

Dominion Nuclear Connecticut, Inc.  
5000 Dominion Boulevard, Glen Allen, Virginia 23060  
Web Address: www.dom.com



July 1, 2008

U. S. Nuclear Regulatory Commission  
Attention: Document Control Desk  
11555 Rockville Pike  
Rockville, MD 20852

Serial No. 08-0331  
NL&OS/GAW R1  
Docket No. 50-336  
License No. DPR-65

**DOMINION NUCLEAR CONNECTICUT, INC.**  
**MILLSTONE POWER STATION UNIT 2**  
**FINAL EVALUATION OF WELD OVERLAY EXAMINATIONS IN REFUELING OUTAGE 18**

Dominion Nuclear Connecticut, Inc. (DNC) hereby provided the final evaluation for the weld overlays (WOL) of dissimilar metal welds (DMW) performed during Refueling Outage 18 (2R18) for Millstone Power Station Unit 2 (MPS2). This completes the remaining obligations associated with the performance of WOLs in 2R18 using provisions of the NRC approved Alternative Request 89-61, Revision 1 (ADAMS Accession No. ML081150692).

Please contact Mr. Geoffrey A. Wertz at (804) 273-3572 if you have any questions or require additional information.

Sincerely,

A handwritten signature in black ink, appearing to read "Gerald T. Bischof".

Gerald T. Bischof  
Vice President – Nuclear Engineering

Commitments made in this letter: None

Enclosure: 2R18 Final Weld Overlay (WOL) Examination Report

cc: U. S. Nuclear Regulatory Commission  
Region I  
475 Allendale Road  
King of Prussia, PA 19406-1415

Mr. J. D. Hughey  
NRC Project Manager Millstone  
U. S. Nuclear Regulatory Commission, Mail Stop OWFN 0-8 B3  
One White Flint North  
11555 Rockville Pike  
Rockville, MD 20852-2738

NRC Senior Resident Inspector  
Millstone Power Station

**ENCLOSURE**

**2R18 FINAL WELD OVERLAY (WOL) EXAMINATION REPORT**

**MILLSTONE POWER STATION UNIT 2  
DOMINION NUCLEAR CONNECTICUT, INC. (DNC)**

## 2R18 FINAL WELD OVERLAY (WOL) EXAMINATION REPORT

The information in the balance of this document is submitted pursuant to the provisions of Section 4.3.1, Required Activities, of the NRC approved Alternative Request RR-89-61, Revision 1, for Millstone Power Station Unit 2 (MPS2), Reference ADAMS Accession No. ML081150692.

The required information includes the inspection results for new WOLs to four nozzle to safe end welds, including their respective adjacent stainless steel safe end to elbow or pipe weld. No additional weld overlays were performed during Refueling Outage 18 (2R18).

- 2-inch Cold Leg Charging Line Inlet Nozzle BCH-C-1001
- 12-inch Hot Leg Shutdown Cooling Outlet Nozzle BSD-C-2001
- 12-inch Hot Leg Surge Line Nozzle BPS-C-1001
- 12-inch Cold Leg Safety Injection Nozzle BSI-C-2001

Applicable pages for component descriptions in the report are as follows:

<u>WOL Component Description</u>	<u>Applicable Pages in Final Report</u>
RCS Charging Inlet (BCH-C-1001)	Pages 2 -25
RCS Shutdown Cooling (BSD-C-2001)	Pages 26 -35
RCS Surge (BPS-C-1001)	Pages 36 - 45
RCS Safety Injection (BSI-C-2001)	Pages 46 - 56

### Level III Inspector Reviewer Comment Regarding 2R18 Examination Data Reports:

The Inservice Inspection (ISI) examination volume to be examined upon completion of the weld overlay consists of the outer 25% of the underlying base material plus the full thickness of the overlay material extending 1/ 2 inches from the weld toe on each side of the weld. As has been described by provisions of the Alternative Request RR-89-61, Revision 1 for Millstone Power Station Unit 2, the current Appendix VIII, Supplement 11 examination procedures are not qualified to examine the outer 25% of the underlying cast stainless steel safe-end. For weld overlays of welds with cast stainless steel safe-ends, the cast stainless steel material is examined using the Appendix VIII, Supplement 11 qualified procedures as a best effort examination. The examination coverage is reported as the amount of volume examined of qualified material in accordance with the examination procedure. The cast stainless steel volume (remaining volume) is examined as a best effort examination and documented on the coverage calculation sheets of the applicable data package.



ULTRASONIC CALIBRATION RECORD

Instrument Data	Search Unit Data	CRT Display	General Data
Mfg./Model: Krautkramer / USN 58R	Beam Angle: 70° Mode: L	<p>70° @ 0.50" SDH @ 82% FSH for PSI</p>	Reference Block No.: N/A
Serial No.: 01HF1W	Wedges: Integral		Calibration Block No.: SI-3-AX-01
Instrument Settings	Manufacturer: Megasonics		Reference Reflectors: 0.5" SDH
File Name: 70° AX MPS2	Model: CSS 70L2		Each Major CRT Div.= 0.2"
Range: 2.00"	Serial No.: V0442		CRT Calibrated In:
Probe Delay: 7.6875 µS	Size & Shape: 2(10x18mm)		Sound Path <input checked="" type="checkbox"/> Depth <input type="checkbox"/>
Velocity: 0.2234 in/µS	Number of Elements: 2		Search Unit Orientation:
Display Delay: 0.040 µs	Frequency: 2.0 MHz		Axial <input checked="" type="checkbox"/> Circ. <input type="checkbox"/>
Energy: High	Focus Sound Path: FS=31mm		Calibration Dates & Times
Damping: 1K OHM	Measured Angle: 70°		
PRF Mode: Autohigh	Cable Type: 174	Initial Calibration: 04/18/2008 706	
PRF Value: 465 Hz	Cable Length: 6 FT	Interim Calibration: N/A N/A	
Frequency: 2.0 MHz	Number of Connectors: 0	Interim Calibration: N/A N/A	
Rectification: Full Wave	Couplant Brand: Soundsafe	Interim Calibration: N/A N/A	
Reject: 0%	Couplant Batch: 06120A	Final Calibration: 04/18/2008 1022	
Reference Sensitivity: 57.0 dB			
Display Start: IP			

RFB  
12/08

Examiner: Robert E. Bailey Jr Level: II Date: 04/18/08

Examiner: \_\_\_\_\_ Level: II Date: 04/18/08

Reviewer: John J. Hayden Level: III Date: 04/18/08

Reviewer: [Signature] Level: QE Date: 04/18/08

[Signature] Level: III Date: 4/20/08

Ami K. H. S. C. T. 04-22-2008



ULTRASONIC CALIBRATION RECORD

Instrument Data		Search Unit Data		CRT Display		General Data	
Mfg./Model	Krautkramer / USN 58R	Beam Angle:	39° Mode: L	<p>39° CIRC @ 0.60" SDH to 83% FSH for ISI</p>	Reference Block No.:	N/A	
Serial No.:	01HF1W	Wedges:	Integral		Calibration Block No.:	SI-3-CIRC-01	
Instrument Settings		Manufacturer:	Megasonics		Reference Reflectors:	0.6" SDH	
File Name:	39° CIRC MPS2	Model:	CSS 39L2		Each Major CRT Div. =	0.2"	
Range	2.00"	Serial No.:	V0447		CRT Calibrated In:		
Probe Delay:	6.3003 μS	Size & Shape:	2(10x18mm)		Sound Path <input checked="" type="checkbox"/> Depth <input type="checkbox"/>		
Velocity:	0.2234 In/μS	Number of Elements:	2		Search Unit Orientation:		
Display Delay:	0.040 μS	Frequency:	2.0 MHz		Axial <input type="checkbox"/> Circ. <input checked="" type="checkbox"/>		
Energy:	High	Focus Sound Path	FS=21mm		Calibration Dates & Times		
Damping:	1K OHM	Measured Angle:	39°		Initial Calibration	Date	Time
PRF Mode:	Autohigh	Cable Type:	174	Interim Calibration	N/A	N/A	
PRF Value:	465 Hz	Cable Length:	6 FT	Interim Calibration	N/A	N/A	
Frequency:	2.0 MHz	Number of Connectors:	0	Interim Calibration	N/A	N/A	
Rectification:	Full Wave	Couplant Brand:	Soundsafe	Final Calibration	04/18/2008	1033	
Reject:	0%	Couplant Batch:	06120A				
Reference Sensitivity:	48.5 dB						
Display Start:	IP						

REB  
2/2/08

Examiner: Robert E. Bailey Jr Level: II Date: 04/18/08

Examiner: \_\_\_\_\_ Level: II Date: 04/18/08

Reviewer: John J. Hayden Level: III Date: 04/18/08

Reviewer: [Signature] Level: QE Date: 04/18/08

[Signature] Level: III Date: 4/20/08

[Signature] Level: HSBCT Date: 4.22.08

Calibration Data Sheet No. MPS-CHR-INLET-03  
Procedure No.: SI-UT-128  
Revision: 1

**ULTRASONIC CALIBRATION RECORD**

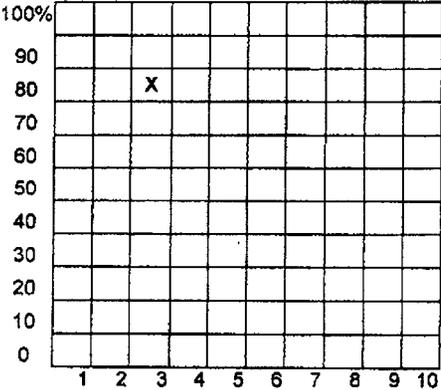
Instrument Data		Search Unit Data		CRT Display	General Data	
Mfg./Model	Krautkramer / USN-58R	Beam Angle:	0° Mode: L		Reference Block No.:	04-6138
Serial No.:	01HF1W	Wedges:	N/A		Calibration Block No.:	SI-3-AX-01
Instrument Settings		Manufacturer:	Krautkramer		Reference Reflectors:	0.60" SDH
File Name:	0° LAM CAL	Model:	MSEB-2		Each Major CRT Div. =	0.2"
Range	2.00"	Serial No.:	57461 57461-3751 <sup>PER 4/24/08</sup>		CRT Calibrated in:	
Probe Delay:	9.5281 μS	Size & Shape:	2(3.5x10mm) Rect		Sound Path <input checked="" type="checkbox"/>	Depth <input checked="" type="checkbox"/>
Velocity:	.2234 in/μS	Number of Elements:	2		Search Unit Orientation:	
Display Delay:	0.042 μS	Frequency:	2.0 MHz		Axial <input checked="" type="checkbox"/>	Circ. <input checked="" type="checkbox"/>
Energy:	High	Focus Sound Path	N/A		Calibration Dates & Times	
Damping:	1K OHM	Measured Angle:	N/A		Initial Calibration	Date: 04/13/2008 Time: 0755
PRF Mode:	Autohigh	Cable Type:	174		Interim Calibration	N/A N/A
PRF Value:	465 Hz	Cable Length:	6 feet		Interim Calibration	N/A N/A
Frequency:	2.0 MHz	Number of Connectors:	0	Interim Calibration	N/A N/A	
Rectification:	Full Wave	Couplant Brand:	Soundsafe	Final Calibration	04/13/2008 1055	
Reject:	0%	Couplant Batch:	06120A			
Reference Sensitivity:	57.0 dB					
Display Start	IP					

EB  
2/2/08

Examiner: Robert E. Bailey Jr Level: II Date: 04/18/08  
 Examiner: \_\_\_\_\_ Level: II Date: 04/18/08  
 Reviewer: John J. Hayden Level: III Date: 04/18/08  
 Reviewer: \_\_\_\_\_ Level: QE Date: 04/18/08  
 \_\_\_\_\_ Level: III Date: 4/20/08  
 \_\_\_\_\_ Level: III Date: 4/22/08

**ULTRASONIC CALIBRATION RECORD**

Calibration Data Sheet No. MPS-CHR-INLET-04  
 Procedure No.: SI-UT-128  
 Revision: 1

Instrument Data	Search Unit Data	CRT Display	General Data																		
<b>Mfg./Model</b> <u>Krautkramer / USN 58R</u> <b>Serial No.:</b> <u>01HF1W</u> <b>Instrument Settings</b> <b>File Name:</b> <u>42° CIRC MPS2</u> <b>Range</b> <u>2.00"</u> <b>Probe Delay:</b> <u>4.1331 μS</u> <b>Velocity:</b> <u>0.2234 in/μs</u> <b>Display Delay:</b> <u>0.040 μS</u> <b>Energy:</b> <u>High</u> <b>Damping:</b> <u>1K OHM</u> <b>PRF Mode:</b> <u>Autohigh</u> <b>PRF Value:</b> <u>465 Hz</u> <b>Frequency:</b> <u>2.0 MHz</u> <b>Rectification:</b> <u>Full Wave</u> <b>Reject:</b> <u>0%</u> <b>Reference Sensitivity:</b> <u>40.5 dB</u> <b>Display Start</b> <u>IP</u>	<b>Beam Angle:</b> <u>42°</u> <b>Mode:</b> <u>L</u> <b>Wedges:</b> <u>Integral</u> <b>Manufacturer:</b> <u>Megasonics</u> <b>Model:</b> <u>CSS 42L2</u> <b>Serial No.:</b> <u>V0446</u> <b>Size &amp; Shape:</b> <u>2(7x12mm)</u> <b>Number of Elements:</b> <u>2</u> <b>Frequency:</b> <u>2.0 MHz</u> <b>Focus Sound Path</b> <u>FS=15mm</u> <b>Measured Angle:</b> <u>42°</u> <b>Cable Type:</b> <u>174</u> <b>Cable Length:</b> <u>6 FT</u> <b>Number of Connectors:</b> <u>0</u> <b>Couplant Brand:</b> <u>Soundsafe</u> <b>Couplant Batch:</b> <u>08120A</u>	 <p>Circ 0.4" SDH @ 83 % FSH FOR PSI</p>	<b>Reference Block No.:</b> <u>N/A</u> <b>Calibration Block No.:</b> <u>SI-3-CIRC-01</u> <b>Reference Reflectors:</b> <u>0.4" SDH</u> <b>Each Major CRT Div. =</b> <u>0.2"</u> <b>CRT Calibrated In:</b> <b>Sound Path</b> <input checked="" type="checkbox"/> <b>Depth</b> <input type="checkbox"/> <b>Search Unit Orientation:</b> <b>Axial</b> <input type="checkbox"/> <b>Circ.</b> <input checked="" type="checkbox"/> <b>Calibration Dates &amp; Times</b> <table border="1"> <thead> <tr> <th></th> <th>Date</th> <th>Time</th> </tr> </thead> <tbody> <tr> <td>Initial Calibration</td> <td>04/18/2008</td> <td>0718</td> </tr> <tr> <td>Interim Calibration</td> <td>N/A</td> <td>N/A</td> </tr> <tr> <td>Interim Calibration</td> <td>N/A</td> <td>N/A</td> </tr> <tr> <td>Interim Calibration</td> <td>N/A</td> <td>N/A</td> </tr> <tr> <td>Final Calibration</td> <td>04/18/2008</td> <td>1028</td> </tr> </tbody> </table>		Date	Time	Initial Calibration	04/18/2008	0718	Interim Calibration	N/A	N/A	Interim Calibration	N/A	N/A	Interim Calibration	N/A	N/A	Final Calibration	04/18/2008	1028
	Date	Time																			
Initial Calibration	04/18/2008	0718																			
Interim Calibration	N/A	N/A																			
Interim Calibration	N/A	N/A																			
Interim Calibration	N/A	N/A																			
Final Calibration	04/18/2008	1028																			

EB  
20/08

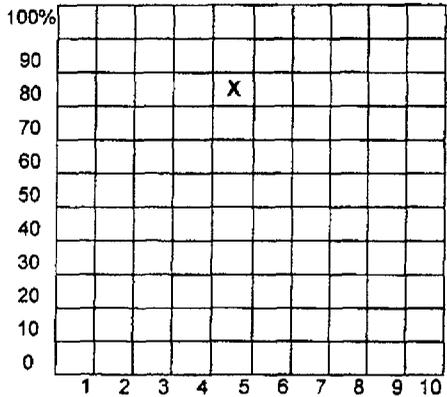
Examiner: Robert E. Bradley Jr. Level: II Date: 04/18/08  
 Examiner: \_\_\_\_\_ Level: II Date: 04/18/08  
 Reviewer: John J. Hayden Level: III Date: 04/18/08  
 Reviewer: \_\_\_\_\_ Level: QE Date: 04/18/08  
 \_\_\_\_\_ Level: III Date: 4/20/08  
 \_\_\_\_\_ Level: ANSE Date: 4.22.08

Calibration Data Sheet No. MPS-CHR-INLET-05

Procedure No.: SI-UT-128

Revision: 1

**ULTRASONIC CALIBRATION RECORD**

Instrument Data	Search Unit Data	CRT Display	General Data																		
<b>Mfg./Model</b> <u>Krautkramer / USN 58R</u> <b>Serial No.:</b> <u>01HF1W</u> <b>Instrument Settings</b> <b>File Name:</b> <u>60° AX MPS2</u> <b>Range</b> <u>2.00"</u> <b>Probe Delay:</b> <u>6.3003 μS</u> <b>Velocity:</b> <u>0.2234 in/μS</u> <b>Display Delay:</b> <u>0.040 μS</u> <b>Energy:</b> <u>High</u> <b>Damping:</b> <u>1K OHM</u> <b>PRF Mode:</b> <u>Autohigh</u> <b>PRF Value:</b> <u>465 Hz</u> <b>Frequency:</b> <u>2.0 MHz</u> <b>Rectification:</b> <u>Full Wave</u> <b>Reject:</b> <u>0%</u> <b>Reference Sensitivity:</b> <u>48.5 dB</u> <b>Display Start:</b> <u>IP</u>	<b>Beam Angle:</b> <u>60°</u> <b>Mode:</b> <u>L</u> <b>Wedges:</b> <u>Integral</u> <b>Manufacturer:</b> <u>Megasonics</u> <b>Model:</b> <u>CSS 60L2</u> <b>Serial No.:</b> <u>V0444</u> <b>Size &amp; Shape:</b> <u>2(7x12mm)</u> <b>Number of Elements:</b> <u>2</u> <b>Frequency:</b> <u>2.0 MHz</u> <b>Focus Sound Path</b> <u>FS=18mm</u> <b>Measured Angle:</b> <u>60°</u> <b>Cable Type:</b> <u>174</u> <b>Cable Length:</b> <u>6 FT</u> <b>Number of Connectors:</b> <u>0</u> <b>Couplant Brand:</b> <u>Soundsafe</u> <b>Couplant Batch:</b> <u>06120A</u>	 <p>60° AX 0.4" SDH @ 82% FSH for PSI exam</p>	<b>Reference Block No.:</b> <u>N/A</u> <b>Calibration Block No.:</b> <u>SI-3-AX-01</u> <b>Reference Reflectors:</b> <u>0.4" SDH</u> <b>Each Major CRT Div. =</b> <u>0.2"</u> <b>CRT Calibrated In:</b> <b>Sound Path</b> <input checked="" type="checkbox"/> <b>Depth</b> <input type="checkbox"/>  <b>Search Unit Orientation:</b> <b>Axial</b> <input checked="" type="checkbox"/> <b>Circ.</b> <input type="checkbox"/>  <b>Calibration Dates &amp; Times</b> <table border="1"> <thead> <tr> <th></th> <th>Date</th> <th>Time</th> </tr> </thead> <tbody> <tr> <td>Initial Calibration</td> <td>04/18/2008</td> <td>0748</td> </tr> <tr> <td>Interim Calibration</td> <td>N/A</td> <td>N/A</td> </tr> <tr> <td>Interim Calibration</td> <td>N/A</td> <td>N/A</td> </tr> <tr> <td>Interim Calibration</td> <td>N/A</td> <td>N/A</td> </tr> <tr> <td>Final Calibration</td> <td>04/18/2008</td> <td>1052</td> </tr> </tbody> </table>		Date	Time	Initial Calibration	04/18/2008	0748	Interim Calibration	N/A	N/A	Interim Calibration	N/A	N/A	Interim Calibration	N/A	N/A	Final Calibration	04/18/2008	1052
	Date	Time																			
Initial Calibration	04/18/2008	0748																			
Interim Calibration	N/A	N/A																			
Interim Calibration	N/A	N/A																			
Interim Calibration	N/A	N/A																			
Final Calibration	04/18/2008	1052																			

FB  
2/2/08

**Examiner:** Robert E. Bailey Jr **Level:** II **Date:** 04/18/08  
**Examiner:** \_\_\_\_\_ **Level:** II **Date:** 04/18/08  
**Reviewer:** John J. Hayden **Level:** III **Date:** 04/18/08  
**Reviewer:** \_\_\_\_\_ **Level:** QE **Date:** 04/18/08  
  
KjHach **Level:** III **Date:** 4/20/08  
E. Sprick-HS/CT **Level:** ANII **Date:** 4.22.08



Calibration Data Sheet No. MPS-CHR-INLET-06

Procedure No.: SI-UT-128

Revision: 1

ULTRASONIC CALIBRATION RECORD

Instrument Data	Search Unit Data	CRT Display	General Data
Mfg./Model: Krautkramer / USN 58R	Beam Angle: ODCR Mode: L	<p>ODCR AX @ 0.1" SDH for 82% PSI</p>	Reference Block No.: N/A
Serial No.: 01HF1W	Wedges: Integral		Calibration Block No.: SI-3-AX-01
Instrument Settings	Manufacturer: Megasonics		Reference Reflectors: 0.1" SDH
File Name: ODCR AX MPS2	Model: CSS ODCR		Each Major CRT Div. = 0.2"
Range: 2.00"	Serial No.: V0445		CRT Calibrated In:
Probe Delay: 4.3719 μS	Size & Shape: 2(7x12mm)		Sound Path <input checked="" type="checkbox"/> Depth <input type="checkbox"/>
Velocity: 0.2234 in/μs	Number of Elements: 2		Search Unit Orientation:
Display Delay: 0.040 μS	Frequency: 2.0 MHz		Axial <input checked="" type="checkbox"/> Circ. <input type="checkbox"/>
Energy: High	Focus Sound Path: FS=15mm		Calibration Dates & Times
Damping: 1K OHM	Measured Angle: N/A		Initial Calibration: 04/13/2008 1056
PRF Mode: Autohigh	Cable Type: 174		Interim Calibration: N/A N/A
PRF Value: 465 Hz	Cable Length: 6 FT		Interim Calibration: N/A N/A
Frequency: 2.0 MHz	Number of Connectors: 0		Interim Calibration: N/A N/A
Rectification: Full Wave	Couplant Brand: Soundsafe	Final Calibration: 04/13/2008 2053	
Reject: 0%	Couplant Batch: 06120A		
Reference Sensitivity: 48.5 dB			
Display Start: IP			

3EB  
8/08

Examiner: Robert E. Bruley Jr Level: II Date: 04/13/08

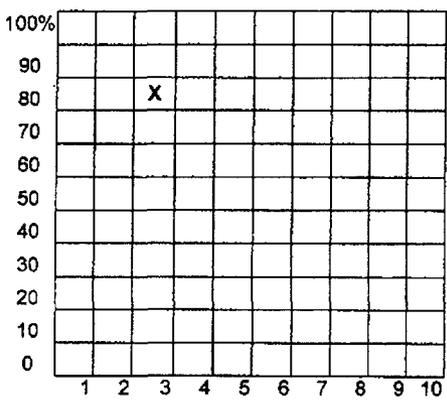
Examiner: \_\_\_\_\_ Level: II Date: 04/13/08

Reviewer: John J. Hayden Level: III Date: 04/18/08

Reviewer: \_\_\_\_\_ Level: QE Date: 04/18/08

KJ Hecker Level: III Date: 4/20/08  
Frank H/SCT Level: N/A Date: 4-22-08

**ULTRASONIC CALIBRATION RECORD**

Instrument Data	Search Unit Data	CRT Display	General Data																		
<b>Mfg./Model</b> <u>Krautkramer / USN 58R</u> <b>Serial No.:</b> <u>01HF1W</u> <b>Instrument Settings</b> <b>File Name:</b> <u>ODCR CIRC MPS2</u> <b>Range</b> <u>2.00"</u> <b>Probe Delay:</b> <u>3.5053 μS</u> <b>Velocity:</b> <u>0.2234 in/μS</u> <b>Display Delay:</b> <u>0.040 μS</u> <b>Energy:</b> <u>High</u> <b>Damping:</b> <u>1K OHM</u> <b>PRF Mode:</b> <u>Autohigh</u> <b>PRF Value:</b> <u>465 Hz</u> <b>Frequency:</b> <u>2.0 MHz</u> <b>Rectification:</b> <u>Full Wave</u> <b>Reject:</b> <u>0%</u> <b>Reference Sensitivity:</b> <u>49.5 dB</u>	<b>Beam Angle:</b> <u>ODCR</u> Mode: <u>L</u> <b>Wedges:</b> <u>Integral</u> <b>Manufacturer:</b> <u>Megasonics</u> <b>Model:</b> <u>CSS ODCR</u> <b>Serial No.:</b> <u>V0448</u> <b>Size &amp; Shape:</b> <u>2(7x12mm)</u> <b>Number of Elements:</b> <u>2</u> <b>Frequency:</b> <u>2.0 MHz</u> <b>Focus Sound Path</b> <u>FS=15mm</u> <b>Measured Angle:</b> <u>N/A</u> <b>Cable Type:</b> <u>174</u> <b>Cable Length:</b> <u>6 FT</u> <b>Number of Connectors:</b> <u>0</u> <b>Couplant Brand:</b> <u>Soundsafe</u> <b>Couplant Batch:</b> <u>06120A</u>	 ODCR CIRC 0.1" SDH @ 83% PSI	<b>Reference Block No.:</b> <u>N/A</u> <b>Calibration Block No.:</b> <u>SI-3-CIRC-01</u> <b>Reference Reflectors:</b> <u>0.1" SDH</u> <b>Each Major CRT Div. =</b> <u>0.2"</u> <b>CRT Calibrated In:</b> Sound Path <input checked="" type="checkbox"/> Depth <input type="checkbox"/> <b>Search Unit Orientation:</b> Axial <input type="checkbox"/> Circ. <input checked="" type="checkbox"/> <b>Calibration Dates &amp; Times</b> <table border="1"> <thead> <tr> <th></th> <th>Date</th> <th>Time</th> </tr> </thead> <tbody> <tr> <td>Initial Calibration</td> <td>04/18/2008</td> <td>0741</td> </tr> <tr> <td>Interim Calibration</td> <td>N/A</td> <td>N/A</td> </tr> <tr> <td>Interim Calibration</td> <td>N/A</td> <td>N/A</td> </tr> <tr> <td>Interim Calibration</td> <td>N/A</td> <td>N/A</td> </tr> <tr> <td>Final Calibration</td> <td>04/18/2008</td> <td>1047</td> </tr> </tbody> </table>		Date	Time	Initial Calibration	04/18/2008	0741	Interim Calibration	N/A	N/A	Interim Calibration	N/A	N/A	Interim Calibration	N/A	N/A	Final Calibration	04/18/2008	1047
	Date	Time																			
Initial Calibration	04/18/2008	0741																			
Interim Calibration	N/A	N/A																			
Interim Calibration	N/A	N/A																			
Interim Calibration	N/A	N/A																			
Final Calibration	04/18/2008	1047																			

EB  
2/08

Display Start IP

Examiner: Robert E. Bruley Jr. Level: II Date: 04/18/08

Examiner: Robert E. Bruley Jr. Level: II Date: 04/18/08

Reviewer: John J. Hayden Level: III Date: 04/18/08

Reviewer: [Signature] Level: QE Date: 04/18/08

[Signature] [Signature] Level: III AN/II Date: 4/20/08  
4-22-08



ULTRASONIC CALIBRATION RECORD

Calibration Data Sheet No. MPS-CHR-INLET-08
Procedure No.: SI-UT-128
Revision: 1

Instrument Data: Mfg./Model Krautkramer / USN 58R, Serial No.: 01HF1W, Instrument Settings: File Name: 60° AX MPS2 32M, Range: 2.00", Probe Delay: 6.3003 μS, Velocity: 0.2234 in/μS, Display Delay: 0.040 μS, Energy: High, Damping: 1K OHM, PRF Mode: Autohigh, PRF Value: 465 Hz, Frequency: 2.0 MHz, Rectification: Full Wave, Reject: 0%, Reference Sensitivity: 56.0dB. Search Unit Data: Beam Angle: 60° Mode: L, Wedges: Integral, Manufacturer: RTD, Model: 60°, Serial No.: 05-1538, Size & Shape: 2(8X14)C, Number of Elements: 2, Frequency: 2.0 MHz, Focus Sound Path: FS=30mm, Measured Angle: 58°, Cable Type: 174, Cable Length: 6 FT, Number of Connectors: 0, Couplant Brand: Soundsafe, Couplant Batch: 06120A. CRT Display: 60° AX 0.6" SDH @ 82% FSH for ISI exam. General Data: Reference Block No.: N/A, Calibration Block No.: SI-3-AX-01, Reference Reflectors: 0.6" SDH, Each Major CRT Div.: 0.2", CRT Calibrated In: Sound Path [X] Depth [ ], Search Unit Orientation: Axial [X] Circ [ ]. Calibration Dates & Times: Initial Calibration 04/18/2008 0711, Interim Calibration N/A N/A, Interim Calibration N/A N/A, Interim Calibration N/A N/A, Final Calibration 04/18/2008 1024.

EB 12/20/08

Display Start IP

Examiner: Robert E. Bruley, Level: II, Date: 04/18/08
Examiner: [Signature], Level: II, Date: 04/18/08
Reviewer: John J. Hayden, Level: III, Date: 04/18/08
Reviewer: [Signature], Level: QE, Date: 04/18/08
KJ Heck, Level: III, Date: 4/22/08
Erick Hysct, Level: AN II, Date: 4-22-08

**ULTRASONIC EXAMINATION RECORD**

Examination Data Sheet No.:	MPS-CHR-INLET-EXAM-01
Calibration Data Sheet No.:	SEE BELOW
Date:	04/18/2008
Time:	0839 to 1010

Plant:	MILLSTONE	Unit:	2	Procedure No.:	SI-UT-128	Revision:	1	Scans Performed	Yes	No
Component:	NPS RCS COLD LEG CHARGING INLET WELD OVERLAY							(1) 0 if req'd	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Component Configuration:	NOZ to SE to PIPE WOL	Examination Angles / Examination Sensitivity					(2) (Towards TDC)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Weld Overlay Diameter:	3.95"	70° Axial: 63.0 dB	42° Circ: 45.5 dB	ODCr Circ 55.5 dB	0° Axial/Circ: 61.0 dB	(3) (Towards BDC)	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
Weld Overlay Thickness:	0.43" min / .55" max	ODCr Axial 54.5 dB	60° AX 18mm 54.5 dB	60° AX 30mm 62.0 dB	N/A	(4) CW	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
Examination Surface:	Surface of weld overlay	N/A	N/A	N/A	N/A	(5) CCW	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
		N/A	N/A	N/A	N/A					

**Comments:**  
 There were no recordable indications detected during the course of these examinations. Geometrical indications originating at the I.D. of the overlaid components were observed during these examinations. Examination sensitivity was adjusted to maintain a 5% to 20 % baseline noise level. 96.8% of the weld overlay examination volume was inspected.  
**Reference Calibration Sheets:** MPS-CHR-INLET-01, MPS-CHR-INLET-03, MPS-CHR-INLET-04, MPS-CHR-INLET-05, MPS-CHR-INLET-06, MPS-CHR-INLET-07 and MPS-CHR-INLET-08

Indication No	% DAC	Exam Angle	Scan No.	L <sub>1</sub>	L <sub>Max</sub>	L <sub>2</sub>	Indication Length	W <sub>1</sub> in.	W <sub>Max</sub> in.	W <sub>2</sub> in.	Indication Width	% Full Screen Width			Comments
												MP 1	MP Max	MP 2	
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Examiner:	<i>Robert C. Bruley Jr</i>	Level:	II	Date:	04/18/08
Reviewer:	<i>Mark H. ...</i>	Level:	<i>AVII</i>	Date:	<i>4.22.08</i>
Reviewer:	<i>John J. Hayden</i>	Level:	III	Date:	04/18/08
Reviewer:	<i>[Signature]</i>	Title:	QE	Date:	04/18/08
Reviewer:	<i>[Signature]</i>	Title:	<i>III</i>	Date:	<i>4/20/08</i>

**ULTRASONIC EXAMINATION RECORD**

Examination Data Sheet No.:	MPS-CHR-INLET-EXAM-02
Calibration Data Sheet No.:	SEE BELOW
Date:	04/18/2008
Time:	0839 to 1010

Plant:	MILLSTONE	Unit:	2	Procedure No.:	SI-UT-128	Revision:	1	Scans Performed	Yes	No
Component:	2 INCH NPS RCS CHARGING INLET DM WELD (BCH-C 1001)							(1) 0 if req'd	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Component Configuration:	NOZ to SE		Examination Angles / Examination Sensitivity				(2) (Towards TDC)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Weld Overlay Diameter:	3.95"	60° Axial 30 mm:	60° Axial 18mm:	39° CIRC	N/A		(3) (Towards BDC)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
		62.0 dB	54.5 dB	56.5 dB						
Weld Overlay Thickness:	0.43"min to 0.55" max	N/A	N/A	N/A	N/A		(4) CW	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Examination Surface:	Surface of weld overlay	N/A	N/A	N/A	N/A		(5) CCW	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
		N/A	N/A	N/A	N/A					

**Comments:**  
 There were no recordable indications detected during the course of these examinations. Geometrical indications originating at the I.D. of the overlaid components were observed during these examinations. Examination sensitivity was adjusted to maintain a 5% to 20 % baseline noise level. 100% of the DM weld (BCH-C-1001) examination volume was inspected.

**Reference Calibration Sheets:** MPS-CHR-INLET-02, MPS-CHR-INLET-05, MPS-CHR-INLET-08

Indication No	% DAC	Exam Angle	Scan No.	L <sub>1</sub>	L <sub>Max</sub>	L <sub>2</sub>	Indication Length	W <sub>1</sub> in.	W <sub>Max</sub> in.	W <sub>2</sub> in.	Indication Width	% Full Screen Width			Comments
												MP 1	MP Max	MP 2	
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Examiner:	<i>Robert E. Bruley Jr</i>	Level:	II	Date:	04/83/08
Reviewer:	<i>Frank [unclear]</i>	Level:	<i>None</i>	Date:	4.22.08
Reviewer:	<i>John J Hayden</i>	Level:	III	Date:	04/18/08
Reviewer:	<i>[Signature]</i>	Title:	QE	Date:	04/18/08
Reviewer:	<i>[Signature]</i>	Title:	<i>III</i>	Date:	4/20/08

**ULTRASONIC EXAMINATION RECORD**

Examination Data Sheet No.:	MPS-CHR-INLET-EXAM-03
Calibration Data Sheet No.:	SEE BELOW
Date:	04/18/2008
Time:	0839 to 1010

Plant:	MILLSTONE	Unit:	2	Procedure No.:	SI-UT-128	Revision:	1	Scans Performed	Yes	No	
Component:	2 INCH NPS RCS CHARGING INLET SM WELD (BCH-C 1003)							(1) 0 if req'd	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Component Configuration:	SE to PIPE		Examination Angles / Examination Sensitivity				(2) (Towards TDC)	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
Weld Overlay Diameter:	3.95"	60° Axial 30 mm:	62.0 dB	60° Axial 18mm:	54.5 dB	39° CIRC	56.5 dB	N/A	(3) (Towards BDC)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Weld Overlay Thickness:	0.43" min to .55" max		N/A	N/A	N/A	N/A	N/A	N/A	(4) CW	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Examination Surface:	Surface of weld overlay		N/A	N/A	N/A	N/A	N/A	N/A	(5) CCW	<input checked="" type="checkbox"/>	<input type="checkbox"/>
			N/A	N/A	N/A	N/A	N/A	N/A			

**Comments:**

There were no recordable indications detected during the course of these examinations. Geometrical indications originating at the I.D. of the overlaid components were observed during these examinations. Examination sensitivity was adjusted to maintain a 5% to 20 % baseline noise level. 100% of the SM (BCH-C-1003) examination volume was inspected.

**Reference Calibration Sheets:** MPS-CHR-INLET-02, MPS-CHR-INLET-05, MPS-CHR-INLET-08

Indication No	% DAC	Exam Angle	Scan No.	L <sub>1</sub>	L <sub>Max</sub>	L <sub>2</sub>	Indication Length	W <sub>1</sub> in.	W <sub>Max</sub> in.	W <sub>2</sub> in.	Indication Width	% Full Screen Width			Comments
												MP 1	MP Max	MP 2	
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Examiner:	<i>Robert E. Bruley</i>	Level:	II	Date:	04/18/08
Reviewer:	<i>Frank NPS CT</i>	Level:	<del>III</del> ANSI	Date:	4-22-08
Reviewer:	<i>John J Hayden</i>	Level:	III	Date:	04/18/08
Reviewer:	<i>[Signature]</i>	Title:	QE	Date:	04/18/08
Reviewer:	<i>Kj Hack</i>	Title:	III	Date:	4/20/08

**MILLSTONE 2 INCH NPS RCS COLD LEG CHARGING INLET WELD OVERLAY  
AXIAL & CIRCUMFERENTIAL COVERAGE ACHIEVED ON WELD OVERLAY**

**NOTE:** The total examination coverage percentage is determined by considering the percentage of the required volume examined in each of the four scan directions (2 axial and 2 circumferential). Each scan direction has a weight of 0.25; the four scans therefore combine to equal 1.0. The percentage of coverage for each scan direction is then multiplied by 0.25 (weighing factor), which yields the corrected total examination coverage for each scan.

Axial Scan from Nozzle = 0.238 (.953 x 0.25) Scan from Pipe = 0.238 (.953 x 0.25)  
Circumferential Clockwise Scan = 0.246 (.984 x 0.25) Counterclockwise Scan = 0.246 (.984 x 0.25)  
Total Coverage: 0.246 + 0.246 + 0.238 + 0.238 = .968 or 96.8%

Review *John J Hayden* 04/18/08

QE Reviewed by: *[Signature]* Date: 04/18/08

*K. Hackman III* 4/20/08  
*Evan K. Hayes AN II* 4.22.08

**MILLSTONE 2 INCH NPS RCS COLD LEG CHARGING INLET WELD OVERLAY  
AXIAL & CIRCUMFERENTIAL COVERAGE ACHIEVED ON WELD BCH-C-1001  
(NOZZLE TO SAFEEND WELD)**

**NOTE:** The total examination coverage percentage is determined by considering the percentage of the required volume examined in each of the four scan directions (2 axial and 2 circumferential). Each scan direction has a weight of 0.25; the four scans therefore combine to equal 1.0. The percentage of coverage for each scan direction is then multiplied by 0.25 (weighting factor), which yields the corrected total examination coverage for each scan.

Axial Scan from Nozzle = 0.25 (1.00 x 0.25) Scan from Pipe = 0.25 ( 1.00 x 0.25 )  
Circumferential Clockwise Scan = 0.25 ( 1.00 x 0.25 ) Counterclockwise Scan = 0.25 ( 1.00 x 0.25 )  
Total Coverage: 0.25 + 0.25 + 0.25 + 0.25 = 1.00 or 100%

Reviewed by: *John J Hayden*

Date: 04/18/08

QE Reviewed by: *[Signature]*

Date: 04/18/08

*J. Hack III 4/20/08*  
*John Hack AM II 4-22-08*

**MILLSTONE 2 INCH NPS RCS COLD LEG CHARGING INLET WELD OVERLAY  
AXIAL & CIRCUMFERENTIAL COVERAGE ACHIEVED ON WELD BCH-C-1003  
(SAFEENDTO PIPE WELD)**

**NOTE:** The total examination coverage percentage is determined by considering the percentage of the required volume examined in each of the four scan directions (2 axial and 2 circumferential). Each scan direction has a weight of 0.25; the four scans therefore combine to equal 1.0. The percentage of coverage for each scan direction is then multiplied by 0.25 (weighting factor), which yields the corrected total examination coverage for each scan.

Axial Scan from Nozzle = 0.25 (1.00 x 0.25) Scan from Pipe = 0.25 ( 1.00 x 0.25 )  
Circumferential Clockwise Scan = 0.25 ( 1.00 x 0.25 ) Counterclockwise Scan = 0.25 ( 1.00 x 0.25 )  
Total Coverage: 0.25 + 0.25 + 0.25 + 0.25 = 1.00 or 100%

Reviewed by: *John J. Hayden*

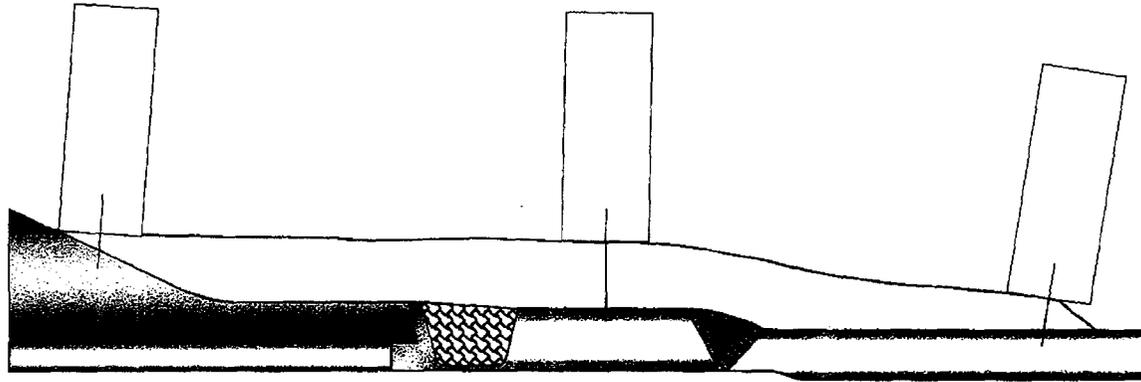
Date: 04/18/08

QE Reviewed by: *[Signature]*

Date: 04/18/08

*KJ Hacken III 4/20/08*  
*E. J. K. DIRECT ANSII 4-22-08*

**MILLSTONE 2 INCH NPS RCS COLD LEG CHARGING INLET WOL  
(0° AXIAL and CIRCUMFERENTIAL)**



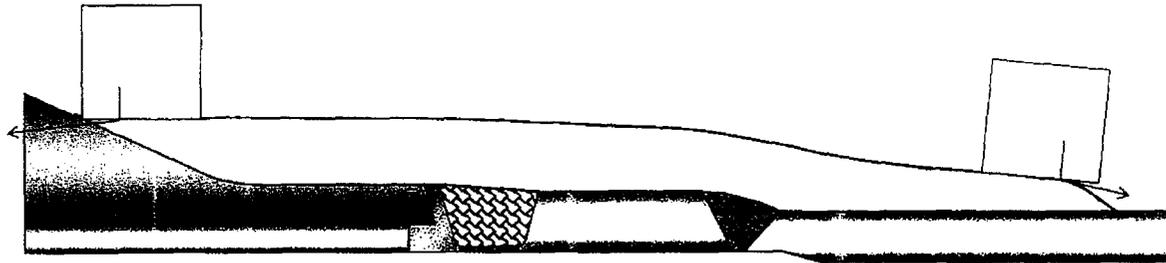
**NOTE:**  
99.4 % WOL examination coverage using the 0° in the Axial direction both upstream and downstream.  
99.4 % WOL examination coverage using the 0° in the Circumferential direction both clockwise and counterclockwise.  
Sketch not to scale. See attached profile.

Review *John J. Hayden* 04/18/08

QE Review: *[Signature]* 04/18/08

*K. Hack III 4/20/08*  
*E. K. HERCT #112 4.22.08*

**MILLSTONE 2 INCH NPS RCS COLD LEG CHARGING INLET WOL  
(ODCr AXIAL)**



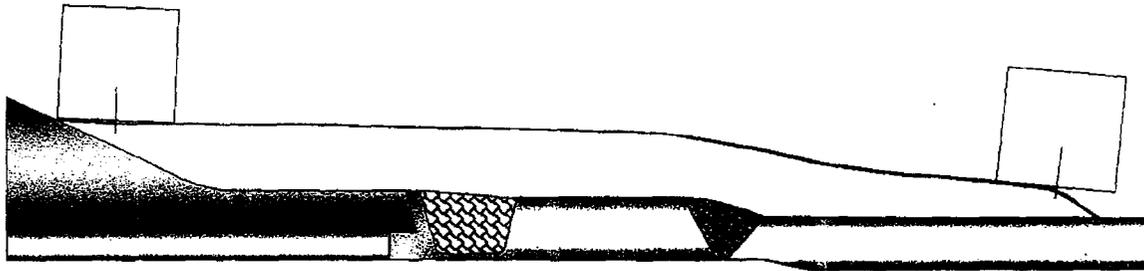
**NOTE:**  
100% WOL examination coverage using the ODCr in the Axial direction both upstream and downstream.  
Sketch of WOL not to scale. See attached WOL profile.

Review: *John J. Hayden* 04/18/08

QE Review: *[Signature]* 04/18/08

*Kj Hacken III 4/20/08*  
*E/K HSB CT ANI 4.22.08*

**MILLSTONE 2 INCH NPS RCS COLD LEG CHARGING INLET WOL  
(ODCr CIRCUMFERENTIAL)**



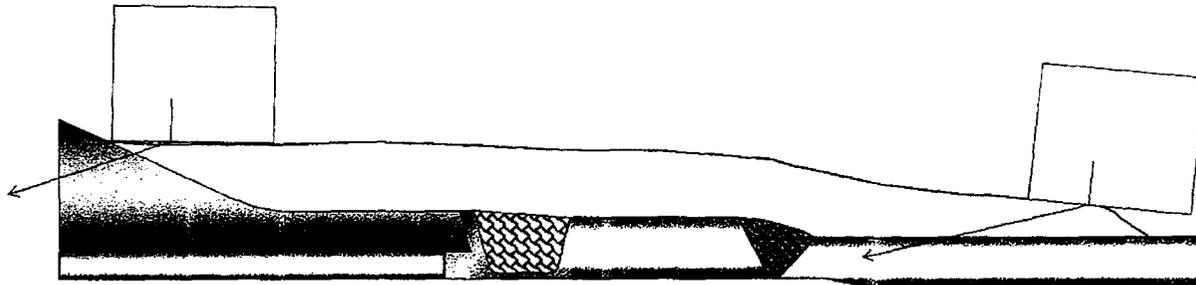
**NOTE:**  
98.0 % WOL examination coverage using the ODCr in both the clockwise and counterclockwise directions.  
Sketch of WOL not to scale. See attached WOL profile.

Review *John J. Hayden* 04/18/08

QE Review: *[Signature]* 04/18/08

*H. Hack III 4/20/08*  
*John K. Hyslop A. H. 4.22.08*

**MILLSTONE 2 INCH NPS RCS COLD LEG CHARGING INLET WOL  
(70° AXIAL)**



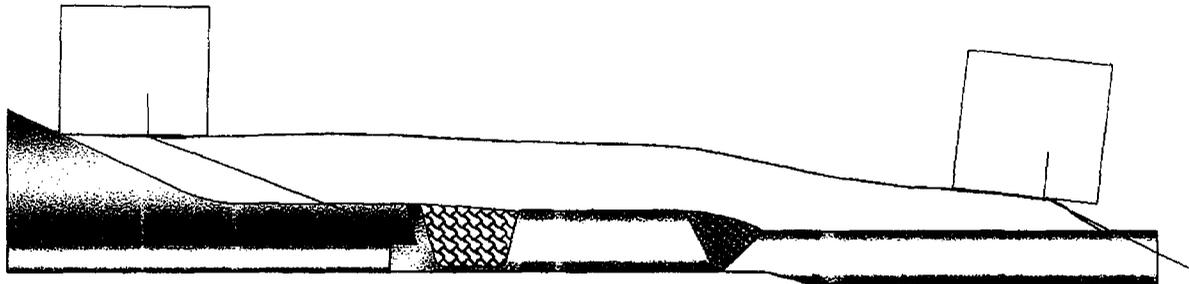
**NOTES:**  
96.7% of the WOL was examined using the 70° in the axial direction facing the nozzle  
Sketch of WOL not to scale. See attached WOL profile.

Review *John J. Hayden* 04/18/08

QE Review: *[Signature]* 04/18/08

*Kj Hack III 4/20/08*  
*Erick Hysct AMZ 4.22.08*

**MILLSTONE 2 INCH NPS RCS COLD LEG CHARGING INLET WOL OVERLAY  
(70° AXIAL)**



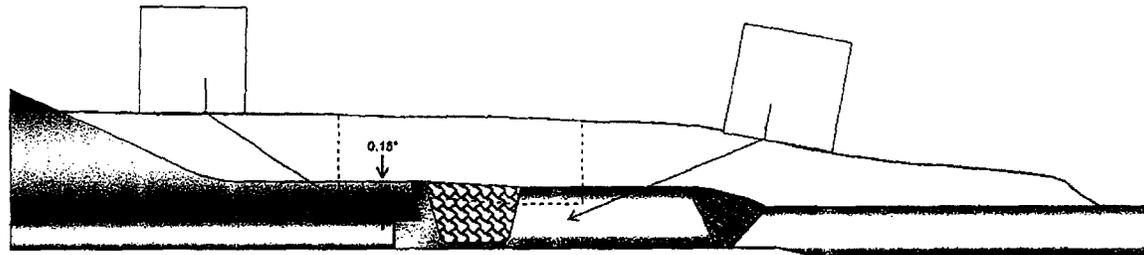
**NOTE:**  
95.3% of the WOL was examined in the axial direction with the 70° facing the pipe  
Sketch of WOL not to scale. See attached WOL profile.

Review *John J. Hayden* 04/18/08

QE Review: *[Signature]* 04/18/08

*KJ Hack III 4/20/08*  
*For K Hack CT AM-F 4.22.08*

**MILLSTONE 2 INCH NPS RCS COLD LEG CHARGING INLET WELD**  
**BCH-C-1001**  
(60° AXIAL)



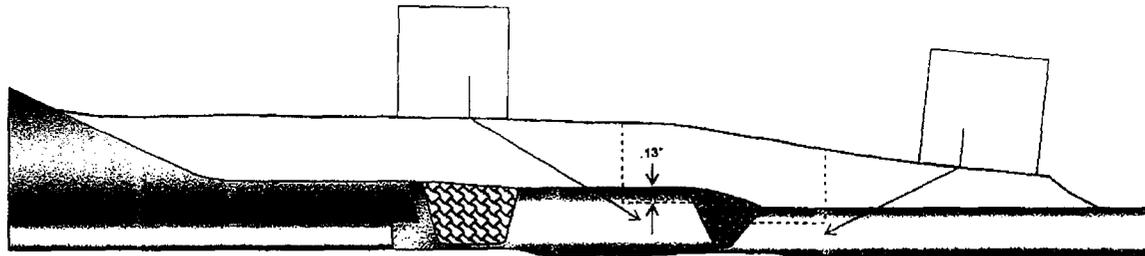
**NOTE:**  
100% of the DM weld BCH-C-1001 WBM was examined with the 60° in the axial direction facing upstream and downstream  
Sketch of WOL not to scale. See attached profile.

Review: *John J. Hayden* 04/18/08

QE Review: *[Signature]* 04/18/08

*Kj Hack III 4/20/08*  
*Frank H. BCT AME 4.22.08*

**MILLSTONE 2INCH NPS RCS COLD LEG CHARGING LINE WELD  
BCH-C-1003  
(60° AXIAL)**



**NOTE:**  
100% of the SM weld BCH-C-1003 WBM examination volume was examined with the 60° in the axial direction facing upstream and downstream.  
Sketch of WOL not to scale. See attached WOL profile.

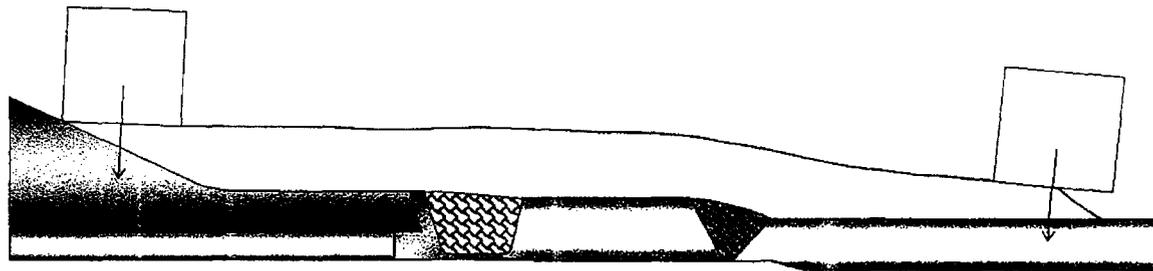
Review *John J. Hayden* 04/18/08

QE Review: *[Signature]* 04/18/08

*[Signature]* III 4/20/08

*[Signature]* H5 SCT A/II 4.22.08

MILLSTONE 2 INCH NPS RCS COLD LEG CHARGING INLET WOL  
(42° CIRCUMFERENTIAL)



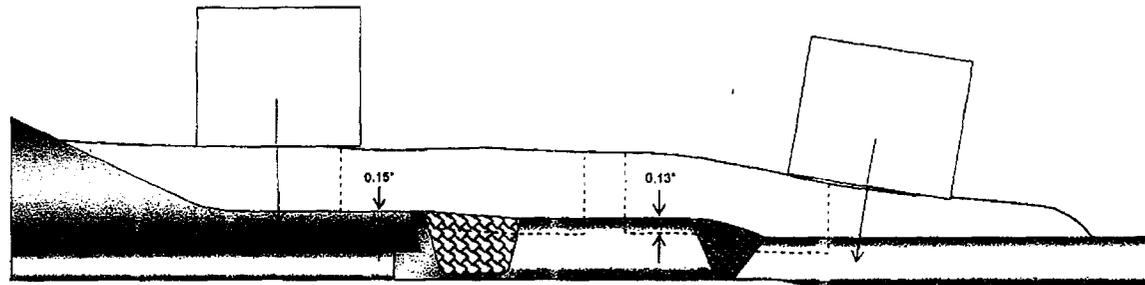
NOTE:  
98.4 % WOL examination coverage using the 42° in both the clockwise and counterclockwise directions.  
Sketch not to scale. See attached WOL profile.

Review *John J. Hayden* 04/18/08

QE Review: *[Signature]* 04/18/08

*Kj Hock III 4/20/08*  
*Spark H56CT AN-II 4.22.08*

**MILLSTONE 2 INCH NPS RCS COLD LEG CHARGING LINE WELDS  
BCH-C-1001 and BCH-C-1003  
(39° CIRCUMFERENTIAL)**



**Note:**  
100% of the DM (BCH-C-1001) and SM (BCH-C-1003) WBM examination volumes were covered in both the clockwise and counterclockwise directions  
Sketch of WOL not to scale. See attached WOL profile.

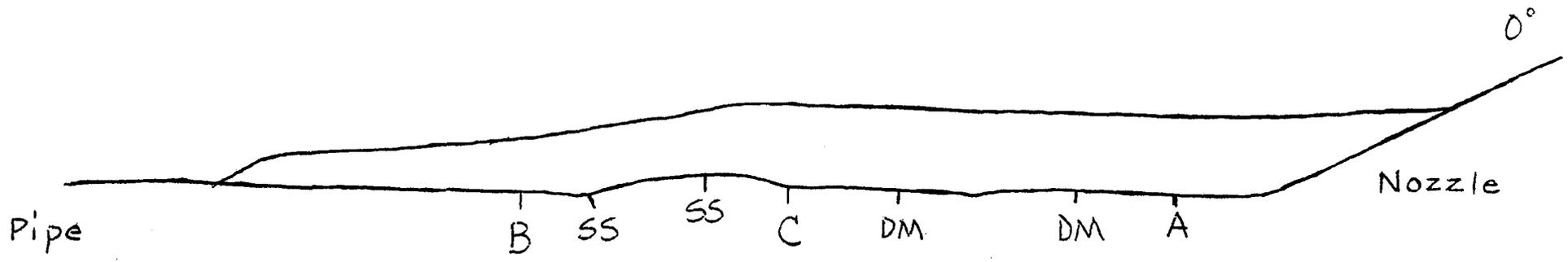
Review *John J. Hayden* 04/18/08

QE Review: *[Signature]* 04/18/08

*Kj Hack III 4/20/08*

*E. Brock 4/22/08 A111 4.22.08*

### RCS CHARGING INLET POST WOL PROFILE @ 0° AZIMUTH



Millstone U2  
2R18

*Hack III 4/20/08*  
*EJK HSC7 A112 4.22.08*

**PHASED ARRAY ULTRASONIC EXAMINATION RECORD**

Examination Data Sheet No.: RCS Shutdown Cooling WOL

Calibration Data Sheet No.: See Comments Section

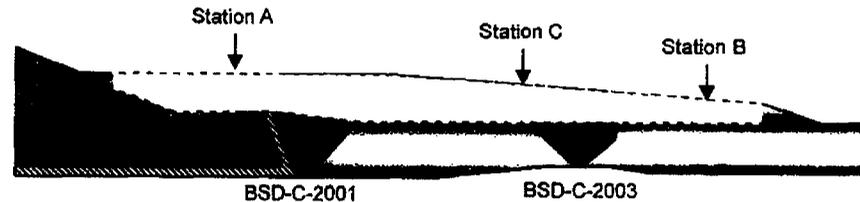
Date: 4/19/08 Time: 1239 to 1330

Plant: Millstone	Unit: 2	Procedure No.: SI-UT-126	Revision: 3	Examination Scans Performed	Yes	No
Component: RCS Shutdown Cooling Nozzle Weld Overlay				(1) Axial (Facing Downstream)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Component Configuration: Nozzle-to-Safe End		Weld Overlay No.: WOL-BSD-C-2001		(2) Axial (Facing Upstream)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Weld Overlay Regions:		Weld Overlay Material		(3) Circumferential (Clockwise Flow <sup>(1)</sup> )	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Examination Surface: Surface of Weld Overlay		Examination Angles		(4) Circumferential (Counterclockwise <sup>(1)</sup> )	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Weld Overlay Thickness:		Axial	Circumferential	Notes:		
Station A: 0.9275 Inch		0° through 84° <sup>(2)</sup>	0° through 70° <sup>(2)</sup>	<sup>(1)</sup> As viewed facing downstream		
Station B: 0.635 Inch		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<sup>(2)</sup> Examination angles are generated in 1° increments		
Station C: 0.8875 Inch						
Examination Sensitivity:		42.0 dB	40.0 dB			

**Comments:**

No suspected flaw indications were observed during the examinations. The examination gain was adjusted to maintain the procedure-specified baseline noise level from 5% to 20% of full screen height. The lower range of examination angles detected responses from the inside surface of the component which were useful for monitoring search unit contact / coupling effectiveness during the examination. 98.4% coverage of the Code-required volume was achieved during the examinations.

Axial scans and final calibration of the Axial probe were completed before the Circ scans were started.



The applicable Calibration Data Sheets are listed below:  
RCS SDC Axial; RCS SDC Circ1; & RCS SDC Circ2

Examiner:	Randall K. McDonald <i>Randall McDonald</i>	Level:	II	Date:	4/19/2008
Examiner:	Samuel T. Sharp <i>Samuel T. Sharp</i>	Level:	II	Date:	4/19/2008
SI Review:	John J. Hayden <i>John J. Hayden</i>	Level:	III	Date:	04/21/08
	<i>Hack</i>				<i>4/21/08</i>
	<i>Hack</i>				<i>4/21/08</i>

**PHASED ARRAY ULTRASONIC EXAMINATION RECORD**

Examination Data Sheet No.: RCS Shutdown Cooling-WBM-DM

Calibration Data Sheet No.: See Comments Section

Date: 4/19/08

Time: 1239 to 1330

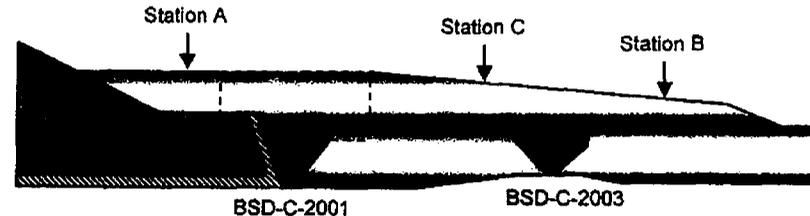
Plant: Millstone	Unit: 2	Procedure No.: SI-UT-126	Revision: 3	Examination Scans Performed	Yes	No
Component: RCS Shutdown Cooling Nozzle Weld Overlay (Weld: BSD-C-2001)				(1) Axial (Facing Downstream)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Component Configuration: Nozzle-to-Safe End		Weld Overlay No.: WOL-BSD-C-2001		(2) Axial (Facing Upstream)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Weld Overlay Regions: Overlay, Weld and Base Material (Outer 25%) Nozzle-to-Safe End				(3) Circumferential (Clockwise Flow <sup>(1)</sup> )	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Examination Surface: Surface of Weld Overlay		Examination Angles		(4) Circumferential (Counterclockwise <sup>(1)</sup> )	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Weld Overlay Thickness: Station A: 0.9275 Inch Station C: 0.8875 Inch		Axial 0° through 84° <sup>(2)</sup> <input checked="" type="checkbox"/>	Circumferential 0° through 70° <sup>(2)</sup> <input checked="" type="checkbox"/>	Notes: <sup>(1)</sup> As viewed facing downstream <sup>(2)</sup> Examination angles are generated in 1° increments		
Examination Sensitivity:		42.0 dB	40.0 dB			

**Comments:**

No suspected flaw indications were observed during the examinations. The examination gain was adjusted to maintain the procedure-specified baseline noise level from 5% to 20% of full screen height. The lower range of examination angles detected responses from the inside surface of the component which were useful for monitoring search unit contact / coupling effectiveness during the examination. 93.4% coverage of the Code-required volume was achieved during the examinations.

Axial scans and final calibration of the Axial probe were completed before the Circ scans were started.

The applicable Calibration Data Sheets are listed below:  
RCS SDC Axial; RCS SDC Circ1; RCS SDC Circ2 & RCS SDC Circ3



Examiner: Randall K. McDonald *Randall McDonald* Level: II Date: 4/19/2008

Examiner: Samuel T. Sharp *Samuel T. Sharp* Level: II Date: 4/19/2008

SI Review: John J. Hayden *John J. Hayden* Level III

04/19/08

*KJHach*

*III*

*4/21/08*

*Spark H/SCT #17E 4/22/08*

**PHASED ARRAY ULTRASONIC EXAMINATION RECORD**

Examination Data Sheet No.: RCS Shutdown Cooling-WBM-SM

Calibration Data Sheet No.: See Comments Section

Date: 4/19/08 Time: 1239 to 1330

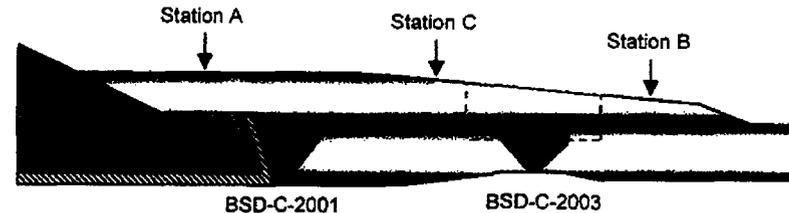
Plant: Millstone	Unit: 2	Procedure No.: SI-UT-126	Revision: 3	Examination Scans Performed	Yes	No
Component: RCS Shutdown Cooling Nozzle Weld Overlay (Weld: BSD-C-2003)				(1) Axial (Facing Downstream)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Component Configuration: Safe End-to-Pipe		Weld Overlay No.: WOL-BSD-C-2001		(2) Axial (Facing Upstream)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Weld Overlay Regions: Overlay, Weld and Base Material (Outer 25%) Safe End-to-Pipe				(3) Circumferential (Clockwise Flow <sup>(1)</sup> )	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Examination Surface: Surface of Weld Overlay		Examination Angles		(4) Circumferential (Counterclockwise <sup>(1)</sup> )	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Weld Overlay Thickness: Station B: 0.635 Inch Station C: 0.8875 Inch		Axial 0° through 84° <sup>(2)</sup> <input checked="" type="checkbox"/>	Circumferential 0° through 70° <sup>(2)</sup> <input checked="" type="checkbox"/>	Notes: <sup>(1)</sup> As viewed facing downstream <sup>(2)</sup> Examination angles are generated in 1° increments		
Examination Sensitivity:		42.0 dB	40.0 dB			

**Comments:**

No suspected flaw indications were observed during the examinations. The examination gain was adjusted to maintain the procedure-specified baseline noise level from 5% to 20% of full screen height. The lower range of examination angles detected responses from the inside surface of the component which were useful for monitoring search unit contact / coupling effectiveness during the examination. 93.5% coverage of the Code-required volume was achieved during the examinations.

Axial scans and final calibration of the Axial probe were completed before the Circ scans were started.

The applicable Calibration Data Sheets are listed below:  
RCS SDC Axial: RCS SDC Circ1: RCS SDC Circ2 & RCS SDC Circ3



Examiner: Randall K. McDonald *Randall McDonald* Level: II Date: 4/19/2008

Examiner: Samuel T. Sharp *Samuel T. Sharp* Level: II Date: 4/19/2008

SI Review: John J. Hayden *John J. Hayden* Level: III Date: 04/19/08

*HJ Hayden* **III** *4/21/08*  
*Flaw ASPECT AND 4-22-08*

**ULTRASONIC PHASED ARRAY CALIBRATION RECORD**

 2R18 Final WOL  
 Examination Report  
 Page 29 of 56

<b>Customer:</b> Welding Services Inc.	<b>Calibration File Name:</b> RCS SDC Axial
<b>Plant/Unit:</b> Millstone Unit 2	<b>Procedure No:</b> SI-UT-126, Rev.3
<b>Component/System:</b> RCS Shutdown Cooling Nozzle WOL	

Wedge				
<b>Manufacturer:</b>	SI	<b>Refracted Angle Verification</b>		
<b>Model:</b>	8.1" Radius WOL	<b>Focal Law Angle</b>	<b>Measured Angle</b>	<b>Index Offset</b>
<b>Material:</b>	Rexolite			
<b>Velocity:</b>	0.228 X 10 <sup>6</sup> in/sec	60°	60°	0.45 inch
<b>Wedge Angle:</b>	16°	45°	47°	0.50 Inch
<b>Scan Direction:</b>	Axial	30°	33°	0.60 inch
<b>Wedge Nominal OD:</b>	16.2"			

Instrument		Search Unit Integral Cable	
<b>Manufacturer:</b>	R/D Tech / Olympus	<b>Type:</b>	32 conductor, 38 gauge coaxial
<b>Model:</b>	OmniScan MX	<b>Length:</b>	8'
<b>Serial Number:</b>	OMNI-1643	<b>Connectors:</b>	Hypertronics
<b>Phased Array Module:</b>	OMNI-M-PA32 / 128PR	<b>Intermediate Cable</b>	
<b>PA Module Serial No.:</b>	OMNI-6088	<b>Type:</b>	32 conductor, 38 gauge coaxial
<b>Software Revision:</b>	1.4R3	<b>Length:</b>	18"
<b>Instrument Settings:</b>	Electronic Record	<b>Connectors:</b>	Hypertronics / OmniScan

Search Unit			
<b>Manufacturer:</b>	GE	<b>Element Length:</b>	2.70 mm
<b>Transmit Model:</b>	115-000-404	<b>Element Width:</b>	1.20 mm
<b>Transmit Serial Number:</b>	01PPCK	<b>Elements (Primary Axis):</b>	16
<b>Receive Model:</b>	115-000-405	<b>Elements (Secondary Axis):</b>	2
<b>Receive Serial Number:</b>	01PNJB	<b>Inactive Element - Transmit:</b>	0
<b>Frequency (MHz):</b>	2.0	<b>Inactive Element - Receive:</b>	0

Calibration Data Files	
<b>Focal Law:</b> ML AX RCS SDC 187mmOD 39mmHP.Law	
<b>Angles Generated:</b> 0° through 84° (1° Increments)	<b>Wave Mode:</b> Longitudinal
<b>Set-up File:</b> RCS_SDC_Ax 39.ops	<b>Focal Sound Path:</b> 39 mm
<b>Couplant / Batch</b> Soundsafe / 06120A	<b>Calibration Block(s):</b> SI-13-AX-01

Calibration Reflector Data					Comments: Applies for the axial examination of the Weld Overlay Material and the Weld and Base Material of the Dissimilar Metal Nozzle-to-Safe End and the Stainless Steel Safe End-to-Pipe weld.  *Active Element Checks performed at Initial and final Cal Checks
Calibration Reflector	Reference Angle	% FSH	Ref. Gain	Wedge Delay	
0.10" Deep SDH	80°	82	40.0 dB	0.0 µsec	
0.50" Deep SDH	70°	85	44.0 dB	0.0 µsec	
1.00" Deep SDH	60°	89	44.0 dB	0.0 µsec	
1.20" Deep SDH	45°	85	37.0 dB	0.0 µsec	
1.00" Deep SDH	0°	89	31.0 dB	0.3 µsec	

Calibration Performed	Examiner	Level	Date - Time
<b>Initial:</b>	Randall K. McDonald <i>Randall McDonald</i>	II	4/19/08 0914
<b>Final:</b>	Randall K. McDonald <i>Randall McDonald</i>	II	4/19/08 1259
<b>Reviewed:</b>	John J. Hayden <i>John J. Hayden</i>	III	04/19/08

SI QE Review

*DJ Hack III 4/21/08*

Date: 4/20/08

*ANZ EPRK HSC 4-22-08*



ULTRASONIC PHASED ARRAY CALIBRATION RECORD

2R18 Final WOL  
Examination Report  
Page 30 of 56

<b>Customer:</b>	Welding Services Inc.	<b>Calibration File Name:</b>	RCS SDC Circ1
<b>Plant/Unit:</b>	Millstone Unit 2	<b>Procedure No:</b>	SI-UT-126, Rev.3
<b>Component/System:</b> RCS Shutdown Cooling Nozzle WOL			

Wedge				
<b>Manufacturer:</b>	SI	<b>Refracted Angle Verification</b>		
<b>Model:</b>	8.1" Radius WOL	<b>Focal Law Angle</b>	<b>Measured Angle</b>	<b>Index Offset</b>
<b>Material:</b>	Rexolite			
<b>Velocity:</b>	0.228 X 10 <sup>9</sup> in/sec	55°	54°	0.44 inch
<b>Wedge Angle:</b>	16°	45°	45°	0.50 inch
<b>Scan Direction:</b>	Circ	30°	30°	0.58 inch
<b>Wedge Nominal OD:</b>	16.2"			

Instrument		Search Unit Integral Cable	
<b>Manufacturer:</b>	R/D Tech / Olympus	<b>Type:</b>	32 conductor, 38 gauge coaxial
<b>Model:</b>	OmniScan MX	<b>Length:</b>	8'
<b>Serial Number:</b>	OMNI-1643	<b>Connectors:</b>	Hypertronics
<b>Phased Array Module:</b>	OMNI-M-PA32 / 128PR	<b>Intermediate Cable</b>	
<b>PA Module Serial No.:</b>	OMNI-6088	<b>Type:</b>	32 conductor, 38 gauge coaxial
<b>Software Revision:</b>	1.4R3	<b>Length:</b>	18'
<b>Instrument Settings:</b>	Electronic Record	<b>Connectors:</b>	Hypertronics / OmniScan

Search Unit			
<b>Manufacturer:</b>	GE	<b>Element Length:</b>	2.70 mm
<b>Transmit Model:</b>	115-000-404	<b>Element Width:</b>	1.20 mm
<b>Transmit Serial Number:</b>	01PPCK	<b>Elements (Primary Axis):</b>	16
<b>Receive Model:</b>	115-000-405	<b>Elements (Secondary Axis):</b>	2
<b>Receive Serial Number:</b>	01PNJB	<b>Inactive Element- Transmit:</b>	0
<b>Frequency (MHz):</b>	2.0	<b>Inactive Element - Recieve:</b>	0

Calibration Data Files			
<b>Focal Law:</b>	ML_CIRC_RCS_SDC_WOL_Z1&3_187mmOD_25mmHP.Law		
<b>Angles Generated:</b>	0° through 70° (1° Increments)	<b>Wave Mode:</b> Longitudinal	
<b>Set-up File:</b>	RCS SDC Circ1 25.ops	<b>Focal Sound Path:</b> 25 mm	
<b>Couplant / Batch</b>	SoundSafe / 06120A	<b>Calibration Block(s):</b> SI-13-Circ-01	

Calibration Reflector Data					Comments: Applies for the circumferential examination of Zones 1 and 3 of the Weld Overlay material.  *Active Element Checks performed at Initial and final Cal Checks
Calibration Reflector	Reference Angle	% FSH	Ref. Gain	Wedge Delay	
0.50" Deep SDH	52°	82	35.5 dB	1.3 μsec	
0.80" Deep SDH	48°	80	35.5 dB	1.3 μsec	

Calibration Performed	Examiner	Level	Date - Time
Initial:	Randall K. McDonald <i>Randall K. McDonald</i>	II	4/19/08 0756
Final:	Randall K. McDonald <i>Randall K. McDonald</i>	II	4/19/08 1318
Reviewed:	John J. Hayden <i>John J. Hayden</i>	III	04/19/08

SI QE Review *[Signature]* III 4/21/08 Date: 4/20/08 *[Signature]* 4/22/08



ULTRASONIC PHASED ARRAY CALIBRATION RECORD

2R18 Final WOL  
Examination Report  
Page 21 of 56

Customer:	Welding Services Inc.	Calibration File Name:	RCS SDC Circ2
Plant/Unit:	Millstone Unit 2	Procedure No.:	SI-UT-126, Rev.3
Component/System: RCS Shutdown Cooling Nozzle WOL			

Wedge				
Manufacturer:	SI	Refracted Angle Verification		
Model:	8.1" Radius WOL	Focal Law Angle	Measured Angle	Index Offset
Material:	Rexolite			
Velocity:	0.228 X 10 <sup>8</sup> in/sec	55°	54°	0.44 inch
Wedge Angle:	16°	45°	45°	0.50 Inch
Scan Direction:	Circ	30°	30°	0.58 inch
Wedge Nominal OD:	16.2"			

Instrument		Search Unit Integral Cable	
Manufacturer:	R/D Tech / Olympus	Type:	32 conductor, 38 gauge coaxial
Model:	OmniScan MX	Length:	8'
Serial Number:	OMNI-1643	Connectors:	Hypertronics
Phased Array Module:	OMNI-M-PA32 / 128PR	Intermediate Cable	
PA Module Serial No.:	OMNI-6088	Type:	32 conductor, 38 gauge coaxial
Software Revision:	1.4R3	Length:	18"
Instrument Settings:	Electronic Record	Connectors:	Hypertronics / OmniScan

Search Unit			
Manufacturer:	GE	Element Length:	2.70 mm
Transmit Model:	115-000-404	Element Width:	1.20 mm
Transmit Serial Number:	01PPCK	Elements (Primary Axis):	16
Receive Model:	115-000-405	Elements (Secondary Axis):	2
Receive Serial Number:	01PNJB	Inactive Element- Transmit:	0
Frequency (MHz):	2.0	Inactive Element - Receive:	0

Calibration Data Files			
Focal Law:	ML_CIRC_RCS_SDC_WOL_Z2_187mmOD_33mmHP.Law		
Angles Generated:	0° through 70° (1° Increments)	Wave Mode:	Longitudinal
Set-up File:	RCS SDC Circ2 33.ops	Focal Sound Path:	33 mm
Couplant / Batch	SoundSafe / 06120A	Calibration Block(s):	SI-13-Circ-01

Calibration Reflector Data					Comments: Applies for the circumferential examination of Zone 2 of the Weld Overlay material.  *Active Element Checks performed at Initial and final Cal Checks
Calibration Reflector	Reference Angle	% FSH	Ref. Gain	Wedge Delay	
0.60" Deep SDH	51°	85	35.0 dB	1.3 µsec	
1.00" Deep SDH	47°	84	38.0 dB	1.3 µsec	

Calibration Performed	Examiner	Level	Date - Time
Initial:	Randall K. McDonald <i>Randall K McDonald</i>	II	4/19/08 0804
Final:	Randall K. McDonald <i>Randall K McDonald</i>	II	4/19/08 1324
Reviewed:	John J. Hayden <i>John J Hayden</i>	III	04/19/08

SI QE Review

*J. Hayden III* 4/21/08

Date: 4/20/08

*Mark H. H. CT 4.22.08*



ULTRASONIC PHASED ARRAY CALIBRATION RECORD

2R18 Final WOL Examination Report

Customer:	Welding Services Inc.	Calibration File Name:	RCS SDC Circ3
Plant/Unit:	Millstone Unit 2	Procedure No.:	SI-UT-126, Rev.3
Component/System: RCS Shutdown Cooling Nozzle WOL			

Wedge				
Manufacturer:	SI	Refracted Angle Verification		
Model:	8.1" Radius WOL	Focal Law Angle	Measured Angle	Index Offset
Material:	Rexolite			
Velocity:	0.228 X 10 <sup>8</sup> in/sec	55°	54°	0.44 inch
Wedge Angle:	16°	45°	45°	0.50 inch
Scan Direction:	Circ	30°	30°	0.58 inch
Wedge Nominal OD:	16.2"			

Instrument		Search Unit Integral Cable	
Manufacturer:	R/D Tech / Olympus	Type:	32 conductor, 38 gauge coaxial
Model:	OmniScan MX	Length:	8'
Serial Number:	OMNI-1643	Connectors:	Hypertronics
Phased Array Module:	OMNI-M-PA32 / 128PR	Intermediate Cable	
PA Module Serial No.:	OMNI-6088	Type:	32 conductor, 38 gauge coaxial
Software Revision:	1.4R3	Length:	18"
Instrument Settings:	Electronic Record	Connectors:	Hypertronics / OmniScan

Search Unit			
Manufacturer:	GE	Element Length:	2.70 mm
Transmit Model:	115-000-404	Element Width:	1.20 mm
Transmit Serial Number:	01PPCK	Elements (Primary Axis):	16
Receive Model:	115-000-405	Elements (Secondary Axis):	2
Receive Serial Number:	01PNJB	Inactive Element - Transmit:	0
Frequency (MHz):	2.0	Inactive Element - Receive:	0

Calibration Data Files			
Focal Law:	ML_CIRC_RCS_SDC_WBM_187mmOD_42mmHP.Law		
Angles Generated:	0° through 70° (1° Increments)	Wave Mode:	Longitudinal
Set-up File:	RCS SDC Circ3 42.0ps	Focal Sound Path:	42 mm
Couplant / Batch	SoundSafe / 06120A	Calibration Block(s):	SI-13-Circ-01

Calibration Reflector Data					Comments: Applies for the circumferential examination of the Weld and Base Material of the Dissimilar Metal Nozzle-to-Safe End and the Stainless Steel Safe End-to-Pipe weld. *Active Element Checks performed at initial and final Cal Checks
Calibration Reflector	Reference Angle	% FSH	Ref. Gain	Wedge Delay	
1.00" Deep SDH	45°	86	36.5 dB	1.3 µsec	
1.00" Deep SDH	46°	86	36.5 dB	1.3 µsec	

Calibration Performed	Examiner	Level	Date - Time
Initial:	Randall K. McDonald <i>Randall K. McDonald</i>	II	4/19/08 0807
Final:	Randall K. McDonald <i>Randall K. McDonald</i>	II	4/19/08 1332
Reviewed:	John J. Hayden <i>John J. Hayden</i>	III	04/19/08

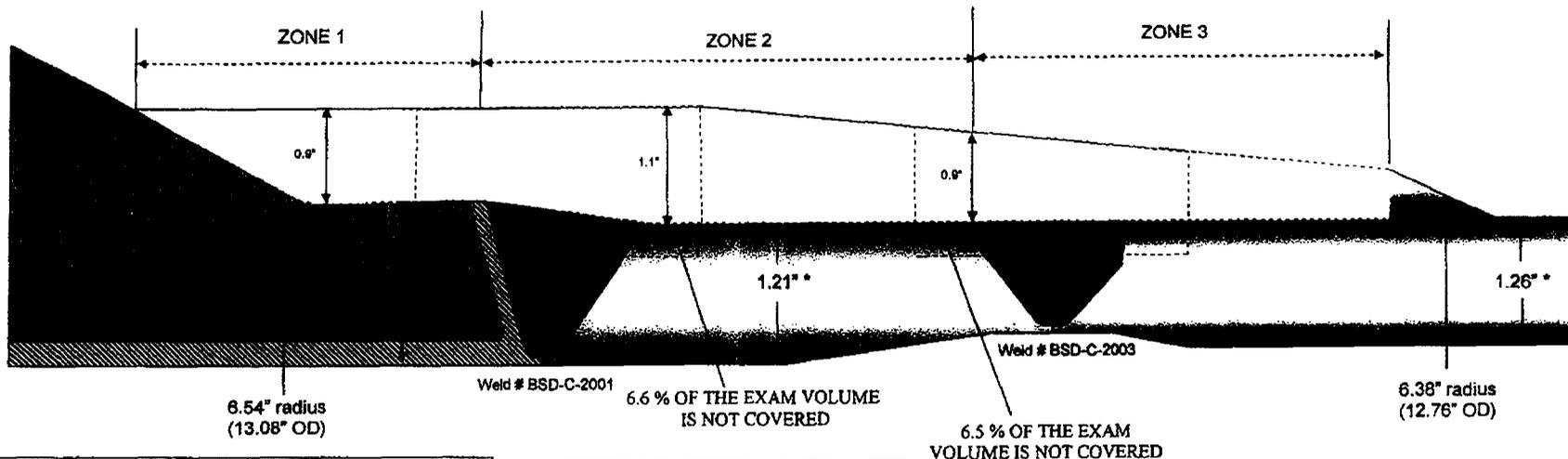
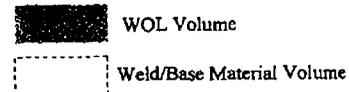
SI OE Review

*JJ Hayden III 4/21/08*

Date: 4/20/08

*SPK H/S BT 4-22-08*

**RCS SHUTDOWN COOLING NOZZLE**



RCS Shutdown Cooling Nozzle	
Examination Region	Setup Name
Axial Scan - WOL Zone 1, 2 & 3	RCS SDC Ax 39
Axial Scan - WBM DM Weld	
Axial Scan - WBM SE Weld	
Circ Scan - WOL Zone 1 & 3	RCS SDC Circ1 25
Circ Scan - WOL Zone 2	RCS SDC Circ2 33
Circ Scan - WBM DM Weld	RCS SDC Circ3 42
Circ Scan - WBM SE Weld	

Examination Data	
Date:	4/19/2008
Examiners:	Samuel T. Sharp & Randall K. McDonald
Start Time:	12:39 PM
Finish Time:	13:30 PM
Scan Sensitivity - Axial:	42.0 dB
Scan Sensitivity - Circ:	40.0 dB

\* Value from previous data

Above sketch is not to scale, please see actual contours for actual surface dimensions.

SI QE Review *[Signature]* Date: 4/20/08

Examiner: Randall K. McDonald *[Signature]* Level: II Date: 4/19/2008

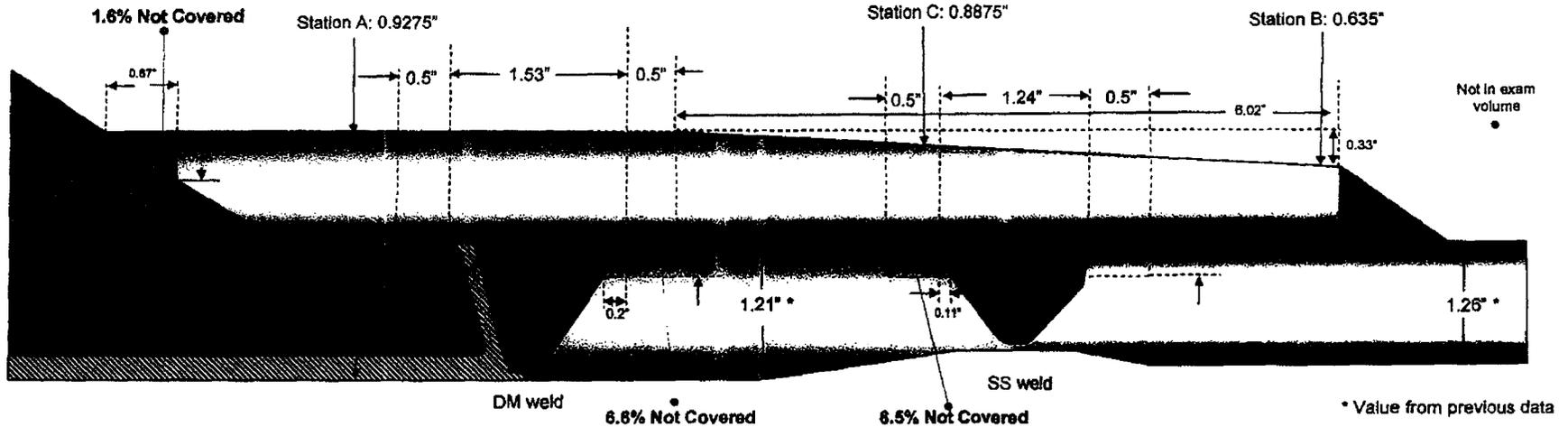
Examiner: Samuel T. Sharp *[Signature]* Level: II Date: 4/19/2008

SI Review: John J. Hayden *[Signature]* Level: III Date: 4/19/2008

*[Handwritten signatures and dates]*  
 KJH/ACK III 4/21/08  
 S/T/K/H/S/O/T A/II 4.22.08

Final WOL Examination Report  
 Page 33 of 56

RCS Shutdown Cooling Nozzle WOL



The PSI examination of the weld overlay material was conducted in one zone which was 11.81" width X 0.9275 deep -- (6.02 X 0.33/2) = 9.78 Sq inches. The circumferential scanning direction was limited on the nozzle end for an area of 0.67" width X 0.46" deep = 0.308 Sq Inches. Each circ scan is assigned a weight factor of 0.25. The limitation divided by the total material mutilled by 0.5 weight factor provides examination coverage of 98.4%.

The ISI examination of the DM weld overlay and ¼ T of the Base material was conducted in one zone which 1+1.53" wide X (0.9275" + 0.355 ") deep = 3.24 Sq inches for the entire DM circumference. Due to the lack of a qualified examination method for cast stainless steel there is an examination limitation of 0.355" X 0.60" + (0.20" X 0.355" /2) which is equal to 0.213 Sq inches. The limitation divided by the total material provides examination coverage of 93.4%.

The ISI examination of the SS weld overlay and ¼ T of the Base material was conducted in one zone which 1+1.24" wide X (0.8875" + 0.315) deep = 2.69 Sq Inches for the entire SS circumference. Due to the lack of a qualified examination method for cast stainless steel there is an examination limitation of (0.315" X 0.50") + (0.315" X 0.11" / 2) which is equal to 0.175 Sq inches. The limitation divided by the total material provides examination coverage of 93.5%.

The examination of the cast stainless material was performed as a "best effort" using current technology. Above sketch is not to scale, please see actual contours for actual surface dimensions.

Examiner:	Randall K. McDonald <i>Randall K. McDonald</i>	Level:	II	Date:	4/19/2008
Examiner:	Samuel T. Sharp <i>Samuel T. Sharp</i>	Level:	II	Date:	4/19/2008
SI Review:	John J. Hayden <i>John J. Hayden</i>	Level:	III	Date:	04/21/08

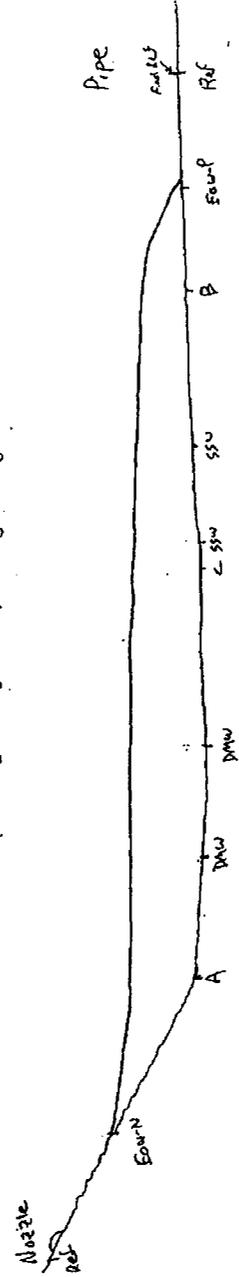
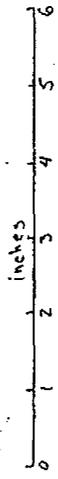
*K/Hacker III 4/21/08*  
*E/S/A/ATE 4-22-08*

Original  
NCS 4/12/08  
Original 4/12/08 NCS

COPY for SA  
NCS 4/12/08

SDC  
Millstone  
Unit 2  
104820

Final  
WOL



Hatch III 4/21/08  
April 22 2008

**PHASED ARRAY ULTRASONIC EXAMINATION RECORD**

Examination Data Sheet No.: RCS Surge WOL

Calibration Data Sheet No.: See Comments Section

Date: 4/22/08 Time: 0041 to 0133

Plant: Millstone	Unit: 2	Procedure No.: SI-UT-126	Revision: 3	Examination Scans Performed	Yes	No
Component: RCS Surge Nozzle Weld Overlay				(1) Axial (Facing Downstream)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Component Configuration: Nozzle-to-Safe End		Weld Overlay No.: WOL-BPS-C-1001		(2) Axial (Facing Upstream)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Weld Overlay Regions:	Weld Overlay Material			(3) Circumferential (Clockwise Flow <sup>(1)</sup> )	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Examination Surface:	Surface of Weld Overlay		Examination Angles		(4) Circumferential (Counterclockwise <sup>(1)</sup> )	<input checked="" type="checkbox"/>
Weld Overlay Thickness:	Station A: 0.915. Inch	Axial 0° through 84° <sup>(2)</sup> <input checked="" type="checkbox"/>	Circumferential 0° through 70° <sup>(2)</sup> <input checked="" type="checkbox"/>	Notes: (1) As viewed facing downstream (2) Examination angles are generated in 1° increments		
	Station B: 0.730 Inch					
	Station C: 0.950 Inch					
Examination Sensitivity:		.45 dB	44 dB			

**Comments:**  
No suspected flaw indications were observed during the examinations. The examination gain was adjusted to maintain the procedure-specified baseline noise level from 5% to 20% of full screen height. The lower range of examination angles detected responses from the inside surface of the component which were useful for monitoring search unit contact / coupling effectiveness during the examination. 100% coverage of the Code-required volume was achieved during the examinations.

Circ scans and final calibration of the Circ probe were completed before the Axial scans were started.

The applicable Calibration Data Sheets are listed below:  
RCS Surge Axial; RCS Surge Circ1; & RCS Surge Circ2

Examiner: Clay Suhler *Clay D. Suhler* Level: II Date: 4/22/08

Examiner: Robert Briley *Robert E. Briley* Level: II Date: 4/22/08

SI Review: John J. Hayden *John J. Hayden* Level: III Date: 04/22/08

*John J. Hayden III 4/22/08 Mark H. G. 4-24-08*

**PHASED ARRAY ULTRASONIC EXAMINATION RECORD**

Examination Data Sheet No.: RCS Surge-WBM-DM

Calibration Data Sheet No.: See Comments Section

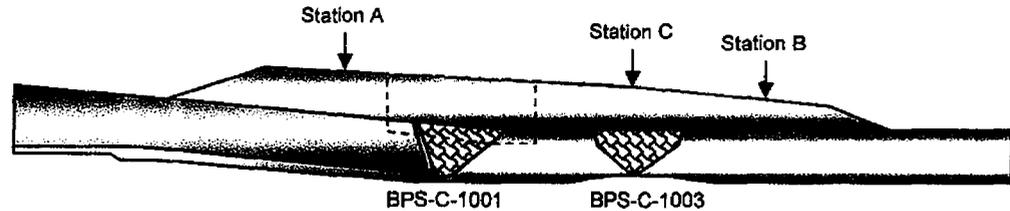
Date: 4/22/08 Time: 0041 to 0133

Plant: Millstone	Unit: 2	Procedure No.: SI-UT-126	Revision: 3	Examination Scans Performed	Yes	No
Component: RCS Surge Nozzle Weld Overlay (Weld: BPS-C-1001)				(1) Axial (Facing Downstream)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Component Configuration: Nozzle-to-Safe End		Weld Overlay No.: WOL-BPS-C-1001		(2) Axial (Facing Upstream)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Weld Overlay Regions:	Overlay, Weld and Base Material (Outer 25%) Nozzle-to-Safe End			(3) Circumferential (Clockwise Flow <sup>(1)</sup> )	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Examination Surface:	Surface of Weld Overlay	Examination Angles		(4) Circumferential (Counterclockwise <sup>(1)</sup> )	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Weld Overlay Thickness: Station A: 0.915 Inch Station C: 1.000 Inch		Axial 0° through 84° <sup>(2)</sup> <input checked="" type="checkbox"/>	Circumferential 0° through 70° <sup>(2)</sup> <input checked="" type="checkbox"/>	Notes: (1) As viewed facing downstream (2) Examination angles are generated in 1° increments		
Examination Sensitivity:		45.0 dB	44.0 dB			

**Comments:**  
No suspected flaw indications were observed during the examinations. The examination gain was adjusted to maintain the procedure-specified baseline noise level from 5% to 20% of full screen height. The lower range of examination angles detected responses from the inside surface of the component which were useful for monitoring search unit contact / coupling effectiveness during the examination. 92.0% coverage of the Code-required volume was achieved during the examinations.

Circ scans and final calibration of the Circ probe were completed before the Axial scans were started.

The applicable Calibration Data Sheets are listed below:  
RCS Surge Axial; RCS Surge Circ1; & RCS Surge Circ3



Examiner: Clay Suhler *Clay D. Suhler* Level: II Date: 4/22/08

Examiner: Robert Briley *Robert E. Briley* Level: II Date: 4/22/08

SI Review: John J. Hayden *John J. Hayden* Level: III Date: 04/22/08

*J. Hack III 4/22/08 E. K. H. CT 4.24.08*

**PHASED ARRAY ULTRASONIC EXAMINATION RECORD**

Examination Data Sheet No.: RCS Surge-WBM-SM

Calibration Data Sheet No.: See Comments Section

Date: 4/22/08 Time: 0041 to 0133

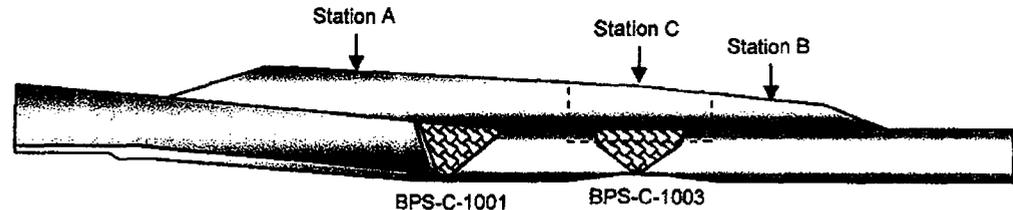
Plant: Millstone	Unit: 2	Procedure No.: SI-UT-126	Revision: 3	Examination Scans Performed	Yes	No
Component: RCS Surge Nozzle Weld Overlay (Weld: BPS-C-1003)				(1) Axial (Facing Downstream)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Component Configuration: Safe End-to-Pipe		Weld Overlay No.: WOL-BPS-C-1001		(2) Axial (Facing Upstream)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Weld Overlay Regions: Overlay, Weld and Base Material (Outer 25%) Safe End-to-Pipe				(3) Circumferential (Clockwise Flow <sup>(1)</sup> )	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Examination Surface: Surface of Weld Overlay		Examination Angles		(4) Circumferential (Counterclockwise <sup>(1)</sup> )	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Weld Overlay Thickness: Station B: 0.713 Inch Station C: 1.000 Inch		Axial 0° through 84° <sup>(2)</sup> <input checked="" type="checkbox"/>	Circumferential 0° through 70° <sup>(2)</sup> <input checked="" type="checkbox"/>	Notes: <sup>(1)</sup> As viewed facing downstream <sup>(2)</sup> Examination angles are generated in 1° increments		
Examination Sensitivity:		45.0 dB	44.0 dB			

**Comments:**

No suspected flaw indications were observed during the examinations. The examination gain was adjusted to maintain the procedure-specified baseline noise level from 5% to 20% of full screen height. The lower range of examination angles detected responses from the inside surface of the component which were useful for monitoring search unit contact / coupling effectiveness during the examination. 88.0% coverage of the Code-required volume was achieved during the examinations.

Circ scans and final calibration of the Circ probe were completed before the Axial scans were started.

The applicable Calibration Data Sheets are listed below:  
RCS Surge Axial: RCS Surge Circ1: & RCS Surge Circ3



Examiner: Clay Suhler *Clay D. Suhler* Level: II Date: 4/22/08

Examiner: Robert Briley *Robert E. Briley* Level: II Date: 4/22/08

SI Review: John J. Hayden *John J. Hayden* Level: III Date: 04/22/08

*J. Hack III 4/22/08 E. K. H. CT 4/24/08*

**ULTRASONIC PHASED ARRAY CALIBRATION RECORD**

<b>Customer:</b> Welding Services Inc.	<b>Calibration File Name:</b> RCS Surge Axial
<b>Plant/Unit:</b> Millstone Unit 2	<b>Procedure No:</b> SI-UT-126, Rev.3
<b>Component/System:</b> RCS Surge Nozzle WOL	

Wedge				
<b>Manufacturer:</b>	SI	<b>Refracted Angle Verification</b>		
<b>Model:</b>	8.1" Radius WOL	<b>Focal Law Angle</b>	<b>Measured Angle</b>	<b>Index Offset</b>
<b>Material:</b>	Rexolite			
<b>Velocity:</b>	0.228 X 10 <sup>5</sup> in/sec	60°	60°	0.45 inch
<b>Wedge Angle:</b>	16°	45°	47°	0.50 Inch
<b>Scan Direction:</b>	Axial	30°	33°	0.60 inch
<b>Wedge Nominal OD:</b>	16.2"			

Instrument		Search Unit Integral Cable	
<b>Manufacturer:</b>	R/D Tech / Olympus	<b>Type:</b>	32 conductor, 38 gauge coaxial
<b>Model:</b>	OmniScan MX	<b>Length:</b>	8'
<b>Serial Number:</b>	OMNI-1643	<b>Connectors:</b>	Hypertronics
<b>Phased Array Module:</b>	OMNI-M-PA32 / 128PR	<b>Intermediate Cable</b>	
<b>PA Module Serial No.:</b>	OMNI-6088	<b>Type:</b>	32 conductor, 38 gauge coaxial
<b>Software Revision:</b>	1.4R3	<b>Length:</b>	18"
<b>Instrument Settings:</b>	Electronic Record	<b>Connectors:</b>	Hypertronics / OmniScan

Search Unit			
<b>Manufacturer:</b>	GE	<b>Element Length:</b>	2.70 mm
<b>Transmit Model:</b>	115-000-404	<b>Element Width:</b>	1.20 mm
<b>Transmit Serial Number:</b>	01PPCK	<b>Elements (Primary Axis):</b>	16
<b>Receive Model:</b>	115-000-405	<b>Elements (Secondary Axis):</b>	2
<b>Receive Serial Number:</b>	01PNJB	<b>Inactive Element - Transmit:</b>	0
<b>Frequency (MHz):</b>	2.0	<b>Inactive Element - Receive:</b>	0

Calibration Data Files			
<b>Focal Law:</b>	ML_AX_RCS_Surge_195mmOD_46mmHP.Law		
<b>Angles Generated:</b>	0° through 84° (1° Increments)	<b>Wave Mode:</b> Longitudinal	
<b>Set-up File:</b>	RCS Surge Ax 46.ops	<b>Focal Sound Path:</b> 46 mm	
<b>Couplant / Batch</b>	Soundsafe / 06120A	<b>Calibration Block(s):</b> SI-13-AX-01	

Calibration Reflector Data					Comments: Applies for the axial examination of the Weld Overlay Material and the Weld and Base Material of the Dissimilar Metal Nozzle-to-Safe End and the Stainless Steel Safe End-to-Pipe weld.  *Active Element Checks performed at Initial and final Cal Checks
Calibration Reflector	Reference Angle	% FSH	Ref. Gain	Wedge Delay	
0.10" Deep SDH	80°	85	43.0 dB	0.3 µsec	
0.50" Deep SDH	70°	84	43.5 dB	1.6 µsec	
1.00" Deep SDH	60°	86	43.5 dB	0.0 µsec	
1.20" Deep SDH	45°	84	37.0 dB	0.0 µsec	
1.00" Deep SDH	0°	85	31.0 dB	0.3 µsec	

Calibration Performed	Examiner	Level	Date - Time
<b>Initial:</b>	Clay Suhler <i>Clay D. Suhler</i>	II	4/21/08 @ 2020
<b>Final:</b>	Clay Suhler <i>Clay D. Suhler</i>	II	4/22/08 @ 0219
<b>Reviewed:</b>	John J. Hayden <i>John J. Hayden</i>	III	04/22/08

*K. H. H. II 04/22/08* *Spk. H. L. C. 4.24.08 ANI*

**ULTRASONIC PHASED ARRAY CALIBRATION RECORD**

<b>Customer:</b>	Welding Services Inc.	<b>Calibration File Name:</b>	RCS Surge Circ1
<b>Plant/Unit:</b>	Millstone Unit 2	<b>Procedure No:</b>	SI-UT-126, Rev.3
<b>Component/System:</b>	RCS Surge Nozzle WOL		

Wedge				
<b>Manufacturer:</b>	SI	<b>Refracted Angle Verification</b>		
<b>Model:</b>	8.1" Radius WOL	<b>Focal Law Angle</b>	<b>Measured Angle</b>	<b>Index Offset</b>
<b>Material:</b>	Rexolite			
<b>Velocity:</b>	0.228 X 10 <sup>8</sup> in/sec	55°	54°	0.44 inch
<b>Wedge Angle:</b>	16°	45°	45°	0.50 inch
<b>Scan Direction:</b>	Circ	30°	30°	0.58 inch
<b>Wedge Nominal OD:</b>	16.2"			

Instrument		Search Unit Integral Cable	
<b>Manufacturer:</b>	R/D Tech / Olympus	<b>Type:</b>	32 conductor, 38 gauge coaxial
<b>Model:</b>	OmniScan MX	<b>Length:</b>	8'
<b>Serial Number:</b>	OMNI-1643	<b>Connectors:</b>	Hypertronics
<b>Phased Array Module:</b>	OMNI-M-PA32 / 128PR	<b>Intermediate Cable</b>	
<b>PA Module Serial No.:</b>	OMNI-6088	<b>Type:</b>	32 conductor, 38 gauge coaxial
<b>Software Revision:</b>	1.4R3	<b>Length:</b>	18"
<b>Instrument Settings:</b>	Electronic Record	<b>Connectors:</b>	Hypertronics / OmniScan

Search Unit			
<b>Manufacturer:</b>	GE	<b>Element Length:</b>	2.70 mm
<b>Transmit Model:</b>	115-000-404	<b>Element Width:</b>	1.20 mm
<b>Transmit Serial Number:</b>	01PPCK	<b>Elements (Primary Axis):</b>	16
<b>Receive Model:</b>	115-000-405	<b>Elements (Secondary Axis):</b>	2
<b>Receive Serial Number:</b>	01PNJB	<b>Inactive Element - Transmit:</b>	0
<b>Frequency (MHz):</b>	2.0	<b>Inactive Element - Receive:</b>	0

Calibration Data Files			
<b>Focal Law:</b>	ML_CIRC_RCS_Surge_WOL_Z1&3_195mmOD_18mmHP.Law		
<b>Angles Generated:</b>	0° through 70° (1° increments)	<b>Wave Mode:</b> Longitudinal	
<b>Set-up File:</b>	RCS Surge Circ1 18.ops	<b>Focal Sound Path:</b> 18mm	
<b>Couplant / Batch</b>	Soundsafe / 06120A	<b>Calibration Block(s):</b> SI-13-Circ-01	

Calibration Reflector Data					Comments: Applies for the circumferential examination of Zones 1 and 3 of the Weld Overlay material.  *Active Element Checks performed at Initial and final Cal Checks
Calibration Reflector	Reference Angle	% FSH	Ref. Gain	Wedge Delay	
0.50" Deep SDH	52°	85	33.0 dB	0.6 µsec	
0.90" Deep SDH	48°	85	38.5 dB	1.7 µsec	

Calibration Performed	Examiner	Level	Date - Time
Initial:	Clay Suhler <i>Clay D. Suhler</i>	II	4/21/08 @ 1920
Final:	Clay Suhler <i>Clay D. Suhler</i>	II	4/22/08 @ 0232
Reviewed:	John J. Hayden <i>John J. Hayden</i>	III	04/22/08

*John J. Hayden III 4/22/08 For KANT ASCT 4.24.08*

**ULTRASONIC PHASED ARRAY CALIBRATION RECORD**

<b>Customer:</b> Welding Services Inc.	<b>Calibration File Name:</b> RCS Surge Circ2
<b>Plant/Unit:</b> Millstone Unit 2	<b>Procedure No:</b> SI-UT-126, Rev.3
<b>Component/System:</b> RCS Surge Nozzle WOL	

Wedge				
<b>Manufacturer:</b>	SI	<b>Refracted Angle Verification</b>		
<b>Model:</b>	8.1" Radius WOL	<b>Focal Law Angle</b>	<b>Measured Angle</b>	<b>Index Offset</b>
<b>Material:</b>	Rexolite			
<b>Velocity:</b>	0.228 X 10 <sup>8</sup> in/sec	55°	54°	0.44 inch
<b>Wedge Angle:</b>	16°	45°	45°	0.50 Inch
<b>Scan Direction:</b>	Circ	30°	30°	0.58 inch
<b>Wedge Nominal OD:</b>	16.2"			

Instrument		Search Unit Integral Cable	
<b>Manufacturer:</b>	R/D Tech / Olympus	<b>Type:</b>	32 conductor, 38 gauge coaxial
<b>Model:</b>	OmniScan MX	<b>Length:</b>	8'
<b>Serial Number:</b>	OMNI-1643	<b>Connectors:</b>	Hypertronics
<b>Phased Array Module:</b>	OMNI-M-PA32 / 128PR	<b>Intermediate Cable</b>	
<b>PA Module Serial No.:</b>	OMNI-6088	<b>Type:</b>	32 conductor, 38 gauge coaxial
<b>Software Revision:</b>	1.4R3	<b>Length:</b>	18"
<b>Instrument Settings:</b>	Electronic Record	<b>Connectors:</b>	Hypertronics / OmniScan

Search Unit			
<b>Manufacturer:</b>	GE	<b>Element Length:</b>	2.70 mm
<b>Transmit Model:</b>	115-000-404	<b>Element Width:</b>	1.20 mm
<b>Transmit Serial Number:</b>	01PPCK	<b>Elements (Primary Axis):</b>	16
<b>Receive Model:</b>	115-000-405	<b>Elements (Secondary Axis):</b>	2
<b>Receive Serial Number:</b>	01PNJB	<b>Inactive Element- Transmit:</b>	0
<b>Frequency (MHz):</b>	2.0	<b>Inactive Element - Recieve:</b>	0

Calibration Data Files			
<b>Focal Law:</b>	ML_CIRC_RCS_Surge_WOL_Z2_195mmOD_41mmHP.Law		
<b>Angles Generated:</b>	0° through 70° (1° Increments)	<b>Wave Mode:</b> Longitudinal	
<b>Set-up File:</b>	RCS Surge Circ2 41.ops	<b>Focal Sound Path:</b> 41 mm	
<b>Couplant / Batch</b>	Soundsafe / 06120A	<b>Calibration Block(s):</b> SI-13-Circ-01	

Calibration Reflector Data					<b>Comments:</b> Applies for the circumferential examination of Zone 2 of the Weld Overlay material.  *Active Element Checks performed at Initial and final Cal Checks
Calibration Reflector	Reference Angle	% FSH	Ref. Gain	Wedge Delay	
0.60" Deep SDH	30°	85	31.0 dB	0.6 µsec	
1.00" Deep SDH	47°	85	37.5 dB	2.1 µsec	

Calibration Performed	Examiner	Level	Date - Time
<b>Initial:</b>	Clay Suhler <i>Clay D. Suhler</i>	II	4/21/08 @ 1925
<b>Final:</b>	Clay Suhler <i>Clay D. Suhler</i>	II	4/22/08 @ 0224
<b>Reviewed:</b>	John J. Hayden <i>John J. Hayden</i>	III	04/22/08

*KJH* *E/K* *AS/CT* *AN/II* *4/22/08* *4.24.08*

**ULTRASONIC PHASED ARRAY CALIBRATION RECORD**

<b>Customer:</b>	Welding Services Inc.	<b>Calibration File Name:</b>	RCS Surge Circ3
<b>Plant/Unit:</b>	Millstone Unit 2	<b>Procedure No:</b>	SI-UT-126, Rev.3
<b>Component/System:</b>	RCS Surge Nozzle WOL		

Wedge				
<b>Manufacturer:</b>	SI	<b>Refracted Angle Verification</b>		
<b>Model:</b>	8.1" Radius WOL	<b>Focal Law Angle</b>	<b>Measured Angle</b>	<b>Index Offset</b>
<b>Material:</b>	Rexolite			
<b>Velocity:</b>	0.228 X 10 <sup>8</sup> in/sec	55°	54°	0.44 inch
<b>Wedge Angle:</b>	16°	45°	45°	0.50 Inch
<b>Scan Direction:</b>	Circ	30°	30°	0.58 inch
<b>Wedge Nominal OD:</b>	16.2"			

Instrument		Search Unit Integral Cable	
<b>Manufacturer:</b>	R/D Tech / Olympus	<b>Type:</b>	32 conductor, 38 gauge coaxial
<b>Model:</b>	OmniScan MX	<b>Length:</b>	8'
<b>Serial Number:</b>	OMNI-1643	<b>Connectors:</b>	Hypertronics
<b>Phased Array Module:</b>	OMNI-M-PA32 / 128PR	<b>Intermediate Cable</b>	
<b>PA Module Serial No.:</b>	OMNI-6088	<b>Type:</b>	32 conductor, 38 gauge coaxial
<b>Software Revision:</b>	1.4R3	<b>Length:</b>	18"
<b>Instrument Settings:</b>	Electronic Record	<b>Connectors:</b>	Hypertronics / OmniScan

Search Unit			
<b>Manufacturer:</b>	GE	<b>Element Length:</b>	2.70 mm
<b>Transmit Model:</b>	115-000-404	<b>Element Width:</b>	1.20 mm
<b>Transmit Serial Number:</b>	01PPCK	<b>Elements (Primary Axis):</b>	16
<b>Receive Model:</b>	115-000-405	<b>Elements (Secondary Axis):</b>	2
<b>Receive Serial Number:</b>	01PNJB	<b>Inactive Element- Transmit:</b>	0
<b>Frequency (MHz):</b>	2.0	<b>Inactive Element - Recieve:</b>	0

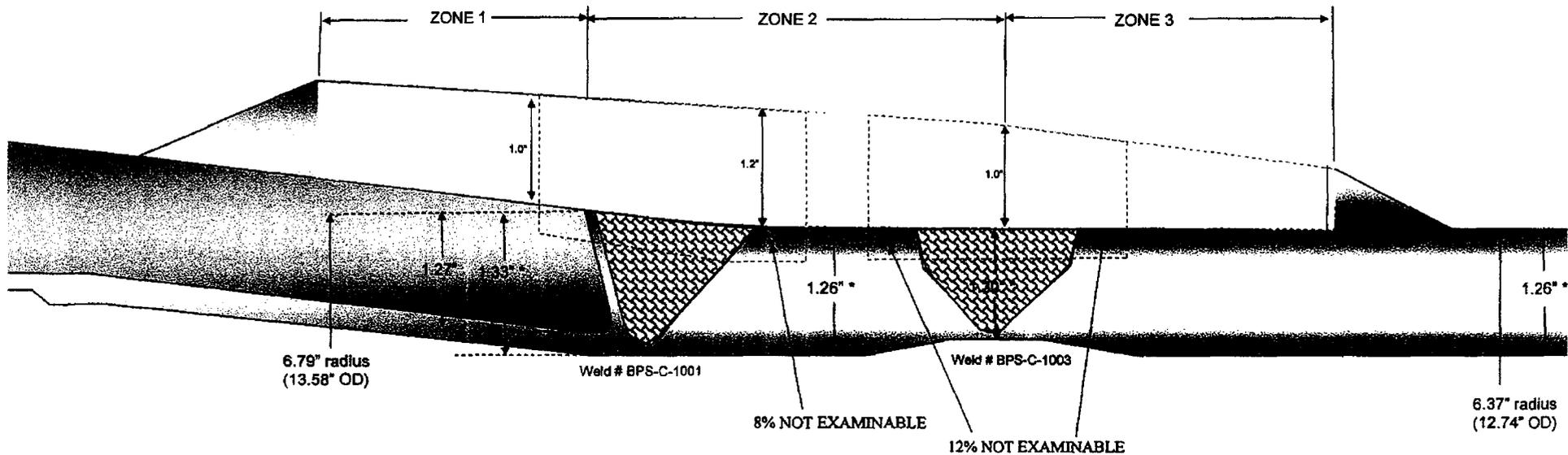
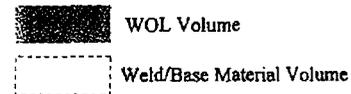
Calibration Data Files	
<b>Focal Law:</b>	ML CIRC RCS Surge WBM 195mmOD 48mmHP.Law
<b>Angles Generated:</b>	0° through 70° (1° Increments)
<b>Wave Mode:</b>	Longitudinal
<b>Set-up File:</b>	RCS Surge Circ3 48.ops
<b>Focal Sound Path:</b>	48 mm
<b>Couplant / Batch</b>	Soundsafe / 06120A
<b>Calibration Block(s):</b>	SI-13-Circ-01

Calibration Reflector Data					Comments:
Calibration Reflector	Reference Angle	% FSH	Ref. Gain	Wedge Delay	
1.00" Deep SDH	45°	85	35.5 dB	1.8 μsec	Applies for the circumferential examination of Weld and Base Material of the Dissimilar Metal Nozzle-to-Safe End and the Stainless Steel Safe End-to-Pipe weld.  *Active Element Checks performed at Initial and final Cal Checks

Calibration Performed	Examiner	Level	Date - Time
<b>Initial:</b>	Clay Suhler <i>Clay D. Suhler</i>	II	4/21/08 @ 1928
<b>Final:</b>	Clay Suhler <i>Clay D. Suhler</i>	II	4/22/08 @ 0236
<b>Reviewed:</b>	John J. Hayden <i>John J. Hayden</i>	III	04/22/08

*JJH* III 4/22/08  
*Flork* 4/22/08  
*AN/FF* 4.24.08

**RCS SURGE NOZZLE**



\* Value from previous de

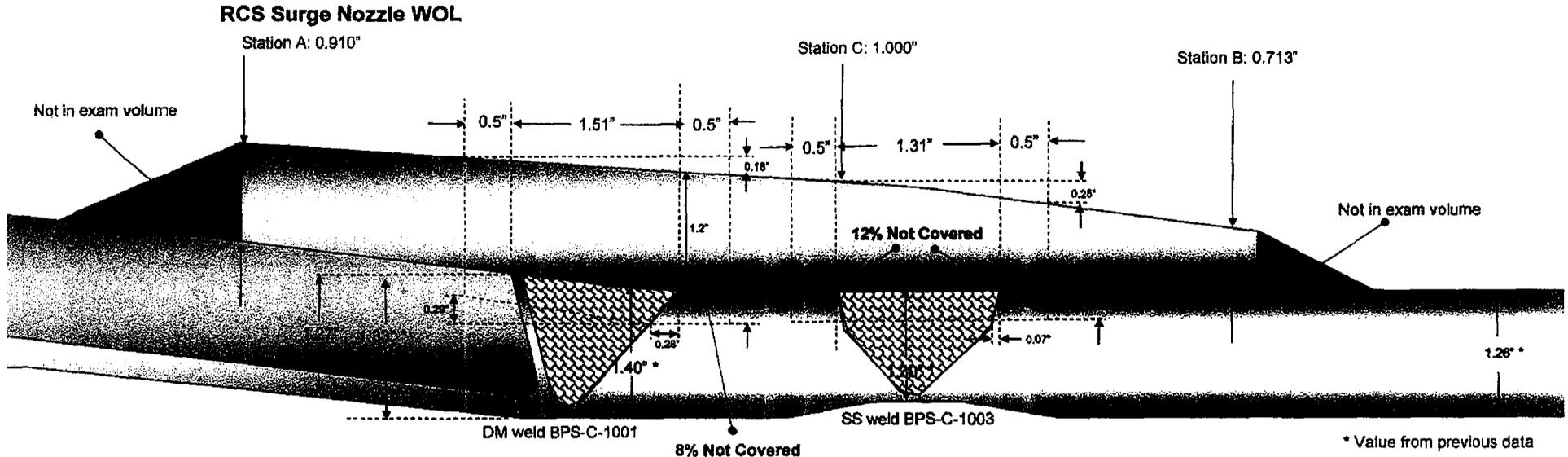
RCS Surge Nozzle	
Examination Region	Setup Name
Axial Scan - WOL Zone 1, 2 & 3	RCS Surge Ax 46
Axial Scan - WBM DM Weld	
Axial Scan - WBM SE Weld	
Circ Scan - WOL Zone 1 & 3	RCS Surge Circ1 18
Circ Scan - WOL Zone 2	RCS Surge Circ2 41
Circ Scan - WBM DM Weld	RCS Surge Circ3 48
Circ Scan - WBM SE Weld	

Examination Data	
Date:	4/22/2008
Examiners:	Clay Suhler & Robert Briley
Start Time:	0041
Finish Time:	0133
Scan Sensitivity - Axial:	45.0 dB
Scan Sensitivity - Circ:	44.0 dB

Examiner: Clay Suhler *Clay D. Suhler* Level: II Date: 4/22/2008  
 Examiner: Robert Briley *Robert E. Briley* Level: II Date: 4/22/2008  
 SI Review: John J. Hayden *John J. Hayden* Level: III Date: 04/22/08

*J. Hayden* III 04/22/08  
*Clark* ANSA 4.24.08

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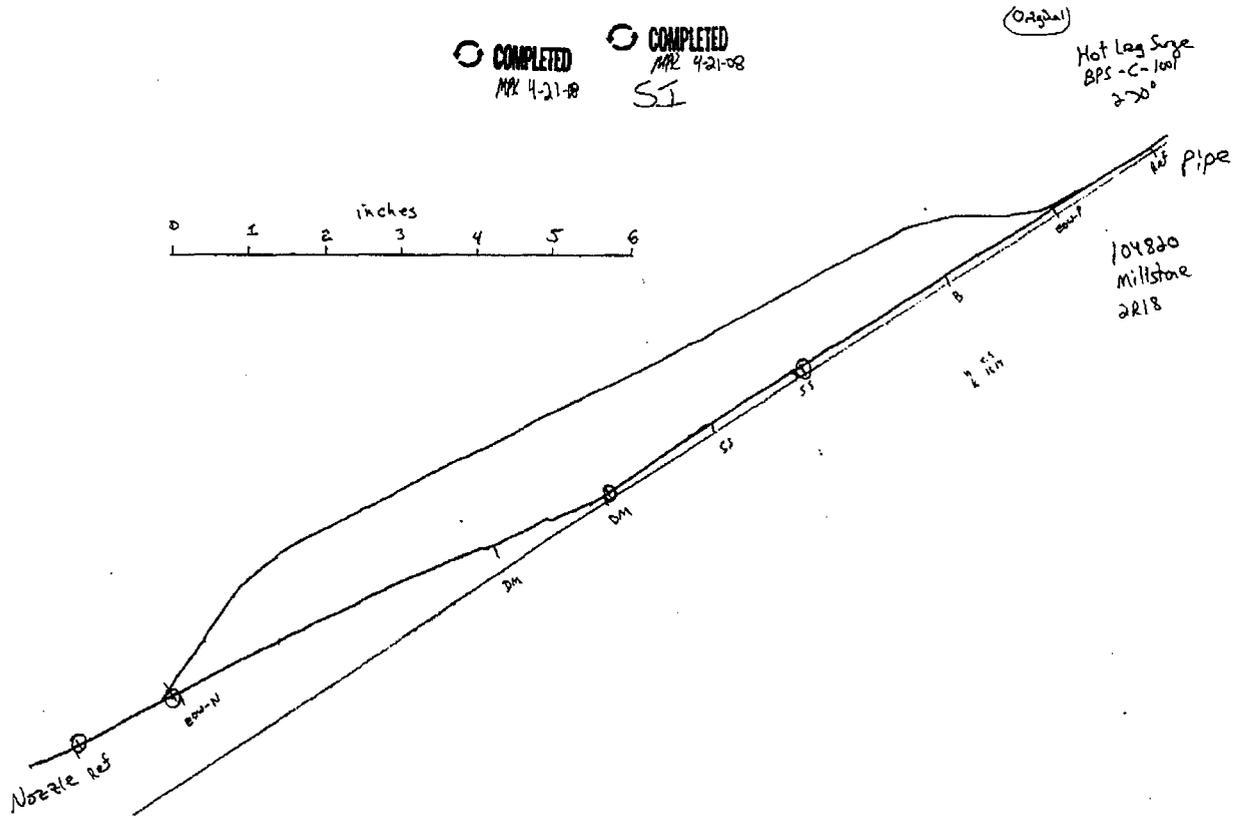


The ISI examination of the DM weld overlay and ¼ T of the Base material was conducted in one zone which 1+1.51" wide X (1.2" + 0.35") deep – ((2.51 X 0.18/2) + (1.73 X 0.29/2)) = 3.41 Sq inches for the entire DM circumference. Due to the lack of a qualified examination method for cast stainless steel there is an examination limitation of 0.35" X 0.50" + (0.28" X 0.35" / 2) which is equal to 0.258 Sq inches. The limitation divided by the total material provides examination coverage of 92.0%.

The ISI examination of the SS weld overlay and ¼ T of the Base material was conducted in one zone which {1+1.31" wide X (1.00" + 0.325" deep} – ((1.31+0.5) X 0.25/2)) = 2.83 Sq inches for the entire SS circumference. Due to the lack of a qualified examination method for cast stainless steel there is an examination limitation of 2 X ((0.325" X 0.50") + (0.325" X 0.07" / 2)) which is equal to 0.348 Sq inches. The limitation divided by the total material provides examination coverage of 88.0%.

The examination of the cast stainless material was performed as a "best effort" using current technology. Above sketch is not to scale, please see actual contours for actual surface dimensions.

Examiner:	<u>Clay Suhler</u> <i>Clay D. Suhler</i>	Level:	II	Date:	4/22/2008
Examiner:	<u>Robert Briley</u> <i>Robert E. Briley</i>	Level:	II	Date:	4/22/2008
SI Review:	<u>John J. Hayden</u> <i>John J. Hayden</i>	Level:	III	Date:	04/22/08
	<i>H. H. H. H. K.</i>		<i>III</i>		<i>04/22/08</i>
			<i>AWK</i>		<i>4-24-08</i>



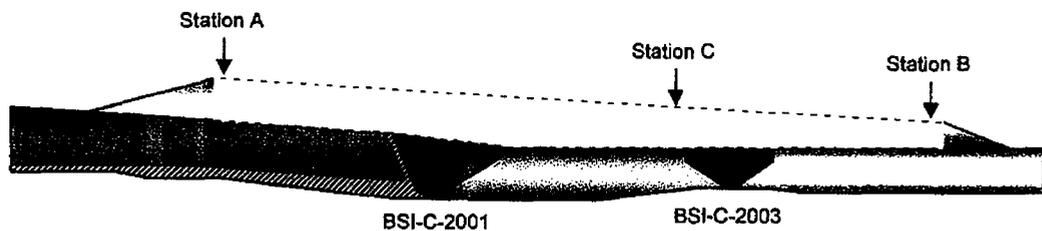
J. Hack III 4/22/08  
Erik ANZ ASIS CT 4.24.08

**PHASED ARRAY ULTRASONIC EXAMINATION RECORD**

Examination Data Sheet No.: RCS Safety Injection Sht 44 WOL  
Calibration Data Sheet No.: See Comments Section  
Date: 4/25/08 Time: 2120 to 2225

Plant: Millstone	Unit: 2	Procedure No.: SI-UT-126	Revision: 3	Examination Scans Performed	Yes	No
Component: RCS Safety Injection sheet 44 Nozzle Weld Overlay				(1) Axial (Facing Downstream)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Component Configuration: Nozzle-to-Safe End		Weld Overlay No.: WOL-BSI-C-2001		(2) Axial (Facing Upstream)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Weld Overlay Regions:	Weld Overlay Material			(3) Circumferential (Clockwise Flow <sup>(1)</sup> )	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Examination Surface:	Surface of Weld Overlay	Examination Angles		(4) Circumferential (Counterclockwise <sup>(1)</sup> )	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Weld Overlay Thickness:	Station A: 0.98. Inch	Axial	Circumferential	Notes: <sup>(1)</sup> As viewed facing downstream <sup>(2)</sup> Examination angles are generated in 1° increments		
	Station B: 0.6925 Inch	0° through 83° <sup>(2)</sup>	0° through 70° <sup>(2)</sup>			
	Station C: 0.955 Inch	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
Examination Sensitivity:		45.0 dB	44.0 dB			

**Comments:**  
No suspected flaw indications were observed during the examinations. The examination gain was adjusted to maintain the procedure-specified baseline noise level from 5% to 20% of full screen height. The lower range of examination angles detected responses from the inside surface of the component which were useful for monitoring search unit contact / coupling effectiveness during the examination. 100% coverage of the Code-required volume was achieved during the examinations.



The applicable Calibration Data Sheets are listed below:  
RCS Safety 44 Axial 1; RCS Safety 44 Axial 2;  
RCS Safety 44 Circ 1; & RCS Safety 44 Circ 2

Examiner: Clay Suhler *Clay D. Suhler* Level: II Date: 4/25/08  
Examiner: Robert Briley *Robert E. Briley* Level: II Date: 4/25/08  
SI Review: John Hayden *John J. Hayden* Level: III Date: 04/26/08

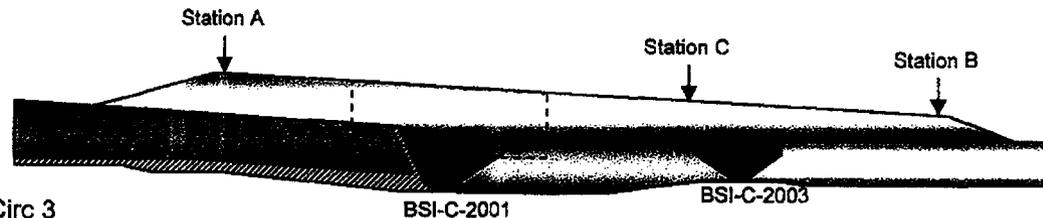
Donovan Reiter: *TL. Dewey III* *re* 04/26/2008

**PHASED ARRAY ULTRASONIC EXAMINATION RECORD**

Examination Data Sheet No.: RCS Safety Injection Sht 44-WBM-DM  
Calibration Data Sheet No.: See Comments Section  
Date: 4/25/08 Time: 2120 to 2225

Plant: Millstone	Unit: 2	Procedure No.: SI-UT-126	Revision: 3	Examination Scans Performed	Yes	No
Component: RCS Surge Nozzle Weld Overlay (Weld: BSI-C-2001)				(1) Axial (Facing Downstream)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Component Configuration: Nozzle-to-Safe End		Weld Overlay No.: WOL-BSI-C-2001		(2) Axial (Facing Upstream)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Weld Overlay Regions:	Overlay, Weld and Base Material (Outer 25%) Nozzle-to-Safe End			(3) Circumferential (Clockwise Flow <sup>(1)</sup> )	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Examination Surface:	Surface of Weld Overlay	Examination Angles		(4) Circumferential (Counterclockwise <sup>(1)</sup> )	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Weld Overlay Thickness: Station A: 0.98 Inch Station C: 0.955 Inch		Axial 0° through 83° <sup>(2)</sup> <input checked="" type="checkbox"/>	Circumferential 0° through 70° <sup>(2)</sup> <input checked="" type="checkbox"/>	Notes: <sup>(1)</sup> As viewed facing downstream <sup>(2)</sup> Examination angles are generated in 1° increments		
Examination Sensitivity:		45.0 dB	44.0 dB			

**Comments:**  
No suspected flaw indications were observed during the examinations. The examination gain was adjusted to maintain the procedure-specified baseline noise level from 5% to 20% of full screen height. The lower range of examination angles detected responses from the inside surface of the component which were useful for monitoring search unit contact / coupling effectiveness during the examination. 92.2% coverage of the Code-required volume was achieved during the examinations.



The applicable Calibration Data Sheets are listed below:  
RCS Safety 44 Axial 1; RCS Safety 44 Axial 2;  
RCS Safety 44 Circ 1; RCS Safety 44 Circ2; & RCS Safety 44 Circ 3

Examiner:	<u>Clay Suhler</u> <i>Clay D. Suhler</i>	Level:	<u>II</u>	Date:	<u>4/25/08</u>
Examiner:	<u>Robert Briley</u> <i>Robert E. Briley</i>	Level:	<u>II</u>	Date:	<u>4/25/08</u>
SI Review:	<u>John Hayden</u> <i>John J. Hayden</i>	Level:	<u>III</u>	Date:	<u>04/26/08</u>

Downs - Review: T.L. Downs *T.L. Downs* 04/26/2008



**PHASED ARRAY ULTRASONIC EXAMINATION RECORD**

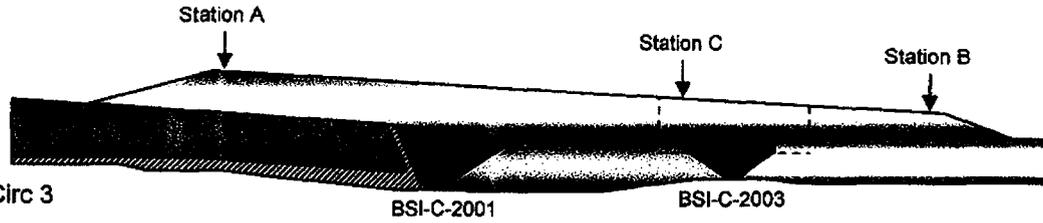
Examination Data Sheet No.: RCS Safety Injection Sht 44-WBM-SM

Calibration Data Sheet No.: See Comments Section

Date: 4/25/08 Time: 2120 to 2225

Plant: Millstone	Unit: 2	Procedure No.: SI-UT-126	Revision: 3	Examination Scans Performed	Yes	No
Component: RCS Safety Injection sheet 44 Nozzle Weld Overlay (Weld: BSI-C-2003)				(1) Axial (Facing Downstream)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Component Configuration: Safe End-to-Pipe		Weld Overlay No.: WOL-BSI-C-2001		(2) Axial (Facing Upstream)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Weld Overlay Regions: Overlay, Weld and Base Material (Outer 25%) Safe End-to-Pipe				(3) Circumferential (Clockwise Flow <sup>(1)</sup> )	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Examination Surface: Surface of Weld Overlay		Examination Angles		(4) Circumferential (Counterclockwise <sup>(1)</sup> )	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Weld Overlay Thickness: Station B: 0.6925 Inch Station C: 0.955 Inch		Axial 0° through 83° <sup>(2)</sup> <input checked="" type="checkbox"/>	Circumferential 0° through 70° <sup>(2)</sup> <input checked="" type="checkbox"/>	Notes: (1) As viewed facing downstream (2) Examination angles are generated in 1° increments		
Examination Sensitivity:		45.0 dB	44.0 dB			

**Comments:**  
No suspected flaw indications were observed during the examinations. The examination gain was adjusted to maintain the procedure-specified baseline noise level from 5% to 20% of full screen height. The lower range of examination angles detected responses from the inside surface of the component which were useful for monitoring search unit contact / coupling effectiveness during the examination. 93.9% coverage of the Code-required volume was achieved during the examinations.



The applicable Calibration Data Sheets are listed below:  
RCS Safety 44 Axial 1; RCS Safety 44 Axial 2;  
RCS Safety 44 Circ 1; RCS Safety 44 Circ2; & RCS Safety 44 Circ 3

Examiner: Clay Suhler *Clay D. Suhler* Level: II Date: 4/25/08

Examiner: Robert Briley *Robert E. Briley* Level: II Date: 4/25/08

SI Review: John Hayden *John J. Hayden* Level: III Date: 04/26/08

Dominion Review: T.L. Desrosiers *T.L. Desrosiers* 04/26/2008



ULTRASONIC PHASED ARRAY CALIBRATION RECORD  
2R18 Final WOL Examination Report  
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Customer:	Welding Services Inc.	Calibration File Name:	RCS Safety 44 Axial 1
Plant/Unit:	Millstone Unit 2	Procedure No:	SI-UT-126, Rev.3
Component/System:	RCS Safety Injection Nozzle Sheet 44 WOL		

Wedge				
Manufacturer:	SI	Refracted Angle Verification		
Model:	8.1" Radius WOL	Focal Law Angle	Measured Angle	Index Offset
Material:	Rexolite			
Velocity:	0.228 X 10 <sup>8</sup> in/sec	60°	60°	0.45 inch
Wedge Angle:	16°	45°	47°	0.50 Inch
Scan Direction:	Axial	30°	33°	0.60 inch
Wedge Nominal OD:	16.2"			

Instrument		Search Unit Integral Cable	
Manufacturer:	R/D Tech / Olympus	Type:	32 conductor, 38 gauge coaxial
Model:	OmniScan MX	Length:	8'
Serial Number:	OMNI-1643	Connectors:	Hypertronics
Phased Array Module:	OMNI-M-PA32 / 128PR	Intermediate Cable	
PA Module Serial No.:	OMNI-6088	Type:	32 conductor, 38 gauge coaxial
Software Revision:	1.4R3	Length:	18'
Instrument Settings:	Electronic Record	Connectors:	Hypertronics / OmniScan

Search Unit			
Manufacturer:	GE	Element Length:	2.70 mm
Transmit Model:	115-000-404	Element Width:	1.20 mm
Transmit Serial Number:	01PPCK	Elements (Primary Axis):	16
Receive Model:	115-000-405	Elements (Secondary Axis):	2
Receive Serial Number:	01PNJB	Inactive Element - Transmit:	0
Frequency (MHz):	2.0	Inactive Element - Receive:	0

Calibration Data Files			
Focal Law:	ML_AX_RCS_SafetyInj_WOLZ1&2_192mmOD_47mmHP.Law		
Angles Generated:	0° through 83° (1° Increments)	Wave Mode:	Longitudinal
Set-up File:	RCS Safety Ax1 47.ops	Focal Sound Path:	47 mm
Couplant / Batch	Soundsafe / 06120A	Calibration Block(s):	SI-13-AX-01

Calibration Reflector Data					Comments: Applies for the axial examination of the Weld Overlay Material Zones 1 and 2 and the Weld and Base Material of the Dissimilar Metal Nozzle-to-Safe End weld.  *Active Element Checks performed at Initial and final Cal Checks
Calibration Reflector	Reference Angle	% FSH	Ref. Gain	Wedge Delay	
0.10" Deep SDH	80°	85	42.0 dB	0.4 µsec	
0.50" Deep SDH	70°	85	44.5 dB	0.1 µsec	
1.00" Deep SDH	60°	83	43.0 dB	0.8 µsec	
1.20" Deep SDH	45°	85	37.0 dB	0.1 µsec	
1.20" Deep SDH	0°	83	32.5 dB	0.2 µsec	

Calibration Performed	Examiner	Level	Date - Time
Initial:	Robert E. Briley <i>(Robert E. Briley)</i>	II	4/25/08 @ 1926
Final:	Robert E. Briley <i>(Robert E. Briley)</i>	II	4/25/08 @ 2346
Reviewed:	John J. Hayden <i>(John J. Hayden)</i>	III	04/26/08

Danion Review: T.L. Devers # 30 04/26/2008

**ULTRASONIC PHASED ARRAY CALIBRATION RECORD**

 2R18 Final WOL  
 Examination Report  
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<b>Customer:</b>	Welding Services Inc.	<b>Calibration File Name:</b>	RCS Safety 44 Axial 2
<b>Plant/Unit:</b>	Millstone Unit 2	<b>Procedure No:</b>	SI-UT-126, Rev.3
<b>Component/System:</b> RCS Safety Injection Nozzle Sheet 44 WOL			

Wedge				
Manufacturer:	SI	Refracted Angle Verification		
<b>Model:</b>	8.1" Radius WOL	Focal Law Angle	Measured Angle	Index Offset
<b>Material:</b>	Rexolite			
<b>Velocity:</b>	0.228 X 10 <sup>8</sup> in/sec	60°	60°	0.45 inch
<b>Wedge Angle:</b>	16°	45°	47°	0.50 Inch
<b>Scan Direction:</b>	Axial	30°	33°	0.60 inch
<b>Wedge Nominal OD:</b>	16.2"			

Instrument		Search Unit Integral Cable	
<b>Manufacturer:</b>	R/D Tech / Olympus	<b>Type:</b>	32 conductor, 38 gauge coaxial
<b>Model:</b>	OmniScan MX	<b>Length:</b>	8'
<b>Serial Number:</b>	OMNI-1643	<b>Connectors:</b>	Hypertronics
<b>Phased Array Module:</b>	OMNI-M-PA32 / 128PR	Intermediate Cable	
<b>PA Module Serial No.:</b>	OMNI-6088	<b>Type:</b>	32 conductor, 38 gauge coaxial
<b>Software Revision:</b>	1.4R3	<b>Length:</b>	18'
<b>Instrument Settings:</b>	Electronic Record	<b>Connectors:</b>	Hypertronics / OmniScan

Search Unit			
<b>Manufacturer:</b>	GE	<b>Element Length:</b>	2.70 mm
<b>Transmit Model:</b>	115-000-404	<b>Element Width:</b>	1.20 mm
<b>Transmit Serial Number:</b>	01PPCK	<b>Elements (Primary Axis):</b>	16
<b>Receive Model:</b>	115-000-405	<b>Elements (Secondary Axis):</b>	2
<b>Receive Serial Number:</b>	01PNJB	<b>Inactive Element - Transmit:</b>	0
<b>Frequency (MHz):</b>	2.0	<b>Inactive Element - Receive:</b>	0

Calibration Data Files			
<b>Focal Law:</b> ML_AX_RCS_SafetyInj_WOLZ3_192mmOD_31mmHP.Law			
<b>Angles Generated:</b> 0° through 83° (1° Increments)		<b>Wave Mode:</b> Longitudinal	
<b>Set-up File:</b> RCS Safety Ax2 31.ops		<b>Focal Sound Path:</b> 31 mm	
<b>Couplant / Batch</b> Soundsafe / 06120A		<b>Calibration Block(s):</b> SI-13-AX-01	

Calibration Reflector Data					Comments: Applies for the axial examination of the Weld Overlay Material Zone 3 and the Weld and Base Material of the Stainless Steel Safe End-to-Pipe weld.  *Active Element Checks performed at Initial and final Cal Checks
Calibration Reflector	Reference Angle	% FSH	Ref. Gain	Wedge Delay	
0.10" Deep SDH	80°	84	40.0 dB	0.0 µsec	
0.40" Deep SDH	70°	85	41.5 dB	0.0 µsec	
0.70" Deep SDH	60°	84	37.9 dB	0.0 µsec	
0.90" Deep SDH	45°	83	33.5 dB	0.2 µsec	
1.20" Deep SDH	0°	85	32.0 dB	0.2 µsec	

Calibration Performed	Examiner	Level	Date - Time
<b>Initial:</b>	Robert E. Briley <i>Robert E. Briley</i>	II	4/25/08 @ 1919
<b>Final:</b>	Robert E. Briley <i>Robert E. Briley</i>	II	4/25/08 @ 2351
<b>Reviewed:</b>	John J. Hayden <i>John J. Hayden</i>	III	04/26/08

Danman Review: T.L. Dewers III TD 04/26/2008

**ULTRASONIC PHASED ARRAY CALIBRATION RECORD**

 2R18 Final WOL  
 Examination Report  
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<b>Customer:</b>	Welding Services Inc.	<b>Calibration File Name:</b>	RCS Safety 44 Circ 1
<b>Plant/Unit:</b>	Millstone Unit 2	<b>Procedure No:</b>	SI-UT-126, Rev.3
<b>Component/System:</b>	RCS Safety Nozzle WOL		

Wedge				
<b>Manufacturer:</b>	SI	<b>Refracted Angle Verification</b>		
<b>Model:</b>	8.1" Radius WOL	<b>Focal Law Angle</b>	<b>Measured Angle</b>	<b>Index Offset</b>
<b>Material:</b>	Rexolite			
<b>Velocity:</b>	0.228 X 10 <sup>8</sup> in/sec	55°	54°	0.44 inch
<b>Wedge Angle:</b>	16°	45°	45°	0.50 Inch
<b>Scan Direction:</b>	Circ	30°	30°	0.58 inch
<b>Wedge Nominal OD:</b>	16.2"			

Instrument		Search Unit Integral Cable	
<b>Manufacturer:</b>	R/D Tech / Olympus	<b>Type:</b>	32 conductor, 38 gauge coaxial
<b>Model:</b>	OmniScan MX	<b>Length:</b>	8'
<b>Serial Number:</b>	OMNI-1643	<b>Connectors:</b>	Hypertronics
<b>Phased Array Module:</b>	OMNI-M-PA32 / 128PR	<b>Intermediate Cable</b>	
<b>PA Module Serial No.:</b>	OMNI-6088	<b>Type:</b>	32 conductor, 38 gauge coaxial
<b>Software Revision:</b>	1.4R3	<b>Length:</b>	18'
<b>Instrument Settings:</b>	Electronic Record	<b>Connectors:</b>	Hypertronics / OmniScan

Search Unit			
<b>Manufacturer:</b>	GE	<b>Element Length:</b>	2.70 mm
<b>Transmit Model:</b>	115-000-404	<b>Element Width:</b>	1.20 mm
<b>Transmit Serial Number:</b>	01PPCK	<b>Elements (Primary Axis):</b>	16
<b>Receive Model:</b>	115-000-405	<b>Elements (Secondary Axis):</b>	2
<b>Receive Serial Number:</b>	01PNJB	<b>Inactive Element- Transmit:</b>	0
<b>Frequency (MHz):</b>	2.0	<b>Inactive Element - Receive:</b>	0

Calibration Data Files			
<b>Focal Law:</b>	ML_CIRC RCS SafetyInj_WOL_Z1&3_192mmOD_18mmHP.Law		
<b>Angles Generated:</b>	0° through 70° (1° Increments)	<b>Wave Mode:</b> Longitudinal	
<b>Set-up File:</b>	RCS Safety Circ1 18.ops	<b>Focal Sound Path:</b> 18mm	
<b>Couplant / Batch</b>	Soundsafe / 06120A	<b>Calibration Block(s):</b> SI-13-Circ-01	

Calibration Reflector Data					<b>Comments:</b> Applies for the circumferential examination of Zones 1 and 3 of the Weld Overlay material.  *Active Element Checks performed at Initial and final Cal Checks
Calibration Reflector	Reference Angle	% FSH	Ref. Gain	Wedge Delay	
0.50" Deep SDH	52°	85	33.0 dB	0.5 µsec	
0.90" Deep SDH	48°	85	38.0 dB	0.5 µsec	

Calibration Performed	Examiner	Level	Date - Time
<b>Initial:</b>	Robert E. Briley <i>Robert E. Briley</i>	II	4/25/08 @ 1844
<b>Final:</b>	Robert E. Briley <i>Robert E. Briley</i>	II	4/25/08 @ 2334
<b>Reviewed:</b>	John J. Hayden <i>John J. Hayden</i>	III	04/26/08

 Dominion Review: T.L. Deves *T.L. Deves* JR 04/26/2008

**ULTRASONIC PHASED ARRAY CALIBRATION RECORD**

<b>Customer:</b>	Welding Services Inc.	<b>Calibration File Name:</b>	RCS Safety 44 Circ 2
<b>Plant/Unit:</b>	Millstone Unit 2	<b>Procedure No:</b>	SI-UT-126, Rev.3
<b>Component/System:</b>	RCS Safety Nozzle WOL		

Wedge				
<b>Manufacturer:</b>	SI	<b>Refracted Angle Verification</b>		
<b>Model:</b>	8.1" Radius WOL	<b>Focal Law Angle</b>	<b>Measured Angle</b>	<b>Index Offset</b>
<b>Material:</b>	Rexolite			
<b>Velocity:</b>	0.228 X 10 <sup>8</sup> in/sec	55°	54°	0.44 inch
<b>Wedge Angle:</b>	16°	45°	45°	0.50 Inch
<b>Scan Direction:</b>	Circ	30°	30°	0.58 inch
<b>Wedge Nominal OD:</b>	16.2"			

Instrument		Search Unit Integral Cable	
<b>Manufacturer:</b>	R/D Tech / Olympus	<b>Type:</b>	32 conductor, 38 gauge coaxial
<b>Model:</b>	OmniScan MX	<b>Length:</b>	8'
<b>Serial Number:</b>	OMNI-1643	<b>Connectors:</b>	Hypertronics
<b>Phased Array Module:</b>	OMNI-M-PA32 / 128PR	<b>Intermediate Cable</b>	
<b>PA Module Serial No.:</b>	OMNI-6088	<b>Type:</b>	32 conductor, 38 gauge coaxial
<b>Software Revision:</b>	1.4R3	<b>Length:</b>	18"
<b>Instrument Settings:</b>	Electronic Record	<b>Connectors:</b>	Hypertronics / OmniScan

Search Unit			
<b>Manufacturer:</b>	GE	<b>Element Length:</b>	2.70 mm
<b>Transmit Model:</b>	115-000-404	<b>Element Width:</b>	1.20 mm
<b>Transmit Serial Number:</b>	01PPCK	<b>Elements (Primary Axis):</b>	16
<b>Receive Model:</b>	115-000-405	<b>Elements (Secondary Axis):</b>	2
<b>Receive Serial Number:</b>	01PNJB	<b>Inactive Element- Transmit:</b>	0
<b>Frequency (MHz):</b>	2.0	<b>Inactive Element - Receive:</b>	0

Calibration Data Files			
<b>Focal Law:</b>	ML_CIRC_RCS_SafetyInj_WOL_Z2_192mmOD_26mmHP.Law		
<b>Angles Generated:</b>	0° through 70° (1° Increments)	<b>Wave Mode:</b> Longitudinal	
<b>Set-up File:</b>	RCS Safety Circ2 26.ops	<b>Focal Sound Path:</b> 26 mm	
<b>Couplant / Batch</b>	Soundsafe / 06120A	<b>Calibration Block(s):</b> SI-13-Circ-01	

Calibration Reflector Data					<b>Comments:</b> Applies for the circumferential examination of Zone 2 of the Weld Overlay material.  *Active Element Checks performed at Initial and final Cal Checks
Calibration Reflector	Reference Angle	% FSH	Ref. Gain	Wedge Delay	
0.60" Deep SDH	51°	85	35.0 dB	1.2 µsec	
1.00" Deep SDH	46°	85	38.0 dB	0.4 µsec	

Calibration Performed	Examiner	Level	Date - Time
<b>Initial:</b>	Robert E. Briley <i>Robert E. Briley</i>	II	4/25/08 @1858
<b>Final:</b>	Robert E. Briley <i>Robert E. Briley</i>	II	4/25/08 @ 2340
<b>Reviewed:</b>	John J. Hayden <i>John J. Hayden</i>	III	04/26/08

Donnison Rawlaw: T.L. Dewers III JO 04/26/2008

**ULTRASONIC PHASED ARRAY CALIBRATION RECORD**

 2R18 Final WOL  
 Examination Report  
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<b>Customer:</b>	Welding Services Inc.	<b>Calibration File Name:</b>	RCS Safety 44 Circ 3
<b>Plant/Unit:</b>	Millstone Unit 2	<b>Procedure No:</b>	SI-UT-126, Rev.3
<b>Component/System:</b>		RCS Safety Nozzle WOL	

Wedge				
Manufacturer:	SI	Refracted Angle Verification		
Model:	8.1" Radius WOL	Focal Law Angle	Measured Angle	Index Offset
Material:	Rexolite			
Velocity:	0.228 X 10 <sup>5</sup> in/sec	55°	54°	0.44 inch
Wedge Angle:	16°	45°	45°	0.50 Inch
Scan Direction:	Circ	30°	30°	0.58 inch
Wedge Nominal OD:	16.2"			

Instrument		Search Unit Integral Cable	
<b>Manufacturer:</b>	R/D Tech / Olympus	<b>Type:</b>	32 conductor, 38 gauge coaxial
<b>Model:</b>	OmniScan MX	<b>Length:</b>	8'
<b>Serial Number:</b>	OMNI-1643	<b>Connectors:</b>	Hypertronics
<b>Phased Array Module:</b>	OMNI-M-PA32 / 128PR	Intermediate Cable	
<b>PA Module Serial No.:</b>	OMNI-6088	<b>Type:</b>	32 conductor, 38 gauge coaxial
<b>Software Revision:</b>	1.4R3	<b>Length:</b>	18"
<b>Instrument Settings:</b>	Electronic Record	<b>Connectors:</b>	Hypertronics / OmniScan

Search Unit			
<b>Manufacturer:</b>	GE	<b>Element Length:</b>	2.70 mm
<b>Transmit Model:</b>	115-000-404	<b>Element Width:</b>	1.20 mm
<b>Transmit Serial Number:</b>	01PPCK	<b>Elements (Primary Axis):</b>	16
<b>Receive Model:</b>	115-000-405	<b>Elements (Secondary Axis):</b>	2
<b>Receive Serial Number:</b>	01PNJB	<b>Inactive Element- Transmit:</b>	0
<b>Frequency (MHz):</b>	2.0	<b>Inactive Element - Receive:</b>	0

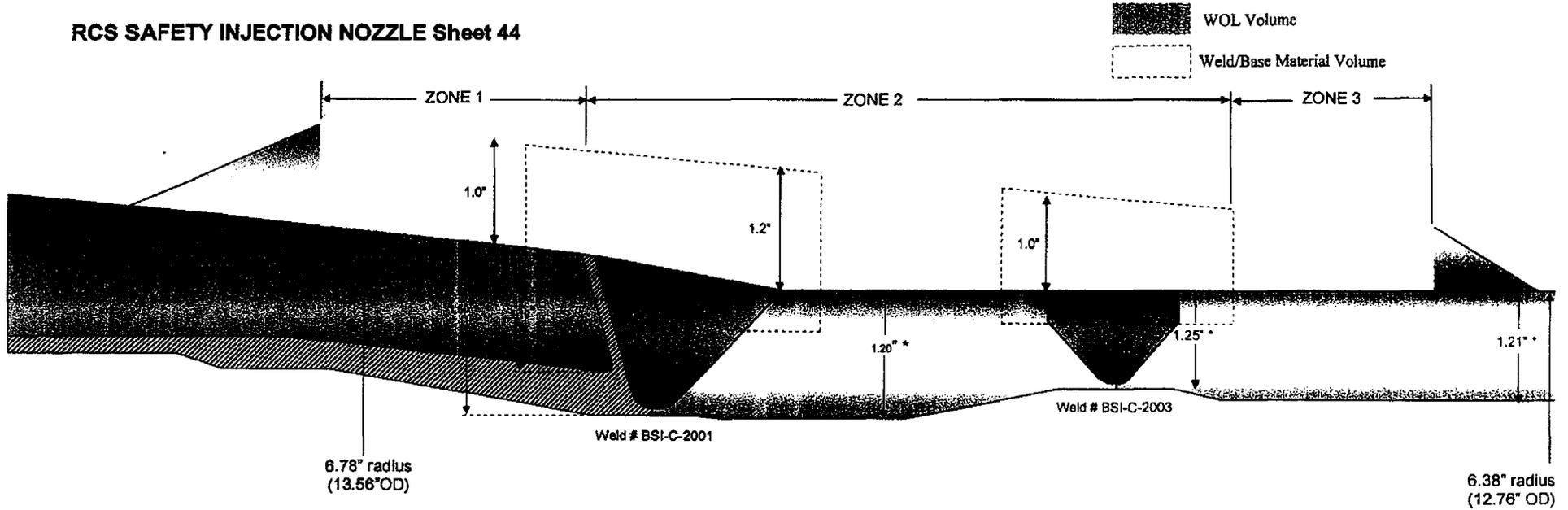
Calibration Data Files			
<b>Focal Law:</b>	ML_CIRC_RCS_SafetyInj_WBM_192mmOD_41mmHP.Law		
<b>Angles Generated:</b>	0° through 70° (1° Increments)	<b>Wave Mode:</b>	Longitudinal
<b>Set-up File:</b>	RCS Safety Circ3 41.ops	<b>Focal Sound Path:</b>	41 mm
<b>Couplant / Batch</b>	Soundsafe / 06120A	<b>Calibration Block(s):</b>	SI-13-Circ-01

Calibration Reflector Data					Comments: Applies for the circumferential examination of the Weld and Base Material of the Dissimilar Metal Nozzle-to-Safe End and the Stainless Steel Safe End-to-Pipe weld. *Active Element Checks performed at Initial and final Cal Checks
Calibration Reflector	Reference Angle	% FSH	Ref. Gain	Wedge Delay	
1.00" Deep SDH	45°	85	38.0 dB	2.9 µsec	
0.90" Deep SDH	47°	84	31.5 dB	2.1 µsec	

Calibration Performed	Examiner	Level	Date - Time
<b>Initial:</b>	Robert E. Briley <i>Robert E. Briley</i>	II	4/25/08 @1903
<b>Final:</b>	Robert E. Briley <i>Robert E. Briley</i>	II	4/25/08 @ 2337
<b>Reviewed:</b>	John J. Hayden <i>John J. Hayden</i>	III	04/26/08

 Dominion Review: TL Desert *TL Desert* JO 04/29/2008

RCS SAFETY INJECTION NOZZLE Sheet 44



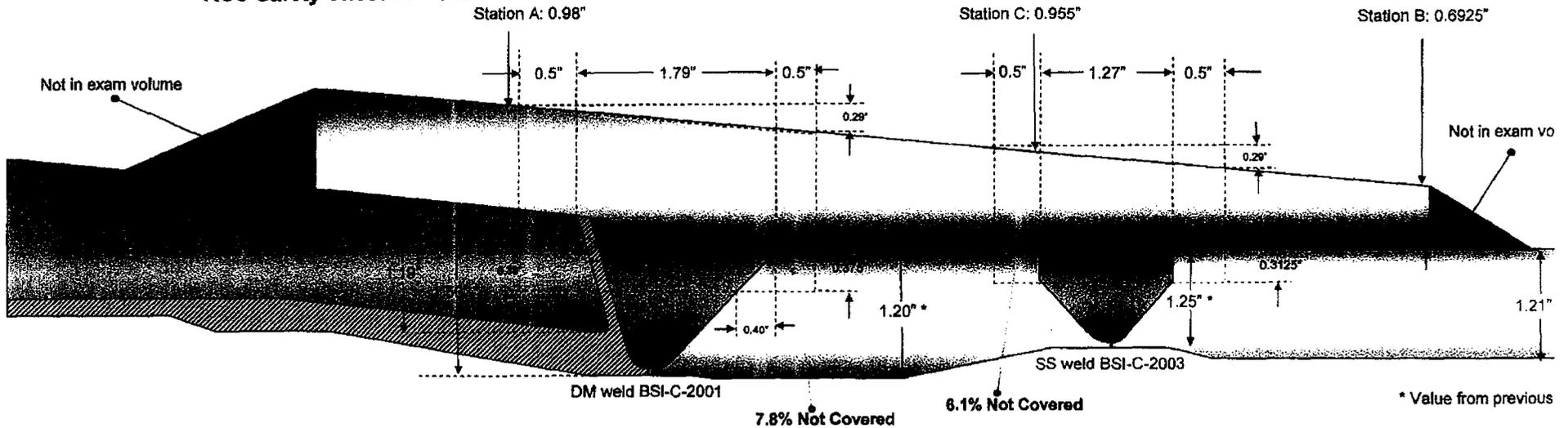
RCS Spray Nozzle	
Examination Region	Setup Name
Axial Scan - WOL Zone 1 & 2	RCS Safety Ax1 47
Axial Scan - WBM DM Weld	
Axial Scan - WOL Zone 3	RCS Safety Ax2 31
Axial Scan - WBM SE Weld	
Circ Scan - WOL Zone 1 & 3	RCS Safety Circ1 18
Circ Scan - WOL Zone 2	RCS Safety Circ2 26
Circ Scan - WBM DM Weld	
Circ Scan - WBM SE Weld	RCS Safety Circ3 41

Examination Data	
Date:	4/25/2008
Examiners:	Clay Suhler & Robert Briley
Start Time:	2120
Finish Time:	2225
Scan Sensitivity - Axial:	45.0 dB
Scan Sensitivity - Circ:	44.0 dB

Examiner: Clay Suhler *Clay Suhler* Level: II Date: 4/25/2008  
 Examiner: Robert Briley *Robert Briley* Level: II Date: 4/25/2008  
 SI Review: John Hayden *John Hayden* Level: III Date: 04/26/08

Dominion Review: T. L. Daves *T. L. Daves* 04/26/2008

**RCS Safety Sheet 44 Nozzle WOL**



The ISI examination of the DM weld overlay and ¼ T of the Base material was conducted in one zone which 1+1.79" wide X (0.98" + 0.375") deep – ((1+1.79) X (0.29/2)) Sq in = 3.38 Sq inches for the entire DM circumference. Due to the lack of a qualified examination method for cast stainless steel there is an examination limitation of 0.375" X 0.50" + (0.40" X 0.375" /2) which is equal to 0.263 Sq inches. The limitation divided by the total material provides examination coverage of 92.2%.

The ISI examination of the SS weld overlay and ¼ T of the Base material was conducted in one zone which 1+1.27" wide X (0.955" + 0.3125") deep – ((1+1.27) X (0.29/2)) = 2.55 Sq inches for the entire SS circumference. Due to the lack of a qualified examination method for cast stainless steel there is an examination limitation of 0.3125" X 0.50" which is equal to 0.156 Sq inches. The limitation divided by the total material provides examination coverage of 93.9%.

The examination of the cast stainless material was performed as a "best effort" using current technology. Above sketch is not to scale, please see actual contours for actual surface dimensions.

Examiner:	Clay Suhler <i>Clay D. Suhler</i>	Level:	II	Date:	4/25/2008
Examiner:	Robert Briley <i>Robert E. Briley</i>	Level:	II	Date:	4/25/2008
SI Review:	John Hayden <i>John J. Hayden</i>	Level:	III	Date:	04/26/08

Dominion Review: J.L. Deso. & J.R. 04/26/08

SI-2001  
180°  
Final Oil

Original

Safety Injection  
Sheet 44

