

**R. M. Krich** Vice President Nuclear Licensing

March 21, 2011

Tennessee Valley Authority 1101 Market Street, LP 3R Chattanooga, Tennessee 37402-2801

10 CFR 50.4 10 CFR 50.55a

ATTN: Document Control Desk U.S. Nuclear Regulatory Commission Washington, D.C. 20555-0001

> Browns Ferry Nuclear Plant, Unit 3 Facility Operating License No. DPR-68 NRC Docket No. 50-296

Subject: American Society of Mechanical Engineers Boiler and Pressure Vessel Code, Section XI, Inservice Inspection Program, Third Ten-Year Inspection Interval, Request for Relief 3-ISI-26

In accordance with 10 CFR 50.55a(g)(5)(iii), the Tennessee Valley Authority (TVA) is requesting relief from weld examination coverage requirements specified in the American Society of Mechanical Engineers Boiler and Pressure Vessel Code, Section XI, 2001 Edition, 2003 Addenda as amended by 10 CFR 50.55a(b)(2)(xv)(A)(2), for one full penetration weld due to access limitations caused by design. This relief is requested for the Browns Ferry Nuclear Plant (BFN), Unit 3, third ten-year inspection interval which began November 19, 2005, and ends November 18, 2015.

Specifically, this request for relief addresses one reactor pressure vessel nozzle-to-vessel (head) full penetration weld. Ultrasonic examinations were performed on the accessible areas of this weld to the maximum extent practical for the design configuration of the weld.

The enclosure to this letter contains the BFN, Unit 3, Request for Relief 3-ISI-26, for NRC review and approval.

U.S. Nuclear Regulatory Commission Page 2 March 21, 2011

This request for relief is consistent with the BFN, Unit 3, Request for Relief 3-ISI-23 submitted by TVA letters dated August 24, 2007 and April 9, 2008. The NRC approved this request by letter dated September 24, 2008.

TVA requests approval of this request for relief within one year from the date of this letter.

There are no new regulatory commitments in this letter. If you have any questions, please contact Tom Matthews at (423) 751-2687.

Respectfully,

ful

R. M. Krich

Enclosure: American Society of Mechanical Engineers Boiler and Pressure Vessel Code, Section XI, Inservice Inspection Program, Third Ten-Year Inspection Interval, Request for Relief 3-ISI-26

cc (Enclosure):

NRC Regional Administrator - Region II NRC Senior Resident Inspector - Browns Ferry Nuclear Plant

### Enclosure

### Tennessee Valley Authority Browns Ferry Nuclear Plant Unit 3

### American Society of Mechanical Engineers Boiler and Pressure Vessel Code, Section XI, Inservice Inspection Program, Third Ten-Year Inspection Interval

**Request for Relief 3-ISI-26** 

### Enclosure

### Tennessee Valley Authority Browns Ferry Nuclear Plant Unit 3

#### American Society of Mechanical Engineers Boiler and Pressure Vessel Code, Section XI, Inservice Inspection Program, Third Ten-Year Inspection Interval

#### **Request for Relief 3-ISI-26**

**Executive Summary:** In accordance with 10 CFR 50.55a(g)(5)(iii), the Tennessee Valley Authority (TVA) is requesting relief from weld examination coverage requirements specified in the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI for one Reactor Pressure Vessel (RPV) nozzle-to-vessel (head) full penetration ultrasonic (UT) weld examination performed during the Browns Ferry Nuclear Plant (BFN), Unit 3, Cycle 13 Refueling Outage in the first period of the third ten-year interval.

The design configuration of the RPV Head nozzle-to-vessel (head) weld precludes a 100 percent UT examination of the required volume for the full penetration weld of the nozzle listed in Table 1 of this enclosure. These examination limitations occur when the ASME Section XI, 2001 Edition, in accordance with 10 CFR 50.55a(b)(2)(xxiv) and, as amended by Sections 10 CFR 50.55a(b)(2)(xv)(B) through 10 CFR 50.55a(b)(2)(xv)(G), and 10 CFR 50.55a(b)(2)(xvi)(A), examination requirements are applied in areas of components constructed and fabricated to early plant designs. Based on a construction permit date prior to January 1, 1971, BFN is exempt from meeting certain provisions of the ASME Code requirements for examination access, to the extent practical, within the limitations of design, geometry, and materials of construction of the components in accordance with 10 CFR 50.55a(g)(4).

A UT examination was performed on the accessible areas to the maximum extent practical given the physical limitations of the subject weld. The subject weld was examined with the latest ultrasonic techniques, procedures, equipment, and personnel qualified to the requirements of the Performance Demonstration Initiative (PDI) Program, as required by 10 CFR 50.55a(g)(4) and 10 CFR 50.55a(g)(6)(ii)(C).

TVA concludes that performance of a UT examination of essentially 100 percent of the RPV nozzle-to-vessel full penetration weld would be impractical. The performance of the UT examination of the subject weld to the maximum extent practical provides an acceptable level of quality and safety because the information and data obtained from the volume examined provides sufficient information to judge the overall integrity of the weld. Therefore, pursuant to 10 CFR 50.55a(g)(5)(iii), TVA requests that relief be granted for the BFN, Unit 3, third ten-year inspection interval.

This relief is requested for the BFN, Unit 3, third ten-year inspection interval which began November 19, 2005, and ends November 18, 2015.

This request for relief is consistent with the BFN, Unit 3, Request for Relief 3-ISI-23 submitted by TVA letters dated August 24, 2007 and April 9, 2008. The NRC approved this request by letter dated September 24, 2008.

Unit: Browns Ferry Nuclear Plant, Unit 3

System: Reactor Pressure Vessel Head Nozzle, System 329

**<u>ASME Code Components Affected</u>:** One RPV nozzle-to-vessel full penetration weld as listed in Table 1 of this enclosure

ASME Code Class: ASME Code Class 1 (Equivalent)

**Section XI Edition:** 2001 Edition, 2003 Addenda in accordance with 10 CFR 50.55a(b)(2)(xxiv) and, as amended by Sections 10 CFR 50.55a(b)(2)(xv)(B) through 10 CFR 50.55a(b)(2)(xv)(G), and 10 CFR 50.55a(b)(2)(xvi)(A), by following the Electric Power Research Institute's (EPRI) PDI processes.

Code Table: IWB-2500-1

Code Examination Category: B-D, "Full Penetration Welds of Nozzles in Vessels"

Code Examination Item Number: B3.90, "Reactor Vessel Nozzle-to-Vessel Welds"

<u>Code Requirement</u>: ASME Section XI, Table IWB-2500-1, Examination Category B-D, Item No. B3.90 requires a volumetric examination of essentially 100 percent of the weld and adjacent base material as depicted in Figure IWB-2500-7(a).

<u>Code Requirements from Which Relief Is Requested</u>: Relief is requested from the requirement of ASME Section XI Code, Table IWB-2500-1, Examination Category B-D, Item No. B3.90 to perform essentially 100 percent volumetric examination of the weld and adjacent base material.

List of Components Associated with this Request for Relief: RPV head, nozzle-to-vessel weld (N6A-NV)

**<u>Reason for Request</u>:** The design configuration of the RPV nozzle-to-vessel (N6A-NV) weld area precludes a UT examination of essentially 100 percent of the required volume. The component design configuration limits UT examination coverage of the weld to the percentage listed in Table 1.

**Proposed Alternative and Basis for Use:** In lieu of the Code require essentially 100 percent volume UT examination, on the nozzle-to-vessel weld, TVA proposes a UT examination of accessible areas to the maximum extent practical given the component design configuration of the RPV nozzle-to-vessel weld.

<u>Justification for Granting Relief</u>: (1) The design configuration of the subject nozzle-to-vessel weld (N6A-NV), precludes UT examination of essentially 100 percent of the required examination volume. In order to examine the weld in accordance with the ASME Code requirements the RPV would require extensive design modifications. The physical arrangement of the nozzle-to-vessel weld precludes UT examination from the nozzle side. The limitations are inherent to the barrel-type nozzle-to-vessel weld design. Scanning from the nozzle surface is ineffective due to the weld location and the asymmetrical inside surface where the nozzle and vessel converge. Experience from the automated UT examination performed from the inside surface has shown that the nozzle-to-vessel weld coverage will not be greatly improved even if performed from the inside surface utilizing the current state-of-the-art techniques. The areas receiving little or no examination coverage are located toward the outside surface of the reactor vessel in the general area of the nozzle outside blend radius.

The blend radius of the weld restricts the scanning movement and/or transducer contact. The reactor vessel inner-half of the thickness and inside surface are interrogated with the UT beam. Degradation located at the inside surface or inner-half of the vessel would be located.

The subject weld was examined with the latest ultrasonic techniques, procedures, equipment, and personnel qualified to the requirements of the PDI Program, in accordance with the requirements of the 2001 Edition, in accordance with 10 CFR 50.55a(b)(2)(xxiv) and, as amended by Sections 10 CFR 50.55a(b)(2)(xv)(B) through 10 CFR 50.55a(b)(2)(xv)(G), and 10 CFR 50.55a(b)(2)(xvi)(A), by following the EPRI's PDI processes.

(2) Radiographic examination as an alternate volumetric examination method was determined to be impractical due to the radiological concerns. Gaining access to the inside surface of the RPV to place radiographic film would require extensive personnel protection due to high radiation and contamination levels. Also, due to the varying thickness at the outside blend radius of the weld several radiographs may be required of one area to obtain the required coverage and/or film density. The additional ASME Code coverage gained by radiography is impractical when weighed against the radiological concerns.

Therefore, TVA concludes that performing a UT examination of essentially 100 percent of the nozzle-to-vessel full penetration weld would be impractical. Further, it would also be impractical to perform other volumetric examinations (i.e., radiography) which may increase examination coverage.

A maximum extent practical UT examination of the subject areas provides an acceptable level of quality and safety. TVA concludes that significant degradation, if present, would be detected during a UT examination performed to the maximum extent practical of the subject weld. As a result, reasonable assurance of operational readiness of the subject weld has been provided.

Therefore pursuant to 10 CFR 50.55a(g)(5)(iii), TVA requests that relief be granted for the BFN, Unit 3, third ten-year ISI inspection interval.

### Implementation Schedule:

This request for relief is applicable to the third ten-year ISI inspection interval for BFN, Unit 3, which began on November 19, 2005, and will end on November 18, 2015. The weld described above is listed in Table 1 of this enclosure. The weld was examined during the first period (Cycle 13 - spring 2008) of the third ten-year inspection interval.

### Precedent:

This request for relief is consistent with BFN, Unit 3, Request for Relief 3-ISI-23 submitted by TVA letters dated August 24, 2007, and April 9, 2008. The NRC approved this request by letter dated September 24, 2008.

### Attachments:

Attachment A (Inservice Inspection Drawings)

3-ISI-0295-A, Revision 001 Sketch SK-B3001, Reactor Pressure Vessel Assembly Sketch SK-B3011, Attachments Map Top Head Assembly Sketch SK-B3016, Weld Detail Head Spray / Instrumentation Nozzle N6

Attachment B (Weld Examination Data Report)

Weld Examination Report, R-054

## Table 1

Weld Number / (System)	Nominal Pipe Size (NPS)	ISI Drawing Number	Examination Coverage Percent	Unit / Cycle	Comments
N6A-NV (RPV Instrumentation Head Nozzle)	6"	3-ISI-0295-A	58.9%	3 / 13 (Spring 2008)	Nozzle-to-vessel weld (RPV Head Nozzle) examined using a 26, 45, and 55 degree shear wave mode and a 60 degree refracted longitudinal wave mode. Scanning was restricted due to nozzle configuration. Exams were performed from the head shell side and outer blend radius. This weld was examined using PDI qualified personnel, procedures, and equipment. The coverage claimed is 58.9%.

### Attachment A

Inservice Inspection Drawings

3-ISI-0295-A, Revision 001

Sketch SK-B3001, Reactor Pressure Vessel Assembly

Sketch SK-B3011, Attachments Map Top Head Assembly

Sketch SK-B3016, Weld Detail Head Spray / Instrumentation Nozzle N6





. .

. . .

· · · ·





.

### Attachment B

Weld Examination Data Report

Weld Examination Report, R054

..

<u>'</u>					0002	32 🔨
TENNESSEE VALI AUTHORITY	LEY	EXAMINATI A RESOLUTIO	ON SUMMARY ND N DATA SHEET		REPORT NUM R054	BER:
PROJECT: BEN UNIT:	3	CVCLE: 13		N6A-NV		
FROJECT. DIA ONIT.	TION MET		SYSTEM BPV		NO 3-ISI-0295	-A-01
			CODE CLASS: 1	151 0 110	CATEGORY	B-D
			COPE CLASS. I	Norgia	TO	Vonvi
PROCEDURE: N-U1-78	REV:4			INOZZIE	TO TO	VESSEI
The Discourse of the second	SAMUAL	MER: ALEX ZIMPEREL	$\mu/A$		~/A	
LEVEL 77	LEVEL	Th	LEVEL:		LEVEL:	
LEVEL.						
The package con	tains the ultr	asonic examination d	ata for N6A-NV			
This evan meets t	he remireme	asonic examination a	XI 2001 edition			·
2003 Addenda for	category B.F	item B3 00 EYDE	AI, 2001 Carriell,		<u></u>	
	category D-L	, ICH D3.70, DAILO	2 03 2 03.			
The examination	was perform	red using ASME Secto	ion XI Annendix VII		<u></u>	
and Appendix VI	I personnel	equipment and techni	ques as ammended by	the		
10CEP50 55a Fing	Dule		ques as animended by			
1001 (30.3581 mil						
	mation is a 6	" nominal diameter D	DV Nozzle to Shell we	la		
located on the PP	/ Wead				······································	
	Ticau.				· · · · · · · · · · · · · · · · ·	
The examination	was perform	ed using TVA Proced	hure N-UT-78 for the	····		<u> </u>
Supplement 4/6 ex	am voloume	and AREVA Procedu	re 54-ISI-850 for the			
Supplement 5 exar	n volume Th	e supplement 4/6 exa	m volume was	····· <u></u> ···		
examined using a	SO degree RI	The supplement 5 v	hime was examined		<u></u>	
using a 26, 45 and	55 degree sh	ear wave as defined it	FPRI modeling			
document ID-2003		cal wave as defined in				
		<u> </u>				
The achieved ex	mination vo	lumes are as follows:				
Supplement 5 volu	me (inner 1	5%) = 100%	······		<u></u>	
Supplement 4/6 vo	lume (outer 8	(5%) = 57.5%				
ASME Code Requi	red Volume	(Full volume) = $58.9\%$	)			
						<u> </u>
			·····			
			<u></u>			
					<u></u>	
					· · · · · · · · · · · · · · · · · · ·	
	· • • • • • • •	- <u> </u>		<u> </u>		
				<u></u>		
·						
RESOLUTION BY: Thomas	Berge	<b>REVIEWED BY:</b>		ANII:		>
ham DRI	, work	1110-1.	1.1.1			
1070		Mau N	um	DATE:	4/22/08-	
LEVEL TE DATE: 8/	7/2	LEVEL: ZZ DA	TE: 4/4/08	PG.	OF T	0
	400					

### Tennessee Valley Authority

# Ultrasonic Examination Data Sheet

Nozzle-to-Shell Weld Examination

Earnington Data Sheet Number         Los Since 10         I Bit Report Number         ZOCE_100         Display Coll           Component Display         NAAVY         Examination Information         We Location: Nazzle TOC.         Component Description: NA NA Keizle-to-Closure Head Weld           Examination Limited:         Mode         Component Description: Nazzle TOC.         Coverage Sheet Number:         Ls Location: Nazzle TOC.           Examination Limited:         Mode         Save         Calibration Stort # 30:0000         San Suffice: OD Hoods Blond           Examination Limited:         Mode         Save         Calibration Sheet #         Date         Time	Utility: TV	A			Site	Browns Ferr	······································				i Init/Out	age: 3/C	vcle 13	RFO		
Component ID: N6A.RV         Component Description: N6 Nozze-6-Closure Head Weld           Examination information           Sold Discrete State         Location Nozze ToC           Sold Discrete State         Converse           Sold Discrete State         Converse           Sold Discrete State         Sold Discrete State           Sold Discrete State         Sold Discrete State           Sold Discrete State           Sold Discrete State         Sold Discrete State           Sold Discrete State           Sold Discrete State         Sold Discrete State           Sold Discrete State         Sold Discrete State             <	Examinati	on Data St	neet Number:				·		ISI Report I	Number:	2054		200,01			
Examination Information           Information Linked: EVec         La Location: Nozzie Bose (Rnozzie)         La Location: Nozzie TDC           Coverage Sheet Number(s):         Scan Information           Scan Information           Scan Information           Scan Information           Scan Surface: OB Nozzie Bose (Rnozzie)         Scan Surface: OB Nozzie Bose           Scan Information           Scan Surface: OB Nozzie Bose (Rnozzie)         Scan Surface: OB Nozzie Bose           Officient Nozzie Bose (Rnozzie)         Scan Surface: OB Nozzie Bose           Scan Surface: OB Nozzie Bose (Rnozzie)         Scan Surface: OB Nozzie Bose           Stew         Calibration Sheet #         Data Sheet #         Farme Theorematics           Stew         Calibration Sheet #         Data Sheet #         Farme Theorematics           Stew         Calibration Sheet #         Data Sheet #         Farme Theorematics           Stew         Calibration Sheet #         Data Sheet #         Farme Theorematics           Stew <th colspa<="" td=""><td>Compone</td><td>nt ID: N6/</td><td>A-NV</td><td></td><td></td><td></td><td></td><td></td><td>Component</td><td>Description:</td><td>N6 Nozzle-to-Clo</td><td>sure Head</td><td>Weld</td><td></td><td></td></th>	<td>Compone</td> <td>nt ID: N6/</td> <td>A-NV</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>Component</td> <td>Description:</td> <td>N6 Nozzle-to-Clo</td> <td>sure Head</td> <td>Weld</td> <td></td> <td></td>	Compone	nt ID: N6/	A-NV						Component	Description:	N6 Nozzle-to-Clo	sure Head	Weld		
ISO / Drawing Number: 351/209-A01         Location: No22# IUC           Examination Information         Stan Information           Examination Procedure, 54-191-850-09         Applicable SCAN: 30-8094520.000         Scan Surface OD Nozz# Bland           Angle Skew         Calibration Sheet #         Date         Time         Temp         Temperate Scan Gain         Scan Surface OD Nozz# Bland           287/a         4:00*         Sarot Marzon         Scan Surface OD Nozz# Bland         Induction (Nozz# IUC           287/a         4:00*         Sarot Marzon         Scan Surface OD Nozz# Bland         Induction (Nozz# IUC           287/a         4:00*         Sarot Marzon         Sarot Marzon         Induction (Nozz# IUC           287/a         4:00*         NA         NA         NA         NA         NA           287/a         4:00*         NA		<del></del>				en en <u>en en se</u> se es	Examinatio	on Informa	ition							
Examination         Examination         Scan Surface OF Nazze Bland           Examination         Processor         Scan Surface OF Nazze Bland         Scan Surface OF Nazze Bland           Adde         Stew         Calibration Sheet #         Oats         Time         Time         Scan Surface OF Nazze Bland           Adde         Stew         Calibration Sheet #         Oats         Time         Time         Time         Scan Surface OF Nazze Bland           Adde         Stew         Calibration Sheet #         Oats         Time         Time         Time         Scan Surface OF Nazze Bland         Indication for Nazze Bland         Na         TZ           287/s         -40*         NA	ISO / Drav	Ming Numb	er: 3-ISI-0295-	<u>A-01</u>					ation: Nozzle Bo	ss (Rnozzle)	<u> </u> L		n: Nozzie	TDC		
Examination Procedure: 54:151-550:06         Applicable SDCNT:: 30-605995-600, 8 30-6044520-000         Scan Gain         Record table Record table Re	Examinati	on Limited	Miles Lin				Scan In	formation	iye Sneet Rumbi	BI(8).						
Examination Procedure, 54:13:00         Calibration Sheet #         Date         Time         Time         Time         Time         Time         Scan Sufface 200         NAA         NA         Scan Sufface 2	·			· · · · · · · · · · · · · · · · · · ·	a and a second		June 1					<u> </u>	·	<u>, , , , , , , , , , , , , , , , , , , </u>		
Angle/ Mode     Skew     Calbration Sheet #     Date     Time     Temp     Temp     Temp     Temp     Scan Gain     Scan Limited     Recordable Indication SN     Indication Date SNeet #     Deale     Time     Temp       28's     40'     327708     0950     75'F     531983     74.0 dB     D'res     BNo     D'res     BNo     N/A     7/3       28's     40'     N/A     N/A     N/A     N/A     N/A     N/A     Temp     Te	Examinatio	n Procedure	: 54-ISI-850-06			Applicable SD	CN's: 30-90699	155-000, & 3	90-9044520-000	·····	·	Scan Su	rface: OD	Nozzle Blend	·	
28%         +00*         322708         D850         75*F         531893         74.0 dB         Dives         BNo         DVes         BNo         NA         73           28%         -00*         322708         0950         75*F         531993         74.0 dB         Dives         BNo         NA         73           28%         -00*         NA         NA         NA         NA         NA         Dives         BNo         Dives         BNo         NA         73           28%         -00*         NA         TA         Sa         Sa         Sa         Sa         Sa         Sa         Sa         Sa         Sa         S	Angle/ Mode		Skew	Calibr	ation Sheet #	Date	Time	Temp	Thermometer S/N:	Scan Gain	Scan Limited	Recor	dable tion(s)	Indication Data Sheet #	Examiner Initials	
28%         -00*         327/08         0960         75*         531993         74.0 dB         Ures         BNo         IVA         N/A         Scan Sufface: 00 Closure Head	26%		+90°			3/27/08	0950	75°F	531993	74.0 dB	Yes No	□Yes	No	N/A	TB	
NAY     N/A     N/A </td <td>26°/s</td> <td></td> <td>-90°</td> <td></td> <td></td> <td>3/27/08</td> <td>0950</td> <td>75°F</td> <td>531993</td> <td>74.0 dB</td> <td>Yes No</td> <td>□Yes</td> <td>No</td> <td>N/A</td> <td>TB</td>	26°/s		-90°			3/27/08	0950	75°F	531993	74.0 dB	Yes No	□Yes	No	N/A	TB	
NA*         NA	N/A°/		N/A°		N/A	N/A	N/A	N/A *F	N/A	N/A dB	Yes No	□Yes	No	N/A	. N/A	
Examination Procedure: 54-161-850-08       Applicable SDCN'S: 30-9044520-000       Scan Gain       Scan Limited       Recordable indication indicatindication indication indication indication indication indication	N/A°/	N/A° N/A		N/A	N/A	N/A °F	N/A	N/A dB	⊡Yes ⊡No	□Yes	□No	N/A	N/A			
Angle       Skew       Catibration Sheet #       Date       Time       Temp       Thempometer SN:       Scan Gain       Scan Limited       Recordable indication bases and the second base indication is an indication indication bases and the second base indication is an indication indication is an indicatin indicatind is an indication is an indication is an in	Examination Procedure: 54-ISI-850-06				Applicable SD	CN's: 30-90699	55-000, & 3	0-9044520-000			Scan Su	rface: OD	Closure Head			
45%       225 to 80°       3/27/08       1006       75°F       531983       64.0d8 $\Box$ Yes $\Box$ No       TA       TA         55%       220° to 60°       3/27/08       1032       75°F       531983       64.0d8 $\Box$ Yes $\Box$ No       NA       TA         Examination Procedure: N-UT78 Rev 4       Applicable SDCN's: N/A       Applicable SDCN's: N/A       Scan Surface: OD Closure Head       Indication (1)       Data Sheet #       Data       Indication (1)       Data Sheet #       Examinetion for Calibration Sheet #       Date       Time       Temp       Thermometer       Scan Gain       Scan Limited       Recordable       Indication (1)       Data Sheet #       Indication (1)       Indication (1)       Indication (1)       Indication (1)       Indication (1)       Indication (1)	Angle/ Mode		Skew	Calibra	ation Sheet #	Date	Time	Temp	Thermometer S/N:	Scan Gain	Scan Limited	Recor Indica	dable tion(s)	Indication Data Sheet #	Examiner Initials	
55%       ±20* to 60*       3/27/08       1032       75*F       531993       68.0dB       Ures       Ures       Sin       N/A       T/B         Examination Procedure: N-UT78 Rev 4       Applicable SDCN*s: N/A       Scan Surface: 0D Closure Head         Mode       Zone       Beam Direction       Calibration Sheet #       Date       Time       Temp       Themmometer       Scan Gain       Scan Limited       Recordable       Indication       Indication       Date #       Time       Temp       Temp       Themmometer       Scan Gain       Scan Limited       Recordable       Indication	45°/s	±25	5° to 80°			3/27/08	1006	75°F	531993	64.0dB	☐Yes ⊠No	□Yes	No	N/A	TB	
Examination Procedure: N-UT78 Rev 4       Applicable SDCN's: N/A       Scan Surface: OD Closure Head         Anglé       Zone       Beam Direction       Calibration Shett #       Date       Time       Temp       Therritometer       Scan Guin       Scan Surface: OD Closure Head         60'/RL       1       ISRadial IC/rc       3/27/08       1345       75*F       531993       95.0 dB       Image:	55°/8	±20	)° to 60°			3/27/08	1032	75°F	531993	68.0dB	□Yes ⊠No	□Yes	No	N/A	TB	
Angle       Zone       Beam Direction       Calibration Sheet #       Date       Time       Temp       Thermometer       Scan Gain       Scan Limited       Recordable       Indication(s)       Indication #       Indin	Examinatio	n Procedure	: N-UT78 Rev 4			Applicable SDCN's: N/A					Scan Surface: OD Closure Head					
60'/RL       1 $\blacksquare$ Radial $\square$ Circ       3/27/08       1345       75°F       531993       95.0 dB $\blacksquare$ Yes $\square$ NA $7B$ 60'/RL       2 $\blacksquare$ Radial $\square$ Circ       3/27/08       1400       75°F       531993       95.0 dB $\blacksquare$ Yes $\square$ NA $7B$ 60'/RL       1 $\square$ Radial $\blacksquare$ Circ       3/27/08       1345       75°F       531993       95.0 dB $\blacksquare$ Yes $\square$ NA $7B$ 60'/RL       1 $\square$ Radial $\blacksquare$ Circ       3/27/08       1345       75°F       531993       95.0 dB $\blacksquare$ Yes $\square$ NA $7B$ 60'/RL       2 $\square$ Radial $\boxdot$ Circ       3/27/08       1400       75°F       531993       95.0 dB $\blacksquare$ Yes $\square$ NA $7B$ 60'/RL       2 $\square$ Radial $\boxdot$ Circ       3/27/08       1400 $75°F$ 631993       95.0 dB $\blacksquare$ Yes $\square$ NA $7B$ Comments:       Signature: $\square$ Radial $\boxdot$ Circ $3/27/08$ Examiner: N/A       Signature: $\square$ Level: N/A $\square$ Date: N/A $\square$ Signature: $\square$ Level: N/A $\square$ Date: N/A       Signature: $\square$ Date: N/A $\square$ Date: N/A $\square$ Signature: <td>Angle/ Mode</td> <td>Zone</td> <td>Beam</td> <td>Direction</td> <td>Calibration Sheet #</td> <td>Date</td> <td>Time</td> <td>Temp</td> <td>Thermometer S/N:</td> <td>Scan Gain</td> <td>Scan Limited</td> <td>Recor Indica</td> <td>idable tion(s)</td> <td>Indication Data Sheet #</td> <td>Examiner Initials</td>	Angle/ Mode	Zone	Beam	Direction	Calibration Sheet #	Date	Time	Temp	Thermometer S/N:	Scan Gain	Scan Limited	Recor Indica	idable tion(s)	Indication Data Sheet #	Examiner Initials	
60'/RL       2       図Radial □Circ       3/27/08       1400       75*F       531993       95.0 dB       ØYes □No       □Yes ØNo       N/A       778         60'/RL       1       □Radial ØCirc       3/27/08       1345       75*F       531993       95.0 dB       ØYes □No       □Yes ØNo       N/A       778         60'/RL       2       □Radial ØCirc       3/27/08       1400       75*F       531993       95.0 dB       ØYes □No       □Yes ØNo       N/A       778         60'/RL       2       □Radial ØCirc       3/27/08       1400       75*F       531993       95.0 dB       ØYes □No       □Yes ØNo       N/A       778         Examiner: Thomas Brown       Level: II       Date: 3/27/08       Examiner: N/A       Signature:       Level: N/A       Date: N/A         Signature:       D       Page       2/2/08       Examiner: N/A       Signature:       Level: N/A       Date: N/A         TVA Review: Matt Vetch       Level: III       Date: 3/27/08       Examiner: N/A       Signature:       DATE ;       H/L/Los         Signature       UAUUUUUU       Date: III       Date: 3/27/08       Examiner: N/A       Signature:       Page 2- of H/L          UAUUUUU <t< td=""><td>60°/RL</td><td>1</td><td>⊠Radi</td><td>al Circ</td><td></td><td>3/27/08</td><td>1345</td><td>75°F</td><td>531993</td><td>95.0 dB</td><td>⊠Yes ⊡No</td><td>□Yes</td><td>No</td><td>N/A</td><td>TB</td></t<>	60°/RL	1	⊠Radi	al Circ		3/27/08	1345	75°F	531993	95.0 dB	⊠Yes ⊡No	□Yes	No	N/A	TB	
60'/RL       1 $\Box$ Radial $\Box$ Circ       3/27/08       1345       75*F       531993       95.0 dB $\Box$ Yes $\Box$ No $\Box$ Yes $\Box$ No       N/A $T_{abc}^{abc}$ 60'/RL       2 $\Box$ Radial $\Box$ Circ       3/27/08       1400       75*F       531993       95.0 dB $\Box$ Yes $\Box$ No $\Box$ Yes $\Box$ No $\Box$ Yes $\Box$ No $\Box$ Yes $\Box$ No $\Box$ No $T_{abc}^{abc}$ Comments:       Examiner: Thomas Brown       Level: II       Date: 3/27/08       Examiner: N/A       Signature:       Level: N/A       Date: N/A         Signature: $\Box$ Deference       Level: III       Date: 3/27/08       Examiner: N/A       Signature:       Level: N/A       Date: N/A         TVA Review: Matriveich       Level: III       Date: 3/27/08       Examiner: N/A       Signature:       Level: N/A       Date: N/A         Signature:       Level: III       Date: 3/27/08       Examiner: N/A       Signature:       Level: N/A       Date: N/A         TVA Review: Matriveich       Level: III       Date: $A/2T$ $A/2T$ $DATE$ ; $4/2U/0x$ $4/2U/0x$ $7/2U/0x$ Page 2- of $H$	60°/RL	2	Radi	al Circ		3/27/08	1400	75⁰F	531993	95.0 dB	⊠Yes ⊡No	□Yes	No	N/A	TR	
80°/RL       2       □Radial ⊠Circ       3/27/08       1400       75°F       531993       95.0 dB       ⊠Yes       No       □Yes       ⊠No       N/A       TB         Comments:         Examiner: Thomas Brown       Signature:       Date: 3/27/08       Examiner: N/A       Signature:       Level: N/A       Date: N/A         Signature:       DB	60°/RL	1	[]Radi	al 🖾 Circ		3/27/08	1345	75°F	531993	95.0 dB	Yes No	□Yes	No	N/A	TB	
Examiner: Thomas Brown     Level: II     Date: 3/27/08     Examiner: N/A     Signature:     Level: N/A     Date: N/A       Signature:     Date:     Date: 3/27/08     Examiner: N/A     Signature:     Level: N/A     Date: N/A       Examiner: Samual Alex Zipperer     Signature:     Level: III     Date: 3/27/08     Examiner: N/A     Signature:       TVA Review: Matr Weich     Level: III     Date:     ANII:     Date:     ANII:       Signature     Matr Weich     Level: III     Date:     ANII:     Date:       Signature     Matr Weich     Level: III     Date:     ANII:     Date: Y/A       Signature     Matr Weich     Level: III     Date:     ANII:     Date: Y/A       Signature     Matr Weich     Level: III     Date:     ANII:     Date: Y/A       Signature     Matr Weich     Level: III     Date:     ANII:     Date: Y/A	60°/RL	2	Radi	al 🖾 Circ		3/27/08	1400	75°F	531993	95.0 dB	⊠Yes ⊡No	□Yes	No	N/A	TB	
Examiner: Thomas Brown     Level: II     Date: 3/27/08     Examiner: N/A     Signature:       Signature:     Signature:     Level: IIL     Date: 3/27/08     Examiner: N/A       VA Review: Matriveich     Level: III     Date: 4/14/08     Date: 4/14/08       Signature     Matriveich     Level: III     Date: 4/14/08	Comment	5:														
Examiner: Samual Alex Zipperer     Level: IIL     Date: 3/27/08     Examiner: N/A     Signature:       Signature:     Image: Signatur	Examiner: Signatur	Thomas Bro e:	D Zu	3		Level: II	Date: 3/27	7/08 E	Examiner: N/A Signature:				Level	I: N/A	Date: N/A	
TVA Review: Matrivelch     Level: III     Date:     ANIE:     DATE:       Signature     Matri Welch     24/4/08     24/4/08     24/22/08       Page 2 of M	Examiner: Signatur	Samual Ales	Zipperer	<u> </u>		Level: IIL	Date: 3/27	7/08 E	Examiner: N/A Signature:				Level	I: N/A   I	Date: N/A	
Page L- of PL	TVA Revie Signatur	e MatrWel	an US	ileh		Level: III	Date: 4/4/	68	9NII:	<u>Ann</u>			DATE ;	Herlos		
														Page	L of N	

Tennessee Valley				ctor	' Pre	ssure	Vess	sel			
	Authority	Manua	al Ultr	asol	nic C	alibrat	ion D	ata Sheet			
ับแ	ity: TVA	Site: Brov	ms Ferry I	Nuclear	Plant	Unit: 3		Outage: Cycle 13 RFO			
IS	D / Drawing Number: ISI 0295-A-	01		ISI Report Number: RO54							
Co	nponent ID: N6A-NV			Component Description: Nozzle – Closure Head							
Exa	mination Procedure: 54-ISI-850	Rev.6		Applicable SDCN(s): 30-9069955-000 & 30-9044520-000							
	Ultrasonic Instrum	ent		Transducer							
Ma	nufacture: Staveley		Manı	ifacture:	KBA	ilado	Mode	Model: Benchmark892-600 842 - La			
Мо	lel: Sonic 136		Seria	l Numbe	er: <del>0160</del>	IR OIL 91	ζ Frequ	uency: 2.25			
Ser	ial Number: 136-861K Dur du	cti: 8/27/08 4	Angie	e:26 °			Meas	sured Angle: 26°			
Lin	earity Sheet No.:		Mode	Mode: Shear				0.5"X0.5"			
	Instrument Settin	gs	Skew	Angle:	± 90°		Meas	sured Skew Angle: ±90°			
Range:" Sound Path Depth			# of E	Elements	s: 1 🕓	Shape: Rect	. Confi	guration:: Single			
ANG	0 Pelay:0.342"			e Type: I	RG-174	Length: 1	nediate Connectors: 0				
œ	Velocity: 127			· · · ·		Verifi	cation Bl	ock			
	Display: IP		Туре	Type: Rompas			S/N: 510	0			
RCVR	Frequency: 2.25		Re	Reflector:		0.7 SDH		1" Radius			
	Reject: Off			Sweep:		0.8		1.6			
/	Pulse Width: 222nS		Am	Amplitude: 50%				65%			
	Damping: 500Ω			Gain: 42.4				42.4			
Ř	Mode: Pulse Echo		Basic Calibration Block								
ULSE	Rep Rate: 2kHz Filter: 2		Block	Block ID: BF-18 Thickness: 6.0" with 0.125" Clad			Material:	Vaterial:Clad/ CS			
٩	Pulser: 150V 300V (*Soni	c 137 only)	Thick				Diameter: Flat				
	*Probe voltage is adjustable with the Sor	ic 137 Instrument. Ti	ne Temp	Temperature: 72 °F			Therm. S	Therm. SN: 531993 DI7 12/17/2006			
	Sonic 136 has a fixed pulse	er voltage.	Coup	Couplant: Ultra Gel II E				Batch No.: 05125 05325			
		Refe	rence Se	nsitivit	y infor	nation					
Ref	lector: 3/4T Hole	Sweep: 5.0 div.			Amplitu	de: 80 %FSH		Gain: 62.2 dB			
Cal	In: Date: 3/27/08 Time 0813	Check: Date:3/2	7/08 Time	0950	Check: [	Date N/A Time	e N/A	I/A Out: Date:3/27/08 Time 1005			
Use Bro	d the longitudinal wave to hit the owner of the longitudinal wave to hit the owner	one inch radius, a o-Shell Welds Mo	Co and the sh odeling # I	ommen lear wav R-2003-	<b>ts</b> e to hit t 17.	he .7 side dril	led hole. F	Reference EPRI Examination of			
Exa Sigi	miner: Thomas Brown	Level: II Da	ate: 3/27/0	8 Exa Sig	aminer: ( nature	Samual Alex 2	Zipperer	Level: IIL Date: 3/27/08			
TV/ Sigi	Review: Matt Welch nature: Man Wilch	Level: III Da	ate: 4/4/08	AA		and the second s	DAT Y	Lec.los Page 3 of /0			

Te	ennessee Valley	React	tor Pre	essure	Vesse	el					
	Authority	Manua	l Ultra	sonic (	Calibrat	ion Da	ta Shee	et			
Uti	lity: TVA	Site: Brown	s Ferry Nuc	lear Plant	Unit: 3		Outage:	Cycle 13 RFO			
ISC	) / Drawing Number: 3-ISI-0295-	A-01	ເຮ	ISI Report Number: ROS4							
Co	mponent ID: N6A-NV		с	Component Description: Nozzle – Closure Head							
Ex	amination Procedure: 54-ISI-850	Rev.6	A	Applicable SDCN(s): 30-9069955-000 & 30-9044520-000							
Γ	Ultrasonic Instru	nent		Transducer							
Ma	nufacture: Staveley		Manufac	ture: KBA		Model:	Benchmark8	92-600			
Мо	del: Sonic 136		Serial N	umber: 0111	РК	Freque	ncy: 2.25				
Se	rial Number: 136-861K Du du	te: \$ 27/08 \$10/08	Angle:4	5°		Measu	red Angle: 47	b			
Lin	earity Sheet No.:		Mode: S	Mode: Shear			.5"X1.0"				
	Instrument Setti	ngs	Skew Ar	ngle: ±25° to	80°	Measu	ed Skew An	gle: N/A			
	Range:" Sound Path	Depth	# of Eler	nents: 1	Shape: Rec	t. Configu	ration:: Singl	e			
ANG	5 Delay:0.609"			ype: RG-174	Length: 1	2' Interme	diate Connec	tors: 0			
	Velocity: 126				Verifi	cation Blo	ck				
~	Display: IP		Type: Ro	Type: Rompas S/			J/N: 5100				
۲ ۵	Frequency: 2.25		Refle	Reflector: 1" Radius			2" F	ladius			
[	Reject: Off		Sw	Sweep: 1.0			2.0				
) 1	Pulse Width: 222nS		Amplit	ude:	70%		80%				
	Damping: 500Ω		Ģ	Bain:	23.0		23.0				
۲. ۲	Mode: Pulse Echo Dual	) 		Basic Calibration Block							
ŪLSE	PRR: 2kHz Filter: 2		Block ID	: BF-18		Material:Cl	Material:Clad/ CS				
l •	Pulser: 150V 300V (*Sor	nic 137 only)	Thicknes	ss: 6.0" with	0.125" Clad	Diameter: I	Diameter: Flat				
	*Probe voltage is adjustable with the So	onic 137 instrument. The	Tempera	ature: 72 °F		Therm. SN: 531993 DD 12/17/2008					
	Sonic 136 has a fixed put		Couplan	t: UltraGel II		Batch No .:	Batch No.: 05125 05325 4/12/08				
		Refere	nce Sens	itivity Info	mation						
Re	Rector: 3/4T Hole	Sweep: 6.6 div.		Amplitu	ide: 80%FSH		Gain: 52.2 d	B			
Cal	In: Date: 3/27/08 Time 0810	Check: Date:3/27/	08 Time 100	5 Check:	Date N/A Time	e N/A	Out: Date:3/2	7/08 Time 1028			
			Com	ments		· · · · ·					
Re	Ference EPRI Examination of Brow	wns Ferry Closure I	Head Nozzk	e-to-Shell W	elds Modeling	# IR-2003-1	<b>7.</b>				
Exa	aminer: Thomas Brown nature	Level: II Date	e: 3/27/08	Examiner: Signature	Samual Alex 2	Zipperer	Level: IIL	Date: 3/27/08			
TV, Sig	A Review: Matr Welch nature: <i>MAT Willich</i>	Level: III Date	14/08	ANIT:	in the second	PATE: 4/2	clos Page	e 4 of 10			

hOrity 'A wing Number: 3-ISI-0295-A int ID: N6A-NV ion Procedure: 54-ISI-850 Ultrasonic Instrum ure: Staveley	Manual Site: Browns -01 Rev.6 1ent	Ultraso	Plant Plant port Nu ponent De cable SD	Unit: 3 Unit: 3 mber: R escription: Noz CN(s): 30-900	ion Da 054 zie – Clos	ata Sheet Outage: Cycle 13 RF sure Head			
A wing Number: 3-ISI-0295-A int ID: N6A-NV ion Procedure: 54-ISI-850 Ultrasonic Instrun ure: Staveley	Site: Browns 01 Rev.6 1ent	Ferry Nuclear ISI Re Comp Applic	Plant eport Nu ponent De cable SD	Unit: 3 mber: R escription: No: CN(s): 30-900	054 zle - Clos	Outage: Cycle 13 RF			
wing Number: 3-ISI-0295-A int ID: N6A-NV ion Procedure: 54-ISI-850 Ultrasonic Instrun ure: Staveley	-01 Rev.6 1ent	ISI Re Comp Applic	oonent De able SD	mber: <u>R</u> escription: No: CN(s): 30-900	054 zie – Cios	sure Head			
ent ID: N6A-NV ion Procedure: 54-ISI-850 <b>Ultrasonic Instrun</b> ure: Staveley	Rev.6 nent	Comp Applic	oonent De able SD	escription: No: CN(s): 30-900	zie – Clos 69955-000	sure Head			
ion Procedure: 54-ISI-850 <b>Ultrasonic Instrun</b> ure: Staveley	Rev.6 nent	Applic	able SD	CN(s): 30-900	69955-000				
Ultrasonic Instrun ure: Staveley	nent					& 30-9044520-000			
ure: Staveley					Transducer				
Madulacture: Staveley			: KBA	l: Benchmark892-600					
onic 136		Serial Numb	er: 00X0	8P	Frequ	Jency: 2.25			
mber: 136-861K Auc dá	在: 8/27/08 新雨10	Angle:55 °			Meas	ured Angle: 55°			
Sheet No.:	······································	Mode: Shear Siz				0.5"X1.0"			
Instrument Settin	igs	Skew Angle: ±20° to 60°			Meas	sured Skew Angle: N/A			
Range:" Sound Path Depth # o		# of Element	ts: 1	Shape: Rect	. Confi	guration:: Single			
y:0.790"		Cable Type:	RG-174	Length: 1	2' Intern	nediate Connectors: 0			
	, <u>,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,</u>		· · · · · · ·	Verific	ation Bl	ock			
splay: IP Type: Rompas		S/N: 510	0						
Frequency: 2.25			:	1" Radius		2" Radius			
Reject: Off		Sweep:		1.0		2.0			
Pulse Width: 222nS		Amplitude:	nplitude: 70%			80%			
Damping: 500Ω		Gain:		27.0		27.0			
de: 🛛 Pulse Echo 🔲 Dual				Basic Ca	libration	<b>ition Block</b>			
2kHz Filter: 2		Block ID: BF-18			Material:Clad/ CS				
r: □150V □300V (*Soni	ic 137 only)	Thickness: 6.0" with 0.125" Clad			Diameter	Diameter: Flat			
be voltage is adjustable with the So	nic 137 instrument. The	Temperature: 72 °F			Therm. SN: 531993 DD 12/17/2008				
Sonic 136 has a fixed pulse	er voltage.	Couplant: UltraGel II			Batch No.: -95125 05325 "7/12/04				
	Referen	ice Sensitivi	ty Infor	mation					
3/4T Hole	Sweep: 7.6 div.		Amplitu	de: 80 %FSH		Gain: 56.8 dB			
e: 3/27/08 Time 0819	Check: Date:3/27/0	8 Time 1031	Check: Date N/A Time N		N/A	A Out: Date:3/27/08 Time 1045			
	mber: 136-861K <i>Quic dat</i> Sheet No.:       Instrument Settin         e:"       ⊠Sound Path       □D         r:0.790"	Instrument Settings         Instrument Settings         e:" $\boxtimes$ Sound Path $\square$ Depth         r:0.790"         ity: 126         ay: IP         iency: 2.25         it: Off         Width: 222nS         bing: 500Ω         : $\boxtimes$ Pulse Echo $\square$ Dual         2kHz       Filter: 2         r: $\square$ 150V $\square$ 300V ("Sonic 137 only)         e voltage is adjustable with the Sonic 137 instrument. The Sonic 136 has a fixed pulser voltage.         Referer         3/4T Hole         Sweep: 7.6 div.         e: 3/27/08 Time 0819	mber: 136-861K       Auc. dat.: δ 21 / b5 / fisht       Angle:55 °         Sheet No.:       Mode: Sheat         Instrument Settings       Skew Angle:         e:°       ⊠Sound Path       □Depth         # of Element       # of Element         r.0.790°       Cable Type:         ay: IP       Type: Romp         uency: 2.25       Reflector:         t: Off       Sweep:         Width: 222nS       Amplitude:         width: 222nS       Amplitude:         width: 222nS       Block ID: BF         r: □150V<□300V (*Sonic 137 only)	mber: 136-861K       Aux. datu:       \$ [21] 18       Mode: Shear         Sheet No.:       Mode: Shear         Instrument Settings       Skew Angle: ±20° to 1         e:" ⊠Sound Path □Depth       # of Elements: 1         r:0.790"       Cable Type: RG-174         ity: 126       Type: Rompas         ay: IP       Type: Rompas         tency: 2.25       Reflector:         t: Off       Sweep:         Width: 222nS       Amplitude:         sing: 500Ω       Gain:         : ⊠Pulse Echo □Dual       Block ID: BF-18         r: □150V □300V (*Sonic 137 only)       Thickness: 6.0" with C         e voltage is adjustable with the Sonic 137 Instrument. The Sonic 136 has a fixed pulser voltage.       Temperature: 72 °F         Couplant: UltraGel II       Reference Sensitivity Inform         3/4T Hole       Sweep: 7.6 div.       Amplitu         e: 3/27/08 Time 0819       Check: Date:3/27/08 Time 1031       Check: I	mber: 136-861K       Aux       Aux       Aux       Angle:55 °         Sheet No.:       Mode: Shear         Instrument Settings       Skew Angle: ±20° to 60°         e:" ⊠Sound Path □Depth       # of Elements: 1       Shape: Rect         r:0.790"       Cable Type: RG-174       Length: 1         ity: 126       Verific         ay: IP       Type: Rompas         tency: 2.25       Reflector:       1° Radius         t: Off       Sweep:       1.0         Width: 222nS       Amplitude:       70%         sing: 500Ω       Gain:       27.0         EQPulse Echo       Dual       Basic Ca         zkHz       Filter: 2       Block ID: BF-18         r: □150V       [300V ("Sonic 137 only)       Thickness: 6.0" with 0.125" Clad         e voltage is adjustable with the Sonic 137 instrument. The Sonic 138 has a fixed pulser voltage.       Temperature: 72 °F         Couplant: UltraGel II       Reference Sensitivity Information         3/4T Hole       Sweep: 7.6 div.       Amplitude: 80 %FSH         e: 3/27/08 Time 0819       Check: Date:3/27/08 Time 1031       Check: Date N/A Time	mber: 136-861K       Aux       Aux       Stress       Meas         Sheet No.:       Mode: Shear       Size:       Size:         Instrument Settings       Skew Angle: ±20° to 60°       Meas         e:" ⊠Sound Path □Depth       # of Elements: 1       Shape: Rect.       Confi         r:0.790"       Cable Type: RG-174       Length: 12'       Interr         ay: IP       Type: Rompas       S/N: 510         ay: IP       Type: Rompas       S/N: 510         eency: 2.25       Reflector:       1" Radius         t: Off       Sweep:       1.0         Width: 222nS       Amplitude:       70%         sing: 500Ω       Gain:       27.0         t: ⊠Pulse Echo □Dual       Basic Calibration         2kHz       Filter: 2       Block ID: BF-18       Material:         r: □150V □300V ("Sonic 137 only)       Thickness: 6.0" with 0.125" Clad       Diameter         e voltage is adjustable with the Sonic 137 Instrument. The Sonic 136 has a fixed pulser voltage.       Temperature: 72 °F       Therm. S         3/4T Hole       Sweep: 7.6 div.       Amplitude: 80 %FSH       e: 3/27/08 Time 0819       Check: Date:3/27/08 Time 1031       Check: Date N/A Time N/A			

### Tennessee Valley Authority

### Reactor Pressure Vessel Manual Ultrasonic Calibration Data Sheet

1										
Uti	lity: TVA	Site: Bro	owns Ferry N	luclear	Plant	Unit: 3		Outage:	Cycle 13 RFO	
ISC	) / Drawing Number: 3-ISI-0295-A-01			ISI Re	port Nur	mber:	1054			
Co	mponent ID: N6A-NV			Component Description: Nozzle-to-Closure Head						
Ex	amination Procedure: N-UT-78 Revis	sion 4		Applicable SDCN(s): N/A						
	Ultrasonic Instrume	nt		Transducer						
Ma	nufacture: GE		Manu	Manufacture: RTD			Model	TRL2-Aust		
Мо	del: Sonic USN 60		Serial	Serial Number: 01-887				ency: 2 MHz		
Se	ial Number: E34054 due detu: 1	103 08 411	ds Angle	: 60°			Measu	red Angle: 60	)°	
Lin	earity Sheet No.:		Mode	: Refrac	ted Long	gitudinal	Size: 2	2(24x42)mm	·	
	Instrument Settings		Focus	Focus: FS~125mm			Squint	Angle: 3°		
<b>.</b>	Range:5.0" Sound Path	epth	# of E	lement	5: 2	Shape: Rec	t. Config	uration:: Dual	- SBS	
ANG	Probe Delay: 10.8012 uS		Cable	Type:	RG-174	Length: 6	interm	ediate Conne	ctors: 0	
Velocity: 0.2127 uS						Verifi	cation Blo	ck		
~	Display Delay: 0.000		Туре:	CS Ro	mpas		S/N: 5100			
ŠČYR	Frequency: 2 – 25 MHz		Re	Reflector:		1" Radius		2" Radius		
	Reject: Off			Sweep:		2.0 div.		4.0 div.		
ĺ	Energy: High		Am	Amplitude:		25 %FSH		80 %FSH		
	Damping: 1KΩ			Gain: 52.0 dB				52.0 dB		
er.	Mode: Pulse Echo 🖾 Dual			Basic Calif			libration	Block		
NLSE	PRR/PRF: Autohigh		Block	Block ID: BF-19 M			Material: (	Aaterial: CS		
Ē			Thick	Thickness: 4.2"			Diameter: Flat			
			Temp	erature	72° F		Therm. SN: 531993 DD 12/17/2008			
			Coup	ant: Ult	raGel II		Batch No.	Batch No .: 05125 05325 4712/08		
		Ref	erence Sei	nsitivil	y Infor	nation				
Re	iector: 1/4T SDH S	weep: 4.2 di	iv.		Amplitud	le: 80% FSH		Gain: 79.5 d	B	
Cal	In: Date 3/27/08 Time 0807 C	heck: Date 3	/27/08 Time	1442	Check: D	Date 3/27/08 T	ime 1543	e 1543 Out: Date 3/27/08Time 1607		
Zoi # 11	ne 1: Near Surface Examination. Ref R-2003-17.	ference EPR	Co	ommen on of Bri	<b>ts</b> owns Fer	τy Closure H	ead Nozzle	to-Sheil Weid	s Modeling	
ົ Sig	aminer: Thomas Brown	_evel: il	Date: 3/27/0	B Exa Sig	aminer: S nature	Samual Alex 2	Zipperer	Level: IIL	Date: 3/27/08	
TV. Sig	A Review: Matt Welch nature: Mai Wilch	_evei: III	Date; 4/4/08	AA			_/ VATE 	liclos Pag	e 6 of 10	

### Tennessee Valley Authority

### Reactor Pressure Vessel Manual Ultrasonic Calibration Data Sheet

SO /	Jtility: TVA Site: Browns Fe			Ferry Nuclear Plant Unit: 3					Outage: Cycle 13 RFO		
	Drawing Number: 3-ISI-0295-A-	01		ISI Re	port Nun	nber: R	054				
Comp	oonent ID: N6A-NV			Comp	onent De	scription: No:	zzle-to-C	losure	Head		
Exami	nination Procedure: N-UT-78 Re	vision 4		Applicable SDCN(s): N/A							
	Ultrasonic Instrum	ent		t i se se se	an a	Tr	ansduc	er			
Manul	facture: GE		Manu	facture	RTD		Мо	del: TF	RL2-Aust		
Mode	H: USN 60		Seria	I Numb	er: 01-887	7	Fre	quenc	y: 2 MHz		
Serial	I Number: 84054 dui dati	: 1/3/08 4/13/18	Angle	Angle: 60° Mode: Refracted Longitudinal				asured	Angle: 60°	•	
_inea	rity Sheet No.:	· • ·	Mode					e: 2(24	lx42)mm		
	Instrument Settin	<b>js</b>	Focu	s: FS~1	25mm		Squ	Squint Angle: 3°			
R	Range:12.0" Sound Path	Depth	# of E	Element	s: 2	Shape: Rec	Configuration:: Dual - SBS				
A A	Probe Delay: 10.8012 uS		Cable	Cable Type: RG-174 Length: 6' I				Intermediate Connectors: 0			
² v	/elocity: 0.2127 uS		1.1	Verification				<b>on Block</b>			
D	Display Delay: 0.000			Type: CS Rompas			S/N: 5100				
	Frequency: 2 – 25 MHz			Reflector: 1"		1" Radius	1" Radius		2" Radius		
R	Reject: Off			Sweep:		0.8 div.			1.7	div.	
E	Energy: High		Am	plitude:		25 %FSH			80 %	FSH	
D	Damping: 1KΩ			Gain: 52.0 dB					52.0	) dB	
~ M	Node: Pulse Echo Dual			Basic Calif			libratio	<b>n Blo</b>	ock		
P	PRR/PRF: Autohigh		Block	ID: BF	-19		Materia	al: CS			
<u>ح</u> [	<u></u>		Thick	ness: 4	.0"		Diame	er: Fla	t		
			Temp	erature	: <b>72° F</b>		Therm.	herm. SN: 531993 DD 12/17/2008			
			Coup	Couplant: UltraGel II Bat			Batch I	tch No .: - 05125 05325 mil/2/05			
		Refere	nce Se	nsitivi	ty Inform	nation		•			
Reflec	ctor: ID Notch	Sweep: 6.5 div.			Amplitud	le: 80% FSH		G	ain: 80.5 dB	)	
Cai In:	: Date 3/27/08 Time 0810	Check: Date 3/27/	08 Time	B Time 1410 N/A				Out: Date 3/27/08Time 1605			





TOTAL WELD LENGTH 41.66 / UP HILL WELD LENGTH = 41.66-4 = 10.41

Man Wilch 135 +14/08 pg 9/10



.

. . .

.

.