

10 CFR 50.55a

RS-20-012
January 29, 2020U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001Braidwood Station, Units 1 and 2
Renewed Facility Operating License Nos. NPF-72 and NPF-77
NRC Docket Nos. STN 50-456 and STN 50-457Subject: Response to Request for Additional Information Regarding Relief Request
Associated with the Third Ten-Year Inservice Inspection Program Interval

- References:
1. Letter from D. Murray (Exelon Generation Company, LLC) to U.S. NRC, "Relief Request Associated with the Third Ten-Year Inservice Inspection Program Interval," dated August 27, 2019 (ML19239A156)
 2. Email from J. Wiebe (U.S. NRC) to L. Palutis (Exelon Generation Company, LLC), "Draft Request for Additional Information Regarding Braidwood Station, Units 1 and 2, Impractical Inservice Inspection Requirements (L-2019-LLA-0081)," dated December 16, 2019 (ML19350B295)

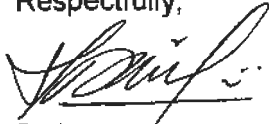
In Reference 1, Exelon Generation Company, LLC (EGC) submitted relief request I3R-18, for Braidwood Station (Braidwood), Units 1 and 2. The proposed request is associated with the Third 10-year Inservice Inspection (ISI) Program Interval for Braidwood Station, Units 1 and 2. The third interval of the Braidwood Station ISI program complies with the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (B&PV) Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," 2001 Edition with 2003 Addenda and ASME B&PV Code, Section XI, 1998 Edition subject to conditions specified in 10 CFR 50.55a(b)(2)(xxi).

In Reference 2, the NRC requested additional information that is needed to complete the review of the proposed relief request. In response to this request, EGC is providing the additional information requested in Attachments 1 through 6.

Additionally, EGC is submitting corrections to Reference 1 Tables I3R-18.1 and I3R-18.2 in Attachment 7.

There are no regulatory commitments contained in this letter. Should you have any questions concerning this letter, please contact Mrs. Linda Palutis at (630) 657-2821.

Respectfully,



Dwi Murray
Sr. Manager Licensing
Exelon Generation Company, LLC

Attachments:

1. Additional Information Supporting 10 CFR 50.55a Relief Request I3R-18
2. Examination Datasheets for 1PZR-01-N1, 1PZR-01-N4A, 2PZR-01-N1, 2PZR-01-N4B, and 2PZR-01-N4C
3. Examination Datasheets for 2SG-01-SGN-01A
4. Examination Datasheets for 2SG-01-SGC-02
5. Examination Datasheets for 1SI-39-25
6. Examination Datasheets for 2AF-01-24 (FW-3), 2AF-01-25 (FW-4), 2AF-02-23 (FW-1), 2AF-02-24 (FW-2), 2AF-03-23 (FW-1), 2AF-03-24 (FW-2), 2AF-04-20 (FW-3), 2AF-04-21 (FW-4), 2CV-21-56 (FW-2), 2CV-21-57 (FW-2), 2CV-21-58 (FW-1), and 2FW-09-25
7. Corrected Tables I3R-18.1 and I3R-18.2

cc: NRC Region III, Regional Administrator
NRC Senior Resident Inspector, Braidwood Station
NRC Project Manager, Braidwood Station
Illinois Emergency Management Agency – Division of Nuclear Safety

ATTACHMENT 1
Additional Information Supporting
10 CFR 50.55a Relief Request I3R-18

In reviewing the Exelon Generation Company, LLC's (EGC) submittal dated August 27, 2019 (ADAMS Accession No. ML19239A156), related to its request under Title 10 of the Code of Federal Regulations (10 CFR) 50.55a(g)(5)(iii) for relief on the basis that achieving the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code) inservice inspection (ISI) requirements is impractical for the Braidwood Station (Braidwood), Units 1 and 2, the NRC staff has determined that the following information is needed in order to complete its review.

RAI-1:

The information provided in the August 27, 2019, submittal regarding the pressurizer shell-to-nozzle welds (Category B-D, Item Number B3.110) identify their material construction as Alloy 82/182. The August 27, 2019, submittal also shows these to be welds between the low alloy steel shell of the pressurizer and low alloy steel nozzle forgings. Without additional clarifying information, the NRC staff is unable to evaluate the impracticality of meeting the ASME Code requirements, whether alternatives should be imposed, and whether an augmented inspection program or other action is needed for added assurance of structural reliability. The licensee is requested to:

1. Confirm that the pressurizer shell-to-nozzle welds (Category B-D, Item Number B3.110) are, in fact, Alloy 82/182 welds.
2. Confirm that there is an Alloy 52/152 weld overlay on the Braidwood, Unit 1 weld 1PZR-01-N4A.
3. If the pressurizer shell-to-nozzle welds (Category B-D, Item Number B3.110) are not fabricated from Alloy 82/182 material, provide the inspection results (i.e., whether reportable indications were found) in response to this question.

RESPONSE:

1. The pressurizer shell-to-nozzle (Category B-D, Item Number B3.110) weld material is E-9018 and the weld does not contain Alloy 82/182 weld material.
2. There is no Alloy 52/152 overlay on Braidwood Unit 1 weld 1PZR-01-N4A.
3. No flaws or defects were identified during the examinations. Attachment 2 provides the complete examination results for 1PZR-01-N1, 1PZR-01-N4A, 2PZR-01-N1, 2PZR-01-N4B, and 2PZR-01-N4C.

Additionally, EGC is submitting corrections to Tables I3R-18.1 and I3R-18.2 in Attachment 7. This attachment replaces the tables provided in Reference 1 in its entirety. In addition to correcting the material of construction, the new tables indicate whether all examinations were inservice inspection of pre-existing welds (ISI) or preservice examination of new welds (PSI), provides examination results summaries for all examinations, and corrects the "Appendix VIII Qualified Examination" indication column for Category B-D and C-A examinations. The Examination Category B-D and C-A components were examined in accordance with Section V, Article 4 as amended by Section XI, Appendix I rather than Appendix VIII techniques.

ATTACHMENT 1
Additional Information Supporting
10 CFR 50.55a Relief Request I3R-18

RAI-2:

The information provided in the August 27, 2019, submittal regarding the pressurizer shell-to-nozzle welds (Category B-D, Item Number B3.110) identify their material construction as Alloy 82/182. Historically, Alloy 82/182 (Inconel) welds in pressurized water reactors are susceptible to primary water stress corrosion cracking (PWSCC). Without additional clarifying information, the NRC staff is unable to evaluate the impracticality of meeting the ASME Code requirements, whether alternatives should be imposed, and whether an augmented inspection program or other action is needed for added assurance of structural reliability.

The licensee is requested to provide the inspection results (i.e., whether reportable indications were found) for the third 10-year ISI interval examinations of the Category B-D welds addressed in Tables I3-R18.1 and I3-R18.2 of its August 27, 2019, submittal. Since these welds are identified as having been fabricated from Alloy 82/182 material, the license is requested to justify the limited coverage obtained to date on these welds with a technical evaluation that addresses the susceptibility to PWSCC. If inspections of similar Category B-D Inconel 82/182 welds were performed during the third 10-year ISI interval, a summary of the inspection results for those welds is requested. If additional Alloy 82/182 welds were not examined, the justification should include an explanation for not examining additional or alternative accessible welds in Category B-D.

In addition, if applicable based on the answer to RAI-1, provide the results of the Braidwood, Unit 1, 1PZR-01-N4A examinations that were performed prior to the weld overlay and the results of subsequent examinations of the weld overlay including the examination results performed during the third ISI interval.

RESPONSE:

The Category B-D welds do not contain Alloy 82/182 weld material. No flaws or defects were identified during examinations of these components. Attachment 2 provides the completed examination results for 1PZR-01-N1, 1PZR-01-N4A, 2PZR-01-N1, 2PZR-01-N4B, and 2PZR-01-N4C. No evaluation to address the susceptibility of PWSCC was performed as the welds are not Inconel 82/182 and not subject to PWSCC.

As identified in RAI-1, there is no Alloy 52/152 overlay on Braidwood Unit 1 weld 1PZR-01-N4A.

In addition, Attachment 3 provides the completed examination results for 2SG-01-SGN-01A. This component is part of the Category B-D population.

RAI-3:

Provide examination results of the low alloy steel weld 2SG-01-SGC-02, which is a Tube Sheet to Barrel weld Category, C-A, Item Number C1.30, for Braidwood Unit 2. Without this additional information, the NRC staff is unable to evaluate the impracticality of meeting the ASME Code requirements, whether alternatives should be imposed, and whether an augmented inspection program or other action is needed for added assurance of structural reliability.

ATTACHMENT 1
Additional Information Supporting
10 CFR 50.55a Relief Request I3R-18

RESPONSE:

No flaws or defects were identified during examinations of this component. Attachment 4 provides the complete examination results for weld 2SG-01-SGC-02.

RAI-4:

Braidwood, Unit 1 weld 1SI-39-25 is identified as having received a limited examination (i.e. only 50% of the required examination volume was examined), and two flaws were identified. Given this information, provide justification that the structural integrity of Braidwood, Unit 1 weld 1SI-39-25 is assured. Without additional information, the NRC staff is unable to evaluate the impracticality of meeting the ASME Code requirements, whether alternatives should be imposed, and whether an augmented inspection program or other action is needed for added assurance of structural reliability.

RESPONSE:

Figure 1 below, provides the flaw indication plot for the subsurface (embedded) flaw for the preservice examination of weld 1SI-39-25. Indications 1 and 3 on the plot are the same flaw with Indication 1 detecting the flaw in the downward 45-degree angle and Indication 3 detecting the same flaw in the upward direction after bouncing off the inside diameter surface. Indication 2 is an inside diameter geometric reflector and not indicative of a material discontinuity.

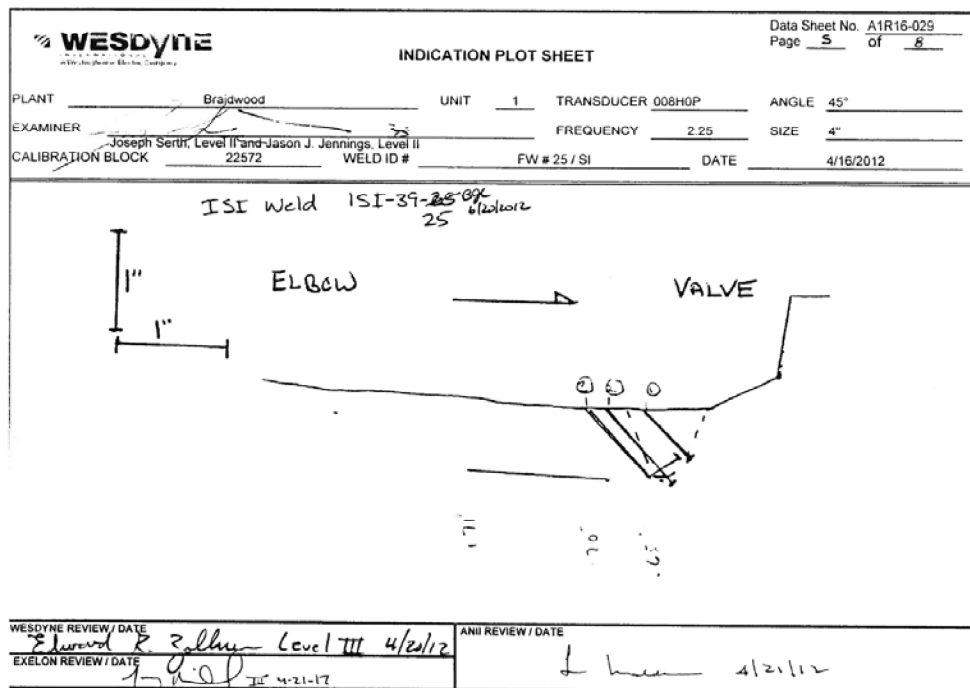


Figure 1. Indication Plot Sheet for the Preservice Examination of Weld 1SI-39-25

ATTACHMENT 1
Additional Information Supporting
10 CFR 50.55a Relief Request I3R-18

The Performance Demonstration Initiative (PDI) piping examination procedure is only qualified for two-sided flaw detection in austenitic stainless-steel welds. The weld is a stainless-steel elbow-to-valve weld and the valve configuration allows examination from only one side, therefore only 50% coverage may be credited. The examination procedure is often capable of detecting flaws on the far side of a weld as has been demonstrated in the case of the flaw in weld 1SI-39-25. The flaw was detected with 45-degree and 60-degree shear wave examination techniques, but not the 60-degree or 0-degree longitudinal wave examination techniques. The flaw was less than the preservice examination acceptance standards of IWB-3514 and was not detected by the Section III radiography examination. Based on these observations the flaw is most likely a small welding fabrication flaw.

Based on the existence of the small weld fabrication flaw observed during the preservice examination, it is unlikely similar flaws or unacceptable flaws are present in the required Section XI examination zone because:

1. The weld received construction code required radiography and no flaws were observed. Radiography is a reliable NDE method for examination of welds for construction quality requirements.
2. There were no other flaws detected by the ultrasonic testing (UT) which examined additional volume on the far side of the weld (volume which could not be credited with coverage based on PDI qualification limitations). Figure 2 provides a plot of UT examination coverage which indicates all the Section XI required weld material was interrogated with UT examination techniques.

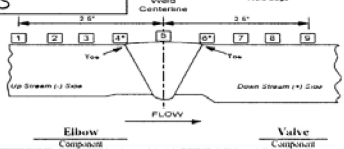
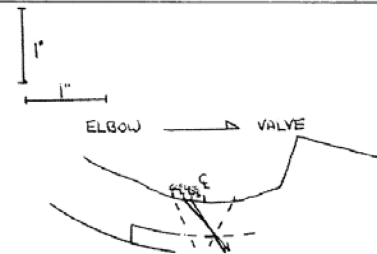
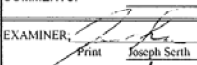
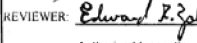

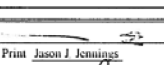
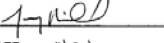
JESDYNE <small>NON-DESTRUCTIVE TESTING</small>		ULTRASONIC EXAMINATION SKETCH SHEET		Data Pkg. #: A11 029																																																		
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Figure 2. Ultrasonic Examination Sketch Sheet for Weld 1SI-39-25

ATTACHMENT 1
Additional Information Supporting
10 CFR 50.55a Relief Request I3R-18

Based on the IWB-3514 preservice acceptance standard acceptability of the flaw, there is no required subsequent examination per Section XI or need for augmented examinations for this Class 2 weld. The examination limitation is essentially identical to all austenitic stainless-steel elbow-to-valve welds in the nuclear industry where valves limit examination access to one side of the weld. Attachment 5 provides the UT report for weld 1SI-39-25, including Figures 1 and 2.

RAI-5:

Several of the NDE reports in Attachment 3 for Category R-A welds did not include the examination results. Provide the examination results for the following Category R-A welds for Braidwood Unit 2. Without this additional information, the NRC staff is unable to evaluate the impracticality of meeting the ASME Code requirements, whether alternatives should be imposed, and whether an augmented inspection program or other action is needed for added assurance of structural reliability.

2FW-09-25, 2AF-03-23 (FW-1), 2AF-03-24 (FW-2), 2AF-04-20 (FW-3), 2AF-04-21 (FW-4), 2AF-02-23 (FW-1), 2AF-02-24 (FW-2), 2AF-01-24 (FW-3), 2AF-01-25 (FW-4), 2CV-21-58 (FW-1), 2CV-21-57(FW-2), and 2CV-21-56(FW-2).

RESPONSE:

Attachment 6 includes the completed examination results for the welds listed below.
Attachment 7 includes a summary of the examination results in the "Remarks" column.

- 2AF-01-24 (FW-3)
- 2AF-01-25 (FW-4)
- 2AF-02-23 (FW-1)
- 2AF-02-24 (FW-2)
- 2AF-03-23 (FW-1)
- 2AF-03-24 (FW-2)
- 2AF-04-20 (FW-3)
- 2AF-04-21 (FW-4)
- 2CV-21-56 (FW-2)
- 2CV-21-57 (FW-2)
- 2CV-21-58 (FW-1)
- 2FW-09-25

ATTACHMENT 2

Examination Datasheets for
1PZR-01-N1, 1PZR-01-N4A, 2PZR-01-N1, 2PZR-01-N4B,
and 2PZR-01-N4C



UT Calibration. amination

Site/Unit: BRW / 1 Procedure: EXE-ISI-210 Outage No.: A1R19
 Summary No.: 1-B03.110.0015 Procedure Rev.: 4 FCN-001 Report No.: A1R19-UT-023
 Workscope: ISI Work Order No.: 01839513-41 Page: 1 of 5

Code: ASME XI, 2001 Ed, 2003 Ad Cat./Item: B-D/B3.110 Location: BOTTOM PZR,R-08
 Drawing No.: 1PZR-01 Description: PRESSURIZER - SURGE NOZZLE
 System ID: RY
 Component ID: 1PZR-01-N1 Size/Length: 1.3" / 82.0" Thickness/Diameter: 3.1" / 14"
 Limitations: Nozzle Bore Start Time: 1631 Finish Time: 1737

Instrument Settings				Search Unit				Cal. Checks			Axial Oriented Search Unit			
Serial No.:	<u>SAP 104766</u>			Serial No.:	<u>01BXY7</u>			Initial Cal.	<u>1347</u>	<u>9/30/2016</u>	Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
Manufacturer:	<u>GEIT</u>			Manufacturer:	<u>KB-Aerotech</u>			Inter. Cal.	<u>1631</u>	<u>9/30/2016</u>	<u>1/4" T SDH</u>	<u>80%</u>	<u>1.9</u>	<u>0.675"</u>
Model:	<u>USN 58LSW</u>	Linearity:	<u>2016-L-007</u>	Size:	<u>0.50"</u>	Model:	<u>Gamma</u>	Inter. Cal.	<u>N/A</u>		<u>1/2" T SDH</u>	<u>48%</u>	<u>4.1</u>	<u>1.46"</u>
Delay:	<u>0.1130 µs</u>	Range:	<u>3.500"</u>	Freq.:	<u>2.25 MHz</u>	Center Freq.:	<u>N/A</u>	Inter. Cal.	<u>N/A</u>		<u>3/4" T SDH</u>	<u>28%</u>	<u>6.2</u>	<u>2.16"</u>
Mtl Cal/Vel:	<u>0.2330 IN/µs</u>	Pulser Type:	<u>Square</u>	Exam Angle:	<u>0°</u>	Squint Angle:	<u>N/A</u>	Final Cal.	<u>1915</u>	<u>9/30/2016</u>				
Damping:	<u>500 Ohms</u>	Reject:	<u>0%</u>	Measured Angle:	<u>0°</u>	Mode:	<u>Long</u>	Couplant						
PRF:	<u>Auto High</u>	SU Freq.:	<u>2.25 MHz</u>	Exit Point:	<u>N/A</u>	# of Elements:	<u>1</u>	Cal. Batch:	<u>16G015</u>					
Frequency:	<u>2.25 MHz</u>	Rectify:	<u>Fullwave</u>	Config.:	<u>Single</u>	Focus:	<u>N/A</u>	Type:	<u>Ultragel II</u>					
Voltage:	<u>450</u>	Pulse Width:	<u>220</u>	Shape:	<u>Round</u>	Contour:	<u>FLAT</u>	Mfg.:	<u>Sonotech</u>					
				Wedge Style:	<u>SWS</u>			Exam Batch:	<u>16G015</u>					
				Search Unit Cable				Type:	<u>Ultragel II</u>					
				Type:	<u>RG-174</u>	Length:	<u>6'</u>	No. Conn.:	<u>0</u>					
				Scan Coverage				Mfg.:	<u>Sonotech</u>					
				Upstream <input checked="" type="checkbox"/>	Downstream <input checked="" type="checkbox"/>	Scan dB:	<u>8.9</u>	Reference Block						
				CW <input type="checkbox"/>	CCW <input type="checkbox"/>	Scan dB:	<u>N/A</u>	Serial No.:	<u>SAP 105633 CS</u>					
				Exam Surface:	<u>OD</u>			Type:	<u>CS 5 Step</u>					
				Surface Condition:	<u>Ground Flush</u>			Reference/Simulator Block						
				Recordable Indication(s):	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	(If Yes, Ref. Attached Ultrasonic Indication Report.)							
				Results:	Accept <input checked="" type="checkbox"/>	Reject <input type="checkbox"/>	Info <input type="checkbox"/>	Comments: Scanned 100% of weld volume. See Comments on Page 4. Dose: 23 mr.						
				Percent Of Coverage Obtained > 90%:	<u>74.7%</u>			Reviewed Previous Data:	<u>Yes</u>					

Examiner	Level	II-PDI	Signature	Date	Reviewer	Signature	Date
Steinbauer, Troy				9/30/2016	Delbusso, James Level III		9/30/2016
Examiner	Level	N/A	Signature	Date	Site Review	Signature	Date
N/A					Hall, Kevin		10-6-16
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A					Adam M. Pini		10-07-2016



UT Calibration, Certification

Site/Unit: BRW / 1 Procedure: EXE-4SI-210 Outage No.: A1R19
Summary No.: 1-803.110.0015 Procedure Rev.: 4 FCN-001 Report No.: A1R19-UT-023
Workscope: ISI Work Order No.: 01839513-01 Page: 2 of 5

Code: ASME XI, 2001 Ed, 2003 Ad Cat./Item: B-D/B3.110 Location: BOTTOM PZR,R-08
Drawing No.: 1PZR-01 Description: PRESSURIZER - SURGE NOZZLE
System ID: RY
Component ID: 1PZR-01-N1 Size/Length: 1.3" / 82.0" Thickness/Diameter: 3.1" / 14"
Limitations: Nozzle Bore Start Time: 1631 Finish Time: 1737

Instrument Settings				Search Unit				Cal. Checks			Axial Oriented Search Unit					
Serial No.:	<u>SAP 104766</u>			Serial No.:	<u>H25005</u>			Initial Cal.	<u>1344</u>	<u>9/30/2016</u>	Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path		
Manufacturer:	<u>GEIT</u>			Manufacturer:	<u>KB-Aerotech</u>			Inter. Cal.	<u>1658</u>	<u>9/30/2016</u>	<u>1/4" T SDH</u>	<u>80%</u>	<u>2.0</u>	<u>1.01"</u>		
Model:	<u>USN 58LSW</u>	Linearity:	<u>2016-L-007</u>	Size:	<u>0.50" x 1.0"</u>	Model:	<u>Gamma</u>	Inter. Cal.	<u>N/A</u>		<u>1/2" T SDH</u>	<u>70%</u>	<u>4.0</u>	<u>2.05"</u>		
Delay:	<u>10.9091 µs</u>	Range:	<u>5.25"</u>	Freq.:	<u>2.25 MHz</u>	Center Freq.:	<u>N/A</u>	Inter. Cal.	<u>N/A</u>		<u>3/4" T SDH</u>	<u>48%</u>	<u>6.0</u>	<u>3.1"</u>		
MTI Cal/Vel:	<u>0.1270 in/µs</u>	Pulser Type:	<u>Square</u>	Exam Angle:	<u>45°</u>	Squint Angle:	<u>N/A</u>	Final Cal.	<u>1917</u>	<u>9/30/2016</u>	<u>5/4" T SDH</u>	<u>20%</u>	<u>10.0</u>	<u>N/A</u>		
Damping:	<u>500 Ohms</u>	Reject:	<u>0%</u>	Measured Angle:	<u>45°</u>	Mode:	<u>Shear</u>	Couplant			<u>ID Notch</u>	<u>22%</u>	<u>8.7</u>	<u>4.5"</u>		
PRF:	<u>Auto High</u>	SU Freq.:	<u>2.25 MHz</u>	Exit Point:	<u>0.65"</u>	# of Elements:	<u>1</u>	Cal. Batch:	<u>16G015</u>			Circumferential Oriented Search Unit				
Frequency:	<u>2.25 MHz</u>	Rectify:	<u>Fullwave</u>	Config.:	<u>Single</u>	Focus:	<u>N/A</u>	Type:	<u>Ultragel II</u>			Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path	
Voltage:	<u>450</u>	Pulse Width:	<u>220</u>	Shape:	<u>Rect.</u>	Contour:	<u>Flat</u>	Mfg.:	<u>Sonotech</u>			<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	
Ax. Gain (dB):	<u>29.8</u>	Circ. Gain (dB):	<u>N/A</u>	Wedge Style:	<u>SWS</u>			Exam Batch:	<u>16G015</u>			Reference/Simulator Block				
<u>1</u> Screen Div. = <u>0.525</u> in. of <u>Sound Path</u>				Search Unit Cable				Type:	<u>Ultragel II</u>			Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
				Type:	<u>RG-174</u>	Length:	<u>12'</u>	Mfg.:	<u>Sonotech</u>			<u>21.4</u>	<u>FSDH</u>	<u>80%</u>	<u>3.8</u>	<u>2.02"</u>
				Scan Coverage				Reference Block				<u>21.4</u>	<u>NSDH</u>	<u>64%</u>	<u>1.9</u>	<u>1.01"</u>
Cal. Block No.:	<u>BWD-071</u>			Upstream <input checked="" type="checkbox"/>	Downstream <input checked="" type="checkbox"/>	Scan dB:	<u>35.8</u>	Serial No.:	<u>SAP 103480 CS</u>							
Thickness:	<u>3.1"</u>	Dia.:	<u>Flat</u>	CW <input checked="" type="checkbox"/>	CCW <input checked="" type="checkbox"/>	Scan dB:	<u>35.8</u>	Type:	<u>1" Angle Beam</u>							
Cal. Blk. Temp.:	<u>71° F</u>	Temp. Tool:	<u>SAP 106896</u>	Exam Surface:	<u>OD</u>											
Comp. Temp.:	<u>90° F</u>	Temp. Tool:	<u>SAP 106896</u>	Surface Condition:	<u>Ground Flush</u>											

Recordable Indication(s): Yes ☐ No ☒ (If Yes, Ref. Attached Ultrasonic Indication Report.)
Results: Accept ☒ Reject ☐ Info ☐

Comments: See Comments on Page 4.

Percent Of Coverage Obtained > 90%: 74.7% Reviewed Previous Data: Yes

Examiner	Level	Signature	Date	Reviewer	Signature	Date
Steinbauer, Troy	II-PDI		9/30/2016	Delbusso, James Level III		9/30/2016
N/A	N/A			Site Review Holt, Kevin		10-6-16
Other	N/A			ANII Review		10-03-2016



UT Calibration. amination

Site/Unit: BRW / 1 Procedure: EXE-ISI-210 Outage No.: A1R19
Summary No.: 1-B03.110.0015 Procedure Rev.: 4 FCN-001 Report No.: A1R19-UT-023
Workscope: ISI Work Order No.: 01839513-01 Page: 3 of 5

Code: ASME XI, 2001 Ed, 2003 Add Cat./Item: B-D/B3.110 Location: BOTTOM PZR,R-08
Drawing No.: 1PZR-01 Description: PRESSURIZER - SURGE NOZZLE
System ID: RY
Component ID: 1PZR-01-N1 Size/Length: 1.3" / 82.0" Thickness/Diameter: 3.1" / 14"
Limitations: Nozzle Bore Start Time: 1631 Finish Time: 1737

Instrument Settings				Search Unit				Cal. Checks			Axial Oriented Search Unit					
Serial No.:	<u>SAP 104766</u>			Serial No.:	<u>009Y45</u>			Initial Cal.	<u>1349</u>	<u>9/30/2016</u>	Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path		
Manufacturer:	<u>GEIT</u>			Manufacturer:	<u>KB-Aerotech</u>			Inter. Cal.	<u>1730</u>	<u>9/30/2016</u>	<u>1/4" T SDH</u>	<u>80%</u>	<u>2.0</u>	<u>1.5"</u>		
Model:	<u>USN 58LSW</u>	Linearity:	<u>2016-L-007</u>	Size:	<u>0.50" x 1.0"</u>	Model:	<u>Gamma</u>	Inter. Cal.	<u>N/A</u>		<u>1/2" T SDH</u>	<u>52%</u>	<u>4.0</u>	<u>3.0"</u>		
Delay:	<u>16.700 μs</u>	Range:	<u>7.500"</u>	Freq.:	<u>2.25 MHz</u>	Center Freq.:	<u>N/A</u>	Inter. Cal.	<u>N/A</u>		<u>3/4" T SDH</u>	<u>35%</u>	<u>6.0</u>	<u>4.5"</u>		
M/Ti Cal/Vel:	<u>0.1270 in/μs</u>	Pulser Type:	<u>Square</u>	Exam Angle:	<u>60°</u>	Squint Angle:	<u>N/A</u>	Final Cal.	<u>1919</u>	<u>9/30/2016</u>	<u>5/4" T SDH</u>	<u>19%</u>	<u>10.0</u>	<u>N/A</u>		
Damping:	<u>500 Ohms</u>	Reject:	<u>0%</u>	Measured Angle:	<u>60°</u>	Mode:	<u>Shear</u>	Couplant			<u>ID Notch</u>	<u>20%</u>	<u>8.4</u>	<u>6.25"</u>		
PRF:	<u>Auto High</u>	SU Freq.:	<u>2.25 MHz</u>	Exit Point:	<u>0.7"</u>	# of Elements:	<u>1</u>	Cal. Batch:	<u>16G015</u>			Circumferential Oriented Search Unit				
Frequency:	<u>2.25 MHz</u>	Rectify:	<u>Fullwave</u>	Config.:	<u>Single</u>	Focus:	<u>N/A</u>	Type:	<u>Ultrage II</u>			Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path	
Voltage:	<u>450</u>	Pulse Width:	<u>220</u>	Shape:	<u>Rect.</u>	Contour:	<u>Flat</u>	Mfg.:	<u>Sonotech</u>			<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	
Ax. Gain (dB):	<u>41.0</u>	Circ. Gain (dB):	<u>N/A</u>	Wedge Style:	<u>SWS</u>			Exam Batch:	<u>16G015</u>			Reference/Simulator Block				
<u>1</u> Screen Div. = <u>0.75</u> in. of <u>Sound Path</u>				Search Unit Cable				Type:	<u>Ultrage II</u>			Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
				Type:	<u>RG-174</u>	Length:	<u>12'</u>	No. Conn.:	<u>0</u>			<u>29.5</u>	<u>NSDH</u>	<u>76%</u>	<u>1.4</u>	<u>1.0"</u>
				Scan Coverage				Mfg.:	<u>Sonotech</u>			<u>29.5</u>	<u>FSDH</u>	<u>80%</u>	<u>2.7</u>	<u>2.0"</u>
				Upstream <input checked="" type="checkbox"/> Downstream <input type="checkbox"/> Scan dB: <u>47.0</u>				Reference Block								
				CW <input type="checkbox"/> CCW <input type="checkbox"/> Scan dB: <u>N/A</u>				Serial No.:	<u>SAP 103480 CS</u>							
				Exam Surface:	<u>OD</u>			Type:	<u>1" Angle Beam</u>							
				Surface Condition:	<u>Ground Flush</u>											
				Recordable Indication(s):	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> (If Yes, Ref. Attached Ultrasonic Indication Report.)											
				Results:	Accept <input checked="" type="checkbox"/> Reject <input type="checkbox"/> Info <input type="checkbox"/>											

Comments: See Comments on Page 4.

Percent Of Coverage Obtained > 90%: <u>74.7%</u> Reviewed Previous Data: <u>Yes</u>						
Examiner	Level	Signature	Date	Reviewer	Signature	Date
<u>Steinbauer, Troy</u>	<u>II-PDI</u>	<u>[Signature]</u>	<u>9/30/2016</u>	<u>Delbusso, James</u>	<u>Level III</u>	<u>9/30/2016</u>
Examiner	Level	Signature	Date	Site Review	Signature	Date
<u>N/A</u>	<u>N/A</u>	<u>[Signature]</u>		<u>John, Kevin</u>	<u>[Signature]</u>	<u>10-6-16</u>
Other	Level	Signature	Date	ANII Review	Signature	Date
<u>N/A</u>	<u>N/A</u>	<u>[Signature]</u>		<u>Adam M. Poni</u>	<u>[Signature]</u>	<u>10-07-2016</u>



Supplemental Report

Report No.: A1R19-UT-023

Page: 4 of 5

Summary No.: 1-B03.110.0015

Examiner: <u>Steinbauer, Troy</u>	Level: <u>II-PDI</u>	Reviewer: <u>Delbusso, James</u>	Level III <u>9/30</u>	Date: <u>9/30/2016</u>
Examiner: <u>N/A</u>	Level: <u>N/A</u>	Site Review: <u>Hall, Kevin</u>	<u>10-6-16</u>	Date: <u>10-6-16</u>
Other: <u>N/A</u>	Level: <u>N/A</u>	ANII Review: <u>Adam M. Pini</u>	<u>10-27-2016</u>	Date: <u>10-27-2016</u>

Comments:

1PZR-01-N1

NOTE: Axial scans limited to a "w" dimension of 6.0" from nozzle taper for 66" (290°) due to proximity of heater penetration tubes. Scans were not limited for 16" (70°).

Total Weld Volume:

1305.85 in³ (Volume obtained from Report # A1R13-UT-015).

UPST

Coverage Missed: 270.2 in³

Coverage Achieved: 79.3%

$1305.85 \text{ in}^3 - 270.2 \text{ in}^3 = 1035.65 \text{ in}^3$ $1035.65 \text{ in}^3 / 1305.85 \text{ in}^3 = 0.793$ $0.793 \times 100 = 79.3\%$

DNST

Coverage Missed: 711.76 in³

Coverage Achieved: 45.5%

$1305.85 \text{ in}^3 - 711.76 \text{ in}^3 = 594.09 \text{ in}^3$ $594.09 \text{ in}^3 / 1305.85 \text{ in}^3 = 0.455$ $0.455 \times 100 = 45.5\%$

CW

Coverage Missed: 169.74 in³

Coverage Achieved: 87.0%

$1305.85 \text{ in}^3 - 169.74 \text{ in}^3 = 1136.11 \text{ in}^3$ $1136.11 \text{ in}^3 / 1305.85 \text{ in}^3 = 0.870$ $0.870 \times 100 = 87.0\%$

CCW

Coverage Missed: 169.74 in³

Coverage Achieved: 87.0%

$1305.85 \text{ in}^3 - 169.74 \text{ in}^3 = 1136.11 \text{ in}^3$ $1136.11 \text{ in}^3 / 1305.85 \text{ in}^3 = 0.870$ $0.870 \times 100 = 87.0\%$

TOTAL COVERAGE

$(79.3 + 45.5 + 87.0 + 87.0) / 4 = 74.7\%$



Supplemental Report

Report No.: A1R19-UT-023

Page: 5 of 5

Summary No.: 1-B03.110.0015

Examiner: Steinbauer, Troy

Examiner: N/A

Other: N/A

Level: II-PDI

Level: N/A

Level: N/A

Reviewer: Delbusso, James Level III

Site Review: Hall, Kevin Jay Miller 1-12-00

ANII Review: Adam McLean

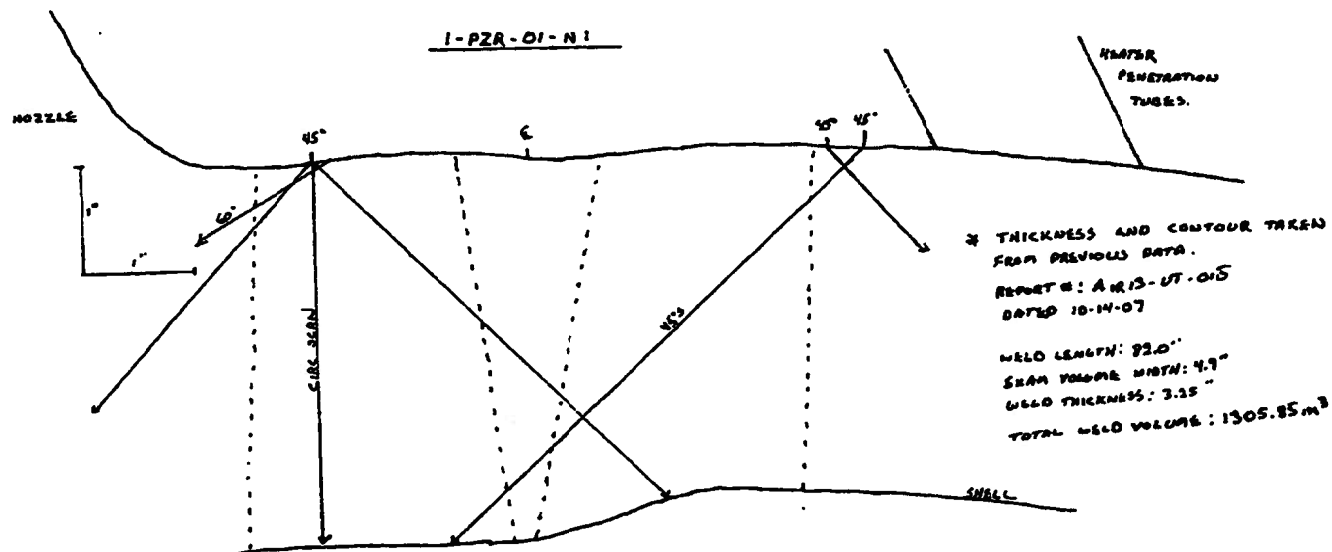
Date: 9/30/2016

Date: 10-6-16

Date: 10-07-2016

Comments: 1PZR-01-N1 T & C taken from previous Report # A1R13-UT-015

Sketch or Photo:





UT Calibration Examination

Site/Unit: **BRW / 1**
Summary No.: **1-B03.110.0013**
Workscope: **ISI**

Procedure: **EXE-ISI-210**
Procedure Rev.: **4 FCN-001**
Work Order No.: **01839513-01**

Outage No.: **A1R19**
Report No.: **A1R19-UT-024**
Page: **1** of **5**

Code: **ASME XI, 2001 Ed, 2003 Ad** Cat./Item: **B-D/B3.110** Location: **TOP OF PZR,R-08**
Drawing No.: **1PZR-01** Description: **PRESSURIZER - SAFETY NOZZLE**
System ID: **RY**
Component ID: **1PZR-01-N4A** Size/Length: **1.5" / 48.0"** Thickness/Diameter: **3.1" / 6"**
Limitations: **Nozzle Bore** Start Time: **1043** Finish Time: **1135**

Instrument Settings
Serial No.: **SAP 104766**
Manufacturer: **GEIT**
Model: **USN 58LSW** Linearity: **2016-L-007**
Delay: **0.1130 μ s** Range: **3.500"**
Mtl Cal/Vel: **0.2330 IN/ μ s** Pulsar Type: **Square**
Damping: **500 Ohms** Reject: **0%**
PRF: **Auto High** SU Freq.: **2.25 MHz**
Frequency: **2.25 MHz** Rectify: **Fullwave**
Voltage: **450** Pulse Width: **220**

Ax. Gain (dB): **2.9** Circ. Gain (dB): **N/A**
1 Screen Div. = **0.35** in. of **Sound Path**

Search Unit
Serial No.: **01BXY7**
Manufacturer: **KB-Aerotech**
Size: **0.50"** Model: **Gamma**
Freq.: **2.25 MHz** Center Freq.: **N/A**
Exam Angle: **0°** Squint Angle: **N/A**
Measured Angle: **0°** Mode: **Long**
Exit Point: **N/A** # of Elements: **1**
Config.: **Single** Focus: **N/A**
Shape: **Round** Contour: **FLAT**
Wedge Style: **SWS**
Search Unit Cable
Type: **RG-174** Length: **6'** No. Conn.: **0**

Calibration Block
Cal. Block No.: **BWD-071**
Thickness: **3.1"** Dia.: **Flat**
Cal. Blk. Temp.: **69° F** Temp. Tool: **SAP 106896**
Comp. Temp.: **78° F** Temp. Tool: **SAP 106896**

Scan Coverage
Upstream ☒ Downstream ☒ Scan dB: **8.9**
CW ☐ CCW ☐ Scan dB: **N/A**
Exam Surface: **OD**
Surface Condition: **Ground Flush**

Recordable Indication(s): Yes ☐ No ☒ (If Yes, Ref. Attached Ultrasonic Indication Report.)

Results: Accept ☒ Reject ☐ Info ☐

Percent Of Coverage Obtained > 90%: **68.7%** Reviewed Previous Data: **Yes**

Cal. Checks	Time	Date
Initial Cal.	0742	9/30/2016
Inter. Cal.	1043	9/30/2016
Inter. Cal.	N/A	
Inter. Cal.	N/A	
Final Cal.	1347	9/30/2016

Couplant
Cal. Batch: **16G015**
Type: **Ultragel II**
Mfg.: **Sonotech**

Exam Batch: **16G015**
Type: **Ultragel II**
Mfg.: **Sonotech**

Reference Block
Serial No.: **SAP 105633 CS**
Type: **CS 5 Step**

Axial Oriented Search Unit				
Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path	
1/4" T SDH	80%	1.9	0.675"	
1/2" T SDH	48%	4.1	1.46"	
3/4" T SDH	28%	6.2	2.16"	
Circumferential Oriented Search Unit				
Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path	
N/A	N/A	N/A	N/A	
Reference/Simulator Block				
Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
0.0	3.0	80%	8.6	2.99"
0.0	2.0	90%	5.7	2.0"

Comments: **Scanned 100% of weld volume. See Comments on Page 4. Dose: 6 mr.**

Examiner	Level	II-PDI	Signature	Date	Reviewer	Signature	Date
Steinbauer, Troy				9/30/2016	Delbusso, James Level III		9/30/2016
Examiner	Level	N/A	Signature	Date	Site Review	Signature	Date
N/A					Hall, Kevin		10/06/2016
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A					Adam M. Primi		10-07-2016



UT Calibration Examination

Site/Unit: **BRW / 1**
 Summary No.: **1-B03.110.0013**
 Workscope: **ISI**

Procedure: **EXE-ISI-210**
 Procedure Rev.: **4 FCN-001**
 Work Order No.: **01839513-01**

Outage No.: **A1R19**
 Report No.: **A1R19-UT-024**
 Page: **2** of **5**

Code: **ASME XI, 2001 Ed, 2003 Ad** Cat./Item: **B-D/B3.110** Location: **TOP OF PZR,R-08**
 Drawing No.: **1PZR-01** Description: **PRESSURIZER - SAFETY NOZZLE**
 System ID: **RY**
 Component ID: **1PZR-01-N4A** Size/Length: **1.5" / 48.0"** Thickness/Diameter: **3.1" / 6"**
 Limitations: **Nozzle Bore** Start Time: **1043** Finish Time: **1135**

Instrument Settings
 Serial No.: **SAP 104766**
 Manufacturer: **GEIT**
 Model: **USN 58LSW** Linearity: **2016-L-007**
 Delay: **10.9091 µs** Range: **5.25"**
 Mtl Cal/Vel: **0.1270 in/µs** Pulser Type: **Square**
 Damping: **500 Ohms** Reject: **0%**
 PRF: **Auto High** SU Freq.: **2.25 MHz**
 Frequency: **2.25 MHz** Rectify: **Fullwave**
 Voltage: **450** Pulse Width: **220**
 Ax. Gain (dB): **29.8** Circ. Gain (dB): **N/A**

1 Screen Div. = **0.525** in. of **Sound Path**

Calibration Block
 Cal. Block No.: **BWD-071**
 Thickness: **3.1"** Dia.: **Flat**
 Cal. Blk. Temp.: **69° F** Temp. Tool: **SAP 106896**
 Comp. Temp.: **78° F** Temp. Tool: **SAP 106896**
Scan Coverage
 Upstream ☒ Downstream ☒ Scan dB: **35.8**
 CW ☒ CCW ☒ Scan dB: **35.8**
 Exam Surface: **OD**
 Surface Condition: **Ground Flush**

Recordable Indication(s): Yes ☐ No ☒ (If Yes, Ref. Attached Ultrasonic Indication Report.)
 Results: Accept ☒ Reject ☐ Info ☐

Percent Of Coverage Obtained > 90%: **68.7%** Reviewed Previous Data: **Yes**

Cal. Checks	Time	Date
Initial Cal.	0753	9/30/2016
Inter. Cal.	1056	9/30/2016
Inter. Cal.	N/A	
Inter. Cal.	N/A	
Final Cal.	1344	9/30/2016

Couplant
 Cal. Batch: **16G015**
 Type: **Ultrigel II**
 Mfg.: **Sonotech**
 Exam Batch: **16G015**
 Type: **Ultrigel II**
 Mfg.: **Sonotech**

Reference Block
 Serial No.: **SAP 103480 CS**
 Type: **1" Angle Beam**

Axial Oriented Search Unit				
Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path	
1/4" T SDH	80%	2.0	1.01"	
1/2" T SDH	70%	4.0	2.05"	
3/4" T SDH	48%	6.0	3.1"	
5/4" T SDH	20%	10.0	N/A	
ID Notch	22%	8.7	4.5"	
Circumferential Oriented Search Unit				
Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path	
N/A	N/A	N/A	N/A	
Reference/Simulator Block				
Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
21.4	FSDH	80%	3.8	2.02"
21.4	NSDH	64%	1.9	1.01"

Comments: **See Comments on Page 4.**

Examiner	Level	II-PDI	Signature	Date	Reviewer	Signature	Date
Steinbauer, Troy				9/30/2016	Delbusso, James	Level III	9/30/2016
Examiner	Level	N/A	Signature	Date	Site Review	Signature	Date
N/A					Hall, Kevin		10/06/2016
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A					Adam M. Perini		10-07-2016



UT Calibration Examination

Site/Unit: **BRW / 1**
Summary No.: **1-B03.110.0013**
Workscope: **ISI**

Procedure: **EXE-ISI-210**
Procedure Rev.: **4 FCN-001**
Work Order No.: **01839513-01**

Outage No.: **A1R19**
Report No.: **A1R19-UT-024**
Page: **3** of **5**

Code: **ASME XI, 2001 Ed, 2003 Ad** Cat./Item: **B-D/B3.110** Location: **TOP OF PZR,R-08**
Drawing No.: **1PZR-01** Description: **PRESSURIZER - SAFETY NOZZLE**
System ID: **RY**
Component ID: **1PZR-01-N4A** Size/Length: **1.5" / 48.0"** Thickness/Diameter: **3.1" / 6"**
Limitations: **Nozzle Bore** Start Time: **1043** Finish Time: **1135**

Instrument Settings				Search Unit				Cal. Checks			Axial Oriented Search Unit					
Serial No.:	SAP 104766			Serial No.:	009Y45			Initial Cal.	0749	9/30/2016	Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path		
Manufacturer:	GEIT			Manufacturer:	KB-Aerotech			Inter. Cal.	1128	9/30/2016	1/4" T SDH	80%	2.0	1.5"		
Model:	USN 58LSW	Linearity:	2016-L-007	Size:	0.50" x 1.0"		Model:	Gamma	Inter. Cal.	N/A	1/2" T SDH	52%	4.0	3.0"		
Delay:	15.700 µs	Range:	7.500"	Freq.:	2.25 MHz	Center Freq.:	N/A	Inter. Cal.	N/A		3/4" T SDH	35%	6.0	4.5"		
M'tl Cal/Vel:	0.1270 in/µs	Pulser Type:	Square	Exam Angle:	60°	Squint Angle:	N/A	Final Cal.	1343	9/30/2016	5/4" T SDH	19%	10.0	N/A		
Damping:	500 Ohms	Reject:	0%	Measured Angle:	60°	Mode:	Shear	Couplant			ID Notch	20%	8.4	6.25"		
PRF:	Auto High	SU Freq.:	2.25 MHz	Exit Point:	0.7"	# of Elements:	1	Cal. Batch:	16G015			Circumferential Oriented Search Unit				
Frequency:	2.25 MHz	Rectify:	Fullwave	Config.:	Single	Focus:	N/A	Type:	Ultragel II			Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path	
Voltage:	450	Pulse Width:	220	Shape:	Rect.	Contour:	Flat	Mfg.:	Sonotech			N/A	N/A	N/A	N/A	
Ax. Gain (dB):	41.0	Circ. Gain (dB):	N/A	Wedge Style:	SWS			Exam Batch:	16G015							
1 Screen Div. = 0.75 in. of Sound Path				Search Unit Cable				Type:	Ultragel II							
				Type:	RG-174	Length:	12'	Mfg.:	Sonotech							
					No. Conn.:	0		Reference Block			Reference/Simulator Block					
Cal. Block No.:	BWD-071			Upstream <input checked="" type="checkbox"/>	Downstream <input type="checkbox"/>	Scan dB:	47.0	Serial No.:	SAP 103480 CS			Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
Thickness:	3.1"	Dia.:	Flat	CW <input type="checkbox"/>	CCW <input type="checkbox"/>	Scan dB:	N/A	Type:	1" Angle Beam			29.5	NSDH	76%	1.4	1.0"
Cal. Blk. Temp.:	69° F	Temp. Tool:	SAP 106896	Exam Surface:	OD						29.5	FSDH	80%	2.7	2.0"	
Comp. Temp.:	78° F	Temp. Tool:	SAP 106896	Surface Condition:	Ground Flush											

Recordable Indication(s): Yes ☐ No ☒ (If Yes, Ref. Attached Ultrasonic Indication Report.)

Results: Accept ☒ Reject ☐ Info ☐

Comments: See Comments on Page 4.

Percent Of Coverage Obtained > 90%: **68.7%** Reviewed Previous Data: **Yes**

Examiner	Level	IL-PDI	Signature	Date	Reviewer	Signature	Date
Steinbauer, Troy				9/30/2016	Delbusso, James Level III		9/30/2016
Examiner	Level	N/A	Signature	Date	Site Review	Signature	Date
N/A					Hall, Kevin		10/06/2016
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A					Adam M. Prime		10-07-2016

Summary No.: 1-B03.110.0013

Examiner: Steinbauer, Troy Level: II-PDI

Reviewer: Delbusso, James Level III gpr Date: 9/30/2016

Examiner: N/A Level: N/A

Site Review: Hall, Kevin Date: 10/06/2016

Other: N/A Level: N/A

ANII Review: Adam M. Pini Date: 10-07-2016

Comments:

1PZR-01-N4A

0° - Scan 100% volume.

45° - Scanned in all four directions.

60° - Scanned upstream.

Total Weld Area:

$(3.3 + 2.7) / 2 = 3.0$ $3.0 \times 4.5 = 13.5 \text{ in}^2$

UPST

Coverage Missed: 0.63 in^2

Coverage Achieved: 95.3%

$13.5 \text{ in}^2 - 0.63 \text{ in}^2 = 12.87 \text{ in}^2$ $12.87 \text{ in}^2 / 13.5 \text{ in}^2 = 0.953 \text{ in}^2$ $0.953 \times 100 = 95.3\%$

DNST

Coverage Missed: 8.35 in^2

Coverage Achieved: 38.1%

$13.5 \text{ in}^2 - 8.35 \text{ in}^2 = 5.15 \text{ in}^2$ $5.15 \text{ in}^2 / 13.5 \text{ in}^2 = 0.381 \text{ in}^2$ $0.381 \times 100 = 38.1\%$

CW

Coverage Missed: 3.96 in^2

Coverage Achieved: 70.6%

$13.5 \text{ in}^2 - 3.96 \text{ in}^2 = 9.54 \text{ in}^2$ $9.54 \text{ in}^2 / 13.5 \text{ in}^2 = 0.706 \text{ in}^2$ $0.706 \times 100 = 70.6\%$

CCW

Coverage Missed: 3.96 in^2

Coverage Achieved: 70.6%

$13.5 \text{ in}^2 - 3.96 \text{ in}^2 = 9.54 \text{ in}^2$ $9.54 \text{ in}^2 / 13.5 \text{ in}^2 = 0.706 \text{ in}^2$ $0.706 \times 100 = 70.6\%$

TOTAL COVERAGE

$(95.3 + 38.1 + 70.6 + 70.6) / 4 = 68.7\%$

Summary No.: **1-B03.110.0013**

Examiner: **Steinbauer, Troy**

Level: **II-PDI**

Reviewer: **Delbusso, James Level III**

Date: **9/30/2016**

Examiner: **N/A**

Level: **N/A**

Site Review: **Hall, Kevin**

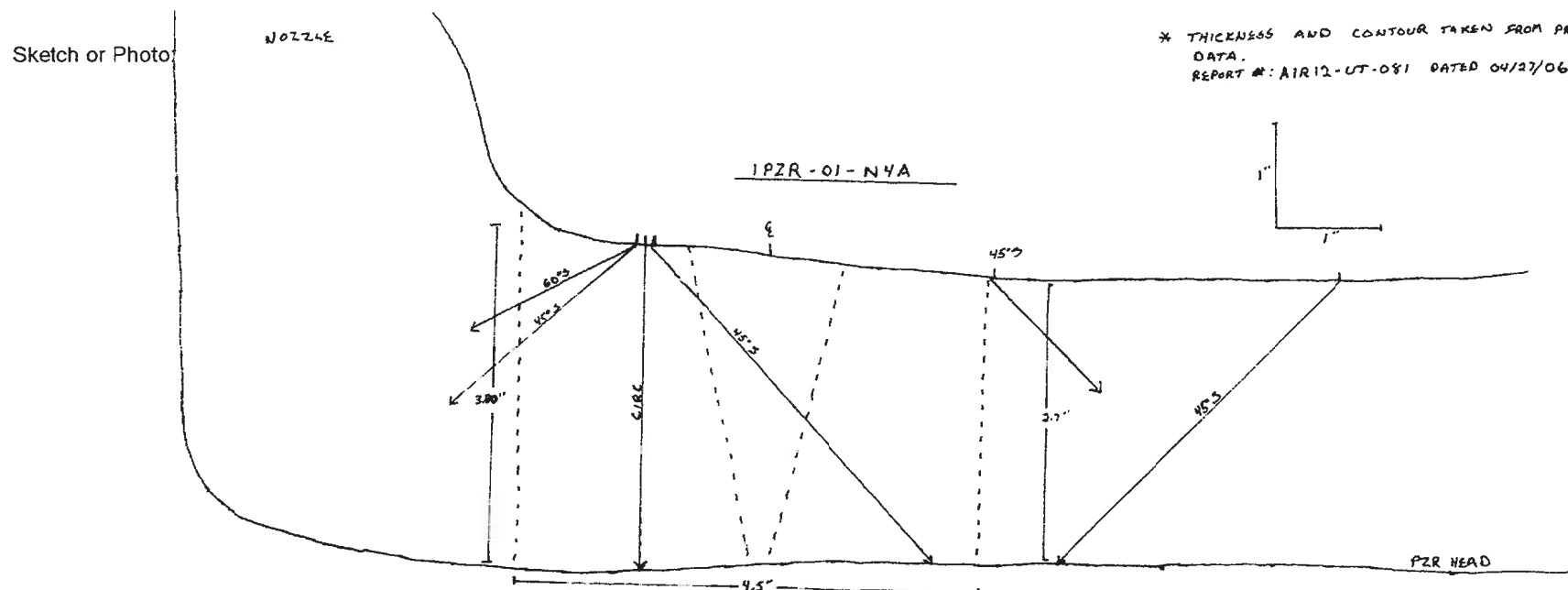
Date: **10/06/2016**

Other: **N/A**

Level: **N/A**

ANII Review: **Adam M. Princi**

Date: **10-07-2016**

Comments: **1PZR-01-N4A T & C taken from previous Report # A1R12-UT-081.**




UT Calibration, Examination

Site/Unit: **BRW / 2**
Summary No.: **2-B03.110.0013**
Workscope: **ISI**

Procedure: **EXE-ISI-210**
Procedure Rev.: **5**
Work Order No.: **01894635-01**

Outage No.: **A2R19**
Report No.: **A2R19-UT-008**
Page: **1** of **2**

Code: **ASME XI, 2001 Ed, 2003 Ad** Cat./Item: **B-D/B3.110** Location: **BOTTOM PZR,R-26**
Drawing No.: **2PZR-01** Description: **PRESSURIZER - SURGE NOZZLE**
System ID: **RY**
Component ID: **2PZR-01-N1** Size/Length: **1.30" / 82.00"** Thickness/Diameter: **2.5625" / 26.10"**
Limitations: **Yes - Nozzle / Shell configuration, Heater Penetration Tubes.** Start Time: **1014** Finish Time: **1031**

Instrument Settings
Serial No.: **SAP 104766**
Manufacturer: **GEIT**
Model: **USN 58LSW** Linearity: **2017-L-001**
Delay: **11.5506** Range: **7.200"**
M/I Cal/Vel: **0.1270** Pulser Type: **Square**
Damping: **500 Ohms** Reject: **0%**
PRF: **Auto High** SU Freq.: **2.25 MHz**
Frequency: **2.25 MHz** Rectify: **Fullwave**
Voltage: **450** Pulse Width: **220**

Ax. Gain (dB): **33.8** Circ. Gain (dB): **N/A**
1 Screen Div. = **0.72"** in. of **Sound Path**

Search Unit
Serial No.: **B03340**
Manufacturer: **Krautkramer**
Size: **0.50" x 1.0"** Model: **Gamma**
Freq.: **2.25 MHz** Center Freq.: **N/A**
Exam Angle: **45°** Squint Angle: **N/A**
Measured Angle: **45°** Mode: **Shear**
Exit Point: **0.70"** # of Elements: **1**
Config.: **Single** Focus: **N/A**
Shape: **Rect.** Contour: **Flat**
Wedge Style: **SWS**

Search Unit Cable
Type: **RG-174** Length: **6'** No. Conn.: **0**

Cal. Checks	Time	Date
Initial Cal.	0812	4/29/2017
Inter. Cal.	N/A	
Inter. Cal.	1014	4/29/2017
Inter. Cal.	N/A	
Final Cal.	1135	4/29/2017

Couplant
Cal. Batch: **N/A**
Type: **Ultragel II**
Mfg.: **Magnaflux**

Exam Batch: **N/A**
Type: **Ultragel II**
Mfg.: **Magnaflux**

Reference Block
Serial No.: **SAP 104873 CS**
Type: **1" Angle Beam**

Axial Oriented Search Unit				
Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path	
1/4" T Hole	80%	1.5	1.082"	
1/2" T Hole	67%	3.0	2.146"	
3/4" T Hole	44%	4.5	3.238"	
ID Notch	20%	6.5	4.650"	
5/4" T Hole	19%	7.5	N/A	
Circumferential Oriented Search Unit				
Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path	
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	
Reference/Simulator Block				
Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
33.8	FSDH	47%	1.5	1.078"
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A

Calibration Block
Cal. Block No.: **BWD-071**
Thickness: **3.1"** Dia.: **Flat**
Cal. Blk. Temp.: **68°** Temp. Tool: **SAP 105543**
Comp. Temp.: **86°** Temp. Tool: **SAP 105543**

Scan Coverage
Upstream ☒ Downstream ☒ Scan dB: **47.8**
CW ☒ CCW ☒ Scan dB: **47.8**
Exam Surface: **OD**
Surface Condition: **As Fabricated**

Recordable Indication(s): Yes ☐ No ☒ (If Yes, Ref. Attached Ultrasonic Indication Report.)

Results: Accept ☒ Reject ☐ Info ☐

Percent Of Coverage Obtained > 90%: **59.2%** Reviewed Previous Data: **Yes**

Comments: **Percentage Coverage Verified from Document A2R13-UT-025. Dose 48 mr.**

Examiner	Level	II-PDI	Signature	Date	Reviewer	Signature	Date
Gbemudu, Giovanni				4/29/2017	Delbusso, James		4/29/2017
Examiner	Level	N/A	Signature	Date	Site Review	Signature	Date
N/A							05/01/2017
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A							05-04-2017



UT Calibration / Examination

Site/Unit: **BRW / 2** Procedure: **EXE-ISI-210** Outage No.: **A2R19**
Summary No.: **2-B03.110.0013** Procedure Rev.: **5** Report No.: **A2R19-UT-008**
Workscope: **ISI** Work Order No.: **01894635-01** Page: **2** of **2**

Code: **ASME XI, 2001 Ed, 2003 Ad** Cat./Item: **B-D/B3.110** Location: **BOTTOM PZR,R-26**
Drawing No.: **2PZR-01** Description: **PRESSURIZER - SURGE NOZZLE**
System ID: **RY**
Component ID: **2PZR-01-N1** Size/Length: **1.30" / 82.00"** Thickness/Diameter: **2.5625" / 26.10"**
Limitations: **Yes - Nozzle / Shell configuration, Heater Penetration Tubes.** Start Time: **1036** Finish Time: **1057**

Instrument Settings				Search Unit				Cal. Checks			Axial Oriented Search Unit					
Serial No.:	SAP 104766			Serial No.:	016K1T			Initial Cal.	0817	4/29/2017	Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path		
Manufacturer:	GEIT			Manufacturer:	KB-Aerotech			Inter. Cal.	N/A		1/4" T Hole	80%	1.5	1.460"		
Model:	USN 58LSW	Linearity:	2017-L-001	Size:	0.50" x 1.0"	Model:	Gamma	Inter. Cal.	1035	4/29/2017	1/2" T Hole	60%	3.2	2.887"		
Delay:	14.9719	Range:	9.400"	Freq.:	2.25 MHz	Center Freq.:	N/A	Inter. Cal.	N/A		3/4" T Hole	40%	4.6	4.270"		
M'tl Cal/Vel:	0.1270	Pulser Type:	Square	Exam Angle:	60°	Squint Angle:	N/A	Final Cal.	1141	4/29/2017	ID Notch	19%	6.7	6.146"		
Damping:	500 Ohms	Reject:	0%	Measured Angle:	57°	Mode:	Shear	Couplant			5/4" T Hole	17%	7.8	N/A		
PRF:	Auto High	SU Freq.:	2.25 MHz	Exit Point:	0.70"	# of Elements:	1	Cal. Batch:	N/A			Circumferential Oriented Search Unit				
Frequency:	2.25 MHz	Rectify:	Fullwave	Config.:	Single	Focus:	N/A	Type:	Ultrigel II			Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path	
Voltage:	450	Pulse Width:	220	Shape:	Rect.	Contour:	Flat	Mfg.:	Magnaflux			N/A	N/A	N/A	N/A	
Ax. Gain (dB):	48	Circ. Gain (dB):	N/A	Wedge Style:	SWS			Exam Batch:	N/A			N/A	N/A	N/A	N/A	
1 Screen Div. = 0.94" in. of Sound Path				Search Unit Cable				Type:	Ultrigel II			N/A	N/A	N/A	N/A	
				Type:	RG-174	Length:	6'	Mfg.:	Magnaflux			N/A	N/A	N/A	N/A	
				No. Conn.:	0			Reference Block			Reference/Simulator Block					
Cal. Block No. BWD-071				Scan Coverage				Serial No.:	SAP 104873 CS			Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
Thickness 3.1" Dia.: Flat				Upstream <input checked="" type="checkbox"/>	Downstream <input checked="" type="checkbox"/>	Scan dB:	62	Type:	1" Angle Beam			48	NSDH	53%	0.7	0.638"
Cal. Blk. Temp. 68° Temp. Tool: SAP 105543				CW <input checked="" type="checkbox"/>	CCW <input checked="" type="checkbox"/>	Scan dB:	62				N/A	N/A	N/A	N/A	N/A	
Comp. Temp. 86° Temp. Tool: SAP 105543				Exam Surface:	OD						N/A	N/A	N/A	N/A	N/A	
Surface Condition: As Fabricated											N/A	N/A	N/A	N/A	N/A	
Recordable Indication(s): Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> (If Yes, Ref. Attached Ultrasonic Indication Report.)																
Results: Accept <input checked="" type="checkbox"/> Reject <input type="checkbox"/> Info <input type="checkbox"/>											Comments: Percentage Coverage Verified from Document A2R13-UT-025.					
Percent Of Coverage Obtained > 90%: 59.2%				Reviewed Previous Data: Yes												

Examiner	Level	II-PDI	Signature	Date	Reviewer	Signature	Date
Gbemudu, Giovanni				4/29/2017	Delbusso, James		4/29/2017
Examiner	Level	N/A	Signature	Date	Site Review	Signature	Date
N/A					Kevin L. Hall		05/01/2017
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A					Adam M. Pini		05-04-2017



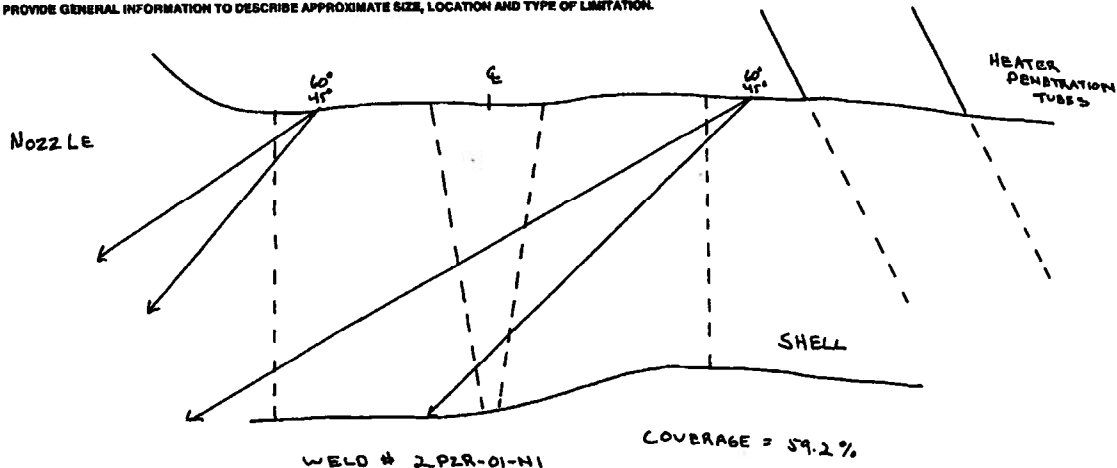
Westinghouse

A2R13-UT-025
Page 4 of 6

LIMITATION TO EXAMINATION

PLANT	BRAIDWOOD	UNIT	2	SKETCH	2PZR-01
SYSTEM/COMPONENT	PZR / PZR-Surge Nozzle			PROCEDURE	EKE-161-210, Rev. 0, FCN N/A
EXAMINER	<i>Tommy E. Jackson</i> Tommy Jackson, Level II			DATE	5/2/2008

RELATED TO: UT X PT MT VT IDENT. NO. 2PZR-01-N1
PROVIDE GENERAL INFORMATION TO DESCRIBE APPROXIMATE SIZE, LOCATION AND TYPE OF LIMITATION.



EXELON REVIEW / DATE *Chris M. Jackson 5-7-08* DRAWN TO SCALE
APP REVIEW DATE *White 5-7-08*



UT Calibration Examination



Site/Unit: BRW / 2
Summary No.: 2-B03.110.0011
Workscope: ISI

Procedure: EXE-ISI-210
Procedure Rev.: 4
Work Order No.: 01603171-01

Outage No.: A2R17
Report No.: A2R17-UT-005
Page: 1 of 4

Code: ASME XI, 2001 Ed, 2003 Add Cat./Item: B-D/B3.110 Location: TOP OF PZR,R-26
Drawing No.: 2PZR-01 Description: PRESSURIZER - SAFETY NOZZLE
System ID: RY
Component ID: 2PZR-01-N48 Size/Length: N/A Thickness/Diameter: 2.0625" / 91.5"
Limitations: One sided examination due to nozzle configuration Start Time: 0958 Finish Time: 1415

Instrument Settings
Serial No.: SAP 30012948 Manufacturer: GEIT Model: USN 60 SW Linearity: A2R17-L-004 Delay: 12.7219 Range: 4.86" MVI Cal/Vet: 0.1186 Pulsar Type: Square Damping: 500 Ohms Reject: 0% PRF: Auto High SU Freq.: 2.25 MHz Frequency: 2.25 MHz Rectify: Fullwave Voltage: 450 Pulse Width: 220

Search Unit
Serial No.: H30048 Manufacturer: KB-Aerotech Size: 0.50" x 1.0" Model: Gamma Freq.: 2.25 MHz Center Freq.: N/A Exam Angle: 45° Squint Angle: N/A Measured Angle: 45° Mode: Shear Exit Point: 0.7" # of Elements: 1 Config.: Single Focus: N/A Shape: Rect. Contour: Flat Wedge Style: SWS

Ax. Gain (dB): 27 Circ. Gain (dB): 27
10 Screen Div. = 4.86 in. of Sound Path

Calibration Block
Cal. Block No.: BWD-071 Thickness: 3.1" Dia.: 0 Cal. Blk. Temp.: 85° Temp. Tool: SAP 30007223 Comp. Temp.: 95° Temp. Tool: SAP 30007223
Upstream ☒ Downstream ☒ Scan dB: 41
CW ☒ CCW ☒ Scan dB: 41
Exam Surface: OD
Surface Condition: Ground

Scan Coverage
Recordable Indication(s): Yes ☐ No ☒ (If Yes, Ref. Attached Ultrasonic Indication Report.)
Results: Accept ☒ Reject ☐ Info ☐
Percent Of Coverage Obtained > 90%: 88.5% Reviewed Previous Data: Yes

Cal. Checks	Time	Date
Initial Cal.	0720	5/5/2014
Inter. Cal.	1000	5/5/2014
Inter. Cal.	1350	5/5/2014
Inter. Cal.	N/A	
Final Cal.	1455	5/5/2014

Couplant
Cal. Batch: 13C028
Type: Ultragel II
Mfg.: Sonotech
Exam Batch: 11625
Type: Ultragel II
Mfg.: Sonotech

Reference Block
Serial No.: SAP 102279
Type: IIW Type 2

Axial Orientated Search Unit			
Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
1/4 Hole	80%	2.0	0.970"
1/2 Hole	60%	4.0	1.94"
3/4 Hole	40%	6.0	2.92"
ID Notch	36%	8.6	4.18"
5/4 Hole	33%	10.0	4.86"

Circumferential Orientated Search Unit			
Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
N/A	N/A	N/A	N/A

Reference/Simulator Block				
Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
27	FSH	30%	2.1	1.020"
27	NSH	25%	0.7	0.340"

Comments: See page 3 of 4 for comments.

Examiner	Level	Signature	Date	Reviewer	Signature	Date
Michael, Dickey	II-PDI	<i>Michael Dickey</i>	5/5/2014	Philip Shamblin	<i>Philip Shamblin</i>	5-10-14
Examiner	Level	Signature	Date	Site Review	Signature	Date
N/A	N/A			Jay Miller	<i>Jay Miller</i>	5-11-14
Other	Level	Signature	Date	ANII Review	Signature	Date
N/A	N/A			Adam M. Prime	<i>Adam M. Prime</i>	05-12-2014



Outage No.: **A2R17**
Report No.: **A2R17-UT-005**
Page: **2** of **4**

Instrument Settings				Search Unit				Cal. Checks			Axial Orientated Search Unit			
Serial No.: SAP 30012948				Serial No.: 01BTJR				Cal. Checks	Time	Date	Calibration Reflector			
Manufacturer: GEIT				Manufacturer: KB-Aerotech				Initial Cal.	0710	5/5/2014	Signal Amplitude %			
Model: USN 60 SW		Linearity: A2R17-L-004		Size: 1.0"		Model: Gamma		Inter. Cal.	0950	5/5/2014	Sweep Division			
Delay: 0.9894		Range: 4.0"		Freq.: 2.25 MHz		Center Freq.: N/A		Inter. Cal.	N/A		Depth			
MTI Cal/Vel: 0.2311		Pulser Type: Square		Exam Angle: 0°		Squint Angle: N/A		Inter. Cal.	N/A		1/4 Hole 80% 1.7 0.68"			
Damping: 500 Ohms		Reject: 0%		Measured Angle: N/A		Mode: Long		Final Cal.	1125	5/5/2014	1/2 Hole 80% 3.6 1.44"			
PRF: Auto High		SU Freq.: 2.25 MHz		Extt Point N/A		# of Elements: 1								
Frequency: 2.25 MHz		Rectify: Fullwave		Config.: Single		Focus: N/A		Couplant						
Voltage: 450		Pulse Width: 220		Shape: Round		Contour: Flat		Cal. Batch: 13C028						
Ax. Gain (dB): 15		Circ. Gain (dB): 15		Wedge Style: Integral				Type: Ultragel II						
10 Screen Div. = 4 in. of Depth				Search Unit Cable				Mfg.: Sonotech						
				Type: RG-174 Length: 6' No. Conn.: 0				Exam Batch: 11625						
Calibration Block				Scan Coverage				Type: Ultragel II						
Cal. Block No. BWD-071				Upstream <input type="checkbox"/> Downstream <input type="checkbox"/> Scan dB: N/A				Mfg.: Sonotech						
Thickness 3.1" Dia.: 0				CW <input checked="" type="checkbox"/> CCW <input checked="" type="checkbox"/> Scan dB: 29				Reference Block						
Cal. Blk. Temp. 85° Temp. Tool: SAP 30007223				Exam Surface: OD				Serial No.: SAP 102279						
Comp. Temp. 95° Temp. Tool: SAP 30007223				Surface Condition: Ground				Type: IIW Type 2						
Recordable Indication(s): Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>				(If Yes, Ref. Attached Ultrasonic Indication Report.)										
Results: Accept <input checked="" type="checkbox"/> Reject <input type="checkbox"/> Info <input type="checkbox"/>								Comments: 0° utilized due to restricted access with the 45°.						
											Circumferential Orientated Search Unit			
											Calibration Reflector			
											Signal Amplitude %			
											Sweep Division			
											Depth			
											N/A			
											N/A			
											N/A			
											N/A			
											Reference/Simulator Block			
Gain dB		Reflector		Signal Amplitude %		Sweep Division		Depth						
15		FSH		40%		1.8		0.72"						
15		NSH		20%		0.8		0.32"						

Comments: 0° utilized due to restricted access with the 45°.

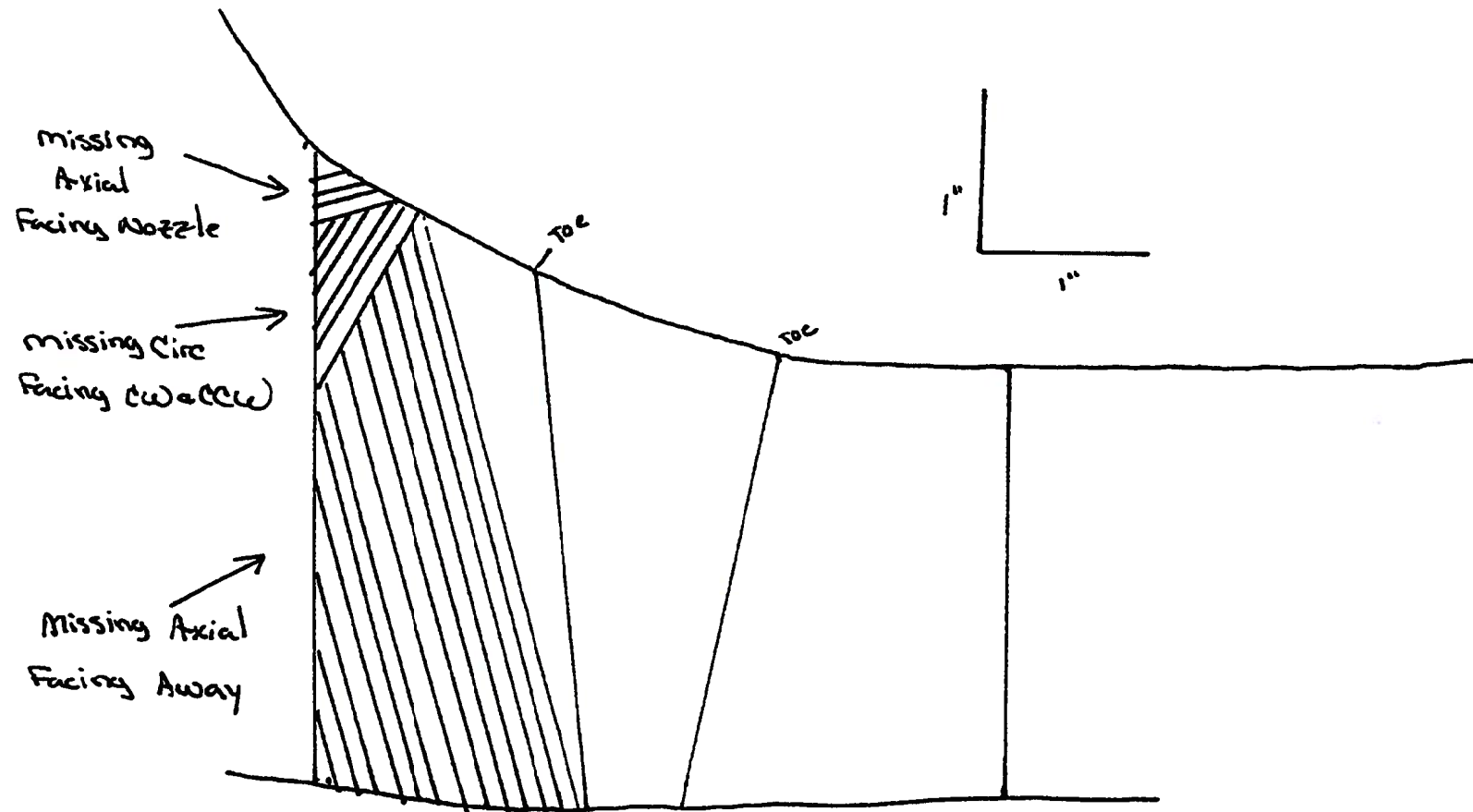
Percent Of Coverage Obtained > 90%: 88.5% Reviewed Previous Data: Yes

Examiner Michael, Dickey	Level II-PDI	Signature <i>Michael Dickey</i>	Date 5/5/2014	Reviewer Philip Shamblin	Signature <i>Philip Shamblin</i>	Date 5-10-14
Examiner N/A	Level N/A	Signature	Date	Site Review Jay Miller	Signature <i>Jay Miller</i>	Date 5-11-14
Other N/A	Level N/A	Signature	Date	ANII Review Adam M. Prince	Signature <i>Adam M. Prince</i>	Date 05-12-2014

Report No.: A2R17-UT-005Page: 3 of 4Summary No.: 2-B03.110.0011Examiner: Michael, Dickey *Michael* Level: II-PDIReviewer: Philip Shamblin *Philip Shamblin* Date: 5-10-14Examiner: N/A Level: N/ASite Review: Jay Miller *Jay Miller* Date: 5-11-14Other: N/A Level: N/AANII Review: Adam M. Prince *Adam M. Prince* Date: 05-12-2014**Comments:****Total coverage required = $4.2" \times 2.7" = 11.34"$** **$1.2" \times 3.0" \times 0.5" = 1.8"$** **Total = 13.14"****Missing axial (Facing Nozzle and away from nozzle)** **$99\% \text{ (Facing up)} + 59.9\% \text{ (Facing down)} = 158.9\%/2 = 79.5\%$** **Missing circ (Facing CW and CCW)** **$97.5\% \text{ (CW)} + 97.5\% \text{ (CCW)} = 195\%/2 = 97.5\%$** **$79.5\% \text{ (Axial)} + 97.5\% \text{ (Circ)} = 177\%/2 = 88.5\%$** **T & C Taken from previous data report number A2R15-UT-034.**

Summary No.: 2-B03.110.0011

Sketch or Photo:





UT Calibration Examination

Site/Unit: BRW / 2
Summary No.: 2-803.110.0012
Workscope: ISI

Procedure: EXE-ISI-210
Procedure Rev.: 4
Work Order No.: 01603171-01

Outage No.: A2R17
Report No.: A2R17-UT-006
Page: 1 of 4

Code: ASME XI, 2001 Ed, 2003 Ad Cat./Item: B-D/B3.110 Location: TOP OF PZR,R-26
Drawing No.: 2PZR-01 Description: PRESSURIZER - SAFETY NOZZLE
System ID: RY
Component ID: 2PZR-01-N4C Size/Length: N/A Thickness/Diameter: 2.0625" / 91.5"
Limitations: One sided examination due to nozzle configuration Start Time: 0958 Finish Time: 1415

Instrument Settings				Search Unit				Cal. Checks			Axial Orientated Search Unit				
Serial No.:	<u>SAP 30012948</u>			Serial No.:	<u>H30048</u>			Cal. Checks	Time	Date	Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path	
Manufacturer:	<u>GEIT</u>			Manufacturer:	<u>KB-Aerotech</u>			Initial Cal.	<u>0720</u>	<u>5/5/2014</u>	1/4 Hole	<u>80%</u>	<u>2.0</u>	<u>0.970"</u>	
Model:	<u>USN 60 SW</u>	Linearity:	<u>A2R17-L-004</u>	Size:	<u>0.50" x 1.0"</u>		Model:	<u>Gemma</u>	Inter. Cal.	<u>1000</u>	<u>5/5/2014</u>	1/2 Hole	<u>60%</u>	<u>4.0</u>	<u>1.94"</u>
Delay:	<u>12.7219</u>	Range:	<u>4.86"</u>	Freq.:	<u>2.25 MHz</u>	Center Freq.:	<u>N/A</u>	Inter. Cal.	<u>1350</u>	<u>5/5/2014</u>	3/4 Hole	<u>40%</u>	<u>6.0</u>	<u>2.92"</u>	
Mtd Cal/Vel:	<u>0.1186</u>	Pulser Type:	<u>Square</u>	Exam Angle:	<u>45°</u>	Squint Angle:	<u>N/A</u>	Inter. Cal.	<u>N/A</u>		ID Notch	<u>36%</u>	<u>8.6</u>	<u>4.18"</u>	
Damping:	<u>500 Ohms</u>	Reject:	<u>0%</u>	Measured Angle:	<u>45°</u>	Mode:	<u>Shear</u>	Final Cal.	<u>1455</u>	<u>5/5/2014</u>	5/4 Hole	<u>33%</u>	<u>10.0</u>	<u>4.86"</u>	
PRF:	<u>Auto High</u>	SU Freq.:	<u>2.25 MHz</u>	Exit Point	<u>0.7"</u>	# of Elements:	<u>1</u>	Couplant							
Frequency:	<u>2.25 MHz</u>	Rectify:	<u>Fullwave</u>	Config.:	<u>Single</u>	Focus:	<u>N/A</u>	Cal. Batch:	<u>13C028</u>						
Voltage:	<u>450</u>	Pulse Width:	<u>220</u>	Shape:	<u>Rect.</u>	Contour:	<u>Flat</u>	Type:	<u>Ultragel II</u>						
				Wedge Style:	<u>SWS</u>			Mfg.:	<u>Sonotech</u>						
				Search Unit Cable				Exam Batch:	<u>11625</u>						
				Type:	<u>RG-174</u>	Length:	<u>6'</u>	Type:	<u>Ultragel II</u>						
				Scan Coverage				Mfg.:	<u>Sonotech</u>						
				Upstream <input checked="" type="checkbox"/>	Downstream <input checked="" type="checkbox"/>	Scan dB:	<u>41</u>	Reference Block							
				CW <input checked="" type="checkbox"/>	CCW <input checked="" type="checkbox"/>	Scan dB:	<u>41</u>	Serial No.:	<u>SAP 102279</u>						
				Exam Surface:				Type:	<u>IW Type 2</u>						
				Surface Condition:											
				<u>Ground</u>											
Recordable Indication(s): Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> (If Yes, Ref. Attached Ultrasonic Indication Report.)															
Results: Accept <input checked="" type="checkbox"/> Reject <input type="checkbox"/> Info <input type="checkbox"/>															
Percent Of Coverage Obtained > 90%: <u>88.5%</u> Reviewed Previous Data: <u>Yes</u>															

Examiner	Level	Signature	Date	Reviewer	Signature	Date
Michael, Dickey	II-PDI	<i>Michael Dickey</i>	5/5/2014	Philip Shamblin	<i>Philip Shamblin</i>	5-10-14
N/A	N/A			Jay Miller	<i>Jay Miller</i>	5-11-14
N/A	N/A			Adam M. Purni	<i>Adam M. Purni</i>	05.12.2014



UT Calibration Examination

Site/Unit: BRW / 2
 Summary No.: 2-803.110.0012
 Workscope: ISI

Procedure: EXE-ISI-210
 Procedure Rev.: 4
 Work Order No.: 01603171-01

Outage No.: A2R17
 Report No.: A2R17-UT-005
 Page: 2 of 4

Code: ASME XI, 2001 Ed, 2003 Ad Cat./Item: B-D/B3.110 Location: TOP OF PZR,R-28

Drawing No.: 2PZR-01 Description: PRESSURIZER - SAFETY NOZZLE

System ID: RY

Component ID: 2PZR-01-N4C Size/Length: N/A Thickness/Diameter: 2.0625" / 91.5"

Limitations: One sided examination due to nozzle configuration Start Time: 0958 Finish Time: 1030

Instrument Settings				Search Unit				Cal. Checks			Axial Orientated Search Unit			
Serial No.:	<u>SAP 30012948</u>			Serial No.:	<u>01BTJR</u>			Initial Cal.	<u>0710</u>	<u>5/5/2014</u>	Calibration Reflector	Signal Amplitude %	Sweep Division	Depth
Manufacturer:	<u>GEIT</u>			Manufacturer:	<u>KB-Aerotech</u>			Inter. Cal.	<u>0950</u>	<u>5/5/2014</u>	<u>1/4 Hole</u>	<u>80%</u>	<u>1.7</u>	<u>0.65"</u>
Model:	<u>USN 60 SW</u>	Linearity:	<u>A2R17-L-004</u>	Size:	<u>1.0"</u>	Model:	<u>Gamma</u>	Inter. Cal.	<u>N/A</u>		<u>1/2 Hole</u>	<u>80%</u>	<u>3.6</u>	<u>1.44"</u>
Delay:	<u>0.9694</u>	Range:	<u>4.0"</u>	Freq.:	<u>2.25 MHz</u>	Center Freq.:	<u>N/A</u>	Inter. Cal.	<u>N/A</u>		<u>3/4 Hole</u>	<u>80%</u>	<u>5.4</u>	<u>2.16"</u>
M'tl Cal/Vel:	<u>0.2311</u>	Pulser Type:	<u>Square</u>	Exam Angle:	<u>0°</u>	Squint Angle:	<u>N/A</u>	Final Cal.	<u>1125</u>	<u>5/5/2014</u>	<u>Backwall</u>	<u>100+%</u>	<u>7.8</u>	<u>3.12"</u>
Damping:	<u>500 Ohms</u>	Reject:	<u>0%</u>	Measured Angle:	<u>N/A</u>	Mode:	<u>Long</u>							
PRF:	<u>Auto High</u>	SU Freq.:	<u>2.25 MHz</u>	Exit Point:	<u>N/A</u>	# of Elements:	<u>1</u>							
Frequency:	<u>2.25 MHz</u>	Rectify:	<u>Fullwave</u>	Config.:	<u>Single</u>	Focus:	<u>N/A</u>							
Voltage:	<u>450</u>	Pulse Width:	<u>220</u>	Shape:	<u>Round</u>	Contour:	<u>Flat</u>							
				Wedge Style:	<u>Integral</u>									
				Search Unit Cable										
				Type:	<u>RG-174</u>	Length:	<u>6'</u>							
				Scan Coverage										
				Upstream <input type="checkbox"/>	Downstream <input type="checkbox"/>	Scan dB:	<u>N/A</u>							
				CW <input checked="" type="checkbox"/>	CCW <input checked="" type="checkbox"/>	Scan dB:	<u>29</u>							
				Exam Surface:	<u>OD</u>									
				Surface Condition:	<u>Ground</u>									
				Reference Block										
				Serial No.:	<u>SAP 102279</u>									
				Type:	<u>IW Type 2</u>									
				Reference/Simulator Block										
				Gain dB	Reflector	Signal Amplitude %	Sweep Division	Depth						
				<u>15</u>	<u>FSH</u>	<u>40%</u>	<u>1.8</u>	<u>0.72"</u>						
				<u>15</u>	<u>NSH</u>	<u>20%</u>	<u>0.8</u>	<u>0.32"</u>						

Percent Of Coverage Obtained > 90%: 88.5% Reviewed Previous Data: Yes

Examiner	Level	Signature	Date	Reviewer	Signature	Date
Michael, Dickey	<u>II-PDI</u>	<u>Michael Dickey</u>	<u>5/5/2014</u>	Philip Shamblin	<u>Philip Shamblin</u>	<u>5-10-14</u>
Examiner	Level	Signature	Date	Site Review	Signature	Date
N/A	<u>N/A</u>			Jay Miller	<u>Jay Miller</u>	<u>5-11-14</u>
Other	Level	Signature	Date	ANII Review	Signature	Date
N/A	<u>N/A</u>			Adam M. Prince	<u>Adam M. Prince</u>	<u>05-12-2014</u>

Summary No.: 2-B03.110.0012Examiner: Michael, Dickey *Dickey Michael* Level: II-PDIExaminer: N/A Level: N/AOther: N/A Level: N/AReviewer: Philip Shamblin *Philip Shamblin* Date: 5-10-14Site Review: Jay Miller *Jay Miller* Date: 5-11-14ANII Review: Adam M. Parris *Adam M. Parris* Date: 05-12-2014**Comments:****Total coverage required = 4.2" x 2.7" = 11.34"****1.2" x 3.0" x 0.5" = 1.8"****Total = 13.14"****Missing axial (Facing Nozzle and away from nozzle)****99% (Facing up) + 59.9% (Facing down) = 158.9%/2 = 79.5%****Missing circ (Facing CW and CCW)****97.5% (CW) + 97.5% (CCW) = 195%/2 = 97.5%****79.5% (Axial) + 97.5% (Circ) = 177%/2 = 88.5%****T & C Taken from previous data report number A2R15-UT-034.**



Supplemental Report

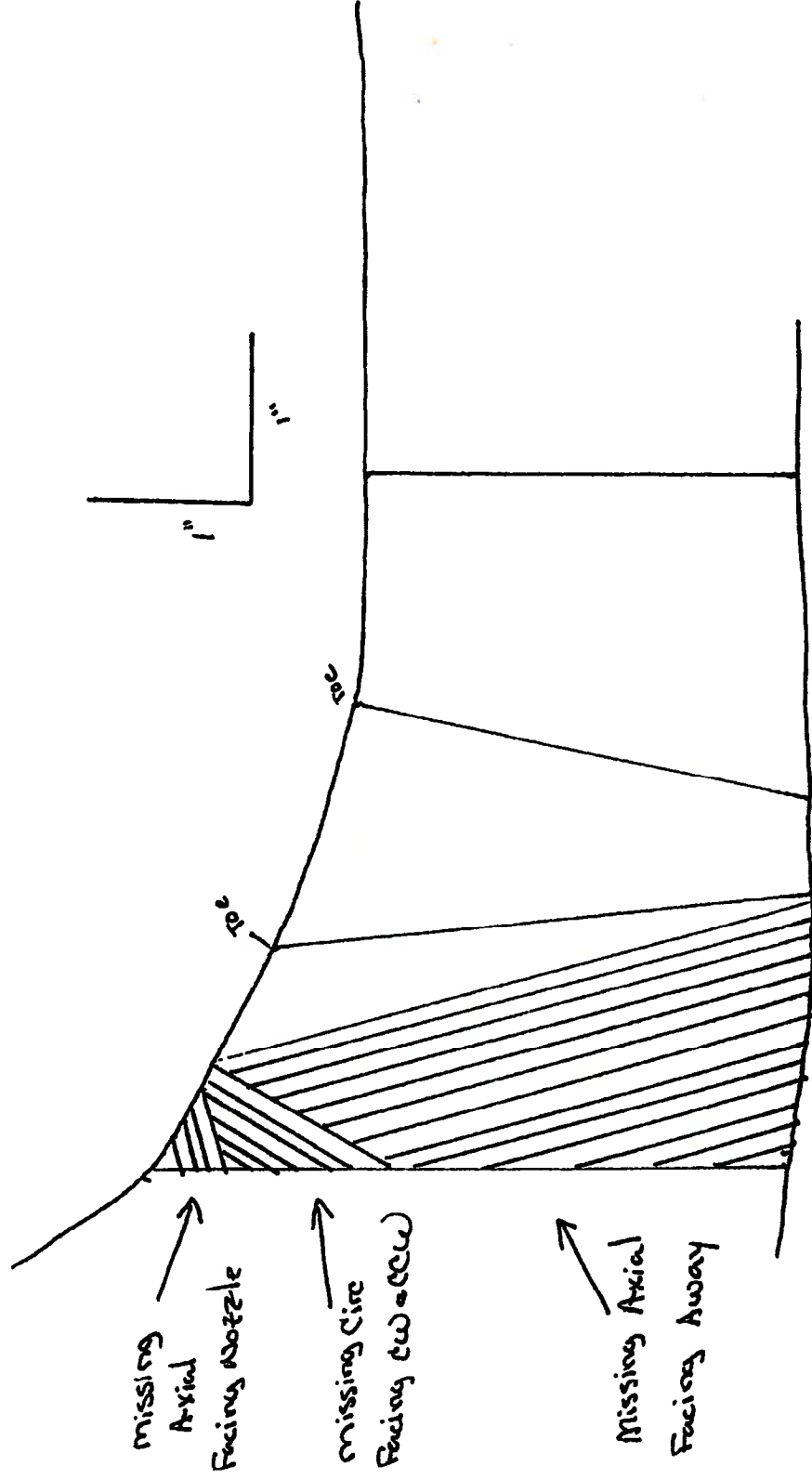


Report No.: A2R17-JT-006

Page: 4 of 4

Summary No.: 2-B03.110.0012

Sketch or Photo:



ATTACHMENT 3

Examination Datasheets for 2SG-01-SGN-01A



UT Calibration Examination



Site/Unit: **BRW / 2**
Summary No.: **2-B03.140.0019**
Workscope: **ISI**

Procedure: **EXE-ISI-52**
Procedure Rev.: **2 FCN-01**
Work Order No.: **01894635-01**

Outage No.: **A2R19**
Report No.: **A2R19-UT-020**
Page: **1** of **2**

Code: **ASME XI, 2001 Ed, 2003 Ad** Cat./Item: **B-D/B3.140** Location: **IMB LOOP A,R-42**
Drawing No.: **2SG-01** Description: **PRIMARY NOZZLE INNER RADIUS**
System ID: **RC**
Component ID: **2SG-01-SGN-01A** Size/Length: **N/A** Thickness/Diameter: **3.1875" / 29.00"**
Limitations: **Permanent Support Structure.** Start Time: **1330** Finish Time: **1530**

Instrument Settings
Serial No.: **SAP 105419**
Manufacturer: **GEIT**
Model: **USN 60 SW** Linearity: **2017-L-002**
Delay: **9.4681** Range: **15.24"**
M'tl Cal/Vel: **0.2345** Pulsar Type: **Square**
Damping: **500 Ohms** Reject: **0%**
PRF: **Auto High** SU Freq.: **2.25 MHz**
Frequency: **2.25 MHz** Rectify: **Fullwave**
Voltage: **450** Pulse Width: **220**
Ax. Gain (dB): **60.3** Circ. Gain (dB): **N/A**
10 Screen Div. = ******* in. of **Sound Path**

Search Unit
Serial No.: **00B954**
Manufacturer: **KB-Aerotech**
Size: **0.50" x 1.0"** Model: **Gamma**
Freq.: **2.25 MHz** Center Freq.: **N/A**
Exam Angle: **33°** Squint Angle: **N/A**
Measured Angle: **33°** Mode: **Long**
Exit Point **0.40"** # of Elements: **1**
Config.: **Single** Focus: **N/A**
Shape: **Rect.** Contour: **Flat**
Wedge Style: **SWS**

Cal. Checks	Time	Date
Initial Cal.	1300	4/30/2017
Inter. Cal.	N/A	
Inter. Cal.	N/A	
Inter. Cal.	N/A	
Final Cal.	1600	4/30/2017

Couplant
Cal. Batch: **15H010**
Type: **Ultragel II**
Mfg.: **Sonotech**
Exam Batch: **15H010**
Type: **Ultragel II**
Mfg.: **Sonotech**

Search Unit Cable
Type: **RG-174** Length: **6'** No. Conn.: **0**
Scan Coverage
Upstream ☐ Downstream ☐ Scan dB: **N/A**
CW ☒ **CCW** ☒ Scan dB: **68.3**
Exam Surface: **OD**
Surface Condition: **Smooth**

Reference Block
Serial No.: **SAP 102279 CS**
Type: **IIV Type 2**

Axial Oriented Search Unit				
Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path	
A	80%	5.0	10.60"	
B	52%	5.7	12.00"	
C	50%	6.5	13.70"	
D	35%	7.3	15.30"	
E	25%	8.0	17.00"	
Circumferential Oriented Search Unit				
Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path	
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	
Reference/Simulator Block				
Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
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

Recordable Indication(s): Yes ☐ No ☒ (If Yes, Ref. Attached Ultrasonic Indication Report.)
Results: Accept ☒ Reject ☐ Info ☐
Percent Of Coverage Obtained > 90%: **85%** Reviewed Previous Data: **Yes**

Comments: ***** 15.24" with display delay adjusted to 30.934". See previous data for limitations. Dose 19.5 mr**

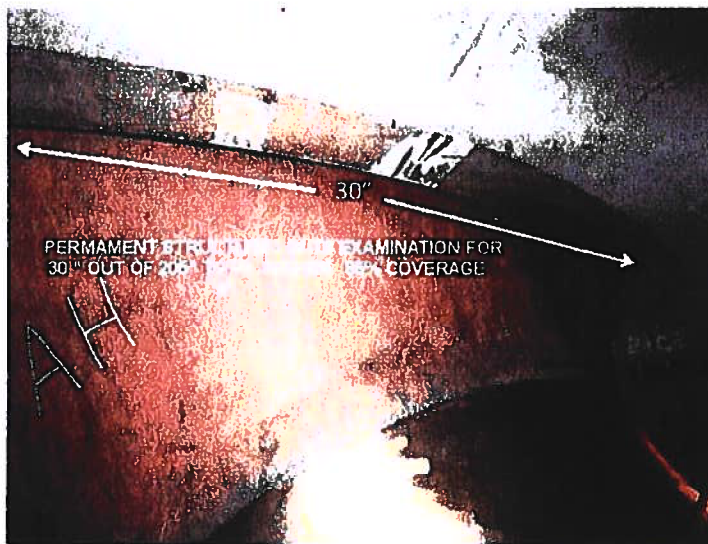
Examiner	Level	II-PDI	Signature	Date	Reviewer	Signature	Date
Serth, Joseph P.				4/30/2017	Delbusso, James		5/1/2017
Examiner	Level	N/A	Signature	Date	Site Review	Signature	Date
N/A					Kenneth L. Hall		05/05/2017
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A					Ackem M. Preme		05-06-2017

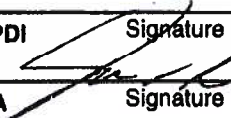
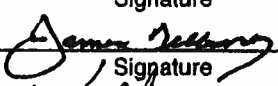
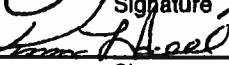

Limitation Record

Site/Unit:	BRW / 2	Procedure:	EXE-ISI-52	Outage No.:	A2R19
Summary No.:	2-B03.140.0019	Procedure Rev.:	2 FCN-01	Report No.:	A2R19-UT-020
Workscope:	ISI	Work Order No.:	01894635-01	Page:	2 of 2

Description of Limitation:

Permanent Structure Limits Examination for 30" of 205" total inches. 85% Coverage


Limitations removal requirements:
Radiation field:

Examiner	Level	Signature	Date	Reviewer	Signature	Date
Serth, Joseph P.	II-PDI		4/30/2017	Delbusso, James		5/1/2017
Examiner	Level	Signature	Date	Site Review	Signature	Date
N/A	N/A			Kevin W. Hall		05/05/2017
Examiner	Level	Signature	Date	ANII Review	Signature	Date
N/A	N/A			Adam M. Pinner		05.06.17

ATTACHMENT 4

Examination Datasheets for 2SG-01-SGC-02



UT Calibration/Examination

Site/Unit: BRW / 2 Procedure: EXE-ISI-210 Outage No.: A2R20
Summary No.: 2-C01.30.0010 Procedure Rev.: 5 Report No.: A2R20-UT-064
Workscope: ISI Work Order No.: 04648672-01 Page: 1 of 5

Code: ASME XI, 2001 Ed, 2003 Ad Cat./Item: C-A/C1.30 Location: IMB LOOP A,R-42
Drawing No.: 2SG-01 Description: TUBESHEET - STUB BARREL
System ID: RC
Component ID: 2SG-01-SGC-02 Size/Length: 426.25" Thickness/Diameter: 3.3125" / 11.3"
Limitations: Exam limited due to Component configuration. Start Time: 0950 Finish Time: 1340

Instrument Settings				Search Unit				Cal. Checks			Axial Oriented Search Unit			
Serial No.:	<u>SAP 105420</u>			Serial No.:	<u>L01012SP</u>			Initial Cal.	<u>0835</u>	<u>10/16/2018</u>	Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
Manufacturer:	<u>GEIT</u>			Manufacturer:	<u>KB-Aerotech</u>			Inter. Cal.	<u>0947</u>	<u>10/16/2018</u>	<u>1/4" T Hole</u>	<u>81%</u>	<u>2.0</u>	<u>1.170"</u>
Model:	<u>USN 60 SW</u>	Linearity:	<u>A2R20-L-002</u>	Size:	<u>1.0"</u>	Model:	<u>Gamma</u>	Inter. Cal.	<u>N/A</u>		<u>1/2" T Hole</u>	<u>60%</u>	<u>2.9</u>	<u>2.344"</u>
Delay:	<u>0.8256</u>	Range:	<u>6.000"</u>	Freq.:	<u>2.25 MHz</u>	Center Freq.:	<u>N/A</u>	Inter. Cal.	<u>1232</u>	<u>10/16/2018</u>	<u>3/4" T Hole</u>	<u>45%</u>	<u>5.1</u>	<u>3.064"</u>
M'tl Cal/Vel:	<u>0.2307</u>	Pulser Type:	<u>Square</u>	Exam Angle:	<u>0°</u>	Squint Angle:	<u>N/A</u>	Final Cal.	<u>1452</u>	<u>10/16/2018</u>				
Damping:	<u>500 Ohms</u>	Reject:	<u>0%</u>	Measured Angle:	<u>N/A</u>	Mode:	<u>Long</u>	Couplant						
PRF:	<u>Auto High</u>	SU Freq.:	<u>2.25 MHz</u>	Exit Point	<u>N/A</u>	# of Elements:	<u>1</u>	Cal. Batch:	<u>18C004</u>					
Frequency:	<u>2.25 MHz</u>	Rectify:	<u>Fullwave</u>	Config.:	<u>Single</u>	Focus:	<u>N/A</u>	Type:	<u>Ultrage II</u>					
Voltage:	<u>450</u>	Pulse Width:	<u>220</u>	Shape:	<u>Round</u>	Contour:	<u>N/A</u>	Mfg.:	<u>Magnaflux</u>					
				Wedge Style:	<u>N/A</u>			Exam Batch:	<u>18C004</u>					
				Search Unit Cable				Type:	<u>Ultrage II</u>					
				Type:	<u>RG-174</u>	Length:	<u>6'</u>	Mfg.:	<u>Magnaflux</u>					
				Scan Coverage				Reference Block						
Cal. Block No.:				<u>BWD-062 CS</u>				Upstream <input checked="" type="checkbox"/>	Downstream <input checked="" type="checkbox"/>	Scan dB:	<u>39.0</u>			
Thickness				<u>3.95"</u>	Dia.:	<u>Flat</u>		CW <input checked="" type="checkbox"/>	CCW <input checked="" type="checkbox"/>	Scan dB:	<u>39.0</u>			
Cal. Blk. Temp.				<u>74° F</u>	Temp. Tool:	<u>SAP 106893</u>		Exam Surface:	<u>OD</u>					
Comp. Temp.				<u>93° F</u>	Temp. Tool:	<u>SAP 106893</u>		Surface Condition:	<u>Ground Flush</u>					
Recordable Indication(s):				Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	(If Yes, Ref. Attached Ultrasonic Indication Report.)								
Results:				Accept <input checked="" type="checkbox"/>	Reject <input type="checkbox"/>	Info <input type="checkbox"/>								
Percent Of Coverage Obtained > 90%:				<u>88.4%</u>		Reviewed Previous Data:		<u>Yes</u>						

Comments: Scanned + 14 dB over reference sensitivity. See Page 5 for coverage limitations. Dose: 30.0 mR

Examiner	Level	II-PDI	Signature	Date	Reviewer	Signature	Date
Davis, Phillip B.				10/16/2018	Delbusso, James WesDyne Level III		10/16/2018
Examiner	Level	N/A	Signature	Date	Site Review	Signature	Date
N/A					Hall, Kevin Exelon Level III		10/18/18
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A					Adam M. Prime		10/19/2018



UT Calibration/Examination

Site/Unit: BRW / 2
Summary No.: 2-C01.30.0010
Workscope: ISI

Procedure: EXE-ISI-210
Procedure Rev.: 5
Work Order No.: 04648672-01

Outage No.: A2R20
Report No.: A2R20-UT-064
Page: 2 of 5

Code: ASME XI, 2001 Ed, 2003 Ad Cat./Item: C-A/C1.30 Location: IMB LOOP A,R-42
Drawing No.: 2SG-01 Description: TUBESHEET - STUB BARREL
System ID: RC
Component ID: 2SG-01-SGC-02 Size/Length: 426.25" Thickness/Diameter: 3.3125" / 11.3"
Limitations: Exam limited due to Component configuration. Start Time: 0950 Finish Time: 1340

Instrument Settings
Serial No.: SAP 105420
Manufacturer: GEIT
Model: USN 60 SW Linearity: A2R20-L-002
Delay: 12.3715 Range: 9.000"
M/TI Cal/Vel: 0.1269 Pulsar Type: Square
Damping: 500 Ohms Reject: 0%
PRF: Auto High SU Freq.: 2.25 MHz
Frequency: 2.25 MHz Rectify: Fullwave
Voltage: 450 Pulse Width: 220

Ax. Gain (dB): 33.0 Circ. Gain (dB): N/A
10 Screen Div. = 9.0 in. of Sound Path
Calibration Block
Cal. Block No. BWD-062 CS
Thickness 3.95" Dia.: Flat
Cal. Blk. Temp. 74° F Temp. Tool: SAP 106893
Comp. Temp. 93° F Temp. Tool: SAP 106893
Recordable Indication(s): Yes ☐ No ☒ (If Yes, Ref. Attached Ultrasonic Indication Report.)
Results: Accept ☒ Reject ☐ Info ☐

Search Unit
Serial No.: 00008Y
Manufacturer: Krautkramer
Size: 0.50" X 1.00" Model: Gamma
Freq.: 2.25 MHz Center Freq.: N/A
Exam Angle: 45° Squint Angle: N/A
Measured Angle: 45° Mode: Shear
Exit Point 0.75" # of Elements: 1
Config.: Single Focus: N/A
Shape: Rect. Contour: N/A
Wedge Style: SWS
Search Unit Cable
Type: RG-174 Length: 6' No. Conn.: 0
Scan Coverage
Upstream ☒ Downstream ☒ Scan dB: 47.0
CW ☒ CCW ☒ Scan dB: 47.0
Exam Surface: OD
Surface Condition: Ground Flush

Cal. Checks	Time	Date
Initial Cal.	0825	10/16/2018
Inter. Cal.	0945	10/16/2018
Inter. Cal.	N/A	
Inter. Cal.	1230	10/16/2018
Final Cal.	1450	10/16/2018

Couplant
Cal. Batch: 18C004
Type: Ultragel II
Mfg.: Magnaflux

Exam Batch: 18C004
Type: Ultragel II
Mfg.: Magnaflux

Axial Oriented Search Unit			
Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
1/4" T Hole	81%	1.7	1.52"
1/2" T Hole	52%	3.5	3.09"
3/4" T Hole	30%	5.1	4.56"
ID Notch	20%	6.6	5.80"
5/4" T Hole	18%	7.8	7.00"

Circumferential Oriented Search Unit			
Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
N/A	N/A	N/A	N/A

Reference/Simulator Block				
Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
33.0	FSDH	61%	1.2	1.06"

Comments: Scanned + 14 dB over reference sensitivity. See Page 5 for coverage limitations.

Percent Of Coverage Obtained > 90%: 88.4% Reviewed Previous Data: Yes

Examiner	Level	II-PDI	Signature	Date	Reviewer	Signature	Date
Davis, Phillip B.				10/16/2018	Delbusso, James	WesDyne Level III	10/16/2018
Examiner	Level	N/A	Signature	Date	Site Review	Signature	Date
N/A					Hall, Kevin	Exelon Level III	10/18/18
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A					Adam M. Prim	10-18-2018	



UT Calibration/Examination

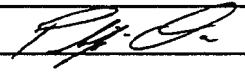
Site/Unit: BRW / 2 Procedure: EXE-ISI-210 Outage No.: A2R20
Summary No.: 2-C01.30.0010 Procedure Rev.: 5 Report No.: A2R20-UT-084
Workscope: ISI Work Order No.: 04648872-01 Page: 3 of 5

Code: ASME XI, 2001 Ed, 2003 Ad Cat./Item: C-A/C1.30 Location: IMB LOOP A,R-42
Drawing No.: 2SG-01 Description: TUBESHEET - STUB BARREL
System ID: RC
Component ID: 2SG-01-SGC-02 Size/Length: 426.25" Thickness/Diameter: 3.3125" / 11.3"
Limitations: Exam limited due to component configuration. Start Time: 0950 Finish Time: 1340

Instrument Settings				Search Unit				Cal. Checks			Axial Oriented Search Unit					
Serial No.:	<u>SAP 105421</u>			Serial No.:	<u>00008W</u>			Initial Cal.	<u>0830</u>	<u>10/16/2018</u>	Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path		
Manufacturer:	<u>GEIT</u>			Manufacturer:	<u>KB-Aerotech</u>			Inter. Cal.	<u>0946</u>	<u>10/16/2018</u>	<u>1/4" T Hole</u>	<u>81%</u>	<u>1.8</u>	<u>2.13"</u>		
Model:	<u>USN 60 SW</u>	Linearity:	<u>A1R18-L-003</u>	Size:	<u>0.50" x 1.0"</u>	Model:	<u>Gamma</u>	Inter. Cal.	<u>1231</u>	<u>10/16/2018</u>	<u>1/2" T Hole</u>	<u>45%</u>	<u>3.7</u>	<u>4.42"</u>		
Delay:	<u>15.0334</u>	Range:	<u>12.000"</u>	Freq.:	<u>2.25 MHz</u>	Center Freq.:	<u>N/A</u>	Inter. Cal.	<u>N/A</u>		<u>3/4" T Hole</u>	<u>31%</u>	<u>5.5</u>	<u>6.66"</u>		
M'tl Cal/Vel:	<u>0.1269</u>	Pulser Type:	<u>Square</u>	Exam Angle:	<u>60°</u>	Squint Angle:	<u>N/A</u>	Final Cal.	<u>1451</u>	<u>10/16/2018</u>	<u>ID Notch</u>	<u>8%</u>	<u>6.9</u>	<u>8.27"</u>		
Damping:	<u>500 Ohms</u>	Reject:	<u>0%</u>	Measured Angle:	<u>59°</u>	Mode:	<u>Shear</u>	Couplant			<u>5/4" T Hole</u>	<u>17%</u>	<u>8.2</u>	<u>9.84"</u>		
PRF:	<u>Auto High</u>	SU Freq.:	<u>2.25 MHz</u>	Exit Point	<u>0.65"</u>	# of Elements:	<u>1</u>	Cal. Batch:	<u>18C004</u>			Circumferential Oriented Search Unit				
Frequency:	<u>2.25 MHz</u>	Rectify:	<u>Fullwave</u>	Config.:	<u>Single</u>	Focus:	<u>N/A</u>	Type:	<u>Ultragel II</u>			Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path	
Voltage:	<u>450</u>	Pulse Width:	<u>220</u>	Shape:	<u>Rect.</u>	Contour:	<u>N/A</u>	Mfg.:	<u>Magnaflux</u>			<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	
Ax. Gain (dB):	<u>41.0</u>	Circ. Gain (dB):	<u>N/A</u>	Wedge Style:	<u>SWS</u>			Exam Batch:	<u>18C004</u>							
<u>10</u> Screen Div. = <u>12.0</u> in. of <u>Sound Path</u>				Search Unit Cable				Type:	<u>Ultragel II</u>							
Calibration Block				Scan Coverage				Mfg.:	<u>Magnaflux</u>							
Cal. Block No.	<u>BWD-062 CS</u>			Upstream <input checked="" type="checkbox"/>	Downstream <input checked="" type="checkbox"/>	Scan dB:	<u>55.0</u>	Reference Block			Reference/Simulator Block					
Thickness	<u>3.95"</u>	Dia.:	<u>Flat</u>	CW <input checked="" type="checkbox"/>	CCW <input checked="" type="checkbox"/>	Scan dB:	<u>55.0</u>	Serial No.:	<u>SAP 104874 CS</u>			Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
Cal. Blk. Temp.	<u>74° F</u>	Temp. Tool:	<u>SAP 106893</u>	Exam Surface:	<u>OD</u>			Type:	<u>2" Angle Beam</u>			<u>41.0</u>	<u>FSDH</u>	<u>81%</u>	<u>1.2</u>	<u>1.44"</u>
Comp. Temp.	<u>93° F</u>	Temp. Tool:	<u>SAP 106893</u>	Surface Condition:	<u>Ground Flush</u>											
Recordable Indication(s):	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> (If Yes, Ref. Attached Ultrasonic Indication Report.)															
Results:	Accept <input checked="" type="checkbox"/> Reject <input type="checkbox"/> Info <input type="checkbox"/>			Comments: Scanned + 14 dB over reference sensitivity. See Page 5 for coverage limitations.												
Percent Of Coverage Obtained > 90%: <u>88.4%</u>				Reviewed Previous Data: <u>Yes</u>												

Examiner	Level	II-PDI	Signature	Date	Reviewer	Signature	Date
Seng, Tony				10/16/2018	Delbusso, James	WesDyne Level III	10/16/2018
Examiner	Level	N/A	Signature	Date	Site Review	Signature	Date
N/A					Hall, Kevin	Exelon Level III	10/18/18
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A					Adam M. Prince	Adam M. Prince	10.18.2018

Summary No.: 2-C01.30.0010

Examiner: Davis, Philip B. 

Level: II-PDI

Reviewer: Delbusso, James WesDyne Level III  Date: 10/16/2018

Examiner: N/A

Level: N/A

Site Review: Hall, Kevin Exelon Level III  Date: 10/18/18

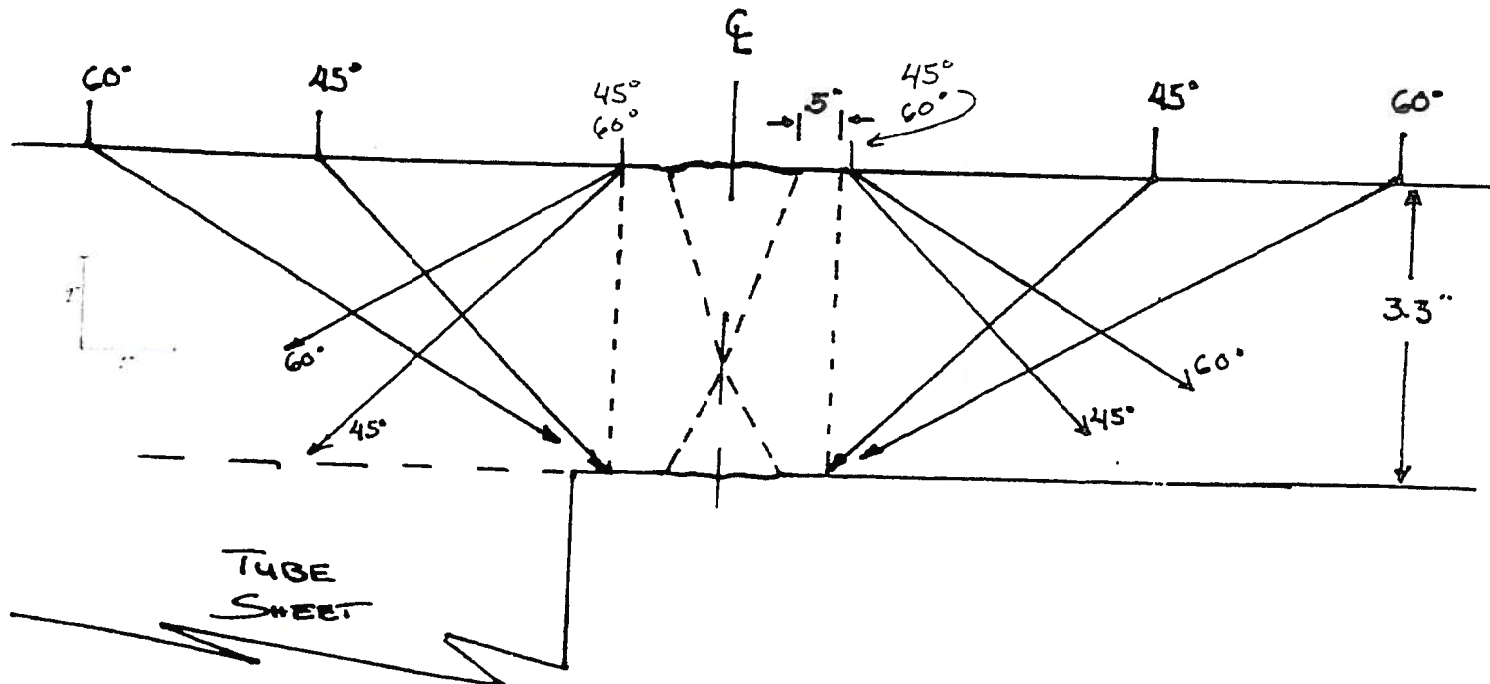
Other: N/A

Level: N/A

ANII Review: Adam M. Prime Adam M. Prime Date: 10-18-2019

Comments: 2SG-01-SGC-02

Sketch or Photo:



Summary No.: 2-C01.30.0010

Examiner: Davis, Philip B.
Examiner: N/A
Other: N/A

Level: II-PDI
Level: N/A
Level: N/A

Reviewer: Delbusso, James WesDyne Level III
Site Review: Hall, Kevin Exelon Level III
ANII Review: Adam M. Prim Adam M. Prim
Date: 10/16/2018
Date: 10/16/18
Date: 10-08-2018

Comments: **2SG-01-SGC-02** Limitations due to configuration.

3-18" HAND HOLES, 10" INSPECTION COVER & 4" BRANCH CONNECTION LIMIT STUD BARREL SIDE SCAN.
3-9" , 1-10" INSPECTION COVERS, 7" BRANCH CONNECTION, 7" ID PLATE & 6" PLUG BRANCH CONNECTION LIMIT TUBE SHEET SIDE SCAN.
3-9" INSPECTION COVERS & 10" INSPECTION COVER LIMITS CIRC SCANS.

Sketch or Photo:

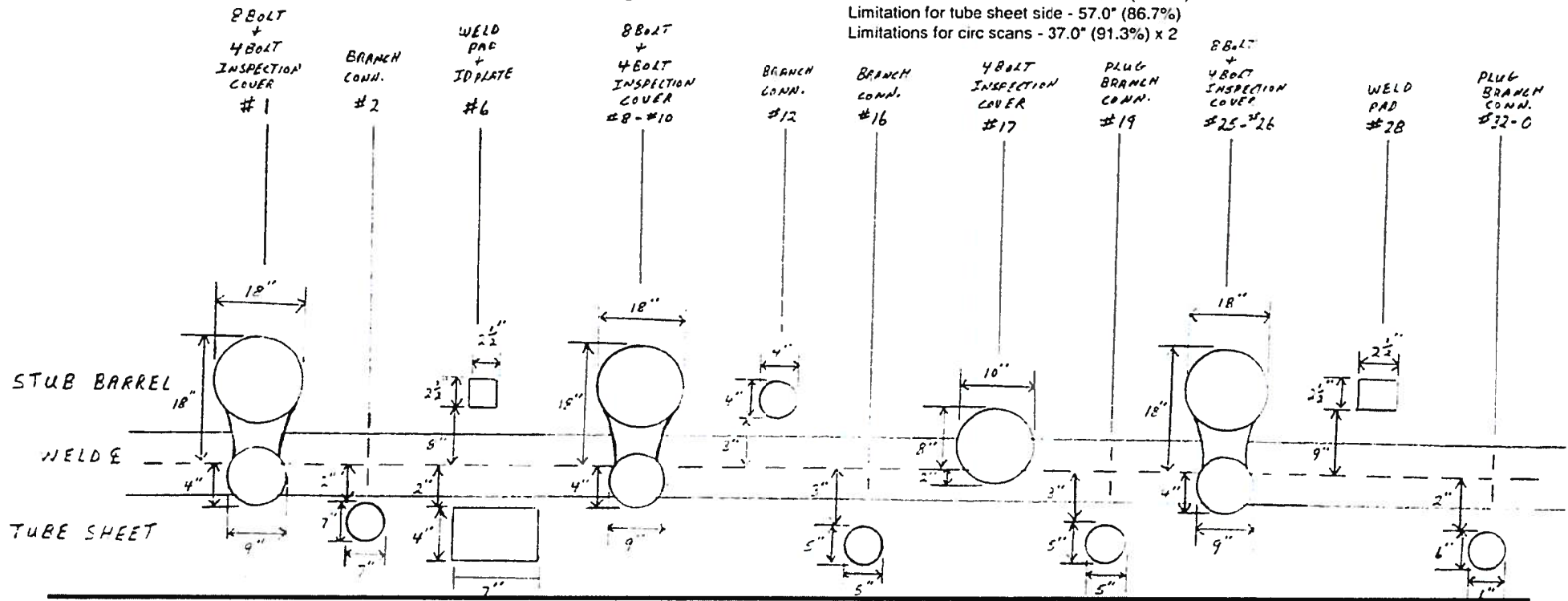
Weld Length - 427.5"

88.4% Coverage

Limitations on stud barrel side - 68.0" (84.1%)

Limitation for tube sheet side - 57.0" (86.7%)

Limitations for circ scans - 37.0" (91.3%) x 2



ATTACHMENT 5

Examination Datasheets for 1SI-39-25

Third Interval Second Period

(Preservice)



Calibration Data Sheet

Plant / Unit Braidwood / 1
 Company Exelon
 Comp / System FW #25 / SI
 Procedure No. EXE-UT-350
 Rev / Chng. No. 2 / 0
 Cal. Block No. 22572
 Cal. Block Temp. 72°F
 Thermometer S/N: SAP 106886
 Size 4" Sch. 160 / 0.531" "T"

Data Sheet # A1R16-029
 Page 1 of 8

Cal. Checks	Time
Initial Calib.	08:05
Initial Calib. Date	04/16/2012
Intermediate	N/A
Intermediate	N/A
Final Calib.	09:10
Final Calib. Date	04/16/2012

Couplant

Code Category: R-A Code Item: R120 Type: Ultragel II
 Batch: 09225

ISI Weld
 ISI-39-25

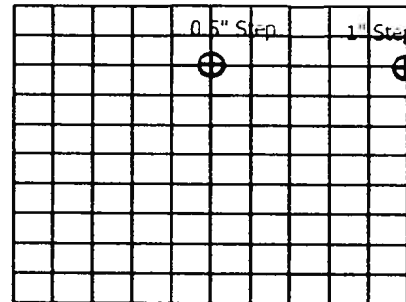
Examination Area / Weld	ACCESS	INDICATIONS				EXAM SENS. (dB)
		FLAW	NON RELEVANT			
		YES	NO	YES (>50% Ref.)	NO	
FW # 25	1 Sided		X		X	35
Remarks / Reason for Incomplete Scan(s) <u>COMPONENT TEMP: 63°F</u> <u>0° used for T&C. 0° exam performed to locate counterbore and/or ID transition.</u> <u>No counterbore detected. Exam volume extended to meet RI-ISI requirements.</u> <u>See attached coverage plot. RT stamp located at 0° TDC.</u>						

Examiners: Joseph Serth Level II Date 04/16/2012
Jason J. Jennings Level II Date 04/16/2012

WesDyne Reviewer / Date: Edward R. Zolner LV III 4/20/12
 Further Evaluation Required? ☒ Yes ☐ No

EXELON LEVEL III REVIEW / DATE

17 April 2012



Search Unit #1

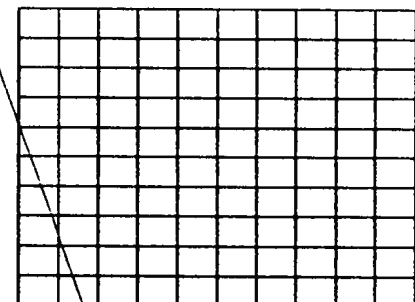
Manufacture: KBA
 Serial No.: 57462976.8
 No. of Elements: 2
 Size: 2(3.5x10) Shape: Rect.
 Freq. 4.0 MHz Style: MSEB4E
 Exam Angle: 0° Mode: Long
 Measured Angle: 0°
 Wedge Style: Integral

Search Unit Cable

Type: RG-174
 Length: 6' No. of Con.: 0

Instrument Settings

Make / Model: GEIT USN 60 SW
 Serial No.: SAP 105203
 Probe Delay: 9.1209 Range: 1.0"
 M'tl Cal / Vel: 0.2270 Pulser: Square
 Damping: 500 Reject: 0%
 PRF: Auto High Freq: 4.0 MHz
 Filter: Fixed Mode: Dual On
 Rectify: Fullwave Voltage: 450
 Pulse Width: 130 ns
 Display Delay: 0
 Reference Sensitivity (dB)
 Axial: 32.0 dB Circ: 32.0 dB
 NSDH Sensitivity: N/A



Search Unit #2

Manufacture: _____
 Serial No.: _____
 No. of Elements: _____
 Size: _____ Shape: _____
 Freq. _____ Style: _____
 Exam Angle: _____ Mode: _____
 Measured Angle: _____
 Wedge Style: _____

Search Unit Cable

Type: N A
 Length: _____ No. of Con.: _____

Instrument Settings

Make / Model: _____
 Serial No.: _____
 Probe Delay: _____ Range: _____
 M'tl Cal / Vel: _____ Pulser: _____
 Damping: _____ Reject: _____
 PRF: _____ Freq: _____
 Filter: _____ Mode: _____
 Rectify: _____ Voltage: _____
 Pulse Width: _____
 Display Delay: _____
 Reference Sensitivity (dB)
 Axial: _____ Circ: _____
 FSDH Sensitivity: _____

ANII REVIEW / DATE

4/21/12



A Westinghouse Electric Company

Calibration Data Sheet

Plant / Unit Braidwood / 1
Company ExelonData Sheet # A1R16-029
Page 2 of 8Comp / System FW #25 / SI
Procedure No. EXE-PDI-UT-2
Rev / Chng. No. 7 / 0
Cal. Block No. 22572
Cal. Block Temp. 72°F
Thermometer S/N: SAP 106886
Size 4" Sch. 160 / 0.531" "T"

Ref. Block:

N/A



Ferritic



Austenitic

Each Major CRT Div. = 0.17"

Cal. Direction: ☐ Axial ☐ Circ. ☒ BothScan Area: ☐ to Weld ☒ to WeldCode Category: R-A Code Item: R120 Type: Ultragel II
Batch: 09225ISI Weld
ISI-39-25

Examination Area / Weld

INDICATIONS

ACCESS	INDICATIONS				EXAM SENS. (dB)
	YES	NO	YES (>50% Ref.)	NO	
FW # 25	1 Sided	X		X	40.7

Remarks / Reason for Incomplete Scan(s)

COMPONENT TEMP: 63°F

Increased exam volume due to RI-HSI requirements. See attached coverage plot. 50% Code coverage achieved due to one side exam. Indication not seen with the 0° or 60° RL.

Examiners: Joseph Serth Level II Date 04/16/2012
Jason J. Jennings Level II Date 04/16/2012

WesDyne Reviewer / Date:

Edward P. Zolner LVI # 4/20/12

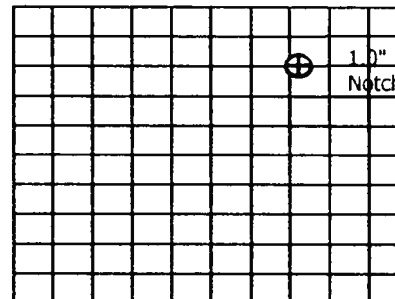
Further Evaluation Required? ☒ Yes ☐ No

EXELON LEVEL III REVIEW / DATE

1-7-2012 4-21-12

RS-20-012 Attachment 3

Reference page 7 of 8 for additional Evaluation 4-21-12



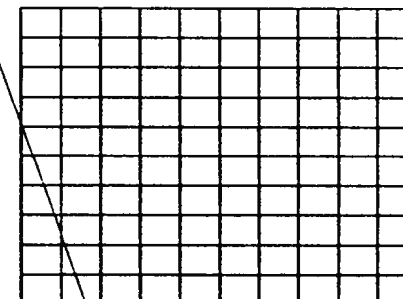
Search Unit #1

Manufacture: KBA
Serial No.: 008H0P
No. of Elements: 1
Size: 0.25" Shape: Round
Freq. 2.25 MHz Style: Comp G
Exam Angle: 45° Mode: Shear
Measured Angle: 43°
Wedge Style: MSWQC

Search Unit Cable

Type: RG-174
Length: 6' No. of Con.: 0

Instrument Settings

Make / Model: GEIT USN 60 SW
Serial No.: SAP 105204
Probe Delay: 4.0300 Range: 1.7"
M'tl Cal / Vel: 0.1234 Pulser: Square
Damping: 500 Reject: 0%
PRF: Auto High Freq: 2.25 MHz
Filter: Fixed Mode: Dual Off
Rectify: Fullwave Voltage: 450
Pulse Width: 220 ns
Display Delay: 0
Reference Sensitivity (dB)
Axial: 28.7 dB Circ: 28.7 dB
FSDH Sensitivity: N/A

Search Unit #2

Manufacture:
Serial No.:
No. of Elements:
Size: Shape:
Freq. Style:
Exam Angle: Mode:
Measured Angle:
Wedge Style:

Search Unit Cable

Type: N A
Length: No. of Con.:

Instrument Settings

Make / Model:
Serial No.:
Probe Delay: Range:
M'tl Cal / Vel: Pulser:
Damping: Reject:
PRF: Freq:
Filter: Mode:
Rectify: Voltage:
Pulse Width:
Display Delay:
Reference Sensitivity (dB)
Axial: Circ:
FSDH Sensitivity:



A Westinghouse Electric Company

Calibration Data Sheet

Plant / Unit Braidwood / 1
 Company Exelon
 Comp / System FW #25 / SI
 Procedure No. EXE-PDI-UT-2
 Rev / Chng. No. 7 / 0
 Cal. Block No. SAP 105091
 Cal. Block Temp. 63°F
 Thermometer S/N: SAP 106886
 Size 4" Sch. 160 / 0.531" "T"

Ref. Block:

SAP N/A



Ferritic



Austenitic

0.2"

Each Major CRT Div. =

Cal. Direction: ☒ Axial ☐ Circ. ☐ BothScan Area: 1 to Weld ☒
11 to Weld ☐

Code Category: R-A Code Item: R120 Type: Ultragel II
 Batch: 09225

ISI Weld
 ISI-39-25

Examination Area / Weld

INDICATIONS

ACCESS	FLAW		NON RELEVANT		EXAM SENS. (dB)
	YES	NO	YES (>50% Ref.)	NO	
FW # 25	1 Sided	X		X	66

Remarks / Reason for Incomplete Scan(s)

COMPONENT TEMP: 63°F

50% Code coverage achieved due to one side exam. 60°RL did not see any indications in the area of the flaw. Scanning was limited due to lift off at weld area.

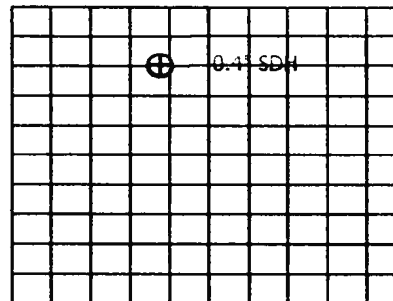
Examiners: Joseph Serth Level II Date 4/16/2012Jason J. Jennings Level II Date 4/16/2012

WesDyne Reviewer / Date:

Edward R. Zolner 10/11 4/20/12Further Evaluation Required? ☒ Yes ☐ NoData Sheet # A1R16-029Page 3 of 8

Cal. Checks	Time
Initial Calib.	11:30
Initial Calib. Date	4/16/2012
Intermediate	N/A
Intermediate	N/A
Final Calib.	12:10
Final Calib. Date	4/16/2012

Couplant



Search Unit #2

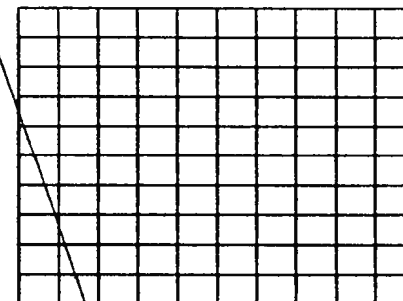
Manufacture: RTD
 Serial No.: 08-375
 No. of Elements: 2
 Size: 2(7x10) Shape Rect.
 Freq. 2.0 MHz Style: TRLA-2
 Exam Angle: 60° Mode: Long
 Measured Angle: 58°
 Wedge Style: Integral

Search Unit Cable

Type: RG-174
 Length: 6' No. of Con.: 0

Instrument Settings

Make / Model: GEIT USN 60 SW
 Serial No.: SAP 105204
 Probe Delay: 8.01 Range: 2.0"
 M'tl Cal / Vel: 0.2270 Pulser: Square
 Damping: 500 Reject: 0%
 PRF: Auto High Freq: 2.0 MHz
 Filter: Fixed Mode: Dual On
 Rectify: Fullwave Voltage: 450
 Pulse Width: 250 ns
 Display Delay: 0
 Reference Sensitivity (dB)
 Axial: 66.0 dB Circ: N/A
 NSDH Sensitivity: N/A



Search Unit #2

Manufacture: _____
 Serial No.: _____
 No. of Elements: _____
 Size: _____ Shape _____
 Freq. _____ Style: _____
 Exam Angle: _____ Mode: _____
 Measured Angle: _____
 Wedge Style: _____

Search Unit Cable

Type: N A
 Length: _____ No. of Con.: _____

Instrument Settings

Make / Model: _____
 Serial No.: _____
 Probe Delay: _____ Range: _____
 M'tl Cal / Vel: _____ Pulser: _____
 Damping: _____ Reject: _____
 PRF: _____ Freq: _____
 Filter: _____ Mode: _____
 Rectify: _____ Voltage: _____
 Pulse Width: _____
 Display Delay: _____
 Reference Sensitivity (dB)
 Axial: _____ Circ: _____
 NSDH Sensitivity: _____

EXELON LEVEL III REVIEW / DATE

1-7 N/A 4-21-12

ANII REVIEW / DATE

J. L. L. L. 4/21/12

ULTRASONIC EXAMINATION INDICATION REPORT

Data Pkg. #: A1R16-029

PAGE 4 OF 8

ISI Weld
ISI-39-25

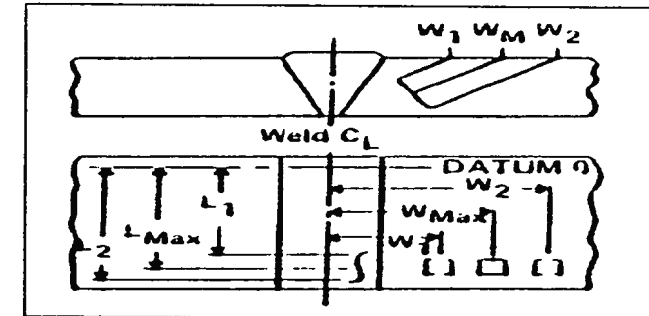
SITE: Braidwood Unit 1

Weld No.: FW #25 Datum 0 Location: Top Dead Center

Procedure No. EXE-PDI-UT-2 Rev. 7

Exam Surface OD ☒ ID ☐ Thickness: 0.65"

Exam Volume: Lower 1/3 ☒ Full ☐



W Max - Distance from CL to SU at Maximum Response
MP - Metal Path
L - Distance from Datum 0
RBR - Remaining Back Reflection
SU Loc - Search Unit Location

Layout shown for perpendicular scan.
For parallel scan, L's & W's would be reversed.

Ind. No.	Max Amp % of DAC	W Max		Forward N/A % of DAC		Backward N/A % of DAC		L Max	L1 0%	L2 0%	RBR Amp 0 degree	SU Loc US, DS CW, CCW	EXAMINATION ANGLE	
				W1	MP	W2	MP		DAC	DAC			<input checked="" type="checkbox"/> 45 S <input type="checkbox"/> 45 RL <input type="checkbox"/> 60 S <input type="checkbox"/> 60 RL <input type="checkbox"/> Other	REMARKS
		W	MP	W1	MP	W2	MP		DAC	DAC				
1	15%	0.2"	0.65"	N/A	N/A	N/A	N/A	2.75"	2.5"	3.5"	N/A	US	1st Leg - 45°	
2	15%	0.7"	.87"	N/A	N/A	N/A	N/A	2.75"	N/A	N/A	N/A	US	45° Root - Intermittent 360°	
3	15%	0.95"	1.16"	N/A	N/A	N/A	N/A	2.75"	2.5"	3.5"	N/A	US	Bounce - 45°	

Add'l. Comments:

Indications 1 and 3 are the same indication and are not ID connected.

EXAMINER:

Print:

Joseph Serth

LEVEL: II

DATE: 4/16/12

EXAMINER:

Print:

Jason J. Jennings

LEVEL: II

DATE: 4/16/12

REVIEWER:

Edward P. Zolner Level III

DATE: 4/20/12

REVIEWER:

[Signature]

DATE: 4-21-12

Authorized Inspection Agency:

[Signature]

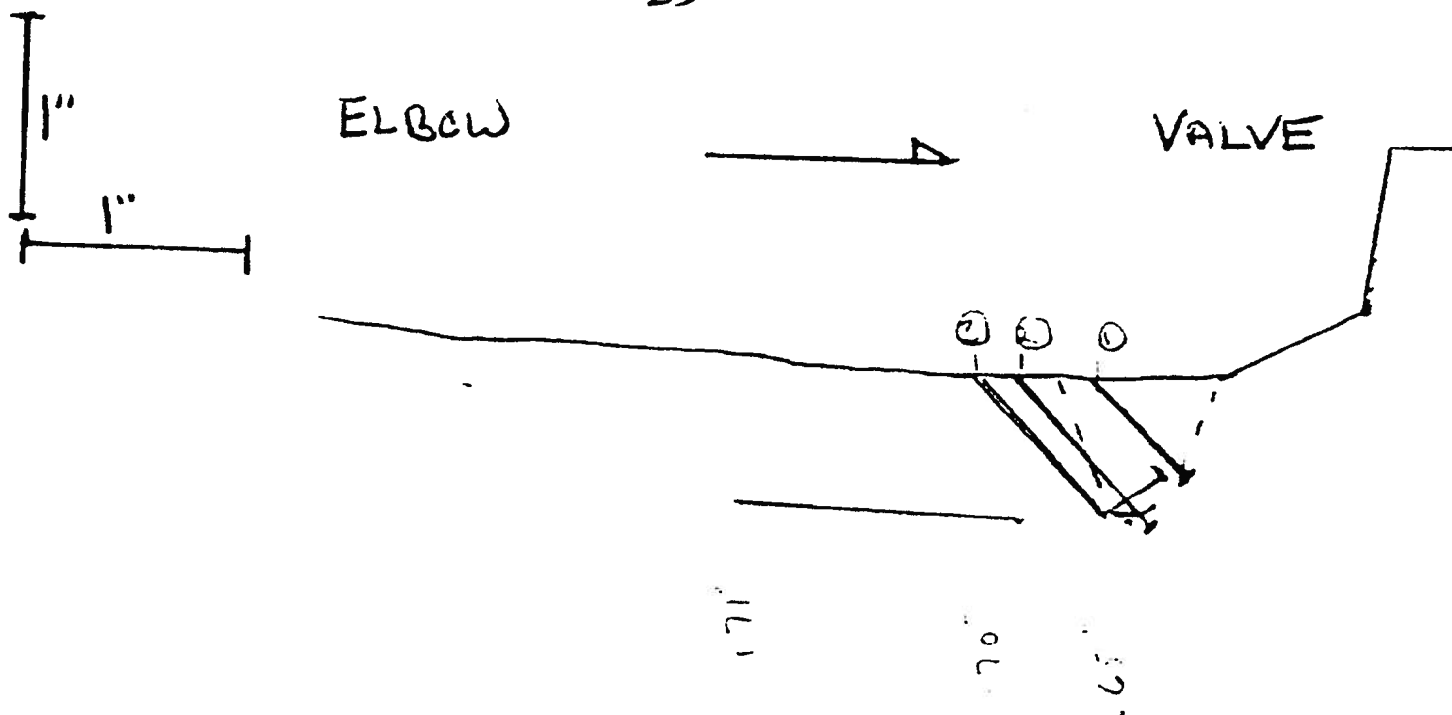
DATE: 4/21/12

INDICATION PLOT SHEET

Data Sheet No. A1R16-029
Page 5 of 8

PLANT Braidwood UNIT 1 TRANSDUCER 008H0P ANGLE 45°
EXAMINER Joseph Serth, Level II and Jason J. Jennings, Level II FREQUENCY 2.25 SIZE 4"
CALIBRATION BLOCK 22572 WELD ID # FW # 25 / SI DATE 4/16/2012

ISI Weld ISI-39-25 B9C
25 6/22/2012



WESDYNE REVIEW / DATE

Edward R. Zolner Level III 4/20/12

EXELON REVIEW / DATE

1700 III 4-21-12

ANII REVIEW / DATE

L. H. 4/21/12



A Westinghouse Electric Company

Calibration Data Sheet

Plant / Unit Braidwood / 1
 Company Exelon
 Comp / System FW #25 / SI
 Procedure No. EXE-PDI-UT-3
 Rev / Chng. No. 2 / 0
 Cal. Block No. 22572
 Cal. Block Temp. 63°F
 Thermometer S/N: SAP 106886
 Size 4" Sch. 160 / 0.531" "T"

Ref. Block:

N/A



Ferritic



Austenitic

Each Major CRT Div. = 0.1" / 0.14"Cal. Direction: ☒ Axial ☐ Circ. ☐ BothScan Area: 1 to Weld ☒
11 to Weld ☐

Code Category: R-A Code Item: R120 Type: Ultragel II
 Batch: 09225

ISI Weld

ISI-39-25

Examination Area / Weld

FW # 25

	INDICATIONS				EXAM
ACCESS	FLAW		NON RELEVANT		SENS.
	YES	NO	YES (>50% Ref.)	NO	(dB)
1 Sided	X			X	*

Remarks / Reason for Incomplete Scan(s)

COMPONENT TEMP: 63 °F

*=Adjusted as needed. Used AATT for thru wall sizing of embedded flaw. 45° showed the highest amplitude tip response. RL=0.41" T=0.65" Lower Tip=0.48". Thru wall dimension of 0.07". Flaw was observed with a 60° Shear.

Examiners: Joseph Serth [Signature] Level II Date 04/16/2012
 N/A Level N/A Date N/A

WesDyne Reviewer / Date: Edward P. Zoller 4/20/12Further Evaluation Required? ☒ Yes ☐ No

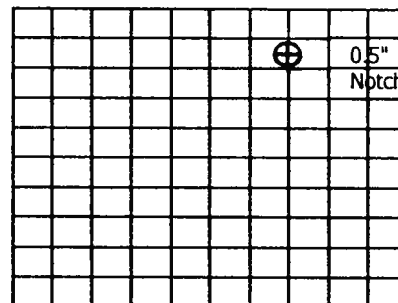
Data Sheet # A1R16-029
 Page 6 of 8

Cal. Checks	Time
Initial Calib.	13:00
Initial Calib. Date	04/16/2012
Intermediate	N/A
Intermediate	N/A
Final Calib.	16:00
Final Calib. Date	04/16/2012

Couplant

Ultragel II

09225



Search Unit #1

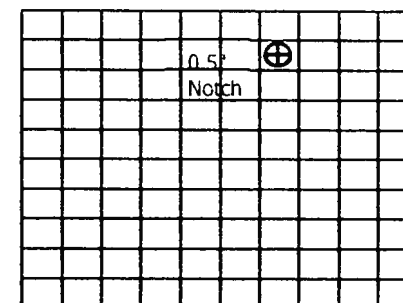
Manufacture: KBA
 Serial No.: 00MXC7
 No. of Elements: 1
 Size: 0.25" Shape: Round
 Freq. 5.0 MHz Style: Comp G
 Exam Angle: 45° Mode: Shear
 Measured Angle: 43°
 Wedge Style: MSWQC

Search Unit Cable

Type: RG-174
 Length: 6' No. of Con.: 0

Instrument Settings

Make / Model: GEIT USN 60 SW
 Serial No.: SAP 105204
 Probe Delay: 4.3156 Range: 1.0"
 M'tl Cal / Vel: 0.127 Pulser: Square
 Damping: 500 Reject: 0%
 PRF: Auto High Freq: 5.0 MHz
 Filter: Fixed Mode: Dual Off
 Rectify: Fullwave Voltage: 450
 Pulse Width: 100 ns
 Display Delay: 0
 Reference Sensitivity (dB)
 Axial: 26.8 dB Circ: N/A
 FSDH Sensitivity: N/A



Search Unit #2

Manufacture: KBA
 Serial No.: 00MM7N
 No. of Elements: 1
 Size: 0.25" Shape: Round
 Freq. 5.0 MHz Style: Comp G
 Exam Angle: 60° Mode: Shear
 Measured Angle: 58°
 Wedge Style: MSWQC

Search Unit Cable

Type: RG-174
 Length: 6' No. of Con.: 0

Instrument Settings

Make / Model: GEIT USN 60 SW
 Serial No.: SAP 105204
 Probe Delay: 4.6022 Range: 1.4"
 M'tl Cal / Vel: 0.127 Pulser: Square
 Damping: 500 Reject: 0%
 PRF: Auto High Freq: 5.0 MHz
 Filter: Fixed Mode: Dual Off
 Rectify: Fullwave Voltage: 450
 Pulse Width: 100 ns
 Display Delay: 0
 Reference Sensitivity (dB)
 Axial: 38.4 dB Circ: N/A
 FSDH Sensitivity: N/A

EXELON LEVEL III REVIEW / DATE

[Signature] 4-21-12

ANII REVIEW / DATE

[Signature] 4/21/12

ISI Weld
155-39-25

ATTACHMENT 3
ASME Planar Flaw Evaluation Form
Page 1 of 2

Pg 7 of 8

Component Number: <u>FW-25</u>		Exam Report #: <u>A1R16-029</u>	
Indication Number: <u>#1 / #3</u>		Flaw Type: <input type="checkbox"/> Surface <input checked="" type="checkbox"/> Subsurface	
ASME Table Utilized: <u>IWB-3514-2</u>		Examination Type: <input type="checkbox"/> Inservice <input checked="" type="checkbox"/> Preservice	
ASME Code Class: <input type="checkbox"/> Class 1	ASME Section XI Code Year: <u>2001 / 2003 Addenda</u>		
<input checked="" type="checkbox"/> Class 2	Acceptable: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		

Rounding off of values shall be performed as follows:

Express "a", "l", "t", Min Depth and Max Depth per paragraph 4.1.1	Allowable Flaw % to paragraph 4.1.3
"d", "2d", "0.4d", "S", "a/l", "a/t", "Y" per paragraph 4.1.2	

"t" 0.65 ☒ UT Thickness at location excluding cladding ☐ Nominal Wall Thickness

"l" 1.0 (Flaw length)

Min Depth: 0.40 x = 0.41 Max Depth: 0.50 x = 0.48"

☐ 1st Leg Sound Path x Cos Angle = Depth ☐ 2nd Leg 2t(Sound Path x Cos Angle) = Depth

☐ Plotted from cross sectional sketch ☒ Thru Wall Sizing ☐ Transducer Resolution – Reference note prior to 4.1.1

"S" 0.15 $\frac{0.65}{2} - 0.50 = 0.15 = "S"$

Minimum Flaw Distance to closest component surface = "S"

"2d" 0.10 $\frac{0.50}{2} - 0.40 = 0.10 = "2d"$

Max Depth minus Min Depth = "2d"

"0.4d" 0.02 $\frac{0.10}{(2d / 2) 0.4} = 0.05 \times 0.4 = 0.02 = "0.4d"$

Flaw Type: ☒ "Subsurface" if $S \geq 0.4d$ ☐ "Surface" if $S < 0.4d$, $a = 2d$ plus S

"d" 0.05 $\frac{0.10}{2} = 0.05 = "d"$

"2d" divided by 2 = "d"

"a" 0.05 "a" equals "d" for subsurface or "2d" plus "S" for surface

"Y" 1.0 Shall not exceed 1.00 $"S" / "a" = "Y"$ $\frac{0.10}{0.05} = 2.0 = "Y"$

"Y" functions to reduce the allowable flaw size as the distance to the surface decreases

"a/l" 0.05 Shall Not Exceed 0.50 $\frac{0.05}{1.0} = 0.05$

"a/t" **7.7%** Actual Flaw % $\frac{0.05}{0.65} = 0.077 \times 100$ **8.6%** Allowable Flaw %

Linear Interpolation Performed: ☐ Yes ☒ No See Attached Work Sheet: ☐ Yes ☒ No

Comments: Indication #1 & #3 are the same indications. Linear interpolation was not performed. The a/l of 0.05 has an a/t of 9.6Y for a thickness of 0.312" and 8.6Y for a thickness of 1.0" The actual a/t of 7.7% is less than the conservative value of 8.6%.

Preparer: <u>Jay Miller</u>	Date: <u>04/21/12</u>
Reviewer: <u>Edward P. Zolner Level III</u>	Date: <u>4/21/12</u>
ANII: <u>L. Miller</u>	Date: <u>4/21/12</u>

Plant/Unit : Braidwood / 1 Comp / System FW # 25 / SI

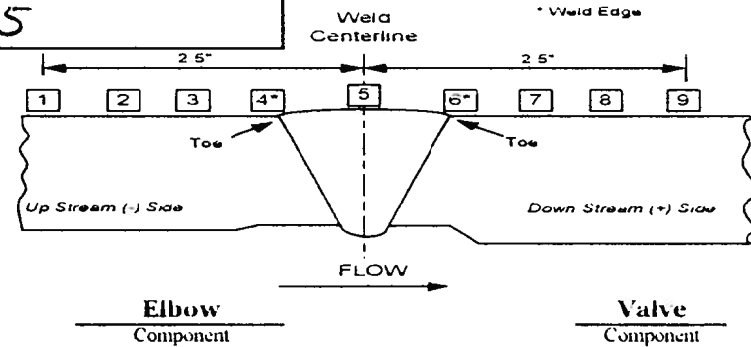
Iso. Drwg: 1SI-39

ISI Weld
ISI-39-25

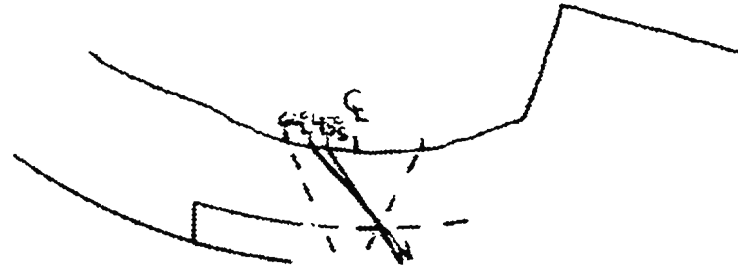
Weld / Component ID Number: FW # 25

Crown Height: **Flush**
Crown Width: **0.80"**
Diameter: **4.0"**
Weld Length: **14.25"**

Position	0	90	180	270
1	0.79"			
2	0.78"			
3	0.76"			
4	0.72"			
5	NR			
6	NR			
7	NR			
8	NR			
9	NR			



ELBOW → VALVE



COMMENTS:

EXAMINER: Joseph Scrlh Lv. II DATE 4/16/2012

Print Joseph Scrlh

EXAMINER: Jason J. Jennings Lv. II DATE: 4/16/2012

Print Jason J. Jennings

REVIEWER: Edward R. Zolner Lv. III DATE 4/21/12

REVIEWER: Jason J. Jennings Lv. II DATE: 4-21-12

Authorized Inspection Agency ISI

DATE 4/21/12

ATTACHMENT 6

Examination Datasheets for

2AF-01-24 (FW-3), 2AF-01-25 (FW-4), 2AF-02-23 (FW-1), 2AF-02-24 (FW-2), 2AF-03-23 (FW-1), 2AF-03-24 (FW-2), 2AF-04-20 (FW-3), 2AF-04-21 (FW-4), 2CV-21-56 (FW-2), 2CV-21-57 (FW-2), 2CV-21-58 (FW-1), and 2FW-09-25



UT Calibration Examination

Site/Unit: BRW / 2
 Summary No.: N/A
 Workscope: PSI

Procedure: ER-AA-335-030
 Procedure Rev.: 4
 Work Order No.: 01782044-02

Outage No.: N/A
 Report No.: UT-2015-007
 Page: 1 of 6

Code: ASME 2001 Edition / 2003 Addenda Cat./Item: N/A Location: Steam Tunnel
 Drawing No.: FX-15 Description: Elbow to Flange
 System ID: AF
 Component ID: Field Weld 3 Size/Length: 0.5" / 14.1" Thickness/Diameter: 0.337" / 4"
 Limitations: Single Sided Access Start Time: 1200 Finish Time: 1225

Instrument Settings
 Serial No.: 0221JM Manufacturer: GE Inspection Technologies Model: USN 60 SW Linearity: 2015-L-001
 Delay: 3.5741 Range: 1.0" M't'l Cal/Vel: 0.1270 Pulser Type: Square
 Damping: 500 Ohms Reject: 0% PRF: Auto High SU Freq.: 5.0 MHz Frequency: 5.0 MHz Rectify: Fullwave
 Voltage: 450 Pulse Width: 100
 Ax. Gain (dB): 21 Circ. Gain (dB): N/A
10 Screen Div. = 1 in. of Sound Path

Search Unit
 Serial No.: SC1493 Manufacturer: KB-Aerotech Size: 0.25" Model: Comp-G
 Freq.: 5.0 MHz Center Freq.: N/A Exam Angle: 45° Squint Angle: N/A
 Measured Angle: 46° Mode: Shear Exit Point: 0.2" # of Elements: 1
 Config.: Single Focus: N/A Shape: Round Contour: N/A
 Wedge Style: MSWQC

Search Unit Cable
 Type: RG-174 Length: 6' No. Conn.: 0

Cal. Checks	Time	Date
Initial Cal.	0720	8/13/2015
Inter. Cal.	1200	8/13/2015
Inter. Cal.	1215	8/13/2015
Inter. Cal.	N/A	
Final Cal.	1312	8/13/2015

Couplant
 Cal. Batch: 13C028
 Type: Ultragel II
 Mfg.: Sonotech
 Exam Batch: 13C028
 Type: Ultragel II
 Mfg.: Sonotech

Axial Oriented Search Unit			
Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
0.5" Notch	80%	7.2	0.72"
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

Circumferential Oriented Search Unit			
Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
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

Reference/Simulator Block				
Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
21	SDH	50%	4.5	0.45"
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A

Calibration Block
 Cal. Block No.: BWD-PDI-516-02 Thickness: 0.5" - 2.0" Dia.: Flat
 Cal. Blk. Temp.: 84° Temp. Tool: 29021141 Comp. Temp.: 106° Temp. Tool: 29021141
 Recordable Indication(s): Yes ☐ No ☒ (If Yes, Ref. Attached Ultrasonic Indication Report.)

Reference Block
 Serial No.: 142410 CS
 Type: 1" Angle Beam

Results: Accept ☒ Reject ☐ Info ☐
 Percent Of Coverage Obtained > 90%: No-90% Reviewed Previous Data: N/A

Comments: Cal Block BWD-PDI-516-02 demonstrated to be ultrasonically equivalent to Flaw Tech Cal Block 22571. Baseline Exam. Weld Doc 2A.

Examiner	Level	III	Signature	Date	Reviewer	Signature	Date
Crothers, Simon, P.			<i>Simon Crothers</i>	8/13/2015	N/A	N/A	
Examiner	Level	N/A	Signature	Date	Site Review	Signature	Date
N/A					Chris H. McKean LUT II	<i>Chris H. McKean</i>	10-1-15
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A					LEE MALABANAN	<i>L. Malaban</i>	10/2/15



UT Calibration/Examination

Site/Unit: BRW / 2
Summary No.: N/A
Workscope: PSI

Procedure: ER-AA-335-030
Procedure Rev.: 4
Work Order No.: 01782044-02

Outage No.: N/A
Report No.: UT-2015-007
Page: 2 of 6

Code: ASME 2001 Edition / 2003 Addenda Cat./Item: N/A Location: Steam Tunnel
Drawing No.: FX-15 Description: Elbow to Flange
System ID: AF
Component ID: Field Weld 3 Size/Length: 0.5" / 14.1" Thickness/Diameter: 0.337" / 4"
Limitations: Single Sided Access Start Time: 1200 Finish Time: 1225

Instrument Settings
Serial No.: 0221JM
Manufacturer: GE Inspection Technologies
Model: USN 60 SW Linearity: 2015-L-001
Delay: 4.9803 Range: 1.5"
MII Cal/Vel: 0.1270 Pulsar Type: Square
Damping: 500 Ohms Reject: 0%
PRF: Auto High SU Freq.: 5.0 MHz
Frequency: 5.0 MHz Rectify: Fullwave
Voltage: 450 Pulse Width: 100

Ax. Gain (dB): 33 Circ. Gain (dB): N/A
10 Screen Div. = 1.5 in. of Sound Path

Calibration Block
Cal. Block No. BWD-PDI-516-02
Thickness 0.5" - 2.0" Dia.: Flat
Cal. Blk. Temp. 84° Temp. Tool: 29021141
Comp. Temp. 106° Temp. Tool: 29021141

Recordable Indication(s): Yes ☒ No ☐ (If Yes, Ref. Attached Ultrasonic Indication Report.)
Results: Accept ☒ Reject ☐ Info ☐

Percent Of Coverage Obtained > 90%: No-90% Reviewed Previous Data: N/A

Search Unit
Serial No.: SC1489
Manufacturer: KB-Aerotech
Size: 0.25" Model: Comp-G
Freq.: 5.0 MHz Center Freq.: N/A
Exam Angle: 60° Squint Angle: N/A
Measured Angle: 60° Mode: Shear
Exit Point 0.25" # of Elements: 1
Config.: Single Focus: N/A
Shape: Round Contour: N/A
Wedge Style: MSWQC

Search Unit Cable
Type: RG-174 Length: 6' No. Conn.: 0

Scan Coverage
Upstream ☒ Downstream ☐ Scan dB: 39
CW ☐ CCW ☐ Scan dB: N/A
Exam Surface: OD
Surface Condition: Ground

Cal. Checks	Time	Date
Initial Cal.	0731	8/13/2015
Inter. Cal.	1216	8/13/2015
Inter. Cal.	1221	8/13/2015
Inter. Cal.	N/A	
Final Cal.	1313	8/13/2015

Couplant
Cal. Batch: 13C028
Type: Ultragel II
Mfg.: Sonotech

Exam Batch: 13C028
Type: Ultragel II
Mfg.: Sonotech

Reference Block
Serial No.: 142410 CS
Type: 1" Angle Beam

Axial Oriented Search Unit			
Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
0.5" Notch	80%	6.0	0.9"
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

Circumferential Oriented Search Unit			
Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
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

Reference/Simulator Block				
Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
28	SDH	80%	4:3	0.64"
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A

Comments: Cal Block BWD-PDI-516-02 demonstrated to be ultrasonically equivalent to Flaw Tech Cal Block 22571. Baseline Exam. Weld Doc 2A.

Examiner	Level	III	Signature	Date	Reviewer	Signature	Date
Crothers, Simon, P.			<i>Simon Crothers</i>	8/13/2015		<i>N/A</i>	<i>N/A</i>
Examiner	Level	N/A	Signature	Date	Site Review	Signature	Date
N/A					<i>Chris H. McKean</i>	<i>Chris H. McKean</i>	10-1-15
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A					<i>LEE MALABANAN</i>	<i>L. Malaban</i>	10/2/15



UT Calibration Examination

Site/Unit: BRW / 2 Procedure: ER-AA-335-030 Outage No.: N/A
 Summary No.: N/A Procedure Rev.: 4 Report No.: UT-2015-007
 Workscope: PSI Work Order No.: 01782044-02 Page: 3 of 6

Code: ASME 2001 Edition / 2003 Addenda Cat./Item: N/A Location: Steam Tunnel
 Drawing No.: FX-15 Description: Elbow to Flange
 System ID: AF
 Component ID: Field Weld 3 Size/Length: 0.5" / 14.1" Thickness/Diameter: 0.337" / 4"
 Limitations: Single Sided Access Start Time: 1200 Finish Time: 1225

Instrument Settings				Search Unit				Cal. Checks			Axial Oriented Search Unit				
Serial No.:	<u>0221JM</u>			Serial No.:	<u>0112WB</u>			Initial Cal.	<u>0739</u>	<u>8/13/2015</u>	Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path	
Manufacturer:	<u>GE Inspection Technologies</u>			Manufacturer:	<u>KB-Aerotech</u>			Inter. Cal.	<u>1221</u>	<u>8/13/2015</u>	<u>0.5" Notch</u>	<u>80%</u>	<u>7.6</u>	<u>1.52"</u>	
Model:	<u>USN 60 SW</u>	Linearity:	<u>2015-L-001</u>	Size:	<u>0.25"</u>	Model:	<u>Comp-G</u>	Inter. Cal.	<u>1225</u>	<u>8/13/2015</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	
Delay:	<u>6.2216</u>	Range:	<u>2.0"</u>	Freq.:	<u>5.0 MHz</u>	Center Freq.:	<u>N/A</u>	Inter. Cal.	<u>N/A</u>		<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	
M'tl Cal/Vel:	<u>0.1270</u>	Pulser Type:	<u>Square</u>	Exam Angle:	<u>70°</u>	Squint Angle:	<u>N/A</u>	Final Cal.	<u>1314</u>	<u>8/13/2015</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	
Damping:	<u>500 Ohms</u>	Reject:	<u>0%</u>	Measured Angle:	<u>71°</u>	Mode:	<u>Shear</u>	Couplant							
PRF:	<u>Auto High</u>	SU Freq.:	<u>5.0 MHz</u>	Exit Point	<u>0.3"</u>	# of Elements:	<u>1</u>	Cal. Batch:	<u>13C028</u>						
Frequency:	<u>5.0 MHz</u>	Rectify:	<u>Fullwave</u>	Config.:	<u>Single</u>	Focus:	<u>N/A</u>	Type:	<u>Ultragel II</u>						
Voltage:	<u>450</u>	Pulse Width:	<u>100</u>	Shape:	<u>Round</u>	Contour:	<u>N/A</u>	Mfg.:	<u>Sonotech</u>						
				Wedge Style:	<u>MSWQC</u>			Exam Batch:	<u>13C028</u>						
				Search Unit Cable				Type:	<u>Ultragel II</u>						
				Type:	<u>RG-174</u>	Length:	<u>6'</u>	Mfg.:	<u>Sonotech</u>						
				Scan Coverage				Reference Block							
Cal. Block No.	<u>BWD-PDI-516-02</u>			Upstream	<input checked="" type="checkbox"/>	Downstream	<input type="checkbox"/>	Scan dB:	<u>42</u>						
Thickness	<u>0.5" - 2.0"</u>			Dia.:	<u>Flat</u>			CW	<input type="checkbox"/>	CCW	<input type="checkbox"/>	Scan dB:	<u>N/A</u>		
Cal. Blk. Temp.	<u>84°</u>	Temp. Tool:	<u>29021141</u>	Exam Surface:	<u>OD</u>			Serial No.:	<u>142410 CS</u>						
Comp. Temp.	<u>106°</u>	Temp. Tool:	<u>29021141</u>	Surface Condition:	<u>Ground</u>			Type:	<u>1" Angle Beam</u>						
Recordable Indication(s): Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> (If Yes, Ref. Attached Ultrasonic Indication Report.)															
Results: Accept <input checked="" type="checkbox"/> Reject <input type="checkbox"/> Info <input type="checkbox"/>															
Percent Of Coverage Obtained > 90%: <u>No-90%</u> Reviewed Previous Data: <u>N/A</u>															
Comments: Cal Block BWD-PDI-516-02 demonstrated to be ultrasonically equivalent to Flaw Tech Cal Block 22571. Baseline Exam. Weld Doc 2A.															

Examiner	Level	III	Signature	Date	Reviewer	Signature	Date
Crothers, Simon, P.			<i>Simon Crothers</i>	8/13/2015	<i>N/A</i>	<i>N/A</i>	
Examiner	Level	N/A	Signature	Date	Site Review	Signature	Date
N/A					<i>Chris H. McKean</i>	<i>Chris H. McKean</i>	10-1-15
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A					<i>LEE MANABANDI</i>	<i>J. Manabandi</i>	10/2/15

Summary No.: **N/A**

Sketch or Photo:

Work Package: 01782044-02

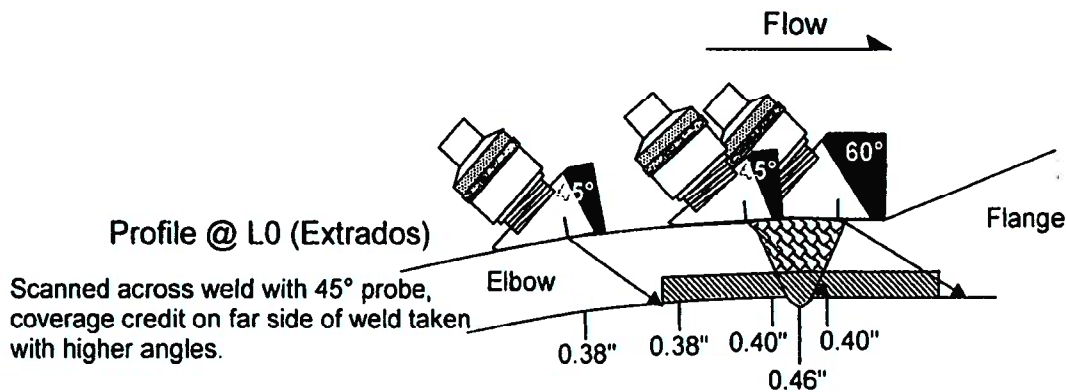
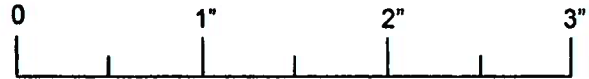
Weld: FW-3

Sketch 1: Coverage Plot

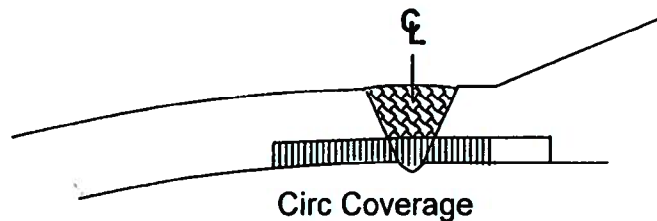
Weld Crown Width: 0.5"

Counterbore US: None

Counterbore DS: None



Note: 70° used to obtain remaining coverage, scan limited to area shown.



Coverage Calc:

- Axial Coverage = 100%
- Circ Coverage = 1.2" of 1.5" exam box width = 80%
- Total = (100% + 80%)/2 = 90%

Chris H. McKelvey
Ch. H. McKelvey
 EXELON LV III 10-1-15

Simon Crothers

ANI / ANII REVIEW
 REVIEW DATE 10/2/15

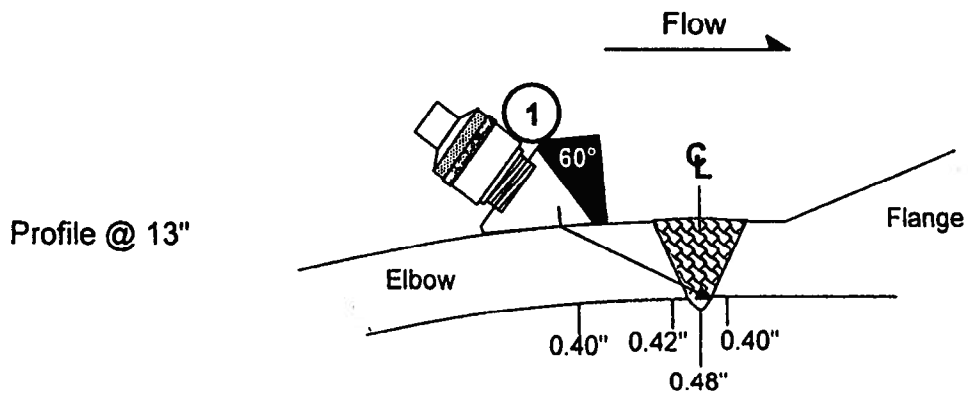
Summary No.: N/A

Sketch or Photo:

Work Package: 01782044-02

Weld: FW-3

Sketch 2: Indication Plot



① Root Geometry, seen intermittently 360°



Chris H. McKean
Ch. H. McKean
 EXELON LV III 10-1-15

Simon Crothers

ANI / ANII REVIEW
 REVIEW DATE 2 Nov 10/2/15



Ultrasonic Indication Report

Site/Unit: BRW / 2
 Summary No.: N/A
 Workscope: PSI

Procedure: ER-AA-335-030
 Procedure Rev.: 4
 Work Order No.: 01782044-02

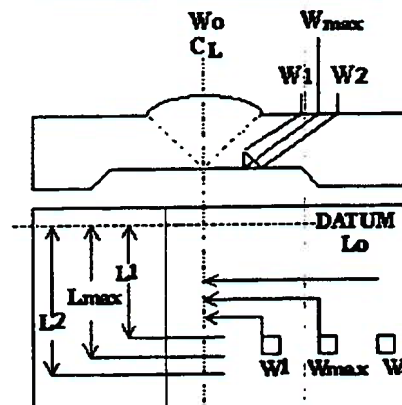
Outage No.: N/A
 Report No.: UT-2015-007
 Page: 6 of 6

Search Unit Angle: 60 °
 Wo Location: Centerline
 Lo Location: Extrados

- ☒ Piping Welds
☐ Ferritic Vessels $\geq 2''T$
☐ Other N/A

MP	Metal Path	Wmax	Distance From Wo To S.U. At Maximum Response
RBR	Remaining Back Reflection	W1	Distance From Wo At <u>N/A</u> Of Max (Forward)
L	Distance From Datum	W2	Distance From Wo At <u>N/A</u> Of Max (Backward)

Comments: **Field Weld 3**



Angle	Indication No.	% Of DAC	W Max		Forward N/A Of Max		Backward N/A Of Max		L1 N/A Of Max	L Max	L2 N/A Of Max	RBR Amp.	Remarks
			W	MP	W1	MP	W2	MP					
60°	1	80%	0.75"	0.9"	N/A	N/A	N/A	N/A	N/A	13"	N/A	N/A	Root Geometry from US side.

Examiner	Level	III	Signature	Date	Reviewer	Signature	Date
Crothers, Simon, P.			<i>Simon Crothers</i>	8/13/2015	<i>N/A</i>	<i>N/A</i>	
Examiner	Level	N/A	Signature	Date	Site Review	Signature	Date
N/A					<i>Mark Sebbey</i>	<i>Mark Sebbey</i>	8/14/15
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A					<i>LEE MALABANAN</i>	<i>L. Malaban</i>	10/2/15



UT Calibration Examination

2AF-01-25

Site/Unit: BRW / 2
Summary No.: N/A
Workscope: PSI

Procedure: ER-AA-335-030
Procedure Rev.: 4
Work Order No.: 01782044-02

Outage No.: N/A
Report No.: UT-2015-008
Page: 1 of 6

Code: ASME 2001 Edition / 2003 Addenda Cat./Item: N/A Location: Steam Tunnel

Drawing No.: FX-15 Description: Flange to Elbow

System ID: AF

Component ID: Field Weld 4 Size/Length: 0.6" / 14.1" Thickness/Diameter: 0.337" / 4"

Limitations: Single Sided Access Start Time: 1200 Finish Time: 1225

Instrument Settings				Search Unit				Cal. Checks			Axial Oriented Search Unit																												
Serial No.:	<u>0221JM</u>			Serial No.:	<u>SC1493</u>			Initial Cal.	<u>0720</u>	<u>8/13/2015</u>	Calibration Reflector	<u>0.5" Notch</u>	<u>80%</u>	<u>7/2</u>	<u>0.72"</u>																								
Manufacturer:	<u>GE Inspection Technologies</u>			Manufacturer:	<u>KB-Aerotech</u>			Inter. Cal.	<u>1200</u>	<u>8/13/2015</u>		<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>																								
Model:	<u>USN 60 SW</u>	Linearity:	<u>2015-L-001</u>	Size:	<u>0.25"</u>	Model:	<u>Comp-G</u>	Inter. Cal.	<u>1215</u>	<u>8/13/2015</u>		<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>																								
Delay:	<u>3.5741</u>	Range:	<u>1.0"</u>	Freq.:	<u>5.0 MHz</u>	Center Freq.:	<u>N/A</u>	Inter. Cal.	<u>N/A</u>			<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>																								
M'tl Cal/Vel:	<u>0.1270</u>	Pulser Type:	<u>Square</u>	Exam Angle:	<u>45°</u>	Squint Angle:	<u>N/A</u>	Final Cal.	<u>1312</u>	<u>8/13/2015</u>		<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>																								
Damping:	<u>500 Ohms</u>	Reject:	<u>0%</u>	Measured Angle:	<u>46°</u>	Mode:	<u>Shear</u>	<table border="1"> <thead> <tr> <th colspan="4">Circumferential Oriented Search Unit</th> </tr> <tr> <th>Calibration Reflector</th> <th>Signal Amplitude %</th> <th>Sweep Division</th> <th>Sound Path</th> </tr> </thead> <tbody> <tr> <td><u>N/A</u></td> <td><u>N/A</u></td> <td><u>N/A</u></td> <td><u>N/A</u></td> </tr> <tr> <td><u>N/A</u></td> <td><u>N/A</u></td> <td><u>N/A</u></td> <td><u>N/A</u></td> </tr> <tr> <td><u>N/A</u></td> <td><u>N/A</u></td> <td><u>N/A</u></td> <td><u>N/A</u></td> </tr> <tr> <td><u>N/A</u></td> <td><u>N/A</u></td> <td><u>N/A</u></td> <td><u>N/A</u></td> </tr> </tbody> </table>								Circumferential Oriented Search Unit				Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>
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PRF:	<u>Auto High</u>	SU Freq.:	<u>5.0 MHz</u>	Exit Point	<u>0.2"</u>	# of Elements:	<u>1</u>																																
Frequency:	<u>5.0 MHz</u>	Rectify:	<u>Fullwave</u>	Config.:	<u>Single</u>	Focus:	<u>N/A</u>	<table border="1"> <thead> <tr> <th colspan="4">Reference/Simulator Block</th> </tr> <tr> <th>Gain dB</th> <th>Reflector</th> <th>Signal Amplitude %</th> <th>Sweep Division</th> <th>Sound Path</th> </tr> </thead> <tbody> <tr> <td><u>21</u></td> <td><u>SDH</u></td> <td><u>50%</u></td> <td><u>4.5</u></td> <td><u>0.45"</u></td> </tr> <tr> <td><u>N/A</u></td> <td><u>N/A</u></td> <td><u>N/A</u></td> <td><u>N/A</u></td> <td><u>N/A</u></td> </tr> <tr> <td><u>N/A</u></td> <td><u>N/A</u></td> <td><u>N/A</u></td> <td><u>N/A</u></td> <td><u>N/A</u></td> </tr> </tbody> </table>								Reference/Simulator Block				Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path	<u>21</u>	<u>SDH</u>	<u>50%</u>	<u>4.5</u>	<u>0.45"</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>
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Voltage:	<u>450</u>	Pulse Width:	<u>100</u>	Shape:	<u>Round</u>	Contour:	<u>N/A</u>																																

Ax. Gain (dB): 21 Circ. Gain (dB): N/A
10 Screen Div. = 1 in. of Sound Path

Search Unit Cable
Type: RG-174 Length: 6' No. Conn.: 0

Calibration Block
Cal. Block No. BWD-PDI-516-02
Thickness 0.5" - 2.0" Dia.: Flat
Cal. Blk. Temp. 84° Temp. Tool: 29021141
Comp. Temp. 106° Temp. Tool: 29021141

Scan Coverage
Upstream ☐ Downstream ☒ Scan dB: 33
CW ☒ CCW ☒ Scan dB: 39
Exam Surface: OD
Surface Condition: Ground

Couplant
Cal. Batch: 13C028
Type: Ultragel II
Mfg.: Sonotech
Exam Batch: 13C028
Type: Ultragel II
Mfg.: Sonotech

Reference Block
Serial No.: 142410 CS
Type: 1" Angle Beam

Recordable Indication(s): Yes ☐ No ☒ (If Yes, Ref. Attached Ultrasonic Indication Report.)

Results: Accept ☒ Reject ☐ Info ☐

Percent Of Coverage Obtained > 90%: No-89% Reviewed Previous Data: N/A

Comments: Cal Block BWD-PDI-516-02 demonstrated to be ultrasonically equivalent to Flaw Tech Cal Block 22571. Baseline Exam. Weld Doc 2A.

Examiner	Level	Signature	Date	Reviewer	Signature	Date
Crothers, Simon, P.	III	<i>Simon Crothers</i>	8/13/2015	<u>N/A</u>	<u>N/A</u>	
Examiner	Level	Signature	Date	Site Review	Signature	Date
<u>N/A</u>	<u>N/A</u>			<u>Chris H. McKee</u>	<u>10-1-15</u>	
Other	Level	Signature	Date	ANII Review	Signature	Date
<u>N/A</u>	<u>N/A</u>			<u>LEE MARRABIAN</u>	<u>10/2/15</u>	



UT Calibration Examination

Site/Unit: BRW / 2
 Summary No.: N/A
 Workscope: PSI

Procedure: ER-AA-335-030
 Procedure Rev.: 4
 Work Order No.: 01782044-02

Outage No.: N/A
 Report No.: UT-2015-008
 Page: 2 of 6

Code: ASME 2001 Edition / 2003 Addenda Cat./Item: N/A Location: Steam Tunnel
 Drawing No.: FX-15 Description: Flange to Elbow
 System ID: AF
 Component ID: Field Weld 4 Size/Length: 0.6" / 14.1" Thickness/Diameter: 0.337" / 4"
 Limitations: Single Sided Access Start Time: 1200 Finish Time: 1225

Instrument Settings
 Serial No.: 0221JM
 Manufacturer: GE Inspection Technologies
 Model: USN 60 SW Linearity: 2015-L-001
 Delay: 4.9803 Range: 1.5"
 M'tl Cal/Vel: 0.1270 Pulsar Type: Square
 Damping: 500 Ohms Reject: 0%
 PRF: Auto High SU Freq.: 5.0 MHz
 Frequency: 5.0 MHz Rectify: Fullwave
 Voltage: 450 Pulse Width: 100
 Ax. Gain (dB): 33 Circ. Gain (dB): N/A
10 Screen Div. = 1.5 in. of Sound Path

Search Unit
 Serial No.: SC1489
 Manufacturer: KB-Aerotech
 Size: 0.25" Model: Comp-G
 Freq.: 5.0 MHz Center Freq.: N/A
 Exam Angle: 60° Squint Angle: N/A
 Measured Angle: 60° Mode: Shear
 Exit Point 0.25" # of Elements: 1
 Config.: Single Focus: N/A
 Shape: Round Contour: N/A
 Wedge Style: MSWQC

Search Unit Cable
 Type: RG-174 Length: 6' No. Conn.: 0

Cal. Checks	Time	Date
Initial Cal.	0731	8/13/2015
Inter. Cal.	1216	8/13/2015
Inter. Cal.	1221	8/13/2015
Inter. Cal.	N/A	
Final Cal.	1313	8/13/2015

Couplant
 Cal. Batch: 13C028
 Type: Ultragel II
 Mfg.: Sonotech
 Exam Batch: 13C028
 Type: Ultragel II
 Mfg.: Sonotech

Axial Oriented Search Unit			
Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
0.5" Notch	80%	6.0	0.9"
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

Circumferential Oriented Search Unit			
Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
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

Reference/Simulator Block				
Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
28	SDH	80%	4.3	0.64"
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A

Calibration Block
 Cal. Block No. BWD-PDI-516-02
 Thickness 0.5" - 2.0" Dia.: Flat
 Cal. Blk. Temp. 84° Temp. Tool: 29021141
 Comp. Temp. 106° Temp. Tool: 29021141
 Recordable Indication(s): Yes ☒ No ☐ (If Yes, Ref. Attached Ultrasonic Indication Report.)
 Results: Accept ☒ Reject ☐ Info ☐

Scan Coverage
 Upstream ☐ Downstream ☒ Scan dB: 39
 CW ☐ CCW ☐ Scan dB: N/A
 Exam Surface: OD
 Surface Condition: Ground

Reference Block
 Serial No.: 142410 CS
 Type: 1" Angle Beam

Comments: Cal Block BWD-PDI-516-02 demonstrated to be ultrasonically equivalent to Flaw Tech Cal Block 22571. Baseline Exam. Weld Doc 2A.

Percent Of Coverage Obtained > 90%: No-89% Reviewed Previous Data: N/A

Examiner	Level	III	Signature	Date	Reviewer	Signature	Date
Crothers, Simon, P.			<i>Simon Crothers</i>	8/13/2015	N/A	<i>N/A</i>	
Examiner	Level	N/A	Signature	Date	Site Review	Signature	Date
N/A					Chris H. McKean	<i>Chris H. McKean</i>	10-1-15
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A					LEE MALABANAN	<i>J. Malabanan</i>	10/2/15



UT Calibration/Examination

Site/Unit: BRW / 2
Summary No.: N/A
Workscope: PSI

Procedure: ER-AA-335-030
Procedure Rev.: 4
Work Order No.: 01782044-02

Outage No.: N/A
Report No.: UT-2015-008
Page: 3 of 6

Code: ASME 2001 Edition / 2003 Addenda Cat./Item: N/A Location: Steam Tunnel
Drawing No.: FX-15 Description: Flange to Elbow
System ID: AF
Component ID: Field Weld 4 Size/Length: 0.6" / 14.1" Thickness/Diameter: 0.337" / 4"
Limitations: Single Sided Access Start Time: 1200 Finish Time: 1225

Instrument Settings
Serial No.: 0221JM
Manufacturer: GE Inspection Technologies
Model: USN 60 SW Linearity: 2015-L-001
Delay: 6.2216 Range: 2.0"
M'il Cal/Vel: 0.1270 Pulser Type: Square
Damping: 500 Ohms Reject: 0%
PRF: Auto High SU Freq.: 5.0 MHz
Frequency: 5.0 MHz Rectify: Fullwave
Voltage: 450 Pulse Width: 100

Ax. Gain (dB): 42 Circ. Gain (dB): N/A
10 Screen Div. = 2 in. of Sound Path

Search Unit
Serial No.: 0112WB
Manufacturer: KB-Aerotech
Size: 0.25" Model: Comp-G
Freq.: 5.0 MHz Center Freq.: N/A
Exam Angle: 70° Squint Angle: N/A
Measured Angle: 71° Mode: Shear
Exit Point 0.3" # of Elements: 1
Config.: Single Focus: N/A
Shape: Round Contour: N/A
Wedge Style: MSWQC

Cal. Checks	Time	Date
Initial Cal.	0739	8/13/2015
Inter. Cal.	1221	8/13/2015
Inter. Cal.	1225	8/13/2015
Inter. Cal.	N/A	
Final Cal.	1314	8/13/2015

Couplant
Cal. Batch: 13C028
Type: Ultragel II
Mfg.: Sonotech

Exam Batch: 13C028
Type: Ultragel II
Mfg.: Sonotech

Axial Oriented Search Unit			
Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
0.5" Notch	80%	7.6	1.52"
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

Circumferential Oriented Search Unit			
Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
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

Reference/Simulator Block				
Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
41	SDH	80%	5.0	1.0"
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A

Calibration Block
Cal. Block No. BWD-PDI-516-02
Thickness 0.5" - 2.0" Dia.: Flat
Cal. Blk. Temp. 84° Temp. Tool: 29021141
Comp. Temp. 106° Temp. Tool: 29021141

Scan Coverage
Upstream ☐ Downstream ☒ Scan dB: 42
CW ☐ CCW ☐ Scan dB: N/A
Exam Surface: OD
Surface Condition: Ground

Reference Block
Serial No.: 142410 CS
Type: 1" Angle Beam

Recordable Indication(s): Yes ☐ No ☒ (If Yes, Ref. Attached Ultrasonic Indication Report.)

Results: Accept ☒ Reject ☐ Info ☐

Comments: Cal Block BWD-PDI-516-02 demonstrated to be ultrasonically equivalent to Flaw Tech Cal Block 22571. Baseline Exam. Weld Doc 2A.

Percent Of Coverage Obtained > 90%: No-89% Reviewed Previous Data: N/A

Examiner	Level	III	Signature	Date	Reviewer	Signature	Date
Crothers, Simon, P.			<i>Simon Crothers</i>	8/13/2015		<i>N/A</i>	
Examiner	Level	N/A	Signature	Date	Site Review	Signature	Date
N/A					<i>Chris H. McKee</i>	<i>Chris H. McKee</i>	10-1-15
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A					<i>LEE MALABANAN</i>	<i>L. Malaban</i>	10/2/15

Summary-No.: N/A

Sketch or Photo:

Work Package: 01782044-02

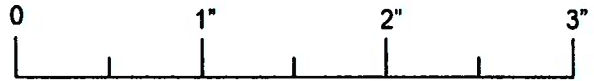
Weld: FW-4

Sketch 1: Coverage Plot

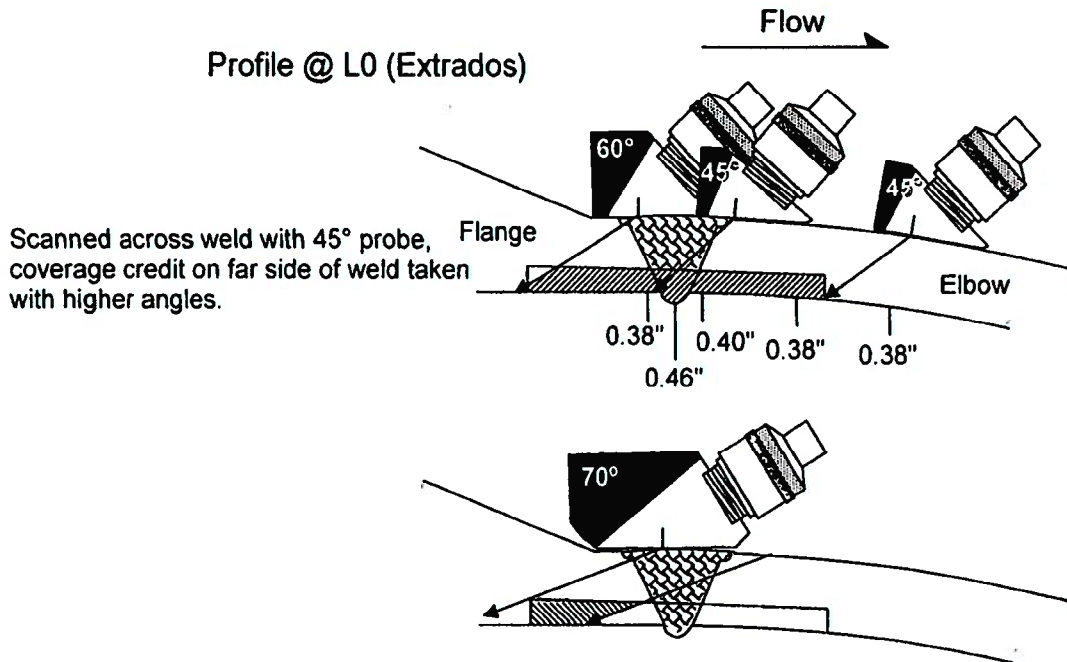
Weld Crown Width: 0.6"

Counterbore US: None

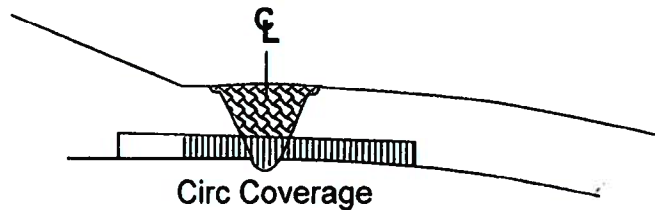
Counterbore DS: None



Profile @ L0 (Extrados)



Note: 70° used to obtain remaining coverage, scan limited to area shown.



Coverage Calc:

- Axial Coverage = 100%
- Circ Coverage = 1.25" of 1.6" exam box width = 78%
- Total = (100% + 78%)/2 = 89%

Simon Crothers

ANI / ANII REVIEW

REVIEW DATE 2/10/15

Chris H. McKean
CH McKean
 EXELON LUT 10-1-15

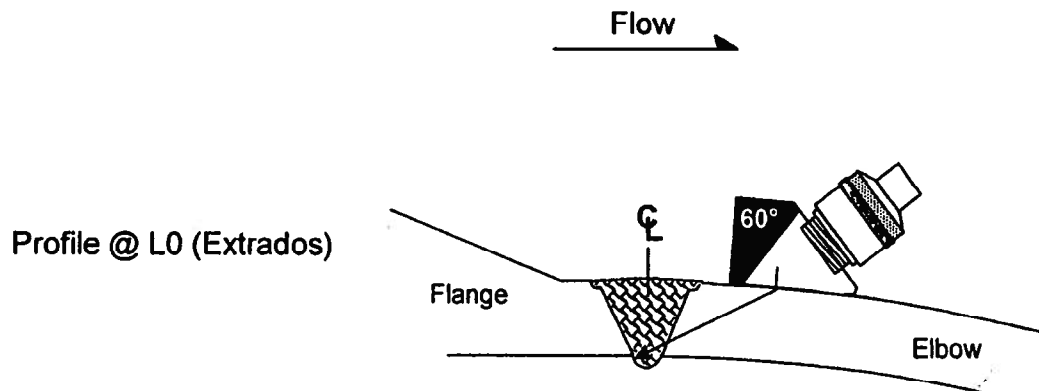
Summary No.: N/A

Sketch or Photo:

Work Package: 01782044-02

Weld: FW-4

Sketch 2: Indication Plot



① Root Geometry, seen intermittently 360°



Chris H. McKean

CHM

EXELON LU III 10-1-15

Simon Crothers

ANI / ANII REVIEW
REVIEW DATE 10/2/15



Ultrasonic Indication Report

Site/Unit: BRW / 2
 Summary No.: N/A
 Workscope: PSI

Procedure: ER-AA-335-030
 Procedure Rev.: 4
 Work Order No.: 01782044-02

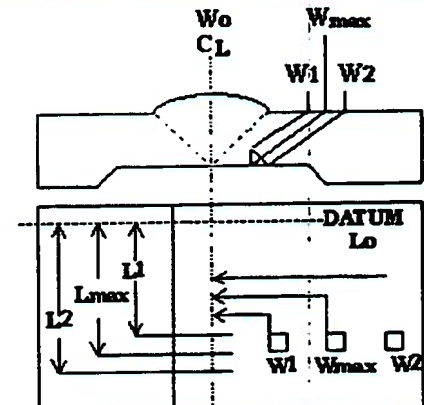
Outage No.: N/A
 Report No.: UT-2015-008
 Page: 6 of 6

Search Unit Angle: 60 °
 Wo Location: Centerline
 Lo Location: Extrados

- ☒ Piping Welds
☐ Ferritic Vessels $\geq 2^{\circ}T$
☐ Other N/A

MP	Metal Path	Wmax	Distance From Wo To S.U. At Maximum Response
RBR	Remaining Back Reflection	W1	Distance From Wo At <u>N/A</u> Of Max (Forward)
L	Distance From Datum	W2	Distance From Wo At <u>N/A</u> Of Max (Backward)

Comments: **Field Weld 4**



Angle	Indication No.	% Of DAC	W Max		Forward N/A Of Max		Backward N/A Of Max		L1 N/A Of Max	L Max	L2 N/A Of Max	RBR Amp.	Remarks
			W	MP	W1	MP	W2	MP					
60°	1	70%	0.7"	0.85"	N/A	N/A	N/A	N/A	N/A	0"	N/A	N/A	Root Geometry from DS side.

Examiner	Level	III	Signature	Date	Reviewer	Signature	Date
Crothers, Simon, P.			<i>Simon Crothers</i>	8/13/2015	<i>N/A</i>	<i>N/A</i>	
Examiner	Level	N/A	Signature	Date	Site Review	Signature	Date
N/A					<i>Mark Seib</i>	<i>Mark Seib</i>	8/14/15
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A					<i>LEE MALABANAN</i>	<i>L. Malaban</i>	10/2/15



UT Calibration/Examination

2AF-02-23

Site/Unit: BRW / 2
Summary No.: N/A
Workscope: PSI

Procedure: ER-AA-335-030
Procedure Rev.: 4
Work Order No.: 01782044-02

Outage No.: N/A
Report No.: UT-2015-005
Page: 1 of 4

Code: ASME 2001 Edition / 2003 Addenda Cat./Item: N/A Location: Steam Tunnel
Drawing No.: FX-15 Description: Elbow to Flange
System ID: AF
Component ID: Field Weld 1 Size/Length: 0.5" / 14.1" Thickness/Diameter: 0.337" / 4"
Limitations: Single Sided Access Start Time: 0953 Finish Time: 1015

Instrument Settings
Serial No.: 0221JM
Manufacturer: GE Inspection Technologies
Model: USN 60 SW Linearity: 2015-L-001
Delay: 3.5741 Range: 1.0"
M/I Cal/Vel: 0.1270 Pulsar Type: Square
Damping: 500 Ohms Reject: 0%
PRF: Auto High SU Freq.: 5.0 MHz
Frequency: 5.0 MHz Rectify: Fullwave
Voltage: 450 Pulse Width: 100

Search Unit
Serial No.: SC1493
Manufacturer: KB-Aerotech
Size: 0.25" Model: Comp-G
Freq.: 5.0 MHz Center Freq.: N/A
Exam Angle: 45° Squint Angle: N/A
Measured Angle: 46° Mode: Shear
Exit Point 0.2" # of Elements: 1
Config.: Single Focus: N/A
Shape: Round Contour: N/A
Wedge Style: MSWQC

Ax. Gain (dB): 21 Circ. Gain (dB): N/A
10 Screen Div. = 1 in. of Sound Path

Calibration Block
Cal. Block No. BWD-PDI-516-02
Thickness 0.5" - 2.0" Dia.: Flat
Cal. Blk. Temp. 84° Temp. Tool: 29021141
Comp. Temp. 98° Temp. Tool: 29021141

Recordable Indication(s): Yes ☐ No ☒ (If Yes, Ref. Attached Ultrasonic Indication Report.)

Results: Accept ☒ Reject ☐ Info ☐

Percent Of Coverage Obtained > 90%: No-90% Reviewed Previous Data: N/A

Cal. Checks	Time	Date
Initial Cal.	0720	8/13/2015
Inter. Cal.	0953	8/13/2015
Inter. Cal.	1003	8/13/2015
Inter. Cal.	N/A	
Final Cal.	1312	8/13/2015

Couplant
Cal. Batch: 13C028
Type: Ultragel II
Mfg.: Sonotech
Exam Batch: 13C028
Type: Ultragel II
Mfg.: Sonotech

Reference Block
Serial No.: 142410 CS
Type: 1" Angle Beam

Axial Oriented Search Unit				
Calibration Reflector		Signal Amplitude %	Sweep Division	Sound Path
0.5" Notch		80%	7.2	0.72"
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
Circumferential Oriented Search Unit				
Calibration Reflector		Signal Amplitude %	Sweep Division	Sound Path
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
Reference/Simulator Block				
Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
21	SDH	50%	4.5	0.45"
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A

Comments: Cal Block BWD-PDI-516-02 demonstrated to be ultrasonically equivalent to Flaw Tech Cal Block 22571. Baseline Exam. Weld Doc 2A.

Examiner	Level	III	Signature	Date	Reviewer	Signature	Date
Crothers, Simon, P.			<i>Simon Crothers</i>	8/13/2015	N/A	<i>N/A</i>	
Examiner	Level	N/A	Signature	Date	Site Review	Signature	Date
N/A					<i>Chris H. McKean</i>	<i>Chris H. McKean</i>	10-1-15
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A					<i>LGE MALABANAN</i>	<i>LGE MALABANAN</i>	10/2/15



UT Calibration Examination

Site/Unit: BRW / 2
Summary No.: N/A
Workscope: PSI

Procedure: ER-AA-335-030
Procedure Rev.: 4
Work Order No.: 01782044-02

Outage No.: N/A
Report No.: UT-2015-005
Page: 2 of 4

Code: ASME 2001 Edition / 2003 Addenda Cat./Item: N/A Location: Steam Tunnel
Drawing No.: FX-15 Description: Elbow to Flange
System ID: AF
Component ID: Field Weld 1 Size/Length: 0.5" / 14.1" Thickness/Diameter: 0.337" / 4"
Limitations: Single Sided Access Start Time: 0953 Finish Time: 1015

Instrument Settings
Serial No.: 0221JM
Manufacturer: GE Inspection Technologies
Model: USN 60 SW Linearity: 2015-L-001
Delay: 4.9803 Range: 1.5"
M'tl Cal/Vel: 0.1270 Pulsar Type: Square
Damping: 500 Ohms Reject: 0%
PRF: Auto High SU Freq.: 5.0 MHz
Frequency: 5.0 MHz Rectify: Fullwave
Voltage: 450 Pulse Width: 100

Ax. Gain (dB): 33 Circ. Gain (dB): N/A
10 Screen Div. = 1.5 in. of Sound Path

Search Unit
Serial No.: SC1489
Manufacturer: KB-Aerotech
Size: 0.25" Model: Comp-G
Freq.: 5.0 MHz Center Freq.: N/A
Exam Angle: 60° Squint Angle: N/A
Measured Angle: 60° Mode: Shear
Exit Point 0.25" # of Elements: 1
Config.: Single Focus: N/A
Shape: Round Contour: N/A
Wedge Style: MSWQC

Cal. Checks	Time	Date
Initial Cal.	0731	8/13/2015
Inter. Cal.	1004	8/13/2015
Inter. Cal.	1012	8/13/2015
Inter. Cal.	N/A	
Final Cal.	1313	8/13/2015

Couplant
Cal. Batch: 13C028
Type: Ultragel II
Mfg.: Sonotech

Exam Batch: 13C028
Type: Ultragel II
Mfg.: Sonotech

Axial Oriented Search Unit			
Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
0.5" Notch	80%	6.0	0.9"
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

Circumferential Oriented Search Unit			
Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
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

Reference/Simulator Block				
Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
28	SDH	80%	4.3	0.64"
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A

Calibration Block
Cal. Block No. BWD-PDI-516-02
Thickness 0.5" - 2.0" Dia.: Flat
Cal. Blk. Temp. 84° Temp. Tool: 29021141
Comp. Temp. 98° Temp. Tool: 29021141

Recordable Indication(s): Yes ☐ No ☒ (If Yes, Ref. Attached Ultrasonic Indication Report.)
Results: Accept ☒ Reject ☐ Info ☐

Scan Coverage
Upstream ☒ Downstream ☐ Scan dB: 39
CW ☐ CCW ☐ Scan dB: N/A
Exam Surface: OD
Surface Condition: Ground

Reference Block
Serial No.: 142410 CS
Type: 1" Angle Beam

Comments: Cal Block BWD-PDI-516-02 demonstrated to be ultrasonically equivalent to Flaw Tech Cal Block 22571. Baseline Exam. Weld Doc 2A.

Percent Of Coverage Obtained > 90%: No-90% Reviewed Previous Data: N/A

Examiner	Level	III	Signature	Date	Reviewer	Signature	Date
Crothers, Simon, P.			<i>Simon Crothers</i>	8/13/2015	N/A	<i>N/A</i>	
Examiner	Level	N/A	Signature	Date	Site Review	Signature	Date
N/A					Chris H. McKean L.VIII	<i>Chris H. McKean</i>	10-1-15
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A					LEE MALABANSAN	<i>J. McKean</i>	10/2/15



UT Calibration, Examination

Site/Unit: BRW / 2
 Summary No.: N/A
 Workscope: PSI

Procedure: ER-AA-335-030
 Procedure Rev.: 4
 Work Order No.: 01782044-02

Outage No.: N/A
 Report No.: UT-2015-005
 Page: 3 of 4

Code: ASME 2001 Edition / 2003 Addenda Cat./Item: N/A Location: Steam Tunnel
 Drawing No.: FX-15 Description: Elbow to Flange
 System ID: AF
 Component ID: Field Weld 1 Size/Length: 0.5" / 14.1" Thickness/Diameter: 0.337" / 4"
 Limitations: Single Sided Access Start Time: 0953 Finish Time: 1015

Instrument Settings
 Serial No.: 0221JM
 Manufacturer: GE Inspection Technologies
 Model: USN 60 SW Linearity: 2015-L-001
 Delay: 6.2216 Range: 2.0"
 Mtl Cal/Vel: 0.1270 Pulsar Type: Square
 Damping: 500 Ohms Reject: 0%
 PRF: Auto High SU Freq.: 5.0 MHz
 Frequency: 5.0 MHz Rectify: Fullwave
 Voltage: 450 Pulse Width: 100

Ax. Gain (dB): 42 Circ. Gain (dB): N/A
10 Screen Div. = 2 in. of Sound Path

Calibration Block
 Cal. Block No. BWD-PDI-516-02
 Thickness 0.5" - 2.0" Dia.: Flat
 Cal. Blk. Temp. 84° Temp. Tool: 29021141
 Comp. Temp. 98° Temp. Tool: 29021141

Recordable Indication(s): Yes ☐ No ☒ (If Yes, Ref. Attached Ultrasonic Indication Report.)

Results: Accept ☒ Reject ☐ Info ☐

Percent Of Coverage Obtained > 90%: No-90% Reviewed Previous Data: N/A

Search Unit
 Serial No.: 0112WB
 Manufacturer: KB-Aerotech
 Size: 0.25" Model: Comp-G
 Freq.: 5.0 MHz Center Freq.: N/A
 Exam Angle: 70° Squint Angle: N/A
 Measured Angle: 71° Mode: Shear
 Exit Point 0.3" # of Elements: 1
 Config.: Single Focus: N/A
 Shape: Round Contour: N/A
 Wedge Style: MSWQC

Search Unit Cable
 Type: RG-174 Length: 6' No. Conn.: 0

Scan Coverage
 Upstream ☒ Downstream ☐ Scan dB: 42
 CW ☐ CCW ☐ Scan dB: N/A
 Exam Surface: OD
 Surface Condition: Ground

Cal. Checks	Time	Date
Initial Cal.	0739	8/13/2015
Inter. Cal.	1012	8/13/2015
Inter. Cal.	1018	8/13/2015
Inter. Cal.	N/A	
Final Cal.	1314	8/13/2015

Couplant
 Cal. Batch: 13C028
 Type: Ultragel II
 Mfg.: Sonotech
 Exam Batch: 13C028
 Type: Ultragel II
 Mfg.: Sonotech

Reference Block
 Serial No.: 142410 CS
 Type: 1" Angle Beam

Axial Oriented Search Unit			
Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
0.5" Notch	80%	7.6	1.52"
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

Circumferential Oriented Search Unit			
Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
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

Reference/Simulator Block				
Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
41	SDH	80%	5.0	1.0"
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A

Comments: Cal Block BWD-PDI-516-02 demonstrated to be ultrasonically equivalent to Flaw Tech Cal Block 22571. Baseline Exam. Weld Doc 2A.

Examiner	Level	III	Signature	Date	Reviewer	Signature	Date
Crothers, Simon, P.			<i>Simon Crothers</i>	8/13/2015	N/A	<i>N/A</i>	
Examiner	Level	N/A	Signature	Date	Site Review	Signature	Date
N/A					Chris H. McKean LV III	<i>Chris H. McKean</i>	10-1-15
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A					LEE MALABANAN	<i>L. Malabanan</i>	10/2/15

Summary No.: **N/A**

Sketch or Photo:

Work Package: 01782044-02

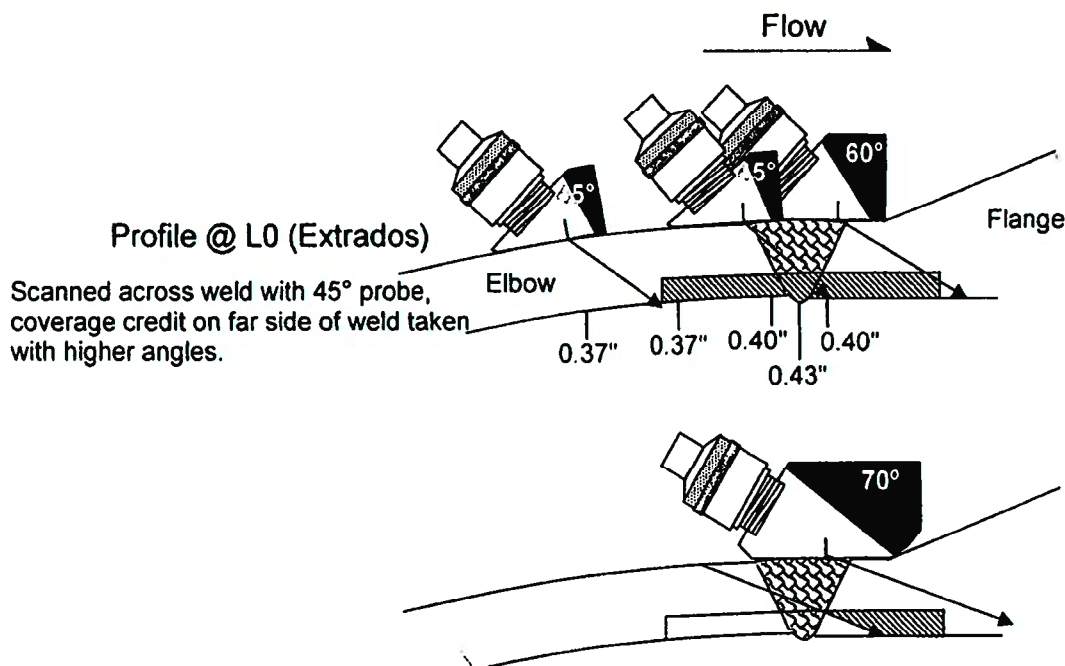
Weld: FW-1

Sketch 1: Coverage Plot

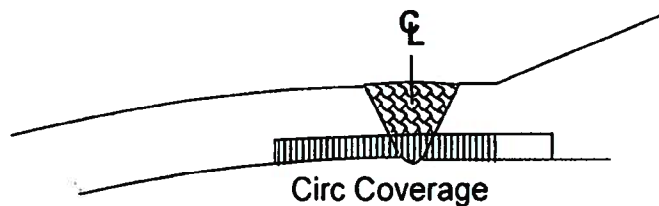
Weld Crown Width: 0.5"

Counterbore US: None

Counterbore DS: None



Note: 70° used to obtain remaining coverage, scan limited to area shown.

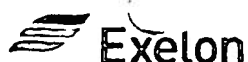

Coverage Calc:

- Axial Coverage = 100%
- Circ Coverage = 1.2" of 1.5" exam box width = 80%
- Total = (100% + 80%)/2 = 90%



Chris H. McKean
 chm
 EXELON L111 10-1-15

ANI / ANII REVIEW
 REVIEW DATE 10/2/15



UT Calibration Examination

2AF-02-24

Site/Unit: **BRW / 2**

Procedure: **ER-AA-335-030**

Outage No.: **N/A**

Summary No.: **N/A**

Procedure Rev.: **4**

Report No.: **UT-2015-006**

Workscope: **PSI**

Work Order No.: **01782044-02**

Page: **1** of **6**

Code: **ASME 2001 Edition / 2003 Addenda**

Cat./Item: **N/A**

Location: **Steam Tunnel**

Drawing No.: **FX-15**

Description: **Flange to Elbow**

System ID: **AF**

Component ID: **Field Weld 2**

Size/Length: **0.5" / 14.1"** Thickness/Diameter: **0.337" / 4"**

Limitations: **Single Sided Access**

Start Time: **0953** Finish Time: **1015**

Instrument Settings

Serial No.: **0221JM**
 Manufacturer: **GE Inspection Technologies**
 Model: **USN 60 SW** Linearity: **2015-L-001**
 Delay: **3.5741** Range: **1.0"**
 M'tl Cal/Vel: **0.1270** Pulsar Type: **Square**
 Damping: **500 Ohms** Reject: **0%**
 PRF: **Auto High** SU Freq.: **5.0 MHz**
 Frequency: **5.0 MHz** Rectify: **Fullwave**
 Voltage: **450** Pulse Width: **100**

Search Unit

Serial No.: **SC1493**
 Manufacturer: **KB-Aerotech**
 Size: **0.25"** Model: **Comp-G**
 Freq.: **5.0 MHz** Center Freq.: **N/A**
 Exam Angle: **45°** Squint Angle: **N/A**
 Measured Angle: **46°** Mode: **Shear**
 Exit Point **0.2"** # of Elements: **1**
 Config.: **Single** Focus: **N/A**
 Shape: **Round** Contour: **N/A**
 Wedge Style: **MSWQC**

Cal. Checks	Time	Date
Initial Cal.	0720	8/13/2015
Inter. Cal.	0953	8/13/2015
Inter. Cal.	1003	8/13/2015
Inter. Cal.	N/A	
Final Cal.	1312	8/13/2015

Couplant

Cal. Batch: **13C028**
 Type: **Ultragel II**
 Mfg.: **Sonotech**
 Exam Batch: **13C028**
 Type: **Ultragel II**
 Mfg.: **Sonotech**

Search Unit Cable

Type: **RG-174** Length: **6'** No. Conn.: **0**

Scan Coverage

Cal. Block No. **BWD-PDI-516-02** Upstream ☐ Downstream ☒ Scan dB: **33**
 Thickness **0.5" - 2.0"** Dia.: **Flat** CW ☒ CCW ☒ Scan dB: **39**
 Cal. Blk. Temp. **84°** Temp. Tool: **29021141** Exam Surface: **OD**
 Comp. Temp. **98°** Temp. Tool: **29021141** Surface Condition: **Ground**

Recordable Indication(s): Yes ☐ No ☒ (If Yes, Ref. Attached Ultrasonic Indication Report.)

Results: Accept ☒ Reject ☐ Info ☐

Percent Of Coverage Obtained > 90%: **No-90%** Reviewed Previous Data: **N/A**

Axial Oriented Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
0.5" Notch	80%	7.2	0.72"
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

Circumferential Oriented Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
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

Reference/Simulator Block

Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
21	SDH	50%	4.5	0.45"
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A

Comments: Cal Block BWD-PDI-516-02 demonstrated to be ultrasonically equivalent to Flaw Tech Cal Block 22571. Baseline Exam. Weld Doc 2A.

Examiner	Level	III	Signature	Date	Reviewer	Signature	Date
Crothers, Simon, P.			<i>Simon Crothers</i>	8/13/2015	N/A	N/A	
Examiner	Level	N/A	Signature	Date	Site Review	Signature	Date
N/A					<i>Chris H. McKenry</i>	<i>Chris H. McKenry</i>	10-1-15
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A					<i>LEE MALABANAN</i>	<i>L. Malaban</i>	10/2/15



UT Calibration Examination

Site/Unit: **BRW / 2**
Summary No.: **N/A**
Workscope: **PSI**

Procedure: **ER-AA-335-030**
Procedure Rev.: **4**
Work Order No.: **01782044-02**

Outage No.: **N/A**
Report No.: **UT-2015-006**
Page: **2** of **6**

Code: **ASME 2001 Edition / 2003 Addenda** Cat./Item: **N/A** Location: **Steam Tunnel**
Drawing No.: **FX-15** Description: **Flange to Elbow**
System ID: **AF**
Component ID: **Field Weld 2** Size/Length: **0.5" / 14.1"** Thickness/Diameter: **0.337" / 4"**
Limitations: **Single Sided Access** Start Time: **0953** Finish Time: **1015**

Instrument Settings
Serial No.: **0221JM**
Manufacturer: **GE Inspection Technologies**
Model: **USN 60 SW** Linearity: **2015-L-001**
Delay: **4.9803** Range: **1.5"**
M'tl Cal/Vel: **0.1270** Pulsar Type: **Square**
Damping: **500 Ohms** Reject: **0%**
PRF: **Auto High** SU Freq.: **5.0 MHz**
Frequency: **5.0 MHz** Rectify: **Fullwave**
Voltage: **450** Pulse Width: **100**

Ax. Gain (dB): **33** Circ. Gain (dB): **N/A**
10 Screen Div. = **1.5** in. of **Sound Path**

Search Unit
Serial No.: **SC1489**
Manufacturer: **KB-Aerotech**
Size: **0.25"** Model: **Comp-G**
Freq.: **5.0 MHz** Center Freq.: **N/A**
Exam Angle: **60°** Squint Angle: **N/A**
Measured Angle: **60°** Mode: **Shear**
Exit Point **0.25"** # of Elements: **1**
Config.: **Single** Focus: **N/A**
Shape: **Round** Contour: **N/A**
Wedge Style: **MSWQC**

Search Unit Cable
Type: **RG-174** Length: **6'** No. Conn.: **0**

Cal. Checks	Time	Date
Initial Cal.	0731	8/13/2015
Inter. Cal.	1004	8/13/2015
Inter. Cal.	1012	8/13/2015
Inter. Cal.	N/A	
Final Cal.	1313	8/13/2015

Couplant
Cal. Batch: **13C028**
Type: **Ultragel II**
Mfg.: **Sonotech**

Exam Batch: **13C028**
Type: **Ultragel II**
Mfg.: **Sonotech**

Axial Oriented Search Unit			
Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
0.5" Notch	80%	6.0	0.9"
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

Circumferential Oriented Search Unit			
Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
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

Reference/Simulator Block				
Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
28	SDH	80%	4.3	0.64"
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A

Calibration Block
Cal. Block No. **BWD-PDI-516-02**
Thickness **0.5" - 2.0"** Dia.: **Flat**
Cal. Blk. Temp. **84°** Temp. Tool: **29021141**
Comp. Temp. **98°** Temp. Tool: **29021141**

Upstream ☐ Downstream ☒ Scan dB: **39**
CW ☐ CCW ☐ Scan dB: **N/A**
Exam Surface: **OD**
Surface Condition: **Ground**

Recordable Indication(s): Yes ☒ No ☐ (If Yes, Ref. Attached Ultrasonic Indication Report.)
Results: Accept ☒ Reject ☐ Info ☐

Reference Block
Serial No.: **142410 CS**
Type: **1" Angle Beam**

Comments: Cal Block BWD-PDI-516-02 demonstrated to be ultrasonically equivalent to Flaw Tech Cal Block 22571. Baseline Exam. Weld Doc 2A.

Examiner	Level	III	Signature	Date	Reviewer	Signature	Date
Crothers, Simon, P.			<i>Simon Crothers</i>	8/13/2015	N/A	<i>N/A</i>	
Examiner	Level	N/A	Signature	Date	Site Review	Signature	Date
N/A					Chris H. McKean LU III	<i>Chris H. McKean</i>	10-1-15
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A					LEE MA CABANAN	<i>Lee Ma Cabanan</i>	10/2/15



UT Calibration/Examination

Site/Unit: BRW / 2
 Summary No.: N/A
 Workscope: PSI

Procedure: ER-AA-335-030
 Procedure Rev.: 4
 Work Order No.: 01782044-02

Outage No.: N/A
 Report No.: UT-2015-006
 Page: 3 of 6

Code: ASME 2001 Edition / 2003 Addenda Cat./Item: N/A Location: Steam Tunnel

Drawing No.: FX-15 Description: Flange to Elbow

System ID: AF

Component ID: Field Weld 2 Size/Length: 0.5" / 14.1" Thickness/Diameter: 0.337" / 4"

Limitations: Single Sided Access Start Time: 0953 Finish Time: 1015

Instrument Settings				Search Unit				Cal. Checks			Axial Oriented Search Unit																								
Serial No.:	<u>0221JM</u>			Serial No.:	<u>0112WB</u>			Initial Cal.	<u>0739</u>	<u>8/13/2015</u>	Calibration Reflector	<u>0.5" Notch</u>	<u>80%</u>	<u>7.6</u>	<u>1.52"</u>																				
Manufacturer:	<u>GE Inspection Technologies</u>			Manufacturer:	<u>KB-Aerotech</u>			Inter. Cal.	<u>1012</u>	<u>8/13/2015</u>		<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>																				
Model:	<u>USN 60 SW</u>	Linearity:	<u>2015-L-001</u>	Size:	<u>0.25"</u>	Model:	<u>Comp-G</u>	Inter. Cal.	<u>1018</u>	<u>8/13/2015</u>		<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>																				
Delay:	<u>6.2216</u>	Range:	<u>2.0"</u>	Freq.:	<u>5.0 MHz</u>	Center Freq.:	<u>N/A</u>	Inter. Cal.	<u>N/A</u>			<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>																				
M'tl Cal/Vel:	<u>0.1270</u>	Pulser Type:	<u>Square</u>	Exam Angle:	<u>70°</u>	Squint Angle:	<u>N/A</u>	Final Cal.	<u>1314</u>	<u>8/13/2015</u>		<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>																				
Damping:	<u>500 Ohms</u>	Reject:	<u>0%</u>	Measured Angle:	<u>71°</u>	Mode:	<u>Shear</u>	Couplant Cal. Batch: <u>13C028</u> Type: <u>Ultragel II</u> Mfg.: <u>Sonotech</u> Exam Batch: <u>13C028</u> Type: <u>Ultragel II</u> Mfg.: <u>Sonotech</u>																											
PRF:	<u>Auto High</u>	SU Freq.:	<u>5.0 MHz</u>	Exit Point	<u>0.3"</u>	# of Elements:	<u>1</u>																												
Frequency:	<u>5.0 MHz</u>	Rectify:	<u>Fullwave</u>	Config.:	<u>Single</u>	Focus:	<u>N/A</u>	Circumferential Oriented Search Unit																											
Voltage:	<u>450</u>	Pulse Width:	<u>100</u>	Shape:	<u>Round</u>	Contour:	<u>N/A</u>	<table border="1"> <thead> <tr> <th>Calibration Reflector</th> <th>Signal Amplitude %</th> <th>Sweep Division</th> <th>Sound Path</th> </tr> </thead> <tbody> <tr><td><u>N/A</u></td><td><u>N/A</u></td><td><u>N/A</u></td><td><u>N/A</u></td></tr> <tr><td><u>N/A</u></td><td><u>N/A</u></td><td><u>N/A</u></td><td><u>N/A</u></td></tr> <tr><td><u>N/A</u></td><td><u>N/A</u></td><td><u>N/A</u></td><td><u>N/A</u></td></tr> <tr><td><u>N/A</u></td><td><u>N/A</u></td><td><u>N/A</u></td><td><u>N/A</u></td></tr> </tbody> </table>								Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>
Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path																																
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<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>																																
Ax. Gain (dB):	<u>42</u>	Circ. Gain (dB):	<u>N/A</u>	Wedge Style:	<u>MSWQC</u>			Reference/Simulator Block																											
<u>10</u> Screen Div. = <u>2</u> in. of <u>Sound Path</u>				Search Unit Cable	Type: <u>RG-174</u> Length: <u>6'</u> No. Conn.: <u>0</u>			<table border="1"> <thead> <tr> <th>Gain dB</th> <th>Reflector</th> <th>Signal Amplitude %</th> <th>Sweep Division</th> <th>Sound Path</th> </tr> </thead> <tbody> <tr><td><u>41</u></td><td><u>SDH</u></td><td><u>80%</u></td><td><u>5.0</u></td><td><u>1.0"</u></td></tr> <tr><td><u>N/A</u></td><td><u>N/A</u></td><td><u>N/A</u></td><td><u>N/A</u></td><td><u>N/A</u></td></tr> <tr><td><u>N/A</u></td><td><u>N/A</u></td><td><u>N/A</u></td><td><u>N/A</u></td><td><u>N/A</u></td></tr> </tbody> </table>								Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path	<u>41</u>	<u>SDH</u>	<u>80%</u>	<u>5.0</u>	<u>1.0"</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>
Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path																															
<u>41</u>	<u>SDH</u>	<u>80%</u>	<u>5.0</u>	<u>1.0"</u>																															
<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>																															
<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>																															
Calibration Block				Scan Coverage				Reference Block																											
Cal. Block No.	<u>BWD-PDI-516-02</u>			Upstream <input type="checkbox"/>	Downstream <input checked="" type="checkbox"/>	Scan dB:	<u>42</u>	Serial No.:	<u>142410 CS</u>																										
Thickness	<u>0.5" - 2.0"</u>			Dia.:	<u>Flat</u>			CW <input type="checkbox"/>	CCW <input type="checkbox"/>	Scan dB:	<u>N/A</u>																								
Cal. Blk. Temp.	<u>84°</u>	Temp. Tool:	<u>29021141</u>	Exam Surface:	<u>OD</u>			Type:	<u>1" Angle Beam</u>																										
Comp. Temp.	<u>98°</u>	Temp. Tool:	<u>29021141</u>	Surface Condition:	<u>Ground</u>																														
Recordable Indication(s): Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> (If Yes, Ref. Attached Ultrasonic Indication Report.)																																			
Results: Accept <input checked="" type="checkbox"/> Reject <input type="checkbox"/> Info <input type="checkbox"/>																																			
Percent Of Coverage Obtained > 90%: <u>No-90%</u> Reviewed Previous Data: <u>N/A</u>																																			

Comments: Cal Block BWD-PDI-516-02 demonstrated to be ultrasonically equivalent to Flaw Tech Cal Block 22571. Baseline Exam. Weld Doc 2A.

Examiner	Level	III	Signature	Date	Reviewer	Signature	Date
Crothers, Simon, P.			<i>Simon Crothers</i>	8/13/2015	<i>N/A</i>	<i>N/A</i>	
Examiner	Level	N/A	Signature	Date	Site Review	Signature	Date
N/A					<i>Chris H. McKean</i>	<i>Ch H McKean</i>	10/2/15
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A					<i>LEE MALABANAN</i>	<i>J. McKean</i>	10/2/15

Summary No.: **N/A**

Sketch or Photo:

Work Package: 01782044-02

Weld: FW-2

Sketch 1: Coverage Plot

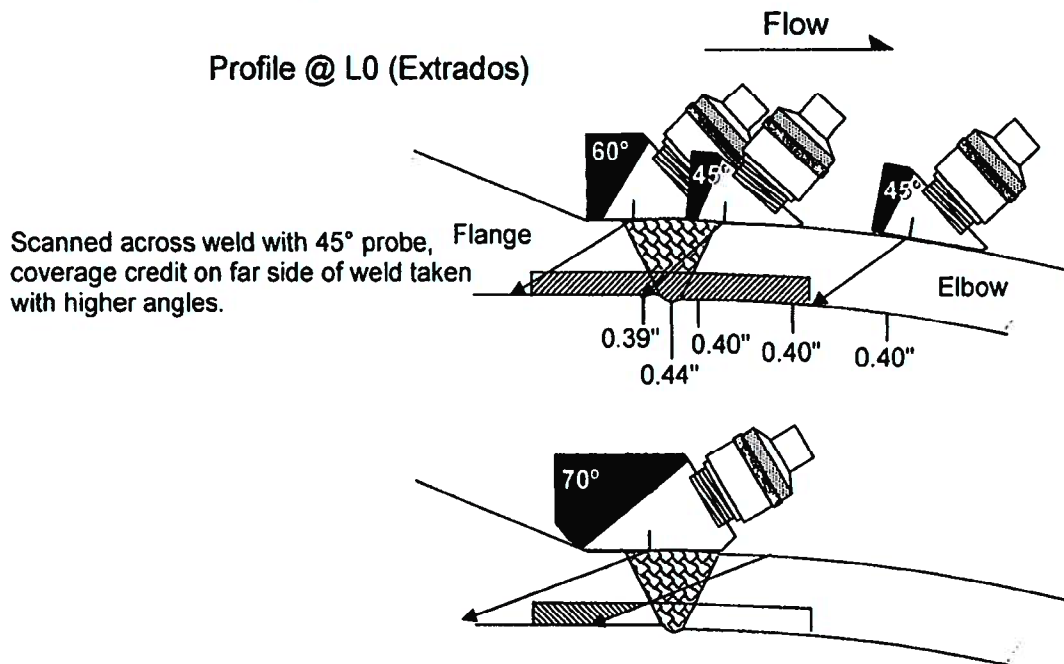
Weld Crown Width: 0.5"

Counterbore US: None

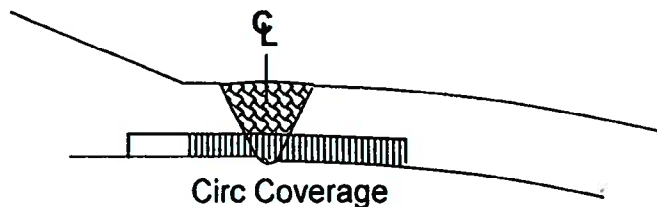
Counterbore DS: None



Profile @ L0 (Extrados)



Note: 70° used to obtain remaining coverage, scan limited to area shown.



Coverage Calc:

- Axial Coverage = 100%
- Circ Coverage = 1.2" of 1.5" exam box width = 80%
- Total = (100% + 80%)/2 = 90%

Simon Crothers

Chris H. McKean

Chris H. McKean

EXELON 10-1-15

ANI / ANII REVIEW

REVIEW DATE *10/2/15*

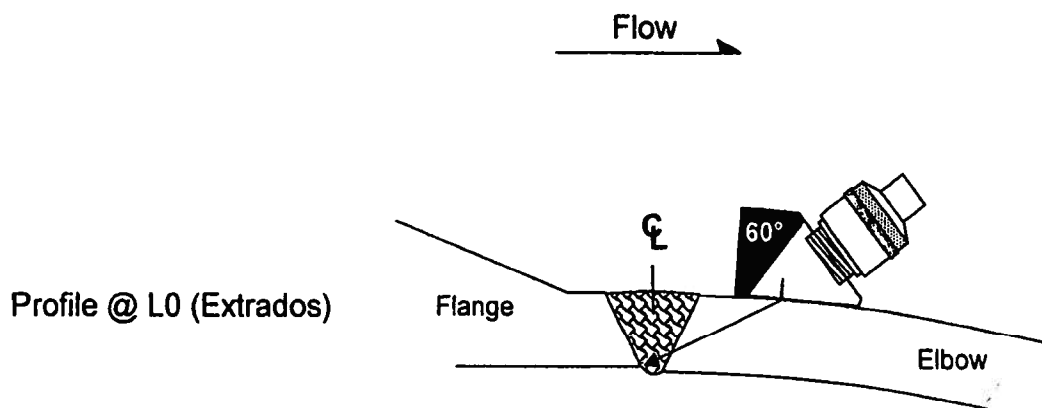
Summary-No.: N/A

Sketch or Photo:

Work Package: 01782044-02

Weld: FW-2

Sketch 2: Indication Plot



① Root Geometry, seen intermittently 360°



Chris H. McKean

Chris H. McKean

EXELON LV III 10-1-15

Simon Crothers

ANI / ANII REVIEW
REVIEW DATED *haden* 10/2/15



Ultrasonic Indication Report

Site/Unit: **BRW / 2**
 Summary No.: **N/A**
 Workscope: **PSI**

Procedure: **ER-AA-335-030**
 Procedure Rev.: **4**
 Work Order No.: **01782044-02**

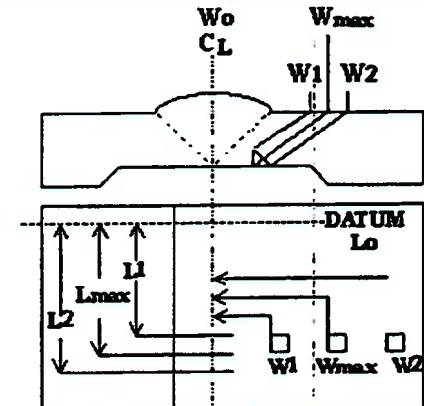
Outage No.: **N/A**
 Report No.: **UT-2015-006**
 Page: **6** of **6**

Search Unit Angle: **60** °
 Wo Location: **Centerline**
 Lo Location: **Extrados**

- ☒ Piping Welds
☐ Ferritic Vessels $\geq 2^{\circ}T$
☐ Other **N/A**

MP	Metal Path	Wmax	Distance From Wo To S.U. At Maximum Response
RBR	Remaining Back Reflection	W1	Distance From Wo At N/A Of Max (Forward)
L	Distance From Datum	W2	Distance From Wo At N/A Of Max (Backward)

Comments: **Field Weld 2**



Angle	Indication No.	% Of DAC	W Max		Forward N/A Of Max		Backward N/A Of Max		L1 N/A Of Max	L Max	L2 N/A Of Max	RBR Amp.	Remarks
			W	MP	W1	MP	W2	MP					
60°	1	100%	0.7"	0.82"	N/A	N/A	N/A	N/A	N/A	0"	N/A	N/A	Root Geometry from DS side.

Examiner	Level	III	Signature	Date	Reviewer	Signature	Date
Crothers, Simon, P.			<i>Simon Crothers</i>	8/13/2015	<i>N/A</i>	<i>N/A</i>	
Examiner	Level	N/A	Signature	Date	Site Review	Signature	Date
N/A					<i>Mark Sebbey</i>	<i>29</i>	8/19/15
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A					<i>J. McLean</i>		10/2/15



UT Calibration/Examination

2AF-03-23

Site/Unit: **BRW / 2**
 Summary No.: **N/A**
 Workscope: **PSI**

Procedure: **ER-AA-335-030**
 Procedure Rev.: **4**
 Work Order No.: **01782044-01**

Outage No.: **N/A**
 Report No.: **UT-2015-001**
 Page: **1** of **6**

Code: **ASME 2001 Edition / 2003 Addenda** Cat./Item: **N/A** Location: **Steam Tunnel**
 Drawing No.: **FX-13** Description: **Elbow to Flange**
 System ID: **AF**
 Component ID: **Field Weld 1** Size/Length: **0.9" / 14.1"** Thickness/Diameter: **0.337" / 4"**
 Limitations: **Single Sided Access** Start Time: **0908** Finish Time: **0938**

Instrument Settings
 Serial No.: **0221JM**
 Manufacturer: **GE Inspection Technologies**
 Model: **USN 60 SW** Linearity: **2015-L-001**
 Delay: **3.5741** Range: **1.0"**
 M'tl Cal/Vel: **0.1270** Pulsar Type: **Square**
 Damping: **500 Ohms** Reject: **0%**
 PRF: **Auto High** SU Freq.: **5.0 MHz**
 Frequency: **5.0 MHz** Rectify: **Fullwave**
 Voltage: **450** Pulse Width: **100**

Search Unit
 Serial No.: **SC1493**
 Manufacturer: **KB-Aerotech**
 Size: **0.25"** Model: **Comp-G**
 Freq.: **5.0 MHz** Center Freq.: **N/A**
 Exam Angle: **45°** Squint Angle: **N/A**
 Measured Angle: **46°** Mode: **Shear**
 Exit Point: **0.2"** # of Elements: **1**
 Config.: **Single** Focus: **N/A**
 Shape: **Round** Contour: **N/A**
 Wedge Style: **MSWQC**

Ax. Gain (dB): **21** Circ. Gain (dB): **N/A**
10 Screen Div. = **1** in. of **Sound Path**
 Search Unit Cable
 Type: **RG-174** Length: **6'** No. Conn.: **0**

Calibration Block
 Cal. Block No.: **BWD-PDI-516-02**
 Thickness: **0.5" - 2.0"** Dia.: **Flat**
 Cal. Blk. Temp.: **84°** Temp. Tool: **29021141**
 Comp. Temp.: **106°** Temp. Tool: **29021141**
 Scan Coverage
 Upstream ☒ Downstream ☐ Scan dB: **33**
 CW ☒ CCW ☒ Scan dB: **39**
 Exam Surface: **OD**
 Surface Condition: **Ground**

Recordable Indication(s): Yes ☐ No ☒ (If Yes, Ref. Attached Ultrasonic Indication Report.)
 Results: Accept ☒ Reject ☐ Info ☐
 Percent Of Coverage Obtained > 90%: **No-87%** Reviewed Previous Data: **N/A**

Cal. Checks	Time	Date
Initial Cal.	0720	8/13/2015
Inter. Cal.	0908	8/13/2015
Inter. Cal.	0921	8/13/2015
Inter. Cal.	N/A	
Final Cal.	1312	8/13/2015

Couplant
 Cal. Batch: **13C028**
 Type: **Ultrage II**
 Mfg.: **Sonotech**
 Exam Batch: **13C028**
 Type: **Ultrage II**
 Mfg.: **Sonotech**

Reference Block
 Serial No.: **142410 CS**
 Type: **1" Angle Beam**

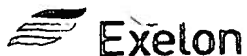
Axial Oriented Search Unit			
Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
0.5" Notch	80%	7.2	0.72"
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Circumferential Oriented Search Unit			
Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
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

Reference/Simulator Block				
Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
21	SDH	50%	4.5	0.45"
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A

Comments: **Cal Block BWD-PDI-516-02 demonstrated to be ultrasonically equivalent to Flaw Tech Cal Block 22571. Baseline Exam. Weld Doc 2A.**

Examiner	Level	III	Signature	Date	Reviewer	Signature	Date
Crothers, Simon, P.			<i>Simon Crothers</i>	8/13/2015	<i>N/A</i>	<i>N/A</i>	
Examiner	Level	N/A	Signature	Date	Site Review	Signature	Date
N/A					<i>Chris H. McKean</i>	<i>Chris H. McKean</i>	10-1-15
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A					<i>LEE MALABAWAN</i>	<i>L. Malabawan</i>	10-5-15



UT Calibration Examination

Site/Unit: **BRW / 2** Procedure: **ER-AA-335-030** Outage No.: **N/A**
Summary No.: **N/A** Procedure Rev.: **4** Report No.: **UT-2015-001**
Workscope: **PSI** Work Order No.: **01782044-01** Page: **2** of **6**

Code: **ASME 2001 Edition / 2003 Addenda** Cat./Item: **N/A** Location: **Steam Tunnel**

Drawing No.: **FX-13** Description: **Elbow to Flange**

System ID: **AF**

Component ID: **Field Weld 1** Size/Length: **0.9" / 14.1"** Thickness/Diameter: **0.337" / 4"**

Limitations: **Single Sided Access** Start Time: **0908** Finish Time: **0938**

Instrument Settings				Search Unit				Cal. Checks			Axial Oriented Search Unit			
Serial No.:	0221JM			Serial No.:	SC1489			Initial Cal.	0731	8/13/2015	Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
Manufacturer:	GE Inspection Technologies			Manufacturer:	KB-Aerotech			Inter. Cal.	0921	8/13/2015	0.5" Notch	80%	6:0	0.9"
Model:	USN 60 SW	Linearity:	2015-L-001	Size:	0.25"	Model:	Comp-G	Inter. Cal.	0930	8/13/2015	N/A	N/A	N/A	N/A
Delay:	4.9803	Range:	1.5"	Freq.:	5.0 MHz	Center Freq.:	N/A	Inter. Cal.	N/A		N/A	N/A	N/A	N/A
M'tl Cal/Vel:	0.1270	Pulser Type:	Square	Exam Angle:	60°	Squint Angle:	N/A	Final Cal.	1313	8/13/2015	N/A	N/A	N/A	N/A
Damping:	500 Ohms	Reject:	0%	Measured Angle:	60°	Mode:	Shear	Couplant						
PRF:	Auto High	SU Freq.:	5.0 MHz	Exit Point	0.25"	# of Elements:	1							
Frequency:	5.0 MHz	Rectify:	Fullwave	Config.:	Single	Focus:	N/A	Cal. Batch:	13C028					
Voltage:	450	Pulse Width:	100	Shape:	Round	Contour:	N/A	Type:	Ultratel II					
Ax. Gain (dB): 33 Circ. Gain (dB): N/A				Wedge Style:	MSWQC			Mfg.:	Sonotech					
				Search Unit Cable				Exam Batch:	13C028					
10 Screen Div. = 1.5 in. of Sound Path				Type:	RG-174 Length: 6' No. Conn.: 0			Type:	Ultratel II					
Calibration Block				Scan Coverage				Mfg.:	Sonotech					
Cal. Block No.	BWD-PDI-516-02			Upstream <input checked="" type="checkbox"/>	Downstream <input type="checkbox"/>	Scan dB:	39	Reference Block						
Thickness	0.5" - 2.0"			Dia.:	Flat			Serial No.:	142410 CS					
Cal. Blk. Temp.	84°			Temp. Tool:	29021141			Type:	1" Angle Beam					
Comp. Temp.	106°			Temp. Tool:	29021141			Reference/Simulator Block						
Recordable Indication(s): Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> (If Yes, Ref. Attached Ultrasonic Indication Report.)														
Results: Accept <input checked="" type="checkbox"/> Reject <input type="checkbox"/> Info <input type="checkbox"/>														
Percent Of Coverage Obtained > 90%: No-87%				Reviewed Previous Data: N/A				Comments: Cal Block BWD-PDI-516-02 demonstrated to be ultrasonically equivalent to Flaw Tech Cal Block 22571. Baseline Exam. Weld Doc 2A.						

Examiner	Level	III	Signature	Date	Reviewer	Signature	Date
Crothers, Simon, P.			<i>Simon Crothers</i>	8/13/2015	N/A	<i>N/A</i>	
Examiner	Level	N/A	Signature	Date	Site Review	Signature	Date
N/A					Chris H. McKean	<i>Chris H. McKean</i>	10-1-15
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A					LEE MALABANAN	<i>Lee Malabanan</i>	10-5-15



UT Calibration/Examination

Site/Unit: **BRW / 2**
 Summary No.: **N/A**
 Workscope: **PSI**

Procedure: **ER-AA-335-030**
 Procedure Rev.: **4**
 Work Order No.: **01782044-01**

Outage No.: **N/A**
 Report No.: **UT-2015-001**
 Page: **3** of **6**

Code: **ASME 2001 Edition / 2003 Addenda** Cat./Item: **N/A** Location: **Steam Tunnel**
 Drawing No.: **FX-13** Description: **Elbow to Flange**
 System ID: **AF**
 Component ID: **Field Weld 1** Size/Length: **0.9" / 14.1"** Thickness/Diameter: **0.337" / 4"**
 Limitations: **Single Sided Access** Start Time: **0908** Finish Time: **0938**

Instrument Settings				Search Unit				Cal. Checks			Axial Oriented Search Unit							
Serial No.:	0221JM			Serial No.:	0112WB			Initial Cal.	0739	8/13/2015	Calibration Reflector	0.5" Notch	Signal Amplitude %	80%	Sweep Division	7.6	Sound Path	1.52"
Manufacturer:	GE Inspection Technologies			Manufacturer:	KB-Aerotech			Inter. Cal.	0930	8/13/2015		N/A		N/A		N/A		N/A
Model:	USN 60 SW	Linearity:	2015-L-001	Size:	0.25"	Model:	Comp-G	Inter. Cal.	0938	8/13/2015		N/A		N/A		N/A		N/A
Delay:	6.2216	Range:	2.0"	Freq.:	5.0 MHz	Center Freq.:	N/A	Inter. Cal.	N/A			N/A		N/A		N/A		N/A
M'll Cal/Vel:	0.1270	Pulser Type:	Square	Exam Angle:	70°	Squint Angle:	N/A	Final Cal.	1314	8/13/2015		N/A		N/A		N/A		N/A
Damping:	500 Ohms	Reject:	0%	Measured Angle:	71°	Mode:	Shear	Couplant Cal. Batch: 13C028 Type: Ultrage II Mfg.: Sonotech Exam Batch: 13C028 Type: Ultrage II Mfg.: Sonotech										
PRF:	Auto High	SU Freq.:	5.0 MHz	Exit Point:	0.3"	# of Elements:	1											
Frequency:	5.0 MHz	Rectify:	Fullwave	Config.:	Single	Focus:	N/A	Circumferential Oriented Search Unit Calibration Reflector: N/A Signal Amplitude %: N/A Sweep Division: N/A Sound Path: N/A										
Voltage:	450	Pulse Width:	100	Shape:	Round	Contour:	N/A											
Ax. Gain (dB): 42 Circ. Gain (dB): N/A				Search Unit Cable				Reference Block Serial No.: 142410 CS Type: 1" Angle Beam										
10 Screen Div. = 2 in. of Sound Path				Type: RG-174 Length: 6' No. Conn.: 0														
Calibration Block				Scan Coverage				Reference/Simulator Block Gain dB: 41 Reflector: SDH Signal Amplitude %: 80% Sweep Division: 5.0 Sound Path: 1.0"										
Cal. Block No.: BWD-PDI-516-02				Upstream <input checked="" type="checkbox"/> Downstream <input type="checkbox"/> Scan dB: 42														
Thickness 0.5" - 2.0" Dia.: Flat				CW <input type="checkbox"/> CCW <input type="checkbox"/> Scan dB: N/A				Cal. Bk. Temp. 84° Temp. Tool: 29021141 Comp. Temp. 106° Temp. Tool: 29021141 Exam Surface: OD Surface Condition: Ground										
Recordable Indication(s): Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> (If Yes, Ref. Attached Ultrasonic Indication Report.)				Results: Accept <input checked="" type="checkbox"/> Reject <input type="checkbox"/> Info <input type="checkbox"/>														
Percent Of Coverage Obtained > 90%: No-87%				Reviewed Previous Data: N/A				Comments: Cal Block BWD-PDI-516-02 demonstrated to be ultrasonically equivalent to Flaw Tech Cal Block 22571. Baseline Exam. Weld Doc 2A.										

Examiner	Level	III	Signature	Date	Reviewer	Signature	Date
Crothers, Simon, P.			<i>Simon Crothers</i>	8/13/2015	<i>N/A</i>	<i>N/A</i>	
Examiner	Level	N/A	Signature	Date	Site Review	Signature	Date
N/A					<i>Chris H. McKean</i>	<i>Chris H. McKean</i>	10-1-15
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A					<i>LES MALABANAN</i>	<i>LES MALABANAN</i>	10-5-15

Summary No.: N/A

Sketch or Photo:

Work Package: 01782044-01

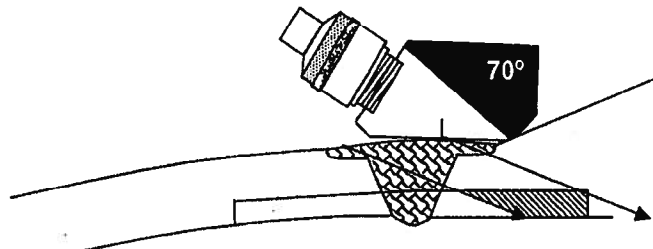
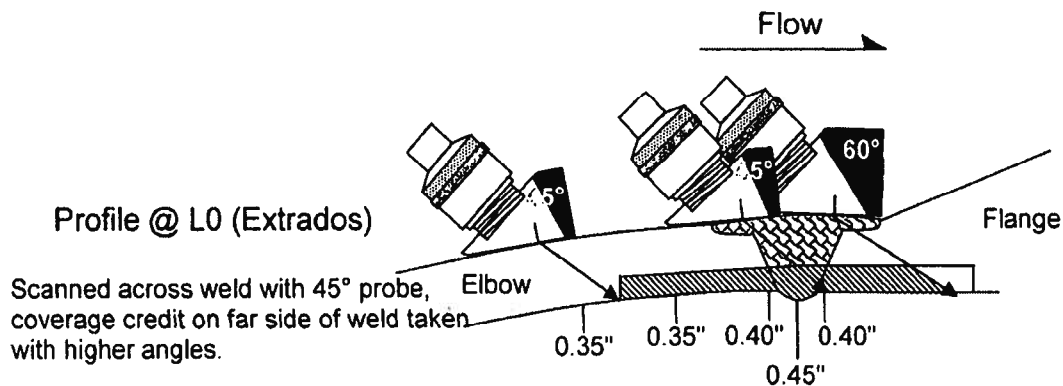
Weld: FW-1

Sketch 1: Coverage Plot

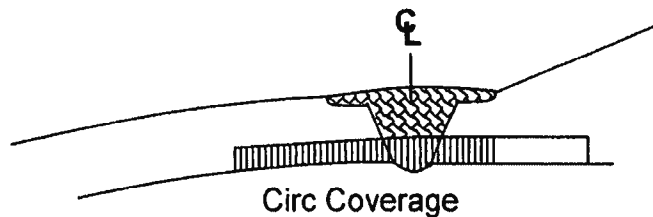
Weld Crown Width: 0.9"

Counterbore US: None

Counterbore DS: None



Note: 70° used to obtain remaining coverage, scan limited to area shown.



Coverage Calc:

- Axial Coverage = 100%
- Circ Coverage = 1.4" of 1.9" exam box width = 74%
- Total = (100% + 74%)/2 = 87%

Simon Crothers

Chris H. McKenna
Ch. H. McKenna
 EXELON L0 III 10-1-15

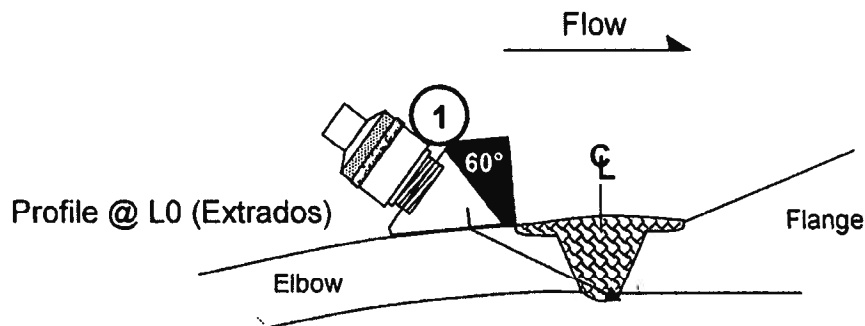
Summary No.: N/A

Sketch or Photo:

Work Package: 01782044-01

Weld: FW-1

Sketch 2: Indication Plot



① Root Geometry, seen intermittently 360°



Simon Crothers

Chris H. McKenna
Chi H. McKenna
 EXELON LV III 10-1-15



Ultrasonic Indication Report

Site/Unit: BRW / 2
 Summary No.: N/A
 Workscope: PSI

Procedure: ER-AA-335-030
 Procedure Rev.: 4
 Work Order No.: 01782044-01

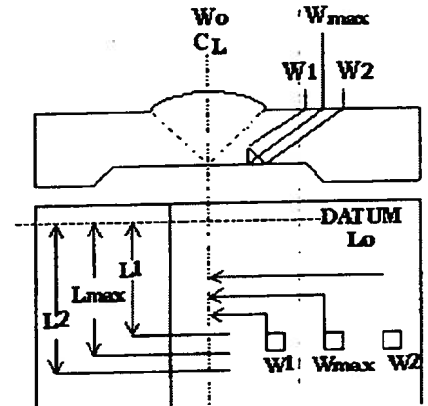
Outage No.: N/A
 Report No.: UT-2015-001
 Page: 6 of 6

Search Unit Angle: 60 °
 Wo Location: Centerline
 Lo Location: Extrados

- ☒ Piping Welds
☐ Ferritic Vessels $\geq 2^{\circ}T$
☐ Other N/A

MP	Metal Path	Wmax	Distance From Wo To S.U. At Maximum Response
RBR	Remaining Back Reflection	W1	Distance From Wo At <u>N/A</u> Of Max (Forward)
L	Distance From Datum	W2	Distance From Wo At <u>N/A</u> Of Max (Backward)

Comments: **Field Weld 1**



Angle	Indication No.	% Of DAC	W Max		Forward N/A Of Max		Backward N/A Of Max		L1 N/A Of Max	L Max	L2 N/A Of Max	RBR Amp.	Remarks
			W	MP	W1	MP	W2	MP					
60°	1	55%	0.7"	0.9"	N/A	N/A	N/A	N/A	N/A	0"	N/A	N/A	Root Geometry from US side.

Examiner	Level	III	Signature	Date	Reviewer	Signature	Date
Crothers, Simon, P.			<i>Simon Crothers</i>	8/13/2015	<i>N/A</i>	<i>N/A</i>	
Examiner	Level	N/A	Signature	Date	Site Review	Signature	Date
N/A					<i>Mark Seby</i>	<i>[Signature]</i>	7/14/15
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A					<i>LEE MACARTHUR</i>	<i>[Signature]</i>	10-5-15



UT Calibration/Examination

Site/Unit: BRW / 2
 Summary No.: N/A
 Workscope: PSI

Procedure: ER-AA-335-030
 Procedure Rev.: 4
 Work Order No.: 01782044-01

Outage No.: N/A
 Report No.: UT-2015-002
 Page: 1 of 6

Code: ASME 2001 Edition / 2003 Addenda Cat./Item: N/A Location: Steam Tunnel
 Drawing No.: FX-13 Description: Flange to Elbow
 System ID: AF
 Component ID: Field Weld 2 Size/Length: 0.9" / 14.1" Thickness/Diameter: 0.337" / 4"
 Limitations: Single Sided Access Start Time: 0908 Finish Time: 0938

Instrument Settings
 Serial No.: 0221JM
 Manufacturer: GE Inspection Technologies
 Model: USN 60 SW Linearity: 2015-L-001
 Delay: 3.5741 Range: 1.0"
 M/I Cal/Vel: 0.1270 Pulsar Type: Square
 Damping: 500 Ohms Reject: 0%
 PRF: Auto High SU Freq.: 5.0 MHz
 Frequency: 5.0 MHz Rectify: Fullwave
 Voltage: 450 Pulse Width: 100

Search Unit
 Serial No.: SC1493
 Manufacturer: KB-Aerotech
 Size: 0.25" Model: Comp-G
 Freq.: 5.0 MHz Center Freq.: N/A
 Exam Angle: 45° Squint Angle: N/A
 Measured Angle: 46° Mode: Shear
 Exit Point 0.2" # of Elements: 1
 Config.: Single Focus: N/A
 Shape: Round Contour: N/A
 Wedge Style: MSWQC

Cal. Checks	Time	Date
Initial Cal.	0720	8/13/2015
Inter. Cal.	0908	8/13/2015
Inter. Cal.	0921	8/13/2015
Inter. Cal.	N/A	
Final Cal.	1312	8/13/2015

Couplant
 Cal. Batch: 13C028
 Type: Ultrage II
 Mfg.: Sonotech
 Exam Batch: 13C028
 Type: Ultrage II
 Mfg.: Sonotech

Search Unit Cable
 Type: RG-174 Length: 6' No. Conn.: 0

Scan Coverage
 Upstream ☐ Downstream ☒ Scan dB: 33
 CW ☒ CCW ☒ Scan dB: 39
 Exam Surface: OD
 Surface Condition: Ground

Ax. Gain (dB): 21 Circ. Gain (dB): N/A
10 Screen Div. = 1 in. of Sound Path

Calibration Block
 Cal. Block No. BWD-PDI-516-02
 Thickness 0.5" - 2.0" Dia.: Flat
 Cal. Blk. Temp. 84° Temp. Tool: 29021141
 Comp. Temp. 106° Temp. Tool: 29021141

Recordable Indication(s): Yes ☐ No ☒ (If Yes, Ref. Attached Ultrasonic Indication Report.)

Results: Accept ☒ Reject ☐ Info ☐

Percent Of Coverage Obtained > 90%: No-87% Reviewed Previous Data: N/A

Axial Oriented Search Unit			
Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
0.5" Notch	80%	7.2	0.72"
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

Circumferential Oriented Search Unit			
Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
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

Reference/Simulator Block				
Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
21	SDH	50%	4.5	0.45"
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A

Comments: Cal Block BWD-PDI-516-02 demonstrated to be ultrasonically equivalent to Flaw Tech Cal Block 22571. Baseline Exam. Weld Doc 2A.

Examiner	Level	III	Signature	Date	Reviewer	Signature	Date
Crothers, Simon, P.			<i>Simon Crothers</i>	8/13/2015	N/A	<i>N/A</i>	
Examiner	Level	N/A	Signature	Date	Site Review	Signature	Date
N/A					Chris H. McKean LVIII	<i>Chris H. McKean</i>	10-1-15
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A					Lee Malabanan	<i>Lee Malabanan</i>	10-5-15



UT Calibration/Examination

Site/Unit: **BRW / 2**
 Summary No.: **N/A**
 Workscope: **PSI**

Procedure: **ER-AA-335-030**
 Procedure Rev.: **4**
 Work Order No.: **01782044-01**

Outage No.: **N/A**
 Report No.: **UT-2015-002**
 Page: **2** of **6**

Code: **ASME 2001 Edition / 2003 Addenda** Cat./Item: **N/A** Location: **Steam Tunnel**
 Drawing No.: **FX-13** Description: **Flange to Elbow**
 System ID: **AF**
 Component ID: **Field Weld 2** Size/Length: **0.9" / 14.1"** Thickness/Diameter: **0.337" / 4"**
 Limitations: **Single Sided Access** Start Time: **0908** Finish Time: **0938**

Instrument Settings				Search Unit				Cal. Checks			Axial Oriented Search Unit				
Serial No.:	0221JM			Serial No.:	SC1489			Cal. Checks	Time	Date	Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path	
Manufacturer:	GE Inspection Technologies			Manufacturer:	KB-Aerotech			Initial Cal.	0731	8/13/2015	0.5" Notch	80%	6.0	0.9"	
Model:	USN 60 SW	Linearity:	2015-L-001	Size:	0.25"	Model:	Comp-G	Inter. Cal.	0921	8/13/2015	N/A	N/A	N/A	N/A	
Delay:	4.9803	Range:	1.5"	Freq.:	5.0 MHz	Center Freq.:	N/A	Inter. Cal.	0930	8/13/2015	N/A	N/A	N/A	N/A	
M'tl Cal/Vel:	0.1270	Pulser Type:	Square	Exam Angle:	60°	Squint Angle:	N/A	Inter. Cal.	N/A		N/A	N/A	N/A	N/A	
Damping:	500 Ohms	Reject:	0%	Measured Angle:	60°	Mode:	Shear	Final Cal.	1313	8/13/2015	N/A	N/A	N/A	N/A	
PRF:	Auto High	SU Freq.:	5.0 MHz	Exit Point	0.25"	# of Elements:	1	Couplant							
Frequency:	5.0 MHz	Rectify:	Fullwave	Config.:	Single	Focus:	N/A	Cal. Batch:	13C028						
Voltage:	450	Pulse Width:	100	Shape:	Round	Contour:	N/A	Type:	Ultragel II						
				Wedge Style:	MSWQC			Mfg.:	Sonotech						
				Search Unit Cable				Exam Batch:	13C028						
				Type:	RG-174	Length:	6'	Type:	Ultragel II						
				Scan Coverage				Mfg.:	Sonotech						
				Upstream	<input type="checkbox"/>	Downstream	<input checked="" type="checkbox"/>	Reference Block							
				Scan dB:	39			Serial No.:	142410 CS						
				CW	<input type="checkbox"/>	CCW	<input type="checkbox"/>	Type:	1" Angle Beam						
				Exam Surface:	OD			Comments: Cal Block BWD-PDI-516-02 demonstrated to be ultrasonically equivalent to Flaw Tech Cal Block 22571. Baseline Exam. Weld Doc 2A.							
				Surface Condition:	Ground										
Recordable Indication(s):				Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	(If Yes, Ref. Attached Ultrasonic Indication Report.)									
Results:				Accept <input checked="" type="checkbox"/>	Reject <input type="checkbox"/>	Info <input type="checkbox"/>									
Percent Of Coverage Obtained > 90%:				No-87%			Reviewed Previous Data: N/A								

Examiner	Level	III	Signature	Date	Reviewer	Signature	Date
Crothers, Simon, P.			<i>Simon Crothers</i>	8/13/2015	<i>N/A</i>	<i>N/A</i>	
Examiner	Level	N/A	Signature	Date	Site Review	Signature	Date
N/A					<i>Chris H. McKern</i>	<i>CH McKern</i>	10-1-15
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A					<i>Lee Malabanan</i>	<i>L Malabanan</i>	10-5-15



UT Calibration/Examination

Site/Unit: BRW / 2 Procedure: ER-AA-335-030 Outage No.: N/A
 Summary No.: N/A Procedure Rev.: 4 Report No.: UT-2015-002
 Workscope: PSI Work Order No.: 01782044-01 Page: 3 of 6

Code: ASME 2001 Edition / 2003 Addenda Cat./Item: N/A Location: Steam Tunnel
 Drawing No.: FX-13 Description: Flange to Elbow
 System ID: AF
 Component ID: Field Weld 2 Size/Length: 0.9" / 14.1" Thickness/Diameter: 0.337" / 4"
 Limitations: Single Sided Access Start Time: 0908 Finish Time: 0938

Instrument Settings				Search Unit				Cal. Checks			Axial Oriented Search Unit			
Serial No.:	<u>0221JM</u>			Serial No.:	<u>0112WB</u>			Initial Cal.	<u>0739</u>	<u>8/13/2015</u>	Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
Manufacturer:	<u>GE Inspection Technologies</u>			Manufacturer:	<u>KB-Aerotech</u>			Inter. Cal.	<u>0930</u>	<u>8/13/2015</u>	<u>0.5" Notch</u>	<u>80%</u>	<u>7.6</u>	<u>1.52"</u>
Model:	<u>USN 60 SW</u>	Linearity:	<u>2015-L-001</u>	Size:	<u>0.25"</u>	Model:	<u>Comp-G</u>	Inter. Cal.	<u>0938</u>	<u>8/13/2015</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>
Delay:	<u>6.2216</u>	Range:	<u>2.0"</u>	Freq.:	<u>5.0 MHz</u>	Center Freq.:	<u>N/A</u>	Inter. Cal.	<u>N/A</u>		<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>
M'tl Cal/Vel:	<u>0.1270</u>	Pulser Type:	<u>Square</u>	Exam Angle:	<u>70°</u>	Squint Angle:	<u>N/A</u>	Final Cal.	<u>1314</u>	<u>8/13/2015</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>
Damping:	<u>500 Ohms</u>	Reject:	<u>0%</u>	Measured Angle:	<u>71°</u>	Mode:	<u>Shear</u>	Couplant Cal. Batch: <u>13C028</u> Type: <u>Ultragel II</u> Mfg.: <u>Sonotech</u> Exam Batch: <u>13C028</u> Type: <u>Ultragel II</u> Mfg.: <u>Sonotech</u>						
PRF:	<u>Auto High</u>	SU Freq.:	<u>5.0 MHz</u>	Exit Point	<u>0.3"</u>	# of Elements:	<u>1</u>							
Frequency:	<u>5.0 MHz</u>	Rectify:	<u>Fullwave</u>	Config.:	<u>Single</u>	Focus:	<u>N/A</u>	Circumferential Oriented Search Unit						
Voltage:	<u>450</u>	Pulse Width:	<u>100</u>	Shape:	<u>Round</u>	Contour:	<u>N/A</u>	Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path			
Ax. Gain (dB):	<u>42</u>	Circ. Gain (dB):	<u>N/A</u>	Wedge Style:	<u>MSWQC</u>			N/A	N/A	N/A	N/A			
<u>10</u> Screen Div. = <u>2</u> in. of <u>Sound Path</u>	Search Unit Cable			Type:	<u>RG-174</u>	Length:	<u>6'</u>	No. Conn.:	<u>0</u>	N/A	N/A	N/A	N/A	
Calibration Block				Scan Coverage				Reference Block						
Cal. Block No.	<u>BWD-PDI-516-02</u>			Upstream	<input type="checkbox"/>	Downstream	<input checked="" type="checkbox"/>	Scan dB:	<u>42</u>	Serial No.:	<u>142410 CS</u>			
Thickness	<u>0.5" - 2.0"</u>	Dia.:	<u>Flat</u>	CW	<input type="checkbox"/>	CCW	<input type="checkbox"/>	Scan dB:	<u>N/A</u>	Type:	<u>1" Angle Beam</u>			
Cal. Blk. Temp.	<u>84°</u>	Temp. Tool:	<u>29021141</u>	Exam Surface:	<u>OD</u>			Comments: Cal Block BWD-PDI-516-02 demonstrated to be ultrasonically equivalent to Flaw Tech Cal Block 22571. Baseline Exam. Weld Doc 2A.						
Comp. Temp.	<u>106°</u>	Temp. Tool:	<u>29021141</u>	Surface Condition:	<u>Ground</u>									
Recordable Indication(s): Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> (If Yes, Ref. Attached Ultrasonic Indication Report.)														
Results: Accept <input checked="" type="checkbox"/> Reject <input type="checkbox"/> Info <input type="checkbox"/>														
Percent Of Coverage Obtained > 90%: <u>No-87%</u>				Reviewed Previous Data: <u>N/A</u>										

Examiner	Level	III	Signature	Date	Reviewer	Signature	Date
Crothers, Simon, P.			<i>Simon Crothers</i>	8/13/2015	<i>N/A</i>	<i>N/A</i>	
Examiner	Level	N/A	Signature	Date	Site Review	Signature	Date
N/A					<i>Chris H. McKean</i>	<i>Chris H. McKean</i>	10-1-15
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A					<i>LSE MALABANAN</i>	<i>LSE MALABANAN</i>	10-5-15

Summary No.: **N/A**

Sketch or Photo:

Work Package: **01782044-01**

Weld: **FW-2**

Sketch 1: **Coverage Plot**

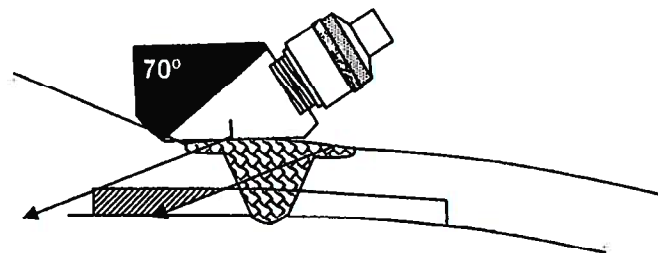
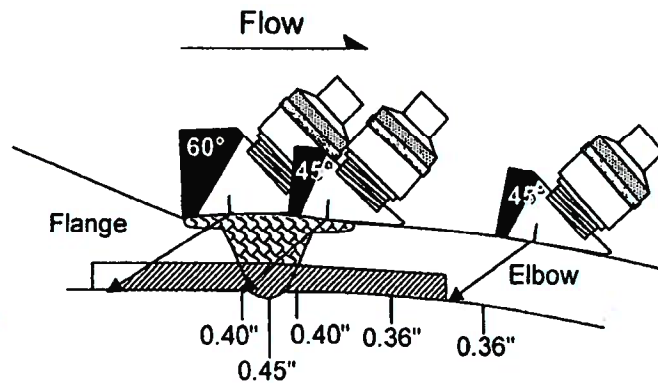
Weld Crown Width: **0.9"**

Counterbore US: **None**

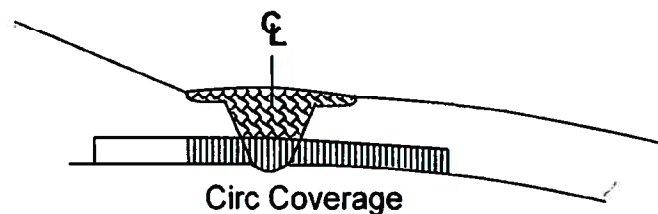
Counterbore DS: **None**

Profile @ L0 (Extrados)

Scanned across weld with 45° probe, coverage credit on far side of weld taken with higher angles.



Note: 70° used to obtain remaining coverage, scan limited to area shown.



Coverage Calc:

- Axial Coverage = 100%
- Circ Coverage = 1.4" of 1.9" exam box width = 74%
- Total = (100% + 74%)/2 = **87%**

Chris H. McKean
CHM
EXELON LVII 10-1-15
Simon Crothers

ANI / ANII REVIEW 10/5/15
REVIEW DATE *10/5/15*

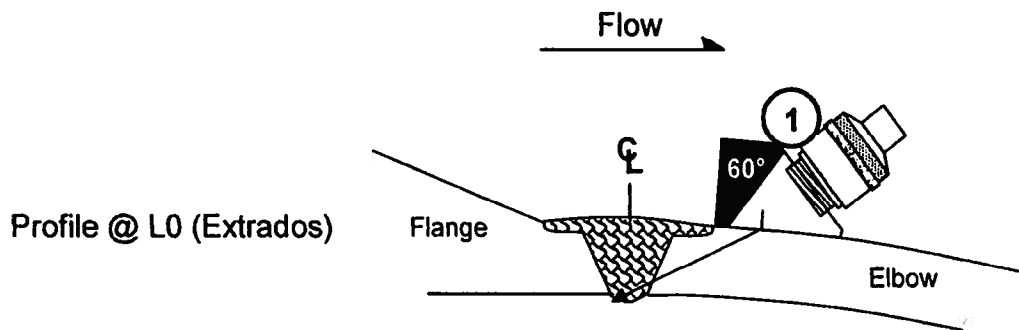
Summary No.: **N/A**

Sketch or Photo:

Work Package: **01782044-01**

Weld: **FW-2**

Sketch 2: **Indication Plot**



① Root Geometry, seen intermittently 360°



Chris H McKean
Chris H McKean
 EXELON LUT 10-1-15

Simon Crothers

ANI / ANII REVIEW
REVIEW DATE *10/5/15*
 Page 33



Ultrasonic Indication Report

Site/Unit: BRW / 2
 Summary No.: N/A
 Workscope: PSI

Procedure: ER-AA-335-030
 Procedure Rev.: 4
 Work Order No.: 01782044-01

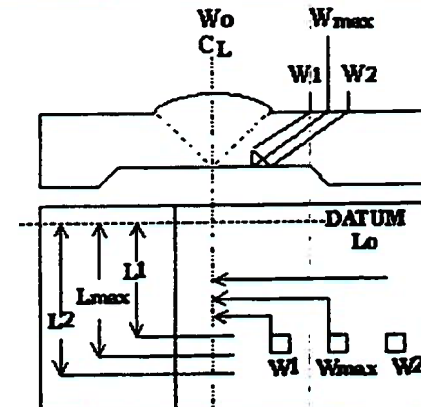
Outage No.: N/A
 Report No.: UT-2015-002
 Page: 6 of 6

Search Unit Angle: 60 °
 Wo Location: Centerline
 Lo Location: Extrados

- ☒ Piping Welds
☐ Ferritic Vessels $\geq 2''$
☐ Other N/A

MP	Metal Path	Wmax	Distance From Wo To S.U. At Maximum Response
RBR	Remaining Back Reflection	W1	Distance From Wo At <u>N/A</u> Of Max (Forward)
L	Distance From Datum	W2	Distance From Wo At <u>N/A</u> Of Max (Backward)

Comments: **Field Weld 2**



Angle	Indication No.	% Of DAC	W Max		Forward N/A Of Max		Backward N/A Of Max		L1 N/A Of Max	L Max	L2 N/A Of Max	RBR Amp.	Remarks
			W	MP	W1	MP	W2	MP					
60°	1	60%	0.7"	0.88"	N/A	N/A	N/A	N/A	N/A	0"	N/A	N/A	Root Geometry from DS side.

Examiner	Level	III	Signature	Date	Reviewer	Signature	Date
Crothers, Simon, P.			<i>Simon Crothers</i>	8/13/2015	<i>N/A</i>	<i>N/A</i>	
Examiner	Level	N/A	Signature	Date	Site Review	Signature	Date
N/A					<i>Mark Seby</i>	<i>Mark Seby</i>	8/19/15
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A					<i>LEE MARRASAN</i>	<i>L MARRASAN</i>	10-5-15



UT Calibration/Examination

2AF-04-20

Site/Unit: BRW / 2
Summary No.: N/A
Workscope: PSI

Procedure: ER-AA-335-030
Procedure Rev.: 4
Work Order No.: 01782044-01

Outage No.: N/A
Report No.: UT-2015-003
Page: 1 of 6

Code: ASME 2001 Edition / 2003 Addenda Cat./Item: N/A Location: Steam Tunnel

Drawing No.: FX-13 Description: Elbow to Flange

System ID: AF

Component ID: Field Weld 3 Size/Length: 0.7" / 14.1" Thickness/Diameter: 0.337" / 4"

Limitations: Single Sided Access Start Time: 1032 Finish Time: 1131

Instrument Settings				Search Unit				Cal. Checks			Axial Oriented Search Unit				
Serial No.:	<u>0221JM</u>			Serial No.:	<u>SC1493</u>			Initial Cal.	<u>0720</u>	<u>8/13/2015</u>	Calibration Reflector	<u>0.5" Notch</u>	<u>80%</u>	<u>7.2</u>	<u>0.72"</u>
Manufacturer:	<u>GE Inspection Technologies</u>			Manufacturer:	<u>KB-Aerotech</u>			Inter. Cal.	<u>1032</u>	<u>8/13/2015</u>	Signal Amplitude %	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>
Model:	<u>USN 60 SW</u>	Linearity:	<u>2015-L-001</u>	Size:	<u>0.25"</u>	Model:	<u>Comp-G</u>	Inter. Cal.	<u>1056</u>	<u>8/13/2015</u>	Sweep Division	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>
Delay:	<u>3.5741</u>	Range:	<u>1.0"</u>	Freq.:	<u>5.0 MHz</u>	Center Freq.:	<u>N/A</u>	Inter. Cal.	<u>N/A</u>		Sound Path	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>
M'tl Cal/Vel:	<u>0.1270</u>	Pulser Type:	<u>Square</u>	Exam Angle:	<u>45°</u>	Squint Angle:	<u>N/A</u>	Final Cal.	<u>1312</u>	<u>8/13/2015</u>	Circumferential Oriented Search Unit				
Damping:	<u>500 Ohms</u>	Reject:	<u>0%</u>	Measured Angle:	<u>46°</u>	Mode:	<u>Shear</u>	Couplant			Calibration Reflector	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>
PRF:	<u>Auto High</u>	SU Freq.:	<u>5.0 MHz</u>	Exit Point	<u>0.2"</u>	# of Elements:	<u>1</u>	Cal. Batch:	<u>13C028</u>	Type:	<u>Ultragel II</u>	Signal Amplitude %	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>
Frequency:	<u>5.0 MHz</u>	Rectify:	<u>Fullwave</u>	Config.:	<u>Single</u>	Focus:	<u>N/A</u>	Mfg.:	<u>Sonotech</u>	Exam Batch:	<u>13C028</u>	Sweep Division	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>
Voltage:	<u>450</u>	Pulse Width:	<u>100</u>	Shape:	<u>Round</u>	Contour:	<u>N/A</u>	Type:	<u>Ultragel II</u>	Mfg.:	<u>Sonotech</u>	Sound Path	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>
Ax. Gain (dB): <u>21</u> Circ. Gain (dB): <u>N/A</u>				Search Unit Cable				Reference Block			Reference/Simulator Block				
<u>10</u> Screen Div. = <u>1</u> in. of <u>Sound Path</u>				Type: <u>RG-174</u> Length: <u>6'</u> No. Conn.: <u>0</u>				Type: <u>Ultragel II</u>			Gain dB				
Calibration Block				Scan Coverage				Type: <u>Sonotech</u>			Reflector				
Cal. Block No. <u>BWD-PDI-516-02</u>				Upstream <input checked="" type="checkbox"/> Downstream <input type="checkbox"/> Scan dB: <u>33</u>				Serial No.: <u>142410 CS</u>			Signal Amplitude %				
Thickness <u>0.5" - 2.0"</u> Dia.: <u>Flat</u>				CW <input checked="" type="checkbox"/> CCW <input checked="" type="checkbox"/> Scan dB: <u>39</u>				Type: <u>1" Angle Beam</u>			Sweep Division				
Cal. Blk. Temp. <u>84°</u> Temp. Tool: <u>29021141</u>				Exam Surface: <u>OD</u>							Sound Path				
Comp. Temp. <u>100°</u> Temp. Tool: <u>29021141</u>				Surface Condition: <u>Ground</u>											
Recordable Indication(s): Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> (If Yes, Ref. Attached Ultrasonic Indication Report.)															
Results: Accept <input checked="" type="checkbox"/> Reject <input type="checkbox"/> Info <input type="checkbox"/>															
Percent Of Coverage Obtained > 90%: <u>No-88%</u>				Reviewed Previous Data: <u>N/A</u>											

Comments: Cal Block BWD-PDI-516-02 demonstrated to be ultrasonically equivalent to Flaw Tech Cal Block 22571. Baseline Exam. Weld Doc 2A.

Examiner	Level	Signature	Date	Reviewer	Signature	Date
Crothers, Simon, P.	III	<i>Simon Crothers</i>	8/13/2015	N/A	<i>N/A</i>	
N/A	N/A			Site Review	<i>Chris H. McKean</i>	10-1-15
N/A	N/A			ANII Review	<i>LEE MALABANAN</i>	10/5/15



UT Calibration/Examination

Site/Unit: **BRW / 2**
 Summary No.: **N/A**
 Workscope: **PSI**

Procedure: **ER-AA-335-030**
 Procedure Rev.: **4**
 Work Order No.: **01782044-01**

Outage No.: **N/A**
 Report No.: **UT-2015-003**
 Page: **2** of **6**

Code: **ASME 2001 Edition / 2003 Addenda** Cat./Item: **N/A** Location: **Steam Tunnel**
 Drawing No.: **FX-13** Description: **Elbow to Flange**
 System ID: **AF**
 Component ID: **Field Weld 3** Size/Length: **0.7" / 14.1"** Thickness/Diameter: **0.337" / 4"**
 Limitations: **Single Sided Access** Start Time: **1032** Finish Time: **1131**

Instrument Settings
 Serial No.: **0221JM**
 Manufacturer: **GE Inspection Technologies**
 Model: **USN 60 SW** Linearity: **2015-L-001**
 Delay: **4.9803** Range: **1.5"**
 M'tl Cal/Vel: **0.1270** Pulsar Type: **Square**
 Damping: **500 Ohms** Reject: **0%**
 PRF: **Auto High** SU Freq.: **5.0 MHz**
 Frequency: **5.0 MHz** Rectify: **Fullwave**
 Voltage: **450** Pulse Width: **100**
 Ax. Gain (dB): **33** Circ. Gain (dB): **N/A**
 10 Screen Div. = **1.5** in. of **Sound Path**

Search Unit
 Serial No.: **SC1489**
 Manufacturer: **KB-Aerotech**
 Size: **0.25"** Model: **Comp-G**
 Freq.: **5.0 MHz** Center Freq.: **N/A**
 Exam Angle: **60°** Squint Angle: **N/A**
 Measured Angle: **60°** Mode: **Shear**
 Exit Point: **0.25"** # of Elements: **1**
 Config.: **Single** Focus: **N/A**
 Shape: **Round** Contour: **N/A**
 Wedge Style: **MSWQC**

Search Unit Cable
 Type: **RG-174** Length: **6'** No. Conn.: **0**

Cal. Checks	Time	Date
Initial Cal.	0731	8/13/2015
Inter. Cal.	1056	8/13/2015
Inter. Cal.	1126	8/13/2015
Inter. Cal.	N/A	
Final Cal.	1313	8/13/2015

Couplant
 Cal. Batch: **13C028**
 Type: **Ultragel II**
 Mfg.: **Sonotech**
 Exam Batch: **13C028**
 Type: **Ultragel II**
 Mfg.: **Sonotech**

Axial Oriented Search Unit			
Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
0.5" Notch	80%	6.0	0.9"
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

Circumferential Oriented Search Unit			
Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
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

Reference/Simulator Block				
Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
28	SDH	80%	4:3	0.64"
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A

Calibration Block
 Cal. Block No.: **BWD-PDI-516-02**
 Thickness: **0.5" - 2.0"** Dia.: **Flat**
 Cal. Blk. Temp.: **84°** Temp. Tool: **29021141**
 Comp. Temp.: **100°** Temp. Tool: **29021141**

Scan Coverage
 Upstream ☒ Downstream ☐ Scan dB: **39**
 CW ☐ CCW ☐ Scan dB: **N/A**
 Exam Surface: **OD**
 Surface Condition: **Ground**

Reference Block
 Serial No.: **142410 CS**
 Type: **1" Angle Beam**

Recordable Indication(s): Yes ☒ No ☐ (If Yes, Ref. Attached Ultrasonic Indication Report.)

Results: Accept ☒ Reject ☐ Info ☐

Percent Of Coverage Obtained > 90%: **No-88%** Reviewed Previous Data: **N/A**

Comments: Cal Block BWD-PDI-516-02 demonstrated to be ultrasonically equivalent to Flaw Tech Cal Block 22571. Baseline Exam. Weld Doc 2A.

Examiner	Level	III	Signature	Date	Reviewer	Signature	Date
Crothers, Simon, P.			<i>Simon Crothers</i>	8/13/2015	N/A	<i>N/A</i>	
Examiner	Level	N/A	Signature	Date	Site Review	Signature	Date
N/A					Chris H. McKean LUT III	<i>Chris H. McKean</i>	10-1-15
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A					LEE MAURANDIAN	<i>L. Maurandian</i>	10-5-15



UT Calibration/Examination

Site/Unit: BRW / 2 Procedure: ER-AA-335-030 Outage No.: N/A
Summary No.: N/A Procedure Rev.: 4 Report No.: UT-2015-003
Workscope: PSI Work Order No.: 01782044-01 Page: 3 of 6

Code: ASME 2001 Edition / 2003 Addenda Cat./Item: N/A Location: Steam Tunnel

Drawing No.: FX-13 Description: Elbow to Flange

System ID: AF

Component ID: Field Weld 3 Size/Length: 0.7" / 14.1" Thickness/Diameter: 0.337" / 4"

Limitations: Single Sided Access Start Time: 1032 Finish Time: 1131

Instrument Settings				Search Unit				Cal. Checks			Axial Oriented Search Unit				
Serial No.:	0221JM			Serial No.:	0112WB			Cal. Checks	Time	Date	Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path	
Manufacturer:	GE Inspection Technologies			Manufacturer:	KB-Aerotech			Initial Cal.	0739	8/13/2015	0.5" Notch	80%	7.6	1.52"	
Model:	USN 60 SW	Linearity:	2015-L-001	Size:	0.25"	Model:	Comp-G	Inter. Cal.	1126	8/13/2015	N/A	N/A	N/A	N/A	
Delay:	6.2216	Range:	2.0"	Freq.:	5.0 MHz	Center Freq.:	N/A	Inter. Cal.	1131	8/13/2015	N/A	N/A	N/A	N/A	
Mt'l Cal/Vel:	0.1270	Pulser Type:	Square	Exam Angle:	70°	Squint Angle:	N/A	Inter. Cal.	N/A		N/A	N/A	N/A	N/A	
Damping:	500 Ohms	Reject:	0%	Measured Angle:	71°	Mode:	Shear	Final Cal.	1314	8/13/2015	N/A	N/A	N/A	N/A	
PRF:	Auto High	SU Freq.:	5.0 MHz	Exit Point	0.3"	# of Elements:	1	Couplant							
Frequency:	5.0 MHz	Rectify:	Fullwave	Config.:	Single	Focus:	N/A								
Voltage:	450	Pulse Width:	100	Shape:	Round	Contour:	N/A	Cal. Batch:	13C028						
Ax. Gain (dB):	42	Circ. Gain (dB):	N/A	Wedge Style:	MSWQC			Type:	Ultragel II						
10 Screen Div. =	2	in. of	Sound Path	Search Unit Cable	Type: RG-174 Length: 6' No. Conn.: 0			Mfg.:	Sonotech						
Calibration Block				Scan Coverage				Reference Block							
Cal. Block No.	BWD-PDI-516-02			Upstream	<input checked="" type="checkbox"/>	Downstream	<input type="checkbox"/>	Scan dB:	42						
Thickness	0.5" - 2.0"			Dia.:	Flat			CW	<input type="checkbox"/>	CCW	<input type="checkbox"/>	Scan dB:	N/A		
Cal. Blk. Temp.	84°			Temp. Tool:	29021141			Exam Surface:	OD						
Comp. Temp.	100°			Temp. Tool:	29021141			Surface Condition:	Ground						
Recordable Indication(s): Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> (If Yes, Ref. Attached Ultrasonic Indication Report.)															
Results: Accept <input checked="" type="checkbox"/> Reject <input type="checkbox"/> Info <input type="checkbox"/>															
Percent Of Coverage Obtained > 90%: <u>No-88%</u> Reviewed Previous Data: <u>N/A</u>															
Comments: Cal Block BWD-PDI-516-02 demonstrated to be ultrasonically equivalent to Flaw Tech Cal Block 22571. Baseline Exam. Weld Doc 2A.															

Examiner	Level	III	Signature	Date	Reviewer	Signature	Date
Crothers, Simon, P.			<i>Simon Crothers</i>	8/13/2015	N/A	<i>N/A</i>	
Examiner	Level	N/A	Signature	Date	Site Review	Signature	Date
N/A					Chris H. McKean LV III	<i>Chris H. McKean</i>	10-1-15
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A					LEE MALABANAN	<i>L. Malaban</i>	10-5-15

Summary No.: **N/A**

Sketch or Photo:

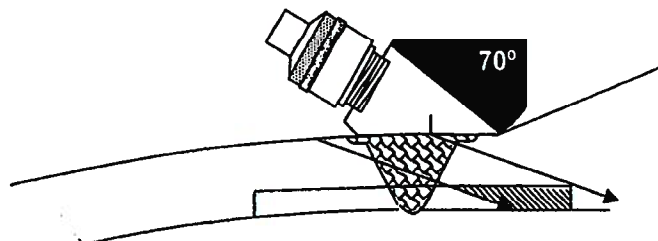
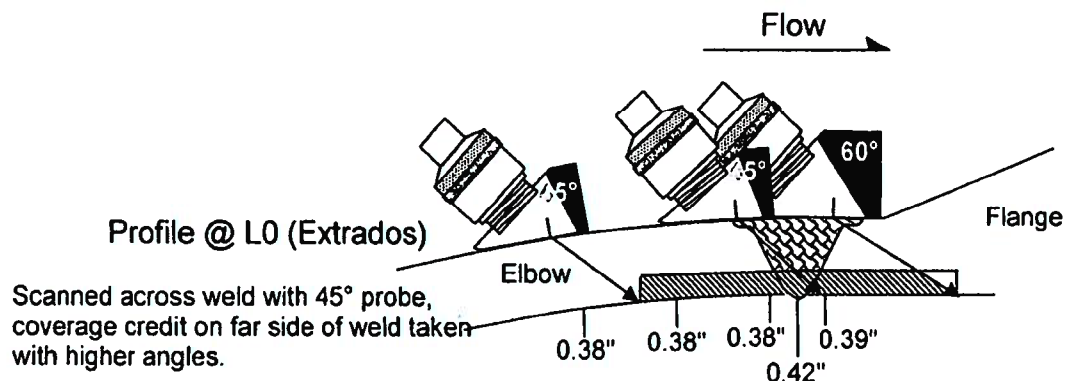
Work Package: **01782044-01**

Weld: **FW-3**

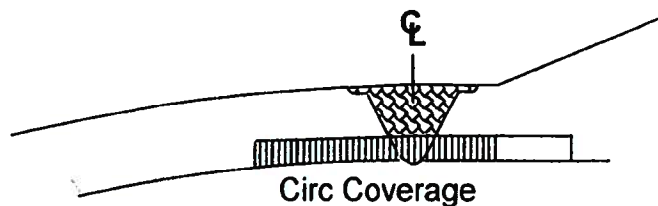
Sketch 1: **Coverage Plot**

Weld Crown Width: **0.7"**

Counterbore US: **None**

Counterbore DS: **None**


Note: 70° used to obtain remaining coverage, scan limited to area shown.



Coverage Calc:

- Axial Coverage = 100%
- Circ Coverage = 1.3" of 1.7" exam box width = 76.5%
- Total = $(100\% + 76.5\%) / 2 = 88\%$

Simon Crothers

Chris H. McKenna
CH McK
 EXELON L0 III 10-1-15

Summary No.: N/A

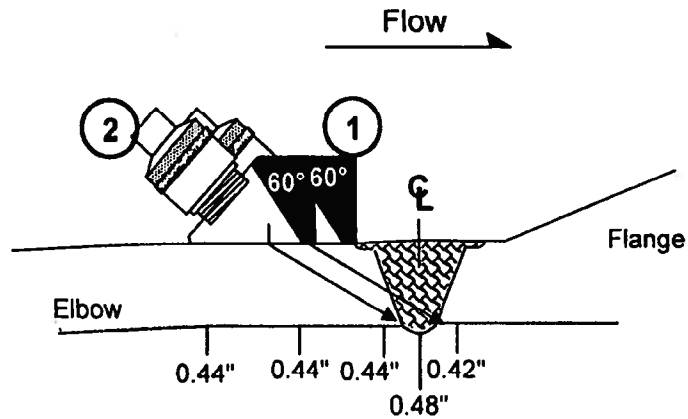
Sketch or Photo:

Work Package: 01782044-01

Weld: FW-3

Sketch 2: Indication Plot

Profile @ 3.5" CW



- ① Root Geometry, seen intermittently 360°
- ② Geometric reflector from ID mismatch, seen intermittently 360°. Flange was open at the time of inspection, inspector verified this condition visually.



Simon Crothers

Chris H. McKernan
CH McKernan
EXELON LUT 10-1-15



Ultrasonic Indication Report

Site/Unit: **BRW / 2**
 Summary No.: **N/A**
 Workscope: **PSI**

Procedure: **ER-AA-335-030**
 Procedure Rev.: **4**
 Work Order No.: **01782044-01**

Outage No.: **N/A**
 Report No.: **UT-2015-003**
 Page: **6** of **6**

Search Unit Angle: **60** °

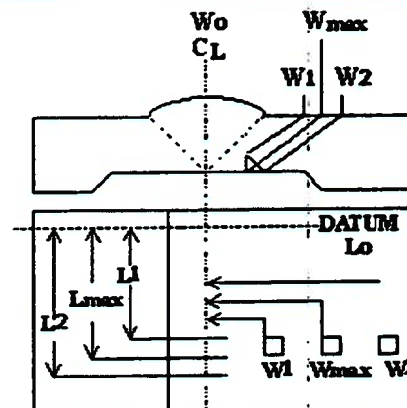
Wo Location: **Centerline**

Lo Location: **Extradose**

- ☒ Piping Welds
☐ Ferritic Vessels $\geq 2^{\circ}T$
☐ Other **N/A**

MP	Metal Path	Wmax	Distance From Wo To S.U. At Maximum Response
RBR	Remaining Back Reflection	W1	Distance From Wo At N/A Of Max (Forward)
L	Distance From Datum	W2	Distance From Wo At N/A Of Max (Backward)

Comments: **Field Weld 3**



Angle	Indication No.	% Of DAC	W Max		Forward N/A Of Max		Backward N/A Of Max		L1 N/A Of Max	L Max	L2 N/A Of Max	RBR Amp.	Remarks
			W	MP	W1	MP	W2	MP					
60°	1	80%	0.6"	0.88"	N/A	N/A	N/A	N/A	N/A	3.5"	N/A	N/A	Root Geometry from US side.
60°	2	55%	0.8"	0.80"	N/A	N/A	N/A	N/A	N/A	3.5"	N/A	N/A	ID Geometry, see Indication Plot.

Examiner	Level	III	Signature	Date	Reviewer	Signature	Date
Crothers, Simon, P.			<i>Simon Crothers</i>	8/13/2015	<i>N/A</i>	<i>N/A</i>	
Examiner	Level	N/A	Signature	Date	Site Review	Signature	Date
N/A					<i>Mark Sahby</i>	<i>29/8/15</i>	8/14/15
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A					<i>LEE MARABANAN</i>	<i>10-5-15</i>	



UT Calibration/Examination

2AF-04-21

Site/Unit: **BRW / 2**
Summary No.: **N/A**
Workscope: **PSI**

Procedure: **ER-AA-335-030**
Procedure Rev.: **4**
Work Order No.: **01782044-01**

Outage No.: **N/A**
Report No.: **UT-2015-004**
Page: **1** of **6**

Code: **ASME 2001 Edition / 2003 Addenda** Cat./Item: **N/A** Location: **Steam Tunnel**
Drawing No.: **FX-13** Description: **Flange to Elbow**
System ID: **AF**
Component ID: **Field Weld 4** Size/Length: **0.7" / 14.1"** Thickness/Diameter: **0.337" / 4"**
Limitations: **Single Sided Access** Start Time: **1032** Finish Time: **1131**

Instrument Settings
Serial No.: **0221JM**
Manufacturer: **GE Inspection Technologies**
Model: **USN 60 SW** Linearity: **2015-L-001**
Delay: **3.5741** Range: **1.0"**
M'tl Cal/Vel: **0.1270** Pulsar Type: **Square**
Damping: **500 Ohms** Reject: **0%**
PRF: **Auto High** SU Freq.: **5.0 MHz**
Frequency: **5.0 MHz** Rectify: **Fullwave**
Voltage: **450** Pulse Width: **100**

Search Unit
Serial No.: **SC1493**
Manufacturer: **KB-Aerotech**
Size: **0.25"** Model: **Comp-G**
Freq.: **5.0 MHz** Center Freq.: **N/A**
Exam Angle: **45°** Squint Angle: **N/A**
Measured Angle: **46°** Mode: **Shear**
Exit Point: **0.2"** # of Elements: **1**
Config.: **Single** Focus: **N/A**
Shape: **Round** Contour: **N/A**
Wedge Style: **MSWQC**

Cal. Checks	Time	Date
Initial Cal.	0720	8/13/2015
Inter. Cal.	1032	8/13/2015
Inter. Cal.	1056	8/13/2015
Inter. Cal.	N/A	
Final Cal.	1312	8/13/2015

Couplant
Cal. Batch: **13C028**
Type: **Ultrigel II**
Mfg.: **Sonotech**
Exam Batch: **13C028**
Type: **Ultrigel II**
Mfg.: **Sonotech**

Axial Oriented Search Unit			
Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
0.5" Notch	80%	7.2	0.72"
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

Circumferential Oriented Search Unit			
Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
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

Reference/Simulator Block				
Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
21	SDH	50%	4.5	0.45"
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A

Ax. Gain (dB): **21** Circ. Gain (dB): **N/A**
10 Screen Div. = **1** in. of **Sound Path**

Search Unit Cable
Type: **RG-174** Length: **6'** No. Conn.: **0**

Calibration Block
Cal. Block No.: **BWD-PDI-516-02**
Thickness **0.5" - 2.0"** Dia.: **Flat**
Cal. Blk. Temp. **84°** Temp. Tool: **29021141**
Comp. Temp. **100°** Temp. Tool: **29021141**

Scan Coverage
Upstream ☐ Downstream ☒ Scan dB: **33**
CW ☒ CCW ☒ Scan dB: **39**
Exam Surface: **OD**
Surface Condition: **Ground**

Reference Block
Serial No.: **142410 CS**
Type: **1" Angle Beam**

Recordable Indication(s): Yes ☒ No ☐ (If Yes, Ref. Attached Ultrasonic Indication Report.)

Results: Accept ☒ Reject ☐ Info ☐

Percent Of Coverage Obtained > 90%: **No-88%** Reviewed Previous Data: **N/A**

Comments: Cal Block BWD-PDI-516-02 demonstrated to be ultrasonically equivalent to Flaw Tech Cal Block 22571. Baseline Exam. Weld Doc 2A.

Examiner	Level	III	Signature	Date	Reviewer	Signature	Date
Crothers, Simon, P.			<i>Simon Crothers</i>	8/13/2015	N/A	<i>N/A</i>	
Examiner	Level	N/A	Signature	Date	Site Review	Signature	Date
N/A					Chris H. McKernan LV III	<i>Chris H. McKernan</i>	10-1-15
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A					LEE MALABANAN	<i>Lee Malabanan</i>	10-5-15



UT Calibration / Examination

Site/Unit: BRW / 2
Summary No.: N/A
Workscope: PSI

Procedure: ER-AA-335-030
Procedure Rev.: 4
Work Order No.: 01782044-01

Outage No.: N/A
Report No.: UT-2015-004
Page: 2 of 6

Code: ASME 2001 Edition / 2003 Addenda Cat./Item: N/A Location: Steam Tunnel
Drawing No.: FX-13 Description: Flange to Elbow
System ID: AF
Component ID: Field Weld 4 Size/Length: 0.7" / 14.1" Thickness/Diameter: 0.337" / 4"
Limitations: Single Sided Access Start Time: 1032 Finish Time: 1131

Instrument Settings
Serial No.: 0221JM
Manufacturer: GE Inspection Technologies
Model: USN 60 SW Linearity: 2015-L-001
Delay: 4.9803 Range: 1.5"
M'tl Cal/Vel: 0.1270 Pulsar Type: Square
Damping: 500 Ohms Reject: 0%
PRF: Auto High SU Freq.: 5.0 MHz
Frequency: 5.0 MHz Rectify: Fullwave
Voltage: 450 Pulse Width: 100
Ax. Gain (dB): 33 Circ. Gain (dB): N/A
10 Screen Div. = 1.5 in. of Sound Path

Search Unit
Serial No.: SC1489
Manufacturer: KB-Aerotech
Size: 0.25" Model: Comp-G
Freq.: 5.0 MHz Center Freq.: N/A
Exam Angle: 60° Squint Angle: N/A
Measured Angle: 60° Mode: Shear
Exit Point 0.25" # of Elements: 1
Config.: Single Focus: N/A
Shape: Round Contour: N/A
Wedge Style: MSWQC
Search Unit Cable
Type: RG-174 Length: 6' No. Conn.: 0

Cal. Checks	Time	Date
Initial Cal.	0731	8/13/2015
Inter. Cal.	1056	8/13/2015
Inter. Cal.	1126	8/13/2015
Inter. Cal.	N/A	
Final Cal.	1313	8/13/2015

Couplant
Cal. Batch: 13C028
Type: Ultrage II
Mfg.: Sonotech
Exam Batch: 13C028
Type: Ultrage II
Mfg.: Sonotech

Axial Oriented Search Unit			
Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
0.5" Notch	80%	6.0	0.9"
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

Circumferential Oriented Search Unit			
Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
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

Reference/Simulator Block				
Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
28	SDH	80%	4.3	0.64"
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A

Calibration Block
Cal. Block No. BWD-PDI-516-02
Thickness 0.5" - 2.0" Dia.: Flat
Cal. Blk. Temp. 84° Temp. Tool: 29021141
Comp. Temp. 100° Temp. Tool: 29021141
Recordable Indication(s): Yes ☒ No ☐ (If Yes, Ref. Attached Ultrasonic Indication Report.)
Results: Accept ☒ Reject ☐ Info ☐

Reference Block
Serial No.: 142410 CS
Type: 1" Angle Beam

Percent Of Coverage Obtained > 90%: No-88% Reviewed Previous Data: N/A

Comments: Cal Block BWD-PDI-516-02 demonstrated to be ultrasonically equivalent to Flaw Tech Cal Block 22571. Baseline Exam. Weld Doc 2A.

Examiner	Level	III	Signature	Date	Reviewer	Signature	Date
Crothers, Simon, P.			<i>Simon Crothers</i>	8/13/2015	<i>N/A</i>	<i>N/A</i>	
Examiner	Level	N/A	Signature	Date	Site Review	Signature	Date
N/A					<i>Chris H. McKean</i>	<i>CHM</i>	10-1-15
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A					<i>LEE MALABANAN</i>	<i>L</i>	10-5-15



UT Calibration Examination

Site/Unit: BRW / 2
 Summary No.: N/A
 Workscope: PSI

Procedure: ER-AA-335-030
 Procedure Rev.: 4
 Work Order No.: 01782044-01

Outage No.: N/A
 Report No.: UT-2015-004
 Page: 3 of 6

Code: ASME 2001 Edition / 2003 Addenda Cat./Item: N/A Location: Steam Tunnel

Drawing No.: FX-13 Description: Flange to Elbow

System ID: AF

Component ID: Field Weld 4 Size/Length: 0.7" / 14.1" Thickness/Diameter: 0.337" / 4"

Limitations: Single Sided Access Start Time: 1032 Finish Time: 1131

Instrument Settings				Search Unit				Cal. Checks			Axial Oriented Search Unit			
Serial No.:	<u>0221JM</u>			Serial No.:	<u>0112WB</u>			Cal. Checks	Time	Date	Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
Manufacturer:	<u>GE Inspection Technologies</u>			Manufacturer:	<u>KB-Aerotech</u>			Initial Cal.	<u>0739</u>	<u>8/13/2015</u>	<u>0.5" Notch</u>	<u>80%</u>	<u>7.6</u>	<u>1.52"</u>
Model:	<u>USN 60 SW</u>	Linearity:	<u>2015-L-001</u>	Size:	<u>0.25"</u>	Model:	<u>Comp-G</u>	Inter. Cal.	<u>1126</u>	<u>8/13/2015</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>
Delay:	<u>6.2216</u>	Range:	<u>2.0"</u>	Freq.:	<u>5.0 MHz</u>	Center Freq.:	<u>N/A</u>	Inter. Cal.	<u>1131</u>	<u>8/13/2015</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>
M'tl Cal/Vel:	<u>0.1270</u>	Pulser Type:	<u>Square</u>	Exam Angle:	<u>70°</u>	Squint Angle:	<u>N/A</u>	Inter. Cal.	<u>N/A</u>		<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>
Damping:	<u>500 Ohms</u>	Reject:	<u>0%</u>	Measured Angle:	<u>71°</u>	Mode:	<u>Shear</u>	Final Cal.	<u>1314</u>	<u>8/13/2015</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>
PRF:	<u>Auto High</u>	SU Freq.:	<u>5.0 MHz</u>	Exit Point	<u>0.3"</u>	# of Elements:	<u>1</u>	Couplant						
Frequency:	<u>5.0 MHz</u>	Rectify:	<u>Fullwave</u>	Config.:	<u>Single</u>	Focus:	<u>N/A</u>	Cal. Batch:	<u>13C028</u>					
Voltage:	<u>450</u>	Pulse Width:	<u>100</u>	Shape:	<u>Round</u>	Contour:	<u>N/A</u>	Type:	<u>Ultragel II</u>					
				Wedge Style:	<u>MSWQC</u>			Mfg.:	<u>Sonotech</u>					
				Search Unit Cable				Exam Batch:	<u>13C028</u>					
				Type:	<u>RG-174</u>	Length:	<u>6'</u>	Type:	<u>Ultragel II</u>					
				No. Conn.:	<u>0</u>			Mfg.:	<u>Sonotech</u>					
Cal. Block No. <u>BWD-PDI-516-02</u>				Scan Coverage				Reference Block						
Thickness <u>0.5" - 2.0"</u> Dia.: <u>Flat</u>				Upstream <input type="checkbox"/>	Downstream <input checked="" type="checkbox"/>	Scan dB: <u>42</u>		Serial No.:	<u>142410 CS</u>					
Cal. Blk. Temp. <u>84°</u> Temp. Tool: <u>29021141</u>				CW <input type="checkbox"/>	CCW <input type="checkbox"/>	Scan dB: <u>N/A</u>		Type:	<u>1" Angle Beam</u>					
Comp. Temp. <u>100°</u> Temp. Tool: <u>29021141</u>				Exam Surface: <u>OD</u>										
Surface Condition: <u>Ground</u>														
Recordable Indication(s): Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> (If Yes, Ref. Attached Ultrasonic Indication Report.)														
Results: Accept <input checked="" type="checkbox"/> Reject <input type="checkbox"/> Info <input type="checkbox"/>														
Percent Of Coverage Obtained > 90%: <u>No-88%</u>				Reviewed Previous Data: <u>N/A</u>				Comments: Cal Block BWD-PDI-516-02 demonstrated to be ultrasonically equivalent to Flaw Tech Cal Block 22571. Baseline Exam. Weld Doc 2A.						

Examiner	Level	III	Signature	Date	Reviewer	Signature	Date
Crothers, Simon, P.			<i>Simon Crothers</i>	8/13/2015	<i>N/A</i>	<i>N/A</i>	
Examiner	Level	N/A	Signature	Date	Site Review	Signature	Date
N/A					<i>Chris H. McKean</i>	<i>Chris H. McKean</i>	10-1-15
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A					<i>LEE MALIBAWAN</i>	<i>L. Malibawan</i>	10-5-15

Primary No.: **N/A**

Sketch or Photo:

Work Package: 01782044-01

Weld: FW-4

Sketch 1: Coverage Plot

Weld Crown Width: 0.7"

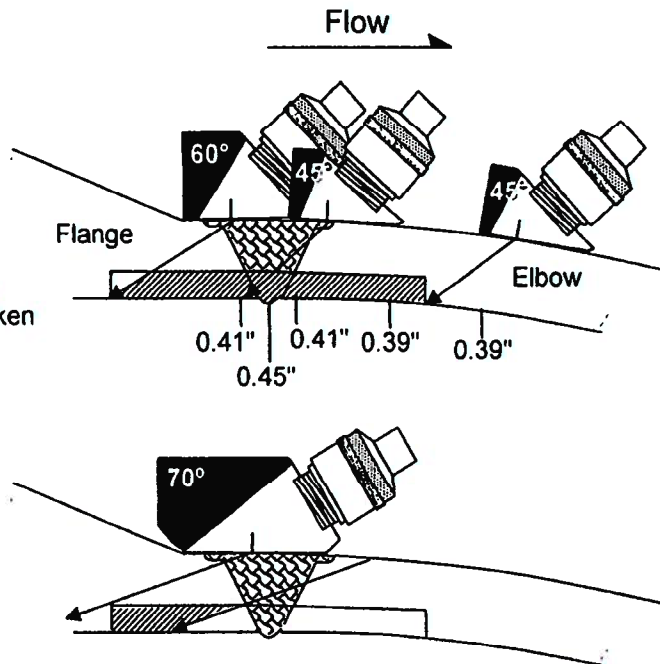
Counterbore US: None

Counterbore DS: None

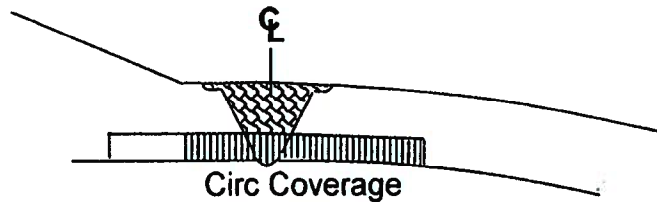


Profile @ L0 (Extrados)

Scanned across weld with 45° probe, coverage credit on far side of weld taken with higher angles.



Note: 70° used to obtain remaining coverage, scan limited to area shown.



Coverage Calc:

- Axial Coverage = 100%
- Circ Coverage = 1.3" of 1.7" exam box width = 76.5%
- Total = (100% + 76.5%)/2 = **88%**

Chris H. McKean
Ch. H. McKean
EXELON L0 III 10-1-15

Simon Crothers

ANI / ANII REVIEW
REVIEW DATE *10/5/15*

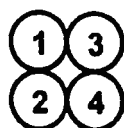
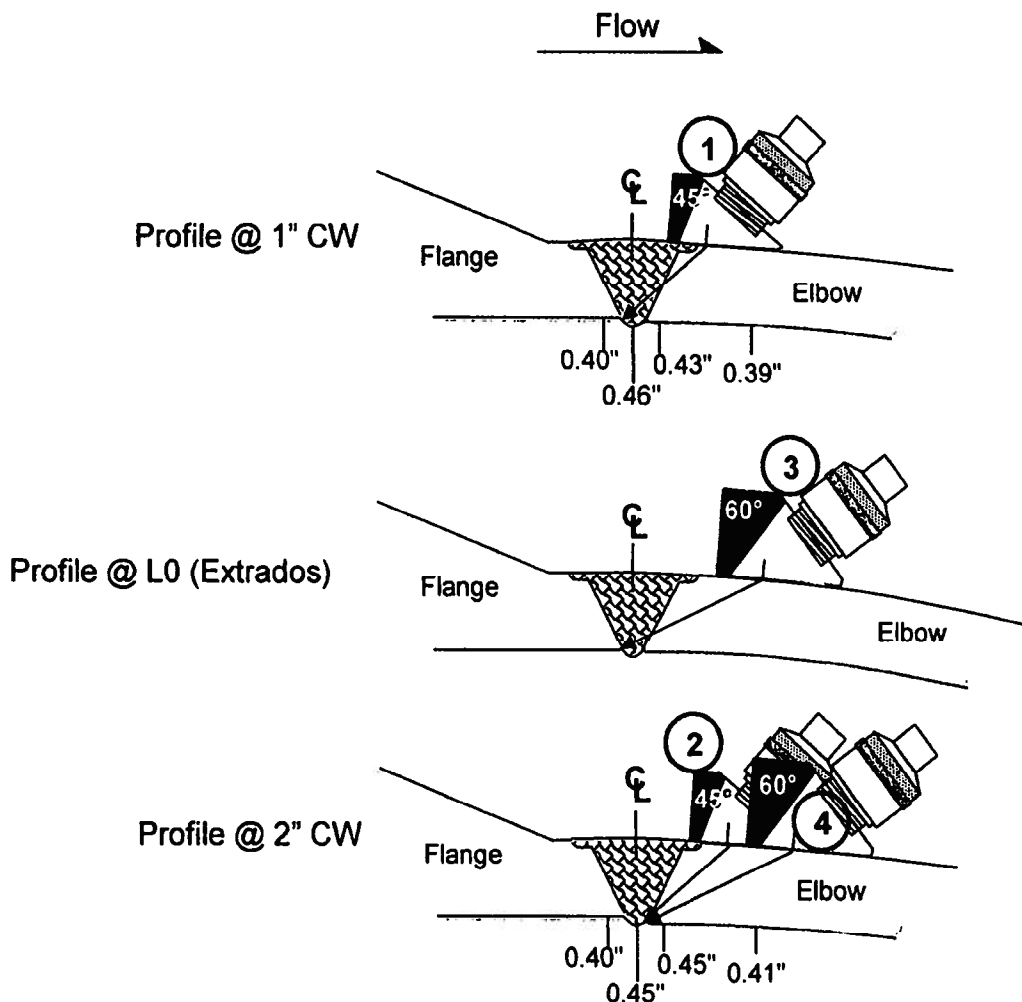
Summary No.: N/A

Sketch or Photo:

Work Package: 01782044-01

Weld: FW-4

Sketch 2: Indication Plot



Root Geometry, seen intermittently 360°

Geometric reflector from ID mismatch, seen intermittently 360°. Flange was open at the time of inspection, inspector verified this condition visually.

CLH/MLH
EXELON LUTZ 10-1-15



Simon Crothers

ANI / ANII REVIEW
REVIEW DATE *10/5/15*

Ultrasonic Indication Report

Site/Unit: BRW / 2
 Summary No.: N/A
 Workscope: PSI

Procedure: ER-AA-335-030
 Procedure Rev.: 4
 Work Order No.: 01782044-01

Outage No.: N/A
 Report No.: UT-2015-004
 Page: 6 of 6

Search Unit Angle: 45° / 60°

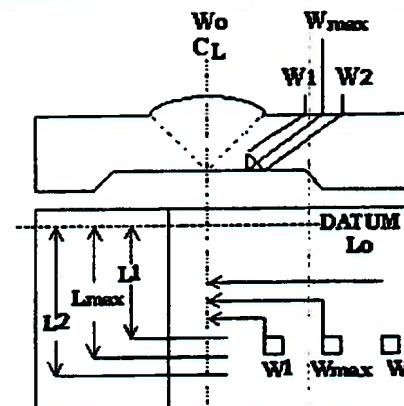
Wo Location: Centerline

Lo Location: Extrados

- ☒ Piping Welds
☐ Ferritic Vessels $\geq 2^{\circ}T$
☐ Other N/A

MP	Metal Path	Wmax	Distance From Wo To S.U. At Maximum Response
RBR	Remaining Back Reflection	W1	Distance From Wo At <u>N/A</u> Of Max (Forward)
L	Distance From Datum	W2	Distance From Wo At <u>N/A</u> Of Max (Backward)

Comments: **Field Weld 4**



Angle	Indication No.	% Of DAC	W Max		Forward N/A Of Max		Backward N/A Of Max		L1 N/A Of Max	L Max	L2 N/A Of Max	RBR Amp.	Remarks
			W	MP	W1	MP	W2	MP					
45°	1	60%	0.4"	0.6"	N/A	N/A	N/A	N/A	N/A	1.0"	N/A	N/A	Root Geometry from DS side.
45°	2	60%	0.5"	0.6"	N/A	N/A	N/A	N/A	N/A	2.0"	N/A	N/A	ID Geometry, see Indication Plot.
60°	3	80%	0.7"	0.85"	N/A	N/A	N/A	N/A	N/A	0"	N/A	N/A	Root Geometry from DS side.
60°	4	60%	0.85"	0.88"	N/A	N/A	N/A	N/A	N/A	2.0"	N/A	N/A	ID Geometry, see Indication Plot.

Examiner	Level	III	Signature	Date	Reviewer	Signature	Date
Crothers, Simon, P.			<i>Simon Crothers</i>	8/13/2015	<i>R/1/14</i>	<i>R/1/14</i>	
Examiner	Level	N/A	Signature	Date	Site Review	Signature	Date
N/A					<i>Mark Sebb</i>	<i>29/11/15</i>	8/13/15
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A					<i>LEE MALABANAN</i>	<i>2/11/15</i>	10-5-15



UT Calibration/Examination

2CV-21-56

Site/Unit: BRW / 2 Procedure: ER-AA-335-031 Outage No.: N/A
 Summary No.: N/A Procedure Rev.: 6 Report No.: UT-2015-012
 Workscope: PSI Work Order No.: 01782743-01 Page: 1 of 6

Code: ASME 2001 Edition / 2003 Addenda Cat./Item: N/A Location: CV Pump Room
 Drawing No.: FX-17 Description: Pipe to Tee
 System ID: CV
 Component ID: Field Weld 2 Size/Length: 4" / 14.5" Thickness/Diameter: 0.531" / 4"
 Limitations: Tee Radius Start Time: 2339 Finish Time: 0045

Instrument Settings
 Serial No.: 0221JM Manufacturer: GE Inspection Technologies
 Model: USN 60 SW Linearity: 2015-L-003
 Delay: 4.1716 Range: 1.5"
 M'tl Cal/Vel: 0.1230 Pulser Type: Square
 Damping: 500 Ohms Reject: 0%
 PRF: Auto High SU Freq.: 2.25 MHz
 Frequency: 2.25 MHz Rectify: Fullwave
 Voltage: 450 Pulse Width: 220

Search Unit
 Serial No.: SB0442 Manufacturer: GEIT
 Size: 0.25" Model: Comp-G
 Freq.: 2.25 MHz Center Freq.: N/A
 Exam Angle: 45° Squint Angle: N/A
 Measured Angle: 45° Mode: Shear
 Exit Point: 0.2" # of Elements: 1
 Config.: Single Focus: N/A
 Shape: Round Contour: N/A
 Wedge Style: MSWQC

Ax. Gain (dB): 20 Circ. Gain (dB): N/A
10 Screen Div. = 1.5 in. of Sound Path

Calibration Block
 Cal. Block No. 22572
 Thickness 0.5" to 2.0" Dia.: Flat
 Cal. Blk. Temp. 72° Temp. Tool: 29021145
 Comp. Temp. 75° Temp. Tool: 29021145

Scan Coverage
 Upstream ☒ Downstream ☒ Scan dB: 32
 CW ☒ CCW ☒ Scan dB: 38
 Exam Surface: OD
 Surface Condition: Ground

Recordable Indication(s): Yes ☐ No ☒ (If Yes, Ref. Attached Ultrasonic Indication Report.)

Results: Accept ☒ Reject ☐ Info ☐

Percent Of Coverage Obtained > 90%: No - 83.3% Reviewed Previous Data: No

Cal. Checks	Time	Date
Initial Cal.	1950	10/13/2015
Inter. Cal.	2339	10/13/2015
Inter. Cal.	2350	10/13/2015
Inter. Cal.	N/A	
Final Cal.	0133	10/14/2015

Couplant
 Cal. Batch: 15E082
 Type: Ultragel II
 Mfg.: Sonotech
 Exam Batch: 15E082
 Type: Ultragel II
 Mfg.: Sonotech

Reference Block
 Serial No.: 43842 SS
 Type: 1" Angle Beam

Axial Oriented Search Unit				
Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path	
1" Notch	80%	9.4	1.41"	
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	
Circumferential Oriented Search Unit				
Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path	
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	
Reference/Simulator Block				
Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
20	SDH	25%	6.9	1.04"
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A

Comments: Baseline Exam. Post RT.
Weld Doc 2A

Examiner	Level	II	Signature	Date	Reviewer	Signature	Date
Salley, Michael				10/14/2015	SIMON CROTHERS L-III		10/15/15
Examiner	Level	N/A	Signature	Date	Site Review	Signature	Date
N/A					Jay Miller		10-15-15
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A					Adam M. Armi		10-15-2015



UT Calibration/Examination

Site/Unit: BRW / 2 Procedure: ER-AA-335-031 Outage No.: N/A
Summary No.: N/A Procedure Rev.: 6 Report No.: UT-2015-012
Workscope: PSI Work Order No.: 01782743-01 Page: 2 of 6

Code: ASME 2001 Edition / 2003 Addenda Cat./Item: N/A Location: CV Pump Room
Drawing No.: FX-17 Description: Pipe to Tee
System ID: CV
Component ID: Field Weld 2 Size/Length: 4" / 14.5" Thickness/Diameter: 0.531" / 4"
Limitations: Tee Radius Start Time: 2339 Finish Time: 0045

Instrument Settings
Serial No.: 0221JM
Manufacturer: GE Inspection Technologies
Model: USN 60 SW Linearity: 2015-L-003
Delay: 5.3369 Range: 2.0"
M'tl Cal/Vel: 0.1230 Pulsar Type: Square
Damping: 500 Ohms Reject: 0%
PRF: Auto High SU Freq.: 2.25 MHz
Frequency: 2.25 MHz Rectify: Fullwave
Voltage: 450 Pulse Width: 220
Ax. Gain (dB): 40 Circ. Gain (dB): N/A
10 Screen Div. = 2 in. of Sound Path

Search Unit
Serial No.: SB0625
Manufacturer: KB-Aerotech
Size: 0.25" Model: Comp-G
Freq.: 2.25 MHz Center Freq.: N/A
Exam Angle: 60° Squint Angle: N/A
Measured Angle: 59° Mode: Shear
Exit Point 0.25" # of Elements: 1
Config.: Single Focus: N/A
Shape: Round Contour: N/A
Wedge Style: MSWQC

Search Unit Cable
Type: RG-174 Length: 6' No. Conn.: 0

Cal. Checks	Time	Date
Initial Cal.	1951	10/13/2015
Inter. Cal.	0004	10/14/2015
Inter. Cal.	0016	10/14/2015
Inter. Cal.	N/A	
Final Cal.	0140	10/14/2015

Couplant
Cal. Batch: 15E082
Type: Ultragel II
Mfg.: Sonotech
Exam Batch: 15E082
Type: Ultragel II
Mfg.: Sonotech

Axial Oriented Search Unit			
Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
1.0" Notch	80%	8.8	1.76"
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

Circumferential Oriented Search Unit			
Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
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

Reference/Simulator Block				
Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
40	SDH	50%	7.2	1.45"
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A

Calibration Block
Cal. Block No. 22572
Thickness 0.5" to 2.0" Dia.: Flat
Cal. Blk. Temp. 72° Temp. Tool: 29021145
Comp. Temp. 75° Temp. Tool: 29021145
Recordable Indication(s): Yes ☐ No ☒ (If Yes, Ref. Attached Ultrasonic Indication Report.)
Results: Accept ☒ Reject ☐ Info ☐

Scan Coverage
Upstream ☒ Downstream ☒ Scan dB: 46
CW ☐ CCW ☐ Scan dB: N/A
Exam Surface: OD
Surface Condition: Ground

Reference Block
Serial No.: 43842 SS
Type: 1" Angle Beam

Comments: Baseline Exam. Post RT.
Weld Doc 2A

Percent Of Coverage Obtained > 90%: No - 83.3% Reviewed Previous Data: No

Examiner	Level	II	Signature	Date	Reviewer	Signature	Date
Salley, Michael			<i>[Signature]</i>	10/14/2015	SIMON CROTHERS L-III	<i>[Signature]</i>	10/15/15
Examiner	Level	N/A	Signature	Date	Site Review	Signature	Date
N/A					Jay Miller	<i>[Signature]</i>	10-15-15
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A					Adam M. Prince	<i>[Signature]</i>	10-15-2015



UT Calibration/Examination

Site/Unit: BRW / 2Procedure: ER-AA-335-031Outage No.: N/ASummary No.: N/AProcedure Rev.: 6Report No.: UT-2015-012Workscope: PSIWork Order No.: 01782743-01Page: 3 of 6Code: ASME 2001 Edition / 2003 Addenda Cat./Item: N/A Location: CV Pump RoomDrawing No.: FX-17 Description: Pipe to TeeSystem ID: CVComponent ID: Field Weld 2 Size/Length: 4" / 14.5" Thickness/Diameter: 0.531" / 4"Limitations: Tee Radius Start Time: 2339 Finish Time: 0045

Instrument Settings

Serial No.: 0221JMManufacturer: GE Inspection TechnologiesModel: USN 60 SW Linearity: 2015-L-003Delay: 6.2422 Range: 3.0"M'tl Cal/Vel: 0.1230 Pulsar Type: SquareDamping: 500 Ohms Reject: 0%PRF: Auto High SU Freq.: 2.25 MHzFrequency: 2.25 MHz Rectify: FullwaveVoltage: 450 Pulse Width: 220Ax. Gain (dB): 49 Circ. Gain (dB): N/A10 Screen Div. = 3 in. of Sound Path

Calibration Block

Cal. Block No. 22572Thickness 0.5" to 2.0" Dia.: FlatCal. Blk. Temp. 72° Temp. Tool: 29021145Comp. Temp. 75° Temp. Tool: 29021145Recordable Indication(s): Yes ☐ No ☒ (If Yes, Ref. Attached Ultrasonic Indication Report.)Results: Accept ☒ Reject ☐ Info ☐Percent Of Coverage Obtained > 90%: No - 83.3% Reviewed Previous Data: No

Search Unit

Serial No.: SB0419Manufacturer: GEITSize: 0.25" Model: Comp-GFreq.: 2.25 MHz Center Freq.: N/AExam Angle: 70° Squint Angle: N/AMeasured Angle: 70° Mode: ShearExit Point 0.3" # of Elements: 1Config.: Single Focus: N/AShape: Round Contour: N/AWedge Style: MSWQC

Search Unit Cable

Type: RG-174 Length: 6' No. Conn.: 0

Scan Coverage

Upstream ☒ Downstream ☒ Scan dB: 49CW ☐ CCW ☐ Scan dB: N/AExam Surface: ODSurface Condition: Ground

Cal. Checks	Time	Date
Initial Cal.	1952	10/13/2015
Inter. Cal.	0026	10/14/2015
Inter. Cal.	0031	10/14/2015
Inter. Cal.	N/A	
Final Cal.	0145	10/14/2015

Couplant

Cal. Batch: 15E082Type: Ultragel IIMfg.: SonotechExam Batch: 15E082Type: Ultragel IIMfg.: Sonotech

Reference Block

Serial No.: 43842 SSType: 1" Angle Beam

Axial Oriented Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
1.0" Notch	80%	9.7	2.92"
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

Circumferential Oriented Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
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

Reference/Simulator Block

Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
43	SDH	80%	3.2	0.95"
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A

Comments: Baseline Exam. Post RT. Weld Doc 2A

Examiner	Level	II	Signature	Date	Reviewer	Signature	Date
Salley, Michael			<i>[Signature]</i>	10/14/2015	SIMON CROTHERS L-III	<i>[Signature]</i>	10/15/15
Examiner	Level	N/A	Signature	Date	Site Review	Signature	Date
N/A					Jay Miller	<i>[Signature]</i>	10-15-15
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A					Adam M. Pirnie	<i>[Signature]</i>	10-15-2015



UT Calibration/Examination

Site/Unit: BRW / 2
Summary No.: N/A
Workscope: PSI

Procedure: ER-AA-335-031
Procedure Rev.: 6
Work Order No.: 01782743-01

Outage No.: N/A
Report No.: UT-2015-012
Page: 4 of 6

Code: ASME 2001 Edition / 2003 Addenda Cat./Item: N/A Location: CV Pump Room
Drawing No.: FX-17 Description: Pipe to Tee
System ID: CV
Component ID: Field Weld 2 Size/Length: 4" / 14.5" Thickness/Diameter: 0.531" / 4"
Limitations: Tee Radius Start Time: 2339 Finish Time: 0045

Instrument Settings
Serial No.: 0221JM
Manufacturer: GE Inspection Technologies
Model: USN 60 SW Linearity: 2015-L-003
Delay: 6.8100 Range: 2.0"
Mtl Cal/Vel: 0.2280 Pulsar Type: Square
Damping: 500 Ohms Reject: 0%
PRF: Auto High SU Freq.: 2.0 MHz
Frequency: 2.0 MHz Rectify: Fullwave
Voltage: 450 Pulse Width: 250
Ax. Gain (dB): 60 Circ. Gain (dB): N/A
10 Screen Div. = 2 in. of Sound Path

Search Unit
Serial No.: 15-66
Manufacturer: RTD
Size: 2(7 x 10)mm Model: TRL2-Aust
Freq.: 2.0 MHz Center Freq.: N/A
Exam Angle: 60° Squint Angle: 2°
Measured Angle: 60° Mode: Long
Exit Point 0.35" # of Elements: 2
Config.: D-SBS Focus: 25mm SP
Shape: Rect. Contour: Flat
Wedge Style: Integral
Search Unit Cable
Type: RG-174 Length: 6' No. Conn.: 0

Cal. Checks	Time	Date
Initial Cal.	1955	10/13/2015
Inter. Cal.	0041	10/14/2015
Inter. Cal.	0045	10/14/2015
Inter. Cal.	N/A	
Final Cal.	0151	10/14/2015

Couplant
Cal. Batch: 15E082
Type: Ultragel II
Mfg.: Sonotech
Exam Batch: 15E082
Type: Ultragel II
Mfg.: Sonotech

Reference Block
Serial No.: 43842 SS
Type: 1" Angle Beam

Axial Oriented Search Unit			
Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
1.0" Notch	80%	10.0	2.0"
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

Circumferential Oriented Search Unit			
Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
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

Reference/Simulator Block				
Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
54	SDH	80%	7.5	1.49"
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A

Calibration Block
Cal. Block No. 22572
Thickness 0.5" to 2.0" Dia.: Flat
Cal. Blk. Temp. 72° Temp. Tool: 29021145
Comp. Temp. 75° Temp. Tool: 29021145
Recordable Indication(s): Yes ☐ No ☒ (If Yes, Ref. Attached Ultrasonic Indication Report.)
Results: Accept ☒ Reject ☐ Info ☐

Scan Coverage
Upstream ☒ Downstream ☐ Scan dB: 60
CW ☐ CCW ☐ Scan dB: N/A
Exam Surface: OD
Surface Condition: Ground

Comments: Baseline Exam. Post RT. Weld Doc 2A

Percent Of Coverage Obtained > 90%: No - 83.3% Reviewed Previous Data: No

Examiner	Level	Signature	Date	Reviewer	Signature	Date
Salley, Michael	II		10/14/2015	SIMON CROTHERS L-III		10/15/15
Examiner	Level	Signature	Date	Site Review	Signature	Date
N/A	N/A			Jay Miller		10-15-15
Other	Level	Signature	Date	ANII Review	Signature	Date
N/A	N/A			Adam M. Pemi		10-15-2015

Summary No.: N/A

Examiner: Salley, Michael *MMS* Level: II

Reviewer: Simon Crothers Date: 10/15/15

Examiner: N/A Level: N/A

Site Review: Jay Miller Date: 10-15-15

Other: N/A Level: N/A

ANII Review: Adam M. Puni Date: 10-15-2015

Work Order: **01782743-01**

Weld: **FW-2**

Sketch 1: Coverage Plot

Weld Crown Width: **0.9"**

Sketch or Photo:

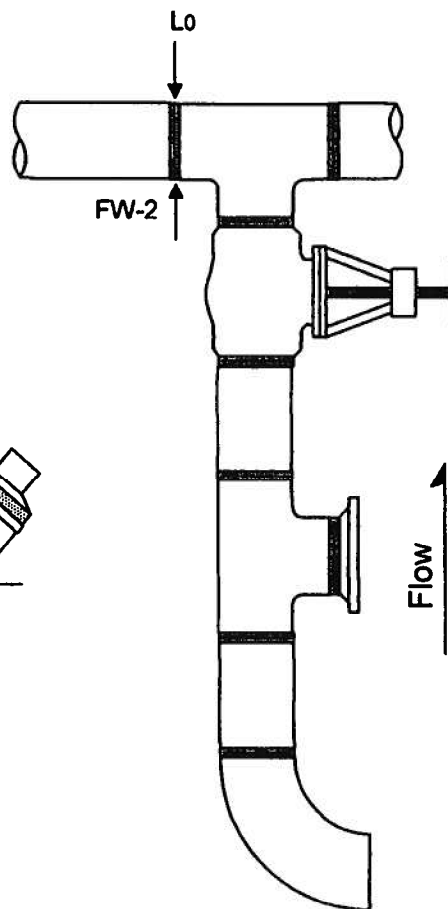
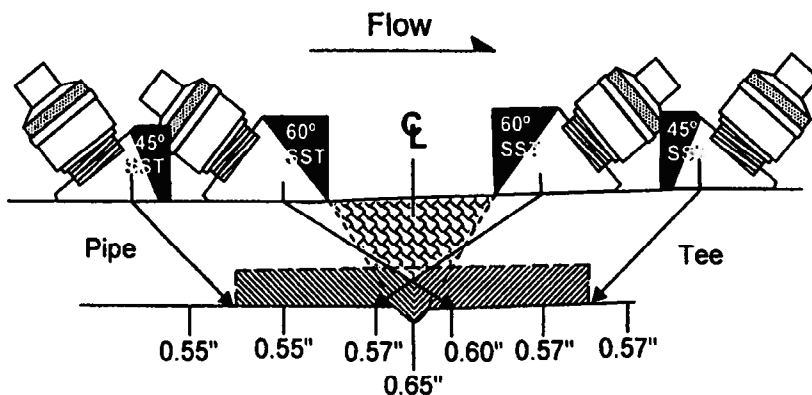
Weld Length: **14.5"**

Counterbore DS: **None**

Counterbore US: **None**

Limitation:

- Tee radius obstructed DS exams for 4.25" @ 180°.



Profile @ 0° (TDC)

US Coverage represents 14.5" of 14.5" weld length.

DS Coverage represents 10.25" of 14.5" weld length.



Summary No.: N/A

Examiner: Salley, Michael *MT S*

Level: II

Reviewer: *Simon Crothers*

Date: 10/15/15

Examiner: N/A

Level: N/A

Site Review: *Jay Miller Jay Miller III*

Date: 10-15-15

Other: N/A

Level: N/A

ANII Review: *Adam M. Prine Adam M. Prine*

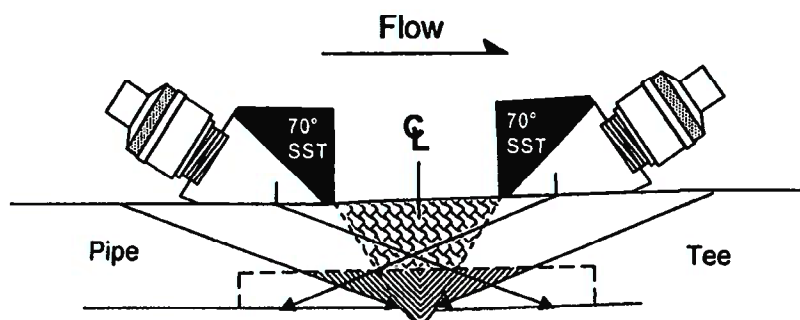
Date: 10-15-2015

Work Order: 01782743-01

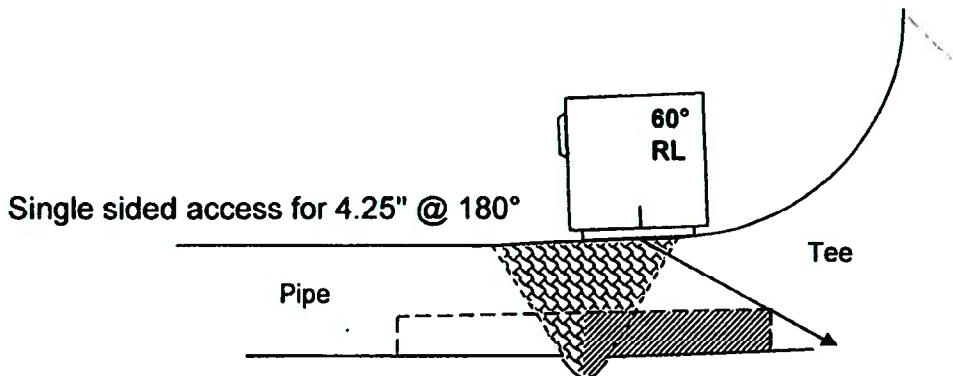
Weld: FW-2

Sketch 2: Coverage Plot


Sketch or Photo:



Note: 70° used to obtain remaining coverage, scan limited to area shown.



Far side of weld examined as per single sided access rules – No coverage credit taken.

Coverage Calc		
Exam	Length	Result
Ax Upst	14.5" of 14.5"	100%
Ax Dnst	10.25" of 14.5"	70.7%
Circ Upst	14.5" of 14.5"	100%
Circ Dnst	10.25" of 14.5"	70.7%
Total:		341.4%
Total / 4:		83.3%



UT Calibration Examination

SC 10/12/15

Site/Unit: BRW / 2 Procedure: ER-AA-335-030 1 Outage No.: N/A

Summary No.: N/A Procedure Rev.: A6 SC 10/12/15 Report No.: UT-2015-010

Workscope: PSI Work Order No.: 01692238-08 Page: 1 of 8

Code: ASME 2001 Edition / 2003 Addenda Cat./Item: N/A Location: CV Pump Room

Drawing No.: FX-17 Description: Tee to Pipe

System ID: CV

Component ID: Field Weld 2 Size/Length: 1.0" / 14.5" Thickness/Diameter: 0.531" / 4"

Limitations: Tee Radius Start Time: 0948 Finish Time: 1019

Instrument Settings

Serial No.: 0221JM Manufacturer: GE Inspection Technologies Model: USN 60 SW Linearity: 2015-L-001 Delay: 4.1716 Range: 1.5" M'tl Cal/Vel: 0.1230 Pulser Type: Square Damping: 500 Ohms Reject: 0% PRF: Auto High SU Freq.: 2.25 MHz Frequency: 2.25 MHz Rectify: Fullwave Voltage: 450 Pulse Width: 220

Search Unit

Serial No.: SB0442 Manufacturer: GEIT Size: 0.25" Model: Comp-G Freq.: 2.25 MHz Center Freq.: N/A Exam Angle: 45° Squint Angle: N/A Measured Angle: 45° Mode: Shear Exit Point: 0.2" # of Elements: 1 Config.: Single Focus: N/A Shape: Round Contour: N/A Wedge Style: MSWOC

Cal. Checks	Time	Date
Initial Cal.	0722	8/14/2015
Inter. Cal.	0948	8/14/2015
Inter. Cal.	1002	8/14/2015
Inter. Cal.	N/A	
Final Cal.	1137	8/14/2015

Couplant

Cal. Batch: 13C028 Type: Ultrage II Mfg.: Sonotech

Exam Batch: 13C028 Type: Ultrage II Mfg.: Sonotech

Ax. Gain (dB): 20 Circ. Gain (dB): N/A

10 Screen Div. = 1.5 in. of Sound Path

Search Unit Cable

Type: RG-174 Length: 6' No. Conn.: 0

Calibration Block

Cal. Block No.: BWD-PDI-304-01 Thickness: 0.5" - 2.0" Dia.: Flat Cal. Blk. Temp.: 86° Temp. Tool: 29021141 Comp. Temp.: 108° Temp. Tool: 29021141

Scan Coverage

Upstream ☒ Downstream ☒ Scan dB: 32 CW ☒ CCW ☒ Scan dB: 32 Exam Surface: OD Surface Condition: Ground

Recordable Indication(s): Yes ☐ No ☒ (If Yes, Ref. Attached Ultrasonic Indication Report.)

Results: Accept ☒ Reject ☐ Info ☐

Percent Of Coverage Obtained > 90%: No-83.3% Reviewed Previous Data: N/A

Axial Oriented Search Unit			
Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
1" Notch	80%	9.4	1.41"
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

Circumferential Oriented Search Unit			
Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
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

Reference/Simulator Block				
Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
20	SDH	25%	6.9	1.04"
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A

Comments: Cal Block BWD-PDI-304-01 demonstrated to be ultrasonically equivalent to Flaw Tech Cal Block 22572. Baseline Exam. Weld Doc 2B.

Examiner	Level	III	Signature	Date	Reviewer	Signature	Date
Crothers, Simon, P.			<i>Simon Crothers</i>	8/14/2015	N/A	<i>N/A</i>	
Examiner	Level	N/A	Signature	Date	Site Review	Signature	Date
N/A					Chris H. McKean	<i>Chris H. McKean</i>	10-1-15
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A					LEE MALABANAN	<i>Lee Malabanan</i>	10/2/15



UT Calibration Examination

SC 10/12/15

Site/Unit: BRW / 2
Summary No.: N/A
Workscope: PSI

Procedure: ER-AA-335-0301
Procedure Rev.: 46 SC 10/12/15
Work Order No.: 01592238-08

Outage No.: N/A
Report No.: UT-2015-010
Page: 2 of 8

Code: ASME 2001 Edition / 2003 Addenda Cat./Item: N/A Location: CV Pump Room
Drawing No.: FX-17 Description: Tee to Pipe
System ID: CV
Component ID: Field Weld 2 Size/Length: 1.0" / 14.5" Thickness/Diameter: 0.531" / 4"
Limitations: Tee Radius Start Time: 0948 Finish Time: 1019

Instrument Settings
Serial No.: 0221JM
Manufacturer: GE Inspection Technologies
Model: USN 60 SW Linearity: 2015-L-001
Delay: 4.9441 Range: 2.0"
M'tl Cal/Vel: 0.1230 Pulser Type: Square
Damping: 500 Ohms Reject: 0%
PRF: Auto High SU Freq.: 2.25 MHz
Frequency: 2.25 MHz Rectify: Fullwave
Voltage: 450 Pulse Width: 220
Ax. Gain (dB): 39 Circ. Gain (dB): N/A
10 Screen Div. = 2 in. of Sound Path

Search Unit
Serial No.: SB0625
Manufacturer: KB-Aerotech
Size: 0.25" Model: Comp-G
Freq.: 2.25 MHz Center Freq.: N/A
Exam Angle: 60° Squint Angle: N/A
Measured Angle: 59° Mode: Shear
Exit Point 0.25" # of Elements: 1
Config.: Single Focus: N/A
Shape: Round Contour: N/A
Wedge Style: MSWQC
Search Unit Cable
Type: RG-174 Length: 6' No. Conn.: 0

Cal. Checks	Time	Date
Initial Cal.	0729	8/14/2015
Inter. Cal.	1002	8/14/2015
Inter. Cal.	1009	8/14/2015
Inter. Cal.	N/A	
Final Cal.	1138	8/14/2015

Couplant
Cal. Batch: 13C028
Type: Ultragel II
Mfg.: Sonotech
Exam Batch: 13C028
Type: Ultragel II
Mfg.: Sonotech

Calibration Block
Cal. Block No. BWD-PDI-304-01
Thickness 0.5" - 2.0" Dia.: Flat
Cal. Blk. Temp. 86° Temp. Tool: 29021141
Comp. Temp. 108° Temp. Tool: 29021141
Upstream ☒ Downstream ☒ Scan dB: 45
CW ☐ CCW ☐ Scan dB: N/A
Exam Surface: OD
Surface Condition: Ground

Reference Block
Serial No.: 171311 SS
Type: 1" Angle Beam

Recordable Indication(s): Yes ☒ No ☐ (If Yes, Ref. Attached Ultrasonic Indication Report.)

Results: Accept ☒ Reject ☐ Info ☐

Percent Of Coverage Obtained > 90%: No-83.3% Reviewed Previous Data: N/A

Axial Oriented Search Unit				
Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path	
1" Notch	80%	8/8	1.76"	
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	
Circumferential Oriented Search Unit				
Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path	
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	
Reference/Simulator Block				
Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
39	SDH	50%	7.2	1.45"
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A

Comments: Cal Block BWD-PDI-304-01 demonstrated to be ultrasonically equivalent to Flaw Tech Cal Block 22572. Baseline Exam. Weld Doc 2B.

Examiner	Level	III	Signature	Date	Reviewer	Signature	Date
Crothers, Simon, P.			<i>Simon Crothers</i>	8/14/2015	N/A	<i>N/A</i>	
Examiner	Level	N/A	Signature	Date	Site Review	Signature	Date
N/A					CHRIS H. MCKENNA LV III	<i>Chris McKenna</i>	10-1-15
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A					LEE MALABANAN	<i>L. Malaban</i>	10/2/15



UT Calibration Examination

SC 10/12/15

Site/Unit: BRW / 2
Summary No.: N/A
Workslope: PSI

Procedure: ER-AA-335-030 1
Procedure Rev.: 86 SC 10/12/15
Work Order No.: 01692238-08

Outage No.: N/A
Report No.: UT-2015-010
Page: 3 of 8

Code: ASME 2001 Edition / 2003 Addenda Cat./Item: N/A Location: CV Pump Room
Drawing No.: FX-17 Description: Tee to Pipe
System ID: CV
Component ID: Field Weld 2 Size/Length: 1.0" / 14.5" Thickness/Diameter: 0.531" / 4"
Limitations: Tee Radius Start Time: 0948 Finish Time: 1019

Instrument Settings
Serial No.: 0221JM
Manufacturer: GE Inspection Technologies
Model: USN 60 SW Linearity: 2015-L-001
Delay: 5.8547 Range: 3.0"
M'tl Cal/Vel: 0.1230 Pulsar Type: Square
Damping: 500 Ohms Reject: 0%
PRF: Auto High SU Freq.: 2.25 MHz
Frequency: 2.25 MHz Rectify: Fullwave
Voltage: 450 Pulse Width: 220
Ax. Gain (dB): 50 Circ. Gain (dB): N/A
10 Screen Div. = 3 in. of Sound Path

Search Unit
Serial No.: SB0419
Manufacturer: GEIT
Size: 0.25" Model: Comp-G
Freq.: 2.25 MHz Center Freq.: N/A
Exam Angle: 70° Squint Angle: N/A
Measured Angle: 70° Mode: Shear
Exit Point 0.3" # of Elements: 1
Config.: Single Focus: N/A
Shape: Round Contour: N/A
Wedge Style: MSWQC
Search Unit Cable
Type: RG-174 Length: 6' No. Conn.: 0

Cal. Checks	Time	Date
Initial Cal.	0735	8/14/2015
Inter. Cal.	1009	8/14/2015
Inter. Cal.	1015	8/14/2015
Inter. Cal.	N/A	
Final Cal.	1139	8/14/2015

Couplant
Cal. Batch: 13C028
Type: Ultragel II
Mfg.: Sonotech
Exam Batch: 13C028
Type: Ultragel II
Mfg.: Sonotech

Axial Oriented Search Unit			
Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
1" Notch	80%	9/7	2.92"
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

Circumferential Oriented Search Unit			
Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
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

Reference/Simulator Block				
Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
42	SDH	40%	3.2	0.95"
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A

Calibration Block
Cal. Block No. BWD-PDI-304-01
Thickness 0.5" - 2.0" Dia.: Flat
Cal. Blk. Temp. 86° Temp. Tool: 29021141
Comp. Temp. 108° Temp. Tool: 29021141
Recordable Indication(s): Yes ☐ No ☒ (If Yes, Ref. Attached Ultrasonic Indication Report.)
Results: Accept ☒ Reject ☐ Info ☐

Reference Block
Serial No.: 171311 SS
Type: 1" Angle Beam

Comments: Cal Block BWD-PDI-304-01 demonstrated to be ultrasonically equivalent to Flaw Tech Cal Block 22572. Baseline Exam. Weld Doc 2B.

Percent Of Coverage Obtained > 90%: No-83.3% Reviewed Previous Data: N/A

Examiner	Level	III	Signature	Date	Reviewer	Signature	Date
Crothers, Simon, P.			<i>Simon Crothers</i>	8/14/2015	<i>N/A</i>	<i>N/A</i>	
Examiner	Level	N/A	Signature	Date	Site Review	Signature	Date
N/A					<i>Chavis H. McKean</i>	<i>Chavis H. McKean</i>	10-1-15
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A					<i>Lee Malabanan</i>	<i>Lee Malabanan</i>	10/2/15



UT Calibration Examination

SC 10/12/15

Site/Unit: BRW / 2
Summary No.: N/A
Workscope: PSI

Procedure: ER-AA-335-0301
Procedure Rev.: #6 SC 10/12/15
Work Order No.: 01692238-08

Outage No.: N/A
Report No.: UT-2015-010
Page: 4 of 8

Code: ASME 2001 Edition / 2003 Addenda Cat./Item: N/A Location: CV Pump Room
Drawing No.: FX-17 Description: Tee to Pipe
System ID: CV
Component ID: Field Weld 2 Size/Length: 1.0" / 14.5" Thickness/Diameter: 0.531" / 4"
Limitations: Tee Radius Start Time: 0948 Finish Time: 1019

Instrument Settings
Serial No.: 0221JM
Manufacturer: GE Inspection Technologies
Model: USN 60 SW Linearity: 2015-L-001
Delay: 6.8100 Range: 2.0"
M'tl Cal/Vel: 0.228 Pulser Type: Square
Damping: 500 Ohms Reject: 0%
PRF: Auto High SU Freq.: 2.0 MHz
Frequency: 2.0 MHz Rectify: Fullwave
Voltage: 450 Pulse Width: 250

Ax. Gain (dB): 59 Circ. Gain (dB): N/A
10 Screen Div. = 2 in. of Sound Path

Calibration Block
Cal. Block No.: BWD-PDI-304-01
Thickness 0.5" - 2.0" Dia.: Flat
Cal. Blk. Temp. 86° Temp. Tool: 29021141
Comp. Temp. 108° Temp. Tool: 29021141

Recordable Indication(s): Yes ☐ No ☒ (If Yes, Ref. Attached Ultrasonic Indication Report.)
Results: Accept ☒ Reject ☐ Info ☐

Percent Of Coverage Obtained > 90%: No-83.3% Reviewed Previous Data: N/A

Search Unit
Serial No.: 15-66
Manufacturer: RTD
Size: 2(7 x 10)mm Model: TRL2-Aust
Freq.: 2.0 MHz Center Freq.: N/A
Exam Angle: 60° Squint Angle: 2°
Measured Angle: 60° Mode: Long
Exit Point 0.35" # of Elements: 2
Config.: D-SBS Focus: FS-25
Shape: Rect. Contour: Flat
Wedge Style: Integral

Search Unit Cable
Type: RG-174 Length: 6' No. Conn.: 0

Scan Coverage
Upstream ☐ Downstream ☒ Scan dB: 59
CW ☐ CCW ☐ Scan dB: N/A
Exam Surface: OD
Surface Condition: Ground

Cal. Checks	Time	Date
Initial Cal.	0749	8/14/2015
Inter. Cal.	1016	8/14/2015
Inter. Cal.	1019	8/14/2015
Inter. Cal.	N/A	
Final Cal.	1142	8/14/2015

Couplant
Cal. Batch: 13C028
Type: Ultrage II
Mfg.: Sonotech
Exam Batch: 13C028
Type: Ultrage II
Mfg.: Sonotech

Reference Block
Serial No.: 171311 SS
Type: 1" Angle Beam

Axial Oriented Search Unit			
Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
1" Notch	80%	10.0	2.0"
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

Circumferential Oriented Search Unit			
Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
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

Reference/Simulator Block				
Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
54	SDH	80%	7.5	1.49"
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A

Comments: Cal Block BWD-PDI-304-01 demonstrated to be ultrasonically equivalent to Flaw Tech Cal Block 22572. Baseline Exam. Weld Doc 2B.

Examiner	Level	III	Signature	Date	Reviewer	Signature	Date
Crothers, Simon, P.			<i>Simon Crothers</i>	8/14/2015	N/A	<i>N/A</i>	
Examiner	Level	N/A	Signature	Date	Site Review	Signature	Date
N/A					Chris H. McKinnon	<i>Chris H. McKinnon</i>	10-1-15
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A					LEE MAUBANAN	<i>L Maubanan</i>	10/2/15

Summary No.: **N/A**

Sketch or Photo:

Work Package: 01692238-08

Weld: FW-2

Sketch 1: Coverage Plot

Weld Crown Width: 1.0"

Weld Length: 14.5"

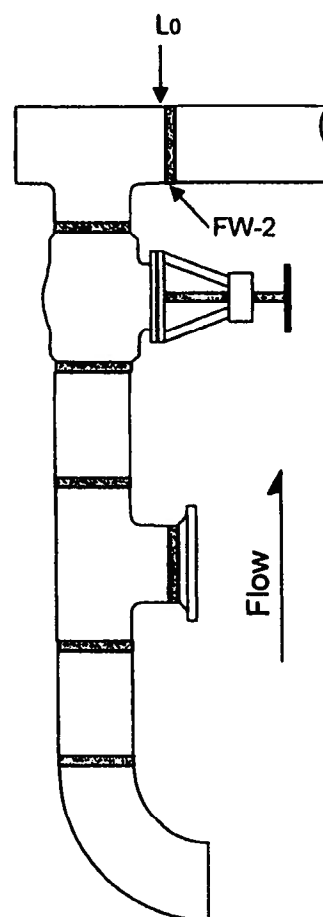
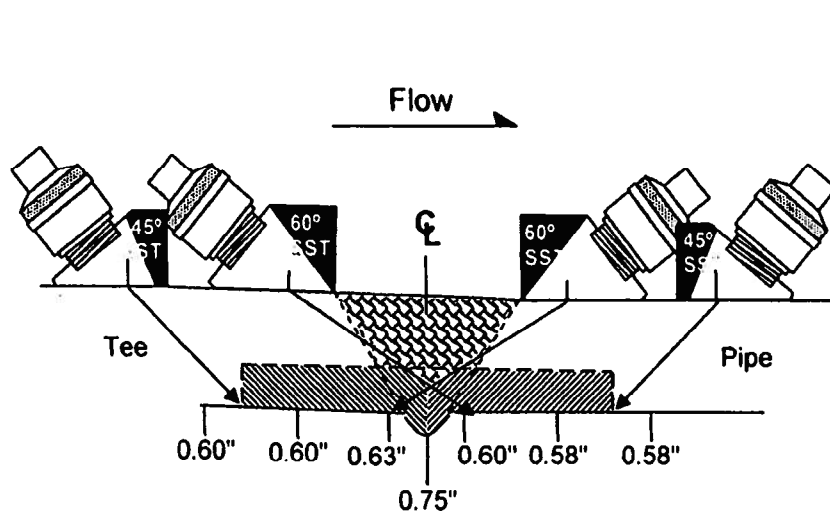
Counterbore DS: None

Counterbore US: None



Limitation:

- Tee radius obstructed US exams for 4.25" @ 180°.



Profile @ 0° (TDC)

US Coverage represents 10.25" of 14.5" weld length.

DS Coverage represents 14.5" of 14.5" weld length.

Simon Crothers

Chris H. McKenna
CHM
 EXELON LLC 10-1-15

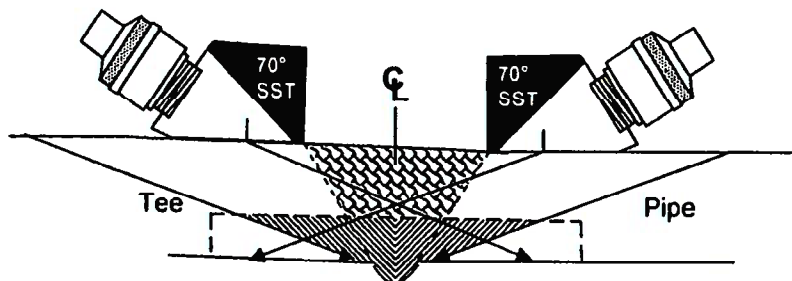
Summary No.: N/A

Sketch or Photo:

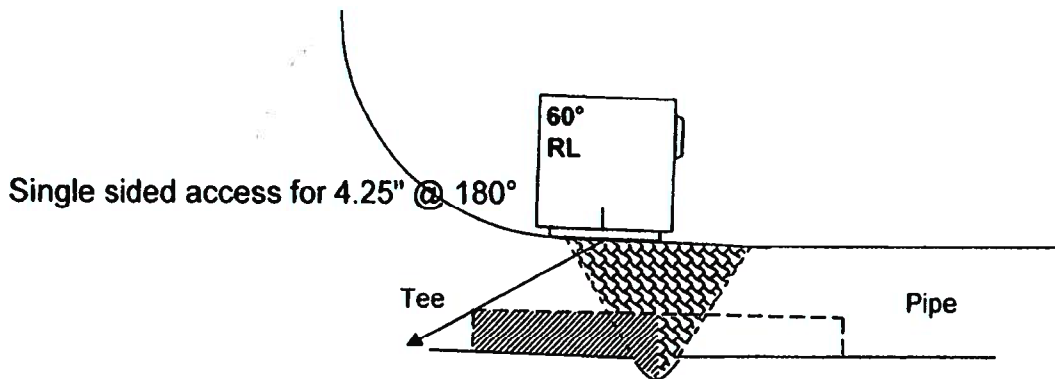
Work Package: 01692238-08

Weld: FW-2

Sketch 2: Coverage Plot



Note: 70° used to obtain remaining coverage, scan limited to area shown.



Far side of weld examined as per single sided access rules – No coverage credit taken.

Coverage Calc		
Exam	Length	Result
Ax Upst	10.25" of 14.5"	70.7%
Ax Dnst	14.5" of 14.5"	100%
Circ Upst	10.25" of 14.5"	70.7%
Circ Dnst	14.5" of 14.5"	100%
Total:		341.4%
Total / 4:		83.3%

Chris H. McKenna
Chit Hmch
 EXELON L. & H. 10-1-15

Simon Gathers

ANI / ANII REVIEW
 REVIEW DATE 10/2/15
 Page 58

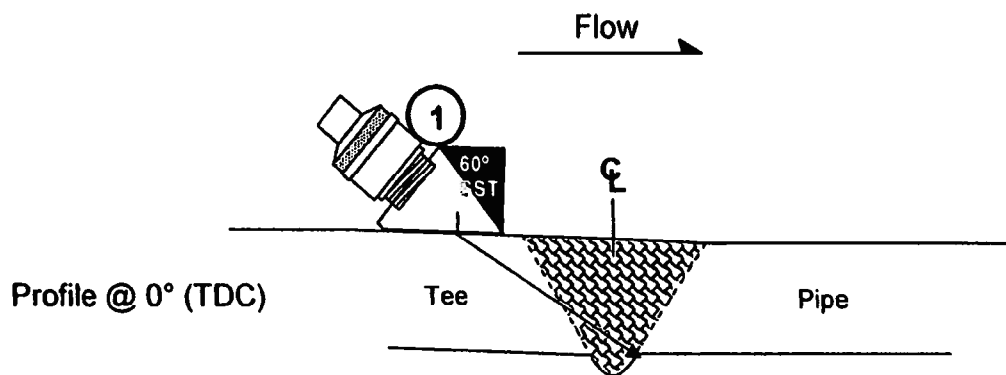
Summary No.: N/A

Sketch or Photo:

Work Package: 01692238-08

Weld: FW-2

Sketch 3: Indication Plot



① Root Geometry, seen intermittently 360°



Chris H. McKern
Chris H. McKern
 EXELON LV III 10-1-15

Simon Crothers

ANI / ANII REVIEW
 REVIEW DATE 10/2/15



Ultrasonic Indication Report

SC 10/12/15

Site/Unit: BRW / 2
 Summary No.: N/A
 Workscope: PSI

Procedure: ER-AA-335-0301
 Procedure Rev.: A6 SC 10/12/15
 Work Order No.: 01692238-08

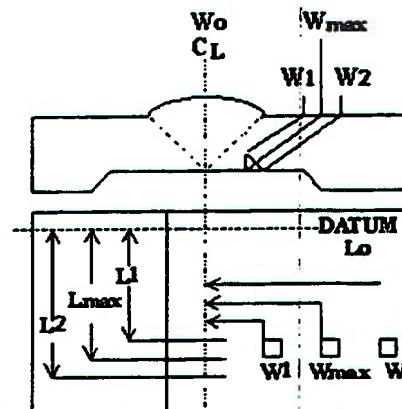
Outage No.: N/A
 Report No.: UT-2015-010
 Page: 8 of 8

Search Unit Angle: 60°
 Wo Location: Centerline
 Lo Location: TDC

- ☒ Piping Welds
☐ Ferritic Vessels $\geq 2''T$
☐ Other N/A

MP	Metal Path	Wmax	Distance From Wo To S.U. At Maximum Response
RBR	Remaining Back Reflection	W1	Distance From Wo At <u>N/A</u> Of Max (Forward)
L	Distance From Datum	W2	Distance From Wo At <u>N/A</u> Of Max (Backward)

Comments: **Field Weld 2**



Angle	Indication No.	% Of DAC	W Max		Forward N/A Of Max		Backward N/A Of Max		L1 N/A Of Max	L Max	L2 N/A Of Max	RBR Amp.	Remarks
			W	MP	W1	MP	W2	MP					
60°	1	60%	0.85"	1.2"	N/A	N/A	N/A	N/A	N/A	0"	N/A	N/A	Root Geometry from US side.

Examiner	Level III	Signature	Date	Reviewer	Signature	Date
Crothers, Simon, P.		<i>Simon Crothers</i>	8/14/2015	<i>N/A</i>	<i>N/A</i>	
Examiner	Level N/A	Signature	Date	Site Review	Signature	Date
N/A				<i>Chris H. McKean</i>	<i>Chris H. McKean</i>	10-1-15
Other	Level N/A	Signature	Date	ANII Review	Signature	Date
N/A				<i>L. Hume</i>		10/1/15



UT Calibration/Examination

2CV-21-58

Site/Unit: BRW / 2
Summary No.: N/A
Workscope: PSI

Procedure: ER-AA-335-031
Procedure Rev.: 6
Work Order No.: 01692238-08

Outage No.: N/A
Report No.: UT-2015-009
Page: 1 of 6

Code: ASME 2001 Edition / 2003 Addenda Cat./Item: N/A Location: CV Pump Room
Drawing No.: FX-17 Description: Valve to Tee
System ID: CV
Component ID: Field Weld 1 Size/Length: 1.0" / 14.5" Thickness/Diameter: 0.531" / 4"
Limitations: Single Sided Access / Tee Radii Start Time: 0948 Finish Time: 1019

Instrument Settings
Serial No.: 0221JM
Manufacturer: GE Inspection Technologies
Model: USN 60 SW Linearity: 2015-L-001
Delay: 4.1716 Range: 1.5"
M'tl Cal/Vel: 0.1230 Pulser Type: Square
Damping: 500 Ohms Reject: 0%
PRF: Auto High SU Freq.: 2.25 MHz
Frequency: 2.25 MHz Rectify: Fullwave
Voltage: 450 Pulse Width: 220
Ax. Gain (dB): 20 Circ. Gain (dB): N/A
10 Screen Div. = 1.5 in. of Sound Path

Search Unit
Serial No.: SB0442
Manufacturer: GEIT
Size: 0.25" Model: Comp-G
Freq.: 2.25 MHz Center Freq.: N/A
Exam Angle: 45° Squint Angle: N/A
Measured Angle: 45° Mode: Shear
Exit Point: 0.2" # of Elements: 1
Config.: Single Focus: N/A
Shape: Round Contour: N/A
Wedge Style: MSWQC
Search Unit Cable
Type: RG-174 Length: 6' No. Conn.: 0

Calibration Block
Cal. Block No.: BWD-PDI-304-01
Thickness 0.5" - 2.0" Dia.: Flat
Cal. Blk. Temp. 86° Temp. Tool: 29021141
Comp. Temp. 108° Temp. Tool: 29021141

Scan Coverage
Upstream ☐ Downstream ☒ Scan dB: 32
CW ☒ CCW ☒ Scan dB: 32
Exam Surface: OD
Surface Condition: Ground

Recordable Indication(s): Yes ☐ No ☒ (If Yes, Ref. Attached Ultrasonic Indication Report.)
Results: Accept ☒ Reject ☐ Info ☐
Percent Of Coverage Obtained > 90%: No-20.7% Reviewed Previous Data: N/A

Cal. Checks	Time	Date
Initial Cal.	0722	8/14/2015
Inter. Cal.	0948	8/14/2015
Inter. Cal.	1002	8/14/2015
Inter. Cal.	N/A	
Final Cal.	1137	8/14/2015

Couplant
Cal. Batch: 13C028
Type: Ultragel II
Mfg.: Sonotech
Exam Batch: 13C028
Type: Ultragel II
Mfg.: Sonotech

Reference Block
Serial No.: 171311 SS
Type: 1" Angle Beam

Axial Oriented Search Unit				
Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path	
1" Notch	80%	9.4	1.41"	
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	
Circumferential Oriented Search Unit				
Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path	
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	
Reference/Simulator Block				
Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
20	SDH	25%	6.9	1.04"
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A

Comments: Cal Block BWD-PDI-304-01 demonstrated to be ultrasonically equivalent to Flaw Tech Cal Block 22572. Baseline Exam. Weld Doc 2A.

Examiner	Level	III	Signature	Date	Reviewer	Signature	Date
Crothers, Simon, P.			<i>Simon Crothers</i>	8/14/2015	N/A	<i>N/A</i>	
Examiner	Level	N/A	Signature	Date	Site Review	Signature	Date
N/A					Chris H. McKenna LUTII	<i>Chris H. McKenna</i>	10-1-15
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A					<i>L. McKenna</i>		10/2/15



UT Calibration Examination

Site/Unit: BRW / 2 Procedure: ER-AA-335-031 Outage No.: N/A
Summary No.: N/A Procedure Rev.: 6 Report No.: UT-2015-009
Workscope: PSI Work Order No.: 01692238-08 Page: 2 of 6

Code: ASME 2001 Edition / 2003 Addenda Cat./Item: N/A Location: CV Pump Room
Drawing No.: FX-17 Description: Valve to Tee
System ID: CV
Component ID: Field Weld 1 Size/Length: 1.0" / 14.5" Thickness/Diameter: 0.531" / 4"
Limitations: Single Sided Access / Tee Radii Start Time: 0948 Finish Time: 1019

Instrument Settings				Search Unit				Cal. Checks			Axial Oriented Search Unit			
Serial No.:	<u>0221JM</u>			Serial No.:	<u>SB0625</u>			Cal. Checks	Time	Date	Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
Manufacturer:	<u>GE Inspection Technologies</u>			Manufacturer:	<u>KB-Aerotech</u>			Initial Cal.	<u>0729</u>	<u>8/14/2015</u>	1" Notch	<u>80%</u>	<u>8/8</u>	<u>1.76"</u>
Model:	<u>USN 60 SW</u>	Linearity:	<u>2015-L-001</u>	Size:	<u>0.25"</u>	Model:	<u>Comp-G</u>	Inter. Cal.	<u>1002</u>	<u>8/14/2015</u>	N/A	N/A	N/A	N/A
Delay:	<u>4.9441</u>	Range:	<u>2.0"</u>	Freq.:	<u>2.25 MHz</u>	Center Freq.:	<u>N/A</u>	Inter. Cal.	<u>1009</u>	<u>8/14/2015</u>	N/A	N/A	N/A	N/A
M'tl Cal/Vel:	<u>0.1230</u>	Pulser Type:	<u>Square</u>	Exam Angle:	<u>60°</u>	Squint Angle:	<u>N/A</u>	Inter. Cal.	<u>N/A</u>		N/A	N/A	N/A	N/A
Damping:	<u>500 Ohms</u>	Reject:	<u>0%</u>	Measured Angle:	<u>59°</u>	Mode:	<u>Shear</u>	Final Cal.	<u>1138</u>	<u>8/14/2015</u>	N/A	N/A	N/A	N/A
PRF:	<u>Auto High</u>	SU Freq.:	<u>2.25 MHz</u>	Exit Point	<u>0.25"</u>	# of Elements:	<u>1</u>	Couplant						
Frequency:	<u>2.25 MHz</u>	Rectify:	<u>Fullwave</u>	Config.:	<u>Single</u>	Focus:	<u>N/A</u>	Cal. Batch:	<u>13C028</u>					
Voltage:	<u>450</u>	Pulse Width:	<u>220</u>	Shape:	<u>Round</u>	Contour:	<u>N/A</u>	Type:	<u>Ultragel II</u>					
				Wedge Style:	<u>MSWQC</u>			Mfg.:	<u>Sonotech</u>					
				Search Unit Cable				Exam Batch:	<u>13C028</u>					
Ax. Gain (dB):	<u>39</u>	Circ. Gain (dB):	<u>N/A</u>	Type:	<u>RG-174</u>	Length:	<u>6'</u>	No. Conn.:	<u>0</u>	Type:	<u>Ultragel II</u>			
<u>10</u> Screen Div. = <u>2</u> in. of <u>Sound Path</u>									Mfg.:	<u>Sonotech</u>				
Calibration Block				Scan Coverage				Reference Block						
Cal. Block No.	<u>BWD-PDI-304-01</u>			Upstream	<input type="checkbox"/>	Downstream	<input checked="" type="checkbox"/>	Scan dB:	<u>45</u>	Serial No.:	<u>171311 SS</u>			
Thickness	<u>0.5" - 2.0"</u>	Dia.:	<u>Flat</u>	CW	<input type="checkbox"/>	CCW	<input type="checkbox"/>	Scan dB:	<u>N/A</u>	Type:	<u>1" Angle Beam</u>			
Cal. Blk. Temp.	<u>86°</u>	Temp. Tool:	<u>29021141</u>	Exam Surface:	<u>OD</u>									
Comp. Temp.	<u>108°</u>	Temp. Tool:	<u>29021141</u>	Surface Condition:	<u>Ground</u>									
Recordable Indication(s): Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> (If Yes, Ref. Attached Ultrasonic Indication Report.)														
Results: Accept <input checked="" type="checkbox"/> Reject <input type="checkbox"/> Info <input type="checkbox"/>														
Percent Of Coverage Obtained > 90%: <u>No-20.7%</u> Reviewed Previous Data: <u>N/A</u>														
Comments: Cal Block BWD-PDI-304-01 demonstrated to be ultrasonically equivalent to Flaw Tech Cal Block 22572. Baseline Exam. Weld Doc 2A.														

Examiner	Level	III	Signature	Date	Reviewer	Signature	Date
Crothers, Simon, P.			<i>Simon Crothers</i>	8/14/2015	<i>N/A</i>	<i>N/A</i>	
Examiner	Level	N/A	Signature	Date	Site Review	Signature	Date
N/A					<i>Chris H. McKean</i>	<i>Chris H. McKean</i>	10-1-15
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A					<i>Lee M. Anderson</i>	<i>J. Mee</i>	10-2-15



UT Calibration Examination

Site/Unit: BRW / 2
Summary No.: N/A
Workscope: PSI

Procedure: ER-AA-335-031
Procedure Rev.: 6
Work Order No.: 01692238-08

Outage No.: N/A
Report No.: UT-2015-009
Page: 3 of 6

Code: ASME 2001 Edition / 2003 Addenda Cat./Item: N/A Location: CV Pump Room
Drawing No.: FX-17 Description: Valve to Tee
System ID: CV
Component ID: Field Weld 1 Size/Length: 1.0" / 14.5" Thickness/Diameter: 0.531" / 4"
Limitations: Single Sided Access / Tee Radii Start Time: 0948 Finish Time: 1019

Instrument Settings
Serial No.: 0221JM Manufacturer: GE Inspection Technologies Model: USN 60 SW Linearity: 2015-L-001 Delay: 5.8547 Range: 3.0" M'tl Cal/Vel: 0.1230 Pulser Type: Square Damping: 500 Ohms PRF: Auto High Frequency: 2.25 MHz Voltage: 450 Rectify: Fullwave Pulse Width: 220
Ax. Gain (dB): 50 Circ. Gain (dB): N/A
10 Screen Div. = 3 in. of Sound Path

Search Unit
Serial No.: SB0419 Manufacturer: GEIT Size: 0.25" Model: Comp-G Freq.: 2.25 MHz Center Freq.: N/A Exam Angle: 70° Squint Angle: N/A Measured Angle: 70° Mode: Shear Exit Point: 0.3" # of Elements: 1 Config.: Single Focus: N/A Shape: Round Contour: N/A Wedge Style: MSWQC
Search Unit Cable
Type: RG-174 Length: 6' No. Conn.: 0

Cal. Checks	Time	Date
Initial Cal.	0735	8/14/2015
Inter. Cal.	1009	8/14/2015
Inter. Cal.	1015	8/14/2015
Inter. Cal.	N/A	
Final Cal.	1139	8/14/2015

Couplant
Cal. Batch: 13C028
Type: Ultragel II
Mfg.: Sonotech
Exam Batch: 13C028
Type: Ultragel II
Mfg.: Sonotech

Axial Oriented Search Unit			
Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
1" Notch	80%	9/7	2.92"
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

Circumferential Oriented Search Unit			
Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
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

Calibration Block
Cal. Block No. BWD-PDI-304-01 Thickness 0.5" - 2.0" Dia.: Flat Cal. Blk. Temp. 86° Temp. Tool: 29021141 Comp. Temp. 108° Temp. Tool: 29021141
Upstream ☐ Downstream ☒ Scan dB: 50 CW ☐ CCW ☐ Scan dB: N/A Exam Surface: OD Surface Condition: Ground
Recordable Indication(s): Yes ☐ No ☒ (If Yes, Ref. Attached Ultrasonic Indication Report.)
Results: Accept ☒ Reject ☐ Info ☐

Reference Block
Serial No.: 171311 SS
Type: 1" Angle Beam

Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
42	SDH	40%	3.2	0.95"
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A

Percent Of Coverage Obtained > 90%: No-20.7% Reviewed Previous Data: N/A

Comments: Cal Block BWD-PDI-304-01 demonstrated to be ultrasonically equivalent to Flaw Tech Cal Block 22572. Baseline Exam. Weld Doc 2A.

Examiner	Level	III	Signature	Date	Reviewer	Signature	Date
Crothers, Simon, P.			<i>Simon Crothers</i>	8/14/2015	<i>N/A</i>	<i>N/A</i>	
Examiner	Level	N/A	Signature	Date	Site Review	Signature	Date
N/A					<i>Chris H. McKern</i>	<i>LUH</i>	10-1-15
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A					<i>LEE MALABONIAN</i>	<i>L. Malabonian</i>	10/2/15



UT Calibration/Examination

Site/Unit: BRW / 2
Summary No.: N/A
Workscope: PSI

Procedure: ER-AA-335-031
Procedure Rev.: 6
Work Order No.: 01692238-08

Outage No.: N/A
Report No.: UT-2015-009
Page: 4 of 6

Code: ASME 2001 Edition / 2003 Addenda Cat./Item: N/A Location: CV Pump Room
Drawing No.: FX-17 Description: Valve to Tee
System ID: CV
Component ID: Field Weld 1 Size/Length: 1.0" / 14.5" Thickness/Diameter: 0.531" / 4"
Limitations: Single Sided Access Start Time: 0948 Finish Time: 1019

Instrument Settings
Serial No.: 0221JM
Manufacturer: GE Inspection Technologies
Model: USN 60 SW Linearity: 2015-L-001
Delay: 6.8100 Range: 2.0"
M'tl Cal/Vel: 0.228 Pulser Type: Square
Damping: 500 Ohms Reject: 0%
PRF: Auto High SU Freq.: 2.0 MHz
Frequency: 2.0 MHz Rectify: Fullwave
Voltage: 450 Pulse Width: 250
Ax. Gain (dB): 59 Circ. Gain (dB): N/A
10 Screen Div. = 2 in. of Sound Path

Search Unit
Serial No.: 15-66
Manufacturer: RTD
Size: 2(7 x 10)mm Model: TRL2-Aust
Freq.: 2.0 MHz Center Freq.: N/A
Exam Angle: 60° Squint Angle: 2°
Measured Angle: 60° Mode: Long
Exit Point 0.35" # of Elements: 2
Config.: D-SBS Focus: FS-25
Shape: Rect. Contour: Flat
Wedge Style: Integral
Search Unit Cable
Type: RG-174 Length: 6' No. Conn.: 0

Cal. Checks	Time	Date
Initial Cal.	0749	8/14/2015
Inter. Cal.	1016	8/14/2015
Inter. Cal.	1019	8/14/2015
Inter. Cal.	N/A	
Final Cal.	1142	8/14/2015

Couplant
Cal. Batch: 13C028
Type: Ultragel II
Mfg.: Sonotech
Exam Batch: 13C028
Type: Ultragel II
Mfg.: Sonotech

Reference Block
Serial No.: 171311 SS
Type: 1" Angle Beam

Axial Oriented Search Unit			
Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
1" Notch	80%	10.0	2.0"
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

Circumferential Oriented Search Unit			
Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
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

Reference/Simulator Block				
Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
54	SDH	80%	7.5	1.49"
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A

Calibration Block
Cal. Block No. BWD-PDI-304-01
Thickness 0.5" - 2.0" Dia.: Flat
Cal. Blk. Temp. 86° Temp. Tool: 29021141
Comp. Temp. 108° Temp. Tool: 29021141
Recordable Indication(s): Yes ☐ No ☒ (If Yes, Ref. Attached Ultrasonic Indication Report.)
Results: Accept ☒ Reject ☐ Info ☐

Percent Of Coverage Obtained > 90%: No-20.7% Reviewed Previous Data: N/A

Comments: Cal Block BWD-PDI-304-01 demonstrated to be ultrasonically equivalent to Flaw Tech Cal Block 22572. Baseline Exam. Weld Doc 2A.

Examiner	Level	III	Signature	Date	Reviewer	Signature	Date
Crothers, Simon, P.			<i>Simon Crothers</i>	8/14/2015	<i>N/A</i>	<i>N/A</i>	
Examiner	Level	N/A	Signature	Date	Site Review	Signature	Date
N/A					<i>Chris H. Mckean</i>	<i>Chris H. Mckean</i>	10-1-15
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A					<i>LEE MALABANAN</i>	<i>L. Malaban</i>	10/2/15

Summary No.: **N/A**

Sketch or Photo:

Work Package: 01692238-08

Weld: FW-1

Sketch 1: Coverage Plot

Weld Crown Width: 1.0"

Weld Length: 14.5"

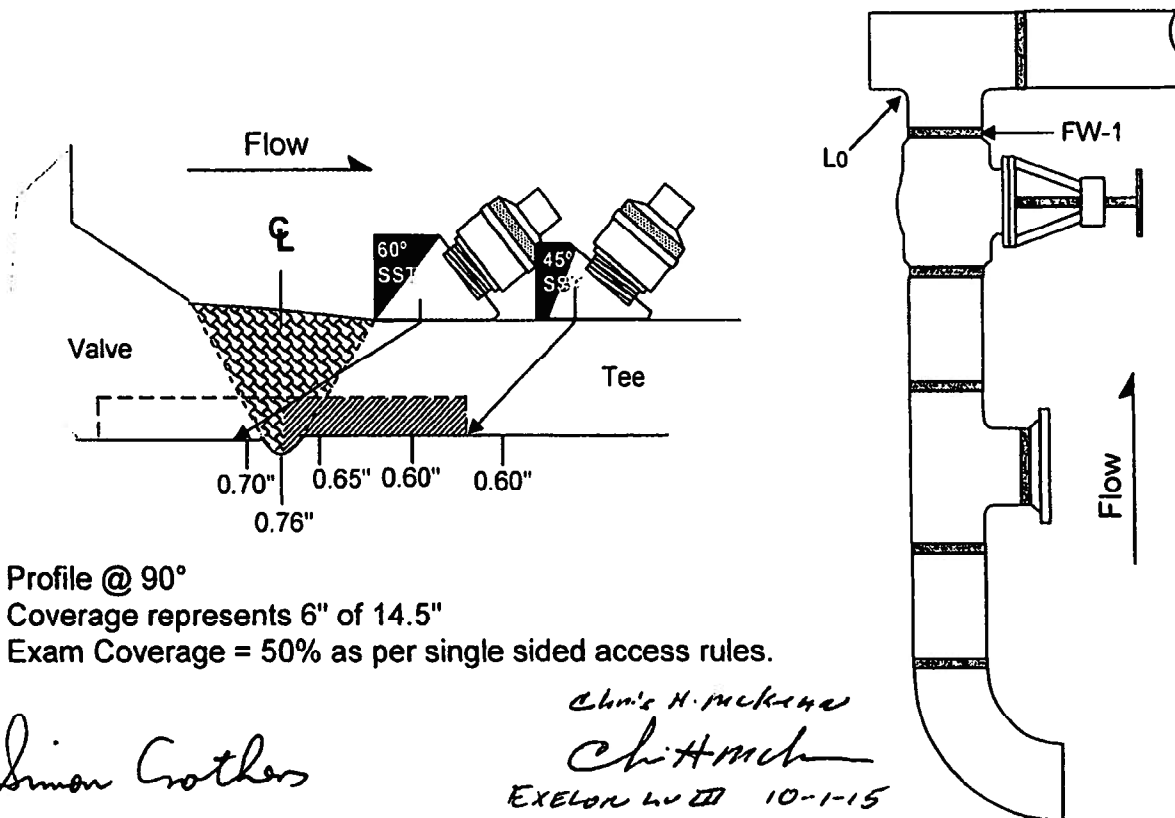
Counterbore DS: None

Counterbore US: None



Limitations:

- Single sided access due to valve.
- Tee radii obstructed exams for 4.25" each @ 0° and 180°.
- Examined 3" of weld length @ 90° & 3" of weld length @ 270°.
- Examined 6" of 14.5" weld length.



Profile @ 90°

Coverage represents 6" of 14.5"

Exam Coverage = 50% as per single sided access rules.

Simon Crothers

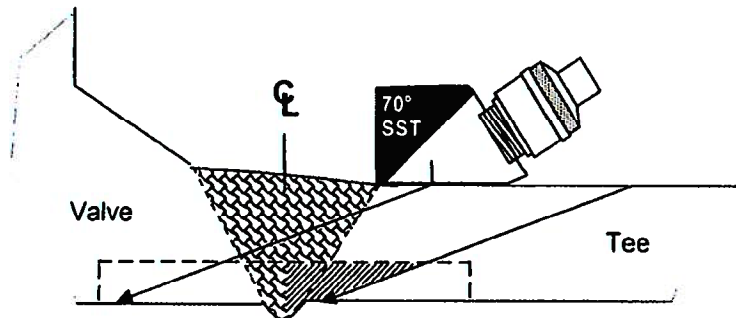
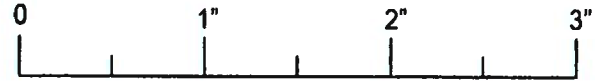
Chris H. McKee
Chittich
 EXELON LUT 10-1-15

Summary No.: **N/A**

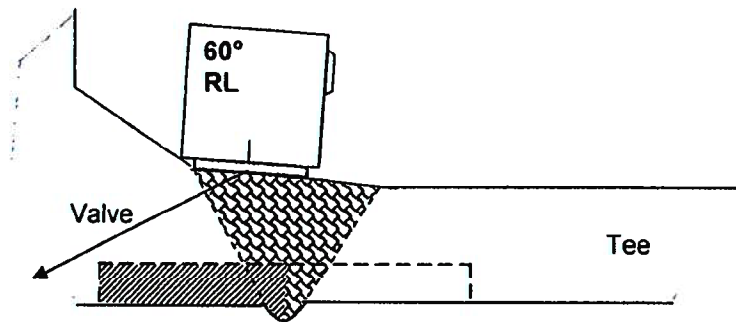
Sketch or Photo:

Work Package: **01692238-08**

Weld: **FW-1**

Sketch 2: **Coverage Plot**


Note: 70° used to obtain remaining near side coverage, scan limited to area shown.



Far side of weld examined as per single sided access rules – No coverage credit taken.

Coverage Calc		
Exam	Length	Result
Ax Upst	0" of 14.5"	0%
Ax Dnst	6" of 14.5"	41.4%
Circ Upst	0" of 14.5"	0%
Circ Dnst	6" of 14.5"	41.4%
Total:		82.8%
Total / 4:		20.7%

CHRISTH MARRIN
Ch H MARRIN
 EXELON LU III 10-1-15

Simon Crothers



UT Calibration/Examination

2FW-09-25

Site/Unit: **BRW / 2**
Summary No.: **2-R01.11.2032**
Workscope: **ISI**

Procedure: **ER-AA-335-030**
Procedure Rev.: **4**
Work Order No.: **01757348-01**

Outage No.: **A2R18**
Report No.: **A2R18-UT-015**
Page: **1** of **4**

Code: **ASME XI, 2001 Ed, 2003 Ad** Cat./Item: **R-A/R1.11-3** Location: **IMB LOOP A,R-42**
Drawing No.: **2FW-09** Description: **ELBOW - SG 2RC01BA AF NOZZLE**
System ID: **FW**
Component ID: **2FW-09-25** Size/Length: **6" / 20.8"** Thickness/Diameter: **0.719" / 6"**
Limitations: **Nozzle Configuration** Start Time: **1339** Finish Time: **1416**

Instrument Settings				Search Unit				Cal. Checks			Axial Oriented Search Unit				
Serial No.:	0221JM			Serial No.:	SD1107			Initial Cal.	1015	10/9/2015	Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path	
Manufacturer:	GE Inspection Technologies			Manufacturer:	KB-Aerotech			Inter. Cal.	1338	10/9/2015	1" Notch	80%	7.3	1.460"	
Model:	USN 60 SW	Linearity:	2015-L-003	Size:	0.375"	Model:	Comp-G	Inter. Cal.	1346	10/9/2015	N/A	N/A	N/A	N/A	
Delay:	3.9866	Range:	2.0"	Freq.:	5.0 MHz	Center Freq.:	N/A	Inter. Cal.	N/A		N/A	N/A	N/A	N/A	
M'tl Cal/Vel:	0.1270	Pulser Type:	Square	Exam Angle:	45°	Squint Angle:	N/A	Final Cal.	1804	10/9/2015	N/A	N/A	N/A	N/A	
Damping:	500 Ohms	Reject:	0%	Measured Angle:	47°	Mode:	Shear	Couplant							
PRF:	Auto High	SU Freq.:	5.0 MHz	Exit Point:	0.3"	# of Elements:	1	Cal. Batch:	15E082						
Frequency:	5.0 MHz	Rectify:	Fullwave	Config.:	Single	Focus:	N/A	Type:	Ultratel II						
Voltage:	450	Pulse Width:	100	Shape:	Round	Contour:	N/A	Mfg.:	Sonotech						
				Wedge Style:	MSWQC			Exam Batch:	13M026						
				Search Unit Cable				Type:	Ultratel II						
				Type:	RG-174	Length:	6	Mfg.:	Sonotech						
				Scan Coverage				Reference Block							
Cal. Block No. 22571				Upstream <input checked="" type="checkbox"/>	Downstream <input checked="" type="checkbox"/>	Scan dB:	38	Serial No.:	33694 CS						
Thickness 0.5" to 2.0" Dia.: Flat				CW <input checked="" type="checkbox"/>	CCW <input checked="" type="checkbox"/>	Scan dB:	44	Type:	1" Angle Beam						
Cal. Blk. Temp. 77° Temp. Tool: 29021141				Exam Surface: OD											
Comp. Temp. 82° Temp. Tool: 29021145				Surface Condition: Ground											
Recordable Indication(s): Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> (If Yes, Ref. Attached Ultrasonic Indication Report.)															
Results: Accept <input checked="" type="checkbox"/> Reject <input type="checkbox"/> Info <input type="checkbox"/> Comments: None															
Percent Of Coverage Obtained > 90%: No - 87.3% Reviewed Previous Data: Yes															

Examiner	Level	II	Signature	Date	Reviewer	Signature	Date
Salley, Michael				10/9/2015	SIMON CROTHERS L-111		10/14/15
Examiner	Level	N/A	Signature	Date	Site Review	Signature	Date
N/A					Jay Miller		10-15-15
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A					LGE MALABANAN		10/15/15

UT Calibration Examination

Site/Unit: **BRW / 2** Procedure: **ER-AA-335-030** Outage No.: **A2R18**
 Summary No.: **2-R01.11.2032** Procedure Rev.: **4** Report No.: **A2R18-UT-015**
 Workscope: **ISI** Work Order No.: **01757348-01** Page: **2** of **4**

Code: **ASME XI, 2001 Ed, 2003 Ad** Cat./Item: **R-A/R1.11-3** Location: **IMB LOOP A,R-42**
 Drawing No.: **2FW-09** Description: **ELBOW - SG 2RC01BA AF NOZZLE**
 System ID: **FW**
 Component ID: **2FW-09-25** Size/Length: **6" / 20.8"** Thickness/Diameter: **0.719" / 6"**
 Limitations: **Nozzle Configuration** Start Time: **1339** Finish Time: **1416**

Instrument Settings				Search Unit				Cal. Checks			Axial Oriented Search Unit			
Serial No.:	0221JM			Serial No.:	SD1092			Initial Cal.	1017	10/9/2015	Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
Manufacturer:	GE Inspection Technologies			Manufacturer:	KB-Aerotech			Inter. Cal.	1347	10/9/2015	1" Notch	80%	6.7	2.0"
Model:	USN 60 SW	Linearity:	2015-L-003	Size:	0.375"	Model:	Comp-G	Inter. Cal.	1359	10/9/2015	N/A	N/A	N/A	N/A
Delay:	6.5678	Range:	3"	Freq.:	5.0 MHz	Center Freq.:	N/A	Inter. Cal.	N/A		N/A	N/A	N/A	N/A
M'tl Cal/Vel:	0.1270	Pulser Type:	Square	Exam Angle:	60°	Squint Angle:	N/A	Final Cal.	1805	10/9/2015	N/A	N/A	N/A	N/A
Damping:	500 Ohms	Reject:	0%	Measured Angle:	60°	Mode:	Shear	Couplant Cal. Batch: 15E082 Type: Ultragel II Mfg.: Sonotech Exam Batch: 13M026 Type: Ultragel II Mfg.: Sonotech						
PRF:	Auto High	SU Freq.:	5.0 MHz	Exit Point:	0.35"	# of Elements:	1							
Frequency:	5.0 MHz	Rectify:	Fullwave	Config.:	Single	Focus:	N/A	Circumferential Oriented Search Unit						
Voltage:	450	Pulse Width:	100	Shape:	Round	Contour:	N/A	Calibration Reflector Signal Amplitude % Sweep Division Sound Path N/A N/A N/A N/A						
Ax. Gain (dB):	40.5	Circ. Gain (dB):	N/A	Wedge Style:	MSWQC			Reference/Simulator Block						
10 Screen Div. = 3 in. of Sound Path				Type:	RG-174	Length:	6	No. Conn.:	0	Gain dB Reflector Signal Amplitude % Sweep Division Sound Path 31 SDH 60% 2.2 0.650"				
Calibration Block Cal. Block No. 22571 Thickness 0.5" to 2.0" Dia.: Flat Cal. Blk. Temp. 77° Temp. Tool: 29021141 Comp. Temp. 82° Temp. Tool: 29021145				Scan Coverage Upstream <input checked="" type="checkbox"/> Downstream <input type="checkbox"/> Scan dB: 50.5 CW <input checked="" type="checkbox"/> CCW <input checked="" type="checkbox"/> Scan dB: 50.5 Exam Surface: OD Surface Condition: Ground				Reference Block Serial No.: 33694 CS Type: 1" Angle Beam						
Recordable Indication(s): Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> (If Yes, Ref. Attached Ultrasonic Indication Report.) Results: Accept <input checked="" type="checkbox"/> Reject <input type="checkbox"/> Info <input type="checkbox"/> Comments: None														
Percent Of Coverage Obtained > 90%: No - 87.3% Reviewed Previous Data: Yes														

Examiner	Level	II	Signature	Date	Reviewer	Signature	Date
Salley, Michael				10/9/2015	SIMON CROTHERS L-III		10/14/15
Examiner	Level	N/A	Signature	Date	Site Review	Signature	Date
N/A					Jay Miller		10-15-15
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A					LGE MALABANAN		10/15/15



UT Calibration/Examination

Site/Unit: **BRW / 2**
Summary No.: **2-R01.11.2032**
Workscope: **ISI**

Procedure: **ER-AA-335-030**
Procedure Rev.: **4**
Work Order No.: **01757348-01**

Outage No.: **A2R18**
Report No.: **A2R18-UT-015**
Page: **3** of **4**

Code: **ASME XI, 2001 Ed, 2003 Ad** Cat./Item: **R-A/R1.11-3** Location: **IMB LOOP A,R-42**
Drawing No.: **2FW-09** Description: **ELBOW - SG 2RC01BA AF NOZZLE**
System ID: **FW**
Component ID: **2FW-09-25** Size/Length: **6" / 20.8"** Thickness/Diameter: **0.719" / 6"**
Limitations: **Nozzle Configuration** Start Time: **1339** Finish Time: **1416**

Instrument Settings
Serial No.: **0221JM**
Manufacturer: **GE Inspection Technologies**
Model: **USN 60 SW** Linearity: **2015-L-003**
Delay: **7.6488** Range: **4.0"**
M'tl Cal/Vel: **0.1270** Pulser Type: **Square**
Damping: **500 Ohms** Reject: **0%**
PRF: **Auto High** SU Freq.: **5.0 MHz**
Frequency: **5.0 MHz** Rectify: **Fullwave**
Voltage: **450** Pulse Width: **100**

Search Unit
Serial No.: **00T2TW**
Manufacturer: **KB-Aerotech**
Size: **0.375"** Model: **Comp-G**
Freq.: **5.0 MHz** Center Freq.: **N/A**
Exam Angle: **70°** Squint Angle: **N/A**
Measured Angle: **70°** Mode: **Shear**
Exit Point **0.35"** # of Elements: **1**
Config.: **Single** Focus: **N/A**
Shape: **Round** Contour: **N/A**

Wedge Style: **MSWQC**
Ax. Gain (dB): **38.5** Circ. Gain (dB): **N/A**
10 Screen Div. = **4** in. of **Sound Path**

Search Unit Cable
Type: **RG-174** Length: **6** No. Conn.: **0**

Calibration Block
Cal. Block No. **22571**
Thickness **0.5" to 2.0"** Dia.: **Flat**
Cal. Blk. Temp. **77°** Temp. Tool: **29021141**
Comp. Temp. **82°** Temp. Tool: **29021145**

Scan Coverage
Upstream ☒ Downstream ☐ Scan dB: **44.5**
CW ☐ CCW ☐ Scan dB: **N/A**
Exam Surface: **OD**
Surface Condition: **Ground**

Recordable Indication(s): Yes ☐ No ☒ (If Yes, Ref. Attached Ultrasonic Indication Report.)
Results: Accept ☒ Reject ☐ Info ☐

Percent Of Coverage Obtained > 90%: **No - 87.3%** Reviewed Previous Data: **Yes**

Cal. Checks	Time	Date
Initial Cal.	1018	10/9/2015
Inter. Cal.	1410	10/9/2015
Inter. Cal.	1416	10/9/2015
Inter. Cal.	N/A	
Final Cal.	1806	10/9/2015

Couplant
Cal. Batch: **15E082**
Type: **Ultragel II**
Mfg.: **Sonotech**
Exam Batch: **13M026**
Type: **Ultragel II**
Mfg.: **Sonotech**

Reference Block
Serial No.: **33694 CS**
Type: **1" Angle Beam**

Axial Oriented Search Unit				
Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path	
1" Notch	80%	7.3	2.905"	
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	
Circumferential Oriented Search Unit				
Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path	
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	
Reference/Simulator Block				
Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
31	SDH	50%	2.3	0.919"
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A

Comments: **None**

Examiner	Level	Signature	Date	Reviewer	Signature	Date
Salley, Michael	II		10/9/2015	SIMON CROTHERS L-111		10/14/15
Examiner	Level	Signature	Date	Site Review	Signature	Date
N/A	N/A			Jay Miller		10-15-15
Other	Level	Signature	Date	ANII Review	Signature	Date
N/A	N/A			LEE MAABANAN		10/15/15

Summary No.: **2-R01.11.2032**

Examiner: **Salley, Michael** *MTS* Level: **II**

Reviewer: *Simon Crothers* Date: **10/14/15**

Examiner: **N/A** Level: **N/A**

Site Review: *Jay Miller* Date: **10-15-15**

Other: **N/A** Level: **N/A**

ANII Review: *LEE MA CUBANAN* Date: **10/15/15**

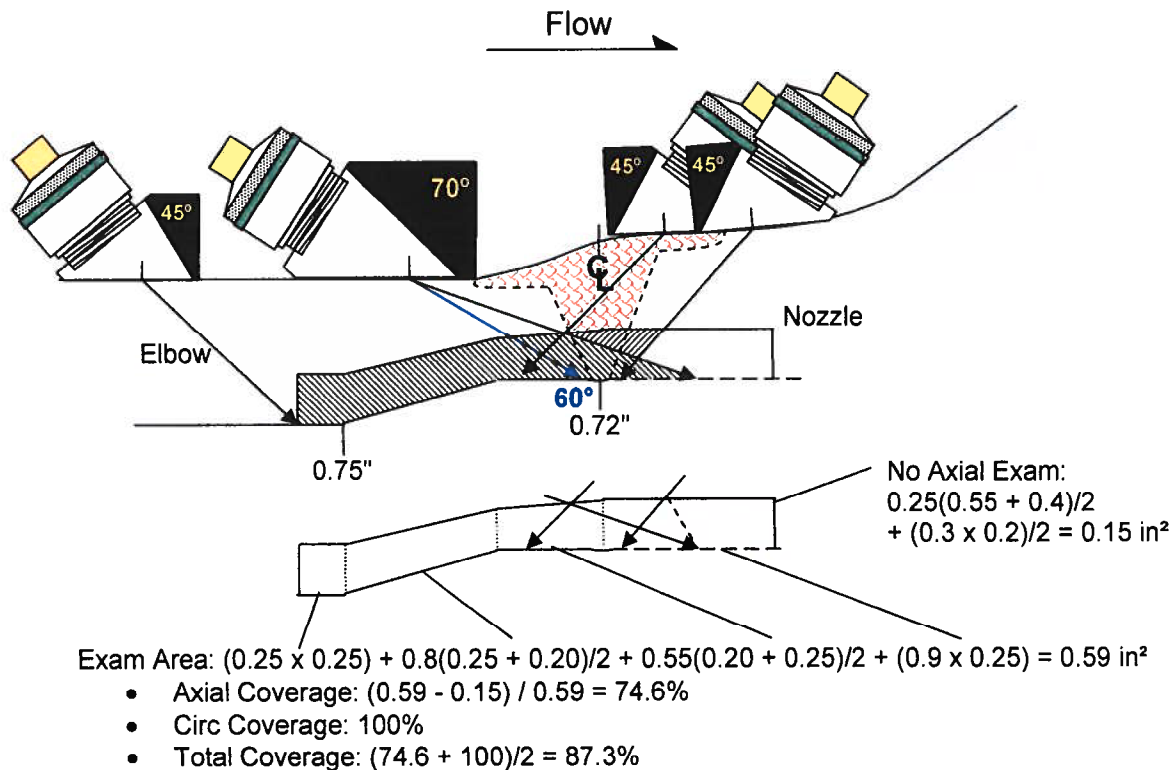
Comments:

Work Order: **01757348-01**

Weld: **2FW-09-25**

Sketch 1: Coverage Plot

Sketch or Photo:


Weld Crown Width: **1.3"**

Counterbore US: **1.35" From Root**

Counterbore DS: **None Detected**


ISI Ultrasonic Scan Plan

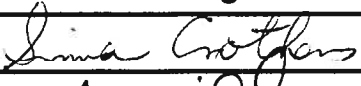
Component Information

Site / Unit:	Braidwood 2	Cal Std.:	CS Alternate / 1.0"
Outage or Year:	A2R18 / Fall 2015	Material:	CS
LTP#:		Nom. Diameter:	6.0"
Component ID:	2FW-09-25	Nom. Thickness:	0.719"
Procedure:	ER-AA-335-030 R4	Configuration:	Elbow to Nozzle
System:	Feedwater	Weld Width:	Measure
Drawing / Iso:	2FW-09	Weld Length:	20.8"
Code Class:	1	Exam Volume:	See R-A sketch
Code Category:	R-A	Accessible Sides:	1
Code Item:	R1.11	Limitations:	Single Sided Access
Circ Exam: Maximum refracted angle to impinge on ID:			51°
Check Previous Date / Verify Measurements & Conditions / Report probe lift-off conditions.			

Equipment / Examination Information

Probes				Exams	
Angle	Mode	Size	Frequency	Axial / Perpendicular	Circ / Parallel
45°	Shear	0.375"	2.25 or 5.0	Yes	Yes
60°	Shear	0.375"	2.25 or 5.0	Note 1	Note 2
70°	Shear	0.375"	2.25 or 5.0	Yes / Note 3	No

1. If 45° probe cannot achieve 100% coverage by scanning across flush weld crown, then perform 60° axial exam.
2. If 45° probe cannot achieve 100% coverage by scanning on flush or flat-topped weld crown, then perform 60° circ exam from base metal, skewed into weld root area. 60° will impinge on ID at skew angles >43°.
3. 70° axial exam due to single sided access.
4. Take T & C at L0, look for counterbore.
5. Measure weld crown width.
6. From previous data profile, this appears to be a single sided exam. Weld appears to be in the wrong location on previous coverage plot.

Entered by Lev III	Signature	Date
Simon Crothers		09/24/15

17N02 III 9-30-15

ATTACHMENT 7
Corrected Tables I3R-18.1 and I3R-18.2

Table I3R-18.1
Braidwood, Unit 1
List of Components with Limited Examination Coverage

Component ID	Weld Description (System)	Exam Requirements (Figure No.) and Method	Exam Category/ Item Number	Outage Examined	Material of Construction	Diameter/ Thickness	Normal Operating Conditions (Pressure / Temperature)	Exam Angle / Frequency (MHz) / Mode	Actual Coverage	Appendix VIII Qualified Exam	Remarks
1SI-39-08	Elbow-to-Valve Weld (SI)	IWC-2500-7(a) Volumetric (LT)	R-A R1.20	A1R16 (PSI)	Elbow: SA403 TP304 Valve: SA479 TP316 Weld: ER308/308L	4" / 0.531"	2485 psig 176 deg-F	0° / 4.00 / Long 45° / 2.25 / Shear 60° / 2.00 / Long	50.0%	Yes	Examination was limited due to valve configuration and one-sided exam. (Reference 1, Attachment 2, Pages 2 and 3) Examination Results – No recordable indications.
1SI-39-08A	Valve-to-Pipe Weld (SI)	IWC-2500-7(a) Volumetric (LT)	R-A R1.20	A1R16 (PSI)	Valve: SA479 TP316 Pipe: SA376 TP304 Weld: ER308/308L	4" / 0.531"	2485 psig 176 deg-F	0° / 4.00 / Long 45° / 2.25 / Shear 60° / 2.00 / Long	50.0%	Yes	Examination was limited due to valve configuration and one-sided exam. (Reference 1, Attachment 2, Pages 4 and 5) Examination Results – No recordable indications.
1SI-39-25	Elbow-to-Valve Weld (SI)	IWC-2500-7(a) Volumetric (LT)	R-A R1.20	A1R16 (PSI)	Elbow: SA403 TP304 Valve: SA479 TP316 Weld: ER308/308L	4" / 0.531"	2485 psig 176 deg-F	0° / 4.00 / Long 45° / 2.25 / Shear 60° / 2.00 / Long 45° / 5.00 / Shear	50.0%	Yes	Examination was limited due to valve configuration and one-sided exam. (Attachment 5, Pages 1 - 8) Examination Results – Root geometry indication, one embedded weld flaw acceptable to IWB-3514 preservice examination acceptance standards.
1SI-39-25A	Valve-to-Pipe Weld (SI)	IWC-2500-7(a) Volumetric (LT)	R-A R1.20	A1R16 (PSI)	Valve: SA479 TP316 Pipe: SA376 TP304 Weld: ER308/308L	4" / 0.531"	2485 psig 176 deg-F	0° / 4.00 / Long 45° / 2.25 / Shear 60° / 2.00 / Long	50.0%	Yes	Examination was limited due to valve configuration and one-sided exam. (Reference 1, Attachment 2, Pages 9 and 10) Examination Results – No recordable indications.
1SI-39-25B	Pipe-to-Valve Weld (SI)	IWC-2500-7(a) Volumetric (LT)	R-A R1.20	A1R16 (PSI)	Pipe: SA376 TP304 Valve: SA479 TP316 Weld: ER308/308L	4" / 0.531"	2485 psig 176 deg-F	45° / 2.25 / Shear 60° / 2.00 / Long	50.0%	Yes	Examination was limited due to valve configuration and one-sided exam. (Reference 1, Attachment 2, Pages 11 and 12) Examination Results – No recordable indications.

Reference 1. Letter from D. Murray (Exelon Generation Company, LLC) to U.S. NRC, "Relief Request Associated with the Third Ten-Year Inservice Inspection Program Interval," dated August 27, 2019 (ML19239A156)

Note: The following systems and their abbreviations are listed here: Auxiliary Feedwater (AF), Chemical and Volume Control System (CV), Pressurizer (RY), Feedwater (FW), Reactor Coolant (RC), Safety Injection (SI)

ATTACHMENT 7
Corrected Tables I3R-18.1 and I3R-18.2

Table I3R-18.1
Braidwood, Unit 1
List of Components with Limited Examination Coverage

Component ID	Weld Description (System)	Exam Requirements (Figure No.) and Method	Exam Category/ Item Number	Outage Examined	Material of Construction	Diameter/ Thickness	Normal Operating Conditions (Pressure / Temperature)	Exam Angle / Frequency (MHz) / Mode	Actual Coverage	Appendix VIII Qualified Exam	Remarks
1CV-22-30 (1CV109-4/FW-1)	Valve-to-Tee Weld (CV)	IWC-2500-7(a) Volumetric (LT)	R-A R1.20	A1R18 (PSI)	Valve: SA351 CF8M Tee: SA403 WP304 Weld: ER308/308L	4" / 0.531"	2485 psig 200 deg-F	45° / 2.25 / Shear 60° / 2.00 / Long.	50.0%	Yes	Examination was limited due to valve configuration and one-sided exam. (Reference 1, Attachment 2, Pages 13 and 14) Examination Results – No recordable Indications.
1PZR-01-N1	Nozzle N1-to-PZR Shell Weld (RY)	IWB-2500-7 Volumetric (LT)	B-D B3.110	A1R19 (ISI)	Nozzle: SA508 CL.2A Shell: SA533 Gr.A CL.2 Weld: E9018	14" / 3.1"	2485 psig 680 deg-F	0° / 2.25 / Long 45° / 2.25 / Shear 60° / 2.25 / Shear	74.7%	No	Examination limited in the "w" dimension of 6.0" at 290° due to proximity of heater penetration tubes. (Attachment 2, Pages 1 - 5) Examination Results – No recordable Indications.
1PZR-01-N4A	Nozzle N4A-to-PZR Shell Weld (RY)	IWB-2500-7 Volumetric (LT)	B-D B3.110	A1R19 (ISI)	Nozzle: SA508 CL.2A Shell: SA533 Gr.A CL.2 Weld: E9018	6" / 3.1"	2485 psig 680 deg-F	0° / 2.25 / Long 45° / 2.25 / Shear 60° / 2.25 / Shear	68.7%	No	Examination limited due to nozzle configuration. (Attachment 2, Pages 6 - 10) Examination Results – No recordable Indications.

Reference 1. Letter from D. Murray (Exelon Generation Company, LLC) to U.S. NRC, "Relief Request Associated with the Third Ten-Year Inservice Inspection Program Interval," dated August 27, 2019 (ML19239A156)

Note: The following systems and their abbreviations are listed here: Auxiliary Feedwater (AF), Chemical and Volume Control System (CV), Pressurizer (RY), Feedwater (FW), Reactor Coolant (RC), Safety Injection (SI)

ATTACHMENT 7
Corrected Tables I3R-18.1 and I3R-18.2

Table I3R-18.2
Braidwood, Unit 2
List of Components with Limited Examination Coverage

Component ID	Weld Description (System)	Exam Requirements (Figure No.) and Method	Exam Category/ Item Number	Outage Examined	Material of Construction	Diameter / Thickness	Normal Operating Conditions (Pressure / Temperature)	Exam Angle / Frequency / Mode	Actual Coverage	Appendix VIII Qualified Exam	Remarks
2SI-39-11	Elbow-to-Valve Weld (SI)	IWC-2500-7(a) Volumetric (UT)	R-A R1.20	A2R16 (PSI)	Elbow: SA403 TP304 Valve: SA479 TP316 Weld: ER308/308L	4" / 0.531"	2485 psig 176 deg-F	0° / 4.00 / Long 45° / 2.25 / Shear 60° / 2.00 / Long.	50.0%	Yes	Examination was limited due to valve configuration and one-sided exam. (Reference 1, Attachment 3, Pages 2 and 3) Examination Results – No recordable Indications.
2SI-39-11A	Valve-to-Pipe Weld (SI)	IWC-2500-7(a) Volumetric (UT)	R-A R1.20	A2R16 (PSI)	Valve: SA479 TP316 Pipe: SA376 TP304 Weld: ER308/308L	4" / 0.531"	2485 psig 176 deg-F	0° / 4.00 / Long 45° / 2.25 / Shear 60° / 2.00 / Long.	50.0%	Yes	Examination was limited due to valve configuration and one-sided exam. (Reference 1, Attachment 3, Pages 4 and 5) Examination Results – No recordable Indications.
2SI-39-28	Elbow-to-Valve Weld (SI)	IWC-2500-7(a) Volumetric (UT)	R-A R1.20	A2R16 (PSI)	Elbow: SA403 TP304 Valve: SA479 TP316 Weld: ER308/308L	4" / 0.531"	2485 psig 176 deg-F	0° / 4.00 / Long 45° / 2.25 / Shear 60° / 2.25 / Shear 70° / 2.25 / Shear 60° / 2.00 / Long.	50.0%	Yes	Examination was limited due to valve configuration and one-sided exam. (Reference 1, Attachment 3, Pages 6 and 7) Examination Results – Inside surface geometry indication.
2SI-39-28A	Valve-to-Pipe Weld (SI)	IWC-2500-7(a) Volumetric (UT)	R-A R1.20	A2R16 (PSI)	Valve: SA479 TP316 Pipe: SA376 TP304 Weld: ER308/308L	4" / 0.531"	2485 psig 176 deg-F	0° / 4.00 / Long 45° / 2.25 / Shear 60° / 2.00 / Long.	50.0%	Yes	Examination was limited due to valve configuration and one-sided exam. (Reference 1, Attachment 3, Pages 8 and 9) Examination Results – No recordable Indications.
2SI-39-28B	Pipe-to-Valve Weld (SI)	IWC-2500-7(a) Volumetric (UT)	R-A R1.20	A2R16 (PSI)	Pipe: SA376 TP304 Valve: SA479 TP316 Weld: ER308/308L	4" / 0.531"	2485 psig 176 deg-F	0° / 4.00 / Long 45° / 2.25 / Shear 60° / 2.25 / Shear 60° / 2.00 / Long.	50.0%	Yes	Examination was limited due to valve configuration and one-sided exam. (Reference 1, Attachment 3, Pages 10 and 11) Examination Results – Root geometry indication.
2FZR-01-N4B	Nozzle N4B-to-PZR Shell Weld (RY)	IWB-2500-7 Volumetric (UT)	B-D B3.110	A2R17 (ISI)	Nozzle: SA508 CL.2A Shell: SA533 Gr.A CL.2 Weld: E9018	91.5" / 2.0625"	2485 psig 680 deg-F	45° / 2.25 / Shear 0° / 2.25 / Long	88.5%	No	Examination was limited due to nozzle configuration and one-sided exam. (Attachment 2, Pages 14 - 17) Examination Results – No recordable Indications.

Reference 1. Letter from D. Murray (Exelon Generation Company, LLC) to U.S. NRC, "Relief Request Associated with the Third Ten-Year Inservice Inspection Program Interval," dated August 27, 2019 (ML19239A156)

Note: The following systems and their abbreviations are listed here: Auxiliary Feedwater (AF), Chemical and Volume Control System (CV), Pressurizer (RY), Feedwater (FW), Reactor Coolant (RC), Safety Injection (SI)

ATTACHMENT 7
Corrected Tables I3R-18.1 and I3R-18.2

Table I3R-18.2
Braidwood, Unit 2
List of Components with Limited Examination Coverage

Component ID	Weld Description (System)	Exam Requirements (Figure No.) and Method	Exam Category/ Item Number	Outage Examined	Material of Construction	Diameter / Thickness	Normal Operating Conditions (Pressure / Temperature)	Exam Angle / Frequency / Mode	Actual Coverage	Appendix VIII Qualified Exam	Remarks
2FZR-01-N4C	Nozzle N4C-to-PZR Shell Weld (RY)	IWB-2500-7 Volumetric (UT)	B-D B3.110	A2R17 (ISI)	Nozzle: SA508 CL.2A Shell: SA533 Gr.A CL.2 Weld: E9018	91.5" / 2.0625"	2485 psig 680 deg-F	45° / 2.25 / Shear 0° / 2.25 / Long	88.5%	No	Examination was limited due to nozzle configuration and one-sided exam. (Attachment 2, Pages 18 - 21) Examination Results – No recordable Indications.
2FW-09-25	Elbow-to-SG 2RC01BA AF Nozzle Weld (FW)	IWC-2500-7(a) Volumetric (UT)	R-A R1.11	A2R18 (ISI)	Elbow: SA234 Gr.WPB Nozzle: SA508 CL.2A	6" / 0.719"	1185 psig 567 deg-F	45° / 5.00 / Shear 60° / 5.00 / Shear 70° / 5.00 / Shear	87.3%	Yes	Examination was limited due to nozzle configuration. (Attachment 6, Page 67- 71) Examination Results – No recordable Indications.
2PZR-01-N1	Nozzle N1-to-PZR Shell Weld (RY)	IWB-2500-7 Volumetric (UT)	B-D B3.110	A2R19 (ISI)	Nozzle: SA508 CL.2A Shell: SA533 Gr.A CL.2 Weld: E9018	26.10" / 2.5625"	2485 psig 680 deg-F	45° / 2.25 / Shear 60° / 2.25 / Shear	59.2%	No	Examination was limited due to nozzle configuration and the proximity of heater penetration tubes. Coverage plot taken from NDE Data Sheet A2R13-UT-025. (Attachment 2, Pages 11 - 13) Examination Results – No recordable Indications.
2SG-01-SGN-01A	Primary Nozzle Inner Radius Section (RC)	IWB-2500-7 Volumetric (UT)	B-D B3.140	A2R19 (ISI)	SA216 Gr WCC	29" / 3.1875"	2485 psig 680 deg-F	33° / 2.25 / Long	85.0%	No	Examination was limited due to a permanent structure for 30" out of the total 205". (Attachment 3, Pages 1 and 2) Examination Results – No recordable Indications.
2SG-01-SGC-02	Tubesheet-to-Barrel Weld (RC)	IWC-2500-2 Volumetric (UT)	C-A C1.30	A2R20 (ISI)	Tubesheet: SA508 CL.2A Barrel: SA533 GR.A CL.2 Weld: E8018-C3	11.3' / 3.3125"	2485 psig 680 deg-F	0° / 2.25 / Long 45° / 2.25 / Shear 60° / 2.25 / Shear	88.4%	No	Examination was limited due to component configuration. (Attachment 4, Pages 1 - 5) Examination Results – No recordable Indications.

Reference 1. Letter from D. Murray (Exelon Generation Company, LLC) to U.S. NRC, "Relief Request Associated with the Third Ten-Year Inservice Inspection Program Interval," dated August 27, 2019 (ML19239A156)

Note: The following systems and their abbreviations are listed here: Auxiliary Feedwater (AF), Chemical and Volume Control System (CV), Pressurizer (RY), Feedwater (FW), Reactor Coolant (RC), Safety Injection (SI)

ATTACHMENT 7
Corrected Tables I3R-18.1 and I3R-18.2

Table I3R-18.2
Braidwood, Unit 2
List of Components with Limited Examination Coverage

Component ID	Weld Description (System)	Exam Requirements (Figure No.) and Method	Exam Category/ Item Number	Outage Examined	Material of Construction	Diameter / Thickness	Normal Operating Conditions (Pressure / Temperature)	Exam Angle / Frequency / Mode	Actual Coverage	Appendix VIII Qualified Exam	Remarks
2AF-03-23 (FW-1)	Elbow-to-Flange Weld (AF)	IWC-2500-7(a) Volumetric (UT)	R-A R1.20	2015 (PSI)	Elbow: SA234 Gr.WPB Flange: SA105 Weld: ER70S-2	4" / 0.337"	1185 psig 100 deg-F	45° / 5.00 / Shear 60° / 5.00 / Shear 70° / 5.00 / Shear	87%	Yes	Examination was limited due to component configuration. (Attachment 6, Pages 23 - 28) Examination Results – Root geometry indication.
2AF-03-24 (FW-2)	Flange-to-Elbow Weld (AF)	IWC-2500-7(a) Volumetric (UT)	R-A R1.20	2015 (PSI)	Flange: SA105 Elbow: SA234 Gr.WPB Weld: ER70S-2	4" / 0.337"	1185 psig 100 deg-F	45° / 5.00 / Shear 60° / 5.00 / Shear 70° / 5.00 / Shear	87%	Yes	Examination was limited due to component configuration. (Attachment 6, Pages 29 - 34) Examination Results – Root geometry indication.
2AF-04-20 (FW-3)	Elbow-to-Flange Weld (AF)	IWC-2500-7(a) Volumetric (UT)	R-A R1.20	2015 (PSI)	Elbow: SA234 Gr.WPB Flange: SA105 Weld: ER70S-2	4" / 0.337"	1185 psig 100 deg-F	45° / 5.00 / Shear 60° / 5.00 / Shear 70° / 5.00 / Shear	88%	Yes	Examination was limited due to component configuration. (Attachment 6, Pages 35 - 40) Examination Results – Root geometry indication, inside surface mismatch geometry indication.
2AF-04-21 (FW-4)	Flange-to-Elbow Weld (AF)	IWC-2500-7(a) Volumetric (UT)	R-A R1.20	2015 (PSI)	Flange: SA105 Elbow: SA234 Gr.WPB Weld: ER70S-2	4" / 0.337"	1185 psig 100 deg-F	45° / 5.00 / Shear 60° / 5.00 / Shear 70° / 5.00 / Shear	88%	Yes	Examination was limited due to component configuration. (Attachment 6, Pages 41 - 46) Examination Results – Root geometry indication, inside surface mismatch geometry indication.
2AF-02-23 (FW-1)	Elbow-to-Flange Weld (AF)	IWC-2500-7(a) Volumetric (UT)	R-A R1.20	2015 (PSI)	Elbow: SA234 Gr.WPB Flange: SA105 Weld: ER70S-2	4" / 0.337"	1185 psig 100 deg-F	45° / 5.00 / Shear 60° / 5.00 / Shear 70° / 5.00 / Shear	90%	Yes	Examination was limited due to component configuration. (Attachment 6, Pages 13 - 16) Examination Results – No recordable Indications.
2AF-02-24 (FW-2)	Flange-to-Elbow Weld (AF)	IWC-2500-7(a) Volumetric (UT)	R-A R1.20	2015 (PSI)	Flange: SA105 Elbow: SA234 Gr.WPB Weld: ER70S-2	4" / 0.337"	1185 psig 100 deg-F	45° / 5.00 / Shear 60° / 5.00 / Shear 70° / 5.00 / Shear	90%	Yes	Examination was limited due to component configuration. (Attachment 6, Pages 17 - 22) Examination Results – Root geometry indication.

Reference 1. Letter from D. Murray (Exelon Generation Company, LLC) to U.S. NRC, "Relief Request Associated with the Third Ten-Year Inservice Inspection Program Interval," dated August 27, 2019 (ML19239A156)

Note: The following systems and their abbreviations are listed here: Auxiliary Feedwater (AF), Chemical and Volume Control System (CV), Pressurizer (RY), Feedwater (FW), Reactor Coolant (RC), Safety Injection (SI)

ATTACHMENT 7
Corrected Tables I3R-18.1 and I3R-18.2

Table I3R-18.2
Braidwood, Unit 2
List of Components with Limited Examination Coverage

Component ID	Weld Description (System)	Exam Requirements (Figure No.) and Method	Exam Category/ Item Number	Outage Examined	Material of Construction	Diameter / Thickness	Normal Operating Conditions (Pressure / Temperature)	Exam Angle / Frequency / Mode	Actual Coverage	Appendix VIII Qualified Exam	Remarks
2AF-01-24 (FW-3)	Elbow-to-Flange Weld (AF)	IWC-2500-7(a) Volumetric (UT)	R-A R1.20	2015 (PSI)	Elbow: SA234 Gr.WPB Flange: SA105 Weld: ER70S-2	4" / 0.337"	1185 psig 100 deg-F	45° / 5.00 / Shear 60° / 5.00 / Shear 70° / 5.00 / Shear	90%	Yes	Examination was limited due to component configuration. (Attachment 6, Pages 1 - 6) Examination Results – Root geometry indication.
2AF-01-25 (FW-4)	Flange-to-Elbow Weld (AF)	IWC-2500-7(a) Volumetric (UT)	R-A R1.20	2015 (PSI)	Flange: SA105 Elbow: SA234 Gr.WPB Weld: ER70S-2	4" / 0.337"	1185 psig 100 deg-F	45° / 5.00 / Shear 60° / 5.00 / Shear 70° / 5.00 / Shear	89%	Yes	Examination was limited due to component configuration. (Attachment 6, Pages 7 - 12) Examination Results – Root geometry indication.
2CV-21-58 (FW-1)	Valve-to-Tee Weld (CV)	IWC-2500-7(a) Volumetric (UT)	R-A R1.20	2015 (PSI)	Valve: SA351 Gr.CF8M Tee: SA 403 Gr.WP304 Weld: ER308/308L	4" / 0.531"	2485 psig 200 deg-F	45° / 2.25 / Shear 60° / 2.25 / Shear 70° / 2.25 / Shear 60° / 2.00 / Long	20.7%	Yes	Examination was limited due to component configuration. (Attachment 6, Pages 61 - 66) Examination Results – No recordable Indications.
2CV-21-57 (FW-2)	Tee-to-Pipe Weld (CV)	IWC-2500-7(a) Volumetric (UT)	R-A R1.20	2015 (PSI)	Tee: SA403 Gr.WP304 Pipe: SA312 TP304 Weld: ER308/308L	4" / 0.531"	2485 psig 200 deg-F	45° / 2.25 / Shear 60° / 2.25 / Shear 70° / 2.25 / Shear 60° / 2.00 / Long	83.3%	Yes	Examination was limited due to component configuration. (Attachment 6, Pages 53 - 60) Examination Results – Root geometry indication.
2CV-21-56 (FW-2)	Pipe-to-Tee Weld (CV)	IWC-2500-7(a) Volumetric (UT)	R-A R1.20	2015 (PSI)	Pipe: SA312 TP304 Tee: SA403 Gr.WP304 Weld: ER308/308L	4" / 0.531"	2485 psig 200 deg-F	45° / 2.25 / Shear 60° / 2.25 / Shear 70° / 2.25 / Shear 60° / 2.00 / Long	83.3%	Yes	Examination was limited due to component configuration. (Attachment 6, Pages 47 - 52) Examination Results – No recordable Indications.

Reference 1. Letter from D. Murray (Exelon Generation Company, LLC) to U.S. NRC, "Relief Request Associated with the Third Ten-Year Inservice Inspection Program Interval," dated August 27, 2019 (ML19239A156)

Note: The following systems and their abbreviations are listed here: Auxiliary Feedwater (AF), Chemical and Volume Control System (CV), Pressurizer (RY), Feedwater (FW), Reactor Coolant (RC), Safety Injection (SI)