distance between the weld and reducer to perform any scanning on the reducer side of the weld. No recordable indications were detected.	50%	Liquid penetrant examination performed obtaining 100 percent coverage. No recordable indications detected.
SIL-504-FW-15	C5.11	Safety Injection 6" Pipe-To-Valve Type 316 Stainless Steel, Schedule 160	45° Shear Wave 60° Shear Wave 60° Longitudinal Wave	Limited examination performed from the pipe side only due to 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%	Liquid penetrant examination performed obtaining 100 percent coverage. One recordable indication was detected that was evaluated as acceptable per ASME Section XI, IWB-3514 acceptance standards.

Weld Number	Code Item #	System Configuration Material	Examination Angle and Wave Mode	Limitation and Results	Ultrasonic Examination Coverage (%)	Surface Examination Results
SIL-8-FW-3	C5.11	Safety Injection 10" Transition Piece-To-Valve Type 316 Stainless Steel, Schedule 160	45° Shear Wave 60° Shear Wave 60° Longitudinal Wave	Limited examination performed from the pipe transition piece side only due to 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%	Liquid penetrant examination performed obtaining 100 percent coverage. No recordable indications detected.

5. Burden Caused by Compliance

Compliance with the Code requirements would require extensive modification or replacement of components with a design that would allow examination from both sides of the weld. This option to meet the 100% Code examination requirement for coverage is considered to be impractical based on the cost, additional radiation exposure and impact to plant equipment.

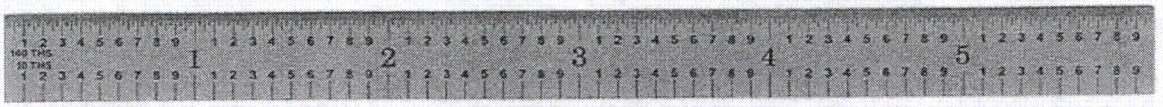
6. Proposed Alternative and Basis for Use

The subject welds received a volumetric examination to the maximum extent practical using the best available techniques, as qualified through the PDI for Supplement 2 with demonstrated best effort for single sided examination, from the accessible side of the weld. Additionally, a surface examination was performed with 100% coverage obtained, and a visual (VT-2) examination is performed each inspection period during the system leakage tests as required by Section XI, Table IWC-2500-1, Category C-H.

Based on the volumetric coverage that was obtained with acceptable results, a surface examination obtaining 100% coverage, 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.

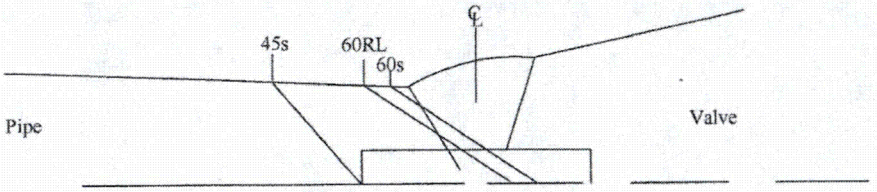
7. Period for Which Relief is Requested

The relief is requested for examinations performed during the third ten-year inspection interval for Millstone Power Station Unit 3, which began on April 23, 2009 and will end April 22, 2019.



Flow

.53" .52" .50" .58" .67"



Requird Examination Volume -.210 sq. inches

Far Side Required Examination Volume-.103 sq. inches

Volume Examined on the far side- .01 (9.7%)

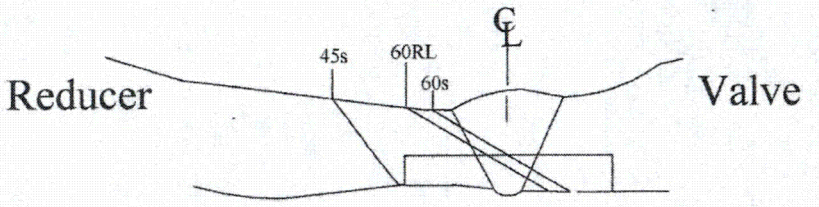
Examination Volume Dimensions: Length 13.6" x Width 1.20" x Height .19" Weld Thickness= .67" Weld Length= 13.6" Weld Width= .70"				
(US-100%+DS-0%+CW-50%+CCW-50%)/4=50%				
Coverage Summary- Weld # CHS-31-FW-1				
	Required Scans- each has a weighing factor of 100% for complete coverage			
Angle	Upstream-Axial	Upstream- Circ.	Downstream Axial	Downstream Circ.
45/60	100%	100%		
60 RL			9.7%(Best Effort)	
			Code Coverage Total	50%
100+100+0+=209.7/4-50%=		Best Effort Coverage (Max 25%) Total		2.4%

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**

Flow →

.56" .49" .44" .49" .57"



Requird Examination Volume -.1887 sq. inches

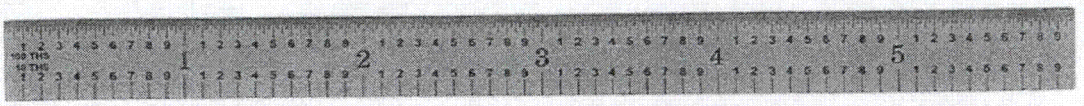
Far Side Required Examination Volume-.103 sq. inches

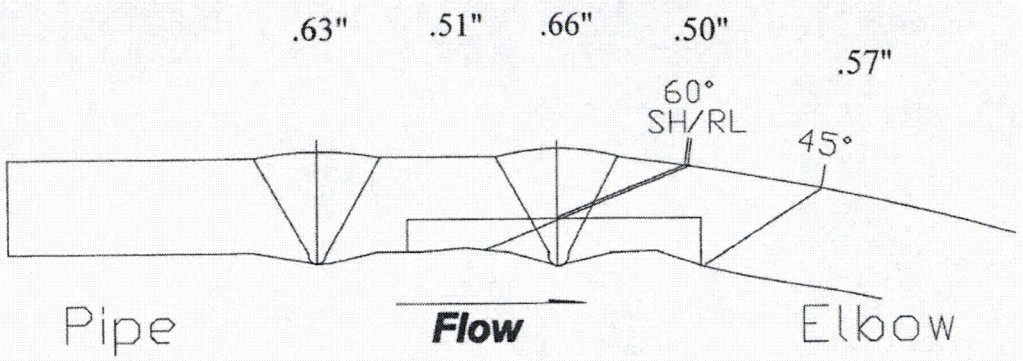
Volume Examined on the far side- .0157 (15.2%)

Examination Volume Dimensions: Length 11.0" x Width 1.1" x Height .19" Weld Thickness= .57" Weld Length= 11.0" Weld Width= .60"				
(US-100%+DS-0%+CW-50%+CCW-50%)/4=50%				
Coverage Summary- Weld # CHS-31-FW-3				
	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%		
60 RL			15.2%(Best Effort)	
			Code Coverage Total	50%
100+100+0+15.2=215.2/4-50%=		Best Effort Coverage (Max 25%) Total		4%

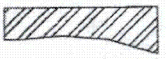
Notes:

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**





Required exam volume- .3346 sq. inches 

Far side required exam volume- .1606 sq. inches 

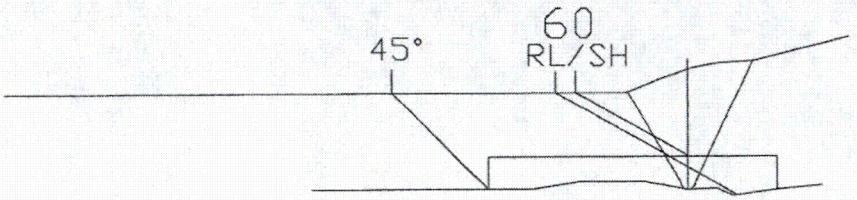
Volume examined on far side- .0492 sq. inches(30.64%) 

Examination Volume Dimensions: Length 16.37" x Width 1.66" x Height .177" Weld Thickness= .66" Weld Length= 16.37" Weld Width= .70"				
(US-0%+DS-100%+CW-50%+CCW-50%)/4=50%				
Coverage Summary- Weld # CHS-32-1-SW-D				
	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%
60 RL	30.64%(Best Effort)			
			Code Coverage Total	50%
100+100+0+30.6=230.6/4-50%=			Best Effort Coverage (Max 25%) Total	7.6%

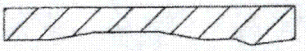
Notes:

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**

.540" .540" .500" .680" .800"



Pipe **Flow** Valve

Required exam volume- .2741 sq. inches 

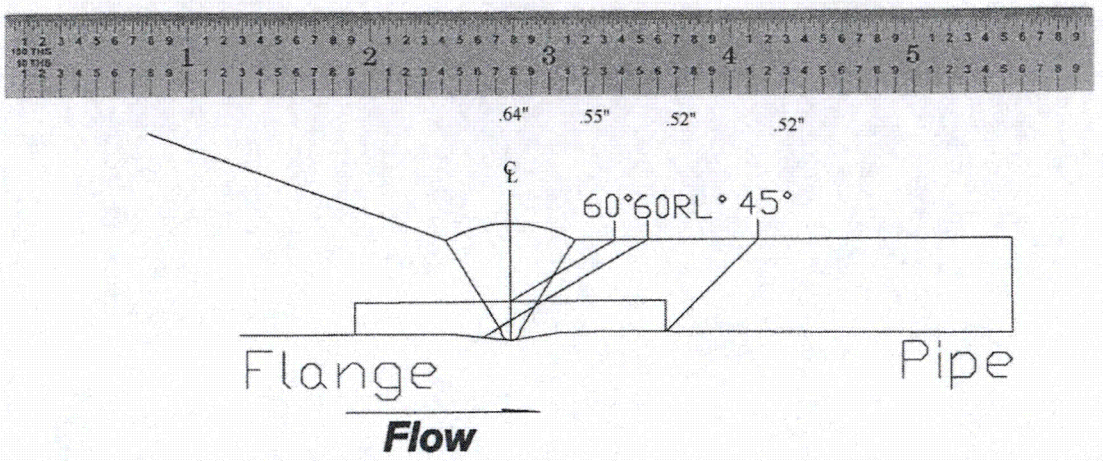
Far side required exam volume- .0974 sq. inches 

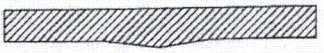
Volume examined on far side- .0144 sq. inches(14.78%) 

Examination Volume Dimensions: Length 16.37" x Width 1.62" x Height .177" Weld Thickness= .68" Weld Length= 16.37" Weld Width= .70"				
(US-100%+DS-0%+CW-50%+CCW-50%)/4=50%				
Coverage Summary- Weld # CHS-32-FW-1				
	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%
60 RL			14.78%(Best Effort)	
			Code Coverage Total	50%
100+100+0+14.7=214.7/4-50%=		Best Effort Coverage (Max 25%) Total		3.6%

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**



Required exam volume- .3099 sq. inches 

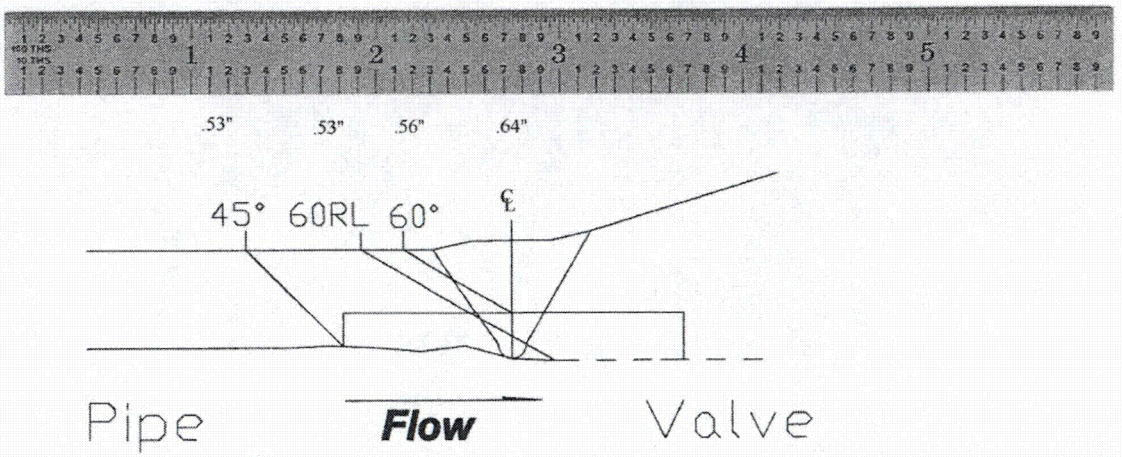
Far side required exam volume- .1571 sq. inches 

Volume examined on far side- .0086 sq. inches (5.4%) 

Examination Volume Dimensions: Length 14.3" x Width 1.72" x Height .173" Weld Thickness= .64" Weld Length= 14.3" Weld Width= .72"				
(US-0%+DS-100%+CW-50%+CCW50%)/4=50%				
Coverage Summary- Weld # CHS-33-1-SW-B				
	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%
60 RL	5.4%(Best Effort)			
			Code Coverage Total	50%
	5.4+0+100+100=207/4-50		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**



Required exam volume- .4204 sq. inches

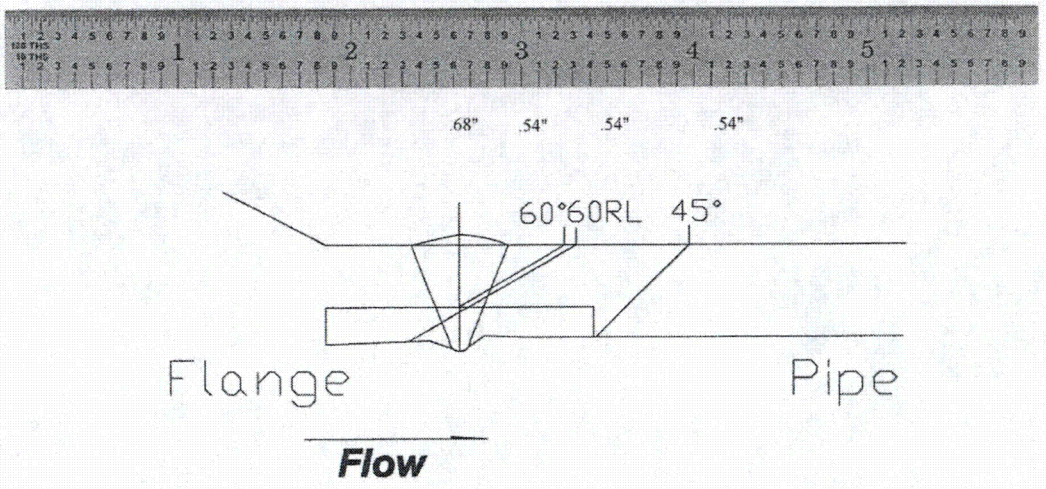
Far side required exam volume- .2375 sq. inches

Volume examined on far side- .0138 sq. inches (5.8)

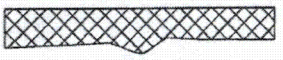
Examination Volume Dimensions: Length 14.3" x Width 1.72" x Height .173" Weld Thickness= .64" Weld Length= 14.3" Weld Width= .72"				
(US-100%+DS-0%+CW-50%+CCW50%)/4=50%				
Coverage Summary- Weld # CHS-33-FW-1				
	Required Scans- each has a weighing factor of 100% for complete coverage			
Angle	Upstream-Axial	Upstream- Circ.	Downstream Axial	Downstream Circ.
45/60	100%	100%		0%
60 RL			5.8%(Best Effort)	
			Code Coverage Total	50%
100+100+5.8+0=205.8/4-50		Best Effort Coverage (Max 25%) Total		1.4%

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**



Required exam volume- .3188 sq. inches



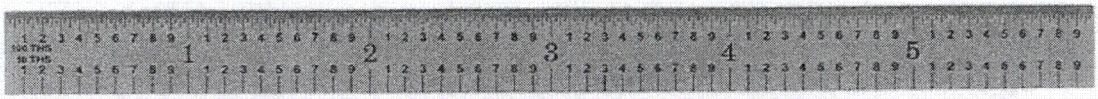
Far side required exam volume- .1667 sq. inches

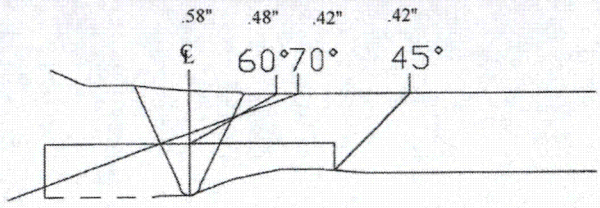
Volume examined on far side - .0304 sq. inches (18.2%)

Examination Volume Dimensions: Length 14.37" x Width 1.57" x Height .179" Weld Thickness= 68" Weld Length= 14.37" Weld Width= .57"				
(US-0%+DS100%+CW-50%+CCW50%)/4=50%				
Coverage Summary- Weld # CHS-33-FW-17				
	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%
70	18.2%(Best Effort)			
			Code Coverage Total	50%
18.2+0+100+100=218.2/400-50		Best Effort Coverage (Max 25%) Total		4.5%

Notes:

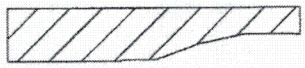
1. **Code Coverage refers to the maximum percentage of the required examination volume that is effectively examined with the qualified examination procedure**
2. **Best Effort Coverage refers to the required examination volume past the centerline that is examined in the axial beam direction with an Appendix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

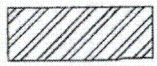


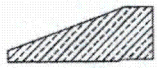


Valve Pipe

Flow

Required exam volume- .3791 sq. inches 

Far side required exam volume- .2333 sq. inches 

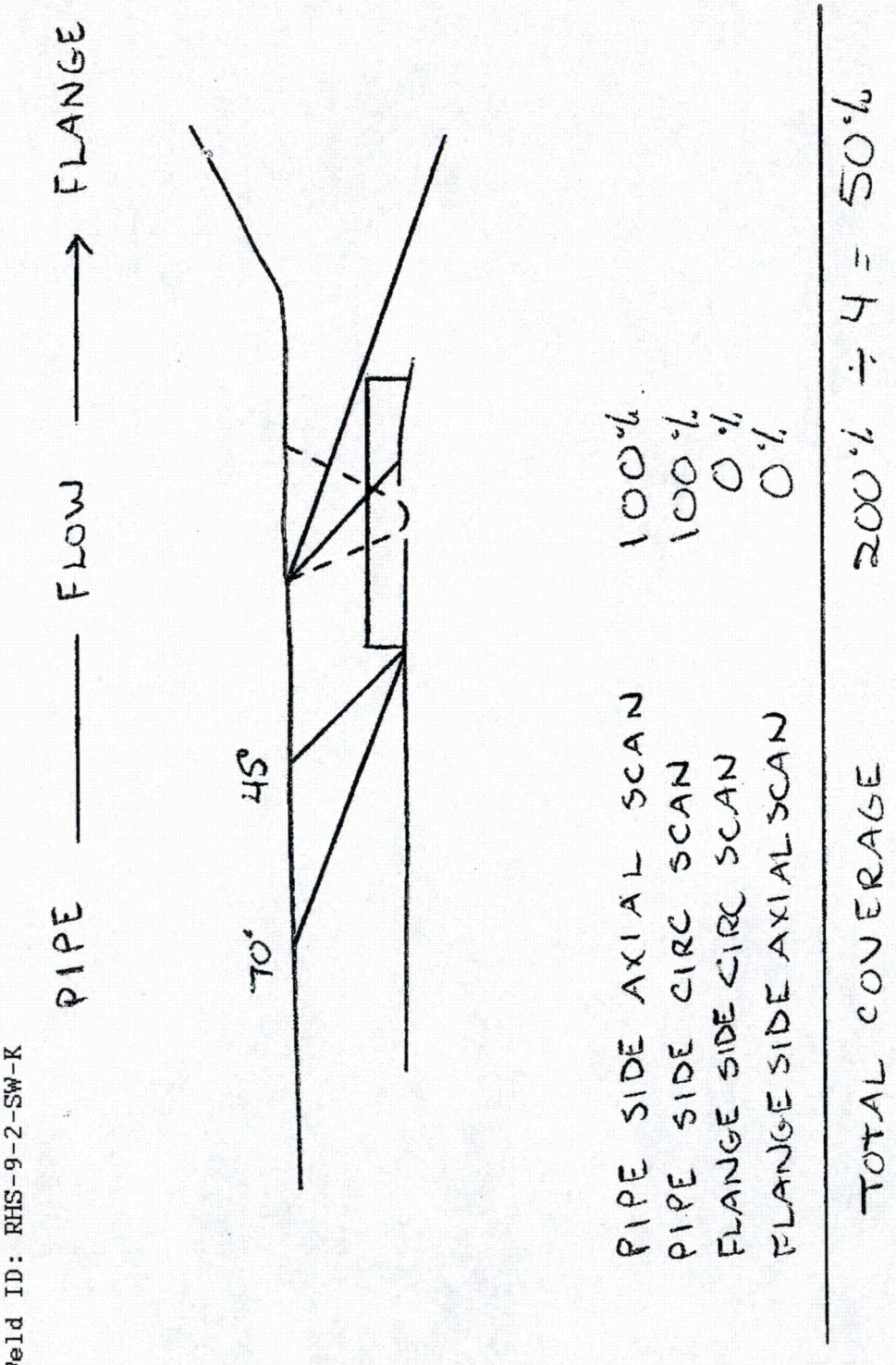
Volume examined on far side- .1591 sq inches (68.1%) 

Examination Volume Dimensions: Length 11.25" x Width 1.60" x Height .15" Weld Thickness= .58" Weld Length= 11.25" Weld Width= .60"				
(US-0%+DS100%+CW-50%+CCW50%)/4=50%				
Coverage Summary- Weld # CHS-33-FW-4				
	Required Scans- each has a weighing factor of 100% for complete coverage			
Angle	Upstream-Axial	Upstream- Circ.	Downstream Axial	Downstream Circ.
45/60		0%	100%	100%
70	68.1%(Best Effort)			
			Code Coverage Total	50%
68.1+0+100+100=268.1/4-50		Best Effort Coverage (Max 25%) Total		17%

Notes:

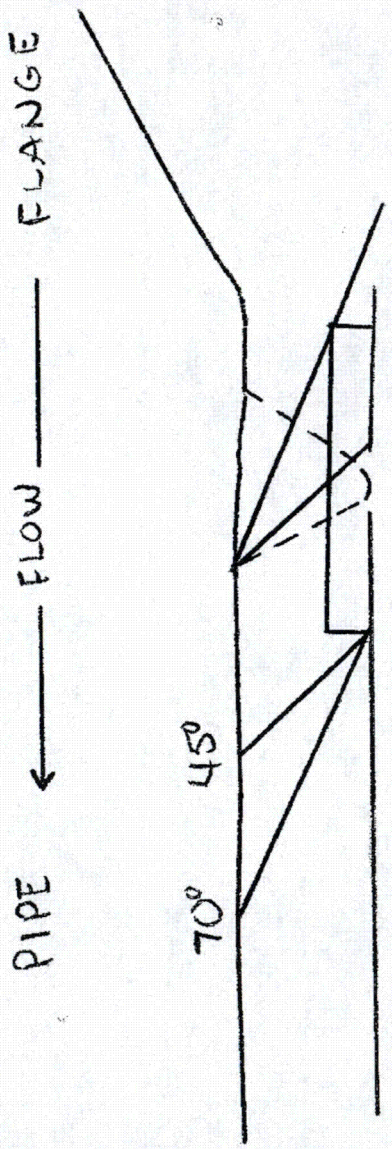
1. **Code Coverage refers to the maximum percentage of the required examination volume that is effectively examined with the qualified examination procedure**
2. **Best Effort Coverage refers to the required examination volume past the centerline that is examined in the axial beam direction with an Appendix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

Weld ID: RHS-9-2-SW-K



PIPE SIDE AXIAL SCAN	100%
PIPE SIDE CIRC SCAN	100%
FLANGE SIDE CIRC SCAN	0%
FLANGE SIDE AXIAL SCAN	0%
TOTAL COVERAGE	200% ÷ 4 = 50%

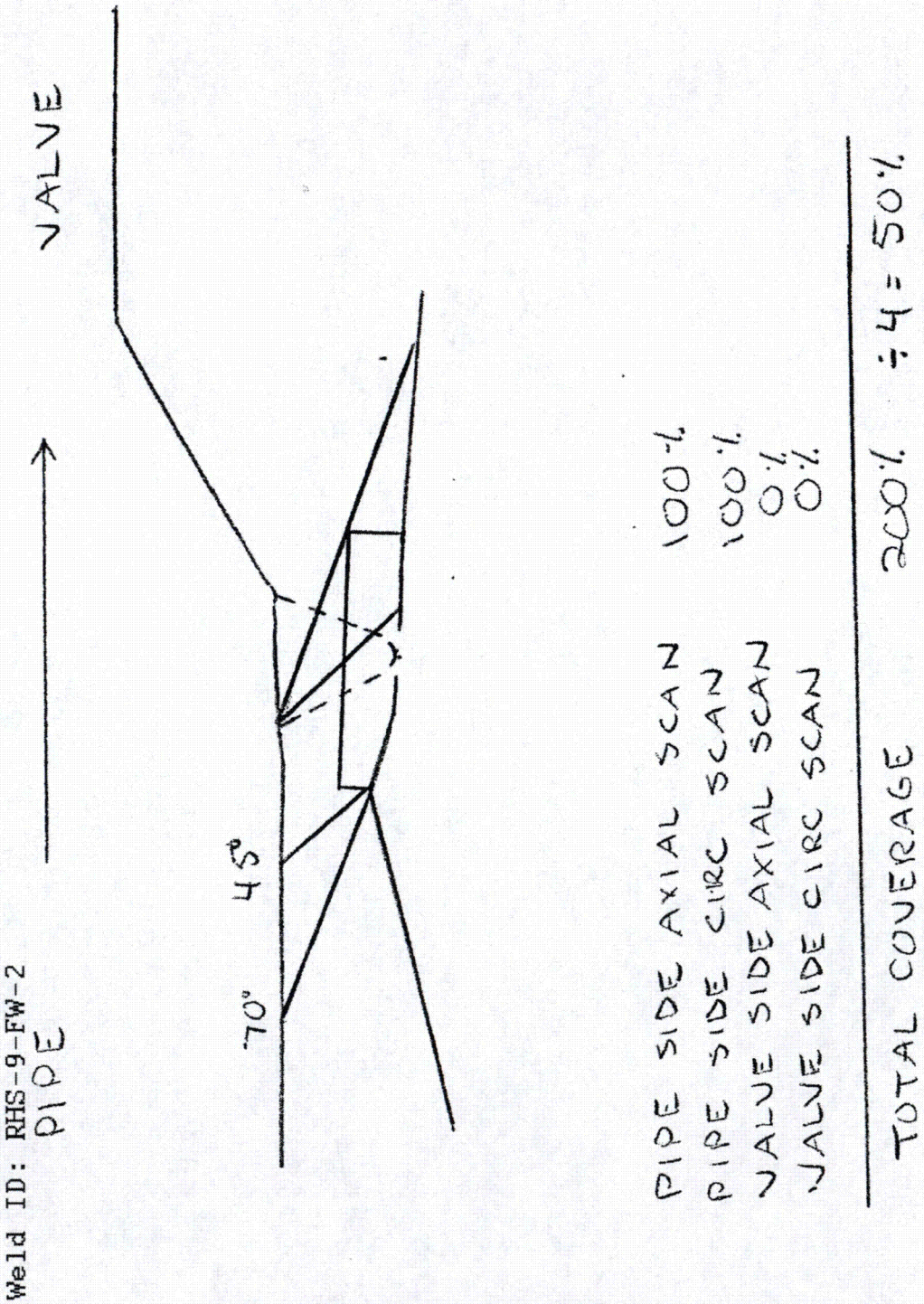
NOTE: An additional 25% total best effort (non-code) coverage was obtained for the flange side axial scan using a 70 degree shear wave search unit.



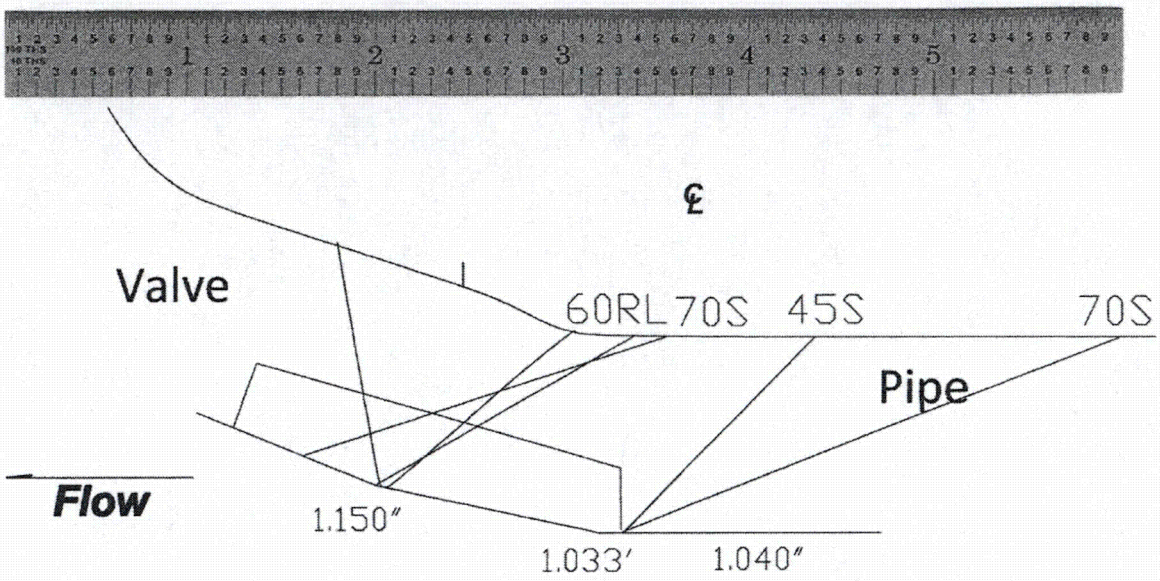
PIPE SIDE AXIAL SCAN	100%
PIPE SIDE CIRC. SCAN	100%
FLANGE SIDE AXIAL SCAN	0%
FLANGE SIDE CIRC SCAN	0%
TOTAL COVERAGE	200 ÷ 4 = 50%

Weld ID: RHS-9-3-SW-B

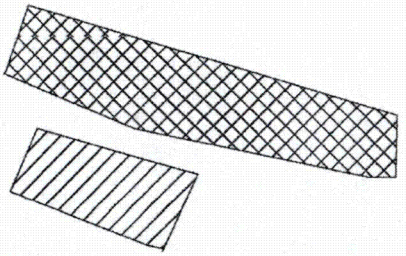
NOTE: An additional 25% total best effort (non-code) coverage was obtained for the flange side axial scan using a 70 degree shear wave search unit.



NOTE: An additional 25% total best effort (non-code) coverage was obtained for the valve side axial scan using a 70 degree shear wave search unit.



Required examination volume- .87 sq. inches



Far side required examination volume- .36 sq. inches

Volume examined on far side-0 sq. inches (0%)

50% Coverage achieved using 70° Shear Examination

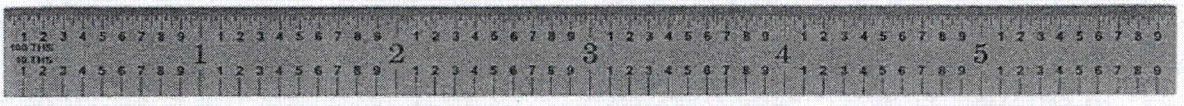
(US-100% + DS-0% + CW-50% + CCW-50%)/4=50%

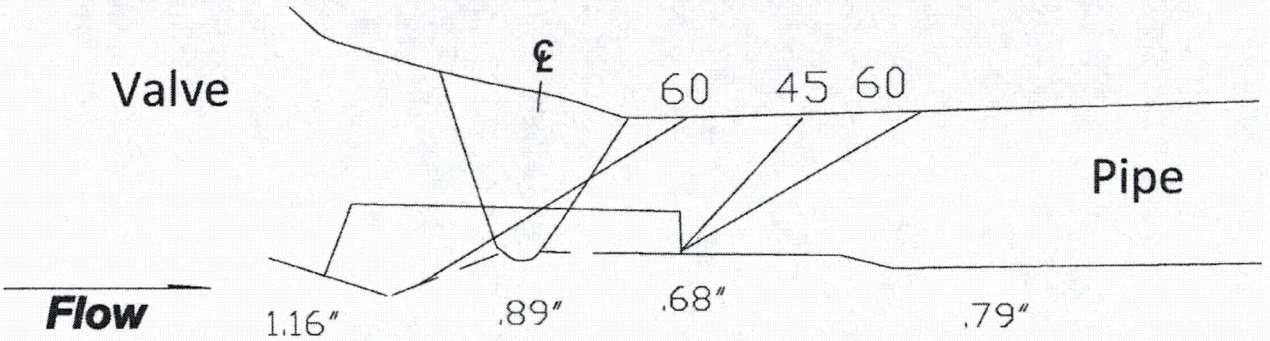
Examination Volume Dimensions: Length 34″ x Width 1.80″ x Height .383
Weld Thickness= 1.15″ Weld Length= 34″ Weld Width= 1.3″

Coverage Summary- Weld # SIL-157-FW-3				
	Required Scans- each has a weighing factor of 100% for complete coverage			
Angle	Upstream-Axial	Upstream- Circ.	Downstream Axial	Downstream Circ.
45				
60		100%	0%	0%
70	100%			
60RL			0% (best effort)	
			Code Coverage Total	50%
			Best Effort Coverage (Max 25%) Total	0%

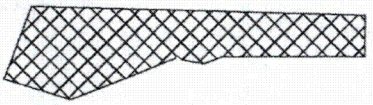
Notes:

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**

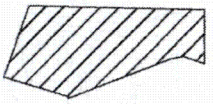




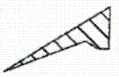
Required examination volume- .55 sq. inches



Far side required examination volume- .35 sq. inches



Volume examined on far side-.05 sq. inches (14.3%)



50% Coverage achieved using 60° Shear Examination

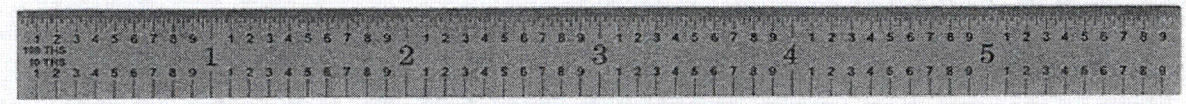
(US-0% + DS-1000% + CW-50% + CCW-50%)/4=50%

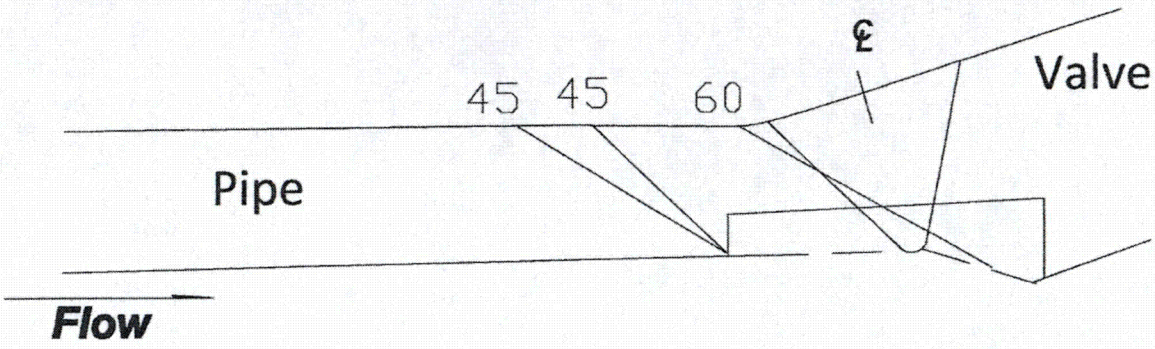
Examination Volume Dimensions: Length 21″ x Width 1.50″ x Height .296″
Weld Thickness= .89″ Weld Length= 21″ Weld Width= 1.0″

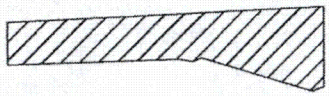
Coverage Summary- Weld # SIL-43-FW-1				
	Required Scans- each has a weighing factor of 100% for complete coverage			
Angle	Upstream-Axial	Upstream- Circ.	Downstream Axial	Downstream Circ.
45				0%
60		0%	100%	100%
70				
60RL	14.3% (best effort)			
			Code Coverage Total	50%
			Best Effort Coverage (Max 25%) Total	14.3%

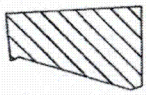
Notes:

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





Required examination volume- .44 sq. inches 

Far side required examination volume- .24 sq. inches 

Volume examined on far side-.04 sq. inches (16.6%) 

50% Coverage achieved using 60° Shear Examination

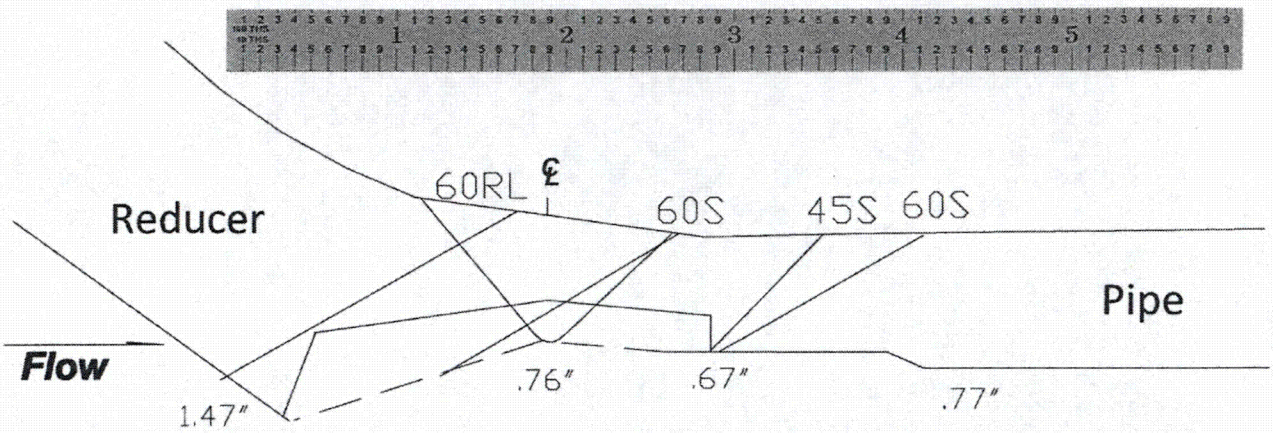
(US-100% + DS-0% + CW-50% + CCW-50%)/4=50%

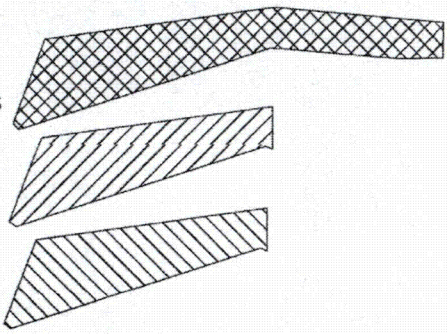
Examination Volume Dimensions: Length 21" x Width 1.5" x Height .28"
Weld Thickness= .84" Weld Length= 21" Weld Width= 1.0"

Coverage Summary- Weld # SIL-43-FW-16				
	Required Scans- each has a weighing factor of 100% for complete coverage			
Angle	Upstream-Axial	Upstream- Circ.	Downstream Axial	Downstream Circ.
45				0%
60	100%	100%		0%
70				
60RL			16.6% (best effort)	
			Code Coverage Total	50%
			Best Effort Coverage (Max 25%) Total	16.6%

Notes:

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





Required examination volume- .75 sq. inches

Far side required examination volume- .53 sq. inches

Volume examined on far side-.53 sq. inches (100%)

50% Coverage achieved using 60° Shear Examination

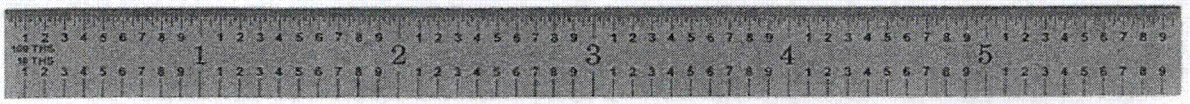
(US-0% + DS-1000% + CW-50% + CCW-50%)/4=50%

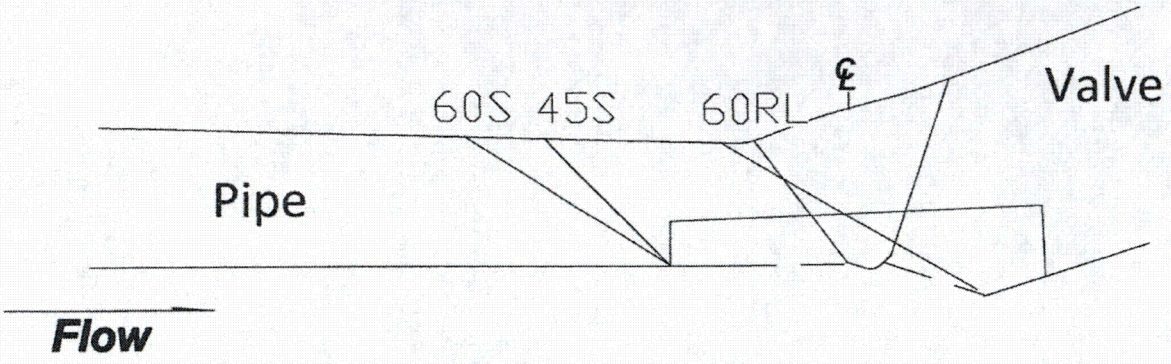
Examination Volume Dimensions: Length 21.8" x Width 2.0" x Height .253"
Weld Thickness= .76" Weld Length= 21.8" Weld Width= 1.5"

Coverage Summary- Weld # SIL-504-1-SW-7				
	Required Scans- each has a weighing factor of 100% for complete coverage			
Angle	Upstream-Axial	Upstream- Circ.	Downstream Axial	Downstream Circ.
45				0%
60		0%	100%	100%
70				
60RL	100% (best effort)			
			Code Coverage Total	50%
			Best Effort Coverage (Max 25%) Total	25%

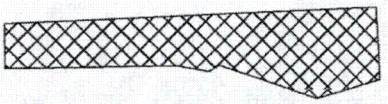
Notes:

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

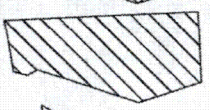




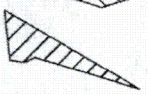
Required examination volume- .57 sq. inches



Far side required examination volume- .35 sq. inches



Volume examined on far side-.07 sq. inches (20%)



50% Coverage achieved using 60° Shear Examination

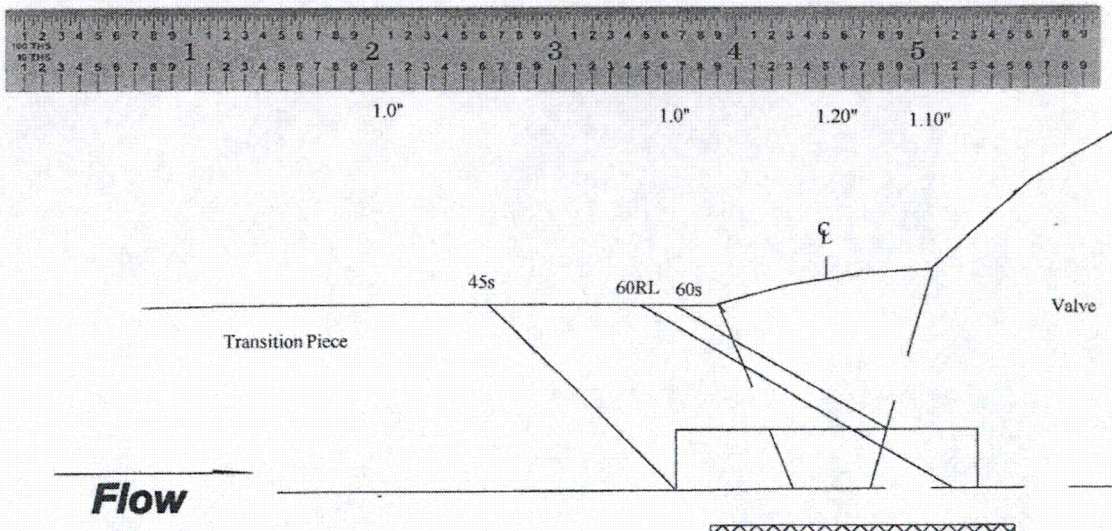
(US-100% + DS-0% + CW-50% + CCW-50%)/4=50%

Examination Volume Dimensions: Length 21" x Width 1.70" x Height .27"
Weld Thickness= .81" Weld Length= 21" Weld Width= 1.20"

Coverage Summary- Weld # SIL-504-FW-15				
	Required Scans- each has a weighing factor of 100% for complete coverage			
Angle	Upstream-Axial	Upstream- Circ.	Downstream Axial	Downstream Circ.
45				0%
60	100%	100%		0%
70				
60RL			20% (best effort)	
			Code Coverage Total	50%
			Best Effort Coverage (Max 25%) Total	20%

Notes:

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



Required Examination Volume .5329 sq. inches

Far Side Required Examination Volume .2591 sq. inches

Volume examined on far side .1283 sq. inches (50%)

Examination Volume Dimensions: Length 34.87" x Width 1.70" x Height .33" Weld Thickness= 1.20" Weld Length= 34.87" Weld Width= 1.20"				
(US-100%+DS-0%+CW-50%+CCW50%)/4=50%				
Coverage Summary- Weld # SIL-8-FW-3				
	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%		
60 RL			50%(Best Effort)	
			Code Coverage Total	**50%**
	100+100+0+50=250/4-50	**Best Effort Coverage (Max 25%) Total**		**12.5%**

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**

ATTACHMENT 5

RELIEF REQUEST IR-3-23
EXAMINATION CATEGORY C-F-2
PRESSURE RETAINING WELDS IN CARBON OR LOW ALLOY STEEL PIPING

DOMINION NUCLEAR CONNECTICUT, INC.
MILLSTONE POWER STATION UNIT 3

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-F-2, Pressure Retaining Welds in Carbon or Low Alloy Steel Piping.
Item Numbers:	C5.51, Circumferential Welds: Piping Welds $\geq$ 3/8 in. (10mm) Nominal Wall Thickness for Piping >NPS 4 (DN 100)
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

ASME Section XI, 2004 Edition, Examination Category C-F-2 requires 100 percent (%) volumetric examination coverage for circumferential piping welds. 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 weld 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 essentially 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 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). No alternative techniques or advanced technologies were considered capable of obtaining complete coverage of the examination volume.

The subject welds include configurations that consist of either pipe to valve or pipe to weldolet that limit the circumferential scans on the upstream side. Due to the tapered surface of the valve or weldolet, within close proximity of the weld, no circumferential scans could be performed on the upstream side of these welds.

The coverage calculations are provided in this attachment.

TABLE 1- Examination Category C-F-2 Weld with Limited Volumetric Examination Coverage

Weld Number	Code Item #	System Configuration Material	Examination Angle and Wave Mode	Limitation and Results	Ultrasonic Examination Coverage (%)	Surface Examination Results
DTM-25-FW-1	C5.51	Main Steam 6" Weldolet-To-Pipe SA106 GR B, Schedule 80	45° Shear Wave	Limited examination performed from the pipe side only due to taper of the weldolet within close proximity of the weld. There is not sufficient distance between the weld and weldolet to perform any scanning on the weldolet side of the weld. One indication was detected that was evaluated as acceptable root geometry.	75%	Magnetic particle examination performed obtaining 100 percent coverage. No recordable indications detected.
MSS-32-FW-2	C5.51	Main Steam 8" Pipe-To-Valve SA106 GR B, Schedule 100	45° Shear Wave	Limited examination performed from the pipe side only due to 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.	75%	Magnetic particle examination performed obtaining 100 percent coverage. No recordable indications detected.

Weld Number	Code Item #	System Configuration Material	Examination Angle and Wave Mode	Limitation and Results	Ultrasonic Examination Coverage (%)	Surface Examination Results
MSS-32-FW-3	C5.51	Main Steam 8" Pipe-To-Valve SA106 GR B, Schedule 100	45° Shear Wave	Limited examination performed from the pipe side only due to 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.	75%	Magnetic particle examination performed obtaining 100 percent coverage. No recordable indications detected.

5. Burden Caused by Compliance

Compliance with the Code requirements would require extensive modification or replacement of components with a design that would allow examination from both sides of the weld. This option to meet the 100% Code examination requirement for coverage is considered to be impractical based on the cost, additional radiation exposure and impact to plant equipment.

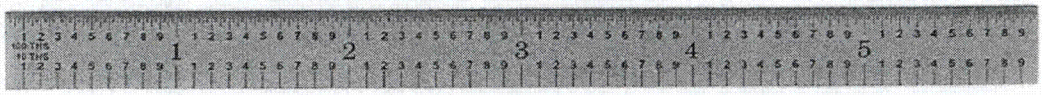
6. Proposed Alternative and Basis for Use

The subject welds received a volumetric examination to the maximum extent practical on the accessible portions of the welds using the best available techniques. Additionally, a surface examination was performed with 100% coverage obtained and a visual (VT-2) examination is performed each inspection period during the system leakage tests as required by Section XI, Table IWC-2500-1, Category C-H.

Based upon the volumetric examination coverage that was obtained with acceptable results, the surface examination obtaining 100% coverage with acceptable results, and the visual (VT-2) examination performed each 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.

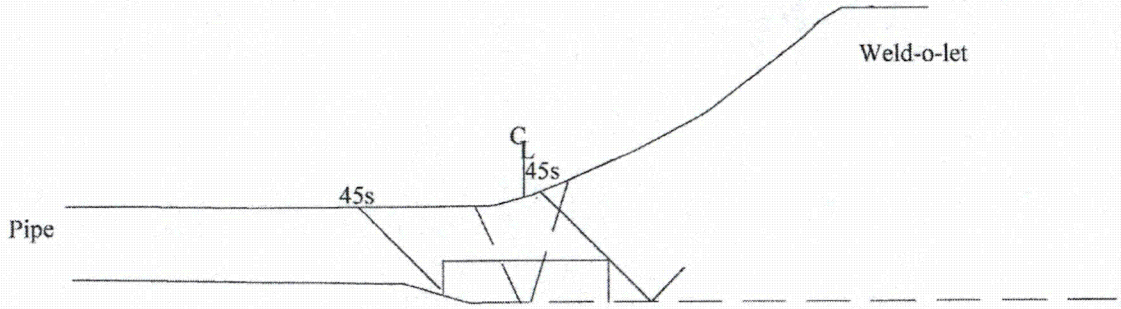
7. Duration of Proposed Alternative

The relief is requested for the third ten-year inspection interval for Millstone Power Station Unit 3, which began on April 23, 2009 and will end April 22, 2019.



Flow

.41" .41" .41" .57"

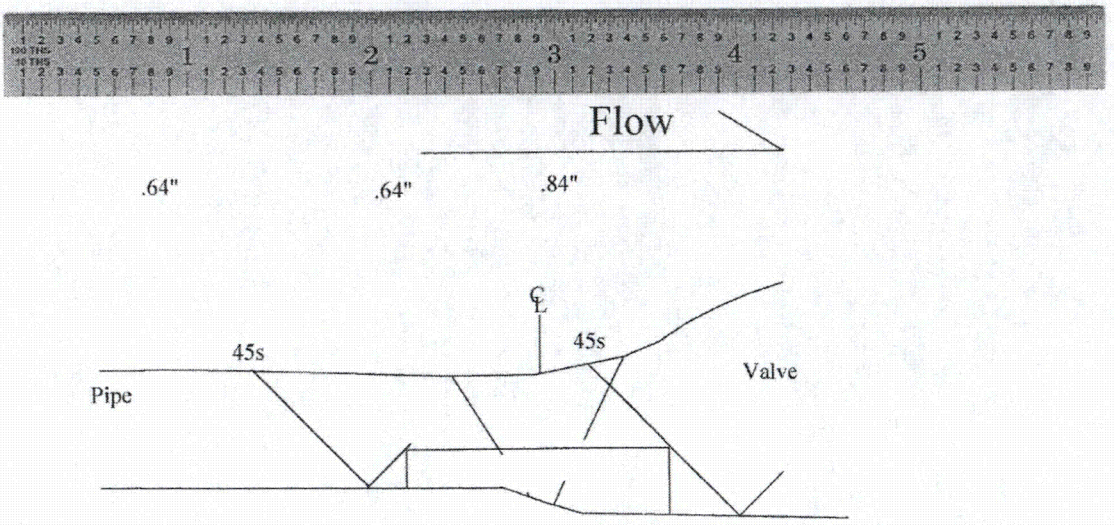


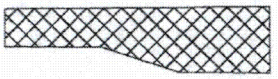
Required Examination Volume- .2333 Sq. inches 

Examination Volume Dimensions: Length 21" x Width 1.00" x Height .13" Weld Thickness= .54" Weld Length= 21" Weld Width= 1.00"				
(US-100%+DS100%+CW-50%+CCW-50%)/4=75%				
Coverage Summary- Weld # DTM-25-FW-1				
	Required Scans- each has a weighing factor of 100% for complete coverage			
Angle	Upstream-Axial	Upstream- Circ.	Downstream Axial	Downstream Circ.
45	100%	0%	100%	100%
			Code Coverage Total	75%
		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**
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**

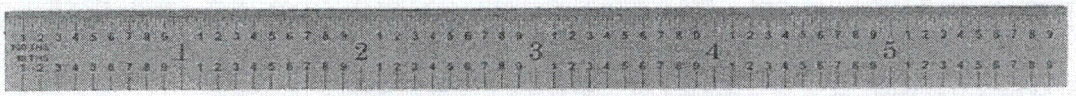


Required Examination volume- .41 sq. inches 

Examination Volume Dimensions: Length 45" x Width 1.45" x Height .21" Weld Thickness= 84" Weld Length= 45" Weld Width= .95"				
(US-100%+DS-100%+CW-50%+CCW-50%)/4=75%				
Coverage Summary- Weld # MSS-32-FW-2				
	Required Scans- each has a weighing factor of 100% for complete coverage			
Angle	Upstream-Axial	Upstream- Circ.	Downstream Axial	Downstream Circ.
45	100%	100%	100%	0%
			Code Coverage Total	75%
		Best Effort Coverage (Max 25%) Total		0%

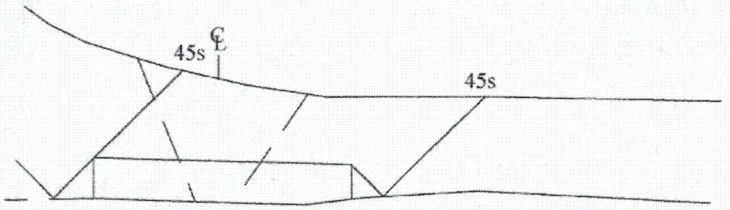
Notes:

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**



Flow

.68" .57" .59" .60"



Required Examination volume- .33 sq. inches 

Examination Volume Dimensions: Length 25.1" x Width 1.50" x Height .21" Weld Thickness= 68" Weld Length= 25.1" Weld Width= 1.00"				
(US-100%+DS100%+CW-50%+CCW-50%)/4=75%				
Coverage Summary- Weld # MSS-32-FW-3				
	Required Scans- each has a weighing factor of 100% for complete coverage			
Angle	Upstream-Axial	Upstream- Circ.	Downstream Axial	Downstream Circ.
45	100%	0%	100%	100%
			Code Coverage Total	75%
		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**
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**