



**Tennessee Valley Authority, Post Office Box 2000, Decatur, Alabama 35609-2000**

September 26, 2005

10 CFR 50.55a

U.S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Mail Stop: OWFN P1-35  
Washington, D.C. 20555-0001

Gentlemen:

In the Matter of                                 )  
Tennessee Valley Authority                 )                 Docket No. 50-296

BROWNS FERRY NUCLEAR PLANT (BFN) - UNIT 3 - AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME) SECTION XI, INSERVICE INSPECTION (ISI) PROGRAM, SECOND TEN-YEAR INSPECTION INTERVAL - REQUESTS FOR RELIEF 3-ISI-7, REVISION 1, 3-ISI-12, AND 3-ISI-19 - RESPONSE TO NRC REQUEST FOR ADDITIONAL INFORMATION (TAC NOS. MC6314, MC6386, AND MC6387)

This letter provides the TVA response to an NRC request for additional information regarding BFN Unit 3, ASME Section XI Inservice Inspection (ISI) Program, requests for relief 3-ISI-7, Revision 1, 3-ISI-12, and 3-ISI-19. These requests for relief were submitted by TVA letter dated March 4, 2005 for NRC review and approval.

Request for relief 3-ISI-7, Revision 1, addressed ten (10) Reactor Pressure Vessel (RPV) nozzle-to-vessel full penetration welds and one (1) nozzle inner radius. The design configuration of the RPV nozzle-to-vessel and inner-radius welds precluded a 100 percent ultrasonic (UT) examination of the required volume for the full penetration welds of the nozzles.

Request for relief 3-ISI-12 addressed three Residual Heat Removal System, and one Reactor Water Cleanup System full penetration austenitic stainless steel piping welds. An ultrasonic examination was performed for these piping welds of the accessible areas, to the maximum extent practical, due to the configuration. Credit for the one-sided only ultrasonic examination provided 50 percent coverage because of a recently added requirement in 10 CFR 50.55a(b)(2)(xv)(A)(2), which

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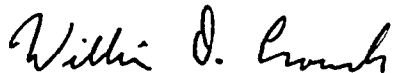
states in part, "Where examination from both sides is not possible on austenitic welds, full coverage credit from a single side may be claimed only after completing a successful single sided Appendix VIII demonstration using flaws on the opposite side of the weld...." At this time, there is no Appendix VIII Program for single sided austenitic welds nor is one planned in the future; therefore, only 50 percent coverage can be claimed. Under the original ASME Section XI Code requirements [prior to 10 CFR 50.55a(b)(2)(xv)(A)(2)], UT coverage attained was essentially 100 percent.

Request for relief 3-ISI-19 addresses three reactor pressure vessel (RPV) longitudinal shell welds. These RPV shell welds did not receive essentially (i.e., greater than 90 percent) 100 percent coverage due to obstructions from other components.

The enclosure to this letter contains the specific NRC questions and the corresponding TVA response.

There are no new regulatory commitments in this letter. If you have any questions, please contact me at (256) 729-2636.

Sincerely,



William D. Crouch  
Manager of Licensing  
and Industry Affairs

cc: See Page 3

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Enclosure

cc (Enclosure):

(Via NRC Electronic Distribution)

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ENCLOSURE

TENNESSEE VALLEY AUTHORITY  
BROWNS FERRY NUCLEAR PLANT (BFN)  
UNIT 3  
AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME) SECTION XI,  
INSERVICE INSPECTION (ISI) PROGRAM  
(SECOND TEN-YEAR INSPECTION INTERVAL)

REQUEST FOR RELIEF 3-ISI-7, REVISION 1, 3-ISI-12, AND 3-ISI-19  
RESPONSE TO NRC REQUEST FOR ADDITIONAL INFORMATION

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This enclosure provides TVA's response to an NRC request for additional information regarding BFN Unit 3, ASME Section XI Inservice Inspection (ISI) Program, requests for relief 3-ISI-7, Revision 1, 3-ISI-12, and 3-ISI-19. These requests for relief were submitted by TVA letter dated March 4, 2005 for NRC review and approval.

Request for relief 3-ISI-7, Revision 1, addressed ten (10) Reactor Pressure Vessel (RPV) nozzle-to-vessel full penetration welds and one (1) nozzle inner radius.

Request for relief 3-ISI-12 addressed three Residual Heat Removal System, and one Reactor Water Cleanup System full penetration austenitic stainless steel piping welds.

Request for relief 3-ISI-19 addressed three reactor pressure vessel (RPV) longitudinal shell welds.

Listed below are the NRC specific questions and the corresponding TVA response.

1.0, Request for Relief 3-ISI-7, Revision 1

NRC Request 1.1

Typically, there can be significant changes between the design drawings and the as-built conditions of plant components. Clarify whether the design drawings represent as-built configurations. State whether the actual as-built dimensions and curvatures that exist on the surfaces, such as the inner radius and outside weld crowns, are accurately depicted on the submitted drawings. Include whether the outside surface weld crowns are ground flush in the blend radius regions, and if possible, provide a surface roughness finish value (in root mean square units), for the reactor pressure vessel (RPV) base metal and nozzle-to-vessel welds. How do the Browns Ferry Nuclear Plant (BFN), Unit 3, nozzle-to-vessel weld as-built configurations compare to conditions on the representative specimens used during the Electric Power Research Institution (EPRI) Performance Demonstration Initiative (PDI) qualification?



### TVA Response to NRC Request 1.1

The design drawings represent the basic as-built configurations of the Unit 3 Reactor Pressure Vessel in the plant. The manufacturer design drawings depict specified dimensions (linear, angular, and radii dimensions), with tolerances specified. These dimensions were verified and documented during the manufacturing process of the vessel by the vendor. The design drawings also contained specific surface finish requirements for machined and welded surfaces. Machined surfaces require a 250 finish or better unless otherwise noted. All welds to be suitable for Non-Destructive Testing with all offsets blended to a 3:1 taper (minimum). The drawings specified minimum radius dimensions for the nozzle to shell weld. To obtain this, the welds were machined and ground flush with the vessel and into the radius blend of the nozzle on the outside of the vessel.

Note: The examinations performed during BFN Unit 3 Cycle 10 refueling outage (Spring 2002) were performed prior to the implementation of the "Final Rule" and did not use ASME Section XI, Appendix VIII qualification criteria (see Attachment A). Examination of Weld N10-IR was conducted using PDI qualified examination criteria. A comparison of the EPRI specimens versus the BFN Unit 3 N10-IR revealed the following:

- The smallest EPRI nozzle specimen has an inner radius dimension of 2.9" and an I.D. Bore dimension of 3.94".
- The BFN Unit 3 N10-IR has an inner radius dimension of 0.75 inches and an I.D. Bore dimension of 1.95 inches.

The qualified procedure utilized the alternative method described in Code Case N-552, with the conditions specified in Regulatory Guide 1.147, Revision 13, January 2004.

### NRC Request 1.2

Describe the ultrasonic methods that were used, including wave propagation modes and angles of interrogation.

## TVA Response to NRC Request 1.2

RPV NOZZLE TO SHELL WELD	NDE REPORT No.	CYCLE NUMBER	COVERAGE
N1B-NV	R-156	10	77%
N2A-NV	R-158	10	77%
N2C-NV	R-160	10	77%
N2E-NV	R-162	10	77%
N3A-NV	R-164	10	77%
N4A-NV	R-166	10	77%
N4F-NV	R-168	10	77%
N5B-NV	R-170	10	71%
N7-NV	R-125	10	70%
N9-NV	R-172	10	74%
N10-Inner Radius	R-188	11	90%

See Attachment A for the above listed Inspection Reports.

## NRC Request 1.3

Submit cross-sectional sketches showing the completed ultrasonic examination volumes for each wave mode and angle used on the subject nozzles. Include in these sketches the required ASME Code examination volumes and state whether the sketches represent the entire circumferential length of the welds, or show limitations to these coverages for specific regions of the welds. Are there any as-built conditions that may impact the examination coverages? Using the sketches and coverages illustrated, describe how the coverage values shown in 3-ISI-7, Revision 1, Table 1 were generated.

## TVA Response to NRC Request 1.3

See attached nondestructive examination reports (see table above for report number)

## 2.0, Request for Relief 3-ISI-12

### NRC Request 2.1

Clearly state the base material type(s) and fabrication forms for each of the subject piping welds. For example, for Weld TRHR-3-191, clarify whether this is a statically cast or austenitic valve welded to a statically cast austenitic elbow, or a statically cast valve welded to a wrought elbow.

### TVA Response to NRC Request 2.1

Listed below are the base material type(s) and fabrication forms for each of the subject piping welds listed in 3-ISI-12.

DRHR-3-19 - 20" Tee 1.272" Nominal Wall to 20" Schedule 80 Pipe: Tee, SA-403, WP316NG, Wrought Austenitic S.S. Pipe, A358, GR304 CL I, Austenitic S.S. Electric Fusion Welded Austenitic, Chromium Nickel Alloy Steel (A240, TP304 S.S. Plate).

DRHR-3-21 - 20" Schedule 80 Elbow to 20" Valve 3-FCV-74-49: Valve, A351, CF8M, Austenitic S.S. Casting. Elbow, A403, WP304, Wrought Austenitic S.S. (Note: In TVA's March 2005 submittal this component was erroneously identified as an elbow to pipe weld rather than valve to elbow weld as stated above.)

TRHR-3-191 - 20" Valve 3-FCV-74-48 to 20" Schedule 80 Elbow: Valve, A351, CF8M, Austenitic S.S. Casting. Elbow, A234 WPB, Wrought C.S. Forging.

RWCU-3-007-G004 - 4" Schedule 80 Pipe to 4" Valve 3-CKV-69-629: Pipe, A333, Gr1, C.S. Seamless Pipe. Valve, A351, CF8M, Austenitic S.S. Casting.

### NRC Request 2.2

Describe the ultrasonic methods that were used, including wave propagation modes and angles of interrogation.

### TVA Response to NRC Request 2.2

An ultrasonic examination was performed on the piping welds to accessible areas to the maximum extent practical due to the configuration. Credit for the one-sided only ultrasonic examination provided 50 percent coverage because of the requirement mandated in 10 CFR 50.55a(b)(2)(xv)(A)(2), which states:

"Where examination from both sides is not possible on austenitic welds, full coverage credit from a single side may be claimed only after completing a successful single sided Appendix VIII demonstration using flaw on the opposite side of the weld." Therefore only 50percent coverage can be claimed. Additionally, there is no Appendix VIII Program for cast austenitic piping welds. Therefore, only 50 percent coverage can be claimed. Under the original ASME Section XI Code requirements UT coverage attained would have been essentially 100 percent.

DRHR-3-19: This weld was examined using a 45 degree shear wave, 0.5", 1.5 MHz and a 60 degree refracted longitudinal wave, 2(10 x 18 mm), 2 MHz transducers. Examination was

performed from the pipe side of the weld across the weld crown. A 5% to 20% ID noise was maintained. There were no obstructions.

DRHR-3-21: This weld was examined using a 45 degree shear wave, 0.5", 1.5 MHz and a 60 degree refracted longitudinal wave, 2(10 x 18 mm), 2 MHz transducers. Examination was performed from the pipe side of the weld across the weld crown. A 5% to 20% ID noise was maintained. There were no obstructions.

TRHR-3-191: This weld was examined using a 45 degree shear wave, 0.5", 1.5 MHz, a 60 degree shear wave, 0.5", 1.5 MHz, a 45 degree refracted longitudinal wave, 2(10 x 18 mm) 2 MHz, a 45 degree refracted longitudinal wave, 2(15 x 25 mm) 2MHz, and a 60 degree refracted longitudinal wave, 2(10 x 18 mm), 2 MHz, transducer. Examination was performed from the pipe side of the weld across the weld crown. A 5% to 20% ID noise was maintained. There were no obstructions.

RWCU-3-007-G004: This weld was examined using a 45 and 60 degree shear wave, 0.375", 2.25 MHz transducers. Examination was performed from the pipe side of the weld across the weld crown. A 5% to 20% ID noise was maintained. There were no obstructions.

### NRC Request 2.3

Submit cross-sectional sketches showing the completed ultrasonic examination volumes for each wave mode and angle used on the subject piping welds. Include in these sketches the required ASME Code examination volume zones and state whether the sketches represent the entire circumferential length of the welds, or show limitations to these coverages for specific regions of the welds. Are there any as-built conditions that may impact the examination coverages, including outside surface weld crowns and surface finishes? If possible, provide a surface roughness finish value (in root mean square units) of the subject piping welds. How do the subject BFN Unit 3 piping weld as-built configurations compare to conditions on the representative specimens used during the EPRI PDI qualification?

### TVA Response to NRC Request 2.3

COMPONENT WELD	REPORT NUMBER	CYCLE NUMBER	EXAMINATION COVERAGE
DRHR-3-19	R-086	11	50%
DRHR-3-21	R-140	10	50%
TRHR-3-191	R-189	11	50%
RWCU-3-007-G004	R-081	11	50%

See Attachment B for the above listed Inspection Reports.

The EPRI PDI specimens used for PDI qualifications have similar configurations (i.e., flush welds, single side access, and weld joint design) as the welds listed in request for relief 3-ISI-12.

#### NRC Request 2.4

The licensee has implemented a Risk-Informed Inservice Inspection (RI-ISI) program at BFN Unit 3. As such, only a limited number of Class 1 piping welds are being inspected, as opposed to the ASME Code requirement of 25 percent of all Class 1 piping welds. Discuss why the partial examinations performed on the subject welds provide an adequate basis to conclude that the targeted degradation mechanisms (intergranular stress corrosion cracking and thermal fatigue) would have been detected, if present, in these welds. Discuss other piping weld examinations in these systems that are also subject to the same degradation mechanisms, and why the limited examinations on the subject welds do not impair or undermine the intent of the RI-ISI program. State whether BFN Unit 3 will inspect additional piping welds (not presently being examined) to account for the limited examination volumes of the subject welds and ensure that an adequate level of susceptible material, as required by the RI-ISI program, is being examined.

#### TVA Response to NRC Request 2.4

TVA received a Safety Evaluation Report (SER) from the NRC dated February 11, 2000, "Browns Ferry Nuclear Plant Unit 3, ASME Code Relief for Risk-Informed Inservice Inspection of Piping Welds." This allowed TVA to utilize an alternate Risk-Informed Inservice Inspection (RI-ISI) Program for BFN Unit 3. This program was developed in general accordance with the Westinghouse Owners Group (WOG) Topical Report WCAP-14572, Revision 1-NPA, which was approved by the NRC staff.

Reference Westinghouse Electric Company, LLC, letter WOG-RIISI-01-014, dated December 19, 2001, Westinghouse Owner's Group Implementation Subgroup Interpretation WOG RI-ISI IN 01.

Reference the Westinghouse Owners Group (WOG) Topical Report WCAP-14572, Revision 1-NPA, "Westinghouse Owners Group Application Of Risk - Informed Methods To Piping Inservice Inspection Topical Report," Section 4.0, Inspection Program Requirements.

The referenced Westinghouse Interpretations state that when inservice or preservice ultrasonic examinations of a location required by ASME Section XI were previously performed in accordance with ASME Section XI and achieved greater than 90 percent coverage and are now performed in accordance with ASME Section XI and the additional requirements of the PDI and 10 CFR 50.55a for the RI-ISI program and achieve  $\leq 90$  percent

coverage, solely because 10 CFR 50.55a does not permit crediting far side examination coverage for single sided examinations of stainless steel material, that the amount of risk addressed by the examination remains the same for that location. As discussed in Westinghouse Owners Group (WOG) Topical Report WCAP-14572, Revision 1-NP-A, "Westinghouse Owners Group Application Of Risk-Informed Methods To Piping Inservice Inspection Topical Report," it should be noted that if a current examination is a partial examination and it continues to be a partial examination in the RI-ISI process, the amount of risk addressed by the examination remains the same.

In summary, since three of the subject welds previously received an ASME Section XI or augmented (NUREG 03013) inservice ultrasonic examination that received >90% coverage and one weld which only had a preservice examination that received >90% coverage and had a low failure importance, it is TVA's position that no change in risk resulted from these examination limitations. Therefore, additional examinations are not required. Request for relief 3-ISI-12 was submitted as recommended by item 4 on page 192 of WCAP-14572, Revision 1-NP-A which states "The coverage obtained, limitations encountered, alternative provisions, and an assessment of how the risk is being addressed should be documented. The information should be formally submitted as a relief request."

### 3.0, Request for Relief 3-ISI-19

#### NRC Request 3.1

It has been proposed by industry (the Boiling-Water Reactor (BWR) Vessel and Internals project), and approved by the U.S. Nuclear Regulatory Commission, that only the longitudinal welds are required to be volumetrically examined to maintain structural integrity of the RPV in a BWR. Relief was requested for 3 of the 15 longitudinal shell welds at BFN Unit 3. Request for Relief 3-ISI-19 states, "twelve of the fifteen welds received essentially (i.e., greater than 90 percent) 100 percent coverage." In addition, the actual examination coverage for the three welds included in 3-ISI-19 were listed as 90, 86, and 89 percent, respectively. For comparison purposes, please summarize the actual coverage(s) obtained on the remaining 12 longitudinal shell welds.

#### TVA Response to NRC Request 3.1

The examination coverage for all 15 of the longitudinal RPV welds is provided in the table below.

RPV VERTICAL WELD	REPORT No.	CYCLE No.	EXAMINATION COVERAGE
VIA	R-212A	11	90%
V1B	R-212B	11	86%
V1C	R-212C	11	89%
V2A	R-212D	11	100%
V2B	R-212E	11	100%
V2C	R-212F	11	100%
V3A	R-212G	11	100%
V3B	R-212H	11	100%
V3C	R-212I	11	100%
V4A	R-212L	11	100%
V4B	R-212J	11	100%
V4C	R-212K	11	100%
V5A	R-212O	11	97%
V5B	R-212P	11	100%
V5C	R-212Q	11	97%

### NRC Request 3.2

Clearly state what the exact limitations encountered due to the obstructions on the vessel inner surface were. For instance, does insufficient clearance exist to accommodate the inspection tool. Describe the constraints that must be considered to perform an effective examination, and show (through sketches and descriptions) how the interferences preclude a full ASME Code Examination. Also, describe if it is possible to deal with these limitations by altering the inspection device.

### TVA Response to NRC Request 3.2

The requested information was provided in TVA's letter dated March 5, 2005, page E2-5 and restated below.

The configuration of BFN Unit 3 RPV and vessel internals prevents essentially 100 percent examination coverage of the three RPV longitudinal shell welds (V-1-A, V-1-B, and V-1-C). The examinations were performed with automated ultrasonic equipment from the vessel inside surface utilizing the Advanced Inservice Reactor Inspection System 21 (AIRIS 21) device, and Enhanced Data Acquisition System-II (EDAS™-II) equipment. The V-1-A, V-1-B, and V-1-C longitudinal shell weld scans were obstructed by the jet pump restrainer bracket and jet pump diffuser and received 90, 86, and 89, percent coverage respectively. The outside surfaces of these three welds were inaccessible due to the concrete bio-shield wall. The UT examinations of the longitudinal shell welds were performed to the maximum extent practical for maximum coverage utilizing the state of the art equipment available at the time the examinations were performed. The UT examinations of the longitudinal shell welds

were performed with equipment, personnel, and procedures qualified to the Performance Demonstration Initiative (PDI) Program in accordance with the requirements of the 1995 Edition, 1996, Addenda of ASME Section XI, Division 1, Appendix VIII as mandated by 10 CFR 50.55a.



## Attachment A

Inspection Reports  
For RPV Nozzle-To-Shell Welds Listed In  
The Table Below

RPV NOZZLE TO SHELL WELD	NDE REPORT No.	CYCLE NUMBER	COVERAGE
N1B-NV	R-156	10	77%
N2A-NV	R-158	10	77%
N2C-NV	R-160	10	77%
N2E-NV	R-162	10	77%
N3A-NV	R-164	10	77%
N4A-NV	R-166	10	77%
N4F-NV	R-168	10	77%
N5B-NV	R-170	10	71%
N7-NV	R-125	10	70%
N9-NV	R-172	10	74%
N10-Inner Radius	R-188	11	90%

Inspection Report R-156  
Weld N1B-NV

00001

TENNESSEE VALLEY AUTHORITY		EXAMINATION SUMMARY AND RESOLUTION SHEET		REPORT NUMBER: <i>R156</i>	
PROJECT: BFN UNIT: 3		CYCLE: 10		COMPONENT ID: N1B	
EXAMINATION METHOD				SYSTEM RPV ISI DWG. NO. 3-ISI-0328-C	
MT <input type="checkbox"/>	PT <input type="checkbox"/>	UT <input checked="" type="checkbox"/>	VT <input type="checkbox"/>	CODE CLASS: 1	CATEGORY: B-D
PROCEDURE: N_UT_9		REV:9	TC:02-06	COFIG.:	Nozzle TO Vessel
EXAMINER: MIKE KLEINJAN		EXAMINER: DAVID KLEINJAN		EXAMINER: N/A	EXAMINER: N/A
LEVEL: <i>II</i>		LEVEL: II		LEVEL: N/A	LEVEL: N/A

This report contains the data associated with the manual ultrasonic examination of code category B-D, Nozzle to Vessel welds. This examination report satisfies ASME section XI requirements for the Nozzle to shell weld..

Examination. Nozzle to Vessel weld N1B

Transverse coverage for the Nozzle to Vessel weld was supplemented by the inner radius examination.

(N1B-IR) *see R157*

0° was used on the weld crown and base material Vessel side

45° was used on the vessel side only scanning over the weld crown

45° Tangent to the weld was used on vessel side CW/CCW

45° Parallel to the weld was used on vessel side CW/CCW

60° was used on the vessel side only scanning over the weld crown

60° Tangent to the weld was used on vessel side CW/CCW

60° Parallel to the weld was used on vessel side CW/CCW

77% code coverage was obtained

This exam was performed with equipment, Procedures, and personnel qualified in accordance with ASME Section XI

*No Recordable Indications*

RESOLUTION BY: Mike Kleinjan <i>Mike Kleinjan</i>		REVIEWED BY: <i>David Kleinjan</i>		ANII: <i>Albert</i>	
LEVEL: II DATE: <i>4-4-02</i>		LEVEL: <i>II</i> DATE: <i>4/8/02</i>		DATE: <i>4/18/02</i>	
				PG. 1 OF 1 <i>15</i>	

*4/11/02*

Calculation of ASME code coverage  
For section XI NDE Examination

N1B

1) 0 degree (weld metal scan)	100%
2) 45 degree Transverse-scan from vessel side of weld	100%
3) 45 degree Transverse-scan from nozzle side of weld	0%
4) 60 degree Transverse-scan from vessel side of weld	100%
5) 60 degree Transverse-scan from nozzle side of weld	0%
6) 45 degree Parallel-scan CW direction	100% *
7) 45 degree Parallel-scan CCW direction	100% *
8) 60 degree Parallel-scan CW direction	100% *
9) 60 degree Parallel-scan CCW direction	100% *

The sum of all the percentage of scans	700%
Divided by the total # of scans	9
Percentage of examination Volume coverage	77%

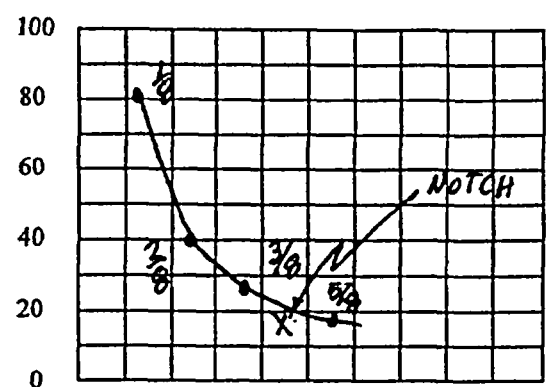
\* Transverse coverage includes coverage obtained during the inner radius examination.

*H56CT*  
*7/18/00*

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<b>TENNESSEE VALLEY AUTHORITY</b>		<b>DIGITAL ULTRASONIC CALIBRATION DATA SHEET</b>		<b>REPORT NUMBER: <i>R156</i></b>								
PROJECT: BFN UNIT: 3 CYCLE: 10		CALIBRATION DATE: 3-29-02										
PROC.: N-UT- 9 REV:9 TC:02-06		CALIBRATION BLOCK NO.: BF18 TEMP: 72.6°F										
INSTR. MFG: STAVELEY DUE DATE: 8-05-02		SIMULATOR BLOCK NO: DB55079										
MODEL/TYPE: SONIC-136 M & TE NO.: VH751		THERMOMETER S/N: 522352 DUE DATE: 5-17-02										
TRANSDUCER MFG: Harisonic		COUPLANT SONOTRACE BATCH: 01141										
S/N DB34198 SIZE: .75 FREQ: 2.25 MHz		EXAM TYPE: SHEAR <input type="checkbox"/> LONG <input checked="" type="checkbox"/> RL <input type="checkbox"/>										
CABLE TYPE: RG174 LENGTH: 120 inches		<b>ANGLE VERIFICATION</b>										
<b>DAC</b>		BLOCK TYPE: <i>Ronpus</i>		S/N: DB35055079								
		NOMINAL ANGLE: 0		ACTUAL ANGLE: N/A								
<p style="text-align: center;">DISPLAY WIDTH: 10 inches</p>		<b>INSTRUMENT SETTINGS</b>										
		<b>REFLECTOR</b>			<b>REFERENCE</b>	<b>MEMORY</b>						
		SCAN DIRECT.	NTCH	SDH	SENSITIVITY	NUMBER						
		AXIAL	<input type="checkbox"/>	<input checked="" type="checkbox"/>	20.8 dB	1						
		CIRC	<input type="checkbox"/>	<input type="checkbox"/>	n/a dB	n/a						
		FREQ: 2.25	MHz		REJECT: off	%						
		ANGLE: n/a	deg		DAMPING: 500	ohms						
		DELAY: .499	msec		PULSER: 222							
		ZERO: n/a	msec		FILTER: Filt 3							
		VELOCITY: .238	msec		REP RATE: 2KHZ							
RANGE: 10	inches		TOF: <input checked="" type="checkbox"/> PEAK <input type="checkbox"/> FLANK									
DISPLAY MODE: PE			POWER: AC									
DUAL: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF			TCG: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF									
REF. REFLECTOR: 1"		GAIN: 8 dB		<b>CALIBRATION TIMES</b>								
AMPLITUDE: 80 %		METAL PATH: 1"		INITIAL TIME: 9:00 FINAL TIME: 14:50								
VERIFICATION TIMES		1) <i>n/a</i> 2) <i>n/a</i> 3) <i>n/a</i> 4) <i>n/a</i> 5) <i>n/a</i> 6) <i>n/a</i> 7) <i>n/a</i> 8) <i>n/a</i> 9) <i>n/a</i>										
<b>LINEARITY CHECK</b>												
VERTICAL	SIGNAL 1		100	90	80	70	60	50	40	30	20	
	SIGNAL 2		50	45	40	35	30	25	20	15	10	
ATTENUATOR	GAIN	SET	-6 dB		-12 dB		SET		+12		SET	+6
	AMP	80%	32 TO 48		16 TO 24		20 %		64 TO 96		40% 64 TO 96	
			40		20				80		80	
<b>COMMENTS:</b>						<b>WELDS/ITEMS EXAMINED:</b>						
						N1B Nozzle To Shell						
<b>EXAMINER:</b>						<b>REVIEWER:</b>						
MIKE W. KLEINJAN			DAVID KLEINJAN			<i>[Signature]</i>			ANII: <i>[Signature]</i>			
<i>[Signature]</i>			<i>[Signature]</i>			<i>[Signature]</i>			DATE: 4/18/02			
LEVEL: II			LEVEL: II			LEVEL: <i>II</i>			DATE: 4/1/02			
						PG.: <del>45</del> OF <del>15</del> <i>4/18/02</i>						
						3 OF 15						

00004

<b>TENNESSEE VALLEY AUTHORITY</b>			<b>DIGITAL ULTRASONIC CALIBRATION DATA SHEET</b>			<b>REPORT NUMBER:</b> <i>R156</i>				
PROJECT: BFN UNIT: 3 CYCLE: 10			CALIBRATION DATE: 3-29-02							
PROC.: N-UT- 9 REV:9 TC:02-06			CALIBRATION BLOCK NO.: BF18 TEMP: 72.6°F							
INSTR. MFG: STAVELEY DUE DATE: 8-05-02			SIMULATOR BLOCK NO: DB55079							
MODEL/TYPE: SONIC-136 M & TE NO.: VH751			THERMOMETER S/N: 522352 DUE DATE: 5-17-02							
TRANSDUCER MFG: Krautkramer			COUPLANT SONOTRACE BATCH: 01141							
S/N DB34843 SIZE: .5x1 FREQ: 2.25 MHz			EXAM TYPE: SHEAR <input checked="" type="checkbox"/> LONG <input type="checkbox"/> RL <input type="checkbox"/>							
CABLE TYPE: RG1743 LENGTH: 120 inches			<b>ANGLE VERIFICATION</b>							
<b>DAC</b>			BLOCK TYPE: IIW			S/N: DB55074				
			NOMINAL ANGLE: 45°			ACTUAL ANGLE: 46°				
 <p style="text-align: center;">DISPLAY WIDTH: 10 inches</p>			<b>INSTRUMENT SETTINGS</b>							
			<b>REFLECTOR</b>			<b>REFERENCE</b>		<b>MEMORY</b>		
			SCAN DIRECT.	NTCH	SDH	SENSITIVITY		NUMBER		
			AXIAL	<input type="checkbox"/>	<input checked="" type="checkbox"/>	42.6 dB		2		
			CIRC	<input type="checkbox"/>	<input type="checkbox"/>	n/a dB		n/a		
			FREQ:	2.25	MHz	REJECT: off		%		
			ANGLE:	N/A	deg	DAMPING: 500		ohms		
			DELAY:	.830	msec	PULSER: 222				
			ZERO:	N/A	msec	FILTER: FITL 3				
			VELOCITY:	.126	msec	REP RATE: 2KHZ				
RANGE:	20	inches	TOF: <input checked="" type="checkbox"/> PEAK <input type="checkbox"/> FLANK							
DISPLAY MODE: PE			POWER: AC							
DUAL: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF			TCG: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF							
REF. REFLECTOR: 1" GAIN: 33.6 dB			<b>CALIBRATION TIMES</b>							
			INITIAL TIME: 9:00			FINAL TIME: 14:50				
AMPLITUDE: 80 % METAL PATH: 1"			VERIFICATION TIMES							
			1) <i>n/a</i> 2) <i>n/a</i> 3) <i>n/a</i> 4) <i>n/a</i> 5) <i>n/a</i> 6) <i>n/a</i> 7) <i>n/a</i> 8) <i>n/a</i> 9) <i>n/a</i>							
<b>LINEARITY CHECK</b>										
VERTICAL	SIGNAL 1	100	90	80	70	60	50	40	30	20
	SIGNAL 2	50	45	40	35	30	25	20	15	10
ATTENUATOR	GAIN	SET	-6 dB	-12 dB	SET	+12	SET	+6		
	AMP	80%	32 TO 48	16 TO 24	20 %	64 TO 96	40%	64 TO 96		
			40	20		80		80		
<b>COMMENTS:</b>						<b>WELDS/ITEMS EXAMINED:</b>				
Delta difference between 3/8 to 5/8 on the clad side is 3 dB ✓						N1B Nozzle to Shell				
EXAMINER: MIKE W. KLEINJAN <i>Mike W. Kleinjan</i>			EXAMINER: DAVID KLEINJAN <i>D. Kleinjan</i>			REVIEWER: <i>[Signature]</i>		ANII: <i>Robert Field</i>		
LEVEL: II			LEVEL: II			DATE: 4/1/02		DATE: 4/1/02		
						PG.: 4 of 15		PG.: 4 of 15		

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00005

TENNESSEE VALLEY AUTHORITY		DIGITAL ULTRASONIC CALIBRATION DATA SHEET		REPORT NUMBER: <b>R 156</b>								
PROJECT: BFN UNIT: 3 CYCLE: 10		CALIBRATION DATE: 3-29-02										
PROC.: N-UT- 9 REV:9 TC:02-06		CALIBRATION BLOCK NO.: BF18 TEMP: 72.6°F										
INSTR. MFG: STAVELEY DUE DATE: 8-05-02		SIMULATOR BLOCK NO: DB55079										
MODEL/TYPE: SONIC-136 M & TE NO.: VH751		THERMOMETER S/N: 522352 DUE DATE: 5-17-02										
TRANSDUCER MFG: Krautkramer		COUPLANT SONOTRACE BATCH: 01141										
S/N DB34154 SIZE: .5x1 FREQ: 2.25 MHz		EXAM TYPE: SHEAR <input checked="" type="checkbox"/> LONG <input type="checkbox"/> RL <input type="checkbox"/>										
CABLE TYPE: RG174 LENGTH: 120 inches		ANGLE VERIFICATION										
DAC		BLOCK TYPE: IIW		S/N: DB55074								
		NOMINAL ANGLE: 60		ACTUAL ANGLE: 59								
<p>AMPLITUDE</p> <p>DISTANCE</p> <p>DISPLAY WIDTH: 10 inches</p>		INSTRUMENT SETTINGS										
		REFLECTOR		REFERENCE		MEMORY						
		SCAN DIRECT.	NTCH	SDH	SENSITIVITY		NUMBER					
		AXIAL	<input type="checkbox"/>	<input checked="" type="checkbox"/>	49 dB		3					
		CIRC	<input type="checkbox"/>	<input type="checkbox"/>	n/a dB		n/a					
		FREQ: 2.25 MHz		REJECT: off		%						
		ANGLE: N/A deg		DAMPING: 500		ohms						
		DELAY: 1.20 msec		PULSER: 222								
		ZERO: N/A msec		FILTER: FITL 3								
		VELOCITY: .123 msec		REP RATE: 2KHZ								
RANGE: 20 inches		TOF: <input checked="" type="checkbox"/> PEAK <input type="checkbox"/> FLANK										
DISPLAY MODE: PE		POWER: AC										
DUAL: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF		TCG: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF										
REF. REFLECTOR: 1" GAIN: 36 dB		CALIBRATION TIMES										
AMPLITUDE: 80 % METAL PATH: 1"		INITIAL TIME: 9:00 FINAL TIME: 14:50										
VERIFICATION TIMES		1) <i>n/a</i> 2) <i>n/a</i> 3) <i>n/a</i> 4) <i>n/a</i> 5) <i>n/a</i> 6) <i>n/a</i> 7) <i>n/a</i> 8) <i>n/a</i> 9) <i>n/a</i>										
LINEARITY CHECK												
VERTICAL	SIGNAL 1		100	90	80	70	60	50	40	30	20	
	SIGNAL 2		50	45	40	35	30	25	20	15	10	
ATTENUATOR	GAIN	SET	-6 dB		-12 dB		SET		+12		SET	+6
	AMP	80%	32 TO 48		16 TO 24		20 %		64 TO 96		40%	64 TO 96
			40		20				80			80
COMMENTS:						WELDS/ITEMS EXAMINED:						
DELTA dB DIFFERENCE IS 4.4 FROM THE 3/8 TO 5/8 ON THE CLAD SIDE						NIB Nozzle to Shell						
EXAMINER: MIKE W. KLEINJAN <i>Mike as they are</i> LEVEL: II		EXAMINER: DAVID KLEINJAN <i>D.K. Kleinjan</i> LEVEL: II		REVIEWER: <i>David Kleinjan</i> LEVEL: <i>III</i> DATE: <i>4/1/02</i>		ANII:		DATE:		PG.: <i>17 OF 15</i> <i>544102</i>		

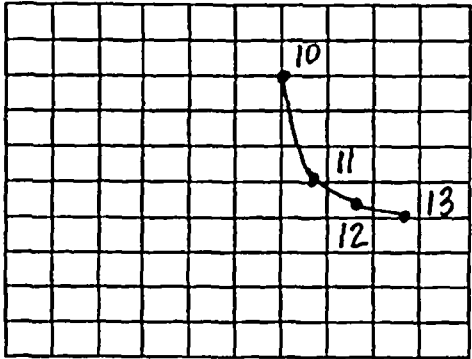
5 OF 15

00006

<b>TENNESSEE VALLEY AUTHORITY</b>			<b>DIGITAL ULTRASONIC CALIBRATION DATA SHEET</b>			<b>REPORT NUMBER: R156</b>						
PROJECT: BFN UNIT: 3 CYCLE: 10			CALIBRATION DATE: 03-29-02									
PROC.: N-UT- 55 REV:9 <del>DOTC: N/A</del>			CALIBRATION BLOCK NO.: BF-84-IR TEMP: 70.5°F									
INSTR. MFG: STAVELEY DUE DATE: 08-11-02			SIMULATOR BLOCK NO: N/A									
MODEL/TYPE: SONIC-137 M & TE NO.: VH-5473			THERMOMETER S/N: 522352 DUE DATE: 05-17-02									
TRANSDUCER MFG: KRAUTKRAMER			COUPLANT SONOTRACE BATCH: 01141									
S/N DB 35163 SIZE: 1.0" FREQ: 2.25 MHz			EXAM TYPE: SHEAR <input type="checkbox"/> LONG <input type="checkbox"/> RL <input checked="" type="checkbox"/>									
CABLE TYPE: RG 174 LENGTH: 120 inches			<b>ANGLE VERIFICATION</b>									
<b>DAC</b>			BLOCK TYPE: CS IIW			S/N: DB 55074						
			NOMINAL ANGLE: 28			ACTUAL ANGLE: N/A						
			<b>INSTRUMENT SETTINGS</b>									
<p style="text-align: center;">DISPLAY WIDTH: 20 inches</p>			<b>REFLECTOR</b>			<b>REFERENCE</b>		<b>MEMORY</b>				
			SCAN DIRECT. NTCH SDH			SENSITIVITY		NUMBER				
			AXIAL <input checked="" type="checkbox"/> <input type="checkbox"/>			63.6 dB		20				
			CIRC <input type="checkbox"/> <input type="checkbox"/>			N/A dB		N/A				
			FREQ: 2.25 MHz			REJECT: OFF		%				
			ANGLE: N/A deg			DAMPING: 200		ohms				
			DELAY: 1.66 msec			PULSER: 222						
			ZERO: N/A msec			FILTER: FILT 1						
			VELOCITY: 0.233 msec			REP RATE: 4 KHZ						
			RANGE: 20.0 inches			TOF: <input type="checkbox"/> PEAK <input checked="" type="checkbox"/> FLANK						
DISPLAY MODE: PE			POWER: AC									
DUAL: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF			TCG: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF									
REF. REFLECTOR: N/A GAIN: N/A dB			<b>CALIBRATION TIMES</b>									
AMPLITUDE: N/A % METAL PATH: N/A"			INITIAL TIME: 0830			FINAL TIME: 1400						
VERIFICATION TIMES			1)N/A	2)N/A	3)N/A	4)N/A	5)N/A	6)N/A	7)N/A	8)N/A	9)N/A	
<b>LINEARITY CHECK</b>												
VERTICAL	SIGNAL 1		100	90	80	70	60	50	40	30	20	
	SIGNAL 2		50	45	40	35	30	25	20	15	10	
ATTENUATOR	GAIN	SET	-6 dB	-12 dB	SET		+12		SET		+6	
	AMP	80%	32 TO 48	16 TO 24	20 %		64 TO 96		40%		64 TO 96	
			40	20			80				80	
<b>COMMENTS:</b>						<b>WELDS/ITEMS EXAMINED:</b>						
						REACTOR PRESSURE VESSEL						
						N1B-IR						
						wedge ID D-14795-214 ✓						
EXAMINER: DAVID KLEINJAN <i>D.K. Kleinjan</i> LEVEL: II			EXAMINER: MIKE KLEINJAN <i>Mike Kleinjan</i> LEVEL: II			REVIEWER: <i>Shel...</i> LEVEL: <i>III</i> DATE: <i>4/1/02</i>			ANII: <i>Albert...</i> DATE: <i>4/1/02</i> PG: <i>44</i> OF <i>115</i> <i>54/11/02</i> <i>6 OF 15</i>			



00007

TENNESSEE VALLEY AUTHORITY		DIGITAL ULTRASONIC CALIBRATION DATA SHEET		REPORT NUMBER: <i>R156</i>								
PROJECT: BFN UNIT: 3		CYCLE: 10 <i>22400</i>		CALIBRATION DATE: 03-29-02								
PROC.: N-UT- 55 REV:9		TC: <i>N/A</i>		CALIBRATION BLOCK NO.: BF-84-IR TEMP: 70.5°F								
INSTR. MFG: STAVELEY		DUE DATE: 08-11-02		SIMULATOR BLOCK NO: N/A								
MODEL/TYPE: SONIC-137		M & TE NO.: VH-5473		THERMOMETER S/N: 522352 DUE DATE: 05-17-02								
TRANSDUCER MFG: KRAUTKRAMER		COUPLANT SONOTRACE BATCH: 01141										
S/N DB 35164 SIZE: 1.0" FREQ: 2.25 MHz		EXAM TYPE: SHEAR <input type="checkbox"/> LONG <input type="checkbox"/> RL <input checked="" type="checkbox"/>										
CABLE TYPE: RG 174 LENGTH: 120 inches		ANGLE VERIFICATION										
DAC		BLOCK TYPE: CS IIW		S/N: DB 55074								
		NOMINAL ANGLE: 32°		ACTUAL ANGLE: N/A								
<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;">100 80 60 40 20 0</div>  <div style="margin-left: 10px; writing-mode: vertical-rl; transform: rotate(180deg);">A M P L I T U D E</div> </div> <p style="text-align: center;">DISPLAY WIDTH: 20 inches</p>		INSTRUMENT SETTINGS										
		REFLECTOR			REFERENCE		MEMORY					
		SCAN DIRECT. NTCH SDH			SENSITIVITY		NUMBER					
		AXIAL <input checked="" type="checkbox"/> <input type="checkbox"/>			63.8 dB		21					
		CIRC <input type="checkbox"/> <input type="checkbox"/>			N/A dB		N/A					
		FREQ: 2.25 MHz			REJECT: OFF %							
		ANGLE: N/A deg			DAMPING: 200 ohms							
		DELAY: 1.35 msec			PULSER: 222							
		ZERO: N/A msec			FILTER: FILT 1							
		VELOCITY: 0.235 msec			REP RATE: 4 KHZ							
RANGE: 20.0 inches			TOF: <input type="checkbox"/> PEAK <input checked="" type="checkbox"/> FLANK									
DISPLAY MODE: PE			POWER: AC									
DUAL: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF			TCG: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF									
CALIBRATION TIMES												
REF. REFLECTOR: N/A			GAIN: N/A dB									
AMPLITUDE: N/A %			METAL PATH: N/A"									
INITIAL TIME: 0940		FINAL TIME: 1410										
VERIFICATION TIMES		1)N/A		2)N/A								
3)N/A		4)N/A		5)N/A								
6)N/A		7)N/A		8)N/A								
9)N/A												
LINEARITY CHECK												
VERTICAL	SIGNAL 1		100	90	80	70	60	50	40	30	20	
	SIGNAL 2		50	45	40	35	30	25	20	15	10	
ATTENUATOR	GAIN	SET	-6 dB	-12 dB	SET	+12	SET	+6				
	AMP	80%	32 TO 48	16 TO 24	20 %	64 TO 96	40%	64 TO 96				
			40	20		80		80				
COMMENTS:						WELDS/ITEMS EXAMINED:						
						REACTOR PRESSURE VESSEL						
						N1B-IR						
						<i>wedge IO D-14795-250</i>						
EXAMINER: DAVID KLEINJAN <i>D.K. Kleinjan</i> LEVEL: II		EXAMINER: MIKE KLEINJAN <i>Mike Kleinjan</i> LEVEL: II		REVIEWER: <i>[Signature]</i> LEVEL: III		DATE: 4/18/02		ANII: <i>[Signature]</i> DATE: 4/18/02				
						PG: 43 OF 415		7 OF 15				

TVA

MANUAL ULTRASONIC VESSEL  
EXAMINATION DATA SHEET

REPORT NO.

R156

PROJECT: BFN UNIT: 3 WELD ID: N13 CONFIG.: NOZZLE COMPONENT: VESSELCAL. SHT. NO.: NA PROCEDURE: N-UT-9 REV.: 9 PCR.: 02-06 ~~#/1~~ TEMP.: 89 PYRO.: 522352SCAN SENS.: ⊗ dB EXAM START: 3/29/02 11:15 EXAM END: 1310 EXAM ANGLE: 0°, 45°, 60°Lo LOCATION: TDC Wo LOCATION: E OF WELD

IND NO.	20%			50%			100%			MAX. AMP.			20%			50%			100%		
	Mp1	W1	L1	Mp1	W1	L1	Mp1	W1	L1	Mp	W	L	Mp2	W2	L2	Mp2	W2	L2	Mp2	W2	L2
28°	SCAN	dB		69.8	⊗					SCANNING #	10/11		BLEND RADIUS								
32°	SCAN	dB		69.6						SCANNING #	10/11		BLEND RADIUS								
0°	SCAN	dB		34.8						SCANNING #	9		ON WELD AND BASE MATERIAL								
45°	SCAN	dB		56.0						SCANNING #	9		VESSEL SIDE ONLY								
45 T	SCAN	dB		56.6						SCANNING #	10/11		CA/CEW								
45 TAN	SCAN	dB		56.6						SCANNING #	10/11		CA/CEW								
60	SCAN	dB		63						SCANNING #	9		VESSEL SIDE ONLY								
60 T	SCAN	dB		63						SCANNING #	10/11		CA/CEW								
60 TAN	SCAN	dB		63						SCANNING #	10/11		CA/CEW								
NO RECORDABLE INDICATIONS																					

COMMENTS: \* 28° AND 32° FOR THE BLEND RADIUS. TRANSVERSE COVERAGE INCLUDES COVERAGE OBTAINED DURING THE INNER RADIUS EXAMINATIONS.

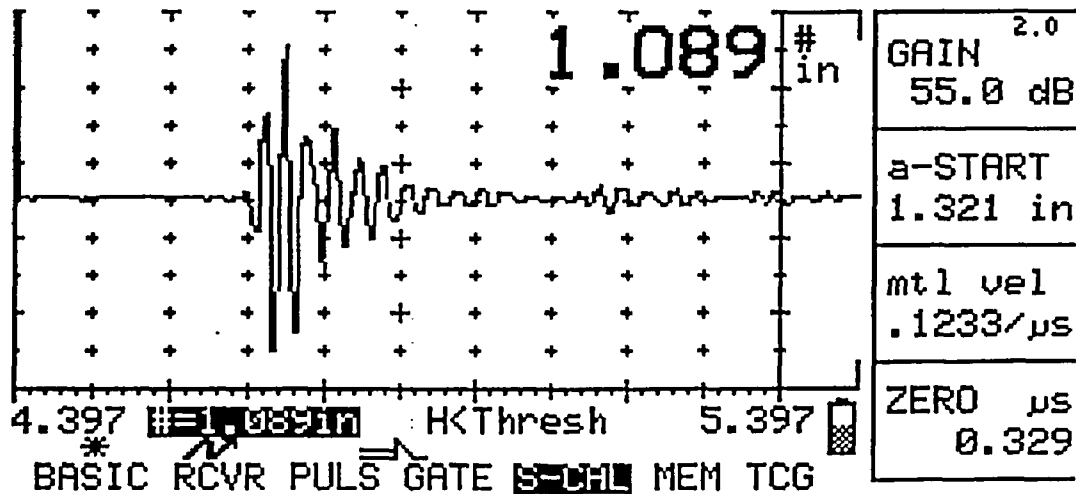
5 TO 10% NOISE LEVEL WAS OBSERVED

EXAMINER: Mike W. #62 LEVEL: II DATE: 3-29-02 REVIEWED BY: Andrzej LEVEL: III DATE: 4/1/02EXAMINER: Del. #62 LEVEL: II DATE: 3-29-02 ANI: What Field DATE: 4/18/02 PAGE 8 OF 15

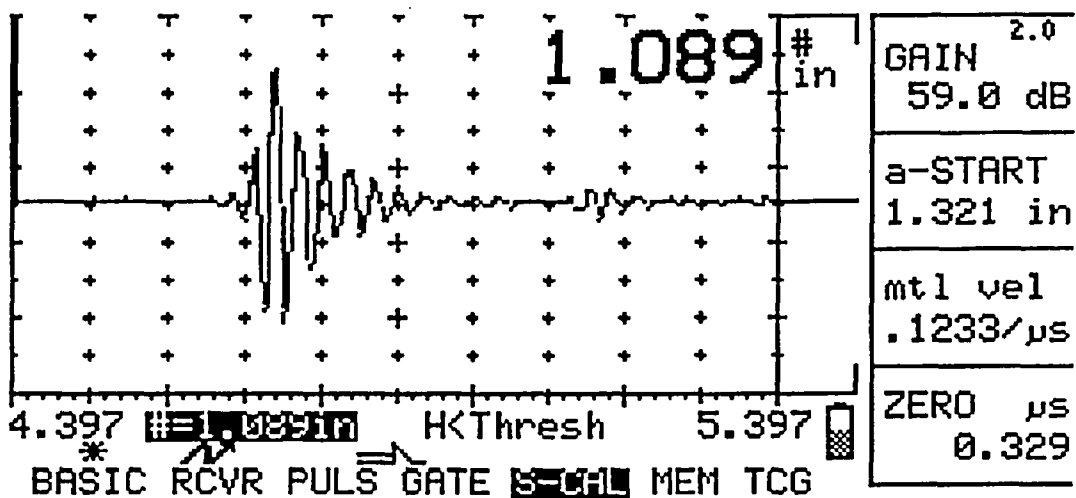
00009

REPORT Number  
R156

## Nozzle Examination 45° Waveforms



## 45° Pre Waveform



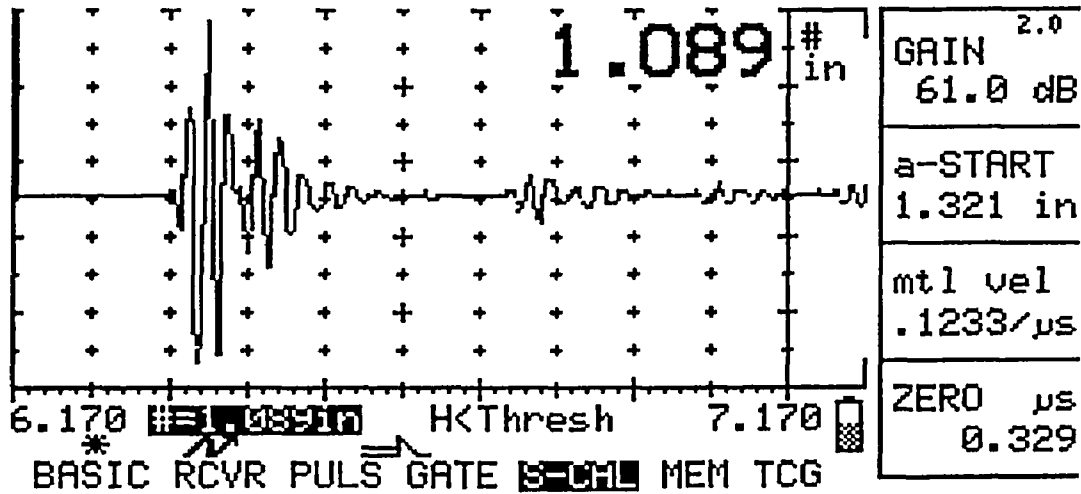
## 45° Post Waveform

H56CT  
dt  
4/10/02

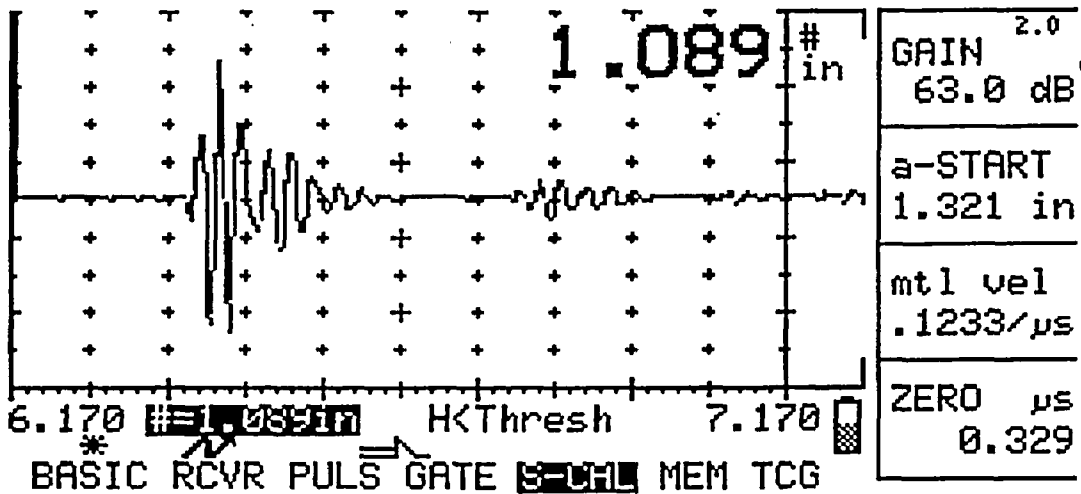
9-8-15

00010  
Report Number  
R156

Nozzle Examination 60° Waveforms



60° Pre Waveform



60° Post Waveform

H 5 BCT  
4/18/00

10 08 15

TVA

BEAM SPREAD AND  
RESOLUTION DATA SHEET

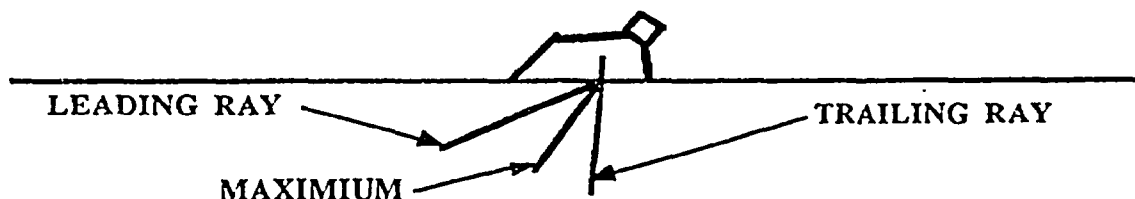
REPORT NO.

R156

PROJECT: BFN UNIT: 3 CALIBRATION BLOCK NO.: BF 18PROCEDURE NO.: N-OT-9 REV.: 9 PCR: 0200 N/A - 1/4/02SEARCH UNIT-MAKE: Krautkramer SIZE: 15K1 FREQ.: 2.25S/N: DB 34843 ANGLE: 45ULTRASONIC INSTRUMENT-MAKE: Smac 13C S/N: VH 751

## BEAM SPREAD

HOLE DEPTH	TRAILING RAY						LEADING RAY			
	20% DAC		50% DAC		100% DAC		20% DAC		50% DAC	
	W	MP	W	MP	MP	W	MP	W	W	MP
1/4T	1 1/8	1.9	1 1/4	2.	2.1	1 5/8	2.4	2	1 7/8	2.3
1/2T	2 7/8	4	3	4.1	4.3	3 1/4	4.8	4 1/8	3 3/4	4.6
3/4T	4 1/4	6	4 1/2	6.3	6.5	4 7/8	7	5 7/8	5 1/4	6.8



## RESOLUTION

NEAR SURFACE REFLECTOR: Notch OD DEPTH: 25 SIZE: 253 CAL BLK.: BF 18FAR SURFACE REFLECTOR: Notch DEPTH: 6.1 SIZE: 253

## SCANNING

REFLECTORS PROVIDE 50% DAC SIGNALS AT SCANNING SPEED

Y ☒N ☐EXAMINER: Mike W. LoganREVIEWED BY: John WhitelyANII: Mike ToddLEVEL: II DATE: 3-30-02LEVEL: III DATE: 4/4/02DATE: 4/18/02  
PAGE: 12 OF 15

TVA

BEAM SPREAD AND  
RESOLUTION DATA SHEET

REPORT NO.

R156

PROJECT: BFN UNIT: 3 CALIBRATION BLOCK NO.: BF 18  
 PROCEDURE NO.: N-UT-9 REV.: 9 PCR: 0206 4/11/02  
 SEARCH UNIT-MAKE: Krautkramer SIZE: .5X1 FREQ.: 2.25  
 S/N: DB 34154 ANGLE: 60  
 ULTRASONIC INSTRUMENT-MAKE: Sonic 13C S/N: VH 751

## BEAM SPREAD

HOLE DEPTH	TRAILING RAY						LEADING RAY			
	20% DAC		50% DAC		100% DAC		20% DAC		50% DAC	
	W	MP	W	MP	MP	W	MP	W	W	MP
1/4T	2 1/8	2.4	2 3/8	2.7	2.9	2 5/8	3.2	3 1/8	2 7/8	3.1
1/2T	4 3/4	4.8	5	5.3	5.8	5 1/4	6.4	6 5/8	6	6.1
3/4T	8 3/8	7.6	7 1/4	8	8.7	7 7/8	9.6	8 5/8	8	9.1

LEADING RAY

TRAILING RAY

MAXIMUM

## RESOLUTION

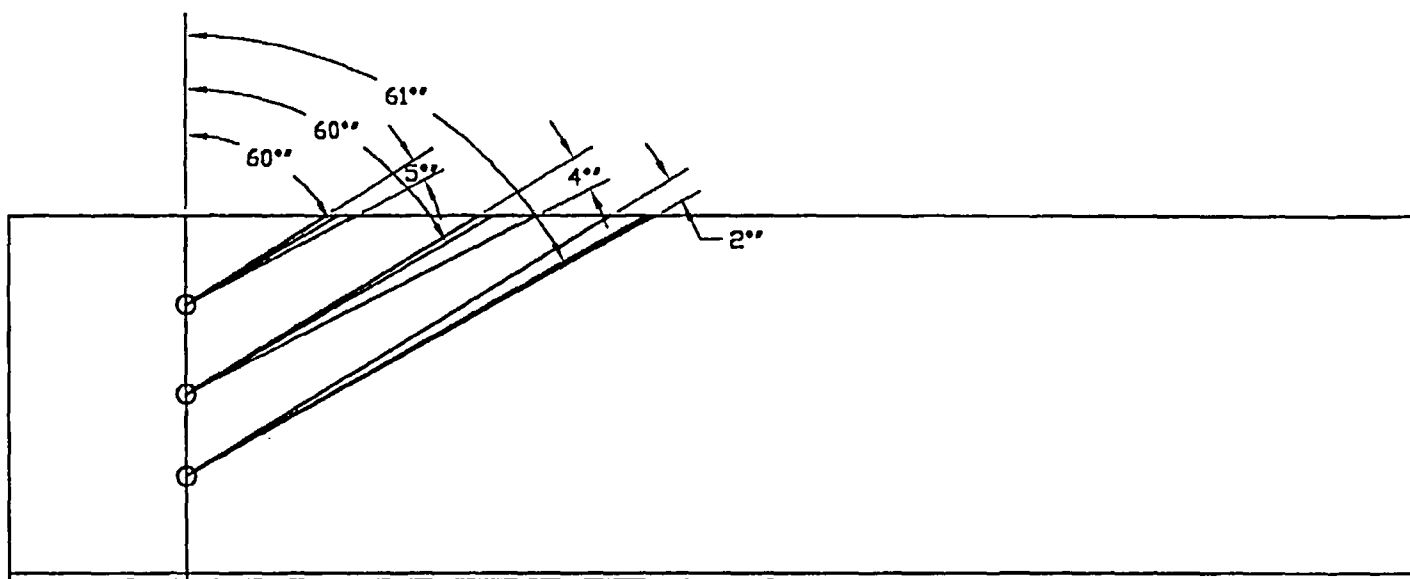
NEAR SURFACE REFLECTOR: Notch OD DEPTH: .25 SIZE: .253 CAL BLK.: BF 18

FAR SURFACE REFLECTOR: Notch ID DEPTH: 6.1 SIZE: .253

## SCANNING

REFLECTORS PROVIDE 50% DAC SIGNALS AT SCANNING SPEED

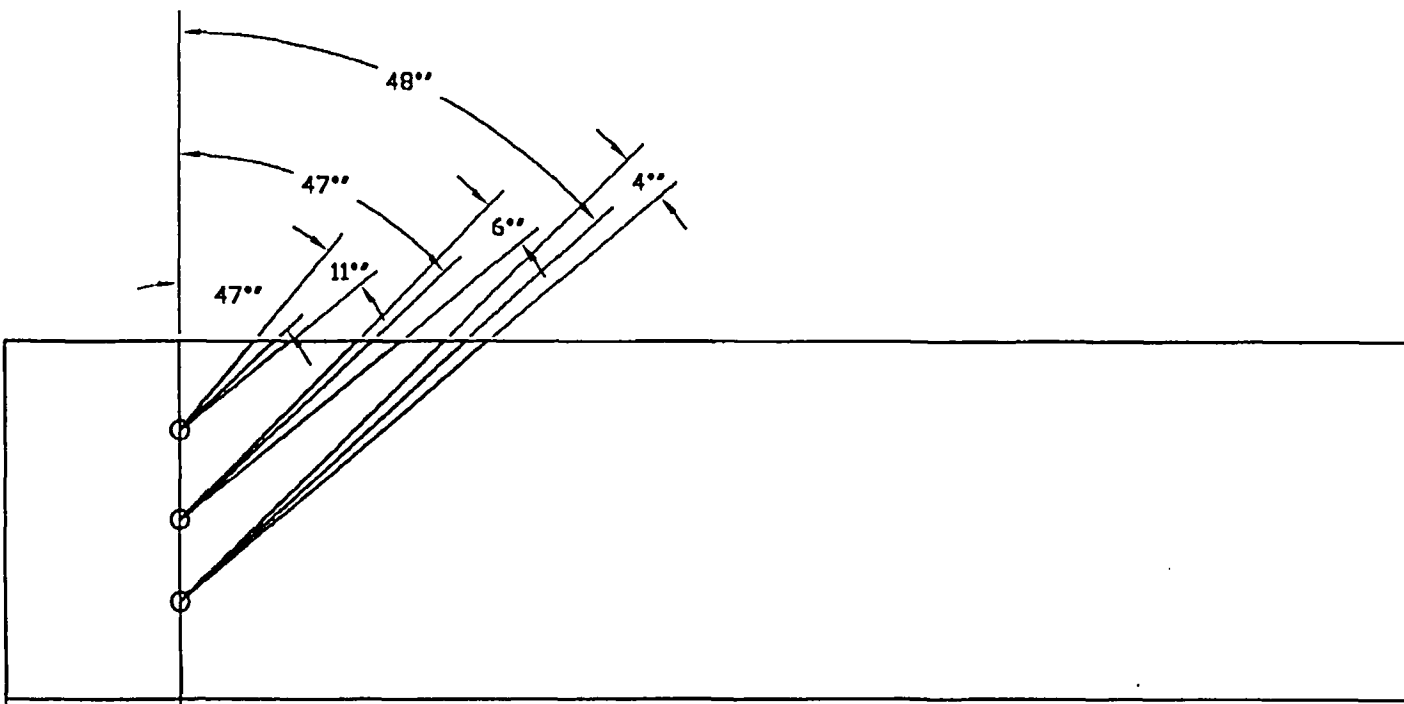
Y ☒N ☐EXAMINER: Mike W. Henry Jr.REVIEWED BY: [Signature]ANTI: [Signature]LEVEL: II DATE: 3-30-02LEVEL: III DATE: 4/4/02DATE: 4/18/02  
PAGE: 12 OF 15



Report Number  
R154

Browns Ferry Unit 3
Beamsread
MARCH 2002
BF-18

00013



Report Number  
R156

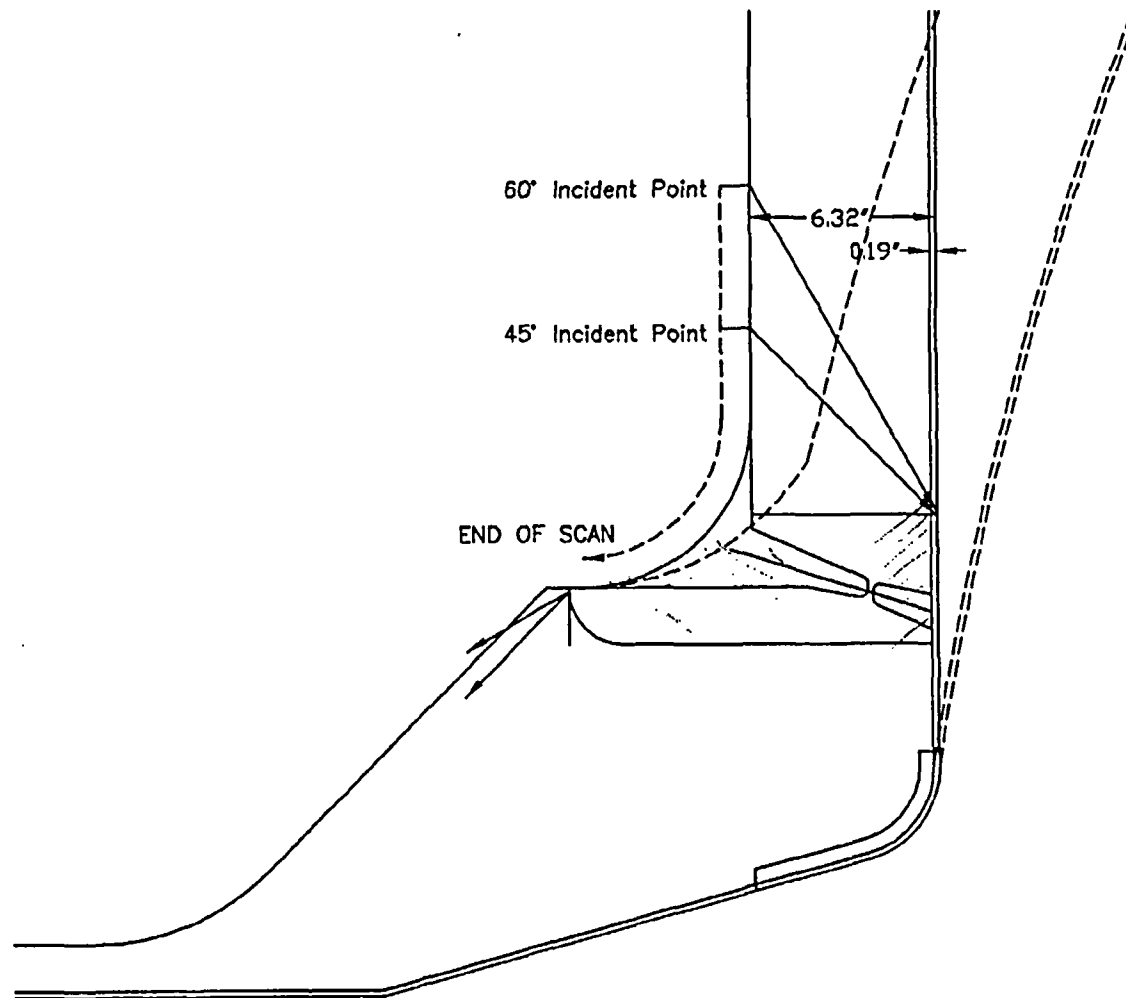
HSB  
4/18/02  
27

Browns Ferry Unit 3
Beamspread
MARCH 2002
BF-18

00014

14-8-15





Transverse coverage includes coverage obtained during the inner radius examination

Repor Number  
R156

HSBC  
941  
4/18/02

Browns Ferry Unit 3
NIB Nozzle-to-Shell
MARCH 2002
SP-NIB-NS

00015

150515

00016

TENNESSEE VALLEY AUTHORITY		EXAMINATION SUMMARY AND RESOLUTION SHEET		REPORT NUMBER: <b>R157</b>	
PROJECT: BFN UNIT: 3		CYCLE: 10		COMPONENT ID: NIB-IR	
EXAMINATION METHOD				SYSTEM RPV	
				ISI DWG. NO. 3-ISI-0328-C	
MT <input type="checkbox"/>	PT <input type="checkbox"/>	UT <input checked="" type="checkbox"/>	VT <input type="checkbox"/>	CODE CLASS: 1	CATEGORY: B-D
PROCEDURE: N-UT-55		REV: 9	TC: <del>N/A</del> <b>02-08</b>	COFIG.: Nozzle	TO Vessel
EXAMINER: MIKE KLEINJAN		EXAMINER: <del>024-000</del> DAVID KLEINJAN		EXAMINER: N/A	EXAMINER: N/A
LEVEL: <b>II</b> <i>5/11/02</i>		LEVEL: II		LEVEL: N/A	LEVEL: N/A

This report contains the data associated with the manual ultrasonic examination of code category B-D, Nozzle Inner radius. This examination report satisfies ASME section XI requirements for the inner radius examination.

NIB-IR: This examination was performed using a 28° and 32° in the blend radius in two directions CW/CCW

100% code coverage was obtained

This exam was performed with equipment, Procedures, and personnel qualified in accordance with ASME Section XI

*No Recordable Indication*

RESOLUTION BY: Mike Kleinjan <i>Mike Kleinjan</i>	REVIEWED BY: <i>David Kleinjan</i>	ANIL <i>What?</i>
LEVEL: II DATE: 4-4-02	LEVEL: <del>III</del> DATE: <i>4/11/02</i>	DATE: 4/18/02
		PG. 1 OF 14

*Jan 4/11/02*

00017

TENNESSEE VALLEY AUTHORITY		DIGITAL ULTRASONIC CALIBRATION DATA SHEET		REPORT NUMBER: <b>R157</b>								
PROJECT: BFN UNIT: 3		CYCLE: 10		CALIBRATION DATE: 03-29-02								
PROC.: N-UT- 55 REV:9		<del>TC: N/A</del>		CALIBRATION BLOCK NO.: BF-84-IR TEMP: 70.5°F								
INSTR. MFG: STAVELEY		DUE DATE: 08-11-02		SIMULATOR BLOCK NO: N/A								
MODEL/TYPE: SONIC-137		M & TE NO.: VH-5473		THERMOMETER S/N: 522352 DUE DATE: 05-17-02								
TRANSDUCER MFG: KRAUTKRAMER				COUPLANT SONOTRACE BATCH: 01141								
S/N DB 35164 SIZE: 1.0" FREQ: 2.25 MHz				EXAM TYPE: SHEAR <input type="checkbox"/> LONG <input type="checkbox"/> RL <input checked="" type="checkbox"/>								
CABLE TYPE: RG 174 LENGTH: 120 inches				ANGLE VERIFICATION								
DAC		BLOCK TYPE: CS IIW		S/N: DB 55074								
		NOMINAL ANGLE: 32°		ACTUAL ANGLE: N/A								
<p style="text-align: center;">DISPLAY WIDTH: 20 inches</p>		INSTRUMENT SETTINGS										
		REFLECTOR			REFERENCE		MEMORY					
		SCAN DIRECT.	NTCH	SDH	SENSITIVITY		NUMBER					
		AXIAL	<input checked="" type="checkbox"/>	<input type="checkbox"/>	63.8 dB		21					
		CIRC	<input type="checkbox"/>	<input type="checkbox"/>	N/A dB		N/A					
		FREQ: 2.25	MHz		REJECT: OFF %							
		ANGLE: N/A	deg		DAMPING: 200 ohms							
		DELAY: 1.35	msec		PULSER: 222							
		ZERO: N/A	msec		FILTER: FILT 1							
		VELOCITY: 0.235	msec		REP RATE: 4 KHZ							
RANGE: 20.0	inches		TOF: <input type="checkbox"/> PEAK <input checked="" type="checkbox"/> FLANK									
DISPLAY MODE: PE			POWER: AC									
DUAL: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF			TCG: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF									
CALIBRATION TIMES												
REF. REFLECTOR: N/A		GAIN: N/A dB		INITIAL TIME: 0940 FINAL TIME: 1410								
AMPLITUDE: N/A %		METAL PATH: N/A"										
VERIFICATION TIMES		1) N/A	2) N/A	3) N/A	4) N/A 5) N/A 6) N/A 7) N/A 8) N/A 9) N/A							
LINEARITY CHECK												
VERTICAL	SIGNAL 1		100	90	80	70	60	50	40	30	20	
	SIGNAL 2		50	45	40	35	30	25	20	15	10	
ATTENUATOR	GAIN	SET	-6 dB		-12 dB		SET		+12		SET +6	
	AMP	80%	32 TO 48		16 TO 24		20 %		64 TO 96		40% 64 TO 96	
			40		20				80		80	
COMMENTS:						WELDS/ITEMS EXAMINED:						
Wedge ID D-14795-250						REACTOR PRESSURE VESSEL						
						NIB-IR						
EXAMINER: DAVID KLEINJAN						EXAMINER: MIKE KLEINJAN						
<i>David Kleinjan</i>						<i>Mike Kleinjan</i>						
LEVEL: II						LEVEL: II						
REVIEWER:						ANII: <i>What Tull</i>						
<i>David Kleinjan</i>						DATE: 4/18/02						
LEVEL: III DATE: 4/18/02						PG.: 1 OF 4 4/18/02						

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00018

TENNESSEE VALLEY AUTHORITY		DIGITAL ULTRASONIC CALIBRATION DATA SHEET		REPORT NUMBER: <b>R157</b>								
PROJECT: BFN UNIT: 3 CYCLE: 10		CALIBRATION DATE: 03-29-02										
PROC.: N-UT- 55 REV:9 <del>03-08</del>		CALIBRATION BLOCK NO.: BF-84-IR TEMP: 70.5°F										
INSTR. MFG: STAVELEY DUE DATE: 08-11-02		SIMULATOR BLOCK NO: N/A										
MODEL/TYPE: SONIC-137 M & TE NO.: VH-5473		THERMOMETER S/N: 522352 DUE DATE: 05-17-02										
TRANSDUCER MFG: KRAUTKRAMER		COUPLANT SONOTRACE BATCH: 01141										
S/N DB 35163 SIZE: 1.0" FREQ: 2.25 MHz		EXAM TYPE: SHEAR <input type="checkbox"/> LONG <input type="checkbox"/> RL <input checked="" type="checkbox"/>										
CABLE TYPE: RG 174 LENGTH: 120 inches		ANGLE VERIFICATION										
DAC		BLOCK TYPE: CS IIW		S/N: DB 55074								
		NOMINAL ANGLE: 28		ACTUAL ANGLE: N/A								
<div style="display: flex; align-items: center;"> <div style="flex: 1;"> </div> <div style="flex: 0.2; text-align: center; font-weight: bold;">A M P L I T U D E</div> </div> <p style="text-align: center;">DISPLAY WIDTH: 20 inches</p>		INSTRUMENT SETTINGS										
		REFLECTOR			REFERENCE		MEMORY					
		SCAN DIRECT. NTCH SDH			SENSITIVITY		NUMBER					
		AXIAL <input checked="" type="checkbox"/> CIRC <input type="checkbox"/>			63.6 dB		20					
					N/A dB		N/A					
		FREQ: 2.25 MHz			REJECT: OFF %							
		ANGLE: N/A deg			DAMPING: 200 ohms							
		DELAY: 1.66 msec			PULSER: 222							
		ZERO: N/A msec			FILTER: FILT 1							
		VELOCITY: 0.233 msec			REP RATE: 4 KHZ							
RANGE: 20.0 inches			TOF: <input type="checkbox"/> PEAK <input checked="" type="checkbox"/> FLANK									
DISPLAY MODE: PE			POWER: AC									
DUAL: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF			TCG: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF									
CALIBRATION TIMES												
REF. REFLECTOR: N/A		GAIN: N/A dB		INITIAL TIME: 0830 FINAL TIME: 1400								
AMPLITUDE: N/A %		METAL PATH: N/A"										
VERIFICATION TIMES		1)N/A 2)N/A 3)N/A		4)N/A 5)N/A 6)N/A 7)N/A 8)N/A 9)N/A								
LINEARITY CHECK												
VERTICAL	SIGNAL 1		100	90	80	70	60	50	40	30	20	
	SIGNAL 2		50	45	40	35	30	25	20	15	10	
ATTENUATOR	GAIN	SET	-6 dB	-12 dB	SET	+12	SET	+6				
	AMP	80%	32 TO 48	16 TO 24	20 %	64 TO 96	40%	64 TO 96				
			40	20		80		80				
COMMENTS:						WELDS/ITEMS EXAMINED:						
Wedge ID D-14795-214						REACTOR PRESSURE VESSEL						
						NIB-IR						
EXAMINER:		EXAMINER:		REVIEWER:		AND						
DAVID KLEINJAN		MIKE KLEINJAN		<i>[Signature]</i>		<i>[Signature]</i>						
LEVEL: II		LEVEL: II		LEVEL: II		DATE: 4/18/02		PG.: 14 OF 14				

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**Inspection Report R-158**  
**Weld N2A-NV**

00020

TENNESSEE VALLEY AUTHORITY		EXAMINATION SUMMARY AND RESOLUTION SHEET		REPORT NUMBER: <b>R158</b>	
PROJECT: BFN UNIT: 3		CYCLE: 10		COMPONENT ID: N2A	
EXAMINATION METHOD				SYSTEM RPV ISI DWG. NO. 3-ISI-0328-C	
MT <input type="checkbox"/>	PT <input type="checkbox"/>	UT <input checked="" type="checkbox"/>	VT <input type="checkbox"/>	CODE CLASS: 1	CATEGORY: B-D
PROCEDURE: N-UT-9		REV: 9	TC: 02-06	COFIG.: Nozzle	TO Vessel
EXAMINER: MIKE KLEINJAN		EXAMINER: DAVID KLEINJAN		EXAMINER: N/A	EXAMINER: N/A
LEVEL: <i>II</i>		LEVEL: II		LEVEL: N/A	LEVEL: N/A

This report contains the data associated with the manual ultrasonic examination of code category B-D, Nozzle to Vessel welds. This examination report satisfies ASME section XI requirements for the Nozzle to shell weld..

Examination. Nozzle to Vessel weld N2A

Transverse coverage for the Nozzle to Vessel weld was supplemented by the inner radius examination.

(N2A-IR) *See R159*

0° was used on the weld crown and base material Vessel side

45° was used on the vessel side only scanning over the weld crown

45° Tangent to the weld was used on vessel side CW/CCW

45° Parallel to the weld was used on vessel side CW/CCW

60° was used on the vessel side only scanning over the weld crown

60° Tangent to the weld was used on vessel side CW/CCW

60° Parallel to the weld was used on vessel side CW/CCW

77% code coverage was obtained

This exam was performed with equipment, Procedures, and personnel qualified in accordance with ASME Section XI

*No RECORDABLE INDICATIONS*

RESOLUTION BY: Mike Kleinjan <i>Mike Kleinjan</i>		REVIEWED BY: <i>David Kleinjan</i>		ANII: <i>Robert Hall</i>	
LEVEL: II DATE: <i>4-4-02</i>		LEVEL: <i>III</i> DATE: <i>4/4/02</i>		DATE: <i>4/18/02</i>	
				PG. 1 OF 15	

Calculation of ASME code coverage  
For section XI NDE Examination

N2A

1) 0 degree (weld metal scan)	100%
2) 45 degree Transverse-scan from vessel side of weld	100%
3) 45 degree Transverse-scan from nozzle side of weld	0%
4) 60 degree Transverse-scan from vessel side of weld	100%
5) 60 degree Transverse-scan from nozzle side of weld	0%
6) 45 degree Parallel-scan CW direction	100% *
7) 45 degree Parallel-scan CCW direction	100% *
8) 60 degree Parallel-scan CW direction	100% *
9) 60 degree Parallel-scan CCW direction	100% *

The sum of all the percentage of scans	700%
Divided by the total # of scans	9
Percentage of examination Volume coverage	77%

\* Transverse coverage includes coverage obtained during the inner radius examination.

H/S BCT  
4/10/02



00022

<b>TENNESSEE VALLEY AUTHORITY</b>		<b>DIGITAL ULTRASONIC CALIBRATION DATA SHEET</b>		<b>REPORT NUMBER: R158</b>								
PROJECT: BFN UNIT: 3 CYCLE: 10		CALIBRATION DATE: 4-1-02										
PROC.: N-UT- 9 REV:9 TC:02-06		CALIBRATION BLOCK NO.: BF18 TEMP: 72.6°F										
INSTR. MFG: Staveley DUE DATE: 8-05-02		SIMULATOR BLOCK NO: DB55079										
MODEL/TYPE: Sonic 136 M & TE NO.: VH751		THERMOMETER S/N: 522352 DUE DATE: 5-17-02										
TRANSDUCER MFG: Harisonic		COUPLANT SONOTRACE BATCH: 01141										
S/N DB34198 SIZE: .75 FREQ: 2.25 MHz		EXAM TYPE: SHEAR <input type="checkbox"/> LONG <input checked="" type="checkbox"/> RL <input type="checkbox"/>										
CABLE TYPE: RG174 LENGTH: 120 inches		<b>ANGLE VERIFICATION</b>										
<b>DAC</b>		BLOCK TYPE: <i>Rampus Rampus</i> S/N: DB55079										
		NOMINAL ANGLE: 0		ACTUAL ANGLE: N/A								
<p style="text-align: center;">DISPLAY WIDTH: 10 inches</p>		<b>INSTRUMENT SETTINGS</b>										
		<b>REFLECTOR</b>		<b>REFERENCE</b>		<b>MEMORY</b>						
		SCAN DIRECT.	NTCH	SDH	SENSITIVITY		NUMBER					
		AXIAL	<input type="checkbox"/>	<input checked="" type="checkbox"/>	20.8 dB		1					
		CIRC	<input type="checkbox"/>	<input type="checkbox"/>	n/a dB		n/a					
		FREQ: 2.25 MHz		REJECT: off %								
		ANGLE: n/a deg		DAMPING: 500 ohms								
		DELAY: .499 msec		PULSER: 222								
		ZERO: n/a msec		FILTER: Filt 3								
		VELOCITY: .238 msec		REP RATE: 2KHZ								
RANGE: 10 inches		TOF: <input checked="" type="checkbox"/> PEAK <input type="checkbox"/> FLANK										
DISPLAY MODE: PE		POWER: AC										
DUAL: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF		TCG: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF										
REF. REFLECTOR: 1" GAIN: 8 dB		<b>CALIBRATION TIMES</b>										
AMPLITUDE: 80 % METAL PATH: 1"		INITIAL TIME: 13:30		FINAL TIME: 18:00								
VERIFICATION TIMES		1) 11:45	2) n/a	3) n/a	4) n/a	5) n/a	6) n/a	7) n/a	8) n/a	9) n/a		
<b>LINEARITY CHECK</b>												
VERTICAL	SIGNAL 1		100	90	80	70	60	50	40	30	20	
	SIGNAL 2		50	45	40	35	30	25	20	15	10	
ATTENUATOR	GAIN	SET	-6 dB		-12 dB		SET		+12		SET	+6
	AMP	80%	32 TO 48		16 TO 24		20 %		64 TO 96		40% 64 TO 96	
			40		20				80		80	
<b>COMMENTS:</b>							<b>WELDS/ITEMS EXAMINED:</b>					
							N2A, N2C, N2E Nozzle to Shell					
<b>EXAMINER:</b>							<b>REVIEWER:</b>		<b>ANII:</b>			
MIKE W. KLEINJAN			DAVID KLEINJAN			<i>[Signature]</i>		<i>[Signature]</i>		<i>[Signature]</i>		
LEVEL: II			LEVEL: II			LEVEL: III		DATE: 4/4/02		DATE: 4/10/02		
									PG.: 13 OF 15			
									4/10/02			

00023

<b>TENNESSEE VALLEY AUTHORITY</b>			<b>DIGITAL ULTRASONIC CALIBRATION DATA SHEET</b>			<b>REPORT NUMBER:</b> <span style="font-size: 1.2em;">R158</span>															
PROJECT: BFN		UNIT: 3	CYCLE: 10		CALIBRATION DATE: 4-1-02																
PROC.: N-UT-		9	REV:9		TC:02-06		CALIBRATION BLOCK NO.: BF18														
INSTR. MFG: Staveley		DUE DATE: 8-05-02			TEMP: 72.6°F																
MODEL/TYPE: Sonic 136		M & TE NO.: VH751			SIMULATOR BLOCK NO: DB55079																
TRANSDUCER MFG: Krautkramer					THERMOMETER S/N: 522352																
S/N DB34843		SIZE: .5x1	FREQ: 2.25 MHz		DUE DATE: 5-17-02																
CABLE TYPE: RG1743		LENGTH: 120 inches			COUPLANT SONOTRACE BATCH: 01141																
					EXAM TYPE: SHEAR <input checked="" type="checkbox"/> LONG <input type="checkbox"/> RL <input type="checkbox"/>																
<b>ANGLE VERIFICATION</b>																					
BLOCK TYPE: IIW					S/N: DB55074																
NOMINAL ANGLE: 45°					ACTUAL ANGLE: 46°																
<b>INSTRUMENT SETTINGS</b>																					
<b>REFLECTOR</b>						<b>REFERENCE</b>		<b>MEMORY</b>													
SCAN DIRECT.		NTCH		SDH		SENSITIVITY		NUMBER													
AXIAL		<input type="checkbox"/>		<input checked="" type="checkbox"/>		45.6 dB		2													
CIRC		<input type="checkbox"/>		<input type="checkbox"/>		n/a dB		n/a													
FREQ: 2.25		MHz		REJECT: off		%															
ANGLE: N/A		deg		DAMPING: 500		ohms															
DELAY: .830		msec		PULSER: 222																	
ZERO: N/A		msec		FILTER: FITL 3																	
VELOCITY: .126		msec		REP RATE: 2KHZ																	
RANGE: 20		inches		TOF: <input checked="" type="checkbox"/> PEAK <input type="checkbox"/> FLANK																	
DISPLAY MODE: PE				POWER: AC																	
DUAL: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF				TCG: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF																	
<b>CALIBRATION TIMES</b>																					
INITIAL TIME: 13:30				FINAL TIME: 18:00																	
VERIFICATION TIMES		1) 4:45		2) n/a		3) n/a		4) n/a													
		5) n/a		6) n/a		7) n/a		8) n/a													
		9) n/a																			
<b>LINEARITY CHECK</b>																					
<b>VERTICAL</b>		SIGNAL 1		100		90		80		70		60		50		40		30		20	
		SIGNAL 2		50		45		40		35		30		25		20		15		10	
<b>ATTENUATOR</b>		GAIN		SET		-6 dB		-12 dB		SET		+12		SET		+6					
		AMP		80%		32 TO 48		16 TO 24		20 %		64 TO 96		40%		64 TO 96					
						40		20				80				80					
<b>COMMENTS:</b>												<b>WELDS/ITEMS EXAMINED:</b>									
Delta difference between 3/8 to 5/8 on the clad side is 3 dB												N2A, N2C, N2E Nozzle to Shell									
<b>EXAMINER:</b> MIKE W. KLEINJAN <i>Mike W. Kleinjan</i> LEVEL: II				<b>EXAMINER:</b> DAVID KLEINJAN <i>D. Kleinjan</i> LEVEL: II				<b>REVIEWER:</b> <i>David Whitaker</i> LEVEL: III				<b>DATE:</b> 4/18/02 PG: 24 OF 15 <i>John 4/18/02</i>									

00024

TENNESSEE VALLEY AUTHORITY		DIGITAL ULTRASONIC CALIBRATION DATA SHEET		REPORT NUMBER: <b>R158</b>								
PROJECT: BFN UNIT: 3 CYCLE: 10		CALIBRATION DATE: 4-1-02										
PROC.: N-UT- 9 REV:9 TC:02-06		CALIBRATION BLOCK NO.: BF18 TEMP: 72.6°F										
INSTR. MFG: Staveley DUE DATE: 8-05-02		SIMULATOR BLOCK NO: DB55079										
MODEL/TYPE: Sonic 136 M & TE NO.: VH751		THERMOMETER S/N: 522352 DUE DATE: 5-17-02										
TRANSDUCER MFG: Krautkramer		COUPLANT SONOTRACE BATCH: 01141										
S/N DB34154 SIZE: .5x1 FREQ: 2.25 MHz		EXAM TYPE: SHEAR <input checked="" type="checkbox"/> LONG <input type="checkbox"/> RL <input type="checkbox"/>										
CABLE TYPE: RG174 LENGTH: 120 inches		ANGLE VERIFICATION										
DAC		BLOCK TYPE: IIW		S/N: DB55074								
		NOMINAL ANGLE: 60		ACTUAL ANGLE: 59								
<p style="text-align: center;">DISPLAY WIDTH: 10 inches</p>		INSTRUMENT SETTINGS										
		REFLECTOR			REFERENCE		MEMORY					
		SCAN DIRECT.	NTCH	SDH	SENSITIVITY		NUMBER					
		AXIAL	<input type="checkbox"/>	<input checked="" type="checkbox"/>	52 dB		3					
		CIRC	<input type="checkbox"/>	<input type="checkbox"/>	n/a dB		n/a					
		FREQ: 2.25 MHz		REJECT: off %								
		ANGLE: N/A deg		DAMPING: 500 ohms								
		DELAY: 1.20 msec		PULSER: 222								
		ZERO: N/A msec		FILTER: FITL 3								
		VELOCITY: .123 msec		REP RATE: 2KHZ								
RANGE: 20 inches		TOF: <input checked="" type="checkbox"/> PEAK <input type="checkbox"/> FLANK										
DISPLAY MODE: PE		POWER: AC										
DUAL: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF		TCG: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF										
CALIBRATION TIMES												
REF. REFLECTOR: 1"		GAIN: 36 dB		INITIAL TIME: 13:30 ✓								
AMPLITUDE: 80 %		METAL PATH: 1"		FINAL TIME: 18:00 ✓								
VERIFICATION TIMES		1) n/a	2) n/a	3) n/a	4) n/a							
		5) n/a	6) n/a	7) n/a	8) n/a							
		9) n/a										
LINEARITY CHECK												
VERTICAL	SIGNAL 1		100	90	80	70	60	50	40	30	20	
	SIGNAL 2		50	45	40	35	30	25	20	15	10	
ATTENUATOR	GAIN	SET	-6 dB		-12 dB		SET		+12		SET	+6
	AMP	80%	32 TO 48		16 TO 24		20 %		64 TO 96		40% 64 TO 96	
			40		20				80		80	
COMMENTS:						WELDS/ITEMS EXAMINED:						
DELTA dB DIFFERENCE IS 4.4 FROM THE 3/8 TO 5/8 ON THE						N2A, N2C, N2E Nozzle to Shell						
CLAD SIDE												
EXAMINER:		EXAMINER:		REVIEWER:		ANI						
MIKE W. KLEINJAN		DAVID KLEINJAN		<i>[Signature]</i>		<i>[Signature]</i>						
<i>with as X-ray</i>		<i>[Signature]</i>		LEVEL: II		DATE: 4/1/02		DATE: 4/1/02				
LEVEL: II		LEVEL: II		LEVEL: II		DATE: 4/1/02		PG.: 25 OF 15				

Jan 4/1/02

00025

TENNESSEE VALLEY AUTHORITY		DIGITAL ULTRASONIC CALIBRATION DATA SHEET		REPORT NUMBER: <b>R158</b>								
PROJECT: BFN UNIT: 3 CYCLE: 10		CALIBRATION DATE: 04-01-02										
PROC.: N-UT- 55 REV:9 <del>OK</del> TC: <del>N/A</del> <del>08</del>		CALIBRATION BLOCK NO.: BF-85-IR TEMP: 68.1° F										
INSTR. MFG: STAVELEY DUE DATE: 08-11-02		SIMULATOR BLOCK NO: N/A										
MODEL/TYPE: SONIC-137 M & TE NO.: VH-5473		THERMOMETER S/N: 522352 DUE DATE: 05-17-02										
TRANSDUCER MFG: KRAUTKRAMER		COUPLANT SONOTRACE BATCH: 01141										
S/N DB 35164 SIZE: 1.0" FREQ: 2.25 MHz		EXAM TYPE: SHEAR <input type="checkbox"/> LONG <input type="checkbox"/> RL <input checked="" type="checkbox"/>										
CABLE TYPE: RG 174 LENGTH: 120 inches		ANGLE VERIFICATION										
DAC		BLOCK TYPE: CS IIW		S/N: DB 55074								
		NOMINAL ANGLE: 25°		ACTUAL ANGLE: N/A								
<p style="text-align: center;">DISPLAY WIDTH: 20 inches</p>		INSTRUMENT SETTINGS										
		REFLECTOR			REFERENCE		MEMORY					
		SCAN DIRECT.	NTCH	SDH	SENSITIVITY		NUMBER					
		AXIAL	<input checked="" type="checkbox"/>	<input type="checkbox"/>	60.0 dB		25					
		CIRC	<input type="checkbox"/>	<input type="checkbox"/>	N/A dB		N/A					
		FREQ: 2.25 MHz			REJECT: OFF %							
		ANGLE: N/A deg			DAMPING: 200 ohms							
		DELAY: 1.12 msec			PULSER: 222							
		ZERO: N/A msec			FILTER: FILT 1							
		VELOCITY: 0.234 msec			REP RATE: 4 KHZ							
RANGE: 20.0 inches			TOF: <input type="checkbox"/> PEAK <input checked="" type="checkbox"/> FLANK									
DISPLAY MODE: PE			POWER: AC									
DUAL: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF			TCG: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF									
REF. REFLECTOR: N/A		GAIN: N/A dB		CALIBRATION TIMES								
AMPLITUDE: N/A %		METAL PATH: N/A"		INITIAL TIME: 1355 FINAL TIME: 1805								
VERIFICATION TIMES		1)N/A	2)N/A	3)N/A	4)N/A	5)N/A						
		6)N/A	7)N/A	8)N/A	9)N/A							
LINEARITY CHECK												
VERTICAL	SIGNAL 1		100	90	80	70	60	50	40	30	20	
	SIGNAL 2		50	45	40	35	30	25	20	15	10	
ATTENUATOR	GAIN	SET	-6 dB	-12 dB	SET	+12	SET	+6				
	AMP	80%	32 TO 48	16 TO 24	20 %	64 TO 96	40%	64 TO 96				
			40	20		80		80				
COMMENTS:							WELDS/ITEMS EXAMINED:					
							REACTOR PRESSURE VESSEL					
							N2A-IR, N2C-IR, N2E-IR					
							Wedge ID D-14795-147					
EXAMINER: DAVID KLEINJAN <i>David Kleinjan</i> LEVEL: II		EXAMINER: MIKE KLEINJAN <i>Mike Kleinjan</i> LEVEL: II		REVIEWER: <i>Sal Whiteley</i> LEVEL: III DATE: 4/4/02		ANTI: <i>Mike Kleinjan</i> DATE: 4/18/02 PG.: 16 OF 15 <i>done 4/18/02</i>						

00026

<b>TENNESSEE VALLEY AUTHORITY</b>		<b>DIGITAL ULTRASONIC CALIBRATION DATA SHEET</b>		<b>REPORT NUMBER: <i>R158</i></b>									
PROJECT: BFN UNIT: 3 CYCLE: 10		CALIBRATION DATE: 04-01-02											
PROC.: N-UT- 55 REV:9 <del>DB TC: N/A</del>		CALIBRATION BLOCK NO.: BF-85-IR TEMP: 68.1° F											
INSTR. MFG: STAVELEY DUE DATE: 08-11-02		SIMULATOR BLOCK NO: N/A											
MODEL/TYPE: SONIC-137 M & TE NO.: VH-5473		THERMOMETER S/N: 522352 DUE DATE: 05-17-02											
TRANSDUCER MFG: KRAUTKRAMER		COUPLANT SONOTRACE BATCH: 01141											
S/N DB 35163 SIZE: 1.0" FREQ: 2.25 MHz		EXAM TYPE: SHEAR <input type="checkbox"/> LONG <input type="checkbox"/> RL <input checked="" type="checkbox"/>											
CABLE TYPE: RG 174 LENGTH: 120 inches		<b>ANGLE VERIFICATION</b>											
<b>DAC</b>		BLOCK TYPE: CS IIW		S/N: DB 55074									
		NOMINAL ANGLE: 19°		ACTUAL ANGLE: N/A									
		<b>INSTRUMENT SETTINGS</b>											
<p style="text-align: center;">DISPLAY WIDTH: 20 inches</p>		<b>REFLECTOR</b>		<b>REFERENCE</b>	<b>MEMORY</b>								
		SCAN DIRECT.	NTCH	SDH	SENSITIVITY	NUMBER							
		AXIAL	<input checked="" type="checkbox"/>	<input type="checkbox"/>	57.2 dB	19							
		CIRC	<input type="checkbox"/>	<input type="checkbox"/>	N/A dB	N/A							
		FREQ: 2.25	MHz		REJECT: OFF	%							
		ANGLE: N/A	deg		DAMPING: 200	ohms							
		DELAY: 0.996	msec		PULSER: 222								
		ZERO: N/A	msec		FILTER: FILT 1								
		VELOCITY: 0.234	msec		REP RATE: 4 KHZ								
		RANGE: 20.0	inches		TOF: <input type="checkbox"/> PEAK <input checked="" type="checkbox"/> FLANK								
DISPLAY MODE: PE		POWER: AC											
DUAL: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF		TCG: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF											
REF. REFLECTOR: N/A GAIN: N/A dB		<b>CALIBRATION TIMES</b>											
AMPLITUDE: N/A % METAL PATH: N/A"		INITIAL TIME: 1245		FINAL TIME: 1807									
VERIFICATION TIMES		1)N/A	2)N/A	3)N/A	4)N/A	5)N/A	6)N/A	7)N/A	8)N/A	9)N/A			
<b>LINEARITY CHECK</b>													
VERTICAL	SIGNAL 1		100	90	80	70	60	50	40	30	20		
	SIGNAL 2		50	45	40	35	30	25	20	15	10		
ATTENUATOR	GAIN	SET	-6 dB		-12 dB		SET		+12		SET		+6
	AMP	80%	32 TO 48		16 TO 24		20 %		64 TO 96		40%		64 TO 96
			40		20				80				80
<b>COMMENTS:</b>						<b>WELDS/ITEMS EXAMINED:</b>							
						REACTOR PRESSURE VESSEL							
						N2A-IR, N2C-IR, N2E-IR							
						Wedge ID D-14795-144							
EXAMINER: DAVID KLEINJAN <i>D.K. Kleinjan</i> LEVEL: II			EXAMINER: MIKE KLEINJAN <i>Mike Kleinjan</i> LEVEL: II			REVIEWER: <i>[Signature]</i> LEVEL: III DATE: 4/4/02			ANII:  DATE: PG.: 17 OF 15 <i>for 4/18/02</i>				

TVA

MANUAL ULTRASONIC VESSEL  
EXAMINATION DATA SHEET

REPORT NO.

R158

PROJECT: BFN UNIT: 3 WELD ID: N2A CONFIG.: Nozzle COMPONENT: VesselCAL. SHT. NO.: NA PROCEDURE: NT-UT-9 REV.: 9 PCR.: 02-00 TEMP.: 85 PYRO.: 522352SCAN SENS.: \* dB EXAM START: 4/01/02 14:30 EXAM END: 1520 EXAM ANGLE: 0°, 45°, 60°Lo LOCATION: TDC Wo LOCATION: E OF WELD

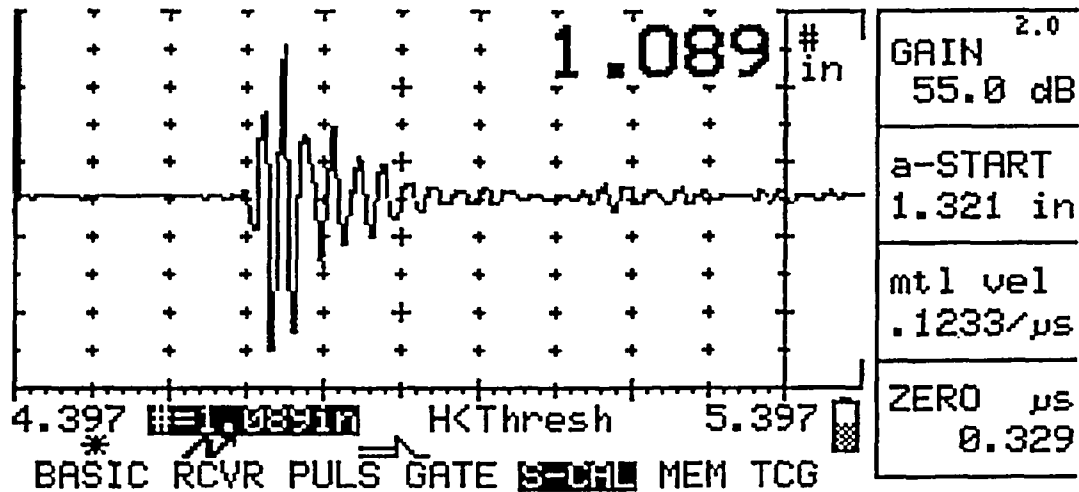
IND NO.	20%			50%			100%			MAX. AMP.			20%			50%			100%		
	Mp1	W1	L1	Mp1	W1	L1	Mp1	W1	L1	Mp	W	L	Mp2	W2	L2	Mp2	W2	L2	Mp2	W2	L2
				*																	
19°	SCAN		dB	63.2			SCANNING	#	10/11	BLEND RADIUS											
25°	SCAN		dB	66.			SCANNING	#	10/11	BLEND RADIUS											
0°	SCAN		dB	34.8			SCANNING	#	9	ON WELD AND BASE MATERIAL											
45°	SCAN		dB	56.6			SCANNING	#	9	ON WELD AND VESSEL SIDE											
45°T	SCAN		dB	56.6			SCANNING	#	10/11	CW/CCW VESSEL SIDE											
45°TAN	SCAN		dB	56.6			SCANNING	#	10/11	CW/CCW VESSEL SIDE											
60°	SCAN		dB	63.			SCANNING	#	9	ON WELD AND VESSEL SIDE											
60°T	SCAN		dB	63.			SCANNING	#	10/11	CW/CCW VESSEL SIDE											
60°TAN	SCAN		dB	63.			SCANNING	#	10/11	CW/CCW VESSEL SIDE											

COMMENTS: 19° AND 25° EXAMINATIONS ARE THE BLEND RADIUS EXAMINATIONS  
 TRANSVERSE EXAMINATION COVERAGE WILL INCLUDE COVERAGE OBTAINED DURING THE  
 INNER RADIUS EXAMINATIONS. 5 TO 10% Noise Level was observed

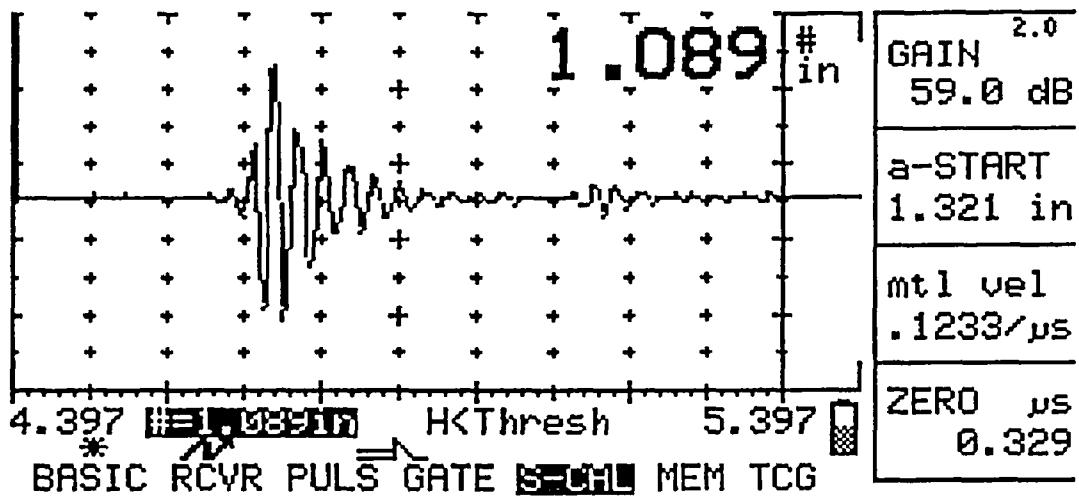
EXAMINER: W. W. & L. W. LEVEL: II DATE: 4-4-02 REVIEWED BY: J. L. Winters LEVEL: III DATE: 4/4/02  
 EXAMINER: W. K. Klega LEVEL: II DATE: 04-01-02 ANI: W. K. Klega DATE: 4/18/02 PAGE 8 OF 15

00028 Report Number  
R158

Nozzle Examination 45 °Waveforms



45° Pre Waveform

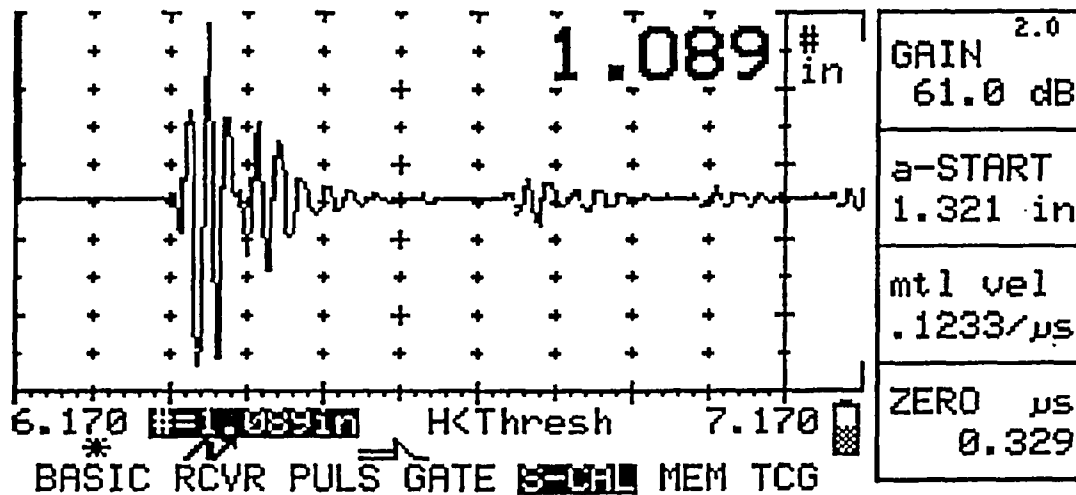


45° Post Waveform

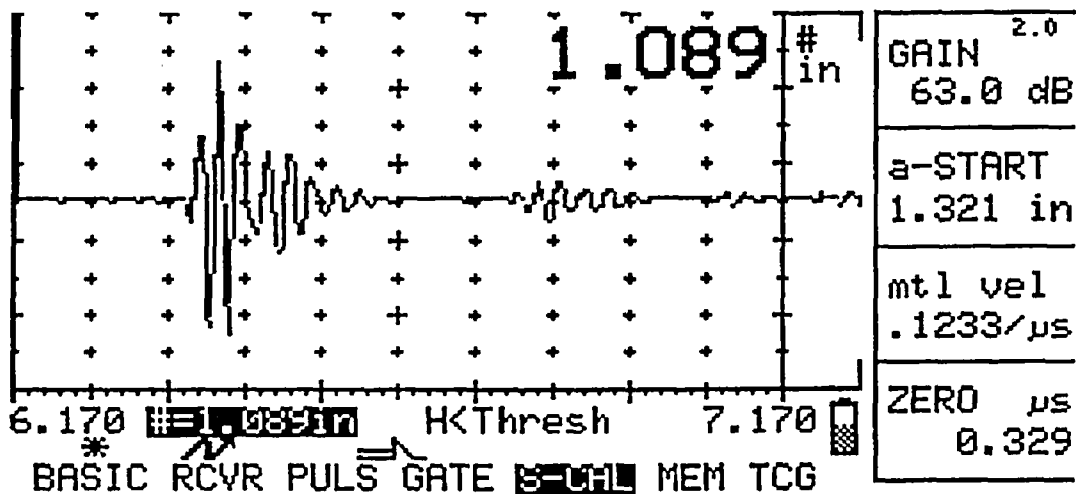
HSBCT  
4/18/02  
A/H

Report Number 00029  
R158

# Nozzle Examination 60 ° Waveforms



60° Pre Waveform



60° Post Waveform

HSBCT  
ATY  
4/18/02



<b>TVA</b>	<b>BEAM SPREAD AND RESOLUTION DATA SHEET</b>	REPORT NO. <b>R158</b>								
PROJECT: <u>BF 11</u> UNIT: <u>3</u> CALIBRATION BLOCK NO.: <u>BF 18</u>										
PROCEDURE NO.: <u>N-UT-9</u> REV.: <u>9</u> PCR: <u>5206 7/12/02 3-30-02</u>										
SEARCH UNIT-MAKE: <u>Krautkramer</u> SIZE: <u>15X1</u> FREQ.: <u>2.25</u>										
S/N: <u>DB 34843</u> ANGLE: <u>45</u>										
ULTRASONIC INSTRUMENT-MAKE: <u>Smec 13C</u> S/N: <u>VH 751</u>										
<b>BEAM SPREAD</b>										
	TRAILING RAY					LEADING RAY				
HOLE DEPTH	20% W	DAC MP	50% W	DAC MP	100% MP	DAC W	20% MP	DAC W	50% W	DAC MP
1/4T	1 1/8	1.9	1 1/4	2.	2.1	1 5/8	2.4	2	1 7/8	2.3
1/2T	2 7/8	4	3	4.1	4.3	3 1/4	4.8	4 1/8	3 3/4	4.6
3/4T	4 1/4	6	4 1/2	6.3	6.5	4 7/8	7	5 7/8	5 1/4	6.8
<b>RESOLUTION</b>										
NEAR SURFACE REFLECTOR: <u>Notch OD</u> DEPTH: <u>25</u> SIZE: <u>.253</u> CAL BLK.: <u>BF 18</u>										
FAR SURFACE REFLECTOR: <u>Notch ID</u> DEPTH: <u>6.1</u> SIZE: <u>.253</u>										
SCANNING REFLECTORS PROVIDE 50% DAC SIGNALS AT SCANNING SPEED <input checked="" type="checkbox"/> Y <input type="checkbox"/> N										
EXAMINER: <u>M. W. Hagen</u>					REVIEWED BY: <u>John Whitaker</u>			ANIL: <u>Robert Hill</u>		
LEVEL: <u>II</u> DATE: <u>3-30-02</u>					LEVEL: <u>III</u> DATE: <u>4/4/02</u>			DATE: <u>4/18/02</u>		
								PAGE: <u>11</u> OF <u>15</u>		

TVA

BEAM SPREAD AND  
RESOLUTION DATA SHEET

REPORT NO.

R158

PROJECT: BFN UNIT: 3 CALIBRATION BLOCK NO.: BF 18PROCEDURE NO.: N-UT-9 REV.: 9 PCR: 0006 N/A 3-30-02SEARCH UNIT-MAKE: Krautkramer SIZE: .5x1 FREQ.: 2.25S/N: DB 34154 ANGLE: 60ULTRASONIC INSTRUMENT-MAKE: Seac 13C S/N: VH 751

## BEAM SPREAD

HOLE DEPTH	TRAILING RAY				LEADING RAY					
	20% DAC		50% DAC		100% DAC		20% DAC		50% DAC	
	W	MP	W	MP	MP	W	MP	W	W	MP
1/4T	2 1/8	2.4	2 3/8	2.7	2.9	2 5/8	3.2	3 1/8	2 7/8	3.1
1/2T	4 3/4	4.8	5	5.3	5.8	5 1/4	6.4	6 5/8	6	6.1
3/4T	8 3/8	7.6	7 1/4	8	8.7	7 7/8	9.6	8 5/8	8	9.1

6 J 4/11/02

LEADING RAY

TRAILING RAY

MAXIMUM

## RESOLUTION

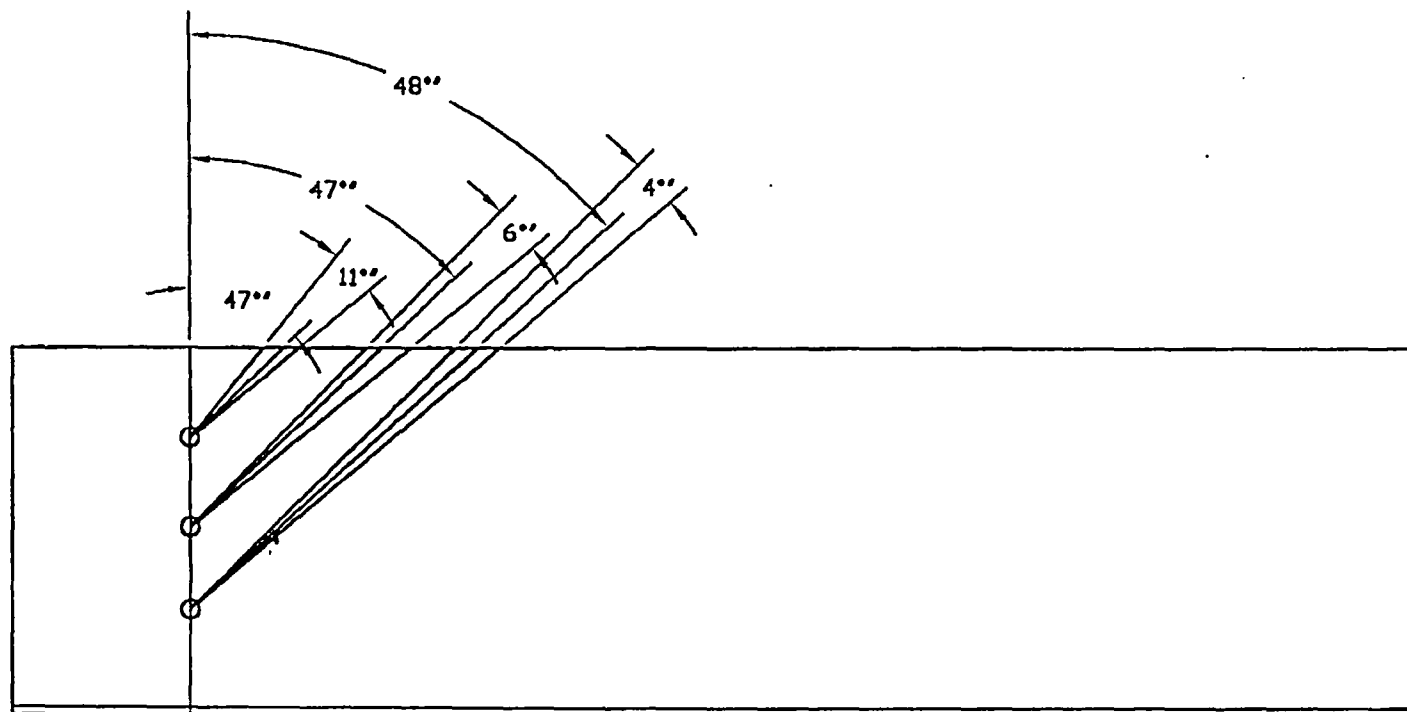
NEAR SURFACE REFLECTOR: Notch OD DEPTH: .25 SIZE: .253 CAL BLK.: BF 18FAR SURFACE REFLECTOR: Notch ID DEPTH: 6.1 SIZE: .253

## SCANNING

REFLECTORS PROVIDE 50% DAC SIGNALS AT SCANNING SPEED

Y ☒ N ☐EXAMINER: Mike W. Henry Jr.REVIEWED BY: [Signature]ANII: [Signature]LEVEL: II DATE: 3-30-02LEVEL: III DATE: 4/4/02DATE: 4/10/02PAGE: 10 OF 15

00032 Report Number  
R158

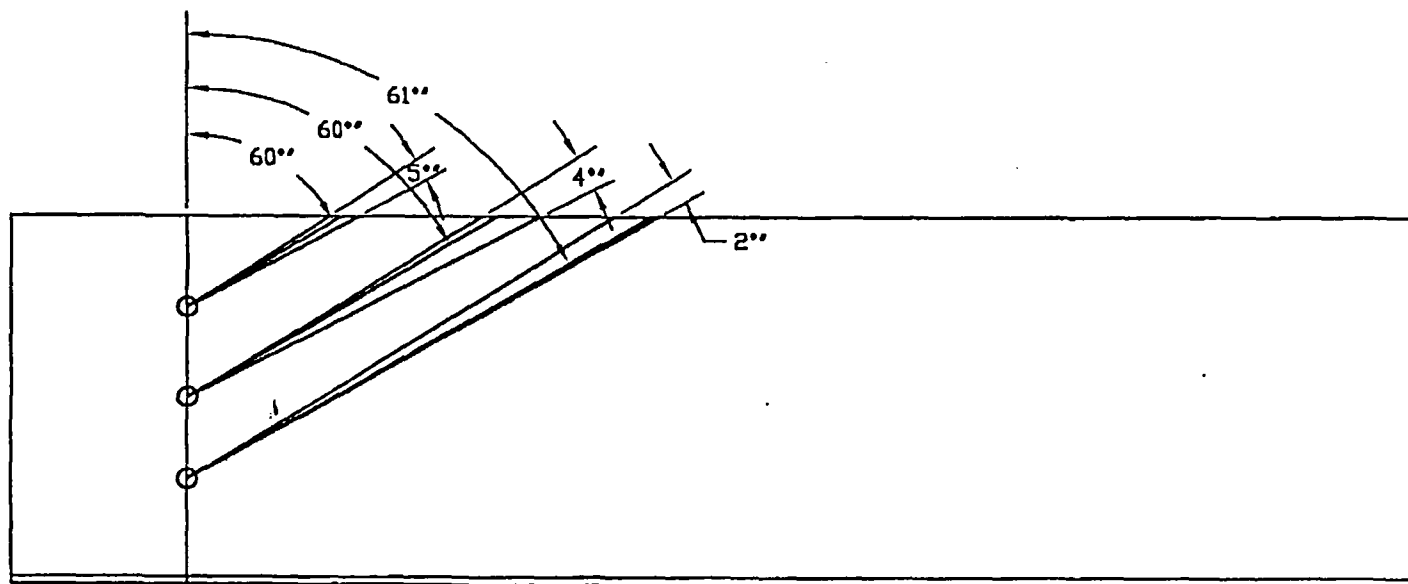


H50CT  
11/14  
4/18/99

13 08 15

Browns Ferry Unit 3
Beamsread
MARCH 2002
BF-18

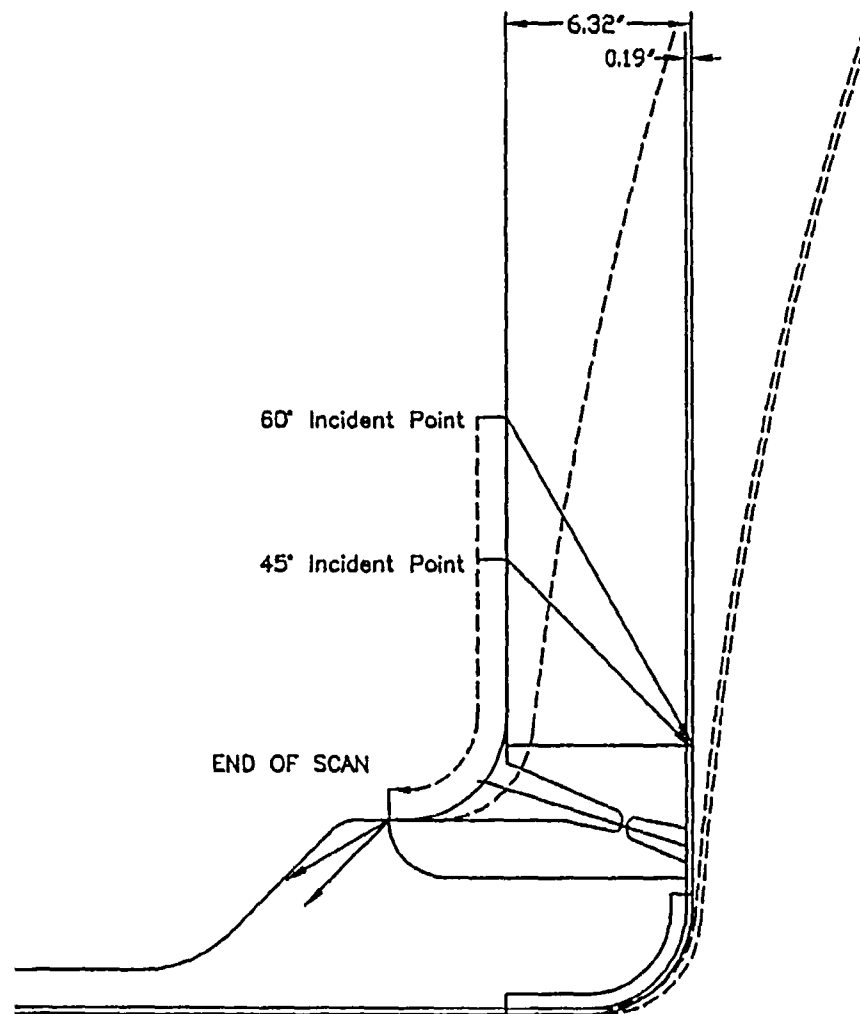
00033 Report Number  
R158



HSBCT  
1795H  
04/18/08  
SI 50 HI

Browns Ferry Unit 3
Beamspread
MARCH 2002
BF-18

00034 Report Number  
R158



Transverse coverage includes  
coverage obtained during the  
inner radius examination

†15BCT  
4/11/02  
4/18/02

Browns Ferry Unit 3
N2 Nozzle-to-Shell
MARCH 2002
SP-N2-NS

15 08 15

00035

TENNESSEE VALLEY AUTHORITY		EXAMINATION SUMMARY AND RESOLUTION SHEET		REPORT NUMBER: <b>R 159</b>	
PROJECT: BFN UNIT: 3		CYCLE: 10		COMPONENT ID: N2A-IR	
EXAMINATION METHOD				SYSTEM RPV	
				ISI DWG. NO. 3-ISI-0328-C	
MT <input type="checkbox"/>	PT <input type="checkbox"/>	UT <input checked="" type="checkbox"/>	VT <input type="checkbox"/>	CODE CLASS: 1	CATEGORY: B-D
PROCEDURE: N-UT-55		REV: 9	TC: <del>N/A</del> <b>AC-08</b>	COFIG.: Nozzle	TO Vessel
EXAMINER: MIKE KLEINJAN <i>10/26/02</i>		EXAMINER: DAVID KLEINJAN		EXAMINER: N/A	EXAMINER: N/A
LEVEL: <b>II</b>		LEVEL: <b>II</b>		LEVEL: N/A	LEVEL: N/A

This report contains the data associated with the manual ultrasonic examination of code category B-D, Nozzle Inner radius. This examination report satisfies ASME section XI requirements for the inner radius examination.

N2A-IR: This examination was performed using a 19° and 25° in the blend radius in two directions CW/CCW

100% code coverage was obtained

This exam was performed with equipment, Procedures, and personnel qualified in accordance with ASME Section XI.

*No Recordable Indication*

RESOLUTION BY: Mike Kleinjan <i>Mike Kleinjan</i>		REVIEWED BY: <i>[Signature]</i>		ANII: <i>What Told</i>	
LEVEL: <b>II</b> DATE: <b>4-4-02</b>		LEVEL: <b>II</b> DATE: <b>4/4/02</b>		DATE: <b>4/18/02</b>	
				PG. 1 OF <b>24</b> <i>12/14/02</i>	

00036

<b>TENNESSEE VALLEY AUTHORITY</b>			<b>DIGITAL ULTRASONIC CALIBRATION DATA SHEET</b>			<b>REPORT NUMBER: <i>R159</i></b>						
PROJECT: BFN UNIT: 3 CYCLE: 10			CALIBRATION DATE: 04-01-02									
PROC.: N-UT- 55 REV:9			CALIBRATION BLOCK NO.: BF-85-IR TEMP: 68.1° F									
INSTR. MFG: STAVELEY DUE DATE: 08-11-02			SIMULATOR BLOCK NO: N/A									
MODEL/TYPE: SONIC-137 M & TE NO.: VH-5473			THERMOMETER S/N: 522352 DUE DATE: 05-17-02									
TRANSDUCER MFG: KRAUTKRAMER			COUPLANT SONOTRACE BATCH: 01141									
S/N DB 35163 SIZE: 1.0" FREQ: 2.25 MHz			EXAM TYPE: SHEAR <input type="checkbox"/> LONG <input type="checkbox"/> RL <input checked="" type="checkbox"/>									
CABLE TYPE: RG 174 LENGTH: 120 inches			<b>ANGLE VERIFICATION</b>									
<b>DAC</b>			BLOCK TYPE: CS IIW			S/N: DB 55074						
			NOMINAL ANGLE: 19°			ACTUAL ANGLE: N/A						
<p>DISPLAY WIDTH: 20 inches</p>			<b>INSTRUMENT SETTINGS</b>									
			<b>REFLECTOR</b>			<b>REFERENCE</b>		<b>MEMORY</b>				
			SCAN DIRECT.	NTCH	SDH	SENSITIVITY		NUMBER				
			AXIAL	<input checked="" type="checkbox"/>	<input type="checkbox"/>	57.2 dB		19				
			CIRC	<input type="checkbox"/>	<input type="checkbox"/>	N/A dB		N/A				
			FREQ: 2.25	MHz		REJECT: OFF		%				
			ANGLE: N/A	deg		DAMPING: 200		ohms				
			DELAY: 0.996	msec		PULSER: 222						
			ZERO: N/A	msec		FILTER: FILT 1						
			VELOCITY: 0.234	msec		REP RATE: 4 KHZ						
RANGE: 20.0	inches		TOF: <input type="checkbox"/> PEAK <input checked="" type="checkbox"/> FLANK									
DISPLAY MODE: PE			POWER: AC									
DUAL: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF			TCG: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF									
REF. REFLECTOR: N/A GAIN: N/A dB			<b>CALIBRATION TIMES</b>									
AMPLITUDE: N/A % METAL PATH: N/A"			INITIAL TIME: 1245			FINAL TIME: 1807						
VERIFICATION TIMES			1)N/A	2)N/A	3)N/A	4)N/A	5)N/A	6)N/A	7)N/A	8)N/A	9)N/A	
<b>LINEARITY CHECK</b>												
VERTICAL	SIGNAL 1		100	90	80	70	60	50	40	30	20	
	SIGNAL 2		50	45	40	35	30	25	20	15	10	
ATTENUATOR	GAIN	SET	-6 dB		-12 dB		SET		+12		SET	+6
	AMP	80%	32 TO 48		16 TO 24		20 %		64 TO 96		40% 64 TO 96	
			40		20				80		80	
<b>COMMENTS:</b>						<b>WELDS/ITEMS EXAMINED:</b>						
Wedge ID D-14795-144						REACTOR PRESSURE VESSEL						
						N2A-IR, N2C-IR, N2E-IR						
EXAMINER: DAVID KLEINJAN <i>D.K. Kleinjan</i> LEVEL: II			EXAMINER: MIKE KLEINJAN <i>Mike Kleinjan</i> LEVEL: II			REVIEWER: <i>[Signature]</i> LEVEL: <i>II</i> DATE: <i>4/18/02</i>			ANI: <i>[Signature]</i> DATE: <i>4/18/02</i> PG.: <i>12 OF 14</i> 2 of 4 <i>from 4/19/02</i>			

00037

TENNESSEE VALLEY AUTHORITY		DIGITAL ULTRASONIC CALIBRATION DATA SHEET		REPORT NUMBER: <b>R159</b>							
PROJECT: BFN UNIT: 3		CYCLE: 10		CALIBRATION DATE: 04-01-02							
PROC.: N-UT- 55		REV: 9		CALIBRATION BLOCK NO.: BF-85-IR TEMP: 68.1° F							
INSTR. MFG: STAVELEY		DUE DATE: 08-11-02		SIMULATOR BLOCK NO: N/A							
MODEL/TYPE: SONIC-137		M & TE NO.: VH-5473		THERMOMETER S/N: 522352 DUE DATE: 05-17-02							
TRANSDUCER MFG: KRAUTKRAMER				COUPLANT SONOTRACE BATCH: 01141							
S/N DB 35164 SIZE: 1.0"		FREQ: 2.25 MHz		EXAM TYPE: SHEAR <input type="checkbox"/> LONG <input type="checkbox"/> RL <input checked="" type="checkbox"/>							
CABLE TYPE: RG 174		LENGTH: 120 inches		ANGLE VERIFICATION							
DAC		BLOCK TYPE: CS IIW		S/N: DB 55074							
		NOMINAL ANGLE: 25°		ACTUAL ANGLE: N/A							
<p>DISPLAY WIDTH: 20 inches</p>		INSTRUMENT SETTINGS									
		REFLECTOR			REFERENCE		MEMORY				
		SCAN DIRECT.	NTCH	SDH	SENSITIVITY		NUMBER				
		AXIAL	<input checked="" type="checkbox"/>	<input type="checkbox"/>	60.0 dB		25				
		CIRC	<input type="checkbox"/>	<input type="checkbox"/>	N/A dB		N/A				
		FREQ: 2.25	MHz		REJECT: OFF		%				
		ANGLE: N/A	deg		DAMPING: 200		ohms				
		DELAY: 1.12	msec		PULSER: 222						
		ZERO: N/A	msec		FILTER: FILT 1						
		VELOCITY: 0.234	msec		REP RATE: 4 KHZ						
RANGE: 20.0	inches		TOF: <input type="checkbox"/> PEAK <input checked="" type="checkbox"/> FLANK								
DISPLAY MODE: PE			POWER: AC								
DUAL: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF			TCG: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF								
CALIBRATION TIMES											
REF. REFLECTOR: N/A		GAIN: N/A dB		INITIAL TIME: 1355 FINAL TIME: 1805							
AMPLITUDE: N/A %		METAL PATH: N/A"		VERIFICATION TIMES							
1) N/A		2) N/A		3) N/A							
4) N/A		5) N/A		6) N/A							
7) N/A		8) N/A		9) N/A							
LINEARITY CHECK											
VERTICAL	SIGNAL 1		100	90	80	70	60	50	40	30	20
	SIGNAL 2		50	45	40	35	30	25	20	15	10
ATTENUATOR	GAIN	SET	-6 dB	-12 dB	SET	+12	SET	+6			
	AMP	80%	32 TO 48	16 TO 24	20 %	64 TO 96	40%	64 TO 96			
			40	20		80		80			
COMMENTS:						WELDS/ITEMS EXAMINED:					
Wedge ID D-14795-147						REACTOR PRESSURE VESSEL					
						N2A-IR, N2C-IR, N2E-IR					
EXAMINER:		EXAMINER:		REVIEWER:		ANIL:					
DAVID KLEINJAN		MIKE KLEINJAN		<i>[Signature]</i>		<i>[Signature]</i>					
<i>[Signature]</i>		<i>[Signature]</i>		DATE: 4/10/02		DATE: 4/10/02					
LEVEL: II		LEVEL: II		LEVEL: III		PG: 13 OF 14 3 of 4					

Jan 4/10/02



10038

**Inspection Report R-160**  
**Weld N2C-NV**

00039

TENNESSEE VALLEY AUTHORITY		EXAMINATION SUMMARY AND RESOLUTION SHEET		REPORT NUMBER: <i>R160</i>	
PROJECT: BFN UNIT: 3		CYCLE: 10		COMPONENT ID: N2C	
EXAMINATION METHOD				SYSTEM RPV	ISI DWG. NO. 3-ISI-0328-C
MT <input type="checkbox"/>	PT <input type="checkbox"/>	UT <input checked="" type="checkbox"/>	VT <input type="checkbox"/>	CODE CLASS: 1	CATEGORY: B-D
PROCEDURE: N_UT_9		REV:9	TC:02-06	COFIG.:	Nozzle TO Vessel
EXAMINER: MIKE KLEINJAN <i>4/11/02</i>		EXAMINER: DAVID KLEINJAN		EXAMINER: N/A	EXAMINER: N/A
LEVEL: <i>II</i>		LEVEL: II		LEVEL: N/A	LEVEL: N/A

This report contains the data associated with the manual ultrasonic examination of code category B-D, Nozzle to Vessel welds. This examination report satisfies ASME section XI requirements for the Nozzle to shell weld..

Examination. Nozzle to Vessel weld N2C

Transverse coverage for the Nozzle to Vessel weld was supplemented by the inner radius examination.

(N2C-IR) *see R161*

0° was used on the weld crown and base material Vessel side

45° was used on the vessel side only scanning over the weld crown

45° Tangent to the weld was used on vessel side CW/CCW

45° Parallel to the weld was used on vessel side CW/CCW

60° was used on the vessel side only scanning over the weld crown

60° Tangent to the weld was used on vessel side CW/CCW

60° Parallel to the weld was used on vessel side CW/CCW

77% code coverage was obtained

This exam was performed with equipment, Procedures, and personnel qualified in accordance with ASME Section XI

*No Recordable Indication*

RESOLUTION BY: Mike Kleinjan <i>Mike Kleinjan</i>		REVIEWED BY: <i>Joe L. Whitely</i>		ANII: <i>Albert T. Holt</i>	
LEVEL: II DATE: <i>4-4-02</i>		LEVEL: <i>II</i> DATE: <i>4/4/02</i>		DATE: <i>4/18/02</i>	
				PG. 1 OF 15	

00040  
REPORT Number  
R160

Calculation of ASME code coverage  
For section XI NDE Examination

N2C

1) 0 degree (weld metal scan)	100%
2) 45 degree Transverse-scan from vessel side of weld	100%
3) 45 degree Transverse-scan from nozzle side of weld	0%
4) 60 degree Transverse-scan from vessel side of weld	100%
5) 60 degree Transverse-scan from nozzle side of weld	0%
6) 45 degree Parallel-scan CW direction	100% *
7) 45 degree Parallel-scan CCW direction	100% *
8) 60 degree Parallel-scan CW direction	100% *
9) 60 degree Parallel-scan CCW direction	100% *

The sum of all the percentage of scans	700%
Divided by the total # of scans	9
Percentage of examination Volume coverage	77%

\* Transverse coverage includes coverage obtained during the inner radius examination.

HSBCJ  
4/18/02  
2 of 15  
5/14/02

00041

TENNESSEE VALLEY AUTHORITY		DIGITAL ULTRASONIC CALIBRATION DATA SHEET		REPORT NUMBER: <b>R160</b>							
PROJECT: BFN UNIT: 3 CYCLE: 10		CALIBRATION DATE: 4-1-02									
PROC.: N-UT- 9 REV:9 TC:02-06		CALIBRATION BLOCK NO.: BF18 TEMP: 72.6°F									
INSTR. MFG: Staveley DUE DATE: 8-05-02		SIMULATOR BLOCK NO: DB55079									
MODEL/TYPE: Sonic 136 M & TE NO.: VH751		THERMOMETER S/N: 522352 DUE DATE: 5-17-02									
TRANSDUCER MFG: Harisonic		COUPLANT SONOTRACE BATCH: 01141									
S/N DB34198 SIZE: .75 FREQ: 2.25 MHz		EXAM TYPE: SHEAR <input type="checkbox"/> LONG <input checked="" type="checkbox"/> RL <input type="checkbox"/>									
CABLE TYPE: RG174 LENGTH: 120 inches		ANGLE VERIFICATION									
DAC		BLOCK TYPE: <i>Recap</i> S/N: DB55079									
		NOMINAL ANGLE: 0		ACTUAL ANGLE: N/A							
<p style="text-align: center;">DISPLAY WIDTH: 10 inches</p>		INSTRUMENT SETTINGS									
		REFLECTOR			REFERENCE	MEMORY					
		SCAN DIRECT.	NTCH	SDH	SENSITIVITY	NUMBER					
		AXIAL	<input type="checkbox"/>	<input checked="" type="checkbox"/>	20.8 dB	1					
		CIRC	<input type="checkbox"/>	<input type="checkbox"/>	n/a dB	n/a					
		FREQ: 2.25 MHz			REJECT: off %						
		ANGLE: n/a deg			DAMPING: 500 ohms						
		DELAY: .499 msec			PULSER: 222						
		ZERO: n/a msec			FILTER: Filt 3						
		VELOCITY: .238 msec			REP RATE: 2KHZ						
RANGE: 10 inches			TOF: <input checked="" type="checkbox"/> PEAK <input type="checkbox"/> FLANK								
DISPLAY MODE: PE			POWER: AC								
DUAL: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF			TCG: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF								
CALIBRATION TIMES											
REF. REFLECTOR: 1" GAIN: 8 dB			INITIAL TIME: 13:30 FINAL TIME: 18:00								
AMPLITUDE: 80 % METAL PATH: 1"											
VERIFICATION TIMES			1) 11:45 2) n/a 3) n/a 4) n/a 5) n/a 6) n/a 7) n/a 8) n/a 9) n/a								
LINEARITY CHECK											
VERTICAL	SIGNAL 1	100	90	80	70	60	50	40	30	20	
	SIGNAL 2	50	45	40	35	30	25	20	15	10	
ATTENUATOR	GAIN	SET	-6 dB	-12 dB	SET	+12	SET	+6			
	AMP	80%	32 TO 48	16 TO 24	20 %	64 TO 96	40%	64 TO 96			
			40	20		80		80			
COMMENTS:						WELDS/ITEMS EXAMINED:					
						N2A, N2C, N2E Nozzle to Shell					
EXAMINER: MIKE W. KLEINJAN <i>Mike W. Kleinjan</i> LEVEL: II		EXAMINER: DAVID KLEINJAN <i>D. Kleinjan</i> LEVEL: II		REVIEWER: <i>David Kleinjan</i> LEVEL: II DATE: 4/1/02		ANII: <i>David Kleinjan</i> DATE: 4/18/02 PG.: 15 OF 15 3 OF 15 <i>David Kleinjan</i>					

00042

TENNESSEE VALLEY AUTHORITY		DIGITAL ULTRASONIC CALIBRATION DATA SHEET		REPORT NUMBER: <b>R160</b>									
PROJECT: BFN UNIT: 3 CYCLE: 10		CALIBRATION DATE: 4-1-02											
PROC.: N-UT- 9 REV:9 TC:02-06		CALIBRATION BLOCK NO.: BF18 TEMP: 72.6°F											
INSTR. MFG: Staveley DUE DATE: 8-05-02		SIMULATOR BLOCK NO: DB55079											
MODEL/TYPE: Sonic 136 M & TE NO.: VH751		THERMOMETER S/N: 522352 DUE DATE: 5-17-02											
TRANSDUCER MFG: Krautkramer		COUPLANT SONOTRACE BATCH: 01141											
S/N DB34843 SIZE: .5x1 FREQ: 2.25 MHz		EXAM TYPE: SHEAR <input checked="" type="checkbox"/> LONG <input type="checkbox"/> RL <input type="checkbox"/>											
CABLE TYPE: RG1743 LENGTH: 120 inches		ANGLE VERIFICATION											
DAC		BLOCK TYPE: IIW		S/N: DB55074									
		NOMINAL ANGLE: 45°		ACTUAL ANGLE: 46°									
<p>DISPLAY WIDTH: 10 inches</p>		INSTRUMENT SETTINGS											
		REFLECTOR			REFERENCE	MEMORY							
		SCAN DIRECT.	NTCH	SDH	SENSITIVITY	NUMBER							
		AXIAL	<input type="checkbox"/>	<input checked="" type="checkbox"/>	45.6 dB	2							
		CIRC	<input type="checkbox"/>	<input type="checkbox"/>	n/a dB	n/a							
		FREQ: 2.25 MHz	REJECT: off %										
		ANGLE: N/A deg	DAMPING: 500 ohms										
		DELAY: .830 msec	PULSER: 222										
		ZERO: N/A msec	FILTER: FITL 3										
		VELOCITY: .126 msec	REP RATE: 2KHZ										
RANGE: 20 inches	TOF: <input checked="" type="checkbox"/> PEAK <input type="checkbox"/> FLANK												
DISPLAY MODE: PE			POWER: AC										
DUAL: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF			TCG: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF										
REF. REFLECTOR: 1"		GAIN: 33.6 dB		CALIBRATION TIMES									
AMPLITUDE: 80 %		METAL PATH: 1"		INITIAL TIME: 13:30 FINAL TIME: 18:00									
VERIFICATION TIMES		1) 11.45	2) n/a	3) n/a	4) n/a								
		5) n/a	6) n/a	7) n/a	8) n/a								
		9) n/a											
LINEARITY CHECK													
VERTICAL	SIGNAL 1		100	90	80	70	60	50	40	30	20		
	SIGNAL 2		50	45	40	35	30	25	20	15	10		
ATTENUATOR	GAIN	SET	-6 dB		-12 dB		SET		+12		SET	+6	
	AMP	80%	32 TO 48		16 TO 24		20 %		64 TO 96		40% 64 TO 96		
			40		20				80		80		
COMMENTS:						WELDS/ITEMS EXAMINED:							
Delta difference between 3/8 to 5/8 on the clad side is 3 dB						N2A, N2C, N2E Nozzle to Shell							
EXAMINER:		EXAMINER:		REVIEWER:		ANII:							
MIKE W. KLEINJAN		DAVID KLEINJAN		<i>[Signature]</i>		<i>[Signature]</i>		DATE: 4/18/02					
LEVEL: II		LEVEL: II		LEVEL: III		DATE: 4/14/02		PG: 15 OF 15		4 OF 15			

00043

TENNESSEE VALLEY AUTHORITY		DIGITAL ULTRASONIC CALIBRATION DATA SHEET		REPORT NUMBER: <b>R160</b>							
PROJECT: BFN UNIT: 3 CYCLE: 10		CALIBRATION DATE: 4-1-02									
PROC.: N-UT- 9 REV:9 TC:02-06		CALIBRATION BLOCK NO.: BF18 TEMP: 72.6°F									
INSTR. MFG: Staveley DUE DATE: 8-05-02		SIMULATOR BLOCK NO: DB55079									
MODEL/TYPE: Sonic 136 M & TE NO.: VH751		THERMOMETER S/N: 522352 DUE DATE: 5-17-02									
TRANSDUCER MFG: Krautkramer		COUPLANT SONOTRACE BATCH: 01141									
S/N DB34154 SIZE: .5x1 FREQ: 2.25 MHz		EXAM TYPE: SHEAR <input checked="" type="checkbox"/> LONG <input type="checkbox"/> RL <input type="checkbox"/>									
CABLE TYPE: RG174 LENGTH: 120 inches		ANGLE VERIFICATION									
DAC		BLOCK TYPE: IIW		S/N: DB55074							
		NOMINAL ANGLE: 60		ACTUAL ANGLE: 59							
<div style="display: flex; align-items: center;"> <div style="flex: 1;"> </div> <div style="flex: 0.2; text-align: center; font-weight: bold;">A M P L I T U D E</div> </div> <p style="text-align: center;">DISPLAY WIDTH: 10 inches</p>		INSTRUMENT SETTINGS									
		REFLECTOR			REFERENCE		MEMORY				
		SCAN DIRECT. NTCH SDH			SENSITIVITY		NUMBER				
		AXIAL <input type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>			52 dB		3				
		CIRC <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>			n/a dB		n/a				
		FREQ: 2.25 MHz			REJECT: off %						
		ANGLE: N/A deg			DAMPING: 500 ohms						
		DELAY: 1.20 msec			PULSER: 222						
		ZERO: N/A msec			FILTER: FITL 3						
		VELOCITY: .123 msec			REP RATE: 2KHZ						
RANGE: 20 inches			TOF: <input checked="" type="checkbox"/> PEAK <input type="checkbox"/> FLANK								
DISPLAY MODE: PE			POWER: AC								
DUAL: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF			TCG: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF								
CALIBRATION TIMES											
REF. REFLECTOR: 1" GAIN: 36 dB			INITIAL TIME: 13:30 FINAL TIME: 18:00								
AMPLITUDE: 80 % METAL PATH: 1"											
VERIFICATION TIMES		1) n/a	2) n/a	3) n/a	4) n/a	5) n/a	6) n/a	7) n/a	8) n/a	9) n/a	
LINEARITY CHECK											
VERTICAL	SIGNAL 1		100	90	80	70	60	50	40	30	20
	SIGNAL 2		50	45	40	35	30	25	20	15	10
ATTENUATOR	GAIN	SET	-6 dB	-12 dB	SET	+12	SET	+6			
	AMP	80%	32 TO 48	16 TO 24	20 %	64 TO 96	40%	64 TO 96			
			40	20		80		80			
COMMENTS:						WELDS/ITEMS EXAMINED:					
DELTA dB DIFFERENCE IS 4.4 FROM THE 3/8 TO 5/8 ON THE CLAD SIDE						N2A, N2C, N2E Nozzle to Shell					
EXAMINER: MIKE W. KLEINJAN <i>Mike W. Kleinjan</i>		EXAMINER: DAVID KLEINJAN <i>D.K. Kleinjan</i>		REVIEWER: <i>Paul Whitaker</i>		ANII: <i>What's the...</i>		DATE: 4/18/02			
LEVEL: II		LEVEL: II		LEVEL: II		DATE: 4/4/02		PG.: 18 TOP 15 5 OF 15 <i>4/14/02</i>			

00044

TENNESSEE VALLEY AUTHORITY		DIGITAL ULTRASONIC CALIBRATION DATA SHEET		REPORT NUMBER: <b>R160</b>							
PROJECT: BFN UNIT: 3 CYCLE: 10		CALIBRATION DATE: 04-01-02									
PROC.: N-UT- 55 REV:9 <del>TCN 12-02</del>		CALIBRATION BLOCK NO.: BF-85-IR TEMP: 68.1° F									
INSTR. MFG: STAVELEY DUE DATE: 08-11-02		SIMULATOR BLOCK NO: N/A									
MODEL/TYPE: SONIC-137 M & TE NO.: VH-5473		THERMOMETER S/N: 522352 DUE DATE: 05-17-02									
TRANSDUCER MFG: KRAUTKRAMER		COUPLANT SONOTRACE BATCH: 01141									
S/N DB 35164 SIZE: 1.0" FREQ: 2.25 MHz		EXAM TYPE: SHEAR <input type="checkbox"/> LONG <input type="checkbox"/> RL <input checked="" type="checkbox"/>									
CABLE TYPE: RG 174 LENGTH: 120 inches		ANGLE VERIFICATION									
DAC		BLOCK TYPE: CS IIW		S/N: DB 55074							
		NOMINAL ANGLE: 25°		ACTUAL ANGLE: N/A							
<p style="text-align: center;">DISPLAY WIDTH: 20 inches</p>		INSTRUMENT SETTINGS									
		REFLECTOR			REFERENCE	MEMORY					
		SCAN DIRECT.	NTCH	SDH	SENSITIVITY	NUMBER					
		AXIAL	<input checked="" type="checkbox"/>	<input type="checkbox"/>	60.0 dB	25					
		CIRC	<input type="checkbox"/>	<input type="checkbox"/>	N/A dB	N/A					
		FREQ: 2.25 MHz	REJECT: OFF %								
		ANGLE: N/A deg	DAMPING: 200 ohms								
		DELAY: 1.12 msec	PULSER: 222								
		ZERO: N/A msec	FILTER: FILT 1								
		VELOCITY: 0.234 msec	REP RATE: 4 KHZ								
RANGE: 20.0 inches	TOF: <input type="checkbox"/> PEAK <input checked="" type="checkbox"/> FLANK										
DISPLAY MODE: PE			POWER: AC								
DUAL: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF			TCG: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF								
REF. REFLECTOR: N/A GAIN: N/A dB		CALIBRATION TIMES									
AMPLITUDE: N/A % METAL PATH: N/A"		INITIAL TIME: 1355		FINAL TIME: 1805							
VERIFICATION TIMES		1)N/A	2)N/A	3)N/A	4)N/A						
		5)N/A	6)N/A	7)N/A	8)N/A						
		9)N/A									
LINEARITY CHECK											
VERTICAL	SIGNAL 1	100	90	80	70	60	50	40	30	20	
	SIGNAL 2	50	45	40	35	30	25	20	15	10	
ATTENUATOR	GAIN	SET	-6 dB	-12 dB	SET	+12	SET	+6			
	AMP	80%	32 TO 48	16 TO 24	20 %	64 TO 96	40%	64 TO 96			
			40	20		80		80			
COMMENTS:						WELDS/ITEMS EXAMINED:					
						REACTOR PRESSURE VESSEL					
						N2A-IR, N2C-IR, N2E-IR					
						wedge ID D-14795-147					
EXAMINER: DAVID KLEINJAN <i>D.K. Kleinjan</i> LEVEL: II		EXAMINER: MIKE KLEINJAN <i>Mike Kleinjan</i> LEVEL: II		REVIEWER: <i>For White</i> LEVEL: <i>III</i> DATE: 4/14/02		ANII: <i>What 7</i> DATE: 5-4/18/02 PG: <i>15</i> OF 15					



00045

TENNESSEE VALLEY AUTHORITY			DIGITAL ULTRASONIC CALIBRATION DATA SHEET			REPORT NUMBER: <b>R160</b>						
PROJECT: BFN UNIT: 3 CYCLE: 10			CALIBRATION DATE: 04-01-02									
PROC.: N-UT- 55 REV:9 <del>02</del> TC: <del>N/A</del> <del>02</del>			CALIBRATION BLOCK NO.: BF-85-IR TEMP: 68.1°F									
INSTR. MFG: STAVELEY DUE DATE: 08-11-02			SIMULATOR BLOCK NO: N/A									
MODEL/TYPE: SONIC-137 M & TE NO.: VH-5473			THERMOMETER S/N: 522352 DUE DATE: 05-17-02									
TRANSDUCER MFG: KRAUTKRAMER			COUPLANT SONOTRACE BATCH: 01141									
S/N DB 35163 SIZE: 1.0" FREQ: 2.25 MHz			EXAM TYPE: SHEAR <input type="checkbox"/> LONG <input type="checkbox"/> RL <input checked="" type="checkbox"/>									
CABLE TYPE: RG 174 LENGTH: 120 inches			ANGLE VERIFICATION									
DAC			BLOCK TYPE: CS IIW		S/N: DB 55074							
			NOMINAL ANGLE: 19°		ACTUAL ANGLE: N/A							
<p style="text-align: center;">DISPLAY WIDTH: 20 inches</p>			INSTRUMENT SETTINGS									
			REFLECTOR			REFERENCE		MEMORY				
			SCAN DIRECT.	NTCH	SDH	SENSITIVITY		NUMBER				
			AXIAL	<input checked="" type="checkbox"/>	<input type="checkbox"/>	57.2 dB		19				
			CIRC	<input type="checkbox"/>	<input type="checkbox"/>	N/A dB		N/A				
			FREQ: 2.25	MHz		REJECT: OFF		%				
			ANGLE: N/A	deg		DAMPING: 200		ohms				
			DELAY: 0.996	msec		PULSER: 222						
			ZERO: N/A	msec		FILTER: FILT 1						
			VELOCITY: 0.234	msec		REP RATE: 4 KHZ						
RANGE: 20.0	inches		TOF: <input type="checkbox"/> PEAK <input checked="" type="checkbox"/> FLANK									
DISPLAY MODE: PE			POWER: AC									
DUAL: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF			TCG: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF									
REF. REFLECTOR: N/A GAIN: N/A dB			CALIBRATION TIMES									
AMPLITUDE: N/A % METAL PATH: N/A"			INITIAL TIME: 1245			FINAL TIME: 1807						
VERIFICATION TIMES			1)N/A	2)N/A	3)N/A	4)N/A	5)N/A	6)N/A	7)N/A	8)N/A	9)N/A	
LINEARITY CHECK												
VERTICAL	SIGNAL 1		100	90	80	70	60	50	40	30	20	
	SIGNAL 2		50	45	40	35	30	25	20	15	10	
ATTENUATOR	GAIN	SET	-6 dB	-12 dB		SET		+12		SET		+6
	AMP	80%	32 TO 48	16 TO 24		20 %		64 TO 96		40%		64 TO 96
			40	20				80				80
COMMENTS:						WELDS/ITEMS EXAMINED:						
						REACTOR PRESSURE VESSEL						
						N2A-IR, N2C-IR, N2E-IR						
						Wedge ID D-14795-144						
EXAMINER: DAVID KLEINJAN <i>D.K. Kleinjan</i> LEVEL: II			EXAMINER: MIKE KLEINJAN <i>Mike Kleinjan</i> LEVEL: II			REVIEWER: <i>[Signature]</i> LEVEL: III DATE: 4/1/02			ANIL: <i>[Signature]</i> DATE: 4/18/02			
PG.: 15 OF 15 7 of 15 4/18/02												

TVA

MANUAL ULTRASONIC VESSEL  
EXAMINATION DATA SHEET

REPORT NO.

R160

PROJECT: BFN UNIT: 3 WELD ID: N2C CONFIG.: Ngg/1e COMPONENT: VESSELCAL. SHT. NO.: NA PROCEDURE: N-UT-9 REV.: 9 PCR.: 02-06/157106 TEMP.: 85 PYRO.: 52232SCAN SENS.: \* dB EXAM START: 4/01/02 1520 EXAM END: 1620 EXAM ANGLE: 0°, 45°, 60°Lo LOCATION: TDC Wo LOCATION: E OF WELD

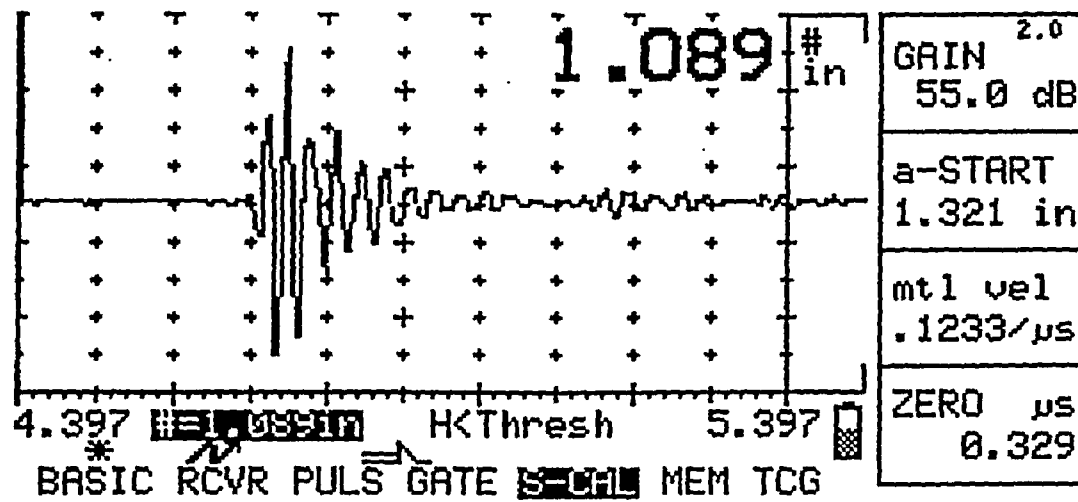
IND NO.	20%			50%			100%			MAX. AMP.			20%			50%			100%		
	Mp1	W1	L1	Mp1	W1	L1	Mp1	W1	L1	Mp	W	L	Mp2	W2	L2	Mp2	W2	L2	Mp2	W2	L2
				*																	
19°	SCAN	dB	63.2				SCANNING	#	10/11			BLEND RADIUS									
25°	SCAN	dB	66.				SCANNING	#	10/11			BLEND RADIUS									
0°	SCAN	dB	34.8				SCANNING	#	9			ON WELD AND BASE MATERIAL									
45°	SCAN	dB	56.6				SCANNING	#	9			ON WELD AND VESSEL SIDE									
45T	SCAN	dB	56.6				SCANNING	#	10/11			GW/CCW VESSEL SIDE									
45TAN	SCAN	dB	56.6				SCANNING	#	10/11			GW/CCW VESSEL SIDE									
60°	SCAN	dB	63.				SCANNING	#	9			ON WELD AND VESSEL SIDE									
60T	SCAN	dB	63.				SCANNING	#	10/11			GW/CCW VESSEL SIDE									
60TAN	SCAN	dB	63.				SCANNING	#	10/11			GW/CCW VESSEL SIDE									
NO RECORDABLE INDICATION																					

COMMENTS: 19° AND 25 EXAMINATIONS ARE THE BLEND RADIUS EXAMINATIONS  
TRANSVERSE EXAMINATION COVERAGE WILL INCLUDE COVERAGE OBTAINED DURING THE  
INNER RADIUS EXAMINATIONS. 50% TO 10% NOISE LEVEL WAS OBSERVED

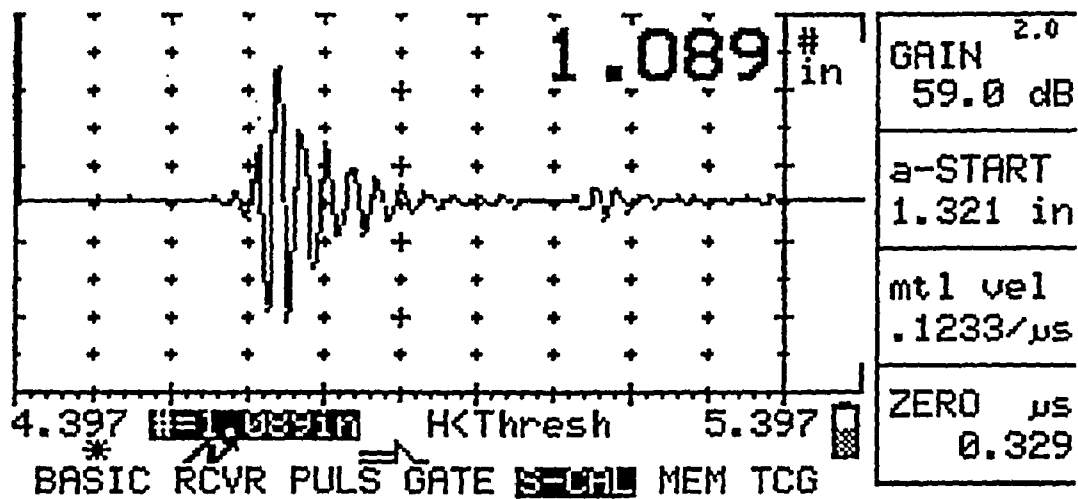
EXAMINER: M. G. Hagan LEVEL: III DATE: 4-4-02REVIEWED BY: J. P. Hagan LEVEL: III DATE: 4/4/02EXAMINER: D. K. Hagan LEVEL: II DATE: 4-11-02ANII: M. G. Hagan DATE: 4/11/02 PAGE 88 OF 15

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R160

Nozzle Examination 45 °Waveforms



45° Pre Waveform

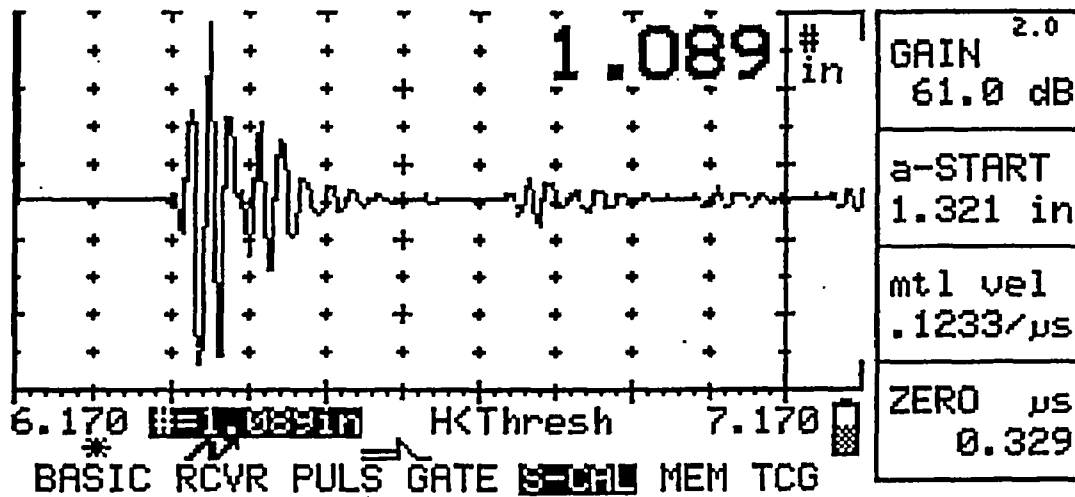


45° Post Waveform

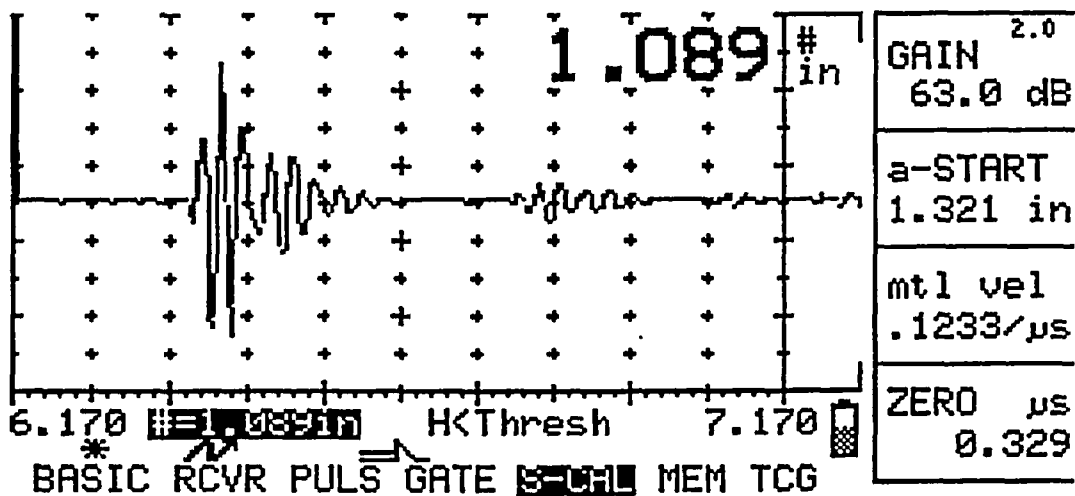
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Nozzle Examination 60° Waveforms



60° Pre Waveform



60° Post Waveform

HSBST  
 4/10/02

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00049

TVA

BEAM SPREAD AND  
RESOLUTION DATA SHEET

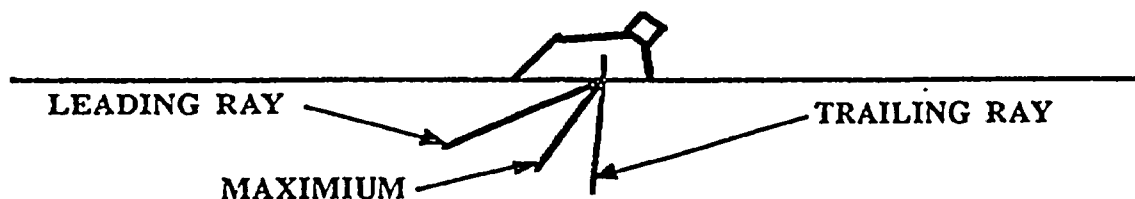
REPORT NO.

R160

PROJECT: BFN UNIT: 3 CALIBRATION BLOCK NO.: BF 18PROCEDURE NO.: N-UT-9 REV.: 9 PCR: Q205 N/A 3/30/02SEARCH UNIT-MAKE: Krautkramer SIZE: 15X1 FREQ.: 2.25S/N: DB 34843 ANGLE: 45ULTRASONIC INSTRUMENT-MAKE: Sumec 135 S/N: VH 751

## BEAM SPREAD

HOLE DEPTH	TRAILING RAY				LEADING RAY					
	20% DAC		50% DAC		100% DAC		20% DAC		50% DAC	
	W	MP	W	MP	MP	W	MP	W	W	MP
1/4T	1 1/8	1.9	1 1/4	2.	2.1	1 5/8	2.4	2	1 7/8	2.3
2T	2 7/8	4	3	4.1	4.3	3 1/4	4.8	4 1/8	3 3/4	4.6
3/4T	4 1/4	6	4 1/2	6.3	6.5	4 7/8	7	5 7/8	5 1/4	6.8



## RESOLUTION

NEAR SURFACE  
REFLECTOR: Notch OD DEPTH: 25 SIZE: .253 CAL BLK.: BF 18FAR SURFACE  
REFLECTOR: Notch ID DEPTH: 6.1 SIZE: .253SCANNING  
REFLECTORS PROVIDE 50% DAC SIGNALS AT SCANNING SPEED ☒ Y ☐ NEXAMINER: M. W. HagenREVIEWED BY: Paul A. HiteANII: Albert HallLEVEL: II DATE: 3-30-02LEVEL: III DATE: 4/4/02DATE: 4/18/02PAGE: 1211 OF 15

TVA

BEAM SPREAD AND  
RESOLUTION DATA SHEET

REPORT NO.

R160

PROJECT: BFA UNIT: 3 CALIBRATION BLOCK NO.: BF 18PROCEDURE NO.: N-UT-9 REV.: 9 PCR: 0206 N/A 3/24/02SEARCH UNIT-MAKE: Krautk SIZE: .5X1 FREQ.: 2.25S/N: DB 34154 ANGLE: 60ULTRASONIC INSTRUMENT-MAKE: Sonn 13C S/N: VH 751

## BEAM SPREAD

HOLE DEPTH	TRAILING RAY				LEADING RAY					
	20% DAC		50% DAC		100% DAC		20% DAC		50% DAC	
	W	MP	W	MP	MP	W	MP	W	W	MP
1/4T	2 1/8	2.4	2 3/8	2.7	2.9	2 5/8	3.2	3 1/8	2 7/8	3.1
1/2T	4 3/4	4.8	5	5.3	5.8	5 1/4	6.4	6 5/8	6	6.1
3/4T	8 3/4	7.6	7 1/4	8	8.7	7 7/8	9.6	8 5/8	8	9.1

LEADING RAY

TRAILING RAY

MAXIMUM

## RESOLUTION

NEAR SURFACE  
REFLECTOR: Notch OD DEPTH: .25 SIZE: .253 CAL BLK.: BF 18FAR SURFACE  
REFLECTOR: Notch ID DEPTH: 6.1 SIZE: .253

## SCANNING

REFLECTORS PROVIDE 50% DAC SIGNALS AT SCANNING SPEED

Y ☒N ☐EXAMINER: Mike W. Henry JrREVIEWED BY: John P. HatcherANII: Robert TullLEVEL: II DATE: 3-30-02LEVEL: III DATE: 4/4/02DATE: 4/18/02PAGE: 1312 OF 15

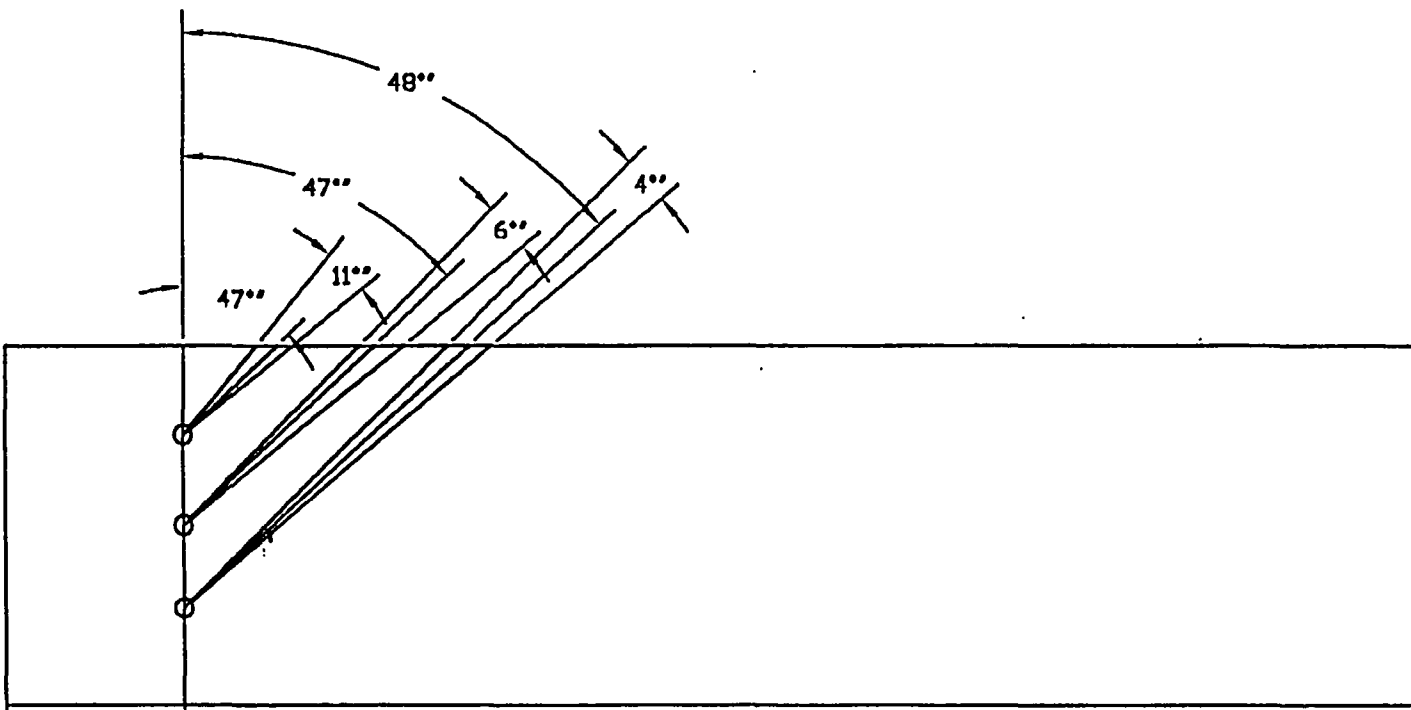
At 800 ft 4/11/02

00051

Repeat Number  
R16b

HSBCF  
4/11/02

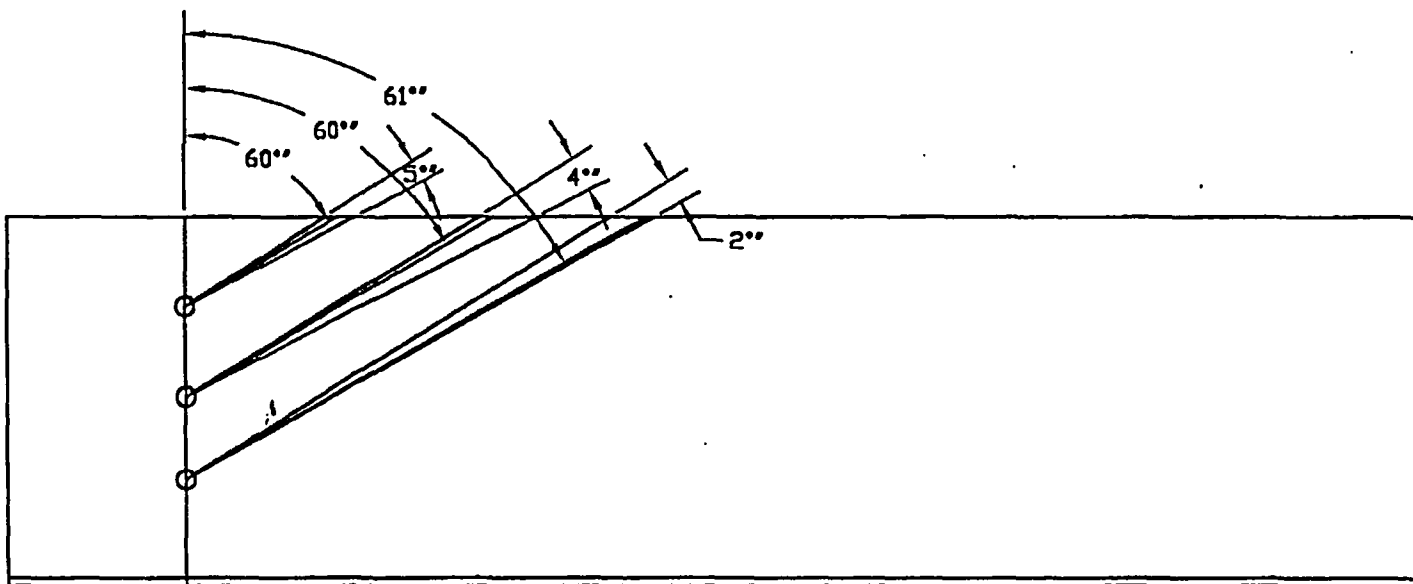
Browns Ferry Unit 3
Beamspread
MARCH 2002
BF-18



Set 80-97/14100

00052

Riser Number  
R160



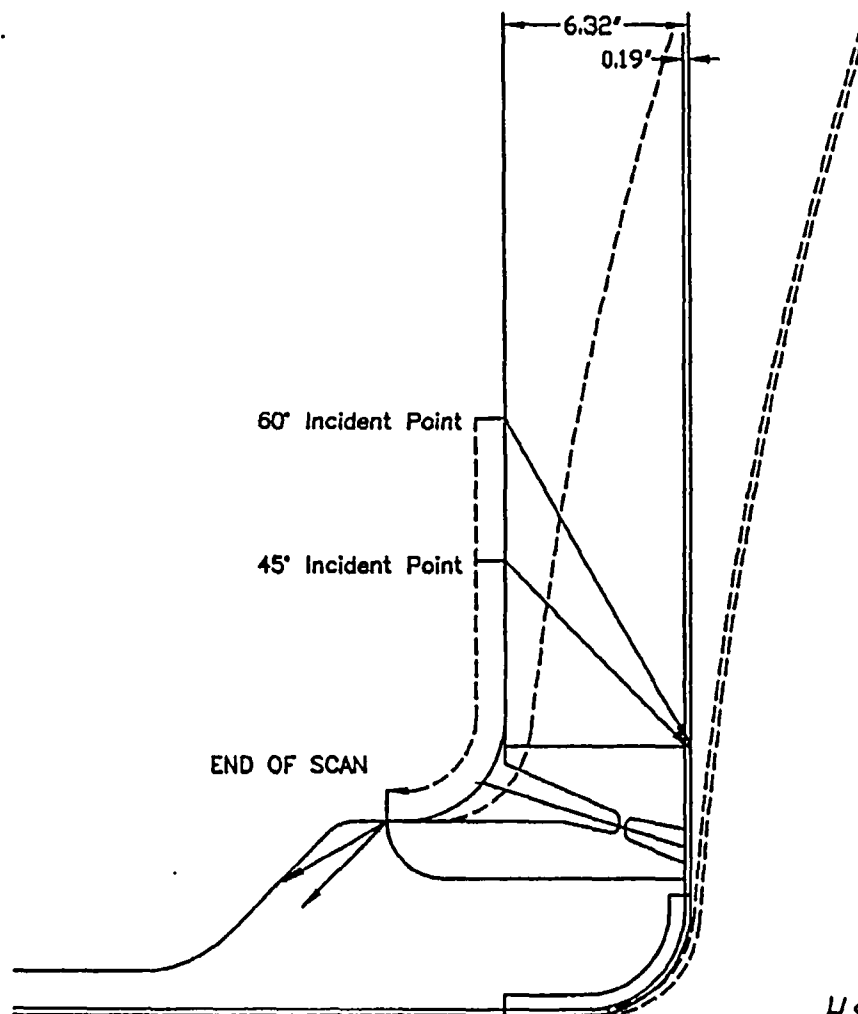
HSBCT  
9/1/02  
4/18/02

Browns Ferry Unit 3
Beamspread
MARCH 2002
BF-18

14 OF 15



Report Number  
00053 R160



Transverse coverage includes  
coverage obtained during the  
inner radius examination

HSBCJ  
4/18/02

Browns Ferry Unit 3
N2 Nozzle-to-Shell
MARCH 2002
SP-N2-NS

51 5 2 51  
15 2 0 5 15

00054

TENNESSEE VALLEY AUTHORITY		EXAMINATION SUMMARY AND RESOLUTION SHEET		REPORT NUMBER: <b>R161</b>	
PROJECT: BFN UNIT: 3 CYCLE: 10		COMPONENT ID: N2C-IR			
EXAMINATION METHOD		SYSTEM RPV		ISI DWG. NO. 3-ISI-0328-C	
MT <input type="checkbox"/>	PT <input type="checkbox"/>	UT <input checked="" type="checkbox"/>	VT <input type="checkbox"/>	CODE CLASS: 1	CATEGORY: B-D
PROCEDURE: N-UT-55		REV: 9	TC: N/A	COFIG.: Nozzle	TO Vessel
EXAMINER: MIKE KLEINJAN <i>4/18/02</i>		EXAMINER: DAVID KLEINJAN <i>03-08</i>		EXAMINER: N/A	EXAMINER: N/A
LEVEL: <i>II</i>		LEVEL: II		LEVEL: N/A	LEVEL: N/A

This report contains the data associated with the manual ultrasonic examination of code category B-D, Nozzle Inner radius. This examination report satisfies ASME section XI requirements for the inner radius examination.

N2C-IR: This examination was performed using a 19° and 25° in the blend radius in two directions CW/CCW

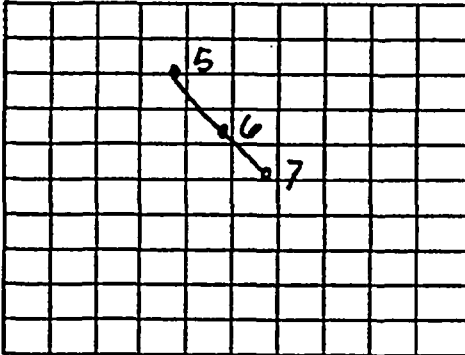
100% code coverage was obtained

This exam was performed with equipment, Procedures, and personnel qualified in accordance with ASME Section XI

*No Recordable Indications*

RESOLUTION BY: Mike Kleinjan <i>Mike Kleinjan</i>		REVIEWED BY: <i>Paul Whitaker</i>		ANIL <i>Robert Hall</i>	
LEVEL: II DATE: <i>4-4-02</i>		LEVEL: <i>II</i> DATE: <i>4/4/02</i>		DATE: <i>4/18/02</i>	
				PG. 1 OF <i>14</i> <i>4/18/02</i>	

00055

<b>TENNESSEE VALLEY AUTHORITY</b>			<b>DIGITAL ULTRASONIC CALIBRATION DATA SHEET</b>			<b>REPORT NUMBER:</b> <span style="font-size: 1.2em;">R161</span>						
PROJECT: BFN UNIT: 3 CYCLE: 10			CALIBRATION DATE: 04-01-02									
PROC.: N-UT- 55 REV:9			CALIBRATION BLOCK NO.: BF-85-IR TEMP: 68.1° F									
INSTR. MFG: STAVELEY DUE DATE: 08-11-02			SIMULATOR BLOCK NO: N/A									
MODEL/TYPE: SONIC-137 M & TE NO.: VH-5473			THERMOMETER S/N: 522352 DUE DATE: 05-17-02									
TRANSDUCER MFG: KRAUTKRAMER			COUPLANT SONOTRACE BATCH: 01141									
S/N DB 35163 SIZE: 1.0" FREQ: 2.25 MHz			EXAM TYPE: SHEAR <input type="checkbox"/> LONG <input type="checkbox"/> RL <input checked="" type="checkbox"/>									
CABLE TYPE: RG 174 LENGTH: 120 inches			<b>ANGLE VERIFICATION</b>									
<b>DAC</b>			BLOCK TYPE: CS IIW			S/N: DB 55074						
			NOMINAL ANGLE: 19°			ACTUAL ANGLE: N/A						
<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;">100 80 60 40 20 0</div>  <div style="margin-left: 10px; writing-mode: vertical-rl; transform: rotate(180deg);">A M P L I T U D E</div> </div> <p style="text-align: center;">DISPLAY WIDTH: 20 inches</p>			<b>INSTRUMENT SETTINGS</b>									
			<b>REFLECTOR</b>			<b>REFERENCE</b>		<b>MEMORY</b>				
			SCAN DIRECT.	NTCH	SDH	SENSITIVITY		NUMBER				
			AXIAL	<input checked="" type="checkbox"/>	<input type="checkbox"/>	57.2 dB		19				
			CIRC	<input type="checkbox"/>	<input type="checkbox"/>	N/A dB		N/A				
			FREQ: 2.25	MHz		REJECT: OFF %						
			ANGLE: N/A	deg		DAMPING: 200 ohms						
			DELAY: 0.996	msec		PULSER: 222						
			ZERO: N/A	msec		FILTER: FILT 1						
			VELOCITY: 0.234	msec		REP RATE: 4 KHZ						
RANGE: 20.0	inches		TOF: <input type="checkbox"/> PEAK <input checked="" type="checkbox"/> FLANK									
DISPLAY MODE: PE			POWER: AC									
DUAL: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF			TCG: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF									
REF. REFLECTOR: N/A GAIN: N/A dB			<b>CALIBRATION TIMES</b>									
AMPLITUDE: N/A % METAL PATH: N/A"			INITIAL TIME: 1245			FINAL TIME: 1807						
VERIFICATION TIMES			1)N/A	2)N/A	3)N/A	4)N/A	5)N/A	6)N/A	7)N/A	8)N/A	9)N/A	
<b>LINEARITY CHECK</b>												
VERTICAL	SIGNAL 1		100	90	80	70	60	50	40	30	20	
	SIGNAL 2		50	45	40	35	30	25	20	15	10	
ATTENUATOR	GAIN	SET	-6 dB		-12 dB		SET		+12		SET	+6
	AMP	80%	32 TO 48		16 TO 24		20 %		64 TO 96		40% 64 TO 96	
			40		20				80		80	
<b>COMMENTS:</b>						<b>WELDS/ITEMS EXAMINED:</b>						
Wedge ID D-14795-144 ✓						REACTOR PRESSURE VESSEL						
						N2A-IR, N2C-IR, N2E-IR ✓						
EXAMINER: DAVID KLEINJAN <i>D.K. Kleinjan</i> LEVEL: II			EXAMINER: MIKE KLEINJAN <i>Mike Kleinjan</i> LEVEL: II			REVIEWER: <i>[Signature]</i> LEVEL: II DATE: 4/1/02			ANIL: <i>[Signature]</i> DATE: 4/1/02 PG.: 2 of 4			

00056

<b>TENNESSEE VALLEY AUTHORITY</b>			<b>DIGITAL ULTRASONIC CALIBRATION DATA SHEET</b>			<b>REPORT NUMBER:</b> <i>R161</i>						
PROJECT: BFN UNIT: 3		CYCLE: 10		CALIBRATION DATE: 04-01-02								
PROC.: N-UT- 55		REV: 9		<i>05 TC: N/A 0008</i>		CALIBRATION BLOCK NO.: BF-85-IR TEMP: 68.1° F						
INSTR. MFG: STAVELEY		DUE DATE: 08-11-02		SIMULATOR BLOCK NO: N/A								
MODEL/TYPE: SONIC-137		M & TE NO.: VH-5473		THERMOMETER S/N: 522352		DUE DATE: 05-17-02						
TRANSDUCER MFG: KRAUTKRAMER				COUPLANT SONOTRACE BATCH: 01141								
S/N DB 35164		SIZE: 1.0"		FREQ: 2.25 MHz		EXAM TYPE: SHEAR <input type="checkbox"/> LONG <input type="checkbox"/> RL <input checked="" type="checkbox"/>						
CABLE TYPE: RG 174		LENGTH: 120 inches		<b>ANGLE VERIFICATION</b>								
<b>DAC</b>				BLOCK TYPE: CS IIW		S/N: DB 55074						
				NOMINAL ANGLE: 25°		ACTUAL ANGLE: N/A						
<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;"> 100 80 60 40 20 0 </div> <div style="flex-grow: 1;"> </div> <div style="margin-left: 10px; writing-mode: vertical-rl; transform: rotate(180deg);"> A M P L I T U D E </div> </div> <p style="text-align: center;">DISPLAY WIDTH: 20 inches</p>				<b>INSTRUMENT SETTINGS</b>								
				<b>REFLECTOR</b>			<b>REFERENCE</b>		<b>MEMORY</b>			
				SCAN DIRECT.	NTCH	SDH	SENSITIVITY		NUMBER			
				AXIAL	<input checked="" type="checkbox"/>	<input type="checkbox"/>	60.0 dB		25			
				CIRC	<input type="checkbox"/>	<input type="checkbox"/>	N/A dB		N/A			
				FREQ: 2.25	MHz		REJECT: OFF		%			
				ANGLE: N/A	deg		DAMPING: 200		ohms			
				DELAY: 1.12	msec		PULSER: 222					
				ZERO: N/A	msec		FILTER: FILT 1					
				VELOCITY: 0.234	msec		REP RATE: 4 KHZ					
				RANGE: 20.0	inches		TOF: <input type="checkbox"/> PEAK <input checked="" type="checkbox"/> FLANK					
				DISPLAY MODE: PE			POWER: AC					
DUAL: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF			TCG: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF									
REF. REFLECTOR: N/A				GAIN: N/A dB								
AMPLITUDE: N/A %				METAL PATH: N/A"								
VERIFICATION TIMES		1) N/A	2) N/A	3) N/A	4) N/A	5) N/A	6) N/A	7) N/A	8) N/A	9) N/A		
<b>LINEARITY CHECK</b>												
VERTICAL	SIGNAL 1		100	90	80	70	60	50	40	30	20	
	SIGNAL 2		50	45	40	35	30	25	20	15	10	
ATTENUATOR	GAIN	SET	-6 dB		-12 dB		SET		+12		SET	+6
	AMP	80%	32 TO 48		16 TO 24		20 %		64 TO 96		40%	
			40		20				80		80	
COMMENTS:						WELDS/ITEMS EXAMINED:						
Wedge ID D-14795-147						REACTOR PRESSURE VESSEL						
						N2A-IR, N2C-IR, N2E-IR						
EXAMINER:		EXAMINER:		REVIEWER:		ANIL:						
DAVID KLEINJAN		MIKE KLEINJAN		<i>[Signature]</i>		<i>[Signature]</i>						
<i>[Signature]</i>		<i>[Signature]</i>		<i>[Signature]</i>		<i>[Signature]</i>						
LEVEL: H		LEVEL: II		LEVEL: <i>II</i>		DATE: <i>4/1/02</i>		DATE: <i>4/18/02</i>				
						PG.: <i>1 of 1</i>		<i>3 of 4</i>				



**Inspection Report R-162**  
**Weld N2E-NV**

00058

TENNESSEE VALLEY AUTHORITY		EXAMINATION SUMMARY AND RESOLUTION SHEET		REPORT NUMBER: <i>R162</i>	
PROJECT: BFN UNIT: 3		CYCLE: 10	COMPONENT ID: N2E		
EXAMINATION METHOD			SYSTEM RPV	ISI DWG. NO. 3-ISI-0328-C	
MT <input type="checkbox"/>	PT <input type="checkbox"/>	UT <input checked="" type="checkbox"/>	VT <input type="checkbox"/>	CODE CLASS: 1	CATEGORY: B-D
PROCEDURE: N-UT-9		REV:9	TC:02-06	COFIG.:	Nozzle TO Vessel
EXAMINER: MIKE KLEINJAN <i>4/4/02</i>		EXAMINER: DAVID KLEINJAN		EXAMINER: N/A	EXAMINER: N/A
LEVEL: <i>II</i>		LEVEL: II		LEVEL: N/A	LEVEL: N/A

This report contains the data associated with the manual ultrasonic examination of code category B-D, Nozzle to Vessel welds. This examination report satisfies ASME section XI requirements for the Nozzle to shell weld..

Examination. Nozzle to Vessel weld N2E

Transverse coverage for the Nozzle to Vessel weld was supplemented by the inner radius examination.

(N2E-IR) *see R163*

0° was used on the weld crown and base material Vessel side

45° was used on the vessel side only scanning over the weld crown

45° Tangent to the weld was used on vessel side CW/CCW

45° Parallel to the weld was used on vessel side CW/CCW

60° was used on the vessel side only scanning over the weld crown

60° Tangent to the weld was used on vessel side CW/CCW

60° Parallel to the weld was used on vessel side CW/CCW

77% code coverage was obtained

This exam was performed with equipment, Procedures, and personnel qualified in accordance with ASME Section XI

*No Recordable Indication*

RESOLUTION BY: Mike Kleinjan <i>mkw 4/4/02</i>	REVIEWED BY: <i>For [Signature]</i>	ANTI: <i>What [Signature]</i>
LEVEL: II DATE: <i>4-4-02</i>	LEVEL: <i>III</i> DATE: <i>4/4/02</i>	DATE: <i>4/10</i> PG. 1 OF <i>15</i> <i>5/10/02</i>

00059

REPORT Number  
R162

Calculation of ASME code coverage  
For section XI NDE Examination

N2E

1) 0 degree (weld metal scan)	100%
2) 45 degree Transverse-scan from vessel side of weld	100%
3) 45 degree Transverse-scan from nozzle side of weld	0%
4) 60 degree Transverse-scan from vessel side of weld	100%
5) 60 degree Transverse-scan from nozzle side of weld	0%
6) 45 degree Parallel-scan CW direction	100% *
7) 45 degree Parallel-scan CCW direction	100% *
8) 60 degree Parallel-scan CW direction	100% *
9) 60 degree Parallel-scan CCW direction	100% *

The sum of all the percentage of scans	700%
Divided by the total # of scans	9
Percentage of examination Volume coverage	77%

\* Transverse coverage includes coverage obtained during the inner radius examination.

HSBCT  
4/19/00  
20815



00060

<b>TENNESSEE VALLEY AUTHORITY</b>		<b>DIGITAL ULTRASONIC CALIBRATION DATA SHEET</b>		<b>REPORT NUMBER:</b> <span style="font-size: 1.5em;">R162</span>							
PROJECT: BFN UNIT: 3 CYCLE: 10		CALIBRATION DATE: 4-1-02									
PROC.: N-UT- 9 REV:9 TC:02-06		CALIBRATION BLOCK NO.: BF18 TEMP: 72.6°F									
INSTR. MFG: Staveley DUE DATE: 8-05-02		SIMULATOR BLOCK NO: DB55079									
MODEL/TYPE: Sonic 136 M & TE NO.: VH751		THERMOMETER S/N: 522352 DUE DATE: 5-17-02									
TRANSDUCER MFG: Harisonic		COUPLANT SONOTRACE BATCH: 01141									
S/N DB34198 SIZE: .75 FREQ: 2.25 MHz		EXAM TYPE: SHEAR <input type="checkbox"/> LONG <input checked="" type="checkbox"/> RL <input type="checkbox"/>									
CABLE TYPE: RG174 LENGTH: 120 inches		<b>ANGLE VERIFICATION</b>									
DAC		BLOCK TYPE: <del>Respus</del> <del>Respus</del> S/N: DB55079		NOMINAL ANGLE: 0 ACTUAL ANGLE: N/A							
		<b>INSTRUMENT SETTINGS</b>									
<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;">100 80 60 40 20 0</div> <div style="margin-left: 10px; writing-mode: vertical-rl; transform: rotate(180deg);">A M P L I T U D E</div> </div> <p>DISPLAY WIDTH: 10 inches</p>		REFLECTOR		REFERENCE		MEMORY					
		SCAN DIRECT.		NTCH		SDH		SENSITIVITY		NUMBER	
		AXIAL		<input type="checkbox"/>		<input checked="" type="checkbox"/>		20.8 dB		1	
		CIRC		<input type="checkbox"/>		<input type="checkbox"/>		n/a dB		n/a	
		FREQ: 2.25 MHz		REJECT: off		%		DAMPING: 500		ohms	
		ANGLE: n/a deg		PULSER: 222		FILTER: Filt 3		REP RATE: 2KHZ		TOF: <input checked="" type="checkbox"/> PEAK <input type="checkbox"/> FLANK	
		DELAY: .499 msec		POWER: AC		TCG: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF		CALIBRATION TIMES		INITIAL TIME: 13:30 FINAL TIME: 18:00	
		ZERO: n/a msec		DUAL: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF		9)n/a		VERIFICATION TIMES		1)n/a 2)n/a 3)n/a 4)n/a 5)n/a 6)n/a 7)n/a 8)n/a 9)n/a	
		VELOCITY: .238 msec		RANGE: 10 inches		J- 4/19/02		LINEARITY CHECK		SIGNAL 1 100 90 80 70 60 50 40 30 20	
		RANGE: 10 inches		DISPLAY MODE: PE		SIGNAL 2 50 45 40 35 30 25 20 15 10		ATTENUATOR		GAIN SET -6 dB -12 dB SET +12 SET +6	
DUAL: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF		TGC: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF		AMP 80% 32 TO 48 16 TO 24 20% 64 TO 96 40% 64 TO 96		COMMENTS:		WELDS/ITEMS EXAMINED:			
J- 4/19/02		40 20 80 80		N2A, N2C, N2E Nozzle to Shell		EXAMINER:		REVIEWER:			
MIKE W. KLEINJAN		DAVID KLEINJAN		DATE: 4/19/02		PG: 24 OF 15		3 J- 4/19/02			
LEVEL: II		LEVEL: II		DATE: 4/19/02		PG: 24 OF 15		3 J- 4/19/02			

00061

<b>TENNESSEE VALLEY AUTHORITY</b>			<b>DIGITAL ULTRASONIC CALIBRATION DATA SHEET</b>			<b>REPORT NUMBER:</b> <span style="font-size: 1.5em;">R162</span>								
PROJECT: BFN		UNIT: 3	CYCLE: 10		CALIBRATION DATE: 4-1-02									
PROC.: N-UT-		9	REV:9		TC:02-06		CALIBRATION BLOCK NO.: BF18							
INSTR. MFG: Staveley		DUE DATE: 8-05-02			TEMP: 72.6°F									
MODEL/TYPE: Sonic 136		M & TE NO.: VH751			SIMULATOR BLOCK NO: DB55079									
TRANSDUCER MFG: Krautkramer					THERMOMETER S/N: 522352									
S/N DB34843		SIZE: .5x1	FREQ: 2.25 MHz		DUE DATE: 5-17-02									
CABLE TYPE: RG1743		LENGTH: 120 inches		COUPLANT SONOTRACE BATCH: 01141										
				EXAM TYPE: SHEAR <input checked="" type="checkbox"/> LONG <input type="checkbox"/> RL <input type="checkbox"/>										
<b>ANGLE VERIFICATION</b>														
				BLOCK TYPE: IIW		S/N: DB55074								
				NOMINAL ANGLE: 45°		ACTUAL ANGLE: 46°								
<b>INSTRUMENT SETTINGS</b>														
<b>REFLECTOR</b>						<b>REFERENCE</b>		<b>MEMORY</b>						
SCAN DIRECT.		NTCH		SDH		SENSITIVITY		NUMBER						
AXIAL		<input type="checkbox"/>		<input checked="" type="checkbox"/>		45.6 dB		2						
CIRC		<input type="checkbox"/>		<input type="checkbox"/>		n/a dB		n/a						
FREQ: 2.25		MHz		REJECT: off		%								
ANGLE: N/A		deg		DAMPING: 500		ohms								
DELAY: .830		msec		PULSER: 222										
ZERO: N/A		msec		FILTER: FITL 3										
VELOCITY: .126		msec		REP RATE: 2KHZ										
RANGE: 20		inches		TOF: <input checked="" type="checkbox"/> PEAK <input type="checkbox"/> FLANK										
DISPLAY MODE: PE				POWER: AC										
DUAL: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF				TCG: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF										
<b>CALIBRATION TIMES</b>														
INITIAL TIME: 13:30				FINAL TIME: 18:00										
VERIFICATION TIMES		1) 11:45		2) n/a		3) n/a		4) n/a						
		5) n/a		6) n/a		7) n/a		8) n/a						
		9) n/a												
<b>LINEARITY CHECK</b>														
VERTICAL		SIGNAL 1		100	90	80	70	60	50	40	30	20		
		SIGNAL 2		50	45	40	35	30	25	20	15	10		
ATTENUATOR		GAIN	SET	-6 dB		-12 dB		SET		+12		SET	+6	
		AMP	80%	32 TO 48		16 TO 24		20 %		64 TO 96		40%	64 TO 96	
				40		20				80			80	
COMMENTS:													WELDS/ITEMS EXAMINED:	
Delta difference between 3/8 to 5/8 on the clad side is 3 dB													N2A, N2C, N2E Nozzle to Shell	
EXAMINER:			EXAMINER:			REVIEWER:			ANTI: <i>Michael T. Hall</i>					
MIKE W. KLEINJAN			DAVID KLEINJAN			<i>David Kleinjan</i>			DATE: 4/19/02					
LEVEL: II			LEVEL: II			LEVEL: III			PG.: 15 OF 16					

4/19/02

00062

<b>TENNESSEE VALLEY AUTHORITY</b>			<b>DIGITAL ULTRASONIC CALIBRATION DATA SHEET</b>			<b>REPORT NUMBER: R162</b>					
PROJECT: BFN UNIT: 3 CYCLE: 10			CALIBRATION DATE: 4-1-02								
PROC.: N-UT- 9 REV:9 TC:02-06			CALIBRATION BLOCK NO.: BF18			TEMP: 72.6°F					
INSTR. MFG: Staveley DUE DATE: 8-05-02			SIMULATOR BLOCK NO.: DB55079								
MODEL/TYPE: Sonic 136 M & TE NO.: VH751			THERMOMETER S/N: 522352			DUE DATE: 5-17-02					
TRANSDUCER MFG: Krautkramer			COUPLANT SONOTRACE BATCH: 01141								
S/N DB34154 SIZE: .5x1 FREQ: 2.25 MHz			EXAM TYPE: SHEAR <input checked="" type="checkbox"/> LONG <input type="checkbox"/> RL <input type="checkbox"/>								
CABLE TYPE: RG174 LENGTH: 120 inches			<b>ANGLE VERIFICATION</b>								
<b>DAC</b>			BLOCK TYPE: IIW			S/N: DB55074					
			NOMINAL ANGLE: 60			ACTUAL ANGLE: 59					
<p style="text-align: center;">DISPLAY WIDTH: 10 inches</p>			<b>INSTRUMENT SETTINGS</b>								
			<b>REFLECTOR</b>			<b>REFERENCE</b>		<b>MEMORY</b>			
			SCAN DIRECT.	NTCH	SDH	SENSITIVITY		NUMBER			
			AXIAL	<input type="checkbox"/>	<input checked="" type="checkbox"/>	52 dB		3			
			CIRC	<input type="checkbox"/>	<input type="checkbox"/>	n/a dB		n/a			
			FREQ: 2.25	MHz		REJECT: off		%			
			ANGLE: N/A	deg		DAMPING: 500		ohms			
			DELAY: 1.20	msec		PULSER: 222					
			ZERO: N/A	msec		FILTER: FITL 3					
			VELOCITY: .123	msec		REP RATE: 2KHZ					
RANGE: 20	inches		TOF: <input checked="" type="checkbox"/> PEAK <input type="checkbox"/> FLANK								
DISPLAY MODE: PE			POWER: AC								
DUAL: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF			TCG: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF								
REF. REFLECTOR: 1" GAIN: 36 dB			<b>CALIBRATION TIMES</b>								
			INITIAL TIME: 13:30			FINAL TIME: 18:00					
AMPLITUDE: 80 % METAL PATH: 1"											
<b>VERIFICATION TIMES</b>			1) n/a	2) n/a	3) n/a	4) n/a	5) n/a	6) n/a	7) n/a	8) n/a	9) n/a
<b>LINEARITY CHECK</b>											
<b>VERTICAL</b>	SIGNAL 1		100	90	80	70	60	50	40	30	20
	SIGNAL 2		50	45	40	35	30	25	20	15	10
<b>ATTENUATOR</b>	GAIN	SET	-6 dB	-12 dB	SET	+12	SET	+6			
	AMP	80%	32 TO 48	16 TO 24	20 %	64 TO 96	40%	64 TO 96			
			40	20		80		80			
<b>COMMENTS:</b>						<b>WELDS/ITEMS EXAMINED:</b>					
DELTA dB DIFFERENCE IS 4.4 FROM THE 3/8 TO 5/8 ON THE CLAD SIDE						N2A, N2C, N2E Nozzle to Shell					
<b>EXAMINER:</b> MIKE W. KLEINJAN <i>Mike W Kleinjan</i> LEVEL: II			<b>EXAMINER:</b> DAVID KLEINJAN <i>D.K. Kleinjan</i> LEVEL: II			<b>REVIEWER:</b> <i>Joe White</i> LEVEL: <del>II</del> DATE: 4/4/02			<b>ANII:</b> <i>Robert L. Smith</i> DATE: 4/19/02 PG.: 185 OF 15 <i>4/19/02</i>		

00063

TENNESSEE VALLEY AUTHORITY		DIGITAL ULTRASONIC CALIBRATION DATA SHEET		REPORT NUMBER: <i>R162</i>							
PROJECT: BFN UNIT: 3		CYCLE: 10		CALIBRATION DATE: 04-01-02							
PROC.: N-UT- 55 REV:9		<i>AS TC N/A 03-08</i>		CALIBRATION BLOCK NO.: BF-85-IR TEMP: 68.1°F							
INSTR. MFG: STAVELEY		DUE DATE: 08-11-02		SIMULATOR BLOCK NO: N/A							
MODEL/TYPE: SONIC-137		M & TE NO.: VH-5473		THERMOMETER S/N: 522352 DUE DATE: 05-17-02							
TRANSDUCER MFG: KRAUTKRAMER				COUPLANT SONOTRACE BATCH: 01141							
S/N DB 35163 SIZE: 1.0" FREQ: 2.25 MHz				EXAM TYPE: SHEAR <input type="checkbox"/> LONG <input type="checkbox"/> RL <input checked="" type="checkbox"/>							
CABLE TYPE: RG 174 LENGTH: 120 inches				ANGLE VERIFICATION							
DAC		BLOCK TYPE: CS IIW		S/N: DB 55074							
		NOMINAL ANGLE: 19°		ACTUAL ANGLE: N/A							
<p>DISPLAY WIDTH: 20 inches</p>		INSTRUMENT SETTINGS									
		REFLECTOR			REFERENCE	MEMORY					
		SCAN DIRECT.	NTCH	SDH	SENSITIVITY	NUMBER					
		AXIAL	<input checked="" type="checkbox"/>	<input type="checkbox"/>	57.2 dB	19					
		CIRC	<input type="checkbox"/>	<input type="checkbox"/>	N/A dB	N/A					
		FREQ: 2.25 MHz	REJECT: OFF %								
		ANGLE: N/A deg	DAMPING: 200 ohms								
		DELAY: 0.996 msec	PULSER: 222								
		ZERO: N/A msec	FILTER: FILT 1								
		VELOCITY: 0.234 msec	REP RATE: 4 KHZ								
RANGE: 20.0 inches	TOF: <input type="checkbox"/> PEAK <input checked="" type="checkbox"/> FLANK										
DISPLAY MODE: PE	POWER: AC										
DUAL: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF	TCG: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF										
REF. REFLECTOR: N/A		GAIN: N/A dB		CALIBRATION TIMES							
AMPLITUDE: N/A %		METAL PATH: N/A"		INITIAL TIME: 1245 FINAL TIME: 1807							
VERIFICATION TIMES		1)N/A	2)N/A	3)N/A	4)N/A 5)N/A 6)N/A 7)N/A 8)N/A 9)N/A						
LINEARITY CHECK											
VERTICAL	SIGNAL 1		100	90	80	70	60	50	40	30	20
	SIGNAL 2		50	45	40	35	30	25	20	15	10
ATTENUATOR	GAIN	SET	-6 dB	-12 dB	SET	+12	SET	+6			
	AMP	80%	32 TO 48	16 TO 24	20 %	64 TO 96	40%	64 TO 96			
			40	20		80		80			
COMMENTS:						WELDS/ITEMS EXAMINED:					
						REACTOR PRESSURE VESSEL					
						N2A-IR, N2C-IR, N2E-IR					
						<i>wedge IO D-14795-144</i>					
EXAMINER: DAVID KLEINJAN <i>[Signature]</i>		EXAMINER: MIKE KLEINJAN <i>[Signature]</i>		REVIEWER: <i>[Signature]</i>		ANII: <i>[Signature]</i>					
LEVEL: II		LEVEL: II		LEVEL: <i>44</i> DATE: <i>4/1/02</i>		DATE: <i>4/19/02</i>		PG.: <i>18</i> OF 15 <i>6 Jan 4/19/02</i>			

00064

<b>TENNESSEE VALLEY AUTHORITY</b>		<b>DIGITAL ULTRASONIC CALIBRATION DATA SHEET</b>		<b>REPORT NUMBER: <i>R162</i></b>									
PROJECT: BFN UNIT: 3 CYCLE: 10		CALIBRATION DATE: 04-01-02											
PROC.: N-UT- 55 REV:9 <i>W8 TC: N/A</i>		CALIBRATION BLOCK NO.: BF-85-IR TEMP: 68.1° F											
INSTR. MFG: STAVELEY DUE DATE: 08-11-02		SIMULATOR BLOCK NO: N/A											
MODEL/TYPE: SONIC-137 M & TE NO.: VH-5473		THERMOMETER S/N: 522352 DUE DATE: 05-17-02											
TRANSDUCER MFG: KRAUTKRAMER		COUPLANT SONOTRACE BATCH: 01141											
S/N DB 35164 SIZE: 1.0" FREQ: 2.25 MHz		EXAM TYPE: SHEAR <input type="checkbox"/> LONG <input type="checkbox"/> RL <input checked="" type="checkbox"/>											
CABLE TYPE: RG 174 LENGTH: 120 inches		<b>ANGLE VERIFICATION</b>											
<b>DAC</b>		BLOCK TYPE: CS IIW		S/N: DB 55074									
		NOMINAL ANGLE: 25°		ACTUAL ANGLE: N/A									
<p style="text-align: center;">DISPLAY WIDTH: 20 inches</p>		<b>INSTRUMENT SETTINGS</b>											
		<b>REFLECTOR</b>			<b>REFERENCE</b>		<b>MEMORY</b>						
		SCAN DIRECT.	NTCH	SDH	SENSITIVITY		NUMBER						
		AXIAL	<input checked="" type="checkbox"/>	<input type="checkbox"/>	60.0 dB		25						
		CIRC	<input type="checkbox"/>	<input type="checkbox"/>	N/A dB		N/A						
		FREQ: 2.25	MHz		REJECT: OFF %								
		ANGLE: N/A	deg		DAMPING: 200 ohms								
		DELAY: 1.12	msec		PULSER: 222								
		ZERO: N/A	msec		FILTER: FILT 1								
		VELOCITY: 0.234	msec		REP RATE: 4 KHZ								
RANGE: 20.0	inches		TOF: <input type="checkbox"/> PEAK <input checked="" type="checkbox"/> FLANK										
DISPLAY MODE: PE			POWER: AC										
DUAL: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF			TCG: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF										
REF. REFLECTOR: N/A		GAIN: N/A dB		<b>CALIBRATION TIMES</b>									
AMPLITUDE: N/A %		METAL PATH: N/A"		INITIAL TIME: 1355		FINAL TIME: 1805							
VERIFICATION TIMES		1)N/A	2)N/A	3)N/A	4)N/A	5)N/A	6)N/A	7)N/A	8)N/A	9)N/A			
<b>LINEARITY CHECK</b>													
VERTICAL	SIGNAL 1		100	90	80	70	60	50	40	30	20		
	SIGNAL 2		50	45	40	35	30	25	20	15	10		
ATTENUATOR	GAIN	SET	-6 dB		-12 dB		SET		+12		SET	+6	
	AMP	80%	32 TO 48		16 TO 24		20 %		64 TO 96		40%	64 TO 96	
			40		20				80			80	
COMMENTS:					WELDS/ITEMS EXAMINED:								
					REACTOR PRESSURE VESSEL								
					N2A-IR, N2C-IR, N2E-IR								
					<i>Wedge IO D-4795-147</i>								
EXAMINER: DAVID KLEINJAN <i>D. Kleinjan</i> LEVEL: II			EXAMINER: MIKE KLEINJAN <i>Mike Kleinjan</i> LEVEL: II			REVIEWER: <i>Paul Whiteaker</i> LEVEL: III DATE: 4/1/02			ANTI: <i>What?</i> DATE: 4/19/02 PG.: 16 OF 15 <i>4/19/02</i>				

TVA

MANUAL ULTRASONIC VESSEL  
EXAMINATION DATA SHEET

REPORT NO.

R162

PROJECT: BFN UNIT: 3 WELD ID: N2E CONFIG.: Npp/2 COMPONENT: VESSELCAL. SHT. NO.: NA PROCEDURE: NT-UT-9 REV.: 9 PCR.: 07-06 TEMP.: 85 PYRO.: 522352  
4/1/02 5-7/1/02SCAN SENS.: X dB EXAM START: 1630 EXAM END: 1745 EXAM ANGLE: 0°, 45°, 60°Lo LOCATION: TDC Wo LOCATION: E OF WELD

IND NO.	20%			50%			100%			MAX. AMP.			20%			50%			100%		
	Mp1	W1	L1	Mp1	W1	L1	Mp1	W1	L1	Mp	W	L	Mp2	W2	L2	Mp2	W2	L2	Mp2	W2	L2
				X																	
19°	SCAN.		dB	63.2			SCANNING	#	10/11	BLEND RADIUS											
25°	SCAN		dB	66.			SCANNING	#	10/11	BLEND RADIUS											
0°	SCAN		dB	34.8			SCANNING	#	9	ON WELD AND BASE MATERIAL											
45°	SCAN		dB	56.6			SCANNING	#	9	ON WELD AND VESSEL SIDE											
45°T	SCAN		dB	56.6			SCANNING	#	10/11	CW/CCW VESSEL SIDE											
45°TAN	SCAN		dB	56.6			SCANNING	#	10/11	CW/CCW VESSEL SIDE											
60°	SCAN		dB	63.			SCANNING	#	9	ON WELD AND VESSEL SIDE											
60°T	SCAN		dB	63.			SCANNING	#	10/11	CW/CCW VESSEL SIDE											
60°TAN	SCAN		dB	63.			SCANNING	#	10/11	CW/CCW VESSEL SIDE											
NO RECORDABLE INDICATION																					

00055

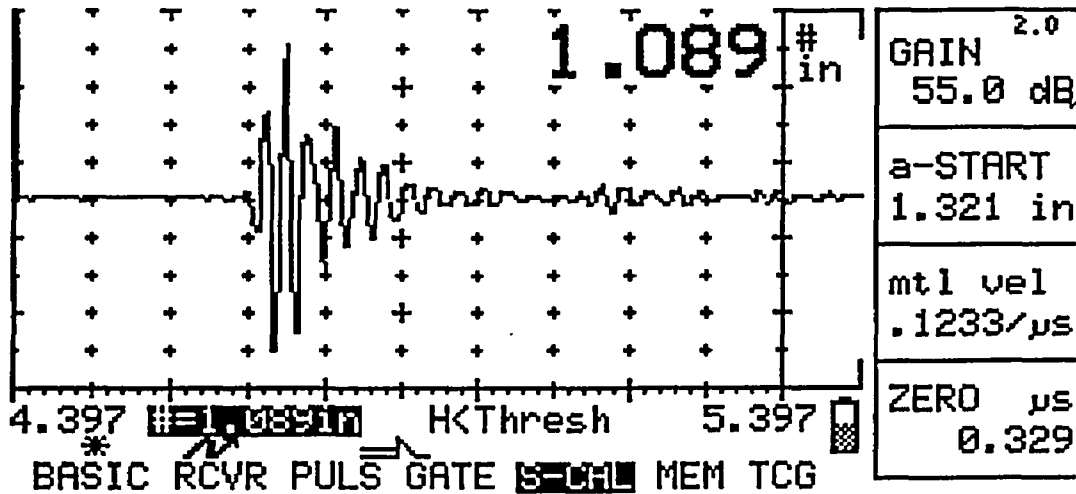
COMMENTS: 19° AND 25° EXAMINATIONS ARE THE BLEND RADIUS EXAMINATIONS  
TRANSVERSE EXAMINATION COVERAGE WILL INCLUDE COVERAGE OBTAINED DURING THE  
INNER RADIUS EXAMINATIONS. 5 TO 10% NOISE LEVEL WAS OBSERVED

EXAMINER: [Signature] LEVEL: II DATE: 4-4-02 REVIEWED BY: [Signature] LEVEL: III DATE: 4/4/02  
EXAMINER: [Signature] LEVEL: II DATE: 4-4-02 ANH: [Signature] DATE: 4/9/02 PAGE 28 OF 15

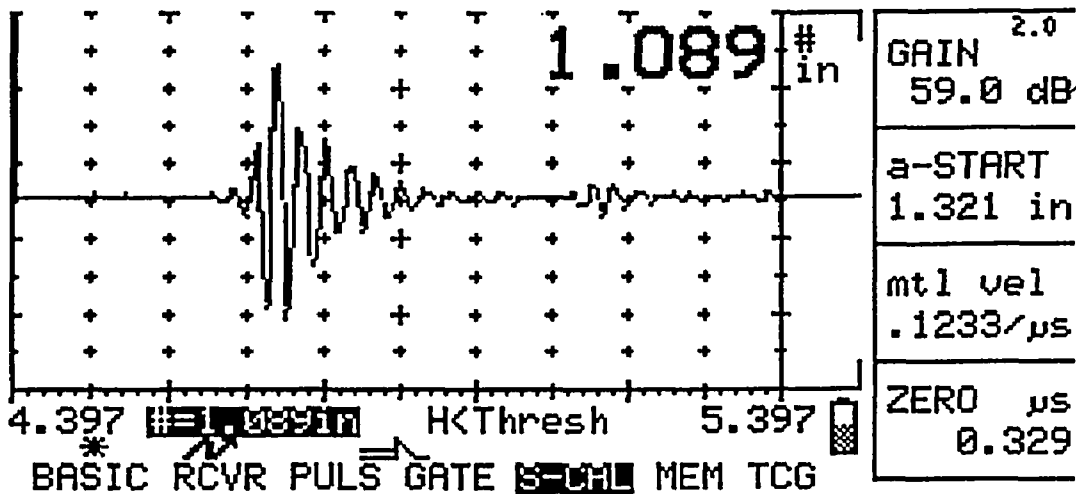
REPORT NUMBER  
R162

00066

Nozzle Examination 45 °Waveforms



45° Pre Waveform



45° Post Waveform

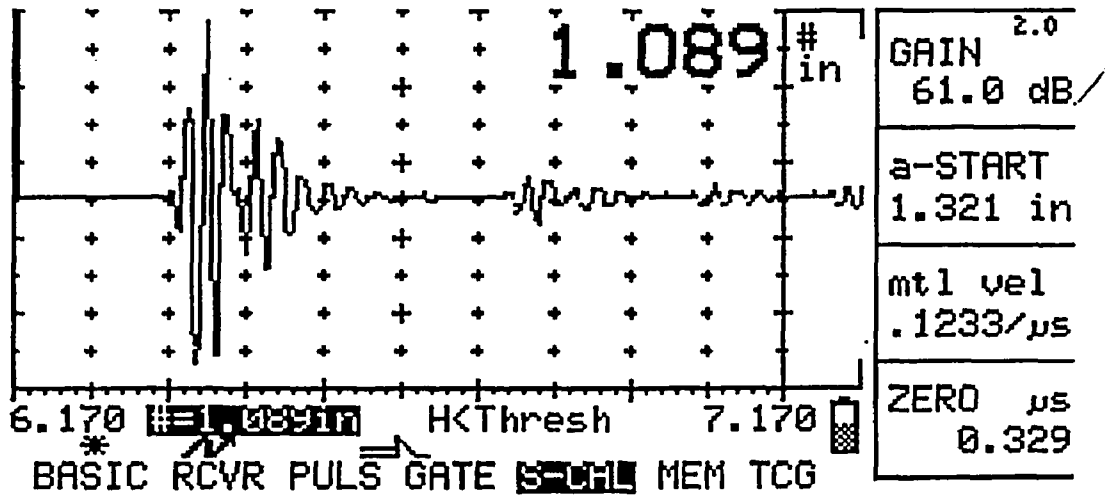
H5ACT  
A4  
4/19/02

954/10/02  
10 08 15

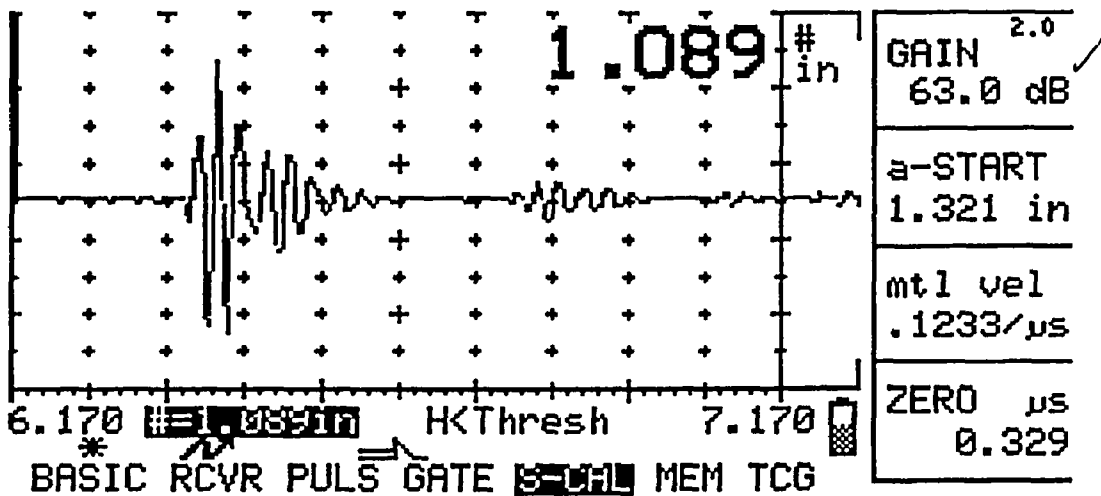
REPORT Number  
R162

00067

Nozzle Examination 60° Waveforms



60° Pre Waveform



60° Post Waveform

ASBCT  
4/19/02

10  
11 05 15  
J4/19/02



TVA

BEAM SPREAD AND  
RESOLUTION DATA SHEET

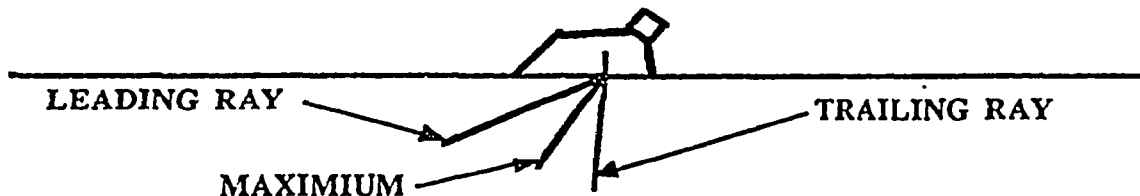
REPORT NO.

R162

PROJECT: BFN UNIT: 3 CALIBRATION BLOCK NO.: BF 18PROCEDURE NO.: N-OT-9 REV.: 9 PCR: 0006 02-09 13202SEARCH UNIT-MAKE: Krautkramer SIZE: .5X1 FREQ.: 2.25S/N: DB 34843 ANGLE: 45ULTRASONIC INSTRUMENT-MAKE: Smc 135 S/N: VH 751

## BEAM SPREAD

HOLE DEPTH	TRAILING RAY						LEADING RAY			
	20% DAC		50% DAC		100% DAC		20% DAC		50% DAC	
	W	MP	W	MP	MP	W	MP	W	W	MP
1/4T	1 1/8	1.9	1 1/4	2.	2.1	1 5/8	2.4	2	1 7/8	2.3
2T	2 7/8	4	3	4.1	4.3	3 1/4	4.8	4 1/8	3 3/4	4.6
3/4T	4 1/4	6	4 1/2	6.3	6.5	4 7/8	7	5 7/8	5 1/4	6.8



## RESOLUTION

NEAR SURFACE  
REFLECTOR: Notch OD DEPTH: 25 SIZE: .253 CAL BLK.: BF 18FAR SURFACE  
REFLECTOR: Notch ID DEPTH: 6.1 SIZE: .253

## SCANNING

REFLECTORS PROVIDE 50% DAC SIGNALS AT SCANNING SPEED

Y ☒N ☐EXAMINER: Mike W. HagenREVIEWED BY: Sal P. KistnerANII: Albert P. HallLEVEL: II DATE: 3-30-02LEVEL: III DATE: 4/4/02DATE: 4/19/02PAGE: 12 OF 15

00069

TVA

BEAM SPREAD AND  
RESOLUTION DATA SHEET

REPORT NO.

R162

PROJECT: BFA UNIT: 3 CALIBRATION BLOCK NO.: BF 18PROCEDURE NO.: N-UT-9 REV.: 9 PCR: 0206 4/19/02 3-3-02SEARCH UNIT-MAKE: Krautkramer SIZE: .5X1 FREQ.: 2.25S/N: DB 34154 ANGLE: 60ULTRASONIC INSTRUMENT-MAKE: Sonn 13C S/N: VH 751

## BEAM SPREAD

HOLE DEPTH	TRAILING RAY				LEADING RAY					
	20% DAC		50% DAC		100% DAC		20% DAC		50% DAC	
	W	MP	W	MP	MP	W	MP	W	W	MP
1/4T	2 1/8	2.4	2 3/8	2.7	2.9	2 5/8	3.2	3 1/8	2 7/8	3.1
1/2T	4 3/4	4.8	5	5.3	5.8	5 1/4	6.4	6 5/8	6	6.1
3/4T	6 3/8	7.6	7 1/4	8	8.7	7 7/8	9.6	8 5/8	8	9.1

6 5/16/02  
LEADING RAY

MAXIMUM

TRAILING RAY

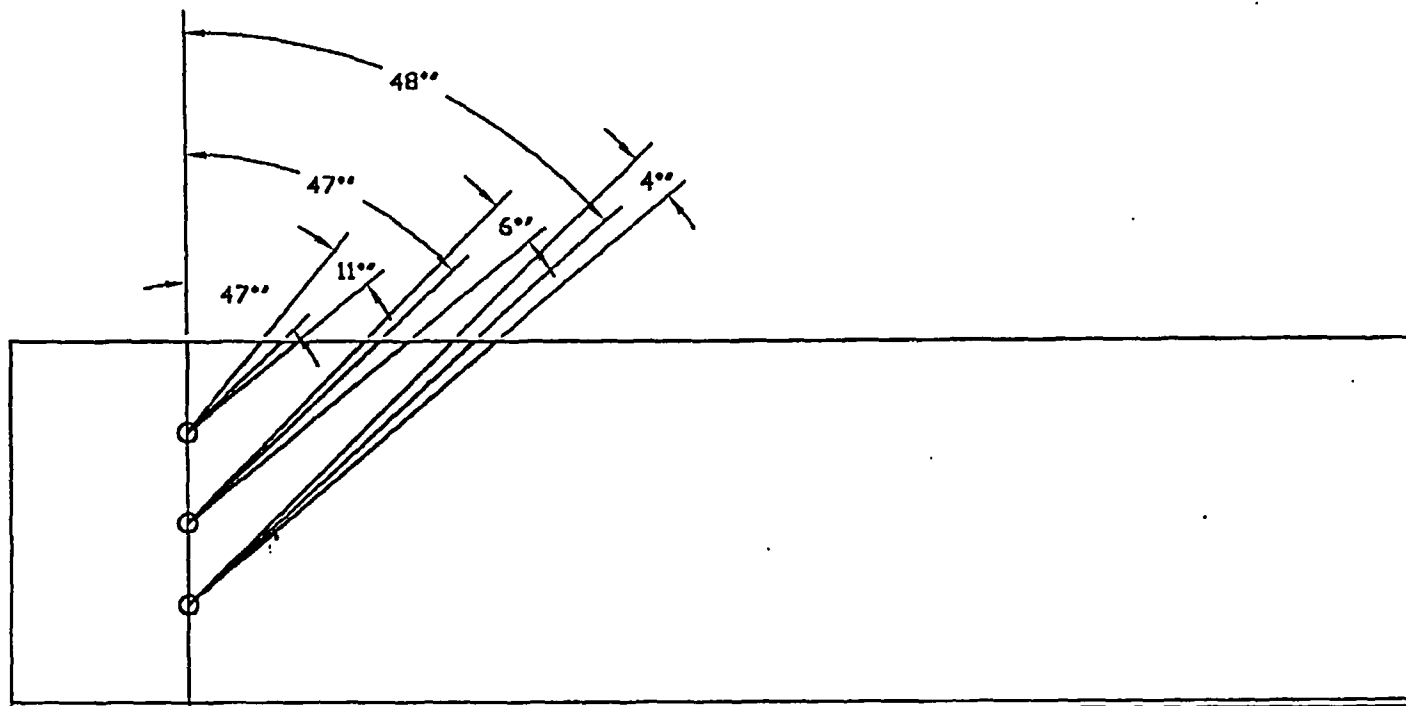
## RESOLUTION

NEAR SURFACE  
REFLECTOR: Notch OD DEPTH: .25 SIZE: .253 CAL BLK.: BF 18FAR SURFACE  
REFLECTOR: Notch ID DEPTH: 6.1 SIZE: .253

## SCANNING

REFLECTORS PROVIDE 50% DAC SIGNALS AT SCANNING SPEED Y ☒ N ☐EXAMINER: Mike W. Henry Jr.REVIEWED BY: John A. Henry Jr.ANII: Albat GoldLEVEL: II DATE: 3-30-02LEVEL: III DATE: 4/4/02DATE: 4/19/02  
PAGE: 13 OF 15

Report Number  
R162 00070



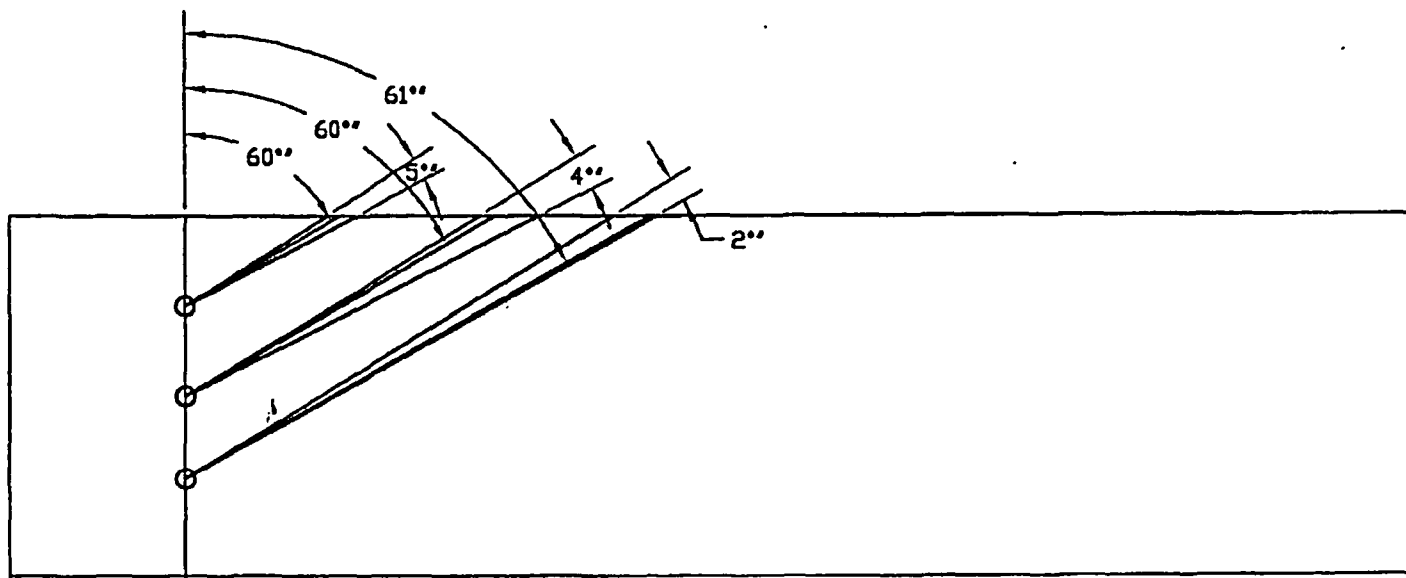
91 3 2 16  
14/3

HSBCF  
A-11  
4/1/99

Browns Ferry Unit 3
Beamsread
MARCH 2002
BF-18

Report Number  
R162

00071



HSBCF  
GXX  
4/19/02

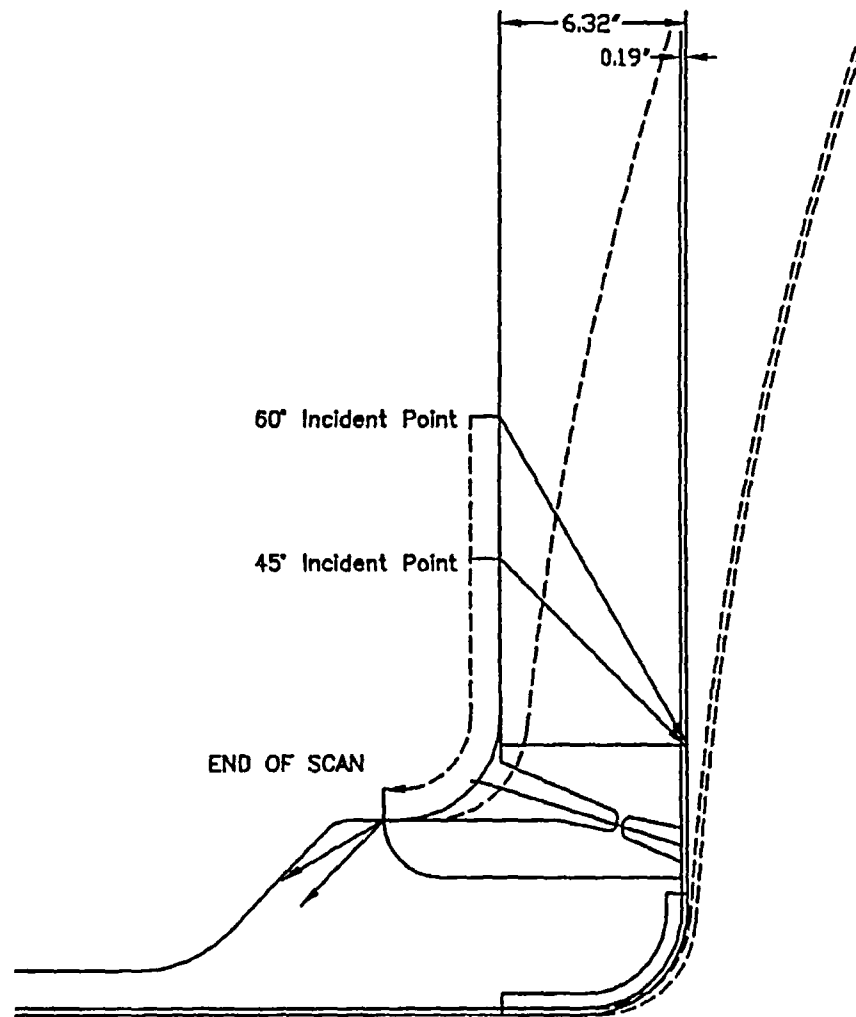
Browns Ferry Unit 3

Beamsread

MARCH 2002

BF-18

14341002  
18 08 15



15 of 15  
4/14/02

Transverse coverage includes coverage obtained during the inner radius examination

HSBCT  
4/14/02

Browns Ferry Unit 3
N2 Nozzle-to-Shell
MARCH 2002
SP-N2-NS

REPORT NUMBER  
R142

00072

00073

TENNESSEE VALLEY AUTHORITY		EXAMINATION SUMMARY AND RESOLUTION SHEET		REPORT NUMBER: <b>R163</b>	
PROJECT: BFN UNIT: 3 CYCLE: 10		COMPONENT ID: N2E-IR			
EXAMINATION METHOD		SYSTEM RPV		ISI DWG. NO. 3-ISI-0328-C	
MT <input type="checkbox"/>	PT <input type="checkbox"/>	UT <input checked="" type="checkbox"/>	VT <input type="checkbox"/>	CODE CLASS: 1	CATEGORY: B-D
PROCEDURE: N-UT-55		REV: 9	TC: <del>N/A</del> 02-08	COFIG.: Nozzle	TO Vessel
EXAMINER: MIKE KLEINJAN <i>4/11/02</i>		EXAMINER: DAVID KLEINJAN		EXAMINER: N/A	EXAMINER: N/A
LEVEL: <i>II</i>		LEVEL: <i>II</i>		LEVEL: N/A	LEVEL: N/A

This report contains the data associated with the manual ultrasonic examination of code category B-D, Nozzle Inner radius. This examination report satisfies ASME section XI requirements for the inner radius examination.

N2E-IR: This examination was performed using a 19° and 25° in the blend radius in two directions CW/CCW

100% code coverage was obtained

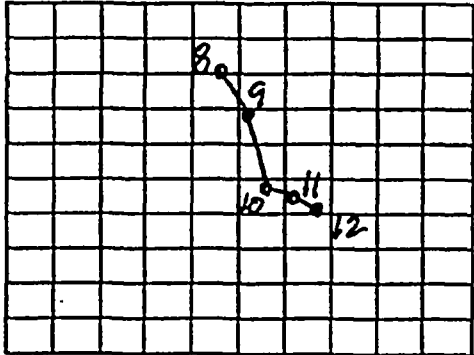
This exam was performed with equipment, Procedures, and personnel qualified in accordance with ASME Section XI

*No Recordable Indication*

RESOLUTION BY: Mike Kleinjan <i>Mike Kleinjan</i>	REVIEWED BY: <i>Paul Whitaker</i>	ANII: <i>Robert Todd</i>
LEVEL: <i>II</i> DATE: <i>4-4-02</i>	LEVEL: <i>II</i> DATE: <i>4/4/02</i>	DATE: <i>4/19/02</i>
		PG. 1 OF <i>24</i> <i>Jan 4/10/02</i>

00074

<b>TENNESSEE VALLEY AUTHORITY</b>			<b>DIGITAL ULTRASONIC CALIBRATION DATA SHEET</b>			<b>REPORT NUMBER:</b> <i>R163</i>						
PROJECT: BFN UNIT: 3 CYCLE: 10			CALIBRATION DATE: 04-01-02									
PROC.: N-UT- 55 REV:9 <i>TC N/A</i>			CALIBRATION BLOCK NO.: BF-85-IR TEMP: 68.1° F									
INSTR. MFG: STAVELEY DUE DATE: 08-11-02			SIMULATOR BLOCK NO: N/A									
MODEL/TYPE: SONIC-137 M & TE NO.: VH-5473			THERMOMETER S/N: 522352 DUE DATE: 05-17-02									
TRANSDUCER MFG: KRAUTKRAMER			COUPLANT SONOTRACE BATCH: 01141									
S/N DB 35164 SIZE: 1.0" FREQ: 2.25 MHz			EXAM TYPE: SHEAR <input type="checkbox"/> LONG <input type="checkbox"/> RL <input checked="" type="checkbox"/>									
CABLE TYPE: RG 174 LENGTH: 120 inches			<b>ANGLE VERIFICATION</b>									
<b>DAC</b>			BLOCK TYPE: CS IIW			S/N: DB 55074						
			NOMINAL ANGLE: 25°			ACTUAL ANGLE: N/A						
<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;">100 80 60 40 20 0</div>  <div style="margin-left: 10px; writing-mode: vertical-rl; transform: rotate(180deg);">A M P L I T U D E</div> </div> <p style="text-align: center;">DISPLAY WIDTH: 20 inches</p>			<b>INSTRUMENT SETTINGS</b>									
			<b>REFLECTOR</b>			REFERENCE		MEMORY				
			SCAN DIRECT.	NTCH	SDH	SENSITIVITY		NUMBER				
			AXIAL	<input checked="" type="checkbox"/>	<input type="checkbox"/>	60.0 dB		25				
			CIRC	<input type="checkbox"/>	<input type="checkbox"/>	N/A dB		N/A				
			FREQ: 2.25	MHz		REJECT: OFF		%				
			ANGLE: N/A	deg		DAMPING: 200		ohms				
			DELAY: 1.12	msec		PULSER: 222						
			ZERO: N/A	msec		FILTER: FILT 1						
			VELOCITY: 0.234	msec		REP RATE: 4 KHZ						
RANGE: 20.0	inches		TOF: <input type="checkbox"/> PEAK <input checked="" type="checkbox"/> FLANK									
DISPLAY MODE: PE			POWER: AC									
DUAL: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF			TCG: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF									
REF. REFLECTOR: N/A GAIN: N/A dB			<b>CALIBRATION TIMES</b>									
AMPLITUDE: N/A % METAL PATH: N/A			INITIAL TIME: 1355			FINAL TIME: 1805						
VERIFICATION TIMES			1)N/A	2)N/A	3)N/A	4)N/A	5)N/A	6)N/A	7)N/A	8)N/A	9)N/A	
<b>LINEARITY CHECK</b>												
VERTICAL	SIGNAL 1		100	90	80	70	60	50	40	30	20	
	SIGNAL 2		50	45	40	35	30	25	20	15	10	
ATTENUATOR	GAIN	SET	-6 dB		-12 dB		SET		+12		SET	+6
	AMP	80%	32 TO 48		16 TO 24		20 %		64 TO 96		40% 64 TO 96	
			40		20				80			
<b>COMMENTS:</b>						<b>WELDS/ITEMS EXAMINED:</b>						
Wedge ID D-14795-147						REACTOR PRESSURE VESSEL						
						N2A-IR, N2C-IR, N2E-IR						
EXAMINER: DAVID KLEINJAN <i>[Signature]</i> LEVEL: H			EXAMINER: MIKE KLEINJAN <i>[Signature]</i> LEVEL: II			REVIEWER: <i>[Signature]</i> LEVEL: <i>III</i> DATE: 4/4/02			ANII:  DATE: PG.: 12 OF 24 2 OF 4 <i>for 4/10/02</i>			

00075

<b>TENNESSEE VALLEY AUTHORITY</b>		<b>DIGITAL ULTRASONIC CALIBRATION DATA SHEET</b>		<b>REPORT NUMBER: <span style="font-size: 1.2em;">R163</span></b>									
PROJECT: BFN UNIT: 3 CYCLE: 10		CALIBRATION DATE: 04-01-02											
PROV: N-UT- 55 REV:9 <del>05 TC-N-17-03</del>		CALIBRATION BLOCK NO.: BF-85-IR TEMP: 68.1° F											
INSTR. MFG: STAVELEY DUE DATE: 08-11-02		SIMULATOR BLOCK NO: N/A											
MODEL TYPE: SONIC-137 M & TE NO.: VH-5473		THERMOMETER S/N: 522352 DUE DATE: 05-17-02											
TRANSDUCER MFG: KRAUTKRAMER		COUPLANT SONOTRACE BATCH: 01141											
S/N <del>DB 35163</del> SIZE: 1.0" FREQ: 2.25 MHz		EXAM TYPE: SHEAR <input type="checkbox"/> LONG <input type="checkbox"/> RL <input checked="" type="checkbox"/>											
CABLE TYPE: <del>RA 374 174</del> LENGTH: 120 inches		<b>ANGLE VERIFICATION</b>											
<b>DAC</b>		BLOCK TYPE: CS IIW		S/N: DB 55074									
		NOMINAL ANGLE: 19°		ACTUAL ANGLE: N/A									
<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;"> 100 80 60 40 20 0 </div> <div style="border: 1px solid black; width: 280px; height: 180px; position: relative;"> <div style="position: absolute; top: 10%; left: 10%;">5</div> <div style="position: absolute; top: 35%; left: 20%;">6</div> <div style="position: absolute; top: 55%; left: 30%;">7</div> </div> <div style="margin-left: 10px; text-align: center;"> A M P L I T U D E </div> </div> <p style="text-align: center;">DISPLAY WIDTH: 20 inches</p>		<b>INSTRUMENT SETTINGS</b>											
		<b>REFLECTOR</b>			<b>REFERENCE</b>		<b>MEMORY</b>						
		SCAN DIRECT. NTCH SDH			SENSITIVITY		NUMBER						
		AXIAL <input checked="" type="checkbox"/> <input type="checkbox"/>			57.2 dB		19						
		CIRC <input type="checkbox"/> <input type="checkbox"/>			N/A dB		N/A						
		FREQ: 2.25 MHz			REJECT: OFF %								
		ANGLE: N/A deg			DAMPING: 200 ohms								
		DELAY: 0.996 msec			PULSER: 222								
		ZERO: N/A msec			FILTER: FILT 1								
		VELOCITY: 0.234 msec			REP RATE: 4 KHZ								
RANGE: 20.0 inches			TOF: <input type="checkbox"/> PEAK <input checked="" type="checkbox"/> FLANK										
DISPLAY MODE: PE			POWER: AC										
DUAL: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF			TCG: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF										
<b>CALIBRATION TIMES</b>													
REF. REFLECTOR: N/A GAIN: N/A dB			INITIAL TIME: 1245 FINAL TIME: 1807										
AMPLITUDE: N/A % METAL PATH: N/A"													
VERIFICATION TIMES		1)N/A	2)N/A	3)N/A	4)N/A	5)N/A	6)N/A	7)N/A	8)N/A	9)N/A			
<b>LINEARITY CHECK</b>													
<b>VERTICAL</b>	SIGNAL 1		100	90	80	70	60	50	40	30	20		
	SIGNAL 2		50	45	40	35	30	25	20	15	10		
<b>ATTENUATOR</b>	GAIN	SET	-6 dB		-12 dB		SET		+12		SET	+6	
	AMP	80%	32 TO 48		16 TO 24		20 %		64 TO 96		40%		
			40		20				80		80		
<b>COMMENTS:</b>						<b>WELDS/ITEMS EXAMINED:</b>							
Wedge ID D-14795-144						REACTOR PRESSURE VESSEL							
						N2A-IR, N2C-IR, N2E-IR							
<b>EXAMINER:</b> DAVID KLEINJAN <i>[Signature]</i> LEVEL: II						<b>EXAMINER:</b> MIKE KLEINJAN <i>[Signature]</i> LEVEL: II		<b>REVIEWER:</b> <i>[Signature]</i> LEVEL: III		<b>DATE:</b> 4/14/02			
								<b>DATE:</b> 4/1/02		<b>PG: 1-3 OF 1-4 3024</b> <i>Jan 4/10/02</i>			



10075

**Inspection Report R-164**  
**Weld N3A-NV**

00077

TENNESSEE VALLEY AUTHORITY		EXAMINATION SUMMARY AND RESOLUTION SHEET		REPORT NUMBER: <b>R164</b>	
PROJECT: BFN UNIT: 3		CYCLE: 10		COMPONENT ID: N3A	
EXAMINATION METHOD				SYSTEM RPV ISI DWG. NO. 3-ISI-0329-C	
MT <input type="checkbox"/>	PT <input type="checkbox"/>	UT <input checked="" type="checkbox"/>	VT <input type="checkbox"/>	CODE CLASS: 1	CATEGORY: B-D
PROCEDURE: N_UT_9		REV: 9	TC: 02-06	COFIG.: Nozzle	TO Vessel
EXAMINER: MIKE KLEINJAN <i>for 4/19/02</i>		EXAMINER: DAVID KLEINJAN		EXAMINER: N/A	EXAMINER: N/A
LEVEL: <i>II</i>		LEVEL: II		LEVEL: N/A	LEVEL: N/A

This report contains the data associated with the manual ultrasonic examination of code category B-D, Nozzle to Vessel welds. This examination report satisfies ASME section XI requirements for the Nozzle to shell weld.

Examination, Nozzle to Vessel weld N3A

Transverse coverage for the Nozzle to Vessel weld was supplemented by the inner radius examination.

(N3A-IR) *see R 165*

0° was used on the weld crown and base material Vessel side

45° was used on the vessel side only scanning over the weld crown

45° Tangent to the weld was used on vessel side CW/CCW

45° Parallel to the weld was used on vessel side CW/CCW

60° was used on the vessel side only scanning over the weld crown

60° Tangent to the weld was used on vessel side CW/CCW

60° Parallel to the weld was used on vessel side CW/CCW

77% code coverage was obtained

This exam was performed with equipment, Procedures, and personnel qualified in accordance with ASME Section XI

*No Recordable Indication*

RESOLUTION BY: Mike Kleinjan <i>Mike W. Kleinjan</i>	REVIEWED BY: <i>David Kleinjan</i>	ANII: <i>Albert Ladd</i>
LEVEL: II DATE: <i>4-4-02</i>	LEVEL: <i>II</i> DATE: <i>4/4/02</i>	DATE: <i>4/19/02</i>
		PG. 1 OF 15 <i>for 4/19/02</i>

REPORT NUMBER  
R164

00078

Calculation of ASME code coverage  
For section XI NDE Examination

N3A

1) 0 degree (weld metal scan)	100%
2) 45 degree Transverse-scan from vessel side of weld	100%
3) 45 degree Transverse-scan from nozzle side of weld	0%
4) 60 degree Transverse-scan from vessel side of weld	100%
5) 60 degree Transverse-scan from nozzle side of weld	0%
6) 45 degree Parallel-scan CW direction	100% *
7) 45 degree Parallel-scan CCW direction	100% *
8) 60 degree Parallel-scan CW direction	100% *
9) 60 degree Parallel-scan CCW direction	100% *

The sum of all the percentage of scans	700%
Divided by the total # of scans	9
Percentage of examination Volume coverage	77%

\* Transverse coverage includes coverage obtained during the inner radius examination.

H5BCT  
4/17/00  
2.6 15

00079

<b>TENNESSEE VALLEY AUTHORITY</b>				<b>DIGITAL ULTRASONIC CALIBRATION DATA SHEET</b>				<b>REPORT NUMBER:</b> <span style="font-size: 1.2em;">R164</span>							
PROJECT: BFN		UNIT: 3		CYCLE: 10		CALIBRATION DATE: 3-31-02									
PROC.: N-UT-		9		REV:9		TC:02-06		CALIBRATION BLOCK NO.: BF18		TEMP: 72.6°F					
INSTR. MFG: STAVELEY				DUE DATE: 8-05-02				SIMULATOR BLOCK NO: DB55079							
MODEL/TYPE: SONIC-136				M & TE NO.: VH751				THERMOMETER S/N: 522352							
TRANSDUCER MFG: Harisonic								DUE DATE: 5-17-02							
S/N DB34198		SIZE: .75		FREQ: 2.25 MHz		COUPLANT SONOTRACE		BATCH: 01141							
CABLE TYPE: RG174		LENGTH: 120 inches				EXAM TYPE: SHEAR <input type="checkbox"/>		LONG <input checked="" type="checkbox"/>		RL <input type="checkbox"/>					
<b>ANGLE VERIFICATION</b>															
BLOCK TYPE: <del>Rompas</del> <i>Rompas</i>						S/N: DB55079									
NOMINAL ANGLE: 0						ACTUAL ANGLE: N/A									
<b>DAC</b>						<b>INSTRUMENT SETTINGS</b>									
<div style="display: flex; align-items: center;"> <div style="flex: 1;"> </div> <div style="flex: 0.2; text-align: center; font-weight: bold;">A M P L I T U D E</div> </div> <p style="text-align: center;">DISPLAY WIDTH: 10 inches</p>						<b>REFLECTOR</b>			<b>REFERENCE</b>		<b>MEMORY</b>				
						SCAN DIRECT.		NTCH		SDH		SENSITIVITY		NUMBER	
						AXIAL		<input type="checkbox"/>		<input checked="" type="checkbox"/>		20.8 dB		1	
						CIRC		<input type="checkbox"/>		<input type="checkbox"/>		n/a dB		n/a	
						FREQ: 2.25		MHz		REJECT: off		%			
						ANGLE: n/a		deg		DAMPING: 500		ohms			
						DELAY: .499		msec		PULSER: 222					
						ZERO: n/a		msec		FILTER: Filt 3					
						VELOCITY: .238		msec		REP RATE: 2KHZ					
						RANGE: 10		inches		TOF: <input checked="" type="checkbox"/> PEAK <input type="checkbox"/> FLANK					
DISPLAY MODE: PE				POWER: AC											
DUAL: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF				TCG: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF											
<b>CALIBRATION TIMES</b>															
INITIAL TIME: 9:00						FINAL TIME: 11:45									
VERIFICATION TIMES		1)		2) N/A		3) N/A		4) N/A		5) N/A					
		6) N/A		7) N/A		8) N/A		9) N/A							
<b>LINEARITY CHECK</b>															
<b>VERTICAL</b>		SIGNAL 1		100	90	80	70	60	50	40	30	20			
		SIGNAL 2		50	45	40	35	30	25	20	15	10			
<b>ATTENUATOR</b>		GAIN	SET	-6 dB		-12 dB		SET		+12		SET	+6		
		AMP	80%	32 TO 48		16 TO 24		20 %		64 TO 96		40%			
				40		20				80		80			
<b>COMMENTS:</b>						<b>WELDS/ITEMS EXAMINED:</b>									
						N3A Nozzle to Shell									
<b>EXAMINER:</b> MIKE W. KLEINJAN <i>Mike W. Kleinjan</i> LEVEL: II				<b>EXAMINER:</b> DAVID KLEINJAN <i>D.R. Kleinjan</i> LEVEL: II				<b>REVIEWER:</b> <i>David Whiteley</i> LEVEL: <i>III</i> DATE: <i>4/1/02</i>							
								<b>ANIL:</b> <i>What Tatt</i> DATE: <i>4/19/02</i> PG.: <i>44</i> OF <i>15</i> <i>5-9/02</i> <span style="float: right;">3 of 15</span>							

00080

<b>TENNESSEE VALLEY AUTHORITY</b>		<b>DIGITAL ULTRASONIC CALIBRATION DATA SHEET</b>		REPORT NUMBER: <b>R164</b>								
PROJECT: BFN UNIT: 3 CYCLE: 10		CALIBRATION DATE: <del>3-29-02</del> <b>3-31-02</b> <i>5/10/02</i>										
PROC.: N-UT- 9 REV:9 TC:02-06		CALIBRATION BLOCK NO.: BF18 TEMP: 72.6°F										
INSTR. MFG: STAVELEY DUE DATE: 8-05-02		SIMULATOR BLOCK NO: DB55079										
MODEL/TYPE: SONIC-136 M & TE NO.: VH751		THERMOMETER S/N: 522352 DUE DATE: 5-17-02										
TRANSDUCER MFG: Krautkramer		COUPLANT SONOTRACE BATCH: 01141										
S/N DB34843 SIZE: .5x1 FREQ: 2.25 MHz		EXAM TYPE: SHEAR <input checked="" type="checkbox"/> LONG <input type="checkbox"/> RL <input type="checkbox"/>										
CABLE TYPE: RG1743 LENGTH: 120 inches		<b>ANGLE VERIFICATION</b>										
<b>DAC</b>		BLOCK TYPE: IIW		S/N: DB55074								
		NOMINAL ANGLE: 45°		ACTUAL ANGLE: 46°								
<p style="text-align: center;">DISPLAY WIDTH: 10 inches</p>		<b>INSTRUMENT SETTINGS</b>										
		<b>REFLECTOR</b>		<b>REFERENCE</b>		<b>MEMORY</b>						
		SCAN DIRECT.	NTCH	SDH	SENSITIVITY	NUMBER						
		AXIAL	<input type="checkbox"/>	<input checked="" type="checkbox"/>	42.6 dB	2						
		CIRC	<input type="checkbox"/>	<input type="checkbox"/>	n/a dB	n/a						
		FREQ:	2.25	MHz	REJECT:	off %						
		ANGLE:	N/A	deg	DAMPING:	500 ohms						
		DELAY:	.830	msec	PULSER:	222						
		ZERO:	N/A	msec	FILTER:	FITL 3						
		VELOCITY:	.126	msec	REP RATE:	2KHZ						
RANGE:	20	inches	TOF: <input checked="" type="checkbox"/> PEAK <input type="checkbox"/> FLANK									
DISPLAY MODE: PE		POWER: AC										
DUAL: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF		TCG: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF										
<b>CALIBRATION TIMES</b>												
REF. REFLECTOR: 1" GAIN: 33.6 dB		INITIAL TIME: 9:00 FINAL TIME: 11:45										
AMPLITUDE: 80 % METAL PATH: 1"												
VERIFICATION TIMES		1) N/A	2) N/A	3) N/A	4) N/A	5) N/A	6) N/A	7) N/A	8) N/A	9) N/A		
<b>LINEARITY CHECK</b>												
VERTICAL	SIGNAL 1		100	90	80	70	60	50	40	30	20	
	SIGNAL 2		50	45	40	35	30	25	20	15	10	
ATTENUATOR	GAIN	SET	-6 dB		-12 dB		SET		+12		SET	+6
	AMP	80%	32 TO 48		16 TO 24		20 %		64 TO 96		40% 64 TO 96	
			40		20				80		80	
COMMENTS:						WELDS/ITEMS EXAMINED:						
Delta difference between 3/8 to 5/8 on the clad side is 3 dB						N3A Nozzle to Shell						
EXAMINER:		EXAMINER:		REVIEWER:		ANIL						
MIKE W. KLEINJAN		DAVID KLEINJAN		<i>[Signature]</i>		<i>[Signature]</i>						
<i>Mike W. Kleinjan</i>		<i>[Signature]</i>		LEVEL: <i>II</i>		DATE: <i>4/19/02</i>		PG: <i>1-5 OF 1-15</i>				
LEVEL: II		LEVEL: <i>II</i>		DATE: <i>4/19/02</i>		4 OF 15 <i>4/19/02</i>						

00081

TENNESSEE VALLEY AUTHORITY		DIGITAL ULTRASONIC CALIBRATION DATA SHEET		REPORT NUMBER: <i>R164</i>						
PROJECT: BFN UNIT: 3 CYCLE: 10		CALIBRATION DATE: <i>3-29-02</i> <del>3-31-02</del>								
PROC.: N-UT- 9 REV:9 TC:02-06		CALIBRATION BLOCK NO.: BF18 TEMP: 72.6°F								
INSTR. MFG: STAVELEY DUE DATE: 8-05-02		SIMULATOR BLOCK NO: DB55079								
MODEL/TYPE: SONIC-136 M & TE NO.: VH751		THERMOMETER S/N: 522352 DUE DATE: 5-17-02								
TRANSDUCER MFG: Krautkramer		COUPLANT SONOTRACE BATCH: 01141								
S/N DB34154 SIZE: .5x1 FREQ: 2.25 MHz		EXAM TYPE: SHEAR <input checked="" type="checkbox"/> LONG <input type="checkbox"/> RL <input type="checkbox"/>								
CABLE TYPE: RG174 LENGTH: 120 inches		ANGLE VERIFICATION								
DAC		BLOCK TYPE: IIW		S/N: DB55074						
		NOMINAL ANGLE: 60		ACTUAL ANGLE: 59						
<p>DISPLAY WIDTH: 10 inches</p>		INSTRUMENT SETTINGS								
		REFLECTOR		REFERENCE		MEMORY				
		SCAN DIRECT.	NTCH	SDH	SENSITIVITY	NUMBER				
		AXIAL	<input type="checkbox"/>	<input checked="" type="checkbox"/>	49 dB	3				
		CIRC	<input type="checkbox"/>	<input type="checkbox"/>	n/a dB	n/a				
		FREQ: 2.25 MHz	REJECT: off %							
		ANGLE: N/A deg	DAMPING: 500 ohms							
		DELAY: 1.20 msec	PULSER: 222							
		ZERO: N/A msec	FILTER: FITL 3							
		VELOCITY: .123 msec	REP RATE: 2KHZ							
RANGE: 20 inches	TOF: <input checked="" type="checkbox"/> PEAK <input type="checkbox"/> FLANK									
DISPLAY MODE: PE		POWER: AC								
DUAL: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF		TCG: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF								
CALIBRATION TIMES										
REF. REFLECTOR: 1" GAIN: 36 dB		INITIAL TIME: 9:00 FINAL TIME: 11:45								
AMPLITUDE: 80 % METAL PATH: 1"										
VERIFICATION TIMES		1) N/A	2) N/A	3) N/A	4) N/A	5) N/A	6) N/A	7) N/A	8) N/A	9) N/A
LINEARITY CHECK										
VERTICAL	SIGNAL 1	100	90	80	70	60	50	40	30	20
	SIGNAL 2	50	45	40	35	30	25	20	15	10
ATTENUATOR	GAIN	SET	-6 dB	-12 dB	SET	+12	SET	+6		
	AMP	80%	32 TO 48	16 TO 24	20 %	64 TO 96	40%	64 TO 96		
			40	20		80		80		
COMMENTS:						WELDS/ITEMS EXAMINED:				
DELTA dB DIFFERENCE IS 4.4 FROM THE 3/8 TO 5/8 ON THE CLAD SIDE						N3A Nozzle to Shell				
EXAMINER:		EXAMINER:		REVIEWER:		ANII: <i>Robert L...</i>				
MIKE W. KLEINJAN		DAVID KLEINJAN		<i>David Kleinjan</i>		DATE: 4/19/02				
LEVEL: II		LEVEL: II		LEVEL: II		PG: 1-6 OF 1-10				

5 OF 15 5/10/02

00082

TENNESSEE VALLEY AUTHORITY		DIGITAL ULTRASONIC CALIBRATION DATA SHEET		REPORT NUMBER: <i>R164</i>							
PROJECT: BFN UNIT: 3 CYCLE: 10		CALIBRATION DATE: 03-31-02									
PROC.: N-UT- 55 REV:9 TC: <i>N/A</i>		CALIBRATION BLOCK NO.: BF-84-IR TEMP: 70.5° F									
INSTR. MFG: STAVELEY DUE DATE: 08-11-02		SIMULATOR BLOCK NO: N/A									
MODEL/TYPE: SONIC-137 M & TE NO.: VH-5473		THERMOMETER S/N: 522352 DUE DATE: 05-17-02									
TRANSDUCER MFG: KRAUTKRAMER		COUPLANT SONOTRACE BATCH: 01141									
S/N DB 35163 SIZE: 1.0" FREQ: 2.25 MHz		EXAM TYPE: SHEAR <input type="checkbox"/> LONG <input type="checkbox"/> RL <input checked="" type="checkbox"/>									
CABLE TYPE: RG 174 LENGTH: 120 inches		ANGLE VERIFICATION									
DAC		BLOCK TYPE: CS IIW		S/N: DB 55074							
		NOMINAL ANGLE: 24		ACTUAL ANGLE: N/A							
<p style="text-align: center;">DISPLAY WIDTH: 20 inches</p>		INSTRUMENT SETTINGS									
		REFLECTOR			REFERENCE		MEMORY				
		SCAN DIRECT.	NTCH	SDH	SENSITIVITY		NUMBER				
		AXIAL	<input checked="" type="checkbox"/>	<input type="checkbox"/>	57.0 dB		24				
		CIRC	<input type="checkbox"/>	<input type="checkbox"/>	N/A dB		N/A				
		FREQ:	2.25	MHz	REJECT:		OFF %				
		ANGLE:	N/A	deg	DAMPING:		200 ohms				
		DELAY:	0.999	msec	PULSER:		222				
		ZERO:	N/A	msec	FILTER:		FILT				
		VELOCITY:	0.233	msec	REP RATE:		4 KHZ				
RANGE:	20.0	inches	TOF: <input type="checkbox"/> PEAK <input checked="" type="checkbox"/> FLANK								
DISPLAY MODE: PE			POWER: AC								
DUAL: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF			TCG: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF								
REF. REFLECTOR: N/A GAIN: N/A dB		CALIBRATION TIMES									
AMPLITUDE: N/A % METAL PATH: N/A		INITIAL TIME: 0815		FINAL TIME: 1135							
VERIFICATION TIMES		1)N/A	2)N/A	3)N/A	4)N/A	5)N/A	6)N/A	7)N/A	8)N/A	9)N/A	
LINEARITY CHECK											
VERTICAL	SIGNAL 1		100	90	80	70	60	50	40	30	20
	SIGNAL 2		50	45	40	35	30	25	20	15	10
ATTENUATOR	GAIN	SET	-6 dB	-12 dB	SET		+12	SET		+6	
	AMP	80%	32 TO 48	16 TO 24	20 %		64 TO 96	40%		64 TO 96	
			40	20			80			80	
COMMENTS:						WELDS/ITEMS EXAMINED:					
						REACTOR PRESSURE VESSEL					
						N3A-IR					
<i>wedge ID 0-14795-248</i>						ANIL <i>Robert Hall</i>					
						DATE: <i>7/19/02</i>					
EXAMINER: DAVID KLEINJAN <i>[Signature]</i> LEVEL: II		EXAMINER: MIKE KLEINJAN <i>[Signature]</i> LEVEL: II		REVIEWER: <i>[Signature]</i> LEVEL: <i>III</i> DATE: <i>7/16/02</i>		PG.: <i>7</i> OF <i>15</i> <i>6 Jan 4/10/02</i>					



00083

TENNESSEE VALLEY AUTHORITY			DIGITAL ULTRASONIC CALIBRATION DATA SHEET			REPORT NUMBER: <b>R164</b>						
PROJECT: BFN UNIT: 3 CYCLE: 10			CALIBRATION DATE: 03-31-02									
PROC.: N-UT- 55 REV:9 <del>VAL. TC: N/A</del>			CALIBRATION BLOCK NO.: BF-84-IR			TEMP: 70.5° F						
INSTR. MFG: STAVELEY DUE DATE: 08-11-02			SIMULATOR BLOCK NO: N/A									
MODEL/TYPE: SONIC-137 M & TE NO.: VH-5473			THERMOMETER S/N: 522352 DUE DATE: 05-17-02									
TRANSDUCER MFG: KRAUTKRAMER			COUPLANT SONOTRACE BATCH: 01141									
S/N DB 35164 SIZE: 1.0" FREQ: 2.25 MHz			EXAM TYPE: SHEAR <input type="checkbox"/> LONG <input type="checkbox"/> RL <input checked="" type="checkbox"/>									
CABLE TYPE: RG 174 LENGTH: 120 inches			ANGLE VERIFICATION									
DAC			BLOCK TYPE: CS IIW			S/N: DB 55074						
			NOMINAL ANGLE: 28			ACTUAL ANGLE: N/A						
<p style="text-align: center;">DISPLAY WIDTH: 20 inches</p>			INSTRUMENT SETTINGS									
			REFLECTOR			REFERENCE		MEMORY				
			SCAN DIRECT.	NTCH	SDH	SENSITIVITY		NUMBER				
			AXIAL	<input checked="" type="checkbox"/>	<input type="checkbox"/>	59.6 dB		28				
			CIRC	<input type="checkbox"/>	<input type="checkbox"/>	N/A dB		N/A				
			FREQ:	2.25 MHz		REJECT: OFF		%				
			ANGLE:	N/A deg		DAMPING: 200		ohms				
			DELAY:	1.39 msec		PULSER: 222						
			ZERO:	N/A msec		FILTER: FILT 1						
			VELOCITY:	0.236 msec		REP RATE: 4 KHZ						
RANGE:	20.0 inches		TOF: <input type="checkbox"/> PEAK <input checked="" type="checkbox"/> FLANK									
DISPLAY MODE: PE			POWER: AC									
DUAL: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF			TCG: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF									
REF. REFLECTOR: N/A GAIN: N/A dB			CALIBRATION TIMES									
AMPLITUDE: N/A % METAL PATH: N/A"			INITIAL TIME: 0900			FINAL TIME: 1136						
VERIFICATION TIMES			1)N/A	2)N/A	3)N/A	4)N/A	5)N/A	6)N/A	7)N/A	8)N/A	9)N/A	
LINEARITY CHECK												
VERTICAL	SIGNAL 1		100	90	80	70	60	50	40	30	20	
	SIGNAL 2		50	45	40	35	30	25	20	15	10	
ATTENUATOR	GAIN	SET	-6 dB	-12 dB	SET		+12		SET		+6	
	AMP	80%	32 TO 48	16 TO 24	20 %		64 TO 96		40%		64 TO 96	
			40	20			80				80	
COMMENTS:						WELDS/ITEMS EXAMINED:						
						REACTOR PRESSURE VESSEL						
						N3A-IR						
						Wedge ID D-14795-249						
EXAMINER: DAVID KLEINJAN <i>D.K.</i> LEVEL: 4H			EXAMINER: MIKE KLEINJAN <i>Mike Kleinjan</i> LEVEL: II			REVIEWER: <i>David White</i> LEVEL: III DATE: 4/14/02			ANIL <i>Anil</i> DATE: 4/19/02 PG.: 1 of 15			

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TVA

MANUAL ULTRASONIC VESSEL  
EXAMINATION DATA SHEET

REPORT NO.

R164

PROJECT: BFN UNIT: 3 WELD ID: N3A CONFIG.: Nozzle COMPONENT: VESSELCAL. SHT. NO.: N/A PROCEDURE: N-UT-9 ~~N-UT-9~~ REV.: 9 PCR.: 02-06, 1-4/10/02 TEMP.: 85 PYRO.: 522352SCAN SENS.: \* dB EXAM START: 9:30 EXAM END: 11:00 EXAM ANGLE: 0°, 45°, 60°Lo LOCATION: TDC Wo LOCATION: Ø OF WELD

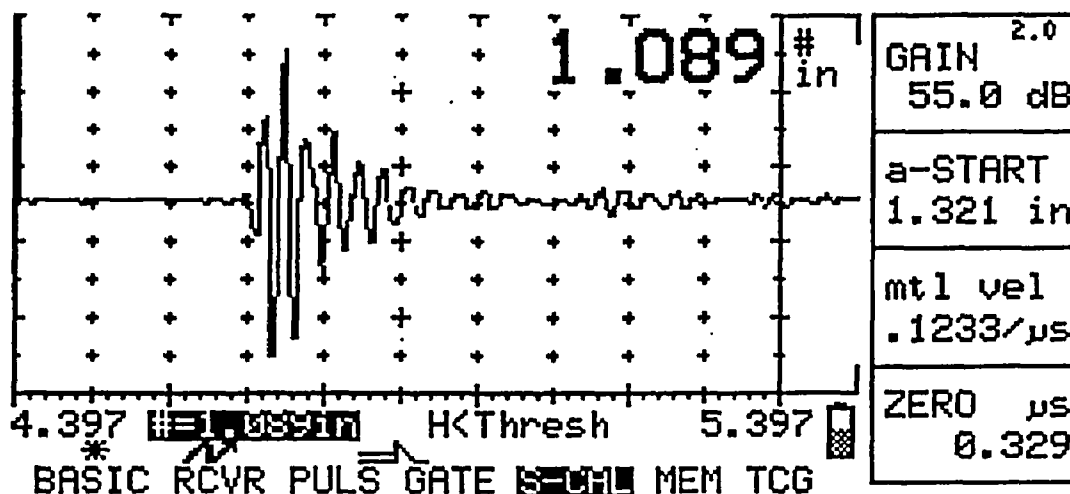
IND NO.	20%			50%			100%			MAX. AMP.			20%			50%			100%		
	Mp1	W1	L1	Mp1	W1	L1	Mp1	W1	L1	Mp	W	L	Mp2	W2	L2	Mp2	W2	L2	Mp2	W2	L2
28°	SCAN		dB	65.6			SCANNING	#	10/11				BLEND RADIUS								
24°	SCAN		dB	63			SCANNING	#	10/11				BLEND RADIUS								
0°	SCAN		dB	34.8			SCANNING	#	9				ON WELD AND BASE MATERIAL								
45°	SCAN		dB	56.6			SCANNING	#	9				ON WELD AND VESSEL SIDE								
45T	SCAN		dB	56.6			SCANNING	#	10/11				CW/CCW VESSEL SIDE								
45TAN	SCAN		dB	56.6			SCANNING	#	10/11				CW/CCW VESSEL SIDE								
60	SCAN		dB	63			SCANNING	#	9				ON WELD AND VESSEL SIDE								
60T	SCAN		dB	63			SCANNING	#	10/11				CW/CCW VESSEL SIDE								
60TAN	SCAN		dB	63			SCANNING	#	10/11				CW/CCW VESSEL SIDE								
NO RECORDABLE INDICATION																					

COMMENTS: 28° AND 24° EXAMINATIONS ARE THE BLEND RADIUS EXAMINATIONS  
TRANSVERSE EXAMINATION COVERAGE WILL INCLUDE COVERAGE OBTAINED DURING THE  
INNER RADIUS EXAMINATIONS. 5 TO 10% Noise Level was observed

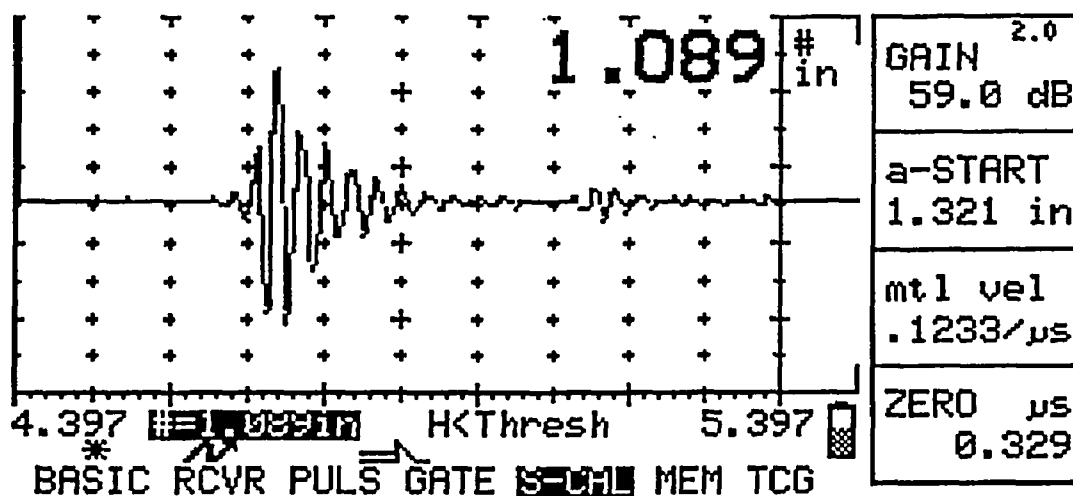
EXAMINER: Mike G. Turner LEVEL: II DATE: 4-4-02REVIEWED BY: Paul A. Tuttle LEVEL: III DATE: 4/4/02EXAMINER: Mike G. Turner LEVEL: II DATE: 03-31-02ANII: Paul A. Tuttle DATE: 4/4/02 PAGE 8 OF 15

Report Num 00085  
R164

Nozzle Examination 45 °Waveforms



45° Pre Waveform

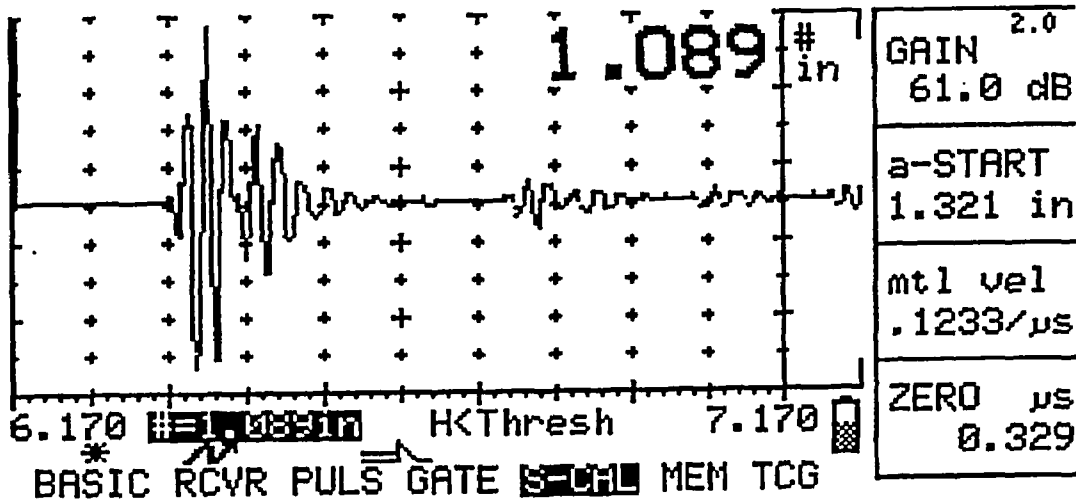


45° Post Waveform

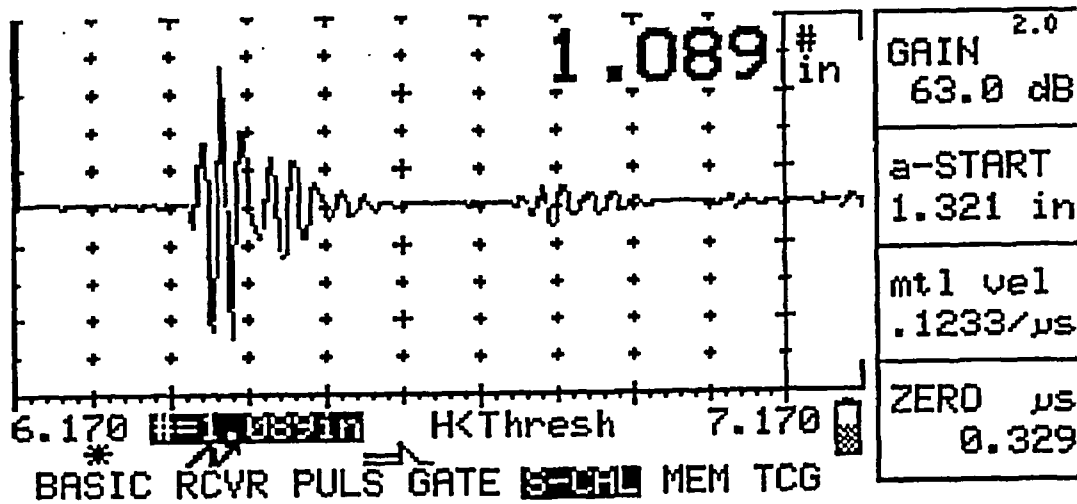
HSBCT  
4/19/02  
9 5 4/10/02  
10.08 46

00086  
REPORT Number  
R164

Nozzle Examination 60° Waveforms



60° Pre Waveform



60° Post Waveform

H5BCT  
10/19/00  
10/24/02  
18-25 15

00087

TVA

BEAM SPREAD AND  
RESOLUTION DATA SHEET

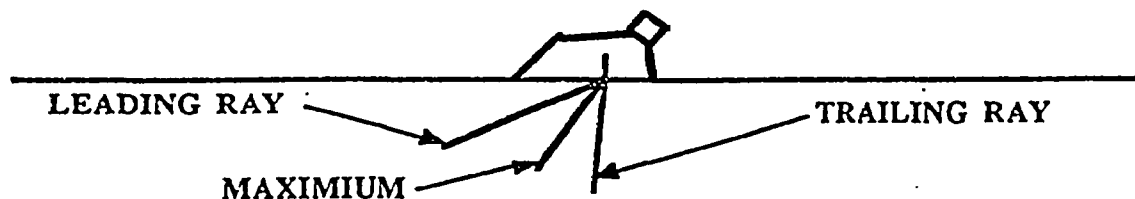
REPORT NO.

R164

PROJECT: BFN UNIT: 3 CALIBRATION BLOCK NO.: BF 18PROCEDURE NO.: N-UT-9 REV.: 9 PCR: 0206 N/A 3-30-02SEARCH UNIT-MAKE: Krautkramer SIZE: 5X1 FREQ.: 2.25S/N: DB 34843 ANGLE: 45ULTRASONIC INSTRUMENT-MAKE: Smc 135 S/N: VH 751

## BEAM SPREAD

HOLE DEPTH	TRAILING RAY						LEADING RAY			
	20% DAC		50% DAC		100% DAC		20% DAC		50% DAC	
	W	MP	W	MP	MP	W	MP	W	W	MP
1/4T	1 1/8	1.9	1 1/4	2.	2.1	1 5/8	2.4	2	1 7/8	2.3
2T	2 7/8	4	3	4.1	4.3	3 1/4	4.8	4 1/8	3 3/4	4.6
3/4T	4 1/4	6	4 1/2	6.3	6.5	4 7/8	7	5 7/8	5 1/4	6.8



## RESOLUTION

NEAR SURFACE REFLECTOR: Notes OD DEPTH: 25 SIZE: .253 CAL BLK.: BF 18FAR SURFACE REFLECTOR: Notes ID DEPTH: 6.1 SIZE: .253

## SCANNING

REFLECTORS PROVIDE 50% DAC SIGNALS AT SCANNING SPEED

Y ☒N ☐EXAMINER: [Signature]REVIEWED BY: [Signature]ANII: [Signature]LEVEL: IF DATE: 3-30-02LEVEL: IF DATE: 4/13/02DATE: 4/19/02PAGE: 4 OF 15

00088

TVA

BEAM SPREAD AND  
RESOLUTION DATA SHEET

REPORT NO.

R164

PROJECT: BFN UNIT: 3 CALIBRATION BLOCK NO.: BF 18PROCEDURE NO.: N-UT-9 REV.: 9 PCR: 0206 H/A 3-30-02SEARCH UNIT-MAKE: Krautkramer SIZE: .5X1 FREQ.: 2.25S/N: DB 34154 ANGLE: 60ULTRASONIC INSTRUMENT-MAKE: Sonic 13C S/N: VH 751

## BEAM SPREAD

HOLE DEPTH	TRAILING RAY				LEADING RAY					
	20% DAC		50% DAC		100% DAC		20% DAC		50% DAC	
	W	MP	W	MP	MP	W	MP	W	W	MP
1/4T	2 1/8	2.4	2 3/8	2.7	2.9	2 5/8	3.2	3 1/8	2 7/8	3.1
1/2T	4 3/4	4.8	5	5.3	5.8	5 1/4	6.4	6 5/8	6	6.1
3/4T	6 3/8	7.6	7 1/4	8	8.7	7 7/8	9.6	8 5/8	8	9.1

LEADING RAY

TRAILING RAY

MAXIMUM

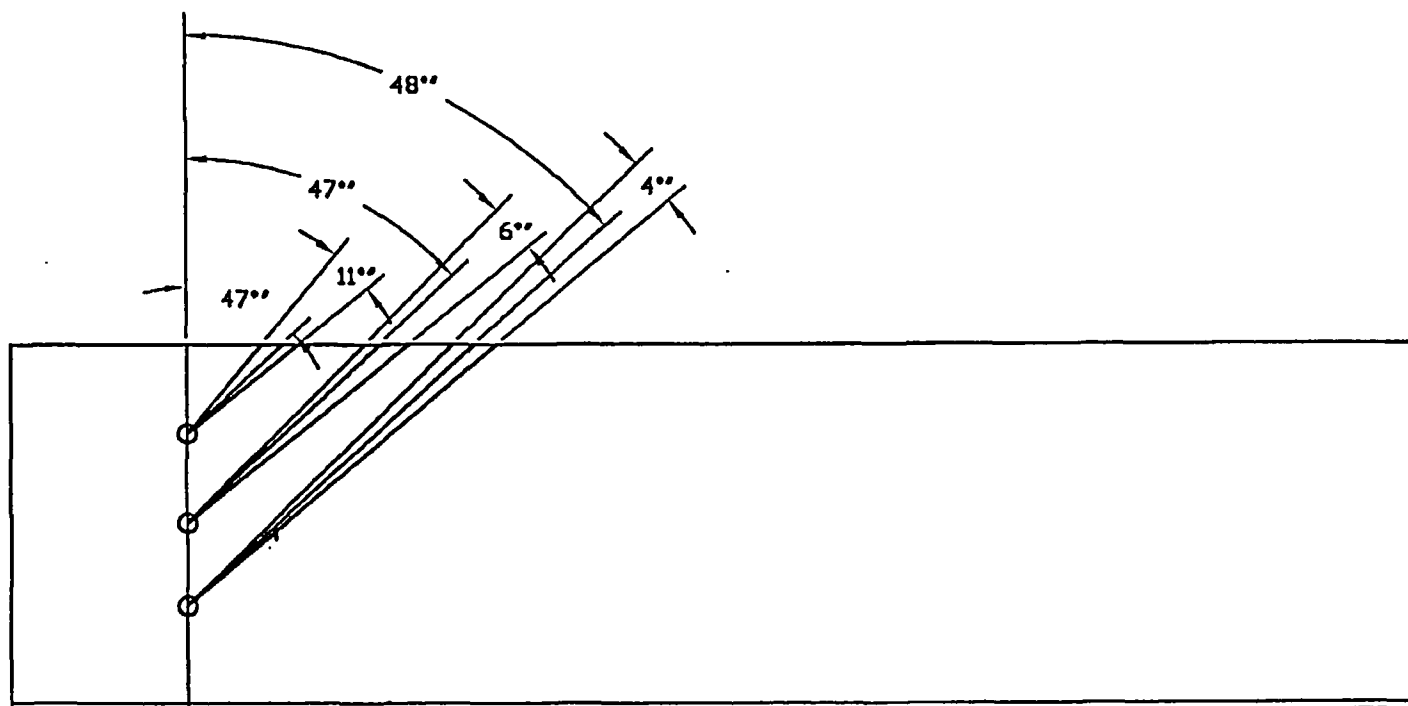
## RESOLUTION

NEAR SURFACE  
REFLECTOR: Notch OD DEPTH: .25 SIZE: .253 CAL BLK.: BF-18FAR SURFACE  
REFLECTOR: Notch ID DEPTH: 6.1 SIZE: .253

## SCANNING

REFLECTORS PROVIDE 50% DAC SIGNALS AT SCANNING SPEED Y ☒ N ☐EXAMINER: Mike W. Henry JrREVIEWED BY: [Signature]ANI: [Signature]LEVEL: II DATE: 3-30-02LEVEL: II DATE: 4/3/02DATE: 4/19/02PAGE: 13 OF 15

REPORT NUMBER  
R164 00089

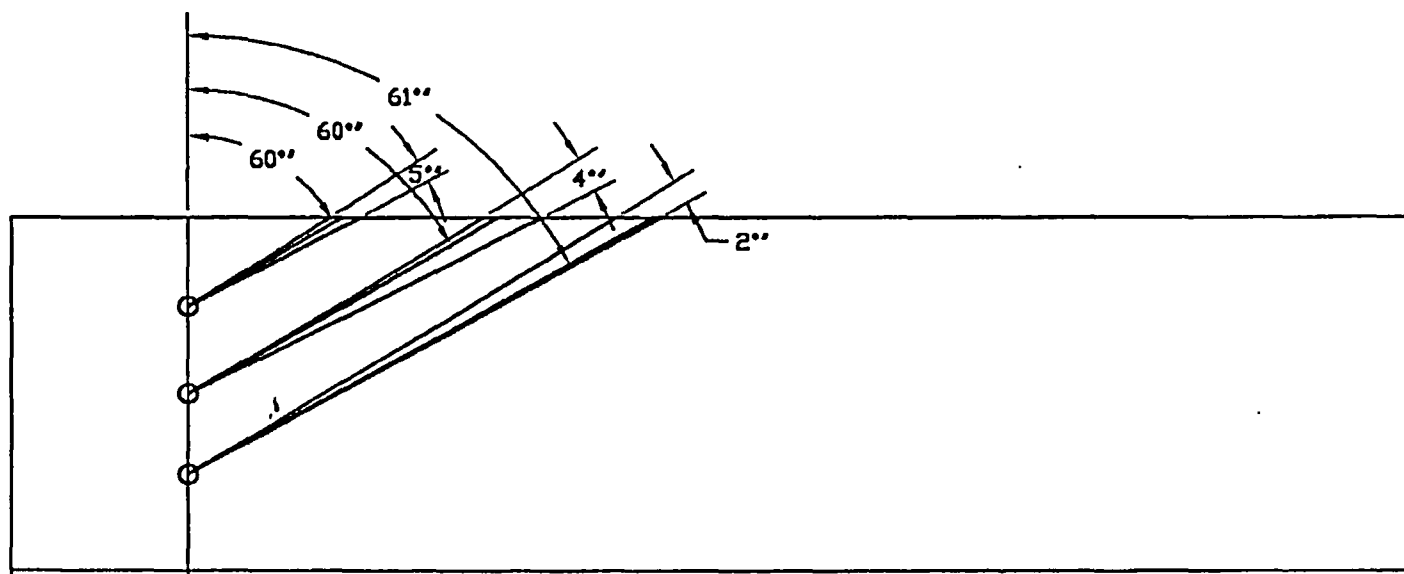


H56CT  
4/19/02  
9/11

13-440815

Browns Ferry Unit 3
Beamsread
MARCH 2002
BF-18

REPORT NUMBER  
R164 00090

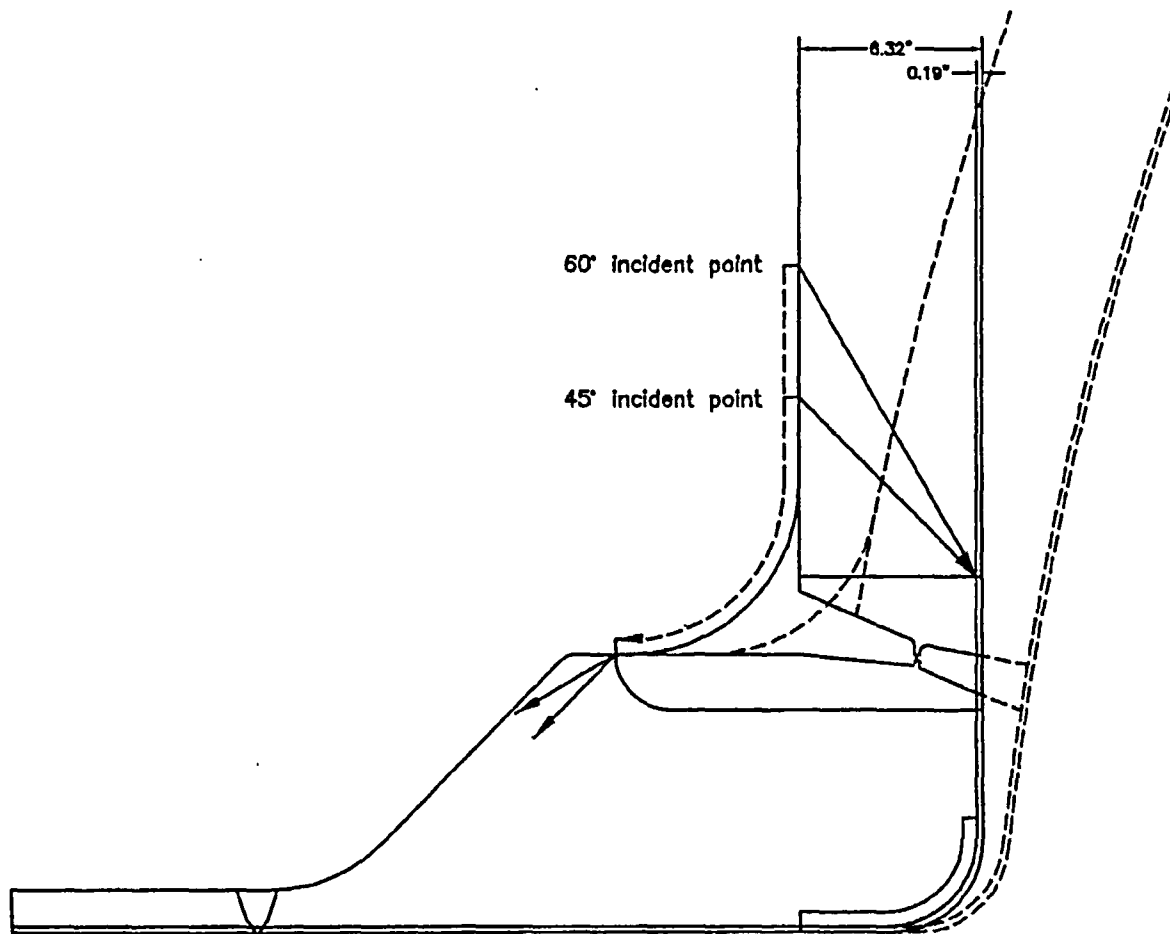


H58CT  
11/19/02

14 15 08 15

Browns Ferry Unit 3
Beamsread
MARCH 2002
BF-18





NOTE: transverse coverage includes coverage obtained during the inner radius examinations

Report Number  
R164

H5BCT  
4/19/02

Browns Ferry Unit 3
N-3 Nozzle-to-Shell
Mrach 2002
SP-N3-NZ

00091

15 of 16  
5/11/02

00092

TENNESSEE VALLEY AUTHORITY		EXAMINATION SUMMARY AND RESOLUTION SHEET		REPORT NUMBER: <b>R165</b>	
PROJECT: BFN UNIT: 3		CYCLE: 10		COMPONENT ID: N3A-IR	
EXAMINATION METHOD				SYSTEM RPV ISI DWG. NO. 3-ISI-0329-C	
MT <input type="checkbox"/>	PT <input type="checkbox"/>	UT <input checked="" type="checkbox"/>	VT <input type="checkbox"/>	CODE CLASS: 1	CATEGORY: B-D
PROCEDURE: N-UT-55		REV: 9	TC: <del>N/A</del> <b>5-08</b>	COFIG.: Nozzle	TO Vessel
EXAMINER: MIKE KLEINJAN <i>Jan 4/10/02</i>		EXAMINER: DAVID KLEINJAN		EXAMINER: N/A	EXAMINER: N/A
LEVEL: <i>II</i>		LEVEL: II		LEVEL: N/A	LEVEL: N/A

This report contains the data associated with the manual ultrasonic examination of code category B-D, Nozzle Inner radius. This examination report satisfies ASME section XI requirements for the inner radius examination.

N3A-IR: This examination was performed using a 24° and 28° in the blend radius in two directions CW/CCW

100% code coverage was obtained

This exam was performed with equipment, Procedures, and personnel qualified in accordance with ASME Section XI

*No Recordable Indication*

RESOLUTION BY: Mike Kleinjan <i>Mike W. Kleinjan</i>	REVIEWED BY: <i>Paul Whitaker</i>	ANH: <i>Robert Field</i>
LEVEL: II DATE: <i>4-4-02</i>	LEVEL: <i>II</i> DATE: <i>4/4/02</i>	DATE: <i>4/19/02</i>
		PG. 1 OF 24

*Jan 4/10/02*

00093

TENNESSEE VALLEY AUTHORITY			DIGITAL ULTRASONIC CALIBRATION DATA SHEET			REPORT NUMBER: <b>R165</b>						
PROJECT: BFN UNIT: 3 CYCLE: 10			CALIBRATION DATE: 03-31-02									
PROC.: N-UT- 55 REV:9 TC: N/A			CALIBRATION BLOCK NO.: BF-84-IR TEMP: 70.5° F									
INSTR. MFG: STAVELEY DUE DATE: 08-11-02			SIMULATOR BLOCK NO: N/A									
MODEL/TYPE: SONIC-137 M & TE NO.: VH-5473			THERMOMETER S/N: 522352 DUE DATE: 05-17-02									
TRANSDUCER MFG: KRAUTKRAMER			COUPLANT SONOTRACE BATCH: 01141									
S/N DB 35163 SIZE: 1.0" FREQ: 2.25 MHz			EXAM TYPE: SHEAR <input type="checkbox"/> LONG <input type="checkbox"/> RL <input checked="" type="checkbox"/>									
CABLE TYPE: RG 174 LENGTH: 120 inches			ANGLE VERIFICATION									
DAC			BLOCK TYPE: CS IIW			S/N: DB 55074						
			NOMINAL ANGLE: 24			ACTUAL ANGLE: N/A						
<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;">100 80 60 40 20 0</div> <div style="border: 1px solid black; width: 200px; height: 150px; position: relative;"> </div> <div style="margin-left: 10px; writing-mode: vertical-rl; transform: rotate(180deg);">A M P L I T U D E</div> </div> <p style="text-align: center;">DISPLAY WIDTH: 20 inches</p>			INSTRUMENT SETTINGS									
			REFLECTOR			REFERENCE		MEMORY				
			SCAN DIRECT.	NTCH	SDH	SENSITIVITY		NUMBER				
			AXIAL	<input checked="" type="checkbox"/>	<input type="checkbox"/>	57.0 dB		24				
			CIRC	<input type="checkbox"/>	<input type="checkbox"/>	N/A dB		N/A				
			FREQ:	2.25	MHz	REJECT:		OFF %				
			ANGLE:	N/A	deg	DAMPING:		200 ohms				
			DELAY:	0.999	msec	PULSER:		222				
			ZERO:	N/A	msec	FILTER:		FILT				
			VELOCITY:	0.233	msec	REP RATE:		4 KHZ				
RANGE:	20.0	inches	TOF: <input type="checkbox"/> PEAK <input checked="" type="checkbox"/> FLANK									
DISPLAY MODE: PE			POWER: AC									
DUAL: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF			TCG: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF									
CALIBRATION TIMES												
REF. REFLECTOR: N/A GAIN: N/A dB			INITIAL TIME: 0815			FINAL TIME: 1135						
AMPLITUDE: N/A % METAL PATH: N/A												
VERIFICATION TIMES			1)N/A	2)N/A	3)N/A	4)N/A	5)N/A	6)N/A				
			7)N/A	8)N/A	9)N/A							
LINEARITY CHECK												
VERTICAL	SIGNAL 1		100	90	80	70	60	50	40	30	20	
	SIGNAL 2		50	45	40	35	30	25	20	15	10	
ATTENUATOR	GAIN	SET	-6 dB	-12 dB	SET		+12		SET		+6	
	AMP	80%	32 TO 48	16 TO 24	20 %		64 TO 96		40%		64 TO 96	
			40	20			80				80	
COMMENTS:						WELDS/ITEMS EXAMINED:						
Wedge ID D-14795-248						REACTOR PRESSURE VESSEL						
						N3A-IR						
EXAMINER: DAVID KLEINJAN						EXAMINER: MIKE KLEINJAN						
LEVEL: II						LEVEL: II						
REVIEWER:						ANII: <i>Robert Hall</i>						
DATE: 4/19/02						DATE: 4/19/02						
PG.: 3 OF 4						PG.: 3 OF 4						

00094

TENNESSEE VALLEY AUTHORITY		DIGITAL ULTRASONIC CALIBRATION DATA SHEET		REPORT NUMBER: <b>R165</b>							
PROJECT: BFN UNIT: 3		CYCLE: 10		CALIBRATION DATE: 03-31-02							
PROC.: N-UT- 55		REV: 9		TC: N/A							
INSTR. MFG: STAVELEY		DUE DATE: 08-11-02		CALIBRATION BLOCK NO.: BF-84-IR TEMP: 70.5° F							
MODEL/TYPE: SONIC-137		M & TE NO.: VH-5473		SIMULATOR BLOCK NO: N/A							
TRANSDUCER MFG: KRAUTKRAMER				THERMOMETER S/N: 522352 DUE DATE: 05-17-02							
S/N DB 35164 SIZE: 1.0"		FREQ: 2.25 MHz		COUPLANT SONOTRACE BATCH: 01141							
CABLE TYPE: RG 174		LENGTH: 120 inches		EXAM TYPE: SHEAR <input type="checkbox"/> LONG <input type="checkbox"/> RL <input checked="" type="checkbox"/>							
ANGLE VERIFICATION											
BLOCK TYPE: CS IIW				S/N: DB 55074							
NOMINAL ANGLE: 28				ACTUAL ANGLE: N/A							
INSTRUMENT SETTINGS											
REFLECTOR				REFERENCE							
SCAN DIRECT.		NTCH		SDH							
AXIAL		<input checked="" type="checkbox"/>		<input type="checkbox"/>							
CIRC		<input type="checkbox"/>		<input type="checkbox"/>							
FREQ: 2.25		MHz		REJECT: OFF %							
ANGLE: N/A		deg		DAMPING: 200 ohms							
DELAY: 1.39		msec		PULSER: 222							
ZERO: N/A		msec		FILTER: FILT 1							
VELOCITY: 0.236		msec		REP RATE: 4 KHZ							
RANGE: 20.0		inches		TOF: <input type="checkbox"/> PEAK <input checked="" type="checkbox"/> FLANK							
DISPLAY MODE: PE		POWER: AC									
DUAL: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF		TCG: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF									
CALIBRATION TIMES											
INITIAL TIME: 0900		FINAL TIME: 1136									
VERIFICATION TIMES		1) N/A		2) N/A							
		3) N/A		4) N/A							
		5) N/A		6) N/A							
		7) N/A		8) N/A							
		9) N/A									
LINEARITY CHECK											
VERTICAL	SIGNAL 1		100	90	80	70	60	50	40	30	20
	SIGNAL 2		50	45	40	35	30	25	20	15	10
ATTENUATOR	GAIN	SET	-6 dB	-12 dB	SET		+12		SET		+6
	AMP	80%	32 TO 48	16 TO 24	20 %		64 TO 96		40%		64 TO 96
			40	20			80				80
COMMENTS:						WELDS/ITEMS EXAMINED:					
Wedge ID D-14795-249						REACTOR PRESSURE VESSEL					
						N3A-IR					
EXAMINER:		EXAMINER:		REVIEWER:		ANII:					
DAVID KLEINJAN		MIKE KLEINJAN		<i>David Kleinjan</i>							
LEVEL: H		LEVEL: II		LEVEL: II		DATE: 1/10/02					
						PG.: 1 OF 1					

3 Jan 4/10/02



**Inspection Report R-166**  
**Weld N4A-NV**

00096

TENNESSEE VALLEY AUTHORITY		EXAMINATION SUMMARY AND RESOLUTION SHEET		REPORT NUMBER: <i>R166</i>	
PROJECT: BFN UNIT: 3		CYCLE: 10		COMPONENT ID: N4A	
EXAMINATION METHOD				SYSTEM RPV ISI DWG. NO. 3-ISI-0327-C	
MT <input type="checkbox"/>	PT <input type="checkbox"/>	UT <input checked="" type="checkbox"/>	VT <input type="checkbox"/>	CODE CLASS: 1	CATEGORY: B-D
PROCEDURE: N-UT-9		REV: 9	TC: 02-06	COFIG.: Nozzle	TO Vessel
EXAMINER: MIKE KLEINJAN <i>for 4/10/02</i>		EXAMINER: DAVID KLEINJAN		EXAMINER: N/A	EXAMINER: N/A
LEVEL: <i>II</i>		LEVEL: II		LEVEL: N/A	LEVEL: N/A

This report contains the data associated with the manual ultrasonic examination of code category B-D, Nozzle to Vessel welds. This examination report satisfies ASME section XI requirements for the Nozzle to shell weld..

Examination. Nozzle to Vessel weld N4A

Transverse coverage for the Nozzle to Vessel weld was supplemented by the inner radius examination.

(N4A-IR) *see R. 142*

0° was used on the weld crown and base material Vessel side

45° was used on the vessel side only scanning over the weld crown

45° Tangent to the weld was used on vessel side CW/CCW

45° Parallel to the weld was used on vessel side CW/CCW

60° was used on the vessel side only scanning over the weld crown

60° Tangent to the weld was used on vessel side CW/CCW

60° Parallel to the weld was used on vessel side CW/CCW

77% code coverage was obtained

This exam was performed with equipment, Procedures, and personnel qualified in accordance with ASME Section XI

*No Recordable Indications*

RESOLUTION BY: Mike Kleinjan <i>Mike Kleinjan</i>	REVIEWED BY: <i>David Kleinjan</i>	ANIL <i>Robert Todd</i>
LEVEL: II DATE: <i>4-4-02</i>	LEVEL: <i>III</i> DATE: <i>4/4/02</i>	DATE: <i>4/19/02</i>
		PG. 1 OF 15 <i>Smiles</i>

REPORT Number  
R166 00097

Calculation of ASME code coverage  
For section XI NDE Examination

N4A

1) 0 degree (weld metal scan)	100%
2) 45 degree Transverse-scan from vessel side of weld	100%
3) 45 degree Transverse-scan from nozzle side of weld	0%
4) 60 degree Transverse-scan from vessel side of weld	100%
5) 60 degree Transverse-scan from nozzle side of weld	0%
6) 45 degree Parallel-scan CW direction	100% *
7) 45 degree Parallel-scan CCW direction	100% *
8) 60 degree Parallel-scan CW direction	100% *
9) 60 degree Parallel-scan CCW direction	100% *

The sum of all the percentage of scans	700%
Divided by the total # of scans	9
Percentage of examination Volume coverage	77%

\* Transverse coverage includes coverage obtained during the inner radius examination.

H5B5T  
4/19/02  
2 of 15  
~~6-08-15~~ 4/19/02



00098

<b>TENNESSEE VALLEY AUTHORITY</b>		<b>DIGITAL ULTRASONIC CALIBRATION DATA SHEET</b>		<b>REPORT NUMBER:</b> <span style="font-size: 1.2em;">R166</span>								
PROJECT: BFN    UNIT: 3    CYCLE: 10		CALIBRATION DATE: 3-30-02										
PROC.: N-UT-    9    REV:9    TC:02-06		CALIBRATION BLOCK NO.: BF18    TEMP: 72.6°F										
INSTR. MFG: Staveley    DUE DATE: 8-05-02		SIMULATOR BLOCK NO: DB55079										
MODEL/TYPE: Sonic 136    M & TE NO.: VH751		THERMOMETER S/N: 522352    DUE DATE: 5-17-02										
TRANSDUCER MFG: Krautkramer		COUPLANT SONOTRACE    BATCH: 01141										
S/N DB34154    SIZE: .5x1    FREQ: 2.25 MHz		EXAM TYPE:    SHEAR <input checked="" type="checkbox"/> LONG <input type="checkbox"/> RL <input type="checkbox"/>										
CABLE TYPE: RG174    LENGTH: 120 inches		<b>ANGLE VERIFICATION</b>										
<b>DAC</b>		BLOCK TYPE: IIW		S/N: DB55074								
		NOMINAL ANGLE: 60		ACTUAL ANGLE: 59								
<p style="text-align: center;">DISPLAY WIDTH: 10 inches</p>		<b>INSTRUMENT SETTINGS</b>										
		<b>REFLECTOR</b>			<b>REFERENCE</b>		<b>MEMORY</b>					
		SCAN DIRECT.	NTCH	SDH	SENSITIVITY		NUMBER					
		AXIAL	<input type="checkbox"/>	<input checked="" type="checkbox"/>	49 dB		3					
		CIRC	<input type="checkbox"/>	<input type="checkbox"/>	n/a dB		n/a					
		FREQ: 2.25 MHz			REJECT: off %							
		ANGLE: N/A deg			DAMPING: 500 ohms							
		DELAY: 1.20 msec			PULSER: 222							
		ZERO: N/A msec			FILTER: FITL 3							
		VELOCITY: .123 msec			REP RATE: 2KHZ							
RANGE: 20 inches			TOF: <input checked="" type="checkbox"/> PEAK <input type="checkbox"/> FLANK									
DISPLAY MODE:			POWER: AC									
DUAL: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF			TCG: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF									
<b>CALIBRATION TIMES</b>												
INITIAL TIME: 9:00			FINAL TIME: 18:30									
VERIFICATION TIMES		1)14:00	2)n/a	3)n/a	4)n/a	5)n/a	6)n/a	7)n/a	8)n/a	9)n/a		
<b>LINEARITY CHECK</b>												
VERTICAL	SIGNAL 1		100	90	80	70	60	50	40	30	20	
	SIGNAL 2		50	45	40	35	30	25	20	15	10	
ATTENUATOR	GAIN	SET	-6 dB		-12 dB		SET		+12		SET	+6
	AMP	80%	32 TO 48		16 TO 24		20 %		64 TO 96		40%    64 TO 96	
			40		20				80		80	
COMMENTS:						WELDS/ITEMS EXAMINED:						
DELTA dB DIFFERENCE IS 4.4 FROM THE 3/8 TO 5/8 ON THE						N4A,N4F Nozzle to Shell						
CLAD SIDE												
EXAMINER:		EXAMINER:		REVIEWER:		ANII:						
MIKE W. KLEINJAN		DAVID KLEINJAN										
LEVEL: II		LEVEL: II		LEVEL: II		DATE: 4/19/02		PG.: 15 OF 15				

3 OF 15

00099

TENNESSEE VALLEY AUTHORITY		DIGITAL ULTRASONIC CALIBRATION DATA SHEET		REPORT NUMBER: <b>R166</b>							
PROJECT: BFN UNIT: 3		CYCLE: 10		CALIBRATION DATE: 3-30-02							
PROC.: N-UT- 9		REV:9 TC:02-06		CALIBRATION BLOCK NO.: BF18 TEMP: 72.6°F							
INSTR. MFG: Staveley		DUE DATE: 8-05-02		SIMULATOR BLOCK NO: DB55079							
MODEL/TYPE: sonic 136		M & TE NO.: VH751		THERMOMETER S/N: 522352 DUE DATE: 5-17-02							
TRANSDUCER MFG: Krautkramer				COUPLANT SONOTRACE BATCH: 01141							
S/N DB34843 SIZE: .5x1		FREQ: 2.25 MHz		EXAM TYPE: SHEAR <input checked="" type="checkbox"/> LONG <input type="checkbox"/> RL <input type="checkbox"/>							
CABLE TYPE: RG1743		LENGTH: 120 inches		ANGLE VERIFICATION							
DAC		BLOCK TYPE: IIW		S/N: DB55074							
		NOMINAL ANGLE: 45°		ACTUAL ANGLE: 46°							
<p>DISPLAY WIDTH: 10 inches</p>		INSTRUMENT SETTINGS									
		REFLECTOR			REFERENCE		MEMORY				
		SCAN DIRECT.	NTCH	SDH	SENSITIVITY		NUMBER				
		AXIAL	<input type="checkbox"/>	<input checked="" type="checkbox"/>	42.6 dB		2				
		CIRC	<input type="checkbox"/>	<input type="checkbox"/>	n/a dB		n/a				
		FREQ:	2.25	MHz	REJECT: off		%				
		ANGLE:	N/A	deg	DAMPING: 500		ohms				
		DELAY:	.830	msec	PULSER: 222						
		ZERO:	N/A	msec	FILTER: FITL 3						
		VELOCITY:	.126	msec	REP RATE: 2KHZ						
RANGE:	20	inches	TOF: <input checked="" type="checkbox"/> PEAK <input type="checkbox"/> FLANK								
DISPLAY MODE: PE			POWER: AC								
DUAL: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF			TCG: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF								
REF. REFLECTOR: 1"		GAIN: 33.6 dB		CALIBRATION TIMES							
AMPLITUDE: 80 %		METAL PATH: 1"		INITIAL TIME: 9:00 FINAL TIME: 18:30							
VERIFICATION TIMES		1) 14:00 2) n/a 3) n/a 4) n/a 5) n/a 6) n/a 7) n/a 8) n/a 9) n/a									
LINEARITY CHECK											
VERTICAL	SIGNAL 1		100	90	80	70	60	50	40	30	20
	SIGNAL 2		50	45	40	35	30	25	20	15	10
ATTENUATOR	GAIN	SET	-6 dB	-12 dB	SET	+12	SET	+6			
	AMP	80%	32 TO 48	16 TO 24	20 %	64 TO 96	40%	64 TO 96			
			40	20		80		80			
COMMENTS:						WELDS/ITEMS EXAMINED:					
Delta difference between 3/8 to 5/8 on the clad side is 3 dB						N4A, N4F Nozzle to Shell					
EXAMINER:		EXAMINER:		REVIEWER:		ANII:					
MIKE W. KLEINJAN		DAVID KLEINJAN		<i>[Signature]</i>		<i>[Signature]</i>					
LEVEL: II		LEVEL: II		LEVEL: II		DATE: 4/19/02		PG.: 13 OF 15			

4 OF 15

00100

<b>TENNESSEE VALLEY AUTHORITY</b>		<b>DIGITAL ULTRASONIC CALIBRATION DATA SHEET</b>		<b>REPORT NUMBER:</b> <i>R166</i>									
PROJECT: BFN UNIT: 3 CYCLE: 10		CALIBRATION DATE: 3-30-02											
PROC.: N-UT- 9 REV:9 TC:02-06		CALIBRATION BLOCK NO.: BF18 TEMP: 72.6°F											
INSTR. MFG: Staveley DUE DATE: 8-05-02		SIMULATOR BLOCK NO: DB55079											
MODEL/TYPE: sonic 136 M & TE NO.: VH751		THERMOMETER S/N: 522352 DUE DATE: 5-17-02											
TRANSDUCER MFG: Harisonic		COUPLANT SONOTRACE BATCH: 01141											
S/N DB34198 SIZE: .75 FREQ: 2.25 MHz		EXAM TYPE: SHEAR <input type="checkbox"/> LONG <input checked="" type="checkbox"/> RL <input type="checkbox"/>											
CABLE TYPE: RG174 LENGTH: 120 inches		<b>ANGLE VERIFICATION</b>											
<b>DAC</b>		BLOCK TYPE: <i>Roncus 2</i> S/N: DB55079		NOMINAL ANGLE: 0 ACTUAL ANGLE: N/A									
		<b>INSTRUMENT SETTINGS</b>											
<p style="text-align: center;">DISPLAY WIDTH: 10 inches</p>		<b>REFLECTOR</b>		<b>REFERENCE</b>									
		SCAN DIRECT. NTCH SDH		SENSITIVITY		MEMORY NUMBER							
		AXIAL <input type="checkbox"/> <input checked="" type="checkbox"/>		20.8 dB		1							
		CIRC <input type="checkbox"/> <input type="checkbox"/>		n/a dB		n/a							
		FREQ: 2.25 MHz		REJECT: off %									
		ANGLE: n/a deg		DAMPING: 500 ohms									
		DELAY: .499 msec		PULSER: 222									
		ZERO: n/a msec		FILTER: Filt 3									
		VELOCITY: .238 msec		REP RATE: 2KHZ									
		RANGE: 10 inches		TOF: <input checked="" type="checkbox"/> PEAK <input type="checkbox"/> FLANK									
DISPLAY MODE:		POWER: AC											
DUAL: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF		TCG: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF											
REF. REFLECTOR: 1" GAIN: 8 dB		<b>CALIBRATION TIMES</b>											
AMPLITUDE: 80 % METAL PATH: 1"		INITIAL TIME: 9:00 FINAL TIME: 1830											
VERIFICATION TIMES		1) 14:00 2) <i>n/a</i> 3) <i>n/a</i> 4) <i>n/a</i> 5) <i>n/a</i> 6) <i>n/a</i> 7) <i>n/a</i> 8) <i>n/a</i> 9) <i>n/a</i>											
<b>LINEARITY CHECK</b>													
VERTICAL	SIGNAL 1		100	90	80	70	60	50	40	30	20		
	SIGNAL 2		50	45	40	35	30	25	20	15	10		
ATTENUATOR	GAIN	SET	-6 dB		-12 dB		SET		+12		SET	+6	
	AMP	80%	32 TO 48		16 TO 24		20 %		64 TO 96		40% 64 TO 96		
			40		20				80		80		
COMMENTS:						WELDS/ITEMS EXAMINED:							
						N4A, N4F Nozzle to Shell							
EXAMINER: MIKE W. KLEINJAN <i>Mike W. Kleinjan</i> LEVEL: II		EXAMINER: DAVID KLEINJAN <i>D. Kleinjan</i> LEVEL: II		REVIEWER: <i>[Signature]</i> LEVEL: <i>II</i> DATE: <i>4/6/02</i>		ANII: <i>Albert Tull</i> DATE: <i>4/19/02</i> PG.: <i>44 OF 15</i> <i>5 OF 15</i>							

00101

TENNESSEE VALLEY AUTHORITY		DIGITAL ULTRASONIC CALIBRATION DATA SHEET		REPORT NUMBER: <b>R166</b>							
PROJECT: BFN UNIT: 3		CYCLE: 10		CALIBRATION DATE: 03-30-02							
PROC.: N-UT- 55		REV: 9 <del>15</del> TC: <del>N/A</del> <del>08</del>		CALIBRATION BLOCK NO.: BF-84-IR TEMP: 70.5°F							
INSTR. MFG: STAVELEY		DUE DATE: 08-11-02		SIMULATOR BLOCK NO: N/A							
MODEL/TYPE: SONIC-137		M & TE NO.: VH-5473		THERMOMETER S/N: 522352 DUE DATE: 05-17-02							
TRANSDUCER MFG: KRAUTKRAMER		COUPLANT SONOTRACE BATCH: 01141									
S/N DB 35164 SIZE: 1.0" FREQ: 2.25 MHz		EXAM TYPE: SHEAR <input type="checkbox"/> LONG <input type="checkbox"/> RL <input checked="" type="checkbox"/>									
CABLE TYPE: RG 174 LENGTH: 120 inches		ANGLE VERIFICATION									
DAC		BLOCK TYPE: CS IIW		S/N: DB 55074							
		NOMINAL ANGLE: 27		ACTUAL ANGLE: N/A							
<p style="text-align: center;">DISPLAY WIDTH: 20 inches</p>		INSTRUMENT SETTINGS									
		REFLECTOR			REFERENCE	MEMORY					
		SCAN DIRECT.	NTCH	SDH	SENSITIVITY	NUMBER					
		AXIAL	<input checked="" type="checkbox"/>	<input type="checkbox"/>	56.2 dB	23					
		CIRC	<input type="checkbox"/>	<input type="checkbox"/>	N/A dB	N/A					
		FREQ: 2.25	MHz		REJECT: OFF	%					
		ANGLE: N/A	deg		DAMPING: 200	ohms					
		DELAY: 0.950	msec		PULSER: 222						
		ZERO: N/A	msec		FILTER: FILT 1						
		VELOCITY: 0.233	msec		REP RATE: 4 KHZ						
RANGE: 20.0		inches		TOF: <input type="checkbox"/> PEAK <input checked="" type="checkbox"/> FLANK							
DISPLAY MODE: PE			POWER: AC								
DUAL: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF		TCG: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF									
CALIBRATION TIMES											
INITIAL TIME: 1505			FINAL TIME: 1810								
VERIFICATION TIMES		1)N/A	2)N/A	3)N/A	4)N/A	5)N/A	6)N/A	7)N/A	8)N/A	9)N/A	
LINEARITY CHECK											
VERTICAL	SIGNAL 1	100	90	80	70	60	50	40	30	20	
	SIGNAL 2	50	45	40	35	30	25	20	15	10	
ATTENUATOR	GAIN	SET	-6 dB	-12 dB	SET	+12	SET	+6			
	AMP	80%	32 TO 48	16 TO 24	20 %	64 TO 96	40%	64 TO 96			
			40	20		80		80			
COMMENTS:						WELDS/ITEMS EXAMINED:					
						REACTOR PRESSURE VESSEL					
						N4A-IR, N4F-IR					
						Wedge ID D-14795-247 ✓					
EXAMINER: DAVID KLEINJAN <i>D.K. Kleinjan</i> LEVEL: II		EXAMINER: MIKE KLEINJAN <i>Mike Kleinjan</i> LEVEL: II		REVIEWER: <i>[Signature]</i> LEVEL: <i>III</i> DATE: 4/18/02		ANTI: <i>Robert Tull</i> DATE: 4/19/02 PG: 47 OF 15 <i>4/19/02</i> 6 OF 15					

00102

TENNESSEE VALLEY AUTHORITY		DIGITAL ULTRASONIC CALIBRATION DATA SHEET		REPORT NUMBER: <i>R166</i>							
PROJECT: BFN UNIT: 3		CYCLE: 10		CALIBRATION DATE: 03-30-02							
PROC.: N-UT- 55 REV:9		TC: <i>N/A</i>		CALIBRATION BLOCK NO.: BF-84-IR TEMP: 70.5°F							
INSTR. MFG: STAVELEY		DUE DATE: 08-11-02		SIMULATOR BLOCK NO: N/A							
MODEL/TYPE: SONIC-137 M & TE NO.: VH-5473		THERMOMETER S/N: 522352		DUE DATE: 05-17-02							
TRANSDUCER MFG: KRAUTKRAMER		COUPLANT SONOTRACE		BATCH: 01141							
S/N DB 35164 SIZE: 1.0" FREQ: 2.25 MHz		EXAM TYPE: SHEAR <input type="checkbox"/> LONG <input type="checkbox"/> RL <input checked="" type="checkbox"/>									
CABLE TYPE: RG 174 LENGTH: 120 inches		ANGLE VERIFICATION									
DAC		BLOCK TYPE: CS IIW		S/N: DB 55074							
		NOMINAL ANGLE: 21		ACTUAL ANGLE: N/A							
<p>DISPLAY WIDTH: 20 inches</p>		INSTRUMENT SETTINGS									
		REFLECTOR			REFERENCE	MEMORY					
		SCAN DIRECT.	NTCH	SDH	SENSITIVITY	NUMBER					
		AXIAL	<input checked="" type="checkbox"/>	<input type="checkbox"/>	55.0 dB	22					
		CIRC	<input type="checkbox"/>	<input type="checkbox"/>	N/A dB	N/A					
		FREQ: 2.25	MHz		REJECT: OFF	%					
		ANGLE: N/A	deg		DAMPING: 200	ohms					
		DELAY: 1.61	msec		PULSER: 222						
		ZERO: N/A	msec		FILTER: FILT 1						
		VELOCITY: 0.233	msec		REP RATE: 4 KHZ						
RANGE: 20.0		inches		TOF: <input type="checkbox"/> PEAK <input checked="" type="checkbox"/> FLANK							
DISPLAY MODE: PE			POWER: AC								
DUAL: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF			TCG: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF								
REF. REFLECTOR: N/A		GAIN: N/A dB		CALIBRATION TIMES							
AMPLITUDE: N/A %		METAL PATH: N/A"		INITIAL TIME: 1505 FINAL TIME: 1810							
VERIFICATION TIMES		1)N/A	2)N/A	3)N/A	4)N/A 5)N/A 6)N/A 7)N/A 8)N/A 9)N/A						
LINEARITY CHECK											
VERTICAL	SIGNAL 1		100	90	80	70	60	50	40	30	20
	SIGNAL 2		50	45	40	35	30	25	20	15	10
ATTENUATOR	GAIN	SET	-6 dB	-12 dB	SET		+12	SET	+6		
	AMP	80%	32 TO 48	16 TO 24	20 %		64 TO 96	40%	64 TO 96		
			40	20			80		80		
COMMENTS:			WELDS/ITEMS EXAMINED:								
			REACTOR PRESSURE VESSEL								
			N4A-IR, N4F-IR								
EXAMINER: DAVID KLEINJAN <i>D.K. Kleinjan</i> LEVEL: II			EXAMINER: MIKE KLEINJAN <i>Mike Kleinjan</i> LEVEL: II			REVIEWER: <i>Paul White</i> LEVEL: III DATE: 4/1/02			ANII: <i>Robert Holt</i> DATE: 4/19/02 PG: 18 OF 15 4/19/02 7 OF 15 Jan		

TVA

MANUAL ULTRASONIC VESSEL  
EXAMINATION DATA SHEET

REPORT NO.

R166

PROJECT: BFN UNIT: 3 WELD ID: N4A CONFIG.: N/A COMPONENT: VESSELCAL. SHT. NO.: N/A PROCEDURE: N-UT-9 <sup>5/11/02</sup> ~~N-UT-7~~ REV.: 9 PCR.: 02-06 TEMP.: 85 PYRO.: 522352SCAN SENS.: \* dB EXAM START: 1630 EXAM END: 1750 EXAM ANGLE: 0°, 45°, 60°Lo LOCATION: TDC Wo LOCATION: E OF WELD

IND NO.	20%			50%			100%			MAX. AMP.			20%			50%			100%		
	Mp1	W1	L1	Mp1	W1	L1	Mp1	W1	L1	Mp	W	L	Mp2	W2	L2	Mp2	W2	L2	Mp2	W2	L2
				*																	
21°	SCAN	dB	61			SCANNING	#	10/11				BLEND RADIUS									
27°	SCAN	dB	62.2			SCANNING	#	10/11				BLEND RADIUS									
0°	SCAN	dB	71.8			SCANNING	#	9				ON WELD AND BASE MATERIAL									
45°	SCAN	dB	56.6			SCANNING	#	9				ON WELD AND VESSEL SIDE									
45T	SCAN	dB	56.6			SCANNING	#	10/11				CW/CCW VESSEL SIDE									
45TAN	SCAN	dB	56.6			SCANNING	#	10/11				CW/CCW VESSEL SIDE									
60°	SCAN	dB	63			SCANNING	#	9				ON WELD AND VESSEL SIDE									
60T	SCAN	dB	63			SCANNING	#	10/11				CW/CCW VESSEL SIDE									
60TAN	SCAN	dB	63			SCANNING	#	10/11				CW/CCW VESSEL SIDE									
NO RECORDABLE INDICATION																					

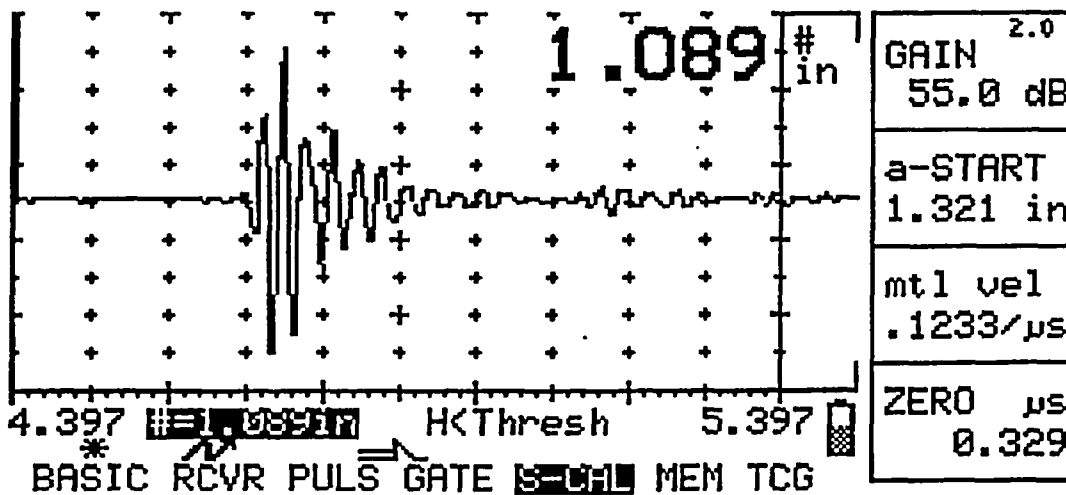
COMMENTS: 21° AND 27° EXAMINATIONS ARE THE BLEND RADIUS EXAMINATIONS  
TRANSVERSE EXAMINATION COVERAGE WILL INCLUDE COVERAGE OBTAINED DURING THE  
INNER RADIUS EXAMINATIONS. 5 TO 10% NOISE LEVEL WAS OBSERVED

EXAMINER: Mike W. [Signature] LEVEL: III DATE: 4-4-02 REVIEWED BY: [Signature] LEVEL: III DATE: 4/16/02  
EXAMINER: [Signature] LEVEL: II DATE: 3-30-02 ANH: [Signature] DATE: 9/19/02 PAGE 23 OF 15

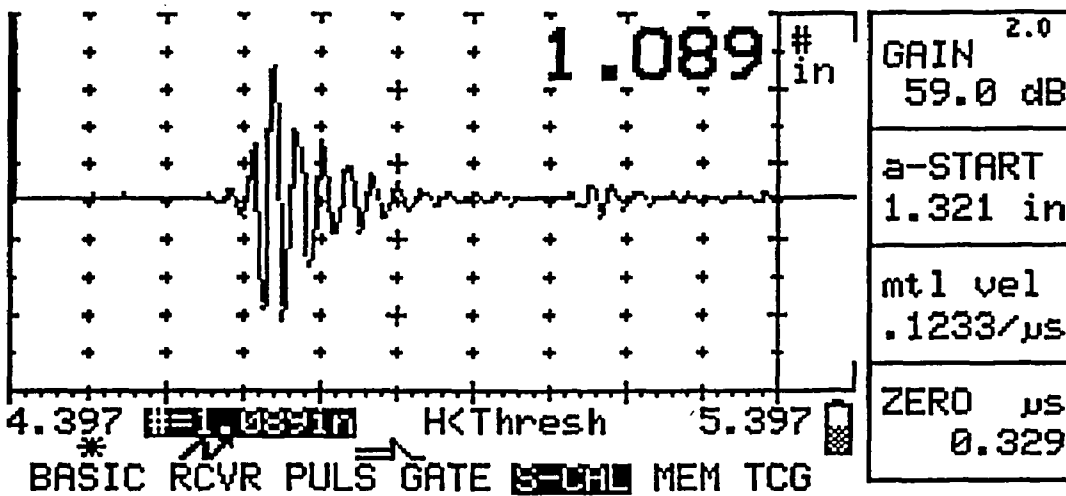
REPORT Number  
R166

00104

Nozzle Examination 45 °Waveforms



45° Pre Waveform



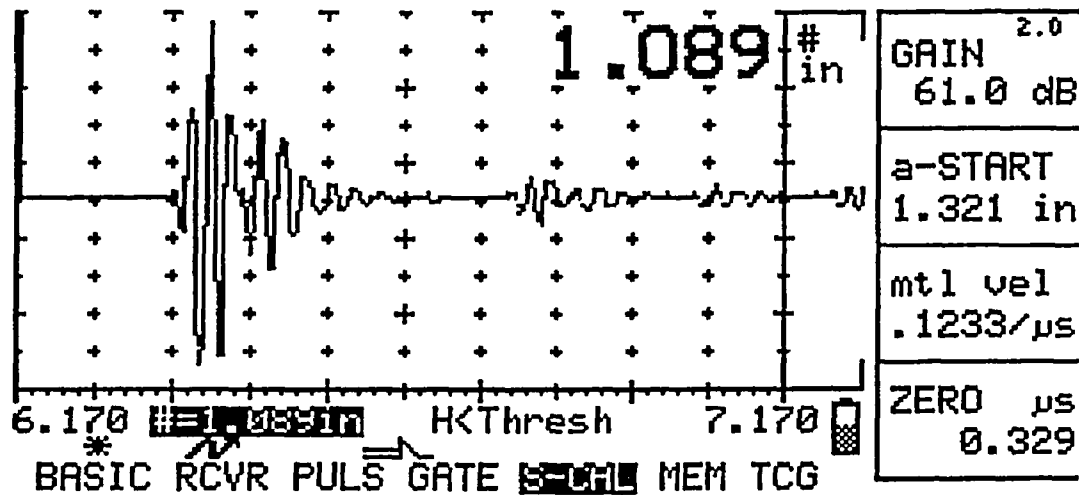
45° Post Waveform

HSBCT  
4/19/02

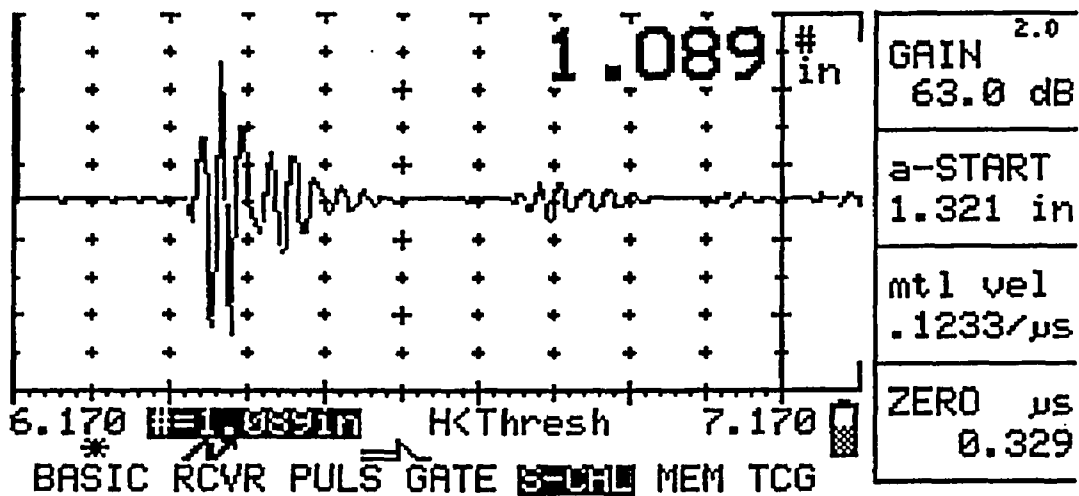
4/10/02 9 15

00105  
Report Number  
R166

Nozzle Examination 60° Waveforms



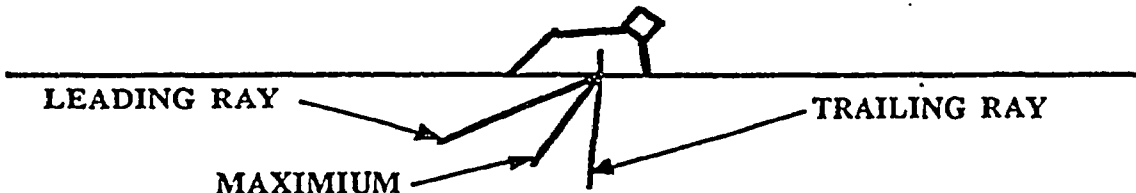
60° Pre Waveform



60° Post Waveform

H5 BGT  
4/19/09



<b>TVA</b>	<b>BEAM SPREAD AND RESOLUTION DATA SHEET</b>	REPORT NO. <b>R166</b>								
PROJECT: <u>BF 11</u> UNIT: <u>3</u> CALIBRATION BLOCK NO.: <u>BF 18</u>										
PROCEDURE NO.: <u>N-UT-9</u> REV.: <u>9</u> PCR: <u>2206 N/A mt 4-4-02</u>										
SEARCH UNIT-MAKE: <u>Krautkramer</u> SIZE: <u>15X1</u> FREQ.: <u>2.25</u>										
S/N: <u>DB 34843</u> ANGLE: <u>45</u>										
ULTRASONIC INSTRUMENT-MAKE: <u>Smac 135</u> S/N: <u>VH 751</u>										
<b>BEAM SPREAD</b>										
	TRAILING RAY						LEADING RAY			
HOLE DEPTH	20% DAC	50% DAC		100% DAC		20% DAC		50% DAC		
	W MP	W MP	MP W	MP W	MP W	W MP	W MP			
1/4T	1 1/8	1.9	1 1/4	2.	2.1	1 5/8	2.4	2	1 7/8	2.3
1/2T	2 7/8	4	3	4.1	4.3	3 1/4	4.8	4 1/8	3 3/4	4.6
3/4T	4 1/4	6	4 1/2	6.3	6.5	4 7/8	7	5 7/8	5 1/4	6.8
 <p style="margin-top: 10px;">LEADING RAY      TRAILING RAY</p> <p style="margin-left: 100px;">MAXIMUM</p>										
<b>RESOLUTION</b>										
NEAR SURFACE REFLECTOR: <u>Note 1 OD</u> DEPTH: <u>25</u> SIZE: <u>253</u> CAL BLK.: <u>BF 18</u>										
FAR SURFACE REFLECTOR: <u>Note 1 ID</u> DEPTH: <u>6.1</u> SIZE: <u>253</u>										
SCANNING REFLECTORS PROVIDE 50% DAC SIGNALS AT SCANNING SPEED    Y <input checked="" type="checkbox"/> N <input type="checkbox"/>										
EXAMINER: <u>Mike W. Hagen</u>					REVIEWED BY: <u>John H. Hagen</u>			ANII: <u>Mike Hagen</u>		
LEVEL: <u>II</u> DATE: <u>3-30-02</u>					LEVEL: <u>III</u> DATE: <u>4/4/02</u>			DATE: <u>4/19/02</u>		
								PAGE: <u>12</u> OF <u>15</u>		

00107

TVA

BEAM SPREAD AND  
RESOLUTION DATA SHEET

REPORT NO.

R166

PROJECT: BFN UNIT: 3 CALIBRATION BLOCK NO.: BF 18PROCEDURE NO.: N-UT-9 REV.: 9 PCR: 0206 H/A 04-04-02SEARCH UNIT-MAKE: Krautkramer SIZE: .5X1 FREQ.: 2.25S/N: DB 34154 ANGLE: 60ULTRASONIC INSTRUMENT-MAKE: Sonn 13C S/N: VH 751

## BEAM SPREAD

HOLE DEPTH	TRAILING RAY						LEADING RAY			
	20% DAC		50% DAC		100% DAC		20% DAC		50% DAC	
	W	MP	W	MP	MP	W	MP	W	W	MP
1/4T	2 1/8	2.4	2 3/8	2.7	2.9	2 5/8	3.2	3 1/8	2 7/8	3.1
1/2T	4 3/4	4.8	5	5.3	5.8	5 1/4	6.4	6 5/8	6	6.1
3/4T	<del>6 3/8</del>	<del>7.6</del>	7 1/4	8	8.7	7 7/8	9.6	8 5/8	8	9.1

6 3/8

LEADING RAY

TRAILING RAY

MAXIMUM

## RESOLUTION

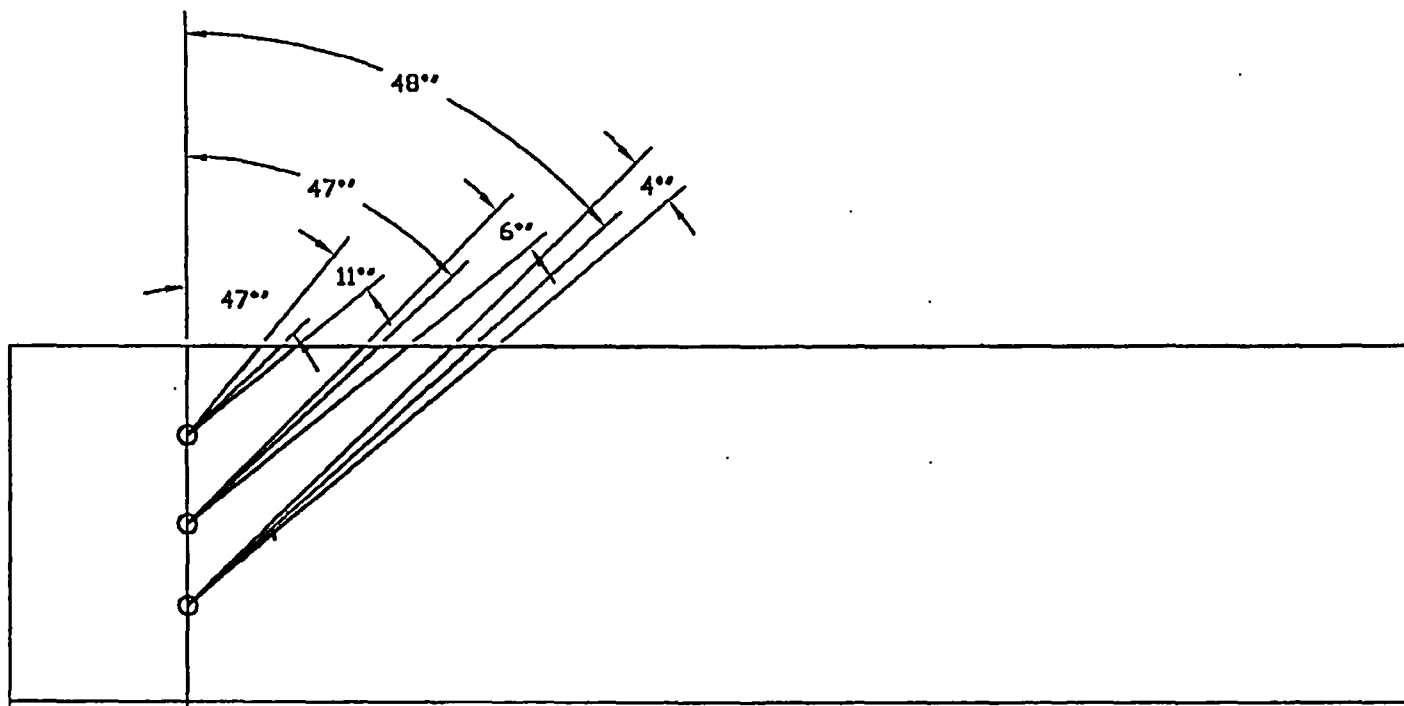
NEAR SURFACE  
REFLECTOR: Notch OD DEPTH: .25 SIZE: .253 CAL BLK.: BF 18FAR SURFACE  
REFLECTOR: Notch ID DEPTH: 6.1 SIZE: .253

## SCANNING

REFLECTORS PROVIDE 50% DAC SIGNALS AT SCANNING SPEED

Y ☒N ☐EXAMINER: Mike W. HenryREVIEWED BY: Paul W. HenryANII: What HallLEVEL: II DATE: 3-30-02LEVEL: II DATE: 4/4/02DATE: 4/19/02PAGE: 151 OF 15

REPORT NUMBER 00108  
R166

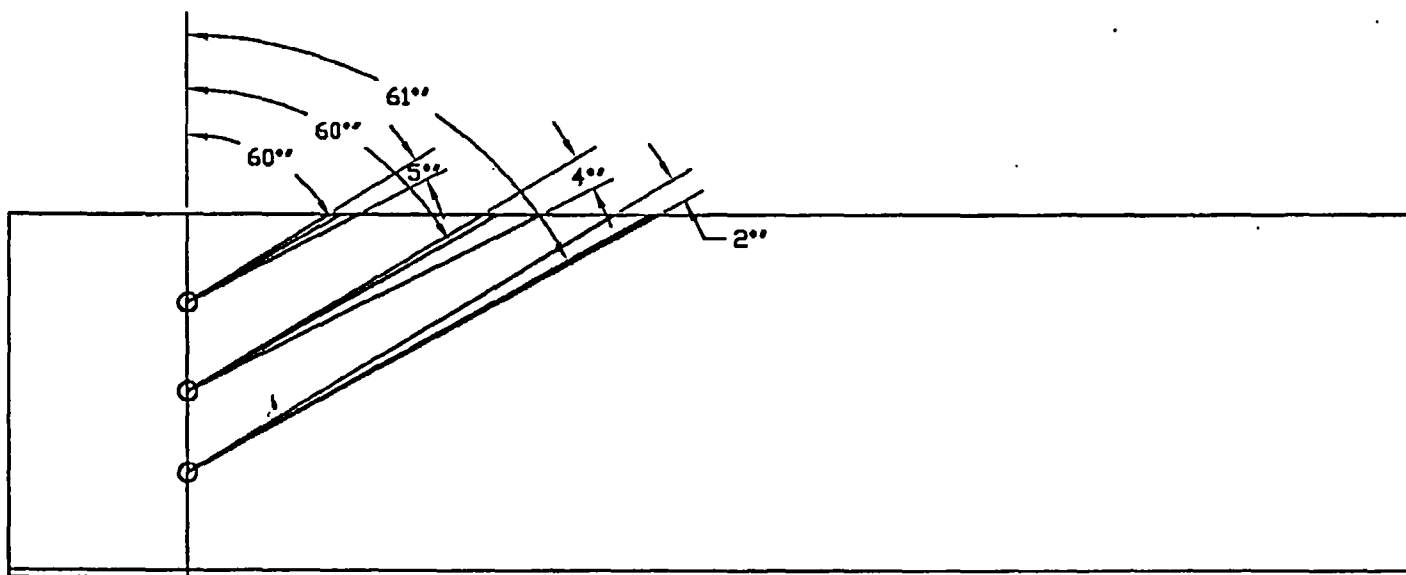


H5BCT  
4/19/02

Browns Ferry Unit 3
Beamspread
MARCH 2002
BF-18

13 14 05 15

Report Number 00109  
R166



HSBET  
ATY  
4/19/02

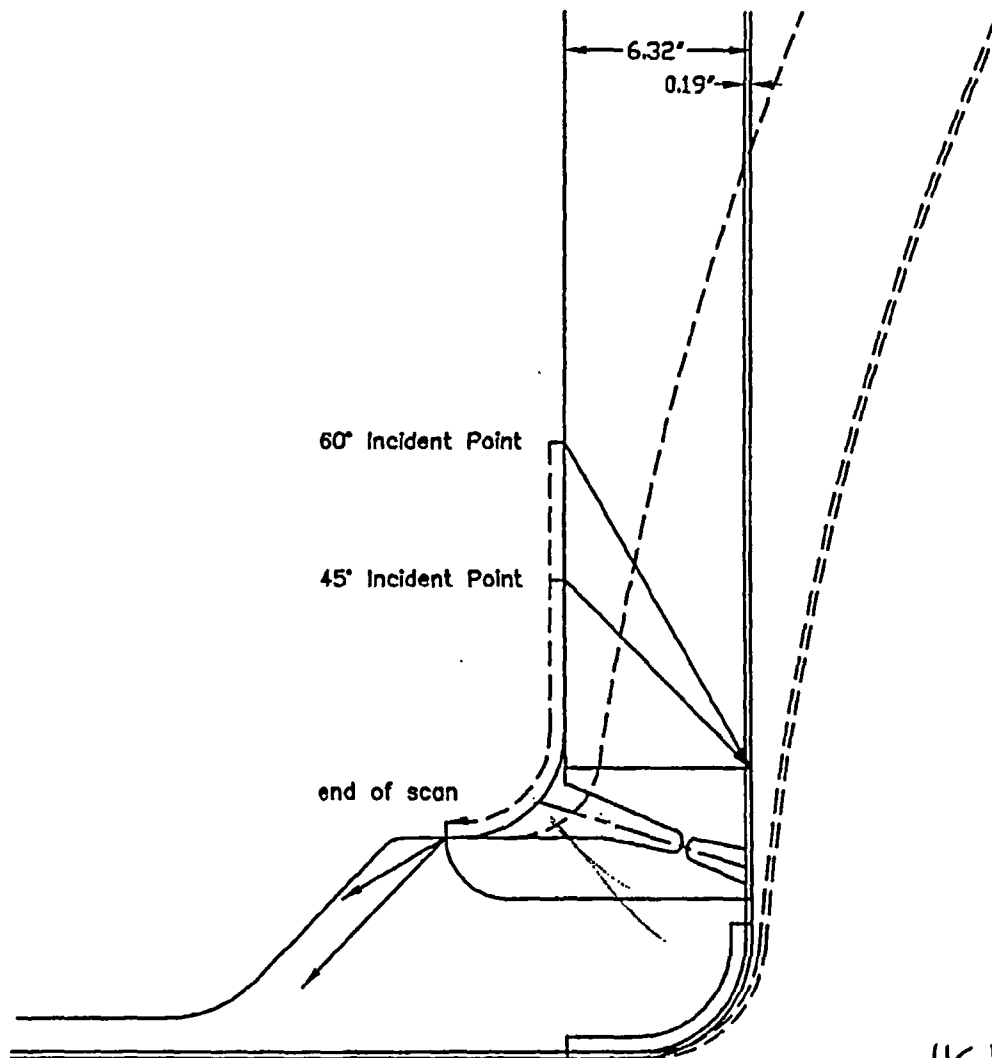
Browns Ferry Unit 3

Beamspread

MARCH 2002

BF-18

5150  
14541462  
180515



NOTE: Transverse coverage includes coverage obtained during the inner radius examinations.

Report Number  
R166

HS BCT  
4/19/02

Browns Ferry Unit 3

N4 Nozzle-to-Shell

March 2002

SP-N4-NS

00110

15 08 15

00111

TENNESSEE VALLEY AUTHORITY		EXAMINATION SUMMARY AND RESOLUTION SHEET		REPORT NUMBER: <b>R167</b>	
PROJECT: BFN UNIT: 3		CYCLE: 10		COMPONENT ID: N4A-IR	
EXAMINATION METHOD				SYSTEM RPV	
				ISI DWG. NO. 3-ISI-0327-C	
MT <input type="checkbox"/>	PT <input type="checkbox"/>	UT <input checked="" type="checkbox"/>	VT <input type="checkbox"/>	CODE CLASS: 1	CATEGORY: B-D
PROCEDURE: N-UT-55		REV: 9	TC: N/A 10-08	COFIG.: Nozzle	TO Vessel
EXAMINER: MIKE KLEINJAN <i>for 4/10/02</i>		EXAMINER: DAVID KLEINJAN <i>4-10-02</i>		EXAMINER: N/A	EXAMINER: N/A
LEVEL: <i>II</i>		LEVEL: II		LEVEL: N/A	LEVEL: N/A

This report contains the data associated with the manual ultrasonic examination of code category B-D, Nozzle Inner radius. This examination report satisfies ASME section XI requirements for the inner radius examination.

N4A-IR: This examination was performed using a 21° and 27° in the blend radius in two directions CW/CCW

100% code coverage was obtained

This exam was performed with equipment, Procedures, and personnel qualified in accordance with ASME Section XI

*No Recordable Indications*

RESOLUTION BY: Mike Kleinjan <i>Mike Kleinjan</i>		REVIEWED BY: <i>[Signature]</i>		ANII: <i>What Left</i>	
LEVEL: II DATE: <i>04-04-02</i>		LEVEL: <i>III</i> DATE: <i>4/4/02</i>		DATE: <i>4/19/02</i>	
				PG. 1 OF <i>24</i> <i>for 4/10/02</i>	

00112

<b>TENNESSEE VALLEY AUTHORITY</b>			<b>DIGITAL ULTRASONIC CALIBRATION DATA SHEET</b>			<b>REPORT NUMBER: R167</b>						
PROJECT: BFN UNIT: 3 CYCLE: 10			CALIBRATION DATE: 03-30-02									
PROC.: N-UT- 55 REV:9 <del>DB TC N/A 02-02</del>			CALIBRATION BLOCK NO.: BF-84-IR TEMP: 70.5°F									
INSTR. MFG: STAVELEY DUE DATE: 08-11-02			SIMULATOR BLOCK NO: N/A									
MODEL/TYPE: SONIC-137 M & TE NO.: VH-5473			THERMOMETER S/N: 522352 DUE DATE: 05-17-02									
TRANSDUCER MFG: KRAUTKRAMER			COUPLANT SONOTRACE BATCH: 01141									
S/N DB 351613 SIZE: 1.0" FREQ: 2.25 MHz			EXAM TYPE: SHEAR <input type="checkbox"/> LONG <input type="checkbox"/> RL <input checked="" type="checkbox"/>									
CABLE TYPE: <del>RG</del> 174 LENGTH: 120 inches			<b>ANGLE VERIFICATION</b>									
<b>DAC</b>			BLOCK TYPE: CS IIW			S/N: DB 55074						
			NOMINAL ANGLE: 21			ACTUAL ANGLE: N/A						
<p style="text-align: center;">DISPLAY WIDTH: 20 inches</p>			<b>INSTRUMENT SETTINGS</b>									
			<b>REFLECTOR</b>			<b>REFERENCE</b>		<b>MEMORY</b>				
			SCAN DIRECT.	NTCH	SDH	SENSITIVITY		NUMBER				
			AXIAL	<input checked="" type="checkbox"/>	<input type="checkbox"/>	55.0 dB		22				
			CIRC	<input type="checkbox"/>	<input type="checkbox"/>	N/A dB		N/A				
			FREQ:	2.25	MHz	REJECT: OFF		%				
			ANGLE:	N/A	deg	DAMPING: 200		ohms				
			DELAY:	1.61	msec	PULSER: 222						
			ZERO:	N/A	msec	FILTER: FILT 1						
			VELOCITY:	0.233	msec	REP RATE: 4 KHZ						
RANGE:	20.0	inches	TOF: <input type="checkbox"/> PEAK <input checked="" type="checkbox"/> FLANK									
DISPLAY MODE: PE			POWER: AC									
DUAL: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF			TCG: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF									
<b>CALIBRATION TIMES</b>												
REF. REFLECTOR: N/A GAIN: N/A dB			INITIAL TIME: 1505 FINAL TIME: 1810									
AMPLITUDE: N/A % METAL PATH: N/A"												
VERIFICATION TIMES			1)N/A	2)N/A	3)N/A	4)N/A	5)N/A	6)N/A	7)N/A	8)N/A	9)N/A	
<b>LINEARITY CHECK</b>												
VERTICAL	SIGNAL 1		100	90	80	70	60	50	40	30	20	
	SIGNAL 2		50	45	40	35	30	25	20	15	10	
ATTENUATOR	GAIN	SET	-6 dB	-12 dB	SET		+12		SET		+6	
	AMP.	80%	32 TO 48	16 TO 24	20 %		64 TO 96		40%		64 TO 96	
			40	20			80				80	
COMMENTS:						WELDS/ITEMS EXAMINED:						
Wedge ID D-14795-246						REACTOR PRESSURE VESSEL						
						N4A-IR, N4F-IR						
EXAMINER: DAVID KLEINJAN <i>D.L. Kleinjan</i> LEVEL: II						EXAMINER: MIKE KLEINJAN <i>Mike Kleinjan</i> LEVEL: II						
REVIEWER: <i>Paul Whiteaker</i> LEVEL: III						ANII: <i>Whatford</i> DATE: 4/19/02 PG: 3 OF 4 2 OF 4						

00113

<b>TENNESSEE VALLEY AUTHORITY</b>		<b>DIGITAL ULTRASONIC CALIBRATION DATA SHEET</b>		<b>REPORT NUMBER:</b> <i>R167</i>								
PROJECT: BFN UNIT: 3		CYCLE: 10		CALIBRATION DATE: 03-30-02								
PROC.: N-UT- 55 REV:9		<del>TC: N/A</del>		CALIBRATION BLOCK NO.: BF-84-IR TEMP: 70.5°F								
INSTR. MFG: STAVELEY		DUE DATE: 08-11-02		SIMULATOR BLOCK NO: N/A								
MODEL/TYPE: SONIC-137 M & TE NO.: VH-5473				THERMOMETER S/N: 522352 DUE DATE: 05-17-02								
TRANSDUCER MFG: KRAUTKRAMER				COUPLANT SONOTRACE BATCH: 01141								
S/N DB 35164 SIZE: 1.0" FREQ: 2.25 MHz				EXAM TYPE: SHEAR <input type="checkbox"/> LONG <input type="checkbox"/> RL <input checked="" type="checkbox"/>								
CABLE TYPE: RG 174 LENGTH: 120 inches				<b>ANGLE VERIFICATION</b>								
<b>DAC</b>		BLOCK TYPE: CS IIW		S/N: DB 55074								
		NOMINAL ANGLE: 27		ACTUAL ANGLE: N/A								
<p style="text-align: center;">DISPLAY WIDTH: 20 inches</p>		<b>INSTRUMENT SETTINGS</b>										
		<b>REFLECTOR</b>			<b>REFERENCE</b>	<b>MEMORY</b>						
		SCAN DIRECT.	NTCH	SDH	SENSITIVITY	NUMBER						
		AXIAL	<input checked="" type="checkbox"/>	<input type="checkbox"/>	56.2 dB	23						
		CIRC	<input type="checkbox"/>	<input type="checkbox"/>	N/A dB	N/A						
		FREQ: 2.25	MHz		REJECT: OFF	%						
		ANGLE: N/A	deg		DAMPING: 200	ohms						
		DELAY: 0.950	msec		PULSER: 222							
		ZERO: N/A	msec		FILTER: FILT 1							
		VELOCITY: 0.233	msec		REP RATE: 4 KHZ							
RANGE: 20.0	inches		TOF: <input type="checkbox"/> PEAK <input checked="" type="checkbox"/> FLANK									
DISPLAY MODE: PE			POWER: AC									
DUAL: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF			TCG: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF									
REF. REFLECTOR: N/A		GAIN: N/A dB		<b>CALIBRATION TIMES</b>								
AMPLITUDE: N/A %		METAL PATH: N/A"		INITIAL TIME: 1505 FINAL TIME: 1810								
VERIFICATION TIMES		1)N/A	2)N/A	3)N/A	4)N/A 5)N/A 6)N/A 7)N/A 8)N/A 9)N/A							
<b>LINEARITY CHECK</b>												
VERTICAL	SIGNAL 1		100	90	80	70	60	50	40	30	20	
	SIGNAL 2		50	45	40	35	30	25	20	15	10	
ATTENUATOR	GAIN	SET	-6 dB	-12 dB		SET		+12		SET	+6	
	AMP	80%	32 TO 48	16 TO 24		20 %		64 TO 96		40%	64 TO 96	
			40	20				80			80	
<b>COMMENTS:</b>						<b>WELDS/ITEMS EXAMINED:</b>						
Wedge ID D-14795-247						REACTOR PRESSURE VESSEL						
						N4A-IR, N4F-IR						
EXAMINER:		EXAMINER:		REVIEWER:		ANII: <i>What hold</i>						
DAVID KLEINJAN		MIKE KLEINJAN		<i>David Kleinjan</i>		DATE: 4/19/02						
LEVEL: II		LEVEL: II		LEVEL: <i>II</i>		PG.: <i>1 of 4</i> 4/19/02						

3 OF 4





**Inspection Report R-168**  
**Weld N4F-NV**

00115

TENNESSEE VALLEY AUTHORITY		EXAMINATION SUMMARY AND RESOLUTION SHEET		REPORT NUMBER: <i>R168</i>	
PROJECT: BFN UNIT: 3		CYCLE: 10		COMPONENT ID: N4F	
EXAMINATION METHOD				SYSTEM RPV	
				ISI DWG. NO. 3-ISI-0327-C	
MT <input type="checkbox"/>	PT <input type="checkbox"/>	UT <input checked="" type="checkbox"/>	VT <input type="checkbox"/>	CODE CLASS: 1	CATEGORY: B-D
PROCEDURE: N-UT-9		REV:9	TC:02-06	COFIG.:	Nozzle TO Vessel
EXAMINER: MIKE KLEINJAN		EXAMINER: DAVID KLEINJAN		EXAMINER: N/A	EXAMINER: N/A
LEVEL:II		LEVEL:II		LEVEL: N/A	LEVEL: N/A

This report contains the data associated with the manual ultrasonic examination of code category B-D, Nozzle to Vessel welds. This examination report satisfies ASME section XI requirements for the Nozzle to shell weld..

Examination. Nozzle to Vessel weld N4F

Transverse coverage for the Nozzle to Vessel weld was supplemented by the inner radius examination.  
(N4F-IR) *see R169*

0° was used on the weld crown and base material Vessel side

45° was used on the vessel side only scanning over the weld crown

45° Tangent to the weld was used on vessel side CW/CCW

45° Parallel to the weld was used on vessel side CW/CCW

60° was used on the vessel side only scanning over the weld crown

60° Tangent to the weld was used on vessel side CW/CCW

60° Parallel to the weld was used on vessel side CW/CCW

77% code coverage was obtained

This exam was performed with equipment, Procedures, and personnel qualified in accordance with ASME Section XI

*No Recordable Indications*

RESOLUTION BY: Mike Kleinjan <i>Mike Kleinjan</i>		REVIEWED BY: <i>Paul Whitaker</i>		ANII: <i>Robert Smith</i>	
LEVEL: II DATE: 4-4-02		LEVEL: <i>III</i> DATE: 4/4/02		DATE: 4/19/02	
				PG. <i>1 OF 15</i> <i>10515</i>	

REPORT Number  
R168

00116

Calculation of ASME code coverage  
For section XI NDE Examination

N4F

1) 0 degree (weld metal scan)	100%
2) 45 degree Transverse-scan from vessel side of weld	100%
3) 45 degree Transverse-scan from nozzle side of weld	0%
4) 60 degree Transverse-scan from vessel side of weld	100%
5) 60 degree Transverse-scan from nozzle side of weld	0%
6) 45 degree Parallel-scan CW direction	100% *
7) 45 degree Parallel-scan CCW direction	100% *
8) 60 degree Parallel-scan CW direction	100% *
9) 60 degree Parallel-scan CCW direction	100% *

The sum of all the percentage of scans	700%
Divided by the total # of scans	9
Percentage of examination Volume coverage	77%

\* Transverse coverage includes coverage obtained during the inner radius examination.

H5BCT  
4/19/02

00117

TENNESSEE VALLEY AUTHORITY			DIGITAL ULTRASONIC CALIBRATION DATA SHEET			REPORT NUMBER: <b>R168</b>						
PROJECT: BFN UNIT: 3		CYCLE: 10		CALIBRATION DATE: 3-30-02								
PROC.: N-UT- 9		REV:9 TC:02-06		CALIBRATION BLOCK NO.: BF18		TEMP: 72.6°F						
INSTR. MFG: Staveley		DUE DATE: 8-05-02		SIMULATOR BLOCK NO: DB55079								
MODEL/TYPE: sonic 136		M & TE NO.: VH751		THERMOMETER S/N: 522352		DUE DATE: 5-17-02						
TRANSDUCER MFG: Harisonic				COUPLANT SONOTRACE		BATCH: 01141						
S/N DB34198		SIZE: .75		FREQ: 2.25 MHz		EXAM TYPE: SHEAR <input type="checkbox"/>		LONG <input checked="" type="checkbox"/> RL <input type="checkbox"/>				
CABLE TYPE: RG174		LENGTH: 120 inches		4-403 ANGLE VERIFICATION								
DAC				BLOCK TYPE: Rumpus <del>Pump</del>		S/N: DB55079						
				NOMINAL ANGLE: 0		ACTUAL ANGLE: N/A						
<div style="display: flex; align-items: center;"> <div style="flex: 1;"> </div> <div style="flex: 0.2; text-align: center; font-weight: bold;">A M P L I T U D E</div> </div> <p style="text-align: center;">DISPLAY WIDTH: 10 inches</p>				INSTRUMENT SETTINGS								
				REFLECTOR			REFERENCE		MEMORY			
				SCAN DIRECT.	NTCH	SDH	SENSITIVITY		NUMBER			
				AXIAL	<input type="checkbox"/>	<input checked="" type="checkbox"/>	20.8 dB		1			
				CIRC	<input type="checkbox"/>	<input type="checkbox"/>	n/a dB		n/a			
				FREQ:	2.25	MHz	REJECT: off		%			
				ANGLE:	n/a	deg	DAMPING: 500		ohms			
				DELAY:	.499	msec	PULSER: 222					
				ZERO:	n/a	msec	FILTER: Filt 3					
				VELOCITY:	.238	msec	REP RATE: 2KHZ					
RANGE:	10	inches	TOF: <input checked="" type="checkbox"/> PEAK <input type="checkbox"/> FLANK									
DISPLAY MODE:			POWER: AC									
DUAL: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF			TCG: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF									
REF. REFLECTOR: 1"				GAIN: 8 dB		CALIBRATION TIMES						
AMPLITUDE: 80 %				METAL PATH: 1"		INITIAL TIME: 9:00 FINAL TIME: 1830						
VERIFICATION TIMES		1) 14:00		2) n/a		3) n/a		4) n/a				
		5) n/a		6) n/a		7) n/a		8) n/a				
		9) n/a										
LINEARITY CHECK												
VERTICAL	SIGNAL 1		100	90	80	70	60	50	40	30	20	
	SIGNAL 2		50	45	40	35	30	25	20	15	10	
ATTENUATOR	GAIN	SET	-6 dB		-12 dB		SET		+12		SET	+6
	AMP	80%	32 TO 48		16 TO 24		20 %		64 TO 96		40%	
			40		20				80			
COMMENTS:						WELDS/ITEMS EXAMINED:						
						N4A, N4F Nozzle to Shell						
EXAMINER: MIKE W. KLEINJAN <i>Mike W. Kleinjan</i>			EXAMINER: DAVID KLEINJAN <i>D.R. Kleinjan</i>			REVIEWER: <i>Paul P. Kleinjan</i>			ANII: <i>What Told</i>			
LEVEL: II			LEVEL: II			DATE: 4/19/02			DATE: 4/19/02			
						PG.: 16 OF 15			3 OF 15			

00118

<b>TENNESSEE VALLEY AUTHORITY</b>		<b>DIGITAL ULTRASONIC CALIBRATION DATA SHEET</b>		<b>REPORT NUMBER: <i>R168</i></b>								
PROJECT: BFN UNIT: 3 CYCLE: 10		CALIBRATION DATE: 3-30-02										
PROC.: N-UT- 9 REV:9 TC:02-06		CALIBRATION BLOCK NO.: BF18 TEMP: 72.6°F										
INSTR. MFG: Stavely DUE DATE: 8-05-02		SIMULATOR BLOCK NO: DB55079										
MODEL/TYPE: sonic 136 M & TE NO.: VH751		THERMOMETER S/N: 522352 DUE DATE: 5-17-02										
TRANSDUCER MFG: Krautkramer		COUPLANT SONOTRACE BATCH: 01141										
S/N DB34843 SIZE: .5x1 FREQ: 2.25 MHz		EXAM TYPE: SHEAR <input checked="" type="checkbox"/> LONG <input type="checkbox"/> RL <input type="checkbox"/>										
CABLE TYPE: RG1743 LENGTH: 120 inches		<b>ANGLE VERIFICATION</b>										
<b>DAC</b>		BLOCK TYPE: IIW		S/N: DB55074								
		NOMINAL ANGLE: 45°		ACTUAL ANGLE: 45°								
<p style="text-align: center;">DISPLAY WIDTH: 10 inches</p>		<b>INSTRUMENT SETTINGS</b>										
		<b>REFLECTOR</b>			<b>REFERENCE</b>		<b>MEMORY</b>					
		SCAN DIRECT.	NTCH	SDH	SENSITIVITY		NUMBER					
		AXIAL	<input type="checkbox"/>	<input checked="" type="checkbox"/>	42.6 dB		2					
		CIRC	<input type="checkbox"/>	<input type="checkbox"/>	n/a dB		n/a					
		FREQ: 2.25	MHz		REJECT: off		%					
		ANGLE: N/A	deg		DAMPING: 500		ohms					
		DELAY: .830	msec		PULSER: 222							
		ZERO: N/A	msec		FILTER: FITL 3							
		VELOCITY: .126	msec		REP RATE: 2KHZ							
RANGE: 20	inches		TOF: <input checked="" type="checkbox"/> PEAK <input type="checkbox"/> FLANK									
DISPLAY MODE: PE			POWER: AC									
DUAL: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF			TCG: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF									
REF. REFLECTOR: 1" GAIN: 33.6 dB		<b>CALIBRATION TIMES</b>										
		INITIAL TIME: 9:00		FINAL TIME: 18:30								
AMPLITUDE: 80 % METAL PATH: 1"		VERIFICATION TIMES										
		1) 14:00 2) <i>N/A</i> 3) <i>N/A</i> 4) <i>N/A</i> 5) <i>N/A</i> 6) <i>N/A</i> 7) <i>N/A</i> 8) <i>N/A</i> 9) <i>N/A</i>										
<b>LINEARITY CHECK</b>												
VERTICAL	SIGNAL 1		100	90	80	70	60	50	40	30	20	
	SIGNAL 2		50	45	40	35	30	25	20	15	10	
ATTENUATOR	GAIN	SET	-6 dB		-12 dB		SET		+12		SET	+6
	AMP	80%	32 TO 48		16 TO 24		20 %		64 TO 96		40% 64 TO 96	
			40		20				80		80	
COMMENTS:						WELDS/ITEMS EXAMINED:						
Delta difference between 3/8 to 5/8 on the clad side is 3 dB						N4A, N4F Nozzle to Shell						
EXAMINER:		EXAMINER:		REVIEWER:		ANII:						
MIKE W. KLEINJAN		DAVID KLEINJAN		<i>[Signature]</i>		<i>[Signature]</i>						
<i>Mike W. Kleinjan</i>		<i>David Kleinjan</i>		<i>[Signature]</i>		DATE: 4/19/02						
LEVEL: II		LEVEL: II		LEVEL: <i>II</i>		DATE: 4/1/02		PG: 18 OF 15 4/10/02				

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00119

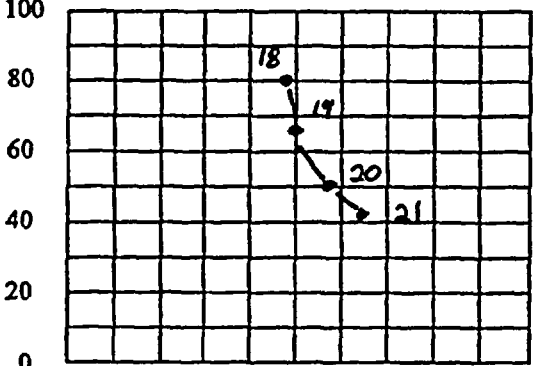
<b>TENNESSEE VALLEY AUTHORITY</b>		<b>DIGITAL ULTRASONIC CALIBRATION DATA SHEET</b>		<b>REPORT NUMBER: <i>R168</i></b>								
PROJECT: BFN UNIT: 3 CYCLE: 10		CALIBRATION DATE: 3-30-02										
PROC.: N-UT- 9 REV:9 TC:02-06		CALIBRATION BLOCK NO.: BF18 TEMP: 72.6°F										
INSTR. MFG: Staveley DUE DATE: 8-05-02		SIMULATOR BLOCK NO: DB55079										
MODEL/TYPE: Sonic 136 M & TE NO.: VH751		THERMOMETER S/N: 522352 DUE DATE: 5-17-02										
TRANSDUCER MFG: Kraunkramer		COUPLANT SONOTRACE BATCH: 01141										
S/N DB34154 SIZE: .5x1 FREQ: 2.25 MHz		EXAM TYPE: SHEAR <input checked="" type="checkbox"/> LONG <input type="checkbox"/> RL <input type="checkbox"/>										
CABLE TYPE: RG174 LENGTH: 120 inches		<b>ANGLE VERIFICATION</b>										
<b>DAC</b>		BLOCK TYPE: IIW		S/N: DB55074								
		NOMINAL ANGLE: 60		ACTUAL ANGLE: 59								
<p style="text-align: center;">DISPLAY WIDTH: 10 inches</p>		<b>INSTRUMENT SETTINGS</b>										
		<b>REFLECTOR</b>			<b>REFERENCE</b>		<b>MEMORY</b>					
		SCAN DIRECT. NTCH SDH			SENSITIVITY		NUMBER					
		AXIAL <input type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>			49 dB		3					
		CIRC <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>			n/a dB		n/a					
		FREQ: 2.25 MHz			REJECT: off		%					
		ANGLE: N/A deg			DAMPING: 500		ohms					
		DELAY: 1.20 msec			PULSER: 222							
		ZERO: N/A msec			FILTER: FITL 3							
		VELOCITY: .123 msec			REP RATE: 2KHZ							
RANGE: 20 inches			TOF: <input checked="" type="checkbox"/> PEAK <input type="checkbox"/> FLANK									
DISPLAY MODE:			POWER: AC									
DUAL: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF			TCG: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF									
REF. REFLECTOR: 1" GAIN: 36 dB		<b>CALIBRATION TIMES</b>										
		INITIAL TIME: 9:00		FINAL TIME: 18:30								
AMPLITUDE: 80 % METAL PATH: 1"												
VERIFICATION TIMES		1)14:00	2)n/a	3)n/a	4)n/a	5)n/a	6)n/a	7)n/a	8)n/a	9)n/a		
<b>LINEARITY CHECK</b>												
VERTICAL	SIGNAL 1		100	90	80	70	60	50	40	30	20	
	SIGNAL 2		50	45	40	35	30	25	20	15	10	
ATTENUATOR	GAIN	SET	-6 dB		-12 dB		SET		+12		SET	+6
	AMP	80%	32 TO 48		16 TO 24		20 %		64 TO 96		40% 64 TO 96	
			40		20				80		80	
COMMENTS:						WELDS/ITEMS EXAMINED:						
DELTA dB DIFFERENCE IS 4.4 FROM THE 3/8 TO 5/8 ON THE						N4A, N4F Nozzle to Shell						
CLAD SIDE												
EXAMINER: MIKE W. KLEINJAN <i>Mike W. Kleinjan</i> LEVEL: II		EXAMINER: DAVID KLEINJAN <i>D.K. Kleinjan</i> LEVEL: II		REVIEWER: <i>[Signature]</i> LEVEL: III DATE: 4/4/02		ANH: <i>Albert Hall</i> DATE: 4/19/02 PG.: 17 OF 15 4/19/02 5 OF 15						

00120

TENNESSEE VALLEY AUTHORITY			DIGITAL ULTRASONIC CALIBRATION DATA SHEET			REPORT NUMBER: <b>R168</b>						
PROJECT: BFN UNIT: 3 CYCLE: 10			CALIBRATION DATE: 03-30-02									
PROC.: N-UT- 55 REV:9 <del>DE. TC: N/A 03-03</del>			CALIBRATION BLOCK NO.: BF-84-IR TEMP: 70.5°F									
INSTR. MFG: STAVELEY DUE DATE: 08-11-02			SIMULATOR BLOCK NO: N/A									
MODEL/TYPE: SONIC-137 M & TE NO.: VH-5473			THERMOMETER S/N: 522352 DUE DATE: 05-17-02									
TRANSDUCER MFG: KRAUTKRAMER			COUPLANT SONOTRACE BATCH: 01141									
S/N DB 35164 SIZE: 1.0" FREQ: 2.25 MHz			EXAM TYPE: SHEAR <input type="checkbox"/> LONG <input type="checkbox"/> RL <input checked="" type="checkbox"/>									
CABLE TYPE: RG 174 LENGTH: 120 inches			ANGLE VERIFICATION									
DAC			BLOCK TYPE: CS IIW			S/N: DB 55074						
			NOMINAL ANGLE: 21			ACTUAL ANGLE: N/A						
<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;">100 80 60 40 20 0</div> <div style="border: 1px solid black; width: 200px; height: 150px; position: relative;"> <div style="position: absolute; top: 10%; left: 10%;">14</div> <div style="position: absolute; top: 15%; left: 15%;">15</div> <div style="position: absolute; top: 40%; left: 60%;">16</div> <div style="position: absolute; top: 45%; left: 70%;">17</div> </div> <div style="margin-left: 10px; text-align: center;">A M P L I T U D E</div> </div> <p style="text-align: center;">DISPLAY WIDTH: 20 inches</p>			INSTRUMENT SETTINGS									
			REFLECTOR			REFERENCE		MEMORY				
			SCAN DIRECT.	NTCH	SDH	SENSITIVITY		NUMBER				
			AXIAL	<input checked="" type="checkbox"/>	<input type="checkbox"/>	55.0 dB		22				
			CIRC	<input type="checkbox"/>	<input type="checkbox"/>	N/A dB		N/A				
			FREQ: 2.25	MHz		REJECT: OFF %						
			ANGLE: N/A	deg		DAMPING: 200 ohms						
			DELAY: 1.61	msec		PULSER: 222						
			ZERO: N/A	msec		FILTER: FILT 1						
			VELOCITY: 0.233	msec		REP RATE: 4 KHZ						
RANGE: 20.0	inches		TOF: <input type="checkbox"/> PEAK <input checked="" type="checkbox"/> FLANK									
DISPLAY MODE: PE			POWER: AC									
DUAL: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF			TCG: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF									
REF. REFLECTOR: N/A GAIN: N/A dB			CALIBRATION TIMES									
AMPLITUDE: N/A % METAL PATH: N/A"			INITIAL TIME: 1505			FINAL TIME: 1810						
VERIFICATION TIMES			1)N/A	2)N/A	3)N/A	4)N/A	5)N/A	6)N/A	7)N/A	8)N/A	9)N/A	
LINEARITY CHECK												
VERTICAL	SIGNAL 1		100	90	80	70	60	50	40	30	20	
	SIGNAL 2		50	45	40	35	30	25	20	15	10	
ATTENUATOR	GAIN	SET	-6 dB	-12 dB	SET		+12		SET		+6	
	AMP	80%	32 TO 48	16 TO 24	20 %		64 TO 96		40%		64 TO 96	
			40	20			80				80	
COMMENTS:						WELDS/ITEMS EXAMINED:						
						REACTOR PRESSURE VESSEL						
						N4A-IR, N4F-IR						
						wedge IO D-14795-246						
EXAMINER: DAVID KLEINJAN <i>David Kleinjan</i> LEVEL: II			EXAMINER: MIKE KLEINJAN <i>Mike Kleinjan</i> LEVEL: II			REVIEWER: <i>John Schmitt</i> LEVEL: III DATE: 4/4/02			ANII: <i>Robert Allen</i> DATE: 4/19/02 PG. 14 OF 15 5/10/02 6 OF 15			



00121

TENNESSEE VALLEY AUTHORITY		DIGITAL ULTRASONIC CALIBRATION DATA SHEET		REPORT NUMBER: <i>R168</i>						
PROJECT: BFN UNIT: 3		CYCLE: 10		CALIBRATION DATE: 03-30-02						
PROC.: N-UT- 55		REV: 9 <i>AP</i> TC: N/A <i>CS</i>		CALIBRATION BLOCK NO.: BF-84-IR TEMP: 70.5°F						
INSTR. MFG: STAVELEY		DUE DATE: 08-11-02		SIMULATOR BLOCK NO: N/A						
MODEL/TYPE: SONIC-137		M & TE NO.: VH-5473		THERMOMETER S/N: 522352 DUE DATE: 05-17-02						
TRANSDUCER MFG: KRAUTKRAMER		COUPLANT SONOTRACE BATCH: 01141								
S/N DB 35164 SIZE: 1.0" FREQ: 2.25 MHz		EXAM TYPE: SHEAR <input type="checkbox"/> LONG <input type="checkbox"/> RL <input checked="" type="checkbox"/>								
CABLE TYPE: RG 174 LENGTH: 120 inches		ANGLE VERIFICATION								
DAC   DISPLAY WIDTH: 20 inches		BLOCK TYPE: CS IIW		S/N: DB 55074						
		NOMINAL ANGLE: 27		ACTUAL ANGLE: N/A						
		INSTRUMENT SETTINGS								
		REFLECTOR		REFERENCE	MEMORY					
		SCAN DIRECT.	NTCH	SDH	SENSITIVITY	NUMBER				
		AXIAL	<input checked="" type="checkbox"/>	<input type="checkbox"/>	56.2 dB	23				
		CIRC	<input type="checkbox"/>	<input type="checkbox"/>	N/A dB	N/A				
		FREQ: 2.25 MHz	REJECT: OFF		%					
		ANGLE: N/A deg	DAMPING: 200		ohms					
		DELAY: 0.950 msec	PULSER: 222							
		ZERO: N/A msec	FILTER: FILT 1							
		VELOCITY: 0.233 msec	REP RATE: 4 KHZ							
		RANGE: 20.0 inches	TOF: <input type="checkbox"/> PEAK <input checked="" type="checkbox"/> FLANK							
		DISPLAY MODE: PE	POWER: AC							
		DUAL: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF	TCG: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF							
REF. REFLECTOR: N/A		GAIN: N/A dB		CALIBRATION TIMES						
AMPLITUDE: N/A %		METAL PATH: N/A"		INITIAL TIME: 1505 FINAL TIME: 1810						
VERIFICATION TIMES		1)N/A	2)N/A	3)N/A	4)N/A	5)N/A				
		6)N/A	7)N/A	8)N/A	9)N/A					
LINEARITY CHECK										
VERTICAL	SIGNAL 1	100	90	80	70	60	50	40	30	20
	SIGNAL 2	50	45	40	35	30	25	20	15	10
ATTENUATOR	GAIN	SET	-6 dB	-12 dB	SET	+12	SET	+6		
	AMP	80%	32 TO 48	16 TO 24	20 %	64 TO 96	40%	64 TO 96		
			40	20		80		80		
COMMENTS:				WELDS/ITEMS EXAMINED:						
				REACTOR PRESSURE VESSEL						
				N4A-IR, N4F-IR						
				<i>wedge ID 0-14795-247</i>						
EXAMINER: DAVID KLEINJAN <i>S.R. Kleyan</i> LEVEL: II		EXAMINER: MIKE KLEINJAN <i>Mike Kleyan</i> LEVEL: II		REVIEWER: <i>[Signature]</i> LEVEL: <i>II</i> DATE: <i>4/16/02</i>		ANII: <i>[Signature]</i> DATE: <i>4/19/02</i> PG.: <i>15 OF 15</i> <i>4/19/02</i> <i>7 OF 15</i>				

TVA

MANUAL ULTRASONIC VESSEL  
EXAMINATION DATA SHEET

REPORT NO.

R168

PROJECT: BFN UNIT: 3 WELD ID: N4F CONFIG.: Npp/6 COMPONENT: VESSELCAL. SHT. NO.: N/A PROCEDURE: NT-UT-9 REV.: 9 PCR.: 0206 2 8-04-02 N/A TEMP.: 85 PYRO.: 522352SCAN SENS.: X dB EXAM START: 3/30/02 15:50 EXAM END: 1650 EXAM ANGLE: 0°, 45°, 60°Lo LOCATION: TDC Wo LOCATION: E OF WELD

IND NO.	20%			50%			100%			MAX. AMP.			20%			50%			100%		
	Mp1	W1	L1	Mp1	W1	L1	Mp1	W1	L1	Mp	W	L	Mp2	W2	L2	Mp2	W2	L2	Mp2	W2	L2
21°	SCAN	dB	61	SCAN	dB	61	SCAN	dB	61	10/11	BLEND RADIUS										
27°	SCAN	dB	62.2	SCAN	dB	62.2	SCAN	dB	62.2	10/11	BLEND RADIUS										
0°	SCAN	dB	74.8	SCAN	dB	74.8	SCAN	dB	74.8	9	ON WELD AND BASE MATERIAL										
45°	SCAN	dB	56.6	SCAN	dB	56.6	SCAN	dB	56.6	9	ON WELD AND VESSEL SIDE										
45°T	SCAN	dB	56.6	SCAN	dB	56.6	SCAN	dB	56.6	10/11	CW/CCW VESSEL SIDE										
45° TAN	SCAN	dB	56.6	SCAN	dB	56.6	SCAN	dB	56.6	10/11	CW/CCW VESSEL SIDE										
60°	SCAN	dB	63	SCAN	dB	63	SCAN	dB	63	9	ON WELD AND VESSEL SIDE										
60°T	SCAN	dB	63	SCAN	dB	63	SCAN	dB	63	10/11	CW/CCW VESSEL SIDE										
60° TAN	SCAN	dB	63	SCAN	dB	63	SCAN	dB	63	10/11	CW/CCW VESSEL SIDE										
NO RECORDABLE INDICATION																					

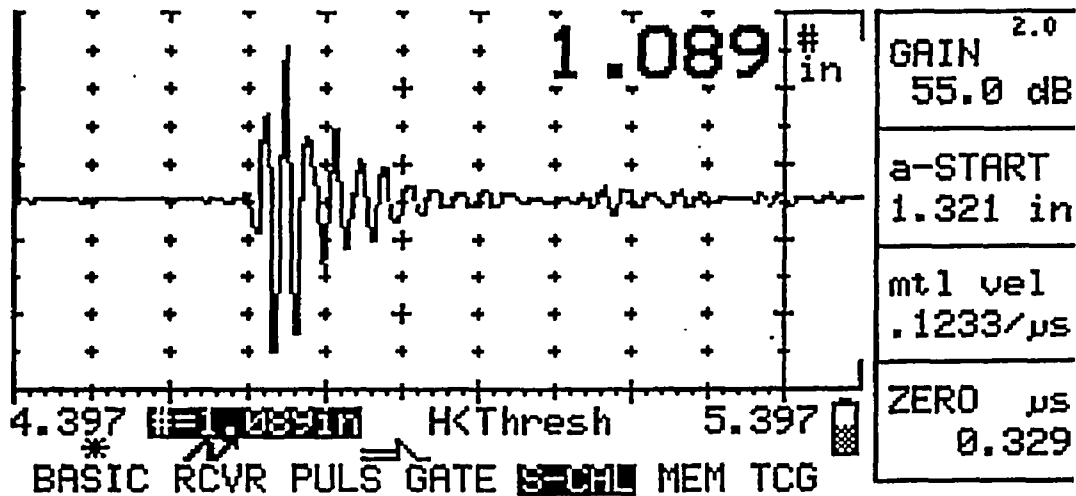
00132

COMMENTS: 21° AND 27° EXAMINATIONS ARE THE BLEND RADIUS EXAMINATIONS  
TRANSVERSE EXAMINATION COVERAGE WILL INCLUDE COVERAGE OBTAINED DURING THE  
INNER RADIUS EXAMINATIONS. 5. TO 10.75 Hertz Level was observed andEXAMINER: W. J. Logan LEVEL: 11 DATE: 3-30-02 REVIEWED BY: W. J. Logan LEVEL: 11 DATE: 3/30/02  
EXAMINER: W. J. Logan LEVEL: 11 DATE: 3-30-02 ANI: W. J. Logan DATE: 4/19/02 PAGE 78 OF 15

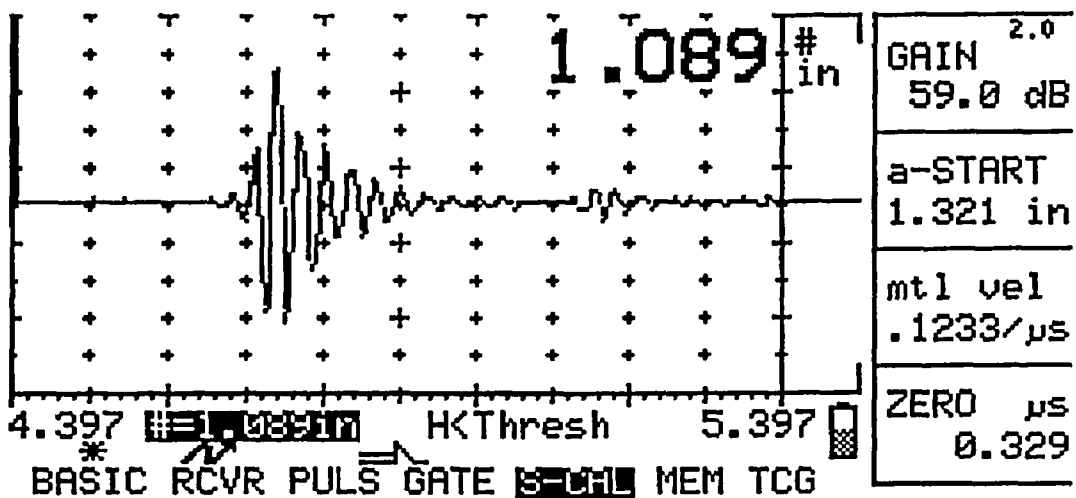
Report Number

R168 00123

Nozzle Examination 45 °Waveforms



45° Pre Waveform

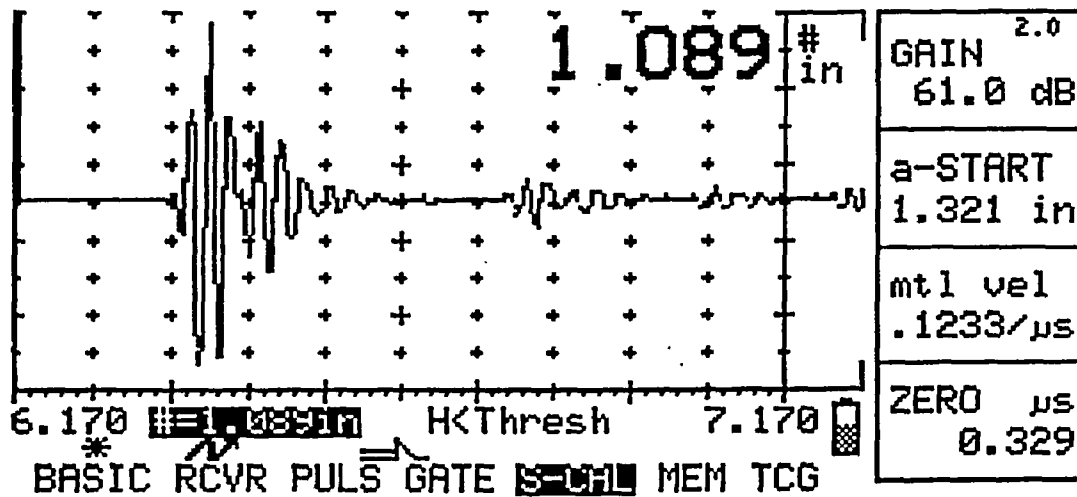


45° Post Waveform

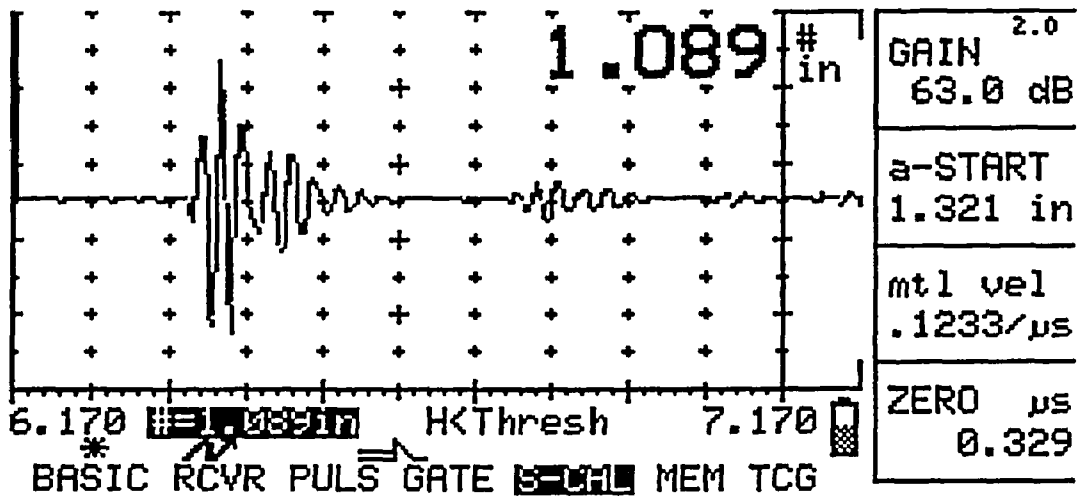
H5BCT  
4/19/02  
90F15  
4/19/02 to 03/15

00124  
REPORT NUMBER  
R168

Nozzle Examination 60° Waveforms



60° Pre Waveform



60° Post Waveform

H5BCt  
4/4/02

4/10/02 10 OF 15  
H515

TVA

BEAM SPREAD AND  
RESOLUTION DATA SHEET

REPORT NO.

R168

PROJECT: BF 1 UNIT: 3 CALIBRATION BLOCK NO.: BF 18PROCEDURE NO.: N-OT-9 REV.: 9 PCR: 0206 8/18/02SEARCH UNIT-MAKE: Krautkramer SIZE: .5X1 FREQ.: 2.25S/N: DB 34843 ANGLE: 45ULTRASONIC INSTRUMENT-MAKE: Some 13C S/N: VH 751

## BEAM SPREAD

HOLE DEPTH	TRAILING RAY				LEADING RAY					
	20% DAC		50% DAC		100% DAC		20% DAC		50% DAC	
	W	MP	W	MP	MP	W	MP	W	W	MP
1/4T	1 1/8	1.9	1 1/4	2.	2.1	1 5/8	2.4	2	1 7/8	2.3
2T	2 7/8	4	3	4.1	4.3	3 1/4	4.8	4 1/8	3 3/4	4.6
3/4T	4 1/4	6	4 1/2	6.3	6.5	4 7/8	7	5 7/8	5 1/4	6.8

LEADING RAY

TRAILING RAY

MAXIMUM

## RESOLUTION

NEAR SURFACE  
REFLECTOR: Notch OD DEPTH: 25 SIZE: .253 CAL BLK.: BF 18FAR SURFACE  
REFLECTOR: Notch ID DEPTH: 6.1 SIZE: .253

## SCANNING

REFLECTORS PROVIDE 50% DAC SIGNALS AT SCANNING SPEED

☒☐EXAMINER: Mike W. HagenREVIEWED BY: Joe M. HagenANII: Albert TaylorLEVEL: II DATE: 3-30-02LEVEL: II DATE: 4/6/02DATE: 4/19/02PAGE: 12 OF 15

TVA

BEAM SPREAD AND  
RESOLUTION DATA SHEET

REPORT NO.

R168

PROJECT: BFA UNIT: 3 CALIBRATION BLOCK NO.: BF 18PROCEDURE NO.: N-UT-9 REV.: 9 PCR: 0206 NTA and 3-30-02SEARCH UNIT-MAKE: Krautkramer SIZE: .5X1 FREQ.: 2.25SN: DB 34154 ANGLE: 60ULTRASONIC INSTRUMENT-MAKE: Sony 13C SN: VH 751

## BEAM SPREAD

HOLE DEPTH	TRAILING RAY				LEADING RAY					
	20% DAC		50% DAC		100% DAC		20% DAC		50% DAC	
	W	MP	W	MP	MP	W	MP	W	W	MP
1/4T	2 1/8	2.4	2 3/8	2.7	2.9	2 5/8	3.2	3 1/8	2 7/8	3.1
1/2T	4 3/4	4.8	5	5.3	5.8	5 1/4	6.4	6 5/8	6	6.1
3/4T	<del>6 3/8</del>	7.6	7 1/4	8	8.7	7 7/8	9.6	8 5/8	8	9.1

6 3/8

LEADING RAY

TRAILING RAY

MAXIMUM

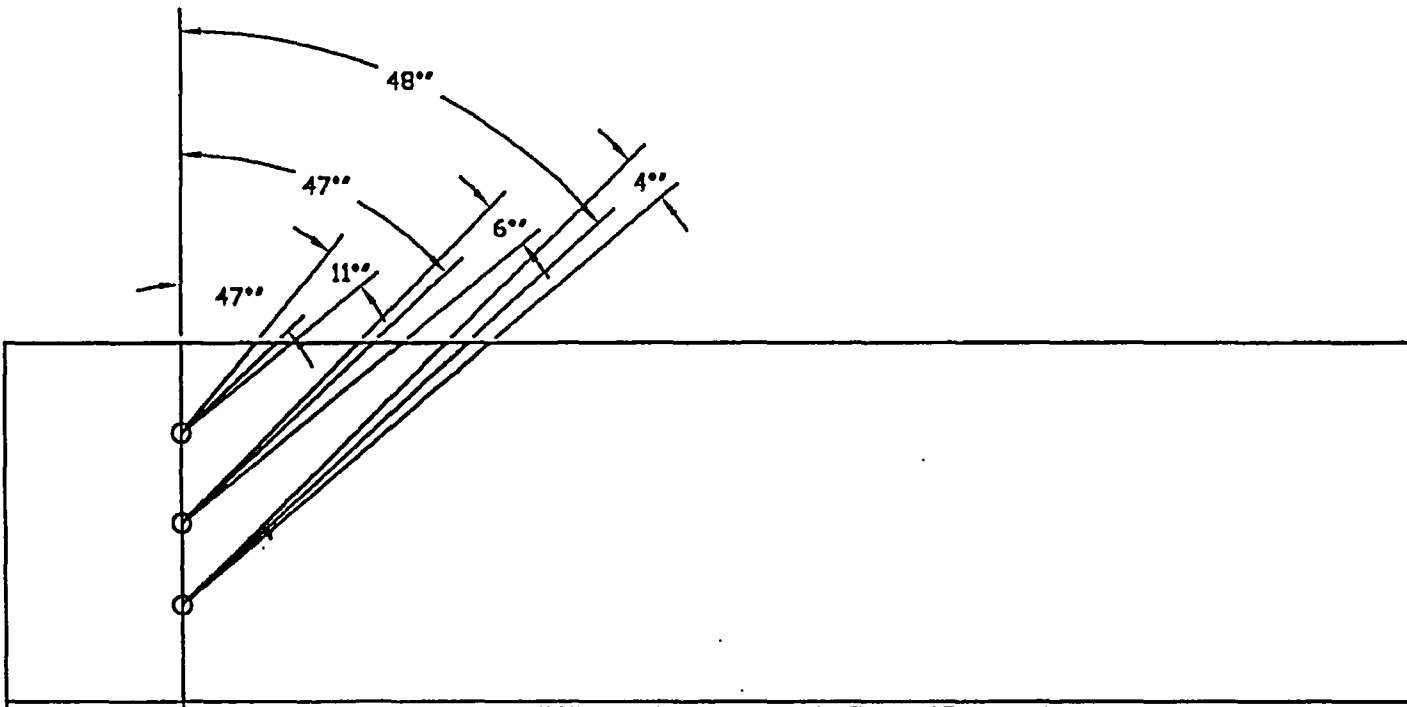
## RESOLUTION

NEAR SURFACE  
REFLECTOR: Notch OD DEPTH: .25 SIZE: .253 CAL BLK.: BF 18FAR SURFACE  
REFLECTOR: Notch ID DEPTH: 6.1 SIZE: .253

## SCANNING

REFLECTORS PROVIDE 50% DAC SIGNALS AT SCANNING SPEED

Y ☒N ☐EXAMINER: Mike W. Henry Jr.REVIEWED BY: [Signature]ANII: Alhat FullDATE: 4/19/02LEVEL: II DATE: 3-30-02LEVEL: III DATE: 4/4/02PAGE: 1215 OF 15



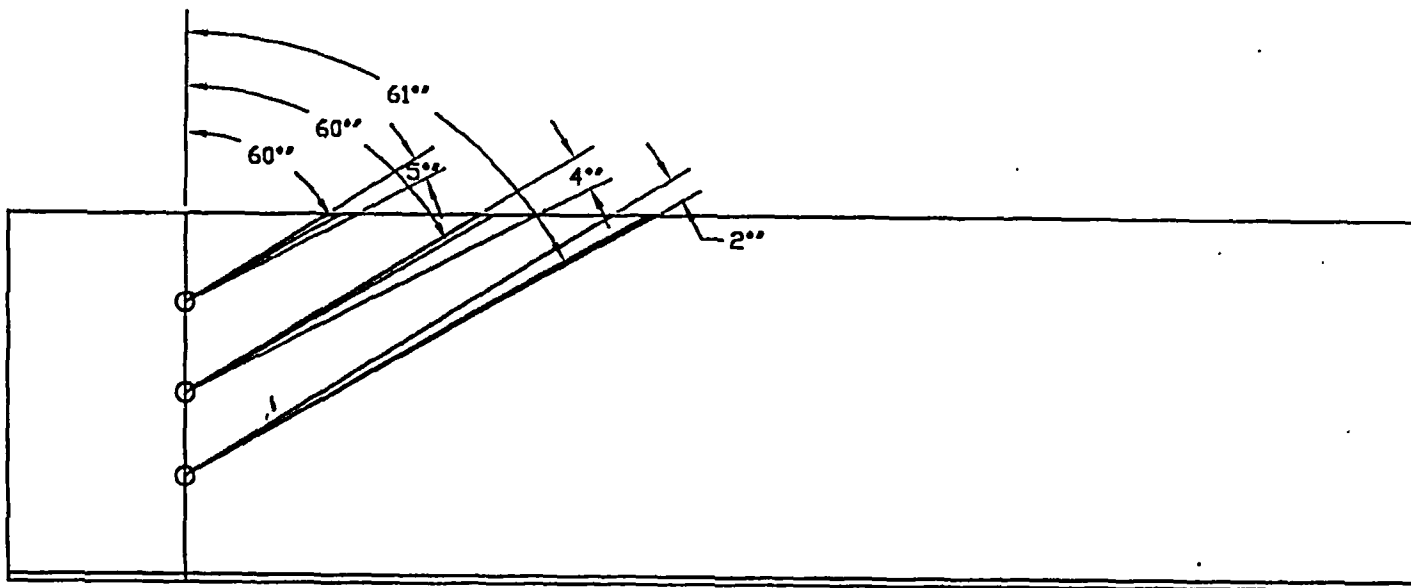
Report Number  
R168

H5BGT  
1/1/02  
4/14/02

Browns Ferry Unit 3
Beamspread
MARCH 2002
BF-18

00127.

13  
4/5/16  
10-4/10/02



Report Number  
R168

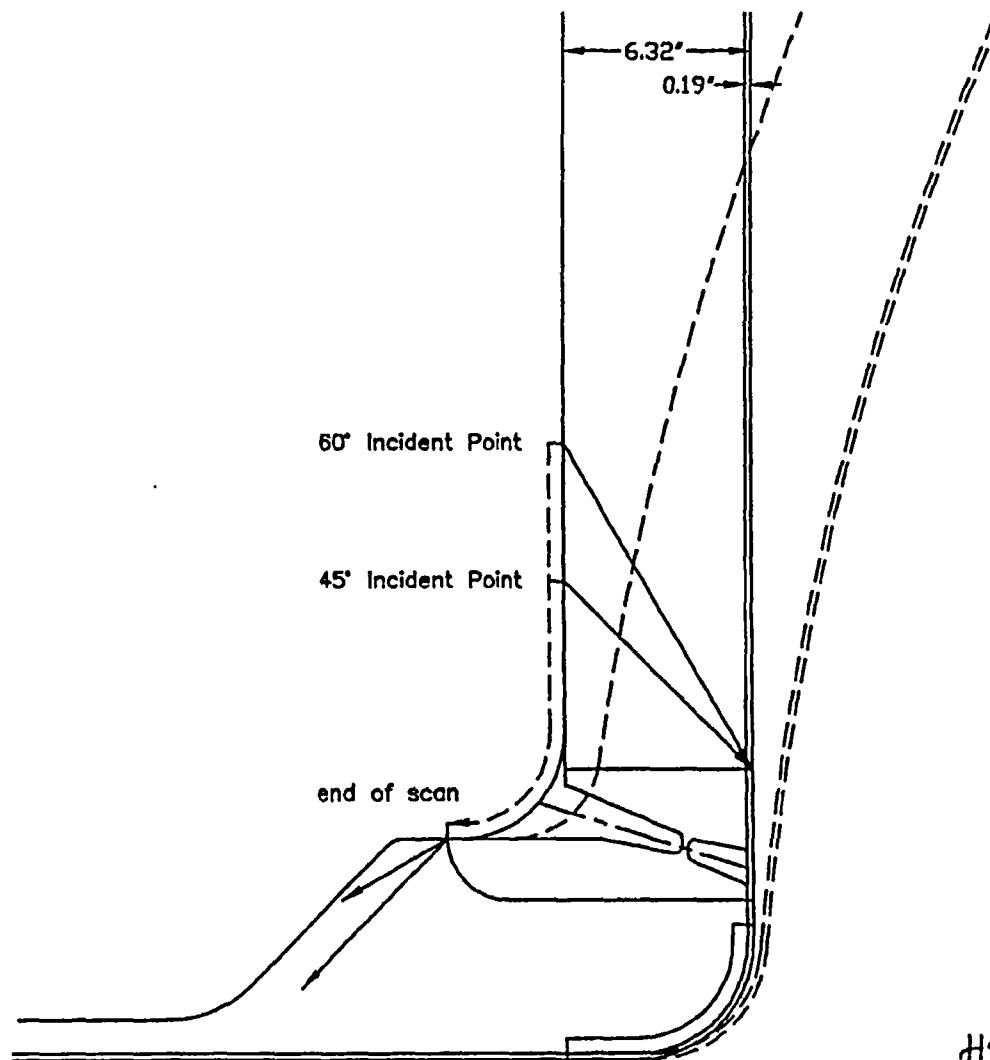
00128

H5BCT  
4/1/02

Browns Ferry Unit 3
Beamspread
MARCH 2002
BF-18

14  
4/1/02





NOTE: Transverse coverage includes coverage obtained during the inner radius examinations.

Refer Number  
R168

H5BCJ 4/19/02	Browns Ferry Unit 3
	N4 Nozzle-to-Shell
	March 2002
	SP-N4-NS

00129

5/1/02  
15 of 15

TENNESSEE VALLEY AUTHORITY		EXAMINATION SUMMARY AND RESOLUTION SHEET		REPORT NUMBER: <i>R169</i>	
PROJECT: BFN UNIT: 3		CYCLE: 10		COMPONENT ID: N4F-IR	
EXAMINATION METHOD				SYSTEM RPV ISI DWG. NO. 3-ISI-0327-C	
MT <input type="checkbox"/>	PT <input type="checkbox"/>	UT <input checked="" type="checkbox"/>	VT <input type="checkbox"/>	CODE CLASS: 1	CATEGORY: B-D
PROCEDURE: N-UT-55		REV: 9	TC: <i>N/A 4-4-02</i>	COFIG.: Nozzle	TO Vessel
EXAMINER: MIKE KLEINJAN		EXAMINER: <i>DAVID KLEINJAN</i>		EXAMINER: N/A	EXAMINER: N/A
LEVEL: II		LEVEL: II		LEVEL: N/A	LEVEL: N/A

This report contains the data associated with the manual ultrasonic examination of code category B-D, Nozzle Inner radius. This examination report satisfies ASME section XI requirements for the inner radius examination.

N4F-IR: This examination was performed using a 21° and 27° in the blend radius in two directions CW/CCW

100% code coverage was obtained

This exam was performed with equipment, Procedures, and personnel qualified in accordance with ASME Section XI

*No Recordable Indications*

RESOLUTION BY: Mike Kleinjan <i>Mike Kleinjan</i>	REVIEWED BY: <i>David Kleinjan</i>	ANII: <i>Albert Todd</i>
LEVEL: II DATE: <i>4-4-02</i>	LEVEL: <i>II</i> DATE: <i>4/4/02</i>	DATE: <i>4/19/02</i>
		PG. <i>1</i> OF <i>4</i> <i>4/19/02</i>

00131

<b>TENNESSEE VALLEY AUTHORITY</b>		<b>DIGITAL ULTRASONIC CALIBRATION DATA SHEET</b>		<b>REPORT NUMBER:</b> <span style="font-size: 1.2em;">R169</span>								
PROJECT: BFN UNIT: 3		CYCLE: 10		CALIBRATION DATE: 03-30-02								
PROC.: N-UT- 55		REV: 9		CALIBRATION BLOCK NO.: BF-84-IR TEMP: 70.5°F								
INSTR. MFG: STAVELEY		DUE DATE: 08-11-02		SIMULATOR BLOCK NO: N/A								
MODEL/TYPE: SONIC-137		M & TE NO.: VH-5473		THERMOMETER S/N: 522352 DUE DATE: 05-17-02								
TRANSDUCER MFG: KRAUTKRAMER		COUPLANT SONOTRACE BATCH: 01141										
S/N DB 3516/3 SIZE: 1.0"		FREQ: 2.25 MHz		EXAM TYPE: SHEAR <input type="checkbox"/> LONG <input type="checkbox"/> RL <input checked="" type="checkbox"/>								
CABLE TYPE: RG 174		LENGTH: 120 inches		<b>ANGLE VERIFICATION</b>								
<b>DAC</b>		BLOCK TYPE: CS IIW		S/N: DB 55074								
		NOMINAL ANGLE: 21		ACTUAL ANGLE: N/A								
<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;"> 100 80 60 40 20 0 </div> <div style="border: 1px solid black; width: 200px; height: 150px; position: relative;"> <div style="position: absolute; top: 10%; left: 10%;">14</div> <div style="position: absolute; top: 25%; left: 15%;">15</div> <div style="position: absolute; top: 40%; left: 15%;">16</div> <div style="position: absolute; top: 45%; left: 20%;">17</div> </div> <div style="margin-left: 10px; text-align: center;"> A M P L I T U D E </div> </div> <p style="margin-top: 10px;">DISPLAY WIDTH: 20 inches</p>		<b>INSTRUMENT SETTINGS</b>										
		<b>REFLECTOR</b>			<b>REFERENCE</b>		<b>MEMORY</b>					
		SCAN DIRECT. NTCH SDH			SENSITIVITY		NUMBER					
		AXIAL <input checked="" type="checkbox"/>			55.0 dB		22					
		CIRC <input type="checkbox"/>			N/A dB		N/A					
		FREQ: 2.25 MHz			REJECT: OFF %							
		ANGLE: N/A deg			DAMPING: 200 ohms							
		DELAY: 1.61 msec			PULSER: 222							
		ZERO: N/A msec			FILTER: FILT 1							
		VELOCITY: 0.233 msec			REP RATE: 4 KHZ							
RANGE: 20.0 inches			TOF: <input type="checkbox"/> PEAK <input checked="" type="checkbox"/> FLANK									
DISPLAY MODE: PE			POWER: AC									
DUAL: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF			TCG: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF									
<b>CALIBRATION TIMES</b>												
REF. REFLECTOR: N/A			GAIN: N/A dB									
AMPLITUDE: N/A %			METAL PATH: N/A"									
VERIFICATION TIMES		1)N/A	2)N/A	3)N/A	4)N/A	5)N/A	6)N/A	7)N/A	8)N/A	9)N/A		
<b>LINEARITY CHECK</b>												
<b>VERTICAL</b>	SIGNAL 1		100	90	80	70	60	50	40	30	20	
	SIGNAL 2		50	45	40	35	30	25	20	15	10	
<b>ATTENUATOR</b>	GAIN	SET	-6 dB		-12 dB		SET		+12		SET	+6
	AMP	80%	32 TO 48		16 TO 24		20 %		64 TO 96		40%	64 TO 96
			40		20				80			80
<b>COMMENTS:</b>						<b>WELDS/ITEMS EXAMINED:</b>						
Wedge ID D=14795-246						REACTOR PRESSURE VESSEL						
						N4A-IR, N4F-IR						
<b>EXAMINER:</b> DAVID KLEINJAN <i>D.K. Kleinjan</i> LEVEL: II		<b>EXAMINER:</b> MIKE KLEINJAN <i>Mike Kleinjan</i> LEVEL: II		<b>REVIEWER:</b> <i>Sheel Patel</i> LEVEL: <i>III</i> DATE: <i>4/1/02</i>		<b>ANII:</b> <i>Albert Padgett</i> DATE: <i>4/19/02</i> PG: <i>1 of 1</i> <i>4/19/02</i> <i>2 or 4</i>						

00132

TENNESSEE VALLEY AUTHORITY		DIGITAL ULTRASONIC CALIBRATION DATA SHEET		REPORT NUMBER: <b>R169</b>								
PROJECT: BFN UNIT: 3		CYCLE: 10		CALIBRATION DATE: 03-30-02								
PROC.: N-UT- 55 REV:9		TC: <del>N/A</del> <b>03</b>		CALIBRATION BLOCK NO.: BF-84-IR TEMP: 70.5°F								
INSTR. MFG: STAVELEY		DUE DATE: 08-11-02		SIMULATOR BLOCK NO: N/A								
MODEL/TYPE: SONIC-137 M & TE NO.: VH-5473				THERMOMETER S/N: 522352 DUE DATE: 05-17-02								
TRANSDUCER MFG: KRAUTKRAMER				COUPLANT SONOTRACE BATCH: 01141								
S/N DB 35164 SIZE: 1.0" FREQ: 2.25 MHz				EXAM TYPE: SHEAR <input type="checkbox"/> LONG <input type="checkbox"/> RL <input checked="" type="checkbox"/>								
CABLE TYPE: RG 174 LENGTH: 120 inches				ANGLE VERIFICATION								
DAC		BLOCK TYPE: CS IIW		S/N: DB 55074								
		NOMINAL ANGLE: 27		ACTUAL ANGLE: N/A								
<p style="text-align: center;">DISPLAY WIDTH: 20 inches</p>		INSTRUMENT SETTINGS										
		REFLECTOR			REFERENCE		MEMORY					
		SCAN DIRECT. NTCH SDH			SENSITIVITY		NUMBER					
		AXIAL <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>			56.2 dB		23					
		CIRC <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>			N/A dB		N/A					
		FREQ: 2.25 MHz			REJECT: OFF %							
		ANGLE: N/A deg			DAMPING: 200 ohms							
		DELAY: 0.950 msec			PULSER: 222							
		ZERO: N/A msec			FILTER: FILT 1							
		VELOCITY: 0.233 msec			REP RATE: 4 KHZ							
RANGE: 20.0 inches			TOF: <input type="checkbox"/> PEAK <input checked="" type="checkbox"/> FLANK									
DISPLAY MODE: PE			POWER: AC									
DUAL: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF			TCG: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF									
REF. REFLECTOR: N/A		GAIN: N/A dB		CALIBRATION TIMES								
AMPLITUDE: N/A %		METAL PATH: N/A"		INITIAL TIME: 1505 FINAL TIME: 1810								
VERIFICATION TIMES		1)N/A 2)N/A 3)N/A		4)N/A 5)N/A 6)N/A 7)N/A 8)N/A 9)N/A								
LINEARITY CHECK												
VERTICAL	SIGNAL 1		100	90	80	70	60	50	40	30	20	
	SIGNAL 2		50	45	40	35	30	25	20	15	10	
ATTENUATOR	GAIN	SET	-6 dB		-12 dB		SET		+12		SET	+6
	AMP	80%	32 TO 48		16 TO 24		20 %		64 TO 96		40% 64 TO 96	
			40		20				80		80	
COMMENTS:						WELDS/ITEMS EXAMINED:						
Wedge ID D-14795-247						REACTOR PRESSURE VESSEL						
						N4A-IR, N4F-IR						
EXAMINER:		EXAMINER:		REVIEWER:		ANII: <i>W. H. H.</i>						
DAVID KLEINJAN		MIKE KLEINJAN		<i>David Kleinjan</i>		DATE: 4/19/02						
LEVEL: II		LEVEL: II		LEVEL: <i>II</i>		DATE: 4/18/02						
						PG.: <i>44</i> OF <i>44</i> <i>4/19/02</i>						

3 of 4

00137

**Inspection Report R-170**  
**Weld N5B-NV**

00134

TENNESSEE VALLEY AUTHORITY		EXAMINATION SUMMARY AND RESOLUTION SHEET		REPORT NUMBER: <b>R170</b>	
PROJECT: BFN UNIT: 3		CYCLE: 10		COMPONENT ID: N5B	
EXAMINATION METHOD				SYSTEM RPV ISI DWG. NO. 3-ISI-0331-C	
MT <input type="checkbox"/>	PT <input type="checkbox"/>	UT <input checked="" type="checkbox"/>	VT <input type="checkbox"/>	CODE CLASS: 1	CATEGORY: B-D
PROCEDURE: N-UT-9		REV: 9	TC: 02-06	COFIG.: Nozzle	TO Vessel
EXAMINER: MIKE KLEINJAN <i>4/11/02</i>		EXAMINER: DAVID KLEINJAN		EXAMINER: N/A	EXAMINER: N/A
LEVEL: <i>II</i>		LEVEL: II		LEVEL: N/A	LEVEL: N/A

This report contains the data associated with the manual ultrasonic examination of code category B-D, Nozzle to Vessel welds. This examination report satisfies ASME section XI requirements for the Nozzle to shell weld..

Examination. Nozzle to Vessel weld N5B

Transverse coverage for the Nozzle to Vessel weld was supplemented by the inner radius examination.

(NSB-IR) *see R171*

0° was used on the weld crown and base material Vessel side

45° was used on the vessel side only scanning over the weld crown

45° Tangent to the weld was used on vessel side CW/CCW

45° Parallel to the weld was used on vessel side CW/CCW

60° was used on the vessel side only scanning over the weld crown

60° Tangent to the weld was used on vessel side CW/CCW

60° Parallel to the weld was used on vessel side CW/CCW

71% code coverage was obtained

This exam was performed with equipment, Procedures, and personnel qualified in accordance with ASME Section XI

- (1)(2) Geometric transverse indications observed (Feedwater Bracket Pads) using the 1/8 and 25 search units. (Transverse SCAN Supplement)
- No Recordable Indications using the 0, 45T, 45P, 60T, 60P Search Units
- (Bracket Pads were verified by underwater cameras) *mt*

RESOLUTION BY: Mike Kleinjan <i>mt w. 4/11/02</i>	REVIEWED BY: <i>David Kleinjan</i>	ANII: <i>Robert Todd</i>
LEVEL: II DATE: 4-4-02.	LEVEL: <i>III</i> DATE: 4/4/02	DATE: 4/19/02
		PG. 1 OF 18

*see 4/11/02*

Calculation of ASME code coverage  
For section XI NDE Examination

N5B

1) 0 Degree (weld metal scan)	100%
2) 45 degree Transverse-scan from vessel side of weld	74%
3) 45 degree Transverse-scan from nozzle side of weld	0%
4) 60 degree Transverse-scan from vessel side of weld	65%
5) 60 degree Transverse-scan from nozzle side of weld	0%
6) 45 degree Parallel-scan CW direction	100%
7) 45 degree Parallel-scan CCW direction	100%
8) 60 degree Parallel-scan CW direction	100%
9) 60 degree Parallel-scan CCW direction	100%

The sum of all the percentage of scans	639%
Divided by the total # of scans	9
Percentage of examination Volume coverage	71%

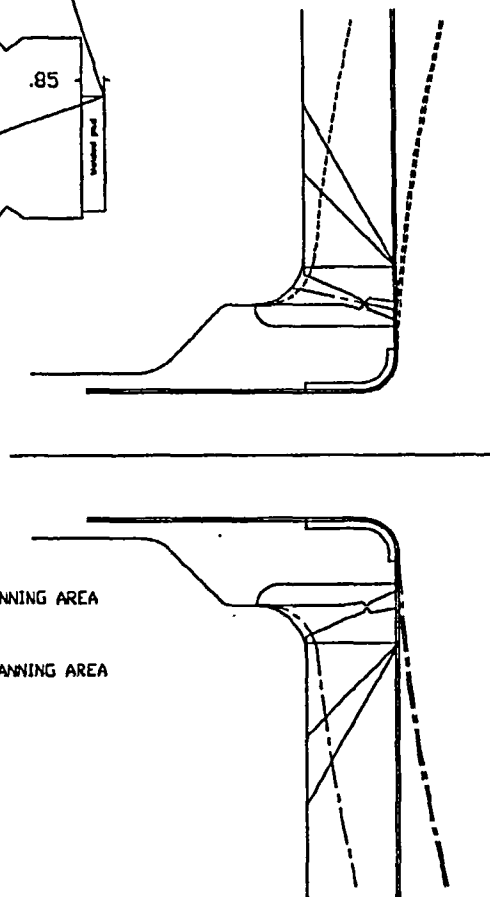
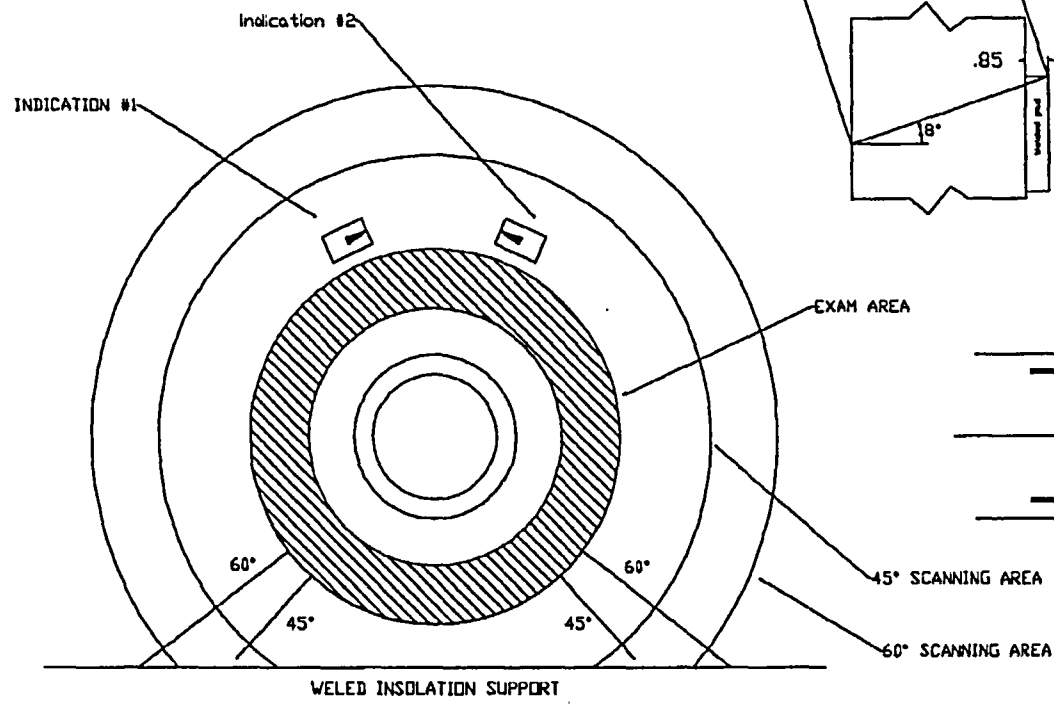
\*Transverse coverage includes coverage obtained during the inner radius examination.

H5BCT  
4/19/02



Report Number

R170 00136



H 5 BCT / 11/19/02

87 50 5

LIMITED SCAN 45° AND 60° DUE TO WELDED INSOLATION SUPPORT

TOTAL EXAM AREA 2555  
EXAM LIMITATION 45° 665  
45° COVERAGE 1819 = 74°

TOTAL EXAM AREA 2555  
EXAM LIMITATION 60° 875  
60° COVERAGE 1680 = 65°

Browns Ferry Unit 3

N5 Nozzle-to-Shell

MARCH 2002

SP-N5-NS

00137

TENNESSEE VALLEY AUTHORITY			DIGITAL ULTRASONIC CALIBRATION DATA SHEET			REPORT NUMBER: <b>R170</b>						
PROJECT: BFN UNIT: 3 CYCLE: 10			CALIBRATION DATE: <del>2-21-02</del> <b>4-4-02</b> <i>4/4/02</i>									
PROC.: N-UT- 9 REV:9 TC:02-06			CALIBRATION BLOCK NO.: BF18 TEMP: 72.6°F									
INSTR. MFG: STAVELEY DUE DATE: 8-05-02			SIMULATOR BLOCK NO: DB55079									
MODEL/TYPE: SONIC 136 M & TE NO.: VH751			THERMOMETER S/N: 522352 DUE DATE: 5-17-02									
TRANSDUCER MFG: Harisonic			COUPLANT SONOTRACE BATCH: 01141									
S/N DB34198 SIZE: .75 FREQ: 2.25 MHz			EXAM TYPE: SHEAR <input type="checkbox"/> LONG <input checked="" type="checkbox"/> RL <input type="checkbox"/>									
CABLE TYPE: RG174 LENGTH: 120 inches			ANGLE VERIFICATION									
DAC			BLOCK TYPE: <del>Rampus</del> <i>Rampus</i> S/N: DB55079									
			NOMINAL ANGLE: 0			ACTUAL ANGLE: N/A						
<p style="text-align: center;">DISPLAY WIDTH: 10 inches</p>			INSTRUMENT SETTINGS									
			REFLECTOR			REFERENCE		MEMORY				
			SCAN DIRECT.	NTCH	SDH	SENSITIVITY		NUMBER				
			AXIAL	<input type="checkbox"/>	<input checked="" type="checkbox"/>	20.8 dB		1				
			CIRC	<input type="checkbox"/>	<input type="checkbox"/>	n/a dB		n/a				
			FREQ:	2.25	MHz	REJECT: off		%				
			ANGLE:	n/a	deg	DAMPING: 500		ohms				
			DELAY:	.499	msec	PULSER: 222						
			ZERO:	n/a	msec	FILTER: Filt 3						
			VELOCITY:	.238	msec	REP RATE: 2KHZ						
RANGE:	10	inches	TOF: <input checked="" type="checkbox"/> PEAK <input type="checkbox"/> FLANK									
DISPLAY MODE: PE			POWER: AC									
DUAL: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF			TCG: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF									
CALIBRATION TIMES												
REF. REFLECTOR: 1" GAIN: 8 dB			INITIAL TIME: 9:00 FINAL TIME: 17:30									
AMPLITUDE: 80 % METAL PATH: 1"												
VERIFICATION TIMES			1)11:45	2)N/A	3)N/A	4)N/A	5)N/A	6)N/A	7)N/A	8)N/A	9)N/A	
LINEARITY CHECK												
VERTICAL	SIGNAL 1		100	90	80	70	60	50	40	30	20	
	SIGNAL 2		50	45	40	35	30	25	20	15	10	
ATTENUATOR	GAIN	SET	-6 dB	-12 dB	SET	+12	SET	+6				
	AMP	80%	32 TO 48	16 TO 24	20 %	64 TO 96	40%	64 TO 96				
			40	20		80		80				
COMMENTS:						WELDS/ITEMS EXAMINED:						
						N5B Nozzle to Shell						
EXAMINER:			EXAMINER:			REVIEWER:			ANII:			
MIKE W. KLEINJAN			DAVID KLEINJAN			<i>David Kleinjan</i>			<i>What</i>			
<i>Mike W. Kleinjan</i>			<i>David Kleinjan</i>			<i>4/4/02</i>			DATE: 4/19/02			
LEVEL: II			LEVEL: II			LEVEL: <i>II</i>			PG. <del>7</del> <i>6</i> OF <del>18</del> <i>18</i>			

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00138

TENNESSEE VALLEY AUTHORITY			DIGITAL ULTRASONIC CALIBRATION DATA SHEET			REPORT NUMBER: <b>R170</b>															
PROJECT: BFN UNIT: 3 CYCLE: 10			CALIBRATION DATE: <del>3-31-02</del> <b>4-4-02</b> <i>5/4/02</i>																		
PROC.: N-UT- 9 REV:9 TC:02-06			CALIBRATION BLOCK NO.: BF18 TEMP: 72.6°F																		
INSTR. MFG: STAVELEY DUE DATE: 8-05-02			SIMULATOR BLOCK NO: DB55079																		
MODEL/TYPE: SONIC 136 M & TE NO.: VH751			THERMOMETER S/N: 522352 DUE DATE: 5-17-02																		
TRANSDUCER MFG: Krautkramer			COUPLANT SONOTRACE BATCH: 01141																		
S/N DB34843 SIZE: .5x1 FREQ: 2.25 MHz			EXAM TYPE: SHEAR <input checked="" type="checkbox"/> LONG <input type="checkbox"/> RL <input type="checkbox"/>																		
CABLE TYPE: RG1743 LENGTH: 120 inches			ANGLE VERIFICATION																		
DAC			BLOCK TYPE: IIW			S/N: DB55074															
			NOMINAL ANGLE: 45°			ACTUAL ANGLE: 46°															
<p style="text-align: center;">DISPLAY WIDTH: 10 inches</p>			INSTRUMENT SETTINGS																		
			REFLECTOR			REFERENCE		MEMORY													
			SCAN DIRECT.	NTCH	SDH	SENSITIVITY		NUMBER													
			AXIAL	<input type="checkbox"/>	<input checked="" type="checkbox"/>	45.6 dB		2													
			CIRC	<input type="checkbox"/>	<input type="checkbox"/>	n/a dB		n/a													
			FREQ:	2.25	MHz	REJECT: off		%													
			ANGLE:	N/A	deg	DAMPING: 500		ohms													
			DELAY:	.830	msec	PULSER: 222															
			ZERO:	N/A	msec	FILTER: FITL 3															
			VELOCITY:	.126	msec	REP RATE: 2KHZ															
RANGE:	20	inches	TOF: <input checked="" type="checkbox"/> PEAK <input type="checkbox"/> FLANK																		
DISPLAY MODE: PE			POWER: AC																		
DUAL: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF			TCG: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF																		
CALIBRATION TIMES																					
REF. REFLECTOR: 1" GAIN: 33.6 dB			INITIAL TIME: 9:00 FINAL TIME: 17:30																		
AMPLITUDE: 80 % METAL PATH: 1"																					
VERIFICATION TIMES			1) 11:45		2) N/A		3) N/A		4) N/A		5) N/A		6) N/A		7) N/A		8) N/A		9) N/A		
LINEARITY CHECK																					
VERTICAL		SIGNAL 1		100	90	80	70	60	50	40	30	20									
		SIGNAL 2		50	45	40	35	30	25	20	15	10									
ATTENUATOR		GAIN	SET	-6 dB		-12 dB		SET		+12		SET		+6							
		AMP	80%	32 TO 48		16 TO 24		20 %		64 TO 96		40%		64 TO 96							
				40		20				80				80							
COMMENTS:											WELDS/ITEMS EXAMINED:										
Delta difference between 3/8 to 5/8 on the clad side is 3 dB											N5B Nozzle to shell										
EXAMINER:											EXAMINER:										
MIKE W. KLEINJAN											DAVID KLEINJAN										
<i>Mike W. Kleinjan</i>											<i>D. Kleinjan</i>										
LEVEL: II											LEVEL: II										
REVIEWER:											ANII:										
<i>Paul Whitton</i>											<i>What Hall</i>										
DATE: <i>4/19/02</i>											DATE: <i>4/19/02</i>										
PG: <i>7</i> OF <i>18</i>											PG: <i>7</i> OF <i>18</i>										

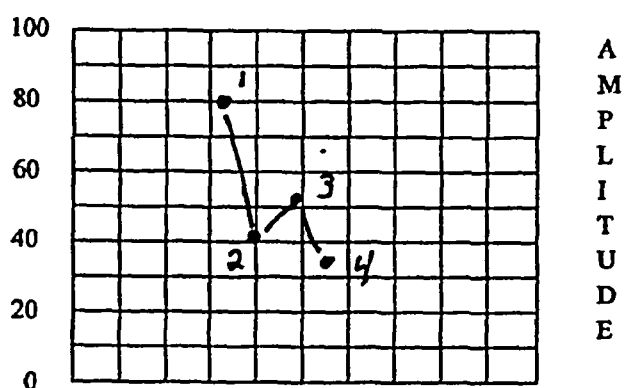
5 OF 18 *5/4/02*

00139

<b>TENNESSEE VALLEY AUTHORITY</b>			<b>DIGITAL ULTRASONIC CALIBRATION DATA SHEET</b>			<b>REPORT NUMBER: <u>R170</u></b>					
PROJECT: BFN    UNIT: 3    CYCLE: 10			CALIBRATION DATE: <u>3-31-02</u> <u>4/4/02</u> <u>5/4/02</u>			CALIBRATION BLOCK NO.: BF18    TEMP: 72.6°F					
PROC.: N-UT-    9    REV:9    TC:02-06			SIMULATOR BLOCK NO: DB55079			THERMOMETER S/N: 522352    DUE DATE: 5-17-02					
INSTR. MFG: STAVELEY    DUE DATE: 8-05-02			COUPLANT SONOTRACE    BATCH: 01141			EXAM TYPE:    SHEAR <input checked="" type="checkbox"/> LONG <input type="checkbox"/> RL <input type="checkbox"/>					
MODEL/TYPE: SONIC 136    M & TE NO.: VH751			CABLE TYPE: RG174    LENGTH: 120 inches			ANGLE VERIFICATION					
TRANSDUCER MFG: Kraunkramer			BLOCK TYPE: IIW			S/N: DB55074					
S/N DB34154    SIZE: .5x1    FREQ: 2.25 MHz			NOMINAL ANGLE: 60			ACTUAL ANGLE: 59					
DAC			INSTRUMENT SETTINGS								
<p>DISPLAY WIDTH: 10 inches</p>			REFLECTOR			REFERENCE	MEMORY				
			SCAN DIRECT.	NTCH	SDH	SENSITIVITY	NUMBER				
			AXIAL	<input type="checkbox"/>	<input checked="" type="checkbox"/>	52    dB	3				
			CIRC	<input type="checkbox"/>	<input type="checkbox"/>	n/a    dB	n/a				
			FREQ: 2.25    MHz	REJECT: off    %							
ANGLE: N/A    deg			DAMPING: 500    ohms								
DELAY: 1.20    msec			PULSER: 222								
ZERO: N/A    msec			FILTER: FITL 3								
VELOCITY: .123    msec			REP RATE: 2KHZ								
RANGE: 20    inches			TOF: <input checked="" type="checkbox"/> PEAK <input type="checkbox"/> FLANK								
DISPLAY MODE: PE			POWER: AC								
DUAL: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF			TCG: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF								
REF. REFLECTOR: 1"    GAIN: 36 dB			CALIBRATION TIMES								
AMPLITUDE: 80 %    METAL PATH: 1"			INITIAL TIME: 9:00			FINAL TIME: 17:30					
VERIFICATION TIMES			1) 11:45	2) N/A	3) N/A	4) N/A	5) N/A	6) N/A	7) N/A	8) N/A	9) N/A
<b>LINEARITY CHECK</b>											
VERTICAL	SIGNAL 1	100	90	80	70	60	50	40	30	20	
	SIGNAL 2	50	45	40	35	30	25	20	15	10	
ATTENUATOR	GAIN	SET	-6 dB	-12 dB	SET	+12	SET	+6			
	AMP	80%	32 TO 48	16 TO 24	20 %	64 TO 96	40%	64 TO 96			
			40	20		80		80			
COMMENTS:						WELDS/ITEMS EXAMINED:					
DELTA dB DIFFERENCE IS 4.4 FROM THE 3/8 TO 5/8 ON THE						N5B Nozzle to Shell					
CLAD SIDE											
EXAMINER:		EXAMINER:		REVIEWER:		ANII: <u>Albert Hall</u>					
MIKE W. KLEINJAN		DAVID KLEINJAN		<u>Paul Whitaker</u>		DATE: <u>4/19/02</u>					
LEVEL: II		LEVEL: II		LEVEL: <u>III</u>		DATE: <u>4/4/02</u>		PG: <u>28 OF 100</u> <u>10 4/11/02</u>			

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00140

TENNESSEE VALLEY AUTHORITY		DIGITAL ULTRASONIC CALIBRATION DATA SHEET		REPORT NUMBER: <b>R170</b>							
PROJECT: BFN UNIT: 3		CYCLE: 10		CALIBRATION DATE: <b>03-31-02 4-4-02 5/11/02</b>							
PROC.: N-UT- 55 REV:9		<del>25.0</del> <b>AC: N/A</b>		CALIBRATION BLOCK NO.: BF-85-IR TEMP: 70.5° F							
INSTR. MFG: STAVELEY		DUE DATE: 08-11-02		SIMULATOR BLOCK NO: N/A							
MODEL/TYPE: SONIC-137		M & TE NO.: VH-5473		THERMOMETER S/N: 522352 DUE DATE: 05-17-02							
TRANSDUCER MFG: KRAUTKRAMER				COUPLANT SONOTRACE BATCH: 01141							
S/N DB 351643 SIZE: 1.0"		FREQ: 2.25 MHz		EXAM TYPE: SHEAR <input type="checkbox"/> LONG <input type="checkbox"/> RL <input checked="" type="checkbox"/>							
CABLE TYPE: RG 174		LENGTH: 120 inches		ANGLE VERIFICATION							
DAC		BLOCK TYPE: CS IIW		S/N: DB 55074							
		NOMINAL ANGLE: 18		ACTUAL ANGLE: N/A							
 <p>DISPLAY WIDTH: 20 inches</p>		INSTRUMENT SETTINGS									
		REFLECTOR			REFERENCE		MEMORY				
		SCAN DIRECT.	NTCH	SDH	SENSITIVITY		NUMBER				
		AXIAL	<input checked="" type="checkbox"/>	<input type="checkbox"/>	52.0 dB		18				
		CIRC	<input type="checkbox"/>	<input type="checkbox"/>	N/A dB		N/A				
		FREQ:	2.25	MHz	REJECT: OFF		%				
		ANGLE:	N/A	deg	DAMPING: 200		ohms				
		DELAY:	1.02	msec	PULSER: 222						
		ZERO:	N/A	msec	FILTER: FILT 1						
		VELOCITY:	0.234	msec	REP RATE: 4 KHZ						
RANGE:	20.0	inches	TOF: <input type="checkbox"/> PEAK <input checked="" type="checkbox"/> FLANK								
DISPLAY MODE: PE			POWER: AC								
DUAL: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF			TCG: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF								
CALIBRATION TIMES											
REF. REFLECTOR: N/A			GAIN: N/A dB								
AMPLITUDE: N/A %			METAL PATH: N/A"								
VERIFICATION TIMES		1) N/A	2) N/A	3) N/A	4) N/A	5) N/A	6) N/A	7) N/A	8) N/A	9) N/A	
LINEARITY CHECK											
VERTICAL	SIGNAL 1		100	90	80	70	60	50	40	30	20
	SIGNAL 2		50	45	40	35	30	25	20	15	10
ATTENUATOR	GAIN	SET	-6 dB	-12 dB	SET	+12	SET	+6			
	AMP	80%	32 TO 48	16 TO 24	20 %	64 TO 96	40%	64 TO 96			
			40	20		80		80			
COMMENTS:						WELDS/ITEMS EXAMINED:					
						REACTOR PRESSURE VESSEL					
						N5B-IR					
						wedge ID D-14795-253/					
EXAMINER: DAVID KLEINJAN <i>David Kleinjan</i>		EXAMINER: MIKE KLEINJAN <i>Mike Kleinjan</i>		REVIEWER: <i>David Kleinjan</i>		ANII: <i>Robert Todd</i>		DATE: 4/19/02			
LEVEL: II		LEVEL: II		LEVEL: III		DATE: 4/14/02		PG.: 1 OF 1 18 5/14/02 7 of 18			

00141

TENNESSEE VALLEY AUTHORITY		DIGITAL ULTRASONIC CALIBRATION DATA SHEET		REPORT NUMBER: <b>R170</b>								
PROJECT: BFN UNIT: 3 CYCLE: 10		CALIBRATION DATE: <del>03-31-02</del> <b>4-4-02</b> <i>5/11/02</i>										
PROC.: N-UT- 55 REV:9 TC: <del>N/A</del> <i>4-4-02</i>		CALIBRATION BLOCK NO.: BF-85-IR TEMP: 70.5° F										
INSTR. MFG: STAVELEY DUE DATE: 08-11-02		SIMULATOR BLOCK NO: N/A										
MODEL/TYPE: SONIC-137 M & TE NO.: VH-5473		THERMOMETER S/N: 522352 DUE DATE: 05-17-02										
TRANSDUCER MFG: KRAUTKRAMER		COUPLANT SONOTRACE BATCH: 01141										
S/N DB 35164 SIZE: 1.0" FREQ: 2.25 MHz		EXAM TYPE: SHEAR <input type="checkbox"/> LONG <input type="checkbox"/> RL <input checked="" type="checkbox"/>										
CABLE TYPE: RG 174 LENGTH: 120 inches		ANGLE VERIFICATION										
DAC		BLOCK TYPE: CS IIW		S/N: DB 55074								
		NOMINAL ANGLE: 25		ACTUAL ANGLE: N/A								
<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;">100 80 60 40 20 0</div> <div style="flex-grow: 1;"> </div> <div style="margin-left: 10px; writing-mode: vertical-rl; transform: rotate(180deg);">A M P L I T U D E</div> </div> <p style="text-align: center;">DISPLAY WIDTH: 20 inches</p>		INSTRUMENT SETTINGS										
		REFLECTOR			REFERENCE	MEMORY						
		SCAN DIRECT.	NTCH	SDH	SENSITIVITY	NUMBER						
		AXIAL	<input checked="" type="checkbox"/>	<input type="checkbox"/>	55.4 dB	25						
		CIRC	<input type="checkbox"/>	<input type="checkbox"/>	N/A dB	N/A						
		FREQ: 2.25 MHz	REJECT: OFF %									
		ANGLE: N/A deg	DAMPING: 200 ohms									
		DELAY: 1.22 msec	PULSER: 222									
		ZERO: N/A msec	FILTER: FILT 1									
		VELOCITY: 0.235 msec	REP RATE: 4 KHZ									
RANGE: 20.0 inches	TOF: <input type="checkbox"/> PEAK <input checked="" type="checkbox"/> FLANK											
*DISPLAY MODE: PE			POWER: AC									
DUAL: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF			TCG: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF									
CALIBRATION TIMES												
REF. REFLECTOR: N/A		GAIN: N/A dB		INITIAL TIME: 1440 FINAL TIME: 1700								
AMPLITUDE: N/A %		METAL PATH: N/A"										
VERIFICATION TIMES	1)N/A	2)N/A	3)N/A	4)N/A	5)N/A 6)N/A 7)N/A 8)N/A 9)N/A							
LINEARITY CHECK												
VERTICAL	SIGNAL 1		100	90	80	70	60	50	40	30	20	
	SIGNAL 2		50	45	40	35	30	25	20	15	10	
ATTENUATOR	GAIN	SET	-6 dB	-12 dB	SET		+12	SET	+6			
	AMP	80%	32 TO 48	16 TO 24	20 %		64 TO 96	40%	64 TO 96			
			40	20			80		80			
COMMENTS:						WELDS/ITEMS EXAMINED:						
Wedge ID D-14795-166 ✓						REACTOR PRESSURE VESSEL						
						N5B-IR						
EXAMINER: <i>R. Kleinjan</i> DAVID KLEINJAN <i>D.K. Kleinjan</i> LEVEL: II						EXAMINER: <i>Mike Kleinjan</i> MIKE KLEINJAN <i>4/11/02</i> <i>JK</i> LEVEL: II						
REVIEWER: <i>Paul Whitaker</i> LEVEL: III DATE: <i>4/11/02</i>						ANII: <i>What full</i> DATE: <i>4/19/02</i> PG: <i>110 OF 118</i> <i>80K/18</i> <i>4/11/02</i>						

TVA

MANUAL ULTRASONIC VESSEL  
EXAMINATION DATA SHEET

REPORT NO.

R170

PROJECT: BFN UNIT: 3 WELD ID: N5 B CONFIG.: INNER RADIUS COMPONENT: N/ACAL. SHT. NO.: N/A PROCEDURE: N-UT-55 REV.: 9 PCR.: N/A TEMP.: 85 PYRO.: 522352  
08-06  
08-4-10-02SCAN SENS.: 58 dB 4/11/02 EXAM START: 1445 EXAM END: 1641 EXAM ANGLE: 18°Lo LOCATION: TDC Wo LOCATION: E of weld

IND NO.	20%			50%			100%			MAX. AMP.			20%			50%			100%		
	Mp1	W1	L1	Mp1	W1	L1	Mp1	W1	L1	Mp	W	L	Mp2	W2	L2	Mp2	W2	L2	Mp2	W2	L2
1							7.5	5 1/4	1.75	7.5	5	1.75							7.5	4 3/4	1.75
2							7.5	6 3/4	1.75	7.5	6 3/4	1.75							7.5	6 3/4	1.75
INDICATION #1 AND #2 are GEOMETRICAL REFLECTORS FROM WELDED PADS ON THE END OF THE VESSEL. ABOVE N5B. SEE PHOTOS																					
THE Location of The welded Pads are at L=5" AND L=6 3/4"																					

COMMENTS: COVERAGE OF THE TRANSVERSE EXAM WILL INCLUDE COVERAGE OBTAINED DURING  
THE INNER RADIUS EXAMINATION. 200% DAC @ Reference indications ① and ②.EXAMINER: Mike G. Luper LEVEL: II DATE: 4-4-02EXAMINER: N/A LEVEL: N/A DATE: N/AREVIEWED BY: John White LEVEL: PT DATE: 4/11/02ANII: Robert Todd DATE: 4/15/02 PAGE 11 OF 18

NOZZLE N5B  
WELDED PADS

REPORT NUMBER  
R170

00143



Browns Ferry

U3 C10

R. O. V. Tech.



Browns Ferry

U3 C10

R. O. V. Tech.

H5BCT  
4/19/02

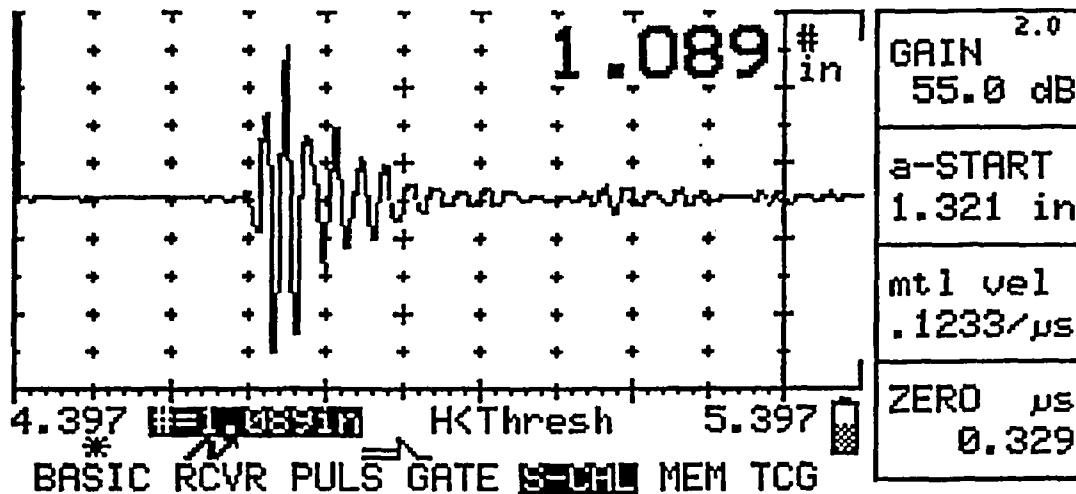
Jan 10  
4/14/02 50818



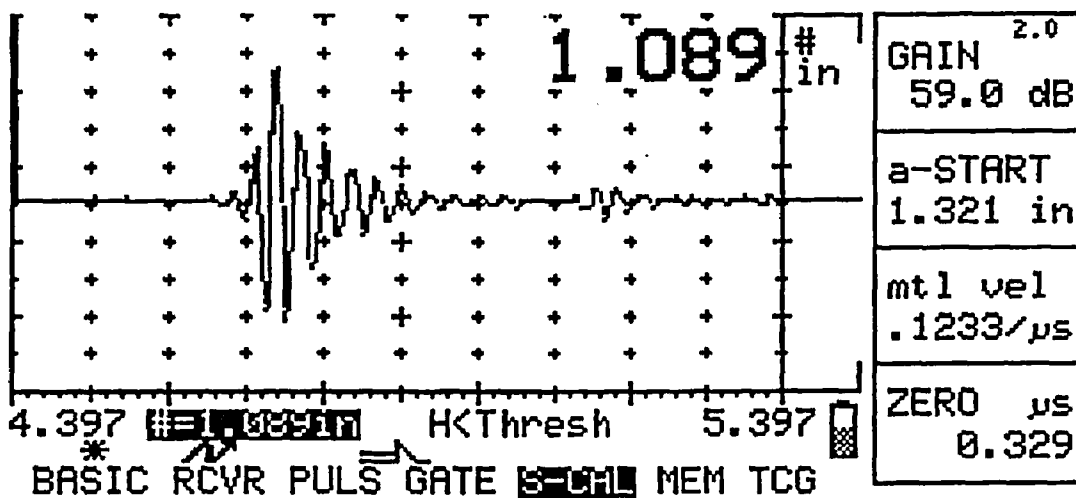


REPORT NUMBER  
R170 00145

Nozzle Examination 45 °Waveforms



45° Pre Waveform



45° Post Waveform

HSBCT  
4/19/02

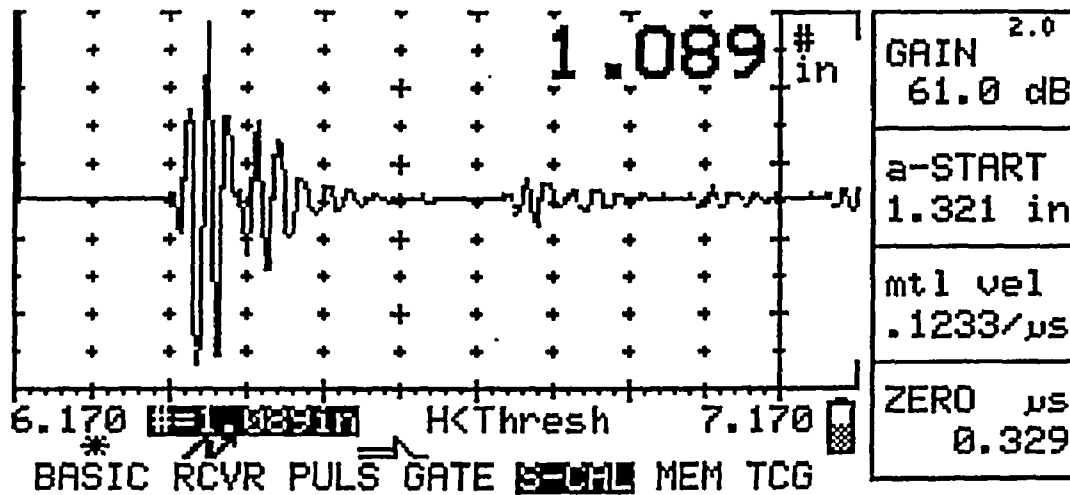
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M 08 18

REPORT NUMBER

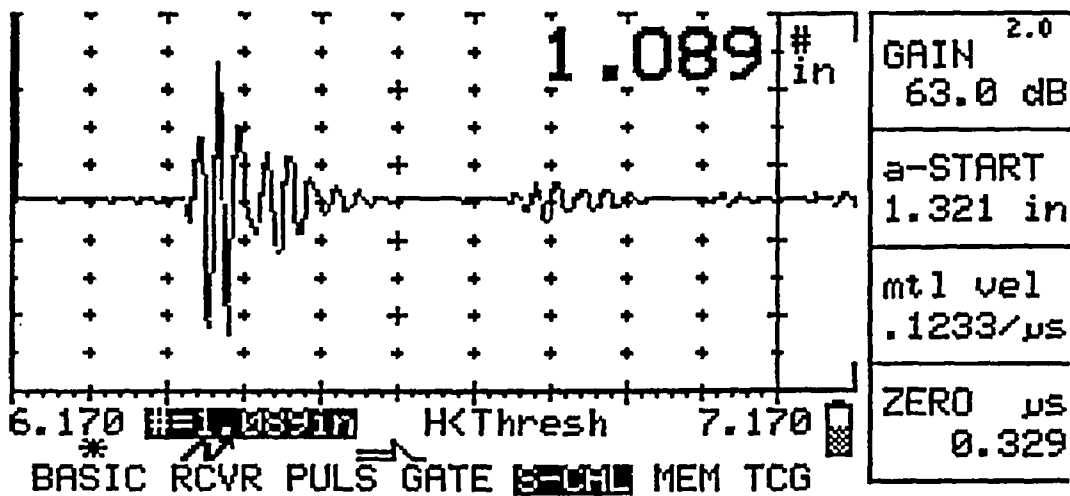
R170

00146

Nozzle Examination 60 ° Waveforms



60° Pre Waveform



60° Post Waveform

H5BCT  
A 4/19/02

13  
4/19/02 + 0.05 18

TVA

BEAM SPREAD AND  
RESOLUTION DATA SHEET

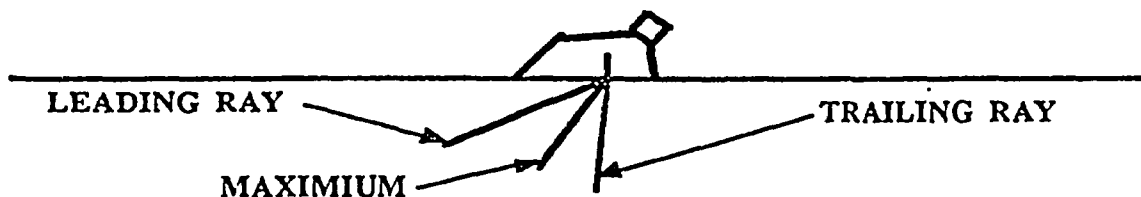
REPORT NO.

R170

PROJECT: BF 1 UNIT: 3 CALIBRATION BLOCK NO.: BF 18PROCEDURE NO.: N-UT-9 REV.: 9 PCR: 02-06 4/19/02SEARCH UNIT-MAKE: Krautkramer SIZE: 15X1 FREQ.: 2.25S/N: DB 34843 ANGLE: 45ULTRASONIC INSTRUMENT-MAKE: Smac 13C S/N: 14 751

## BEAM SPREAD

HOLE DEPTH	TRAILING RAY				LEADING RAY					
	20% DAC		50% DAC		100% DAC		20% DAC		50% DAC	
	W	MP	W	MP	MP	W	MP	W	W	MP
1/4T	1 1/8	1.9	1 1/4	2.	2.1	1 5/8	2.4	2	1 7/8	2.3
1/2T	2 7/8	4	3	4.1	4.3	3 1/4	4.8	4 1/8	3 3/4	4.6
3/4T	4 1/4	6	4 1/2	6.3	6.5	4 7/8	7	5 7/8	5 1/4	6.8



## RESOLUTION

NEAR SURFACE REFLECTOR: Note OD DEPTH: 25 SIZE: 253 CAL BLK.: BF 18FAR SURFACE REFLECTOR: Note ID DEPTH: 6.1 SIZE: 253

## SCANNING

REFLECTORS PROVIDE 50% DAC SIGNALS AT SCANNING SPEED

☒ Y☐ NEXAMINER: Mike W. KlineREVIEWED BY: John P. KlineANII: Alkat TullLEVEL: IV DATE: 3-30-02LEVEL: III DATE: 4/1/02DATE: 4/19/02PAGE: 12 OF 18

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TVA

BEAM SPREAD AND  
RESOLUTION DATA SHEET

REPORT NO.

R170

PROJECT: BFN UNIT: 3 CALIBRATION BLOCK NO.: BF 18PROCEDURE NO.: N-UT-9 REV.: 9 PCR: 02-06 4/18 4/11/02SEARCH UNIT-MAKE: Krautkramer SIZE: .5X1 FREQ.: 2.25S/N: DB 34154 ANGLE: 60ULTRASONIC INSTRUMENT-MAKE: Sonn 13C S/N: VH 751

## BEAM SPREAD

HOLE DEPTH	TRAILING RAY						LEADING RAY			
	20% DAC		50% DAC		100% DAC		20% DAC		50% DAC	
	W	MP	W	MP	MP	W	MP	W	W	MP
1/4T	2 1/8	2.4	2 3/8	2.7	2.9	2 5/8	3.2	3 1/8	2 7/8	3.1
1/2T	4 3/4	4.8	5	5.3	5.8	5 1/4	6.4	6 5/8	6	6.1
3/4T	<del>6 1/8</del> <sup>5 1/4</sup> 8 3/4	7.6	7 1/4	8	8.7	7 7/8	9.6	8 5/8	8	9.1

LEADING RAY

TRAILING RAY

MAXIMUM

## RESOLUTION

NEAR SURFACE  
REFLECTOR: Natch OD DEPTH: .25 SIZE: .253 CAL BLK.: BF 18FAR SURFACE  
REFLECTOR: Natch ID DEPTH: 6.1 SIZE: .253

## SCANNING

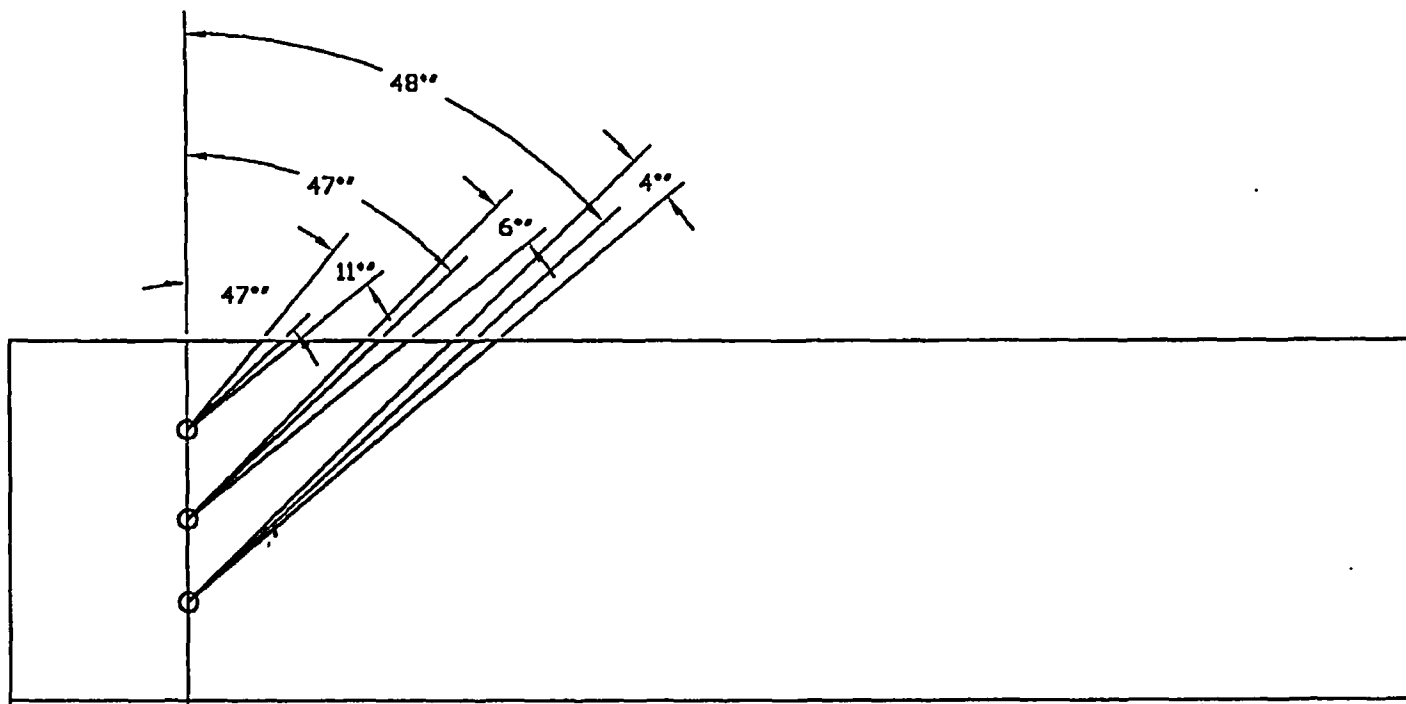
REFLECTORS PROVIDE 50% DAC SIGNALS AT SCANNING SPEED

Y ☒N ☐EXAMINER: Mike W. HenryREVIEWED BY: Paul ChuteANII: What FallLEVEL: II DATE: 3-30-02LEVEL: III DATE: 4/4/02DATE: 4/19/02  
PAGE: 44 / 50F 18

REPORT NUMBER

R170

00149



160818

H/S BCT  
2/4  
4/19/02

Browns Ferry Unit 3

Beamspread

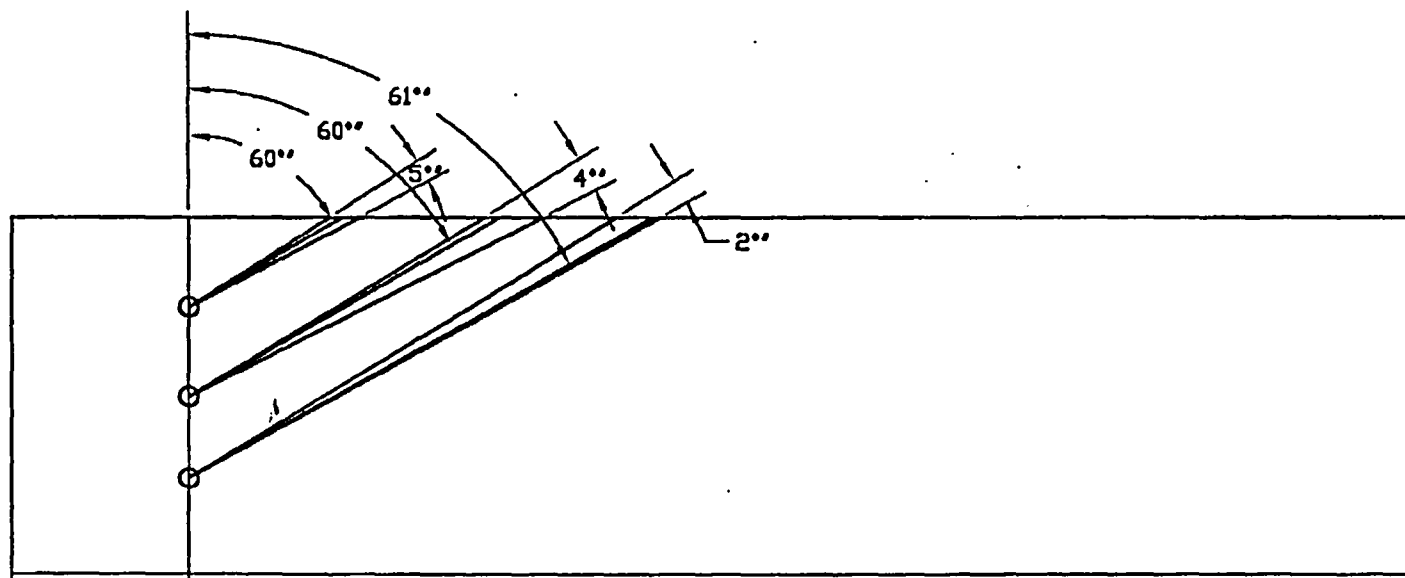
MARCH 2002

BF-18

Report Number

R170

00130



H56CT  
4/19/02

Browns Ferry Unit 3

Beamspread

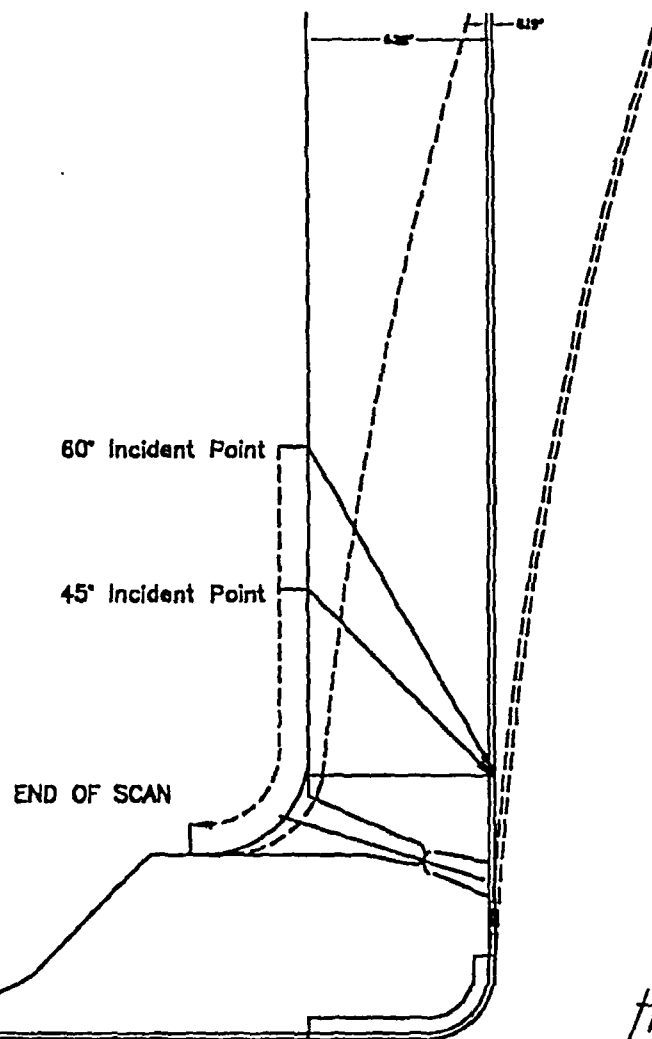
MARCH 2002

BF-18

173-4402  
173-4402

REPORT NUMBER

R170 00151



Transverse coverage includes coverage obtained during the inner radius examination

HISBCT  
01/11  
4/19/02

Browns Ferry Unit 3
N5 Nozzle-to-Shell
MARCH 2002
SP-N5-NS

8150K 201/1/02  
81



TENNESSEE VALLEY AUTHORITY		EXAMINATION SUMMARY AND RESOLUTION SHEET		REPORT NUMBER: <b>B171</b>	
PROJECT: BFN UNIT: 3		CYCLE: 10		COMPONENT ID: NSB-IR	
EXAMINATION METHOD				SYSTEM RPV ISI DWG. NO. 3-ISI-0331-C	
MT <input type="checkbox"/>	PT <input type="checkbox"/>	UT <input checked="" type="checkbox"/>	VT <input type="checkbox"/>	CODE CLASS: 1	CATEGORY: B-D
PROCEDURE: N-UT-55		REV: 9	TC: <del>N/A</del> <b>03-08</b>	COFIG.: Nozzle	TO Vessel
EXAMINER: MIKE KLEINJAN <i>5/4/11/02</i>		EXAMINER: <del>DAVID KLEINJAN</del> <b>DAVID KLEINJAN</b>		EXAMINER: N/A	EXAMINER: N/A
LEVEL: <b>II</b>		LEVEL: <b>II</b>		LEVEL: N/A	LEVEL: N/A

This report contains the data associated with the manual ultrasonic examination of code category B-D, Nozzle to Vessel welds. This examination report satisfies ASME section XI requirements for the Nozzle to shell weld and the inner radius examination.

NSB-IR: This examination was performed using a 25° and 18° in the blend radius in two directions CW/CCW

100% code coverage was obtained

This exam was performed with equipment, Procedures, and personnel qualified in accordance with ASME Section XI

*Geometric indications observed out of the exam Area for the inner radius exam. (Forwarder Bracket Pads) (See NSB for details)*

*No Recordable Indications*

RESOLUTION BY: Mike Kleinjan <i>Mike Kleinjan</i>	REVIEWED BY: <i>[Signature]</i>	ANII: <i>[Signature]</i>
LEVEL: <b>II</b> DATE: <i>4/2/02</i>	LEVEL: <b>II</b> DATE: <i>4/4/02</i>	DATE: <i>4/19/02</i>
PG. 1 OF 24		<i>5/4/11/02</i>

00153

TENNESSEE VALLEY AUTHORITY		DIGITAL ULTRASONIC CALIBRATION DATA SHEET		REPORT NUMBER: <b>R171</b>																					
PROJECT: BFN UNIT: 3		CYCLE: 10		CALIBRATION DATE: 03-31-02																					
PROC.: N-UT- 55		REV: 9		CALIBRATION BLOCK NO.: BF-85-IR TEMP: 70.5° F																					
INSTR. MFG: STAVELEY		DUE DATE: 08-11-02		SIMULATOR BLOCK NO: N/A																					
MODEL/TYPE: SONIC-137		M & TE NO.: VH-5473		THERMOMETER S/N: 522352 DUE DATE: 05-17-02																					
TRANSDUCER MFG: KRAUTKRAMER				COUPLANT SONOTRACE BATCH: 01141																					
S/N DB 351643		SIZE: 1.0" FREQ: 2.25 MHz		EXAM TYPE: SHEAR <input type="checkbox"/> LONG <input type="checkbox"/> RL <input checked="" type="checkbox"/>																					
CABLE TYPE: 1/2" RG 174		LENGTH: 120 inches		ANGLE VERIFICATION																					
DAC		BLOCK TYPE: CS IIW		S/N: DB 55074																					
		NOMINAL ANGLE: 18		ACTUAL ANGLE: N/A																					
<p>DISPLAY WIDTH: 20 inches</p>		<b>INSTRUMENT SETTINGS</b> <table border="1"> <thead> <tr> <th colspan="3">REFLECTOR</th> <th>REFERENCE</th> <th>MEMORY</th> </tr> <tr> <th>SCAN DIRECT.</th> <th>NTCH</th> <th>SDH</th> <th>SENSITIVITY</th> <th>NUMBER</th> </tr> </thead> <tbody> <tr> <td>AXIAL</td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> <td>52.0 dB</td> <td>18</td> </tr> <tr> <td>CIRC</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>N/A dB</td> <td>N/A</td> </tr> </tbody> </table>		REFLECTOR			REFERENCE	MEMORY	SCAN DIRECT.	NTCH	SDH	SENSITIVITY	NUMBER	AXIAL	<input checked="" type="checkbox"/>	<input type="checkbox"/>	52.0 dB	18	CIRC	<input type="checkbox"/>	<input type="checkbox"/>	N/A dB	N/A	FREQ: 2.25 MHz REJECT: OFF % ANGLE: N/A deg DAMPING: 200 ohms DELAY: 1.02 msec PULSER: 222 ZERO: N/A msec FILTER: FILT 1 VELOCITY: 0.234 msec REP RATE: 4 KHZ RANGE: 20.0 inches TOF: <input type="checkbox"/> PEAK <input checked="" type="checkbox"/> FLANK DISPLAY MODE: PE POWER: AC DUAL: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF TCG: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF	
REFLECTOR			REFERENCE	MEMORY																					
SCAN DIRECT.	NTCH	SDH	SENSITIVITY	NUMBER																					
AXIAL	<input checked="" type="checkbox"/>	<input type="checkbox"/>	52.0 dB	18																					
CIRC	<input type="checkbox"/>	<input type="checkbox"/>	N/A dB	N/A																					
REF. REFLECTOR: N/A		GAIN: N/A dB		<b>CALIBRATION TIMES</b>																					
AMPLITUDE: N/A %		METAL PATH: N/A"		INITIAL TIME: 1330 FINAL TIME: 1700																					
VERIFICATION TIMES		1)N/A 2)N/A 3)N/A		4)N/A 5)N/A 6)N/A 7)N/A 8)N/A 9)N/A																					
<b>LINEARITY CHECK</b>																									
VERTICAL	SIGNAL 1		100	90	80	70	60	50	40	30	20														
	SIGNAL 2		50	45	40	35	30	25	20	15	10														
ATTENUATOR	GAIN	SET	-6 dB	-12 dB	SET	+12	SET	+6																	
	AMP	80%	32 TO 48	16 TO 24	20 %	64 TO 96	40%	64 TO 96																	
			40	20		80		80																	
COMMENTS:						WELDS/ITEMS EXAMINED:																			
Wedge ID d-14795-253						REACTOR PRESSURE VESSEL																			
						N5B-IR																			
EXAMINER:		EXAMINER:		REVIEWER:		ANII: <i>Albert Tuck</i>																			
DAVID KLEINJAN		MIKE KLEINJAN		<i>4/11/02</i>		DATE: <i>4/19/02</i>																			
LEVEL: II		LEVEL: II		LEVEL: III		PG: 1 OF 4																			

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00154

<b>TENNESSEE VALLEY AUTHORITY</b>			<b>DIGITAL ULTRASONIC CALIBRATION DATA SHEET</b>			<b>REPORT NUMBER: R171</b>						
PROJECT: BFN UNIT: 3 CYCLE: 10			CALIBRATION DATE: 03-31-02									
PROC.: N-UT- 55 REV:9 TC: N/A			CALIBRATION BLOCK NO.: BF-85-IR TEMP: 70.5° F									
INSTR. MFG: STAVELEY DUE DATE: 08-11-02			SIMULATOR BLOCK NO: N/A									
MODEL/TYPE: SONIC-137 M & TE NO.: VH-5473			THERMOMETER S/N: 522352 DUE DATE: 05-17-02									
TRANSDUCER MFG: KRAUTKRAMER			COUPLANT SONOTRACE BATCH: 01141									
S/N DB 35164 SIZE: 1.0" FREQ: 2.25 MHz			EXAM TYPE: SHEAR <input type="checkbox"/> LONG <input type="checkbox"/> RL <input checked="" type="checkbox"/>									
CABLE TYPE: RG 174 LENGTH: 120 inches			<b>ANGLE VERIFICATION</b>									
<b>DAC</b>			BLOCK TYPE: CS IIW			S/N: DB 55074						
			NOMINAL ANGLE: 25			ACTUAL ANGLE: N/A						
<p style="text-align: center;">DISPLAY WIDTH: 20 inches</p>			<b>INSTRUMENT SETTINGS</b>									
			<b>REFLECTOR</b>			<b>REFERENCE</b>		<b>MEMORY</b>				
			SCAN DIRECT.	NTCH	SDH	SENSITIVITY		NUMBER				
			AXIAL	<input checked="" type="checkbox"/>	<input type="checkbox"/>	55.4 dB		25				
			CIRC	<input type="checkbox"/>	<input type="checkbox"/>	N/A dB		N/A				
			FREQ:	2.25	MHz	REJECT: OFF		%				
			ANGLE:	N/A	deg	DAMPING: 200		ohms				
			DELAY:	1.22	msec	PULSER: 222						
			ZERO:	N/A	msec	FILTER: FILT 1						
			VELOCITY:	0.235	msec	REP RATE: 4 KHZ						
RANGE:	20.0	inches	TOF: <input type="checkbox"/> PEAK <input checked="" type="checkbox"/> FLANK									
*DISPLAY MODE: PE			POWER: AC									
DUAL: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF			TCG: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF									
REF. REFLECTOR: N/A GAIN: N/A dB			<b>CALIBRATION TIMES</b>									
AMPLITUDE: N/A % METAL PATH: N/A"			INITIAL TIME: 1440			FINAL TIME: 1700						
VERIFICATION TIMES			1)N/A	2)N/A	3)N/A	4)N/A	5)N/A	6)N/A	7)N/A	8)N/A	9)N/A	
<b>LINEARITY CHECK</b>												
VERTICAL	SIGNAL 1		100	90	80	70	60	50	40	30	20	
	SIGNAL 2		50	45	40	35	30	25	20	15	10	
ATTENUATOR	GAIN	SET	-6 dB	-12 dB	SET		+12		SET		+6	
	AMP	80%	32 TO 48	16 TO 24	20 %		64 TO 96		40%		64 TO 96	
			40	20			80				80	
COMMENTS:						WELDS/ITEMS EXAMINED:						
Wedge ID D-14795-166						REACTOR PRESSURE VESSEL						
						N5B-IR						
EXAMINER: DAVID KLEINJAN <i>D.K. Kleinjan</i> LEVEL: II			EXAMINER: MIKE KLEINJAN <i>Mike Kleinjan</i> LEVEL: II			REVIEWER: <i>John P. Smith</i> LEVEL: III			DATE: 4/19/02			
						DATE: 4/19/02			PG: 2 OF 4			

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**Inspection Report R-125**  
**Weld N7-NV**

00055

TENNESSEE VALLEY AUTHORITY		EXAMINATION SUMMARY AND RESOLUTION SHEET		REPORT NUMBER: <b>R125</b>	
PROJECT: BFN UNIT: 3		CYCLE: 10		COMPONENT ID: N7 NOZZLE	
EXAMINATION METHOD				SYSTEM: RPV ISI DWG. NO. 3-ISI-0295-A	
MT <input type="checkbox"/>	PT <input type="checkbox"/>	UT <input checked="" type="checkbox"/>	VT <input type="checkbox"/>	CODE CLASS: 1	CATEGORY: B-D
PROCEDURE: N-UT-9		REV: 9	TC: <del>N/A</del> 02-01	COFIG.: .RPV HEAD	TO NOZZLE
EXAMINER: D. GRONEWOLD		EXAMINER: N/A		EXAMINER: N/A	EXAMINER: N/A
LEVEL: II		LEVEL: N/A		LEVEL: N/A	LEVEL: N/A

A MANUAL ULTRASONIC EXAMINATION WAS PERFORMED ON THE N7 NOZZLE WHICH  
IS A RPV HEAD TO NOZZLE WELD TO THE REQUIREMENTS OF ASME SECTION V, XI **4/5/02**

A 0 deg. , 45 deg. and a 60deg INSPECTION ANGLES WERE USED.

THIS WELD WAS LIMITED TO SCANNING ON THE HEAD SIDE DUE TO THE  
CONFIGURATION.

THE NOZZLE INNER RADIUS WAS SEEN 360 WITH THE 45 AND THE 60

NO OTHER INDICATIONS WERE DETECTED.

70 % COVERAGE WAS ACHEIVED

0 deg. = 50%

45 deg. = 82 %

60 deg. = 90 %

45 & 60 CW & CCW = 60 %

RESOLUTION BY: DOUGLAS GRONEWOLD <i>Douglas Gronewold</i>		REVIEWED BY: <i>Douglas Gronewold</i>		ANII: <i>What's that?</i>	
LEVEL: II DATE: 3-29-02		LEVEL: III DATE: 3-31-02		DATE: 4/5/02	
				PG. 1 OF 13	

00056

<b>TENNESSEE VALLEY AUTHORITY</b>		<b>DIGITAL ULTRASONIC CALIBRATION DATA SHEET</b>		<b>REPORT NUMBER: R125</b>								
PROJECT: BFN UNIT: 3		CYCLE: 10 05.07		CALIBRATION DATE: 3/29/02								
PROC.: N-UT- 9 REV:9		TC: NA 02.06		CALIBRATION BLOCK NO.: BF 19 TEMP: 81°F								
INSTR. MFG: KRAUTKRAMER		DUE DATE: 6/15/02		SIMULATOR BLOCK NO: NA								
MODEL/TYPE: USN 52L		M & TE NO.: E30219		THERMOMETER S/N: 562775 DUE DATE: 12/8/02								
TRANSDUCER MFG: Aerotech		COUPLANT ULTRAGEL II BATCH: 0325										
S/N C03305 SIZE: 1.0		FREQ: 2.25 MHz		EXAM TYPE: SHEAR <input type="checkbox"/> LONG <input checked="" type="checkbox"/> RL <input type="checkbox"/>								
CABLE TYPE: RG 58		LENGTH: 72" inches		<b>ANGLE VERIFICATION</b>								
<b>DAC</b>		BLOCK TYPE: NA		S/N: NA								
		NOMINAL ANGLE: 0°		ACTUAL ANGLE: NA								
<p>DISPLAY WIDTH: 5.61 inches</p>		<b>INSTRUMENT SETTINGS</b>										
		<b>REFLECTOR</b>			<b>REFERENCE</b>		<b>MEMORY</b>					
		SCAN DIRECT.	NTCH	SDH	SENSITIVITY		NUMBER					
		AXIAL	<input type="checkbox"/>	<input checked="" type="checkbox"/>	22 dB		12					
		CIRC	<input type="checkbox"/>	<input type="checkbox"/>	NA dB		NA					
		FREQ: 2.8 MHz			REJECT: 0 %							
		ANGLE: OFF deg			DAMPING: 1000 ohms							
		DELAY: -0.125 msec			PULSER: SINGLE *							
		ZERO: 1.261 msec			FILTER: FIXED *							
		VELOCITY: .2318 msec			REP RATE: HIGH							
RANGE: 5.61 inches			TOF: <input checked="" type="checkbox"/> PEAK <input type="checkbox"/> FLANK									
RECTIFIER: FULL			POWER: DC									
DUAL: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF			TCG: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF									
REF. REFLECTOR: NA		GAIN: NA dB		<b>CALIBRATION TIMES</b>								
AMPLITUDE: NA %		METAL PATH: NA*		INITIAL TIME: 0640 FINAL TIME: 1345								
VERIFICATION TIMES		1)N/A	2)N/A	3)N/A	4)N/A	5)N/A	6)N/A	7)N/A	8)N/A	9)N/A		
<b>* PDI QUALIFIED INSTRUMENT SETTINGS:</b> <b>VERIFY INSTRUMENT SETTINGS AND CALIBRATION SEQUENCE ARE IN ACCORDANCE WITH TABLE 2</b> <b>OF THE APPLICABLE PDI QUALIFICATION IMPLEMENTATION PROCEDURE !</b>												
<b>LINEARITY CHECK</b>												
<b>VERTICAL</b>	SIGNAL 1		100	90	80	70	60	50	40	30	20	
	SIGNAL 2		50	45	40	35	30	25	20	15	10	
<b>ATTENUATOR</b>	GAIN	SET	-6 dB		-12 dB		SET		+12		SET	+6
	AMP	80%	32 TO 48		16 TO 24		20 %		64 TO 96		40% 64 TO 96	
			40		20				80		80	
<b>COMMENTS:</b>						<b>WELDS/ITEMS EXAMINED:</b>						
						N7 SHELL TO NOZZLE WELD						
						head						
EXAMINER:		EXAMINER:		REVIEWER:		ANH: <i>What</i>						
<i>Donna Aronow</i>		N/A		<i>Donna Aronow</i>		DATE: 4/5/02						
LEVEL: II		LEVEL:		LEVEL: <i>II</i>		DATE: 3-30-02		PG.: 2 OF 13				

00057

<b>TENNESSEE VALLEY AUTHORITY</b>		<b>DIGITAL ULTRASONIC CALIBRATION DATA SHEET</b>		<b>REPORT NUMBER:</b> <i>R125</i>									
PROJECT: BFN UNIT: 3		CYCLE: 10 <i>8.2</i>		CALIBRATION DATE: 3/29/02									
PROC.: N-UT- 9 REV:9		TC: <i>NK 63-06</i>		CALIBRATION BLOCK NO.: BF 19 TEMP: 81°F									
INSTR. MFG: KRAUTKRAMER		DUE DATE: 6/15/02		SIMULATOR BLOCK NO: 790913									
MODEL/TYPE: USN 52L		M & TE NO.: E30219		THERMOMETER S/N: 562775 DUE DATE: 12/8/02									
TRANSDUCER MFG: HARISONICS		COUPLANT ULTRAGEL II BATCH: 0325											
S/N T7429 SIZE: 1" x .5"		FREQ: 2.25 MHz		EXAM TYPE: SHEAR <input checked="" type="checkbox"/> LONG <input type="checkbox"/> RL <input type="checkbox"/>									
CABLE TYPE: RG 58		LENGTH: 72" inches		<b>ANGLE VERIFICATION</b>									
<b>DAC</b>		BLOCK TYPE: IIW		S/N: 5307									
		NOMINAL ANGLE: 45°		ACTUAL ANGLE: 47									
<p>DISPLAY WIDTH: 8.6 inches</p>		<b>INSTRUMENT SETTINGS</b>											
		<b>REFLECTOR</b>			<b>REFERENCE</b>		<b>MEMORY</b>						
		SCAN DIRECT. NTCH SDH			SENSITIVITY		NUMBER						
		AXIAL <input type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>			30 dB		10						
		CIRC <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>			NA dB		NA						
		FREQ: 2.8 MHz			REJECT: 0 %								
		ANGLE: 47 deg			DAMPING: 1000 ohms								
		DELAY: -0.555 msec			PULSER: SINGLE *								
		ZERO: 12.337 msec			FILTER: FIXED *								
		VELOCITY: .1272 msec			REP RATE: HIGH								
RANGE: 8.6 inches			TOF: <input checked="" type="checkbox"/> PEAK <input type="checkbox"/> FLANK										
RECTIFIER: FULL			POWER: DC										
DUAL: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF			TCG: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF										
<b>REF. REFLECTOR: ROMPAS 50dB</b>		<b>GAIN: 30 dB</b>		<b>CALIBRATION TIMES</b>									
AMPLITUDE: 40 %		METAL PATH: 1.08"		INITIAL TIME: 0620 FINAL TIME: 1330									
VERIFICATION TIMES		1)N/A 2)N/A 3)N/A		4)N/A 5)N/A 6)N 7)N/A 8)N/A 9)N/A									
* PDI QUALIFIED INSTRUMENT SETTINGS:													
VERIFY INSTRUMENT SETTINGS AND CALIBRATION SEQUENCE ARE IN ACCORDANCE WITH TABLE 2 OF THE APPLICABLE PDI QUALIFICATION IMPLEMENTATION PROCEDURE !													
<b>LINEARITY CHECK</b>													
VERTICAL	SIGNAL 1		100	90	80	70	60	50	40	30	20		
	SIGNAL 2		50	45	40	35	30	25	20	15	10		
ATTENUATOR	GAIN	SET	-6 dB		-12 dB		SET		+12		SET	+6	
	AMP	80%	32 TO 48		16 TO 24		20 %		64 TO 96		40%	64 TO 96	
			40		20				80			80	
COMMENTS:						WELDS/ITEMS EXAMINED:							
NEAR FIELD RESOLUTION WAS CHECKED BY MOVING						N7 NOZZLE to Head <i>4/5/02</i>							
TRANSDUCER OVER THE OD NOTCH AND WATCHING THE													
SIGNAL RESPONSE WALK INTO THE INITIAL PULSE.													
EXAMINER:		EXAMINER:		REVIEWER:		ANII:							
<i>Douglas Bruneau</i>		<i>N/A</i>		<i>Darlene Duling</i>		<i>What Tabb</i>							
LEVEL: <i>II</i>		LEVEL:		LEVEL: <i>III</i>		DATE: <i>4/5/02</i>		PG.: 3 OF 13					



00058

TENNESSEE VALLEY AUTHORITY		DIGITAL ULTRASONIC CALIBRATION DATA SHEET		REPORT NUMBER: <i>R125</i>								
PROJECT: BFN UNIT: 3		CYCLE: 10 <i>1000</i>		CALIBRATION DATE: 3/29/02								
PROC.: N-UT- 9 REV:9		TC: <i>MAC-2</i>		CALIBRATION BLOCK NO.: BF 19 TEMP: 81°F								
INSTR. MFG: KRAUTKRAMER		DUE DATE: 6/15/02		SIMULATOR BLOCK NO: 790913								
MODEL/TYPE: USN 52L		M & TE NO.: E30219		THERMOMETER S/N: 562775 DUE DATE: 12/8/02								
TRANSDUCER MFG: Harisonic		COUPLANT ULTRAGEL II BATCH: 0325										
S/N T7429		SIZE: 1" x 5"		FREQ: 2.25 MHz								
CABLE TYPE: RG 58		LENGTH: 72" inches		EXAM TYPE: SHEAR <input checked="" type="checkbox"/> LONG <input type="checkbox"/> RL <input type="checkbox"/>								
ANGLE VERIFICATION												
BLOCK TYPE: IIW				S/N: 5307								
NOMINAL ANGLE: 60°				ACTUAL ANGLE: 63								
INSTRUMENT SETTINGS												
REFLECTOR			REFERENCE	MEMORY								
SCAN DIRECT.	NTCH	SDH	SENSITIVITY	NUMBER								
AXIAL	<input type="checkbox"/>	<input checked="" type="checkbox"/>	38 dB	20								
CIRC	<input type="checkbox"/>	<input type="checkbox"/>	dB									
FREQ: 2-8 MHz			REJECT: 0 %									
ANGLE: 63 deg			DAMPING: 1000 ohms									
DELAY: -.859 msec			PULSER: <i>STINGLE</i> *									
ZERO: 16.47% msec			FILTER: <i>FIXED</i> *									
VELOCITY: 1.287 msec			REP RATE: HIGH									
RANGE: 11.23 inches			TOF: <input checked="" type="checkbox"/> PEAK <input type="checkbox"/> FLANK									
RECTIFIER: FULL			POWER: DC									
DUAL: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF			TCG: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF									
CALIBRATION TIMES												
INITIAL TIME: 0610			FINAL TIME: 1340									
VERIFICATION TIMES		1)N/A	2)N/A	3)N/A	4)N/A							
		5)N/A	6)N	7)N/A	8)N/A							
		9)N/A										
* PDI QUALIFIED INSTRUMENT SETTINGS:												
VERIFY INSTRUMENT SETTINGS AND CALIBRATION SEQUENCE ARE IN ACCORDANCE WITH TABLE 2 OF THE APPLICABLE PDI QUALIFICATION IMPLEMENTATION PROCEDURE !												
LINEARITY CHECK												
VERTICAL	SIGNAL 1		100	90	80	70	60	50	40	30	20	
	SIGNAL 2		50	45	40	35	30	25	20	15	10	
ATTENUATOR	GAIN	SET	-6 dB		-12 dB		SET		+12		SET	+6
	AMP	80%	32 TO 48		16 TO 24		20 %		64 TO 96		40%	
			40		20				80		80	
COMMENTS:						WELDS/ITEMS EXAMINED:						
NEAR FIELD RESOLUTION WAS CHECKED BY MOVING THE						N7 NOZZLE <i>70 lead</i>						
TRANSDUCER OVER THE OD NOTCH AND WATCHING THE												
SIGNAL RESPONSE WALK INTO THE INITIAL PULSE.												
EXAMINER:		EXAMINER:		REVIEWER:		ANIL:						
<i>Douglas Monrois</i>		<i>W/A</i>		<i>Darlene Dickey</i>		<i>Robert Hall</i>						
LEVEL: <i>II</i>		LEVEL:		LEVEL: <i>IV</i>		DATE: <i>4/5/02</i>		PG.: 4		OF 13		







00062

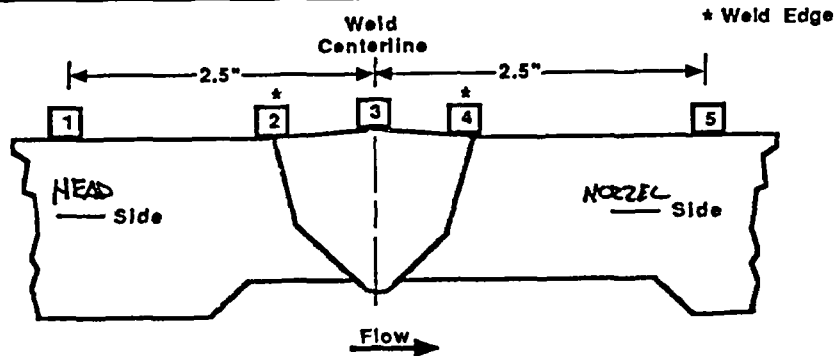
TVA	WALL THICKNESS PROFILE SHEET	REPORT NO:
		R125

PROJECT: BFN  
UNIT: 3

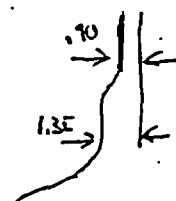
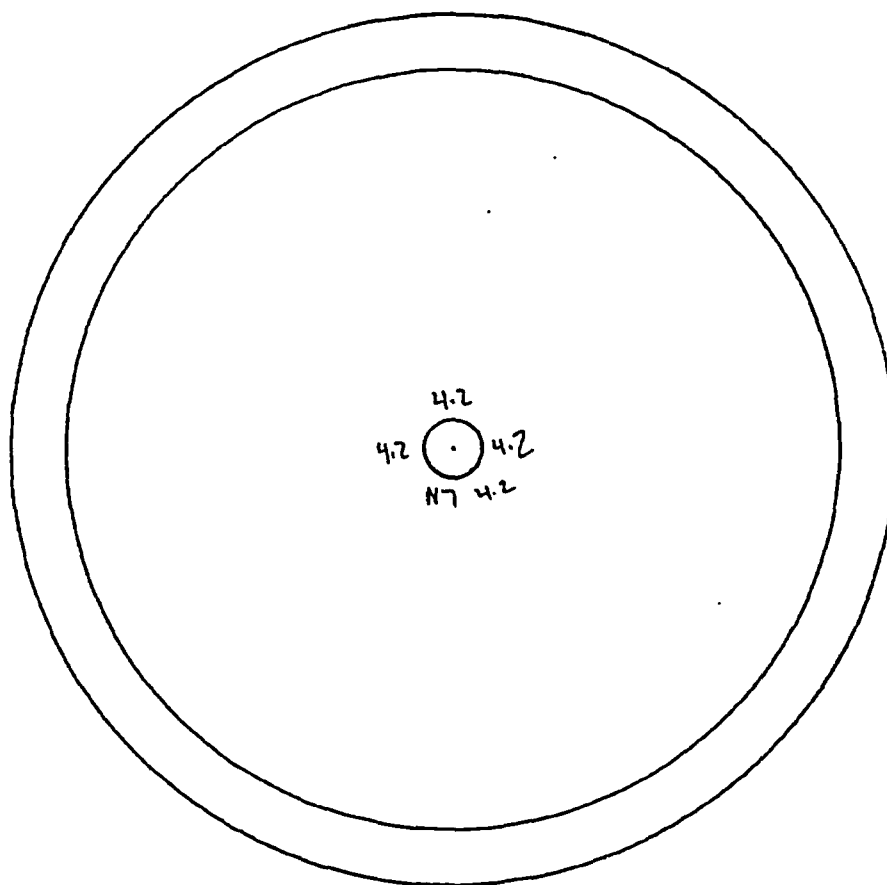
WELD NO: N7  
SYSTEM: RV Head

Record Thickness Measurements As Indicated, Including Weld Width, Edge-To-Edge At 0°

Position	0°	90°	180°	270°
1	4.2	4.2	4.2	4.2
2	4.15	4.15	4.15	4.15
3	4.15	4.15	4.15	4.15
4	4.15	4.15	4.15	4.15
5	N/A	N/A	N/A	N/A



CROWN HEIGHT: \_\_\_\_\_ DIAMETER: \_\_\_\_\_  
CROWN WIDTH: \_\_\_\_\_ WELD LENGTH: \_\_\_\_\_



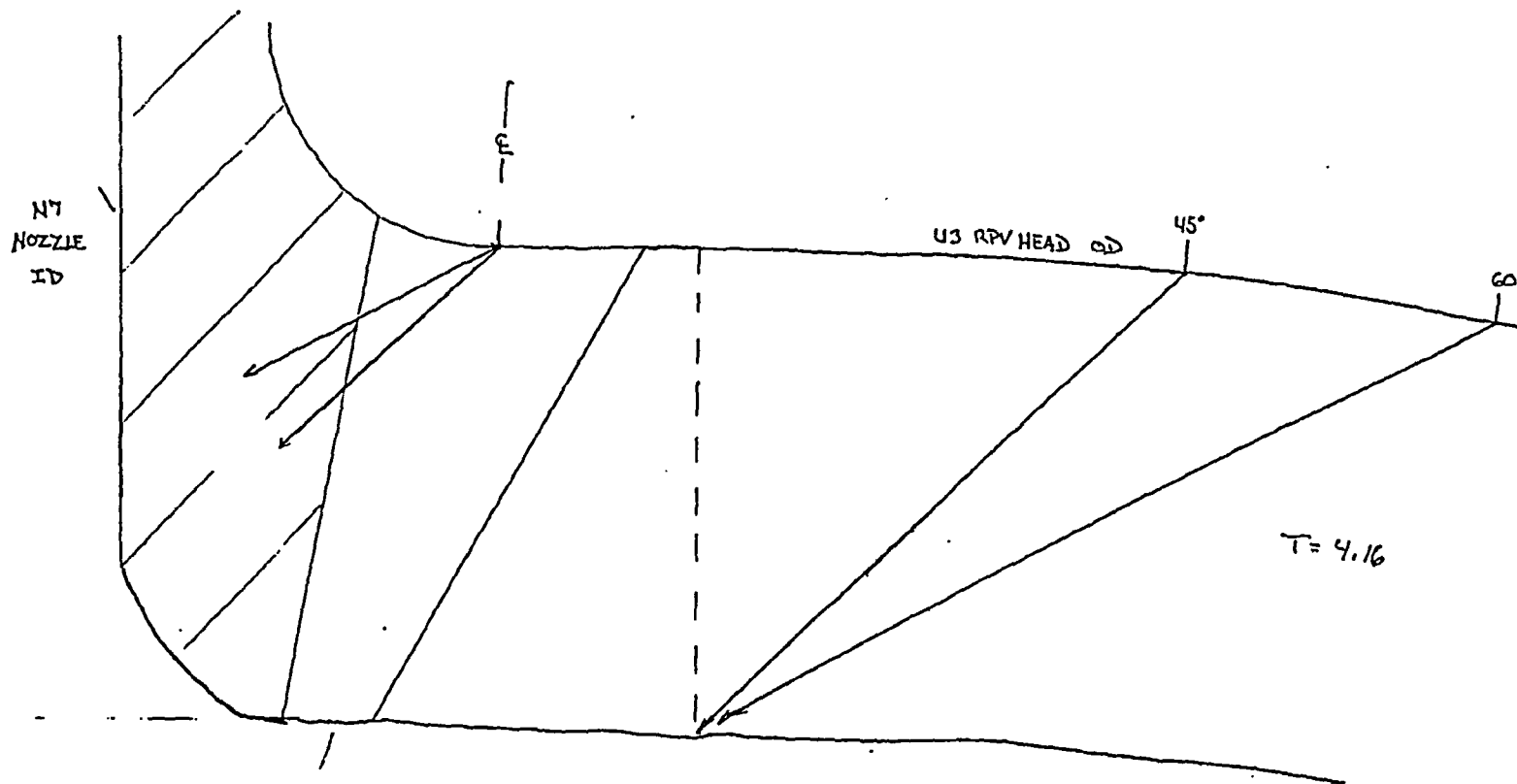
EXAMINER: Dyle Aronson  
LEVEL: II  
DATE: 3-29-02

REVIEWED BY: Deann Aubrey  
LEVEL: III DATE: 3-29-02

ANII What's Left  
DATE: 4/5/02  
PAGE 8 OF 13

00063

R-125



Douglas Groves with  
3-29-02

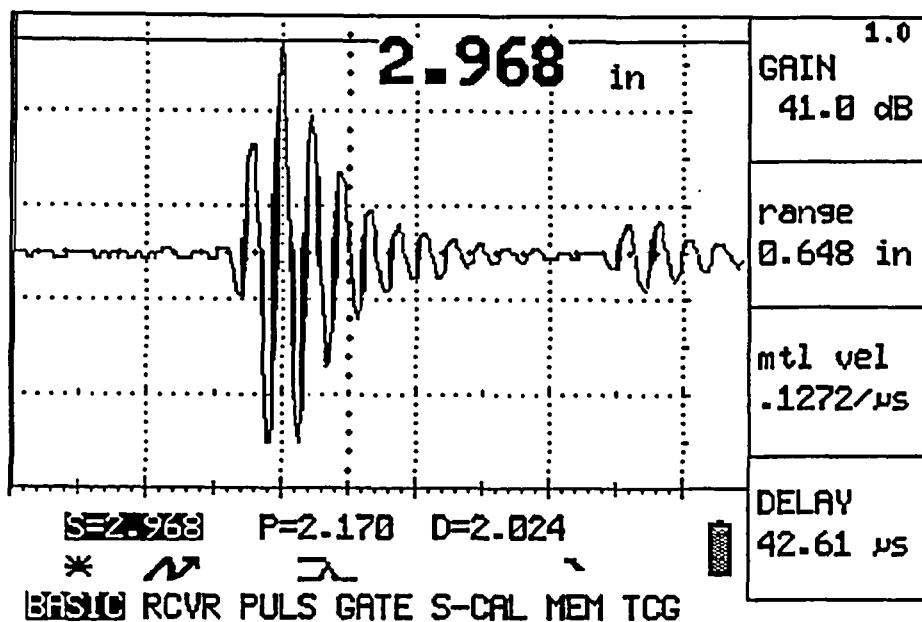
HSBCT  
01/1/02

Date 2/1/03

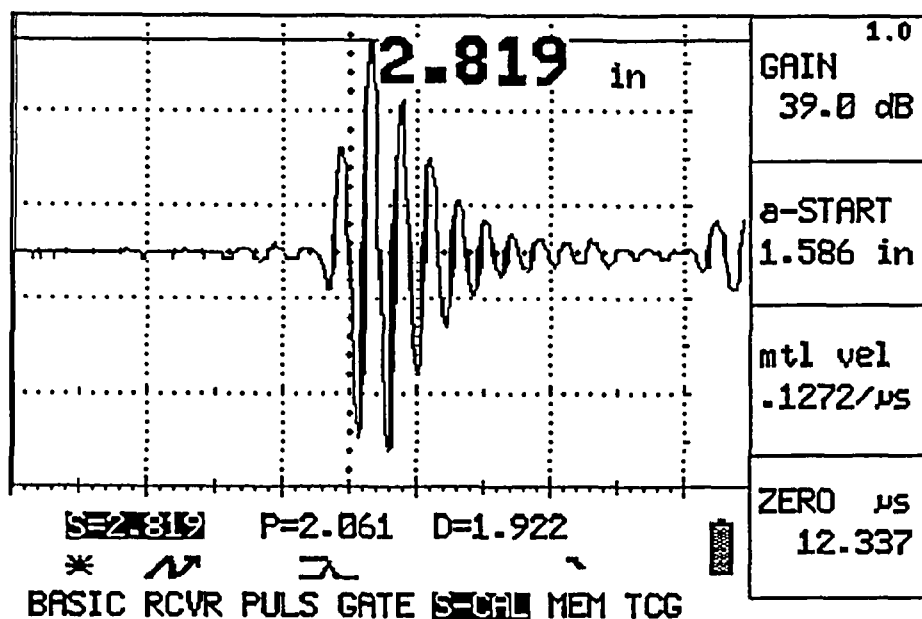
# 45° Waveforms

R125

00064



45° Pre Examination Waveform

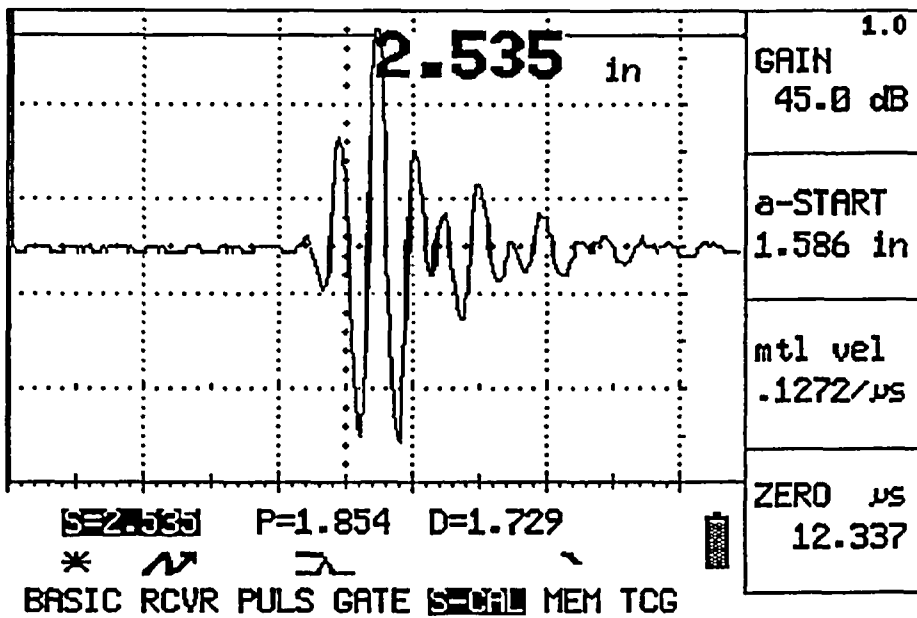


45° Post Examination Waveform

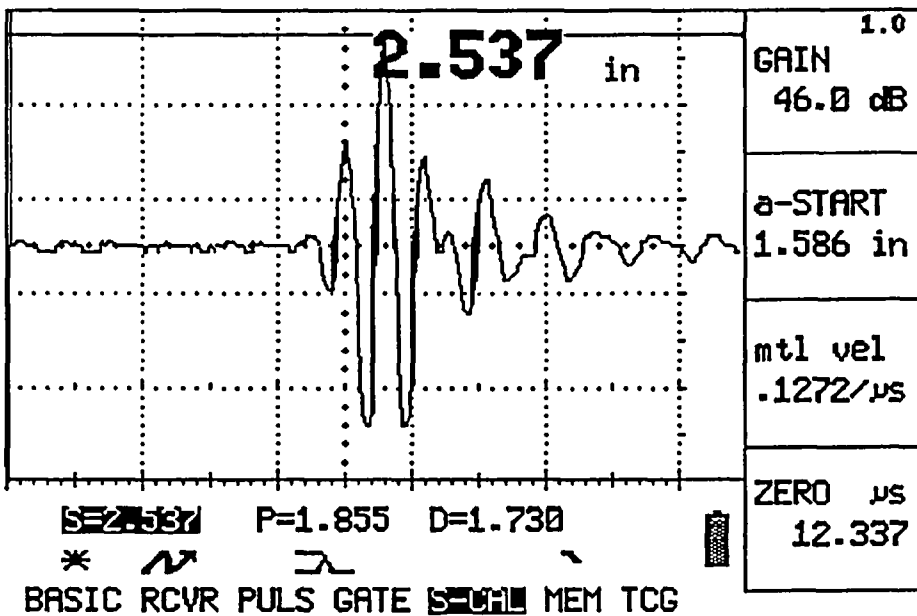
HSBCT  
9/1/00  
4/5/00

# 60° Waveforms

00065



## 60° Pre Examination Waveform



## 60° Post Examination Waveform

HSBCT  
AT  
4/5/00



TVA

BEAM SPREAD AND  
RESOLUTION DATA SHEET

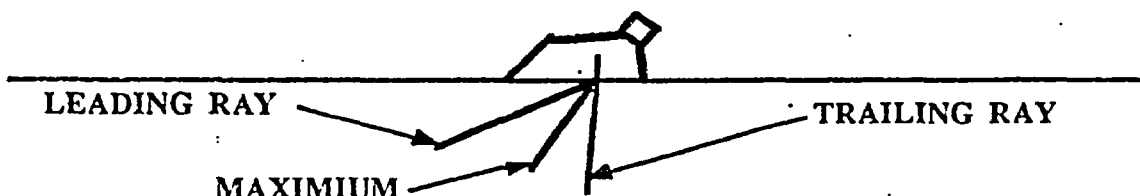
REPORT NO.

R125

PROJECT: BFNP UNIT: 3 CALIBRATION BLOCK NO.: BF19  
 PROCEDURE NO.: N-UT-9 REV.: 9 PCR: N/A  
 SEARCH UNIT-MAKE: Horasonic SIZE: 1" x .5" FREQ.: 2.25  
 S/N: T7429 ANGLE: 60  
 ULTRASONIC INSTRUMENT-MAKE: KB S/N: E30219

## BEAM SPREAD

HOLE DEPTH	TRAILING RAY				LEADING RAY					
	20% DAC		50% DAC		100% DAC		20% DAC		50% DAC	
	W	MP	W	MP	MP	W	MP	W	W	MP
1/4T	1.3	1.58	1.55	1.70	2.09	1.9	2.74	2.65	2.3	2.46
1/2T	2.85	3.39	3.0	3.55	4.16	3.7	5.32	4.95	4.55	4.98
3/4T	4.4	5.33	4.65	5.56	6.35	5.57	7.25	6.53	6.40	7.08



## RESOLUTION

NEAR SURFACE REFLECTOR: OD NOTCH DEPTH: .078" SIZE: 2" x 1/4" CAL BLK.: BF 19  
 FAR SURFACE REFLECTOR: ID NOTCH DEPTH: .075" SIZE: 2" x 1/4"

## SCANNING

REFLECTORS PROVIDE 50% DAC SIGNALS AT SCANNING SPEED

Y ☒N ☐EXAMINER: Douglas ArnesenREVIEWED BY: David ArnesenANII: Albert LaddLEVEL: II DATE: 3-29-02LEVEL: III DATE: 3-31-02DATE: 4/5/02  
PAGE: 12 OF 13

00067

TVA

BEAM SPREAD AND  
RESOLUTION DATA SHEET

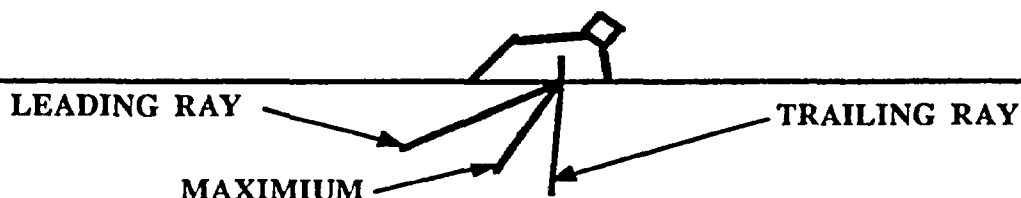
REPORT NO.

R125

PROJECT: BFNP UNIT: 3 CALIBRATION BLOCK NO.: BF19PROCEDURE NO.: N-UT-9 REV.: 9 PCR: N/ASEARCH UNIT-MAKE: Harsonic SIZE: 1" X .5" FREQ.: 2.25S/N: T7429 ANGLE: 45ULTRASONIC INSTRUMENT-MAKE: KB S/N: E30219

## BEAM SPREAD

HOLE DEPTH	TRAILING RAY						LEADING RAY			
	20% DAC		50% DAC		100% DAC		20% DAC		50% DAC	
	W	MP	W	MP	MP	W	MP	W	W	MP
1/4T	.8	1.19	.93	1.30	1.42	1.13	1.67	1.42	1.135	1.162
1/2T	1.8	2.65	1.95	2.73	2.95	2.35	3.35	2.75	2.65	3.2
3/4T	2.9	4.09	3.05	4.19	4.48	3.4	5.03	4.1	3.85	4.83



## RESOLUTION

NEAR SURFACE  
REFLECTOR: OD NOTCH DEPTH: .078" SIZE: 2" X 1/4" CAL BLK.: BF19FAR SURFACE  
REFLECTOR: ID NOTCH DEPTH: .075" SIZE: 2" X 1/4"

## SCANNING

REFLECTORS PROVIDE 50% DAC SIGNALS AT SCANNING SPEED

Y ☒N ☐EXAMINER: James MonnellREVIEWED BY: Douglas DaleyANII: Alta T. HallDATE: 4/5/02LEVEL: II DATE: 3-29-02LEVEL: III DATE: 3-31-02PAGE: 13 OF 13

**Inspection Report R-172**  
**Weld N9-NV**

00156

TENNESSEE VALLEY AUTHORITY		EXAMINATION SUMMARY AND RESOLUTION SHEET		REPORT NUMBER: <b>R172</b>	
PROJECT: BFN UNIT: 3		CYCLE: 10		COMPONENT ID: N9	
EXAMINATION METHOD				SYSTEM RPV	
				ISI DWG. NO. 3-ISI-0332-C	
MT <input type="checkbox"/>	PT <input type="checkbox"/>	UT <input checked="" type="checkbox"/>	VT <input type="checkbox"/>	CODE CLASS: 1	CATEGORY: B-D
PROCEDURE: N_UT_9		REV:9	TC:02-06	COFIG.: Nozzle	TO Vessel
EXAMINER: MIKE KLEINJAN		EXAMINER: DAVID KLEINJAN		EXAMINER: N/A	EXAMINER: N/A
LEVEL: II <i>see 4/19/02</i>		LEVEL: II		LEVEL: N/A	LEVEL: N/A

This report contains the data associated with the manual ultrasonic examination of code category B-D, Nozzle to Vessel welds. This examination report satisfies ASME section XI requirements for the Nozzle to shell weld..

Examination. Nozzle to Vessel weld N9

Transverse coverage for the Nozzle to Vessel weld was supplemented by the inner radius examination.  
(N9-IR) *see R 173*

0° was used on the weld crown and base material Vessel side

45° was used on the vessel side only scanning over the weld crown

45° Tangent to the weld was used on vessel side CW/CCW

45° Parallel to the weld was used on vessel side CW/CCW

60° was used on the vessel side only scanning over the weld crown

60° Tangent to the weld was used on vessel side CW/CCW

60° Parallel to the weld was used on vessel side CW/CCW

74% code coverage was obtained

This exam was performed with equipment, Procedures, and personnel qualified in accordance with ASME Section XI

*No Recordable Indications*

RESOLUTION BY: Mike Kleinjan <i>Mike W. Kleinjan</i>	REVIEWED BY: <i>David Kleinjan</i>	ANIL: <i>What?</i>
LEVEL: II DATE: 4-4-02	LEVEL: II DATE: 4/4/02	DATE: 4/19/02
		PG. 1 OF 16

REPORT Number  
R172

00157

Calculation of ASME code coverage  
For section XI NDE Examination

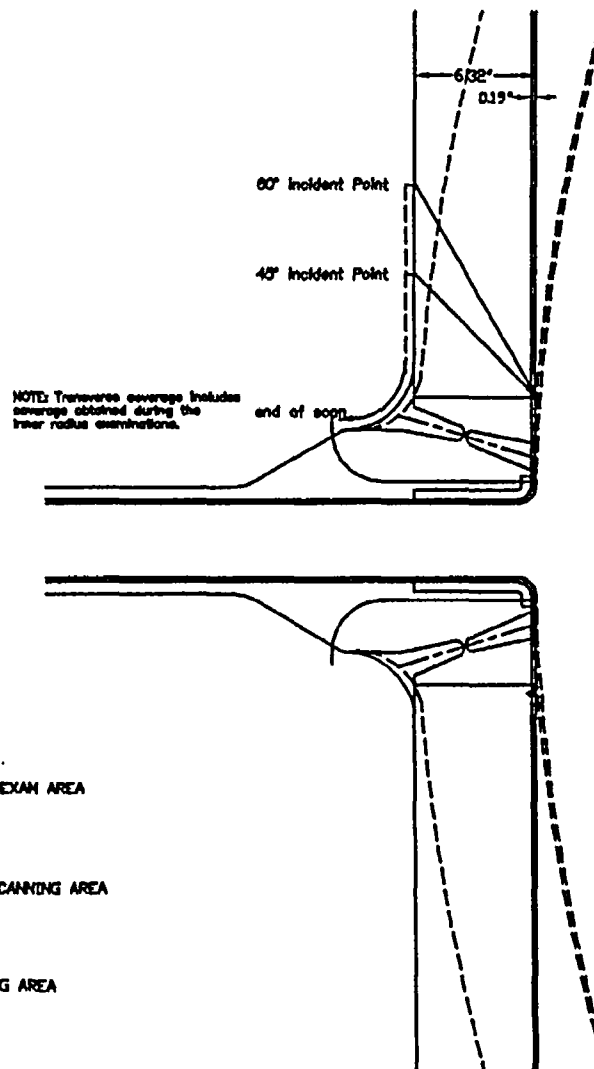
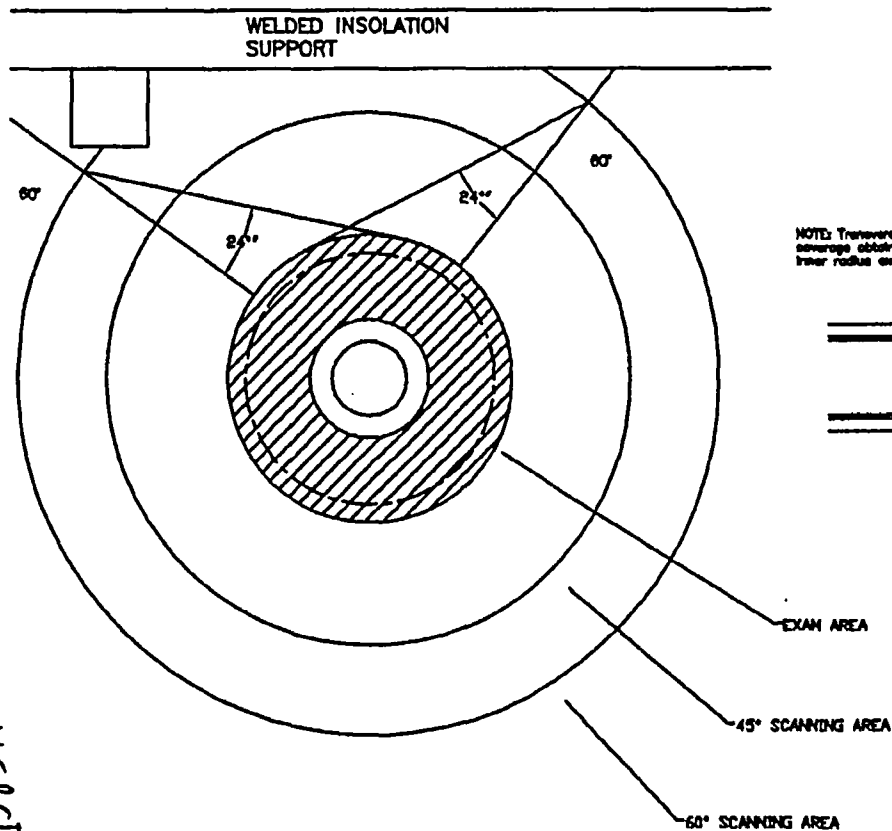
N9

1) 0 degree (weld metal scan)	100%
2) 45 degree Transverse-scan from vessel side of weld	100%
3) 45 degree Transverse-scan from nozzle side of weld	0%
4) 60 degree Transverse-scan from vessel side of weld	70 %
5) 60 degree Transverse-scan from nozzle side of weld	0%
6) 45 degree Parallel-scan CW direction	100% *
7) 45 degree Parallel-scan CCW direction	100% *
8) 60 degree Parallel-scan CW direction	100% *
9) 60 degree Parallel-scan CCW direction	100% *

The sum of all the percentage of scans	670%
Divided by the total # of scans	9
Percentage of examination Volume coverage	74%

\* Transverse coverage includes coverage obtained during the inner radius examination.

H5BCT  
4/19/02



NOTE: Transverse coverage includes coverage obtained during the inner radius examinations.

end of scan

Report Number  
R172

Browns Ferry Unit 3
N9 Nozzle-to-Shell
March 2002
SP-N9-NS

LIMITED SCAN 60° DUE TO WELDED INSULATION SUPPORT

TOTAL EXAM AREA 179.17  
EXAM LIMITATION 60° 54.62  
60° COVERAGE 124.55 = 70%

HSBCI  
07/19/02

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00158

00159

<b>TENNESSEE VALLEY AUTHORITY</b>			<b>DIGITAL ULTRASONIC CALIBRATION DATA SHEET</b>			<b>REPORT NUMBER: <span style="font-size: 1.2em;">R172</span></b>						
PROJECT: BFN    UNIT: 3    CYCLE: 10			CALIBRATION DATE: 04-01-02									
PROC.: N-UT-    9    REV:9    TC:02-06			CALIBRATION BLOCK NO.: BF18    TEMP: 72.6°F									
INSTR. MFG: STAVELEY    DUE DATE: 8-05-02			SIMULATOR BLOCK NO: DB55079									
MODEL/TYPE: SONIC 136    M & TE NO.: VH751			THERMOMETER S/N: 522352    DUE DATE: 5-17-02									
TRANSDUCER MFG: Harisonic			COUPLANT SONOTRACE    BATCH: 01141									
S/N DB34198    SIZE: .75    FREQ: 2.25 MHz			EXAM TYPE:    SHEAR <input type="checkbox"/> LONG <input checked="" type="checkbox"/> RL <input type="checkbox"/>									
CABLE TYPE: RG174    LENGTH: 120 inches			<b>ANGLE VERIFICATION</b>									
<b>DAC</b>			BLOCK TYPE: <i>Repass</i> <i>Repass</i> S/N: DB55079									
			NOMINAL ANGLE: 0    ACTUAL ANGLE: N/A									
<div style="display: flex; align-items: center;"> <div style="flex: 1;"> <p style="text-align: center;">DISPLAY WIDTH: 10 inches</p> </div> <div style="flex: 0.2; text-align: center; font-weight: bold;">A M P L I T U D E</div> </div>			<b>INSTRUMENT SETTINGS</b>									
			<b>REFLECTOR</b>			<b>REFERENCE</b>		<b>MEMORY</b>				
			SCAN DIRECT.    NTCH    SDH			SENSITIVITY		NUMBER				
			AXIAL <input type="checkbox"/> <input checked="" type="checkbox"/>			20.8    dB		1				
			CIRC <input type="checkbox"/> <input type="checkbox"/>			n/a    dB		n/a				
			FREQ: 2.25    MHz			REJECT: off    %						
			ANGLE: n/a    deg			DAMPING: 500    ohms						
			DELAY: .499    msec			PULSER: 222						
			ZERO: n/a    msec			FILTER: Filt 3						
			VELOCITY: .238    msec			REP RATE: 2KHZ						
RANGE: 10    inches			TOF: <input checked="" type="checkbox"/> PEAK <input type="checkbox"/> FLANK									
DISPLAY MODE: PE			POWER: AC									
DUAL: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF			TCG: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF									
REF. REFLECTOR: 1"    GAIN: 8 dB			<b>CALIBRATION TIMES</b>									
AMPLITUDE: 80 %    METAL PATH: 1"			INITIAL TIME: 9:00			FINAL TIME: 17:30						
VERIFICATION TIMES			1) 11:45		2) N/A		3) N/A					
			4) N/A		5) N/A		6) N/A					
			7) N/A		8) N/A		9) N/A					
<b>LINEARITY CHECK</b>												
<b>VERTICAL</b>	SIGNAL 1		100	90	80	70	60	50	40	30	20	
	SIGNAL 2		50	45	40	35	30	25	20	15	10	
<b>ATTENUATOR</b>	GAIN	SET	-6 dB		-12 dB		SET		+12		SET	+6
	AMP	80%	32 TO 48		16 TO 24		20 %		64 TO 96		40%	64 TO 96
			40		20				80			80
<b>COMMENTS:</b>						<b>WELDS/ITEMS EXAMINED:</b>						
						N9 Nozzle to Shell						
<b>EXAMINER:</b> MIKE W. KLEINJAN <i>Mike W. Kleinjan</i> LEVEL: II			<b>EXAMINER:</b> DAVID KLEINJAN <i>D.R. Kleinjan</i> LEVEL: II			<b>REVIEWER:</b> <i>[Signature]</i> LEVEL: <i>III</i> DATE: <i>4/19/02</i>			<b>ANII:</b> <i>Robert Todd</i> DATE: 4/19/02 PG: <i>16</i> OF <i>16</i> <i>4/19/02</i>			

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00160

<b>TENNESSEE VALLEY AUTHORITY</b>			<b>DIGITAL ULTRASONIC CALIBRATION DATA SHEET</b>			<b>REPORT NUMBER: <span style="font-size: 1.2em;">R172</span></b>						
PROJECT: BFN    UNIT: 3    CYCLE: 10			CALIBRATION DATE: 04-01-02									
PROC.: N-UT-    9    REV:9    TC:02-06			CALIBRATION BLOCK NO.: BF18    TEMP: 72.6°F									
INSTR. MFG: STAVELEY    DUE DATE: 8-05-02			SIMULATOR BLOCK NO: DB55079									
MODEL/TYPE: SONIC 136    M & TE NO.: VH751			THERMOMETER S/N: 522352    DUE DATE: 5-17-02									
TRANSDUCER MFG: Krautkramer			COUPLANT SONOTRACE    BATCH: 01141									
S/N DB34843    SIZE: .5x1    FREQ: 2.25 MHz			EXAM TYPE:    SHEAR <input checked="" type="checkbox"/> LONG <input type="checkbox"/> RL <input type="checkbox"/>									
CABLE TYPE: RG1743    LENGTH: 120 inches			<b>ANGLE VERIFICATION</b>									
<b>DAC</b>			BLOCK TYPE: IIW			S/N: DB55074						
			NOMINAL ANGLE: 45°			ACTUAL ANGLE: 46°						
<div style="display: flex; align-items: center;"> <div style="flex: 1;"> <p style="text-align: center;">DISPLAY WIDTH: 10 inches</p> </div> <div style="flex: 0.2; text-align: center; font-weight: bold;">A M P L I T U D E</div> </div>			<b>INSTRUMENT SETTINGS</b>									
			<b>REFLECTOR</b>			<b>REFERENCE</b>		<b>MEMORY</b>				
			SCAN DIRECT.	NTCH	SDH	SENSITIVITY		NUMBER				
			AXIAL	<input type="checkbox"/>	<input checked="" type="checkbox"/>	45.6	dB	2				
			CIRC	<input type="checkbox"/>	<input type="checkbox"/>	n/a	dB	n/a				
			FREQ:	2.25	MHz	REJECT: off		%				
			ANGLE:	N/A	deg	DAMPING: 500		ohms				
			DELAY:	.830	msec	PULSER: 222						
			ZERO:	N/A	msec	FILTER: FITL 3						
			VELOCITY:	.126	msec	REP RATE: 2KHZ						
RANGE:	20	inches	TOF: <input checked="" type="checkbox"/> PEAK <input type="checkbox"/> FLANK									
DISPLAY MODE: PE			POWER: AC									
DUAL: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF			TCG: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF									
REF. REFLECTOR: 1"    GAIN: 33.6 dB			<b>CALIBRATION TIMES</b>									
AMPLITUDE: 80 %    METAL PATH: 1"			INITIAL TIME: 9:00			FINAL TIME: 17:30						
VERIFICATION TIMES			1) 11:45	2) N/A	3) N/A	4) N/A	5) N/A	6) N/A	7) N/A	8) N/A	9) N/A	
<b>LINEARITY CHECK</b>												
<b>VERTICAL</b>	SIGNAL 1		100	90	80	70	60	50	40	30	20	
	SIGNAL 2		50	45	40	35	30	25	20	15	10	
<b>ATTENUATOR</b>	GAIN	SET	-6 dB		-12 dB		SET		+12		SET	+6
	AMP	80%	32 TO 48		16 TO 24		20 %		64 TO 96		40%	64 TO 96
			40		20				80			80
<b>COMMENTS:</b>						<b>WELDS/ITEMS EXAMINED:</b>						
Delta difference between 3/8 to 5/8 on the clad side is 3 dB						N9 Nozzle to shell						
<b>EXAMINER:</b> MIKE W. KLEINJAN <i>Mike W Kleinjan</i>			<b>EXAMINER:</b> DAVID KLEINJAN <i>D.K. Kleinjan</i>			<b>REVIEWER:</b> <i>[Signature]</i>			<b>ANTI:</b> <i>Robert Todd</i>			
LEVEL: II			LEVEL: III			LEVEL: <i>II</i>			DATE: 4/19/02			
						DATE: 4/4/02			PG: 17 OF 18			

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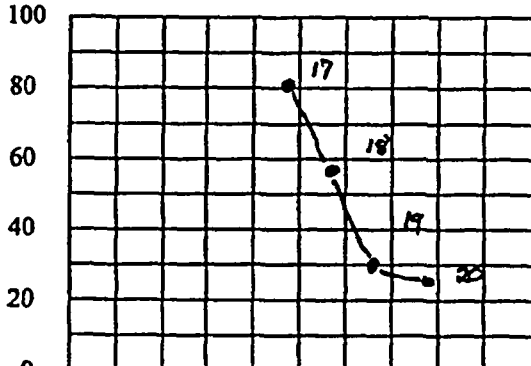

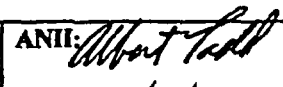
00161

<b>TENNESSEE VALLEY AUTHORITY</b>		<b>DIGITAL ULTRASONIC CALIBRATION DATA SHEET</b>		<b>REPORT NUMBER: <i>R172</i></b>								
PROJECT: BFN UNIT: 3 CYCLE: 10		CALIBRATION DATE: 04-01-02										
PROC.: N-UT- 9 REV:9 TC:02-06		CALIBRATION BLOCK NO.: BF18 TEMP: 72.6°F										
INSTR. MFG: STAVELEY DUE DATE: 8-05-02		SIMULATOR BLOCK NO: DB55079										
MODEL/TYPE: SONIC 136 M & TE NO.: VH751		THERMOMETER S/N: 522352 DUE DATE: 5-17-02										
TRANSDUCER MFG: Krautkramer		COUPLANT SONOTRACE BATCH: 01141										
S/N DB34154 SIZE: .5x1 FREQ: 2.25 MHz		EXAM TYPE: SHEAR <input checked="" type="checkbox"/> LONG <input type="checkbox"/> RL <input type="checkbox"/>										
CABLE TYPE: RG174 LENGTH: 120 inches		<b>ANGLE VERIFICATION</b>										
<b>DAC</b>		BLOCK TYPE: IIW		S/N: DB55074								
		NOMINAL ANGLE: 60		ACTUAL ANGLE: 59								
<p style="text-align: center;">DISPLAY WIDTH: 10 inches</p>		<b>INSTRUMENT SETTINGS</b>										
		<b>REFLECTOR</b>			<b>REFERENCE</b>		<b>MEMORY</b>					
		SCAN DIRECT.	NTCH	SDH	SENSITIVITY		NUMBER					
		AXIAL	<input type="checkbox"/>	<input checked="" type="checkbox"/>	52 dB		3					
		CIRC	<input type="checkbox"/>	<input type="checkbox"/>	n/a dB		n/a					
		FREQ: 2.25 MHz			REJECT: off %							
		ANGLE: N/A deg			DAMPING: 500 ohms							
		DELAY: 1.20 msec			PULSER: 222							
		ZERO: N/A msec			FILTER: FITL 3							
		VELOCITY: .123 msec			REP RATE: 2KHZ							
RANGE: 20 inches			TOF: <input checked="" type="checkbox"/> PEAK <input type="checkbox"/> FLANK									
DISPLAY MODE: PE			POWER: AC									
DUAL: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF			TCG: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF									
<b>CALIBRATION TIMES</b>												
REF. REFLECTOR: 1" GAIN: 36 dB			INITIAL TIME: 9:00 FINAL TIME: 17:30									
AMPLITUDE: 80 % METAL PATH: 1"			VERIFICATION TIMES									
1) 11:45 2) N/A 3) N/A			4) N/A 5) N/A 6) N/A 7) N/A 8) N/A 9) N/A									
<b>LINEARITY CHECK</b>												
<b>VERTICAL</b>	SIGNAL 1		100	90	80	70	60	50	40	30	20	
	SIGNAL 2		50	45	40	35	30	25	20	15	10	
<b>ATTENUATOR</b>	GAIN	SET	-6 dB		-12 dB		SET		+12		SET +6	
	AMP	80%	32 TO 48		16 TO 24		20 %		64 TO 96		40% 64 TO 96	
			40		20				80		80	
<b>COMMENTS:</b>						<b>WELDS/ITEMS EXAMINED:</b>						
DELTA dB DIFFERENCE IS 4.4 FROM THE 3/8 TO 5/8 ON THE CLAD SIDE						N9 Nozzle to Shell						
EXAMINER: MIKE W. KLEINJAN <i>Mike W Kleinjan</i> LEVEL: II		EXAMINER: DAVID KLEINJAN <i>David Kleinjan</i> LEVEL: II		REVIEWER: <i>Paul K. K. K.</i> LEVEL: III DATE: 4/4/02		ANII: <i>What?</i> DATE: 4/19/02 PG.: 4 OF 10 54/100 6 OF 16						

00162

TENNESSEE VALLEY AUTHORITY			DIGITAL ULTRASONIC CALIBRATION DATA SHEET			REPORT NUMBER: <b>R172</b>					
PROJECT: BFN		UNIT: 3	CYCLE: 10		CALIBRATION DATE: 04-01-02						
PROC.: N-UT-		55	REV: 9	TC: N/A	CALIBRATION BLOCK NO.: BF-85-IR						
INSTR. MFG: STAVELEY		DUE DATE: 08-11-02			TEMP: 65.4° F						
MODEL/TYPE: SONIC-137		M & TE NO.: VH-5473			SIMULATOR BLOCK NO: N/A						
TRANSDUCER MFG: KRAUTKRAMER					THERMOMETER S/N: 522352						
S/N DB 35164		SIZE: 1.0"	FREQ: 2.25 MHz		DUE DATE: 05-17-02						
CABLE TYPE: RG 174		LENGTH: 120 inches			COUPLANT SONOTRACE BATCH: 01141						
					EXAM TYPE: SHEAR <input type="checkbox"/> LONG <input type="checkbox"/> RL <input checked="" type="checkbox"/>						
ANGLE VERIFICATION											
BLOCK TYPE: CS IIW					S/N: DB 55074						
NOMINAL ANGLE: 13°					ACTUAL ANGLE: N/A						
INSTRUMENT SETTINGS											
REFLECTOR					REFERENCE		MEMORY				
SCAN DIRECT.	NTCH	SDH	SENSITIVITY		NUMBER						
AXIAL	<input checked="" type="checkbox"/>	<input type="checkbox"/>	50.0 dB		13						
CIRC	<input type="checkbox"/>	<input type="checkbox"/>	N/A dB		N/A						
FREQ:	2.25	MHz	REJECT: OFF		%						
ANGLE:	N/A	deg	DAMPING: 200		ohms						
DELAY:	0.875	msec	PULSER: 222								
ZERO:	N/A	msec	FILTER: FILT 1								
VELOCITY:	0.234	msec	REP RATE: 4 KHZ								
RANGE:	10.0	inches	TOF: <input type="checkbox"/> PEAK <input checked="" type="checkbox"/> FLANK								
DISPLAY MODE: PE			POWER: AC								
DUAL: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF			TCG: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF								
CALIBRATION TIMES											
REF. REFLECTOR: N/A			GAIN: N/A dB			INITIAL TIME: 0915					
AMPLITUDE: N/A %			METAL PATH: N/A"			FINAL TIME: 1105					
VERIFICATION TIMES			1)N/A	2)N/A	3)N/A	4)N/A	5)N/A	6)N/A			
			7)N/A	8)N/A	9)N/A						
LINEARITY CHECK											
VERTICAL	SIGNAL 1		100	90	80	70	60	50	40	30	20
	SIGNAL 2		50	45	40	35	30	25	20	15	10
ATTENUATOR	GAIN	SET	-6 dB	-12 dB	SET	+12	SET	+6			
	AMP	80%	32 TO 48	16 TO 24	20 %	64 TO 96	40%	64 TO 96			
			40	20		80		80			
COMMENTS:						WELDS/ITEMS EXAMINED:					
						REACTOR PRESSURE VESSEL					
						N9-IR					
						wedge ID D 14795-251					
EXAMINER:			EXAMINER:			REVIEWER:		ANII:			
DAVID KLEINJAN			MIKE KLEINJAN			<i>[Signature]</i>		<i>[Signature]</i>			
<i>[Signature]</i>			<i>[Signature]</i>			DATE: 4/19/02		PG: 19 OF 16			
LEVEL: II			LEVEL: II			DATE: 4/19/02		7 OF 16			

00163

TENNESSEE VALLEY AUTHORITY		DIGITAL ULTRASONIC CALIBRATION DATA SHEET		REPORT NUMBER: <b>R172</b>							
PROJECT: BFN UNIT: 3		CYCLE: 10		CALIBRATION DATE: 04-01-02							
PROC.: N-UT- 55 REV: 9		REV: 9		CALIBRATION BLOCK NO.: BF-85-IR TEMP: 65.4° F							
INSTR. MFG: STAVELEY		DUE DATE: 08-11-02		SIMULATOR BLOCK NO: N/A							
MODEL/TYPE: SONIC-137		M & TE NO.: VH-5473		THERMOMETER S/N: 522352 DUE DATE: 05-17-02							
TRANSDUCER MFG: KRAUTKRAMER				COUPLANT SONOTRACE BATCH: 01141							
S/N DB 35164 SIZE: 1.0"		FREQ: 2.25 MHz		EXAM TYPE: SHEAR <input type="checkbox"/> LONG <input type="checkbox"/> RL <input checked="" type="checkbox"/>							
CABLE TYPE: RG 174		LENGTH: 120 inches		ANGLE VERIFICATION							
DAC		BLOCK TYPE: CS IIW		S/N: DB 55074							
		NOMINAL ANGLE: 16°		ACTUAL ANGLE: N/A							
 <div style="position: absolute; left: 450px; top: 340px; writing-mode: vertical-rl; transform: rotate(180deg);">AMPLITUDE</div>		INSTRUMENT SETTINGS									
		REFLECTOR			REFERENCE		MEMORY				
		SCAN DIRECT.	NTCH	SDH	SENSITIVITY		NUMBER				
		AXIAL	<input checked="" type="checkbox"/>	<input type="checkbox"/>	47.0 dB		16				
		CIRC	<input type="checkbox"/>	<input type="checkbox"/>	N/A dB		N/A				
		FREQ: 2.25 MHz		REJECT: OFF %							
		ANGLE: N/A deg		DAMPING: 200 ohms							
		DELAY: 1.01 msec		PULSER: 222							
		ZERO: N/A msec		FILTER: FILT 1							
		VELOCITY: 0.234 msec		REP RATE: 4 KHZ							
RANGE: 10.0 inches		TOF: <input type="checkbox"/> PEAK <input checked="" type="checkbox"/> FLANK									
DISPLAY MODE: PE		POWER: AC									
DUAL: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF		TCG: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF									
CALIBRATION TIMES											
INITIAL TIME: 0820		FINAL TIME: 1107									
VERIFICATION TIMES		1)N/A	2)N/A	3)N/A	4)N/A	5)N/A	6)N/A	7)N/A	8)N/A	9)N/A	
LINEARITY CHECK											
VERTICAL		SIGNAL 1	100	90	80	70	60	50	40	30	20
		SIGNAL 2	50	45	40	35	30	25	20	15	10
ATTENUATOR		GAIN	SET	-6 dB	-12 dB	SET	+12	SET	+6		
		AMP	80%	32 TO 48	16 TO 24	20 %	64 TO 96	40%	64 TO 96		
				40	20		80		80		
COMMENTS:						WELDS/ITEMS EXAMINED:					
						REACTOR PRESSURE VESSEL					
						N9-IR					
						wedge ID D-14795-252					
EXAMINER:		EXAMINER:		REVIEWER:		ANII:					
DAVID KLEINJAN		MIKE KLEINJAN									
LEVEL: II		LEVEL: II		LEVEL: II		DATE: 4/19/08					
				DATE: 4/19/08		PG. 11 OF 16					

8 of 16

TVA

MANUAL ULTRASONIC VESSEL  
EXAMINATION DATA SHEET

REPORT NO.

R172

PROJECT: BFN UNIT: 3 WELD ID: N9 CONFIG.: None COMPONENT: VESSELCAL. SHT. NO.: N/A PROCEDURE: NT-UT-9 REV.: 9 PCR: 0206/444 <sup>L 4-1.02</sup> TEMP.: 85 PYRO.: 52235SCAN SENS.: \* dB EXAM START: <sup>4/10/02</sup> 9:45 EXAM END: 10:30 EXAM ANGLE: 0°, 45°, 60°Lo LOCATION: TDC Wo LOCATION: E OF WELD

IND NO.	20%			50%			100%			MAX. AMP.			20%			50%			100%								
	Mp1	W1	L1	Mp1	W1	L1	Mp1	W1	L1	Mp	W	L	Mp2	W2	L2	Mp2	W2	L2	Mp2	W2	L2						
				*																							
13°	SCAN.	dB	56			SCANNING	#	10/11		BLEND RADIUS																	
16°	SCAN	dB	53			SCANNING	#	10/11		BLEND RADIUS																	
0°	SCAN	dB	74.8			SCANNING	#	9		ON WELD AND BASE MATERIAL																	
45°	SCAN	dB	56.6			SCANNING	#	9		ON WELD AND VESSEL SIDE																	
45T	SCAN	dB	56.6			SCANNING	#	10/11		CW/CCW VESSEL SIDE																	
45 TAN	SCAN	dB	56.6			SCANNING	#	10/11		CW/CCW VESSEL SIDE																	
60°	SCAN	dB	63			SCANNING	#	9		ON WELD AND VESSEL SIDE																	
60T	SCAN	dB	63			SCANNING	#	10/11		CW/CCW VESSEL SIDE																	
60 TAN	SCAN	dB	63			SCANNING	#	10/11		CW/CCW VESSEL SIDE																	
				</																							

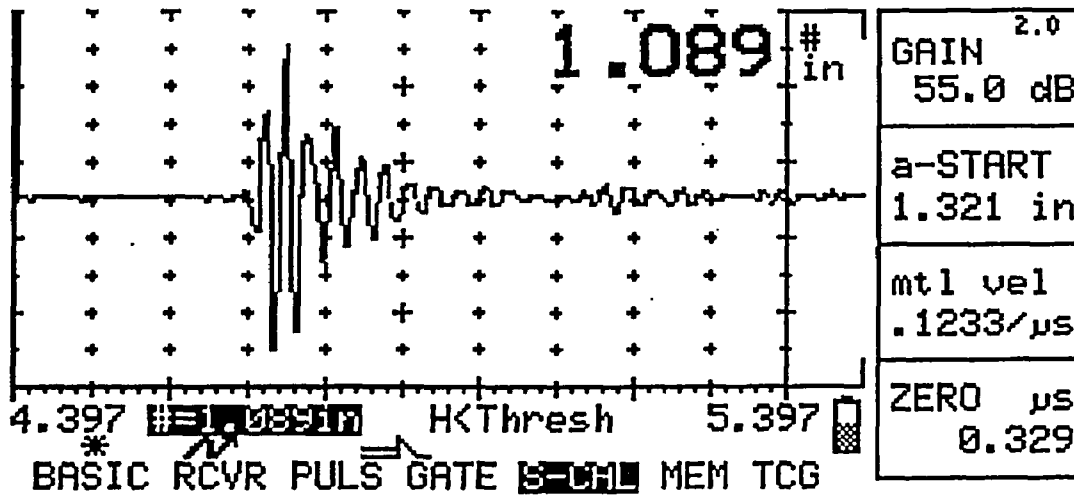
COMMENTS: 13° AND 16° EXAMINATIONS ARE THE BLEND RADIUS EXAMINATIONS  
TRANSVERSE EXAMINATION COVERAGE WILL INCLUDE COVERAGE OBTAINED DURING THE  
INNER RADIUS EXAMINATIONS. 5 TO 10% NOISE LEVEL WAS OBSERVED AT 4-1.02

EXAMINER: Mike W. Kline LEVEL: II DATE: 4-4-02 REVIEWED BY: A. M. M. M. LEVEL: III DATE: 4/4/02  
EXAMINER: A. R. Kline LEVEL: II DATE: 04-01-02 ANH: Robert T. Hall DATE: 4/19/02 PAGE 89 OF 16

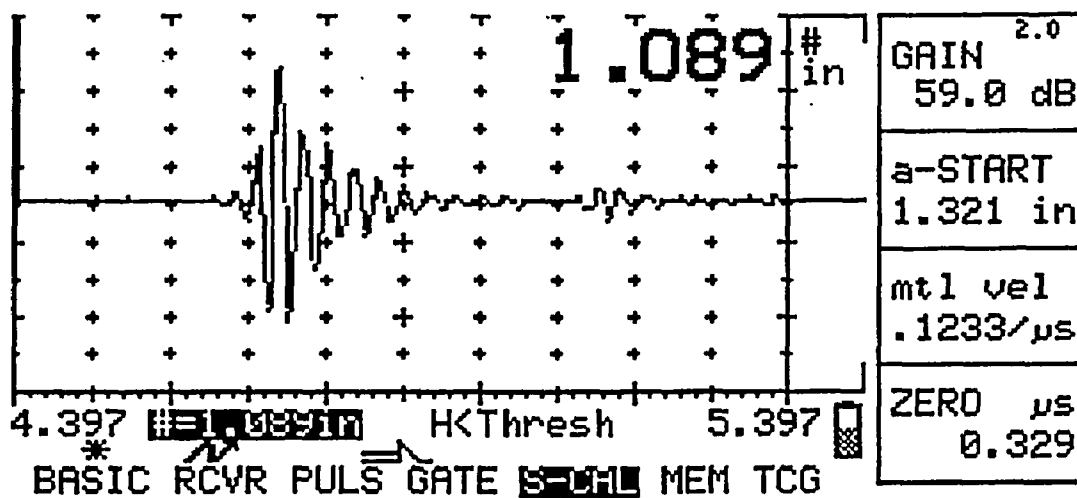
REPORT Number  
R172

00165

Nozzle Examination 45 °Waveforms



45° Pre Waveform



45° Post Waveform

H S BCT  
4/19/02

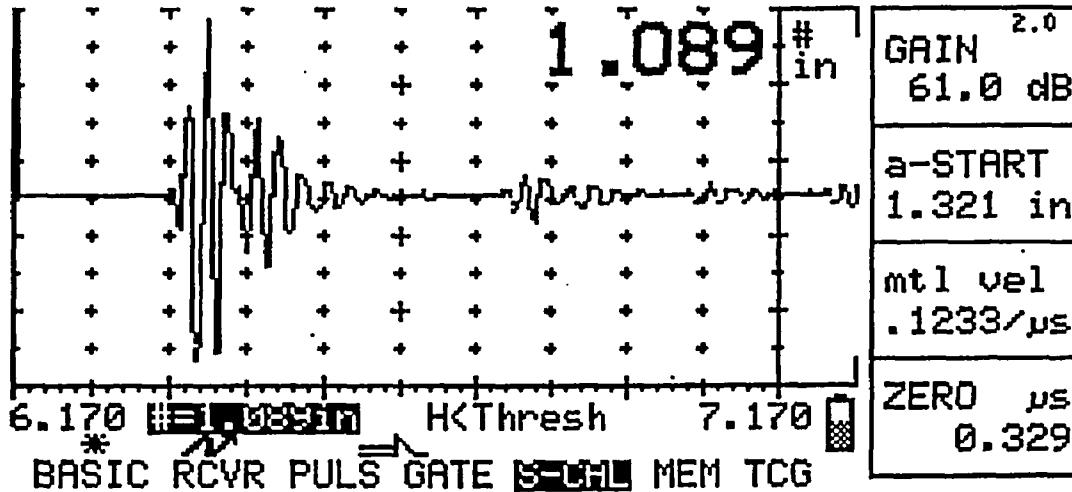
10 J 4/19/02  
15 0.5 10

REPORT NUMBER

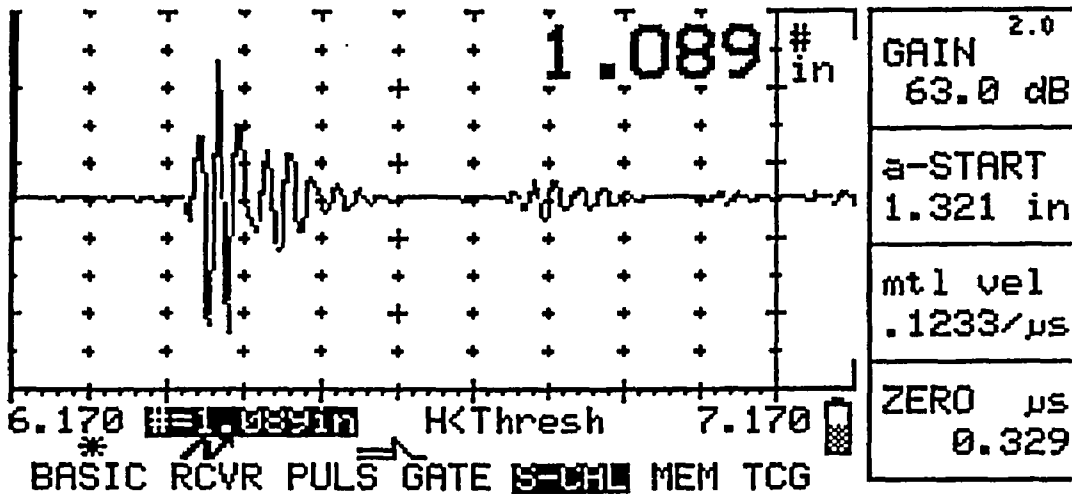
R172

00166

Nozzle Examination 60° Waveforms



60° Pre Waveform



60° Post Waveform

HSBCT  
4/19/00

11 8 4/19/00  
16 0.5 IC

TVA

BEAM SPREAD AND  
RESOLUTION DATA SHEET

REPORT NO.

R172

PROJECT: BFN UNIT: 3 CALIBRATION BLOCK NO.: BF 18PROCEDURE NO.: N-UT-9 REV.: 9 PCR: 0206 7-30-02SEARCH UNIT-MAKE: Krautkramer SIZE: 5X1 FREQ.: 2.25S/N: DB 34843 ANGLE: 45ULTRASONIC INSTRUMENT-MAKE: Smc 135 S/N: VH 751

## BEAM SPREAD

HOLE DEPTH	TRAILING RAY				LEADING RAY					
	20% DAC		50% DAC		100% DAC		20% DAC		50% DAC	
	W	MP	W	MP	MP	W	MP	W	W	MP
1/4T	1 1/8	1.9	1 1/4	2.	2.1	1 5/8	2.4	2	1 7/8	2.3
2T	2 7/8	4	3	4.1	4.3	3 1/4	4.8	4 1/8	3 3/4	4.6
3/4T	4 1/4	6	4 1/2	6.3	6.5	4 7/8	7	5 7/8	5 1/4	6.8

LEADING RAY

TRAILING RAY

MAXIMUM

## RESOLUTION

NEAR SURFACE REFLECTOR: Notch OD DEPTH: 25 SIZE: .253 CAL BLK.: BF 18FAR SURFACE REFLECTOR: Notch ID DEPTH: 6.1 SIZE: .253

## SCANNING

REFLECTORS PROVIDE 50% DAC SIGNALS AT SCANNING SPEED

Y ☒N ☐EXAMINER: M. W. HagenREVIEWED BY: J. P. HagenANIL: What HallLEVEL: II DATE: 3-30-02LEVEL: II DATE: 4/4/02DATE: 4/19/02PAGE: 12 OF 16

TVA

BEAM SPREAD AND  
RESOLUTION DATA SHEET

REPORT NO.

R172

PROJECT: BFN UNIT: 3 CALIBRATION BLOCK NO.: BF 18PROCEDURE NO.: N-UT-9 REV.: 9 PCR: 0206 WTA 3-30-02SEARCH UNIT-MAKE: Krautkramer SIZE: .5x1 FREQ.: 2.25S/N: DB 34154 ANGLE: 60ULTRASONIC INSTRUMENT-MAKE: Sonn 13C S/N: VH 751

## BEAM SPREAD

HOLE DEPTH	TRAILING RAY				LEADING RAY					
	20% DAC		50% DAC		100% DAC		20% DAC		50% DAC	
	W	MP	W	MP	MP	W	MP	W	W	MP
1/4T	2 1/8	2.4	2 3/8	2.7	2.9	2 5/8	3.2	3 1/8	2 7/8	3.1
1/2T	4 3/4	4.8	5	5.3	5.8	5 1/4	6.4	6 5/8	6	6.1
3/4T	6 3/8	7.6	7 1/4	8	8.7	7 7/8	9.6	8 5/8	8	9.1

6 3/8

LEADING RAY

TRAILING RAY

MAXIMUM

## RESOLUTION

NEAR SURFACE REFLECTOR: Natch OD DEPTH: .25 SIZE: .253 CAL BLK.: BF 18FAR SURFACE REFLECTOR: Natch ID DEPTH: 6.1 SIZE: .253

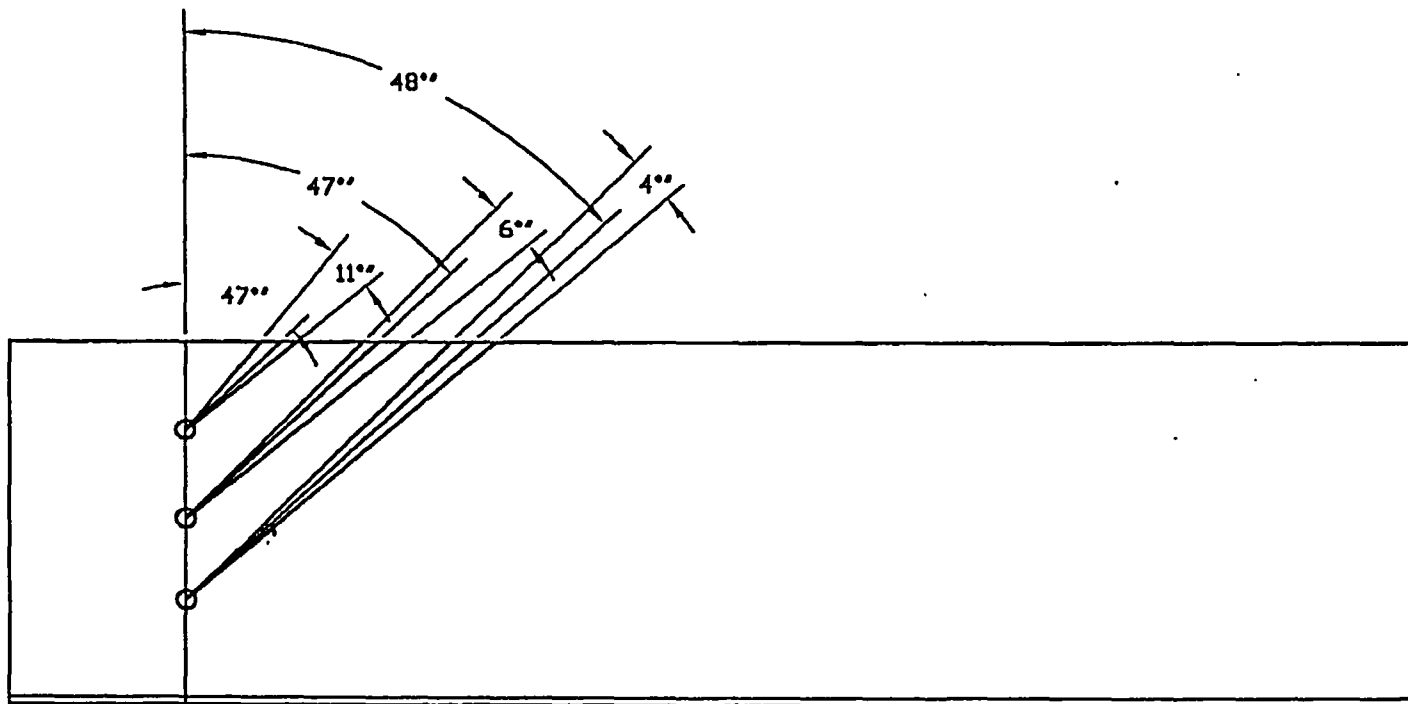
## SCANNING

REFLECTORS PROVIDE 50% DAC SIGNALS AT SCANNING SPEED

Y ☒N ☐EXAMINER: Mike W. HenryREVIEWED BY: John WhiteANII: Robert LaddLEVEL: II DATE: 3-30-02LEVEL: III DATE: 4/4/02DATE: 4/19/02PAGE: 48 OF 16



Report Number  
R172 00169



HSBCT  
2/7/02  
4/14/02

Browns Ferry Unit 3

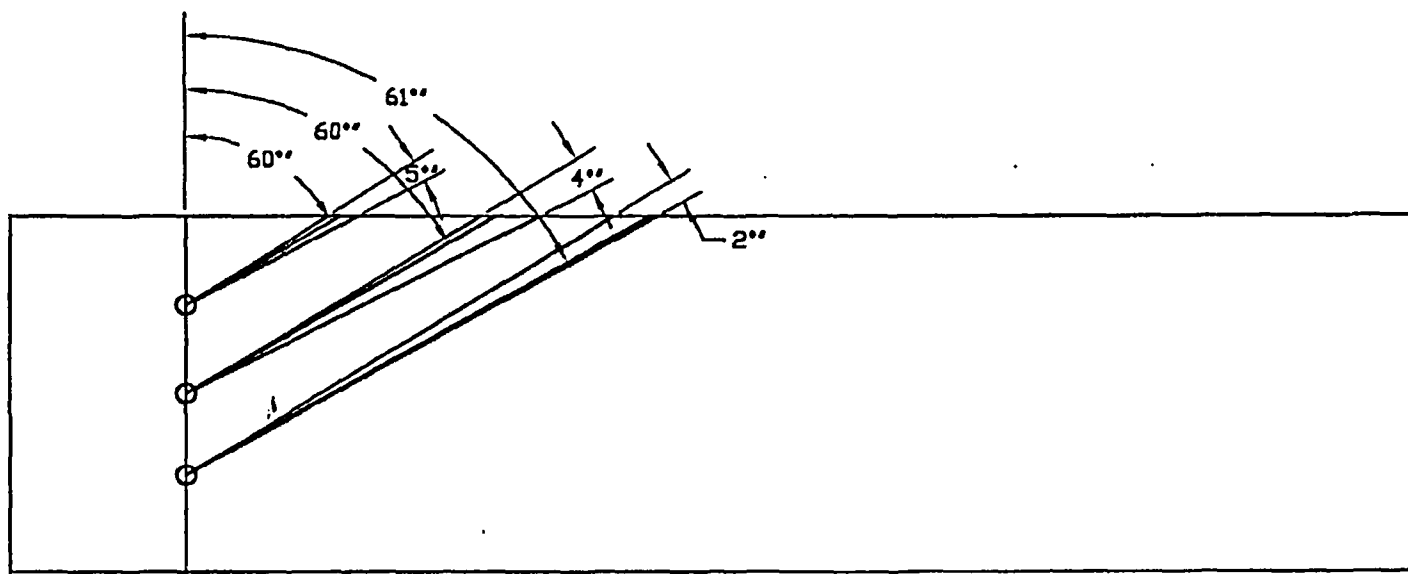
Beamspread

MARCH 2002

BF-18

21 50 21 41  
4/14/02

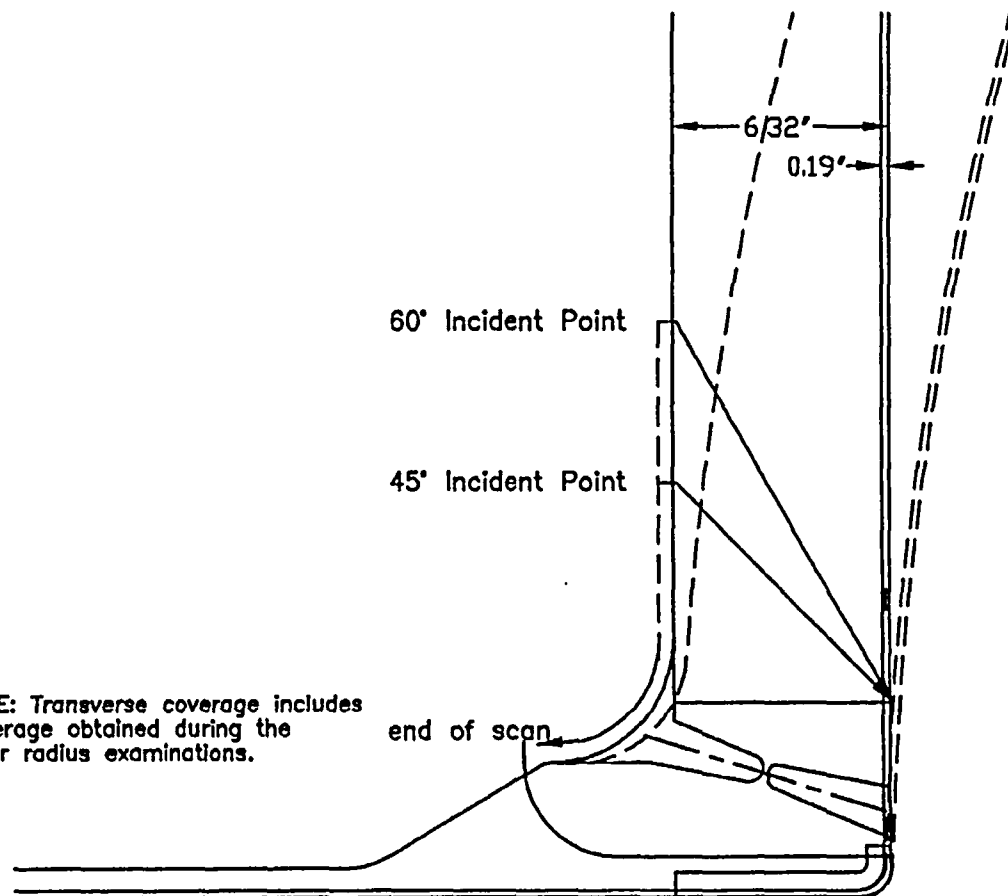
REPORT NUMBER  
R172 00170



HSBCT  
CPT  
4/11/02

Browns Ferry Unit 3
Beamsread
MARCH 2002
BF-18

015014-0510



NOTE: Transverse coverage includes coverage obtained during the inner radius examinations.

end of scan

Report Number  
R172

H5BCT  
4/19/02

Browns Ferry Unit 3
N9 Nozzle-to-Shell
March 2002
SP-N9-NS

00171

5/4/02  
K.0516

00172

TENNESSEE VALLEY AUTHORITY		EXAMINATION SUMMARY AND RESOLUTION SHEET		REPORT NUMBER: <b>R173</b>	
PROJECT: BFN UNIT: 3		CYCLE: 10		COMPONENT ID: N9-IR	
EXAMINATION METHOD				SYSTEM RPV	
				ISI DWG. NO. 3-ISI-0332-C	
MT <input type="checkbox"/>	PT <input type="checkbox"/>	UT <input checked="" type="checkbox"/>	VT <input type="checkbox"/>	CODE CLASS: 1	
CATEGORY: B-D					
PROCEDURE: N-UT-55		REV: 9	TC: N/A	COFIG.:	Nozzle TO Vessel
EXAMINER: MIKE KLEINJAN <i>for 4/11/02</i>		EXAMINER: DAVID KLEINJAN <i>4/4/02</i>		EXAMINER: N/A	
LEVEL: II		LEVEL: II		LEVEL: N/A	

This report contains the data associated with the manual ultrasonic examination of code category B-D, Nozzle Inner radius. This examination report satisfies ASME section XI requirements for the inner radius examination.

N9-IR: This examination was performed using a 16° and 13° in the blend radius in two directions CW/CCW

100% code coverage was obtained

This exam was performed with equipment, Procedures, and personnel qualified in accordance with ASME Section XI

*No Recordable Indication*

RESOLUTION BY: Mike Kleinjan <i>Mike Kleinjan</i>		REVIEWED BY: <i>Paul [Signature]</i>		ANII: <i>What Todd</i>	
LEVEL: II DATE: 4-4-02		LEVEL: II DATE: 4/4/02		DATE: 4/19/02	
				PG. 1 OF 4 <i>4/11/02</i>	

00173

<b>TENNESSEE VALLEY AUTHORITY</b>			<b>DIGITAL ULTRASONIC CALIBRATION DATA SHEET</b>			<b>REPORT NUMBER: R173</b>					
PROJECT: BFN UNIT: 3 CYCLE: 10			CALIBRATION DATE: 04-01-02								
PROC.: N-UT- 55 REV:9 TC: N/A			CALIBRATION BLOCK NO.: BF-85-IR TEMP: 65.4° F								
INSTR. MFG: STAVELEY DUE DATE: 08-11-02			SIMULATOR BLOCK NO: N/A								
MODEL/TYPE: SONIC-137 M & TE NO.: VH-5473			THERMOMETER S/N: 522352 DUE DATE: 05-17-02								
TRANSDUCER MFG: KRAUTKRAMER			COUPLANT SONOTRACE BATCH: 01141								
S/N DB 3516/3 SIZE: 1.0" FREQ: 2.25 MHz			EXAM TYPE: SHEAR <input type="checkbox"/> LONG <input type="checkbox"/> RL <input checked="" type="checkbox"/>								
CABLE TYPE: RG 174 LENGTH: 120 inches			<b>ANGLE VERIFICATION</b>								
<b>DAC</b>			BLOCK TYPE: CS IIW			S/N: DB 55074					
			NOMINAL ANGLE: 13°			ACTUAL ANGLE: N/A					
<p style="text-align: center;">DISPLAY WIDTH: 10 inches</p>			<b>INSTRUMENT SETTINGS</b>								
			<b>REFLECTOR</b>			<b>REFERENCE</b>		<b>MEMORY</b>			
			SCAN DIRECT.	NTCH	SDH	SENSITIVITY		NUMBER			
			AXIAL	<input checked="" type="checkbox"/>	<input type="checkbox"/>	50.0 dB		13			
			CIRC	<input type="checkbox"/>	<input type="checkbox"/>	N/A dB		N/A			
			FREQ: 2.25	MHz		REJECT: OFF		%			
			ANGLE: N/A	deg		DAMPING: 200		ohms			
			DELAY: 0.875	msec		PULSER: 222					
			ZERO: N/A	msec		FILTER: FILT 1					
			VELOCITY: 0.234	msec		REP RATE: 4 KHZ					
RANGE: 10.0	inches		TOF: <input type="checkbox"/> PEAK <input checked="" type="checkbox"/> FLANK								
DISPLAY MODE: PE			POWER: AC								
DUAL: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF			TCG: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF								
REF. REFLECTOR: N/A GAIN: N/A dB			<b>CALIBRATION TIMES</b>								
AMPLITUDE: N/A % METAL PATH: N/A"			INITIAL TIME: 0915			FINAL TIME: 1105					
VERIFICATION TIMES			1)N/A	2)N/A	3)N/A	4)N/A	5)N/A	6)N/A	7)N/A	8)N/A	9)N/A
<b>LINEARITY CHECK</b>											
VERTICAL	SIGNAL 1		100	90	80	70	60	50	40	30	20
	SIGNAL 2		50	45	40	35	30	25	20	15	10
ATTENUATOR	GAIN	SET	-6 dB	-12 dB	SET		+12		SET		+6
	AMP	80%	32 TO 48	16 TO 24	20 %		64 TO 96		40%		64 TO 96
			40	20			80				80
COMMENTS:						WELDS/ITEMS EXAMINED:					
Wedge ID D-14795-251						REACTOR PRESSURE VESSEL					
						N9-IR					
EXAMINER: DAVID KLEINJAN <i>D.K. Kleinjan</i> LEVEL: II			EXAMINER: MIKE KLEINJAN <i>Mike W. Kleinjan</i> LEVEL: II			REVIEWER: <i>Paul Whitley</i> LEVEL: III DATE: 4/1/02			ANII: <i>What Paul</i> DATE: 4/1/02 PG: 44 OF 44 5/17/02		

00174

TENNESSEE VALLEY AUTHORITY			DIGITAL ULTRASONIC CALIBRATION DATA SHEET			REPORT NUMBER: <b>R173</b>							
PROJECT: BFN		UNIT: 3	CYCLE: 10		CALIBRATION DATE: 04-01-02								
PROC.: N-UT-		55	REV: 9	4-15-02	TC: N/A		CALIBRATION BLOCK NO.: BF-85-IR						
INSTR. MFG: STAVELEY		DUE DATE: 08-11-02			TEMP: 65.4° F								
MODEL/TYPE: SONIC-137		M & TE NO.: VH-5473			SIMULATOR BLOCK NO: N/A								
TRANSDUCER MFG: KRAUTKRAMER					THERMOMETER S/N: 522352								
S/N DB 35164		SIZE: 1.0"	FREQ: 2.25 MHz		DUE DATE: 05-17-02								
CABLE TYPE: RG 174		LENGTH: 120 inches			COUPLANT SONOTRACE								
					BATCH: 01141								
					EXAM TYPE: SHEAR <input type="checkbox"/> LONG <input type="checkbox"/> RL <input checked="" type="checkbox"/>								
ANGLE VERIFICATION													
BLOCK TYPE: CS IIW					S/N: DB 55074								
NOMINAL ANGLE: 16°					ACTUAL ANGLE: N/A								
INSTRUMENT SETTINGS													
REFLECTOR						REFERENCE		MEMORY					
SCAN DIRECT.		NTCH		SDH		SENSITIVITY		NUMBER					
AXIAL		<input checked="" type="checkbox"/>		<input type="checkbox"/>		47.0 dB		16					
CIRC		<input type="checkbox"/>		<input type="checkbox"/>		N/A dB		N/A					
FREQ: 2.25		MHz		REJECT: OFF		%							
ANGLE: N/A		deg		DAMPING: 200		ohms							
DELAY: 1.01		msec		PULSER: 222									
ZERO: N/A		msec		FILTER: FILT 1									
VELOCITY: 0.234		msec		REP RATE: 4 KHZ									
RANGE: 10.0		inches		TOF: <input type="checkbox"/> PEAK <input checked="" type="checkbox"/> FLANK									
DISPLAY MODE: PE				POWER: AC									
DUAL: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF				TCG: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF									
CALIBRATION TIMES													
REF. REFLECTOR: N/A			GAIN: N/A dB			INITIAL TIME: 0820							
AMPLITUDE: N/A %			METAL PATH: N/A"			FINAL TIME: 1107							
VERIFICATION TIMES			1) N/A	2) N/A	3) N/A	4) N/A	5) N/A	6) N/A					
			7) N/A	8) N/A	9) N/A								
LINEARITY CHECK													
VERTICAL		SIGNAL 1		100	90	80	70	60	50	40	30	20	
		SIGNAL 2		50	45	40	35	30	25	20	15	10	
ATTENUATOR		GAIN	SET	-6 dB	-12 dB	SET		+12		SET		+6	
		AMP	80%	32 TO 48	16 TO 24	20 %		64 TO 96		40%		64 TO 96	
				40	20			80				80	
COMMENTS:						WELDS/ITEMS EXAMINED:							
Wedge ID D-14795-252						REACTOR PRESSURE VESSEL							
						N9-IR							
EXAMINER:			EXAMINER:			REVIEWER:		ANII:					
DAVID KLEINJAN			MIKE KLEINJAN			<i>[Signature]</i>		<i>[Signature]</i>					
<i>[Signature]</i>			<i>[Signature]</i>			DATE: 4/19/02		DATE: 4/19/02					
LEVEL: II			LEVEL: II			LEVEL: <i>[Signature]</i>		PG: 47 OF 44 4/19/02					

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00175

**Inspection Report R-188**  
**Nozzle N10-Inner Radius**



TENNESSEE VALLEY AUTHORITY		EXAMINATION SUMMARY AND RESOLUTION SHEET		REPORT NUMBER: <i>R188</i>	
PROJECT: BFN UNIT: 3		CYCLE: 11		COMPONENT ID: N10-IR	
EXAMINATION METHOD				SYSTEM: RVP ISI DWG. NO: 3-ISI-0411-C-01	
MT <input type="checkbox"/>	PT <input type="checkbox"/>	UT <input checked="" type="checkbox"/>	VT <input type="checkbox"/>	CODE CLASS: 1	CATEGORY: B-D
PROCEDURE: 54-ISI-850*		REV: 3	TC: *	COFIG.:	VESSEL to NOZZLE
EXAMINER: <i>FR</i> <i>DREW PETERSON</i> <i>PER TEL CON</i>		EXAMINER: <i>NA</i>		EXAMINER: <i>NA</i>	EXAMINER: <i>NA</i>
LEVEL: <i>Waffler</i> <i>3-18-04</i>		LEVEL:		LEVEL:	LEVEL:

\* SDCN 30-5037583-00

This report contains the data associated with the manual ultrasonic examination of the N10-IR Nozzle to RPV lower head weld inner radius.

The inner radius was examined with a 65 deg shear and a 70 deg shear from the head side and no recordable indications were observed.



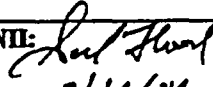
The procedure utilized for the examination was 54-ISI-850 rev-3. Note: Refer to EPRI Model IR-2007-43 for a description of the scanning volume and coverage plots. Examination combined volume coverage 90%.

Note 1: This ultrasonic examination was performed in accordance the criteria of 10CFR 50.55a(b) (2) (xv) (G) and the minimum coverage requirements of 10CFR 50.55a(b) (2) (xv) (K) were met.



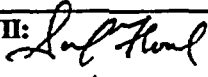
This examination satisfies the requirements of ASME Sec.XI, Category B-D, for item number B3.90, figure number IWB 2500-7(b) exam volume, and was performed using ASME Sec XI, Appendix VIII qualified personnel, procedures, and equipment as amended by the Final Rule.

RESOLUTION BY: <i>Waffler</i>	REVIEWED BY: <i>Waffler</i>	ANIL: <i>Waffler</i>
LEVEL: <i>III</i> DATE: <i>3/19/04</i>	LEVEL: <i>II</i> DATE: <i>3-18-04</i>	DATE: <i>3/29/04</i>
		PG. <i>1</i> OF <i>6</i>

00332

<b>TENNESSEE VALLEY AUTHORITY</b>			<b>DIGITAL ULTRASONIC CALIBRATION DATA SHEET</b>			<b>REPORT NUMBER:</b> <i>R188</i>																																																																																																						
PROJECT: BFN UNIT 3			CYCLE: 11			CALIBRATION DATE: 3-4-04																																																																																																						
PROC.: 54-ISI-850			REV:03 TC: (2)			CALIBRATION BLOCK NO.: BF-18 TEMP: 69° F																																																																																																						
INSTR. MFG: Staveley			DUE DATE: 5-12-04			SIMULATOR BLOCK NO: N/A																																																																																																						
MODEL/TYPE: Sonic136			M & TE NO.: VH-8035 ✓			THERMOMETER S/N: VH-8875 ✓ DUE DATE: 7-19-04																																																																																																						
TRANSDUCER MFG: Benchmark/KBA						COUPLANT Sonotrace BATCH: 01141																																																																																																						
S/N DB 35289 ✓ SIZE: .5x1.0 ✓			FREQ: ✓ 2.25 MHz			EXAM TYPE: SHEAR <input checked="" type="checkbox"/> LONG <input type="checkbox"/> RL <input type="checkbox"/>																																																																																																						
CABLE TYPE: R6-174			LENGTH: 300 inches ✓			<b>ANGLE VERIFICATION</b>																																																																																																						
<b>DAC</b>			BLOCK TYPE: IIW			S/N: 7500586																																																																																																						
			NOMINAL ANGLE: 70°			ACTUAL ANGLE: 70°																																																																																																						
<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;"> 100 80 60 40 20 0 </div> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table> <div style="margin-left: 10px; writing-mode: vertical-rl; transform: rotate(180deg);"> A M P L I T U D E </div> </div> <p style="margin-top: 10px;">DISPLAY WIDTH: inches 20.0"</p>																																																																																																							<b>INSTRUMENT SETTINGS</b>					
<b>REFLECTOR</b>						<b>REFERENCE</b>		<b>MEMORY</b>																																																																																																				
SCAN DIRECT.		NTCH		SDH		SENSITIVITY		NUMBER																																																																																																				
AXIAL		<input type="checkbox"/>		<input checked="" type="checkbox"/>		50.4 dB		3																																																																																																				
CIRC		<input type="checkbox"/>		<input type="checkbox"/>		NA dB		NA																																																																																																				
*FREQ: 2.25 MHz				*REJECT: OFF %																																																																																																								
ANGLE: 70° deg				*DAMPING: 500 / ohms																																																																																																								
DELAY: 2.44" msec				*PULSER: 222 µs /																																																																																																								
ZERO: N/A msec				FILTER: 2																																																																																																								
VELOCITY: 0.128" / msec				*PRR/PRF: 2kHz																																																																																																								
RANGE: 20.0" inches				TOF: <input type="checkbox"/> PEAK <input checked="" type="checkbox"/> FLANK																																																																																																								
*DISPLAY MODE: P-E				TCG: ON <input type="checkbox"/> OFF <input checked="" type="checkbox"/>																																																																																																								
REF. REFLECTOR: N/A			GAIN: N/A			<b>CALIBRATION TIMES</b>																																																																																																						
AMPLITUDE: N/A			METAL PATH: N/A			INITIAL TIME: 0815 FINAL TIME: 1200																																																																																																						
VERIFICATION TIMES			1)	2)	3)	4)	5)	6)																																																																																																				
			7)	8)	9)																																																																																																							
<b>* PDI QUALIFIED INSTRUMENT SETTINGS:</b> <b>VERIFY INSTRUMENT SETTINGS AND CALIBRATION SEQUENCE ARE IN ACCORDANCE WITH TABLE 2</b> <b>OF THE APPLICABLE PDI QUALIFICATION IMPLEMENTATION PROCEDURE !</b>																																																																																																												
<b>LINEARITY CHECK</b>																																																																																																												
<b>VERTICAL</b>		SIGNAL 1	100	90	80	70	60	50	40	30	20	10																																																																																																
		SIGNAL 2	50	45	40	35	30	25	20	15	10	5																																																																																																
<b>ATTENUATOR</b>		GAIN	SET	-6 dB		-12 dB		SET		+12		SET																																																																																																
		AMP	80	32-48		16-24		20		64-96		40																																																																																																
				40		20				80		85																																																																																																
<b>COMMENTS:</b>						<b>WELDS/ITEMS EXAMINED:</b>																																																																																																						
(1) No intermediate connections used						N10-IR																																																																																																						
(2) SDCN 30-5037583-00																																																																																																												
<b>EXAMINER:</b> 			<b>EXAMINER:</b> N/A			<b>REVIEWER:</b> 			<b>ANIL:</b> 																																																																																																			
<b>LEVEL: II</b>			<b>LEVEL: II</b>			<b>LEVEL: II DATE: 3-14-04</b>			<b>DATE: 3/29/04</b>																																																																																																			
									<b>PG. 2 OF 6</b>																																																																																																			

00333

<b>TENNESSEE VALLEY AUTHORITY</b>		<b>DIGITAL ULTRASONIC CALIBRATION DATA SHEET</b>		<b>REPORT NUMBER:</b> <i>R188</i>								
PROJECT: BFN UNIT 3		CYCLE: 11		CALIBRATION DATE: 3-4-04								
PROC.: 54-ISI-850		REV:03 TC: (2)		CALIBRATION BLOCK NO.: BF-18 TEMP: 69° F								
INSTR. MFG: Staveley		DUE DATE: 5-12-04		SIMULATOR BLOCK NO: N/A								
MODEL/TYPE: Sonic136		M & TE NO.: VH-8035 ✓		THERMOMETER S/N: VH-8875 ✓ DUE DATE: 7-19-04								
TRANSDUCER MFG: Benchmark/KBA				COUPLANT Sonotrace BATCH: 01141								
S/N DB 34852 ✓ SIZE: .5x1.0 ✓		FREQ: .2.25 MHz		EXAM TYPE: SHEAR <input checked="" type="checkbox"/> LONG <input type="checkbox"/> RL <input type="checkbox"/>								
CABLE TYPE: RG-174		LENGTH: 300 inches ✓		<b>ANGLE VERIFICATION</b>								
<b>DAC</b>		BLOCK TYPE: ITW		S/N: 7500586								
		NOMINAL ANGLE: 65°		ACTUAL ANGLE: 65°								
<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;"> 100 80 60 40 20 0 </div> <div style="border: 1px solid black; width: 200px; height: 150px; position: relative;"> <div style="position: absolute; top: 10%; left: 10%; font-size: 2em;">X IN ✓</div> <div style="position: absolute; top: 15%; left: 15%;">N = TC#</div> </div> <div style="margin-left: 10px; writing-mode: vertical-rl; transform: rotate(180deg);"> A M P L I T U D E </div> </div>		<b>INSTRUMENT SETTINGS</b>										
		<b>REFLECTOR</b>			<b>REFERENCE</b>	<b>MEMORY</b>						
		SCAN DIRECT.	NTCH	SDH	SENSITIVITY	NUMBER						
		AXIAL	<input checked="" type="checkbox"/>	<input type="checkbox"/>	61.4 dB	4						
		CIRC	<input type="checkbox"/>	<input type="checkbox"/>	NA dB	NA						
		*FREQ: 2.25 MHz			*REJECT: OFF %							
		ANGLE: 65° deg			*DAMPING: 500 ohms							
		DELAY: 14.1" msec			*PULSER: 222 µs							
		ZERO: N/A msec			FILTER: 2							
		VELOCITY: 0.127" msec			*PRR/PRF: 2kHz							
RANGE: 5.0" ** inches			TOF: <input type="checkbox"/> PEAK <input checked="" type="checkbox"/> FLANK									
*DISPLAY MODE: P-E			TCG: ON <input type="checkbox"/> OFF <input checked="" type="checkbox"/>									
REF. REFLECTOR: N/A		GAIN: N/A		<b>CALIBRATION TIMES</b>								
AMPLITUDE: N/A		METAL PATH: N/A		INITIAL TIME: 0820 FINAL TIME: 1157								
VERIFICATION TIMES		1)	2)	3)	4)							
		5)	6)	7)	8)							
		9)										
<b>* PDI QUALIFIED INSTRUMENT SETTINGS:</b> <b>VERIFY INSTRUMENT SETTINGS AND CALIBRATION SEQUENCE ARE IN ACCORDANCE WITH TABLE 2</b> <b>OF THE APPLICABLE PDI QUALIFICATION IMPLEMENTATION PROCEDURE !</b>												
<b>LINEARITY CHECK</b>												
<b>VERTICAL</b>	SIGNAL 1		100	90	80	70	60	50	40	30	20	10
	SIGNAL 2		50	45	40	35	30	25	20	15	10	5
<b>ATTENUATOR</b>	GAIN	SET	-6 dB		-12 dB		SET		+12		SET	
	AMP	80	32-48		16-24		20		64-96		40	
			40		20				80		85	
<b>COMMENTS:</b>						<b>WELDS/ITEMS EXAMINED:</b>						
** Screen 5.0" with 13.0" delayed off						N10-IR						
(1) No intermediate connections used												
(2) SDCN 30-5037583-00												
<b>EXAMINER:</b> 		<b>EXAMINER:</b> N/A		<b>REVIEWER:</b> 		<b>ANII:</b> 						
LEVEL: II		LEVEL: II		LEVEL: II DATE: 3-14-04		DATE: 3/29/04		PG. 3 OF 6				

R188

R188

**L<sub>0</sub> LOCATION:** N/A **W<sub>0</sub> LOCATION:** N/A

REVIEWED BY: [Signature] LEVEL: IT DATE: 3-14-04  
 ANL: [Signature] DATE: 3/29/04 PAGE 5 OF 6

110335



## Ultrasonic Examination Limitation and Coverage Report

### Browns Ferry Unit-3 Standby Liquid Control Nozzle Inner Radius

#### N10-IR

The ultrasonic examination volume includes the clad and inner  $\frac{1}{2}$ " thickness as measured from the inside diameter surface. The EPRI Model parameters were used to inspect the examination volume using 65, and 70 degree shear wave scans.

The combined model scans were used to calculate the total examination coverage and limited area not covered by these techniques. The examination limitations are shown in square inches in order to simplify calculations. See the applicable Ultrasonic Examination Limitation/Coverage Sketch and the Browns Ferry Unit 3 - N10 Model Plots.

Required Examination Area: = 5.35 sq. in.

Model Combined Area Examined: = 4.815 sq. in.

Model Limited Area Not Examined: = .45 sq. in.

Model Percentages: 90%

Reviewed By: 

Level: II

Date: 3-19-04

Page: 6 of 6



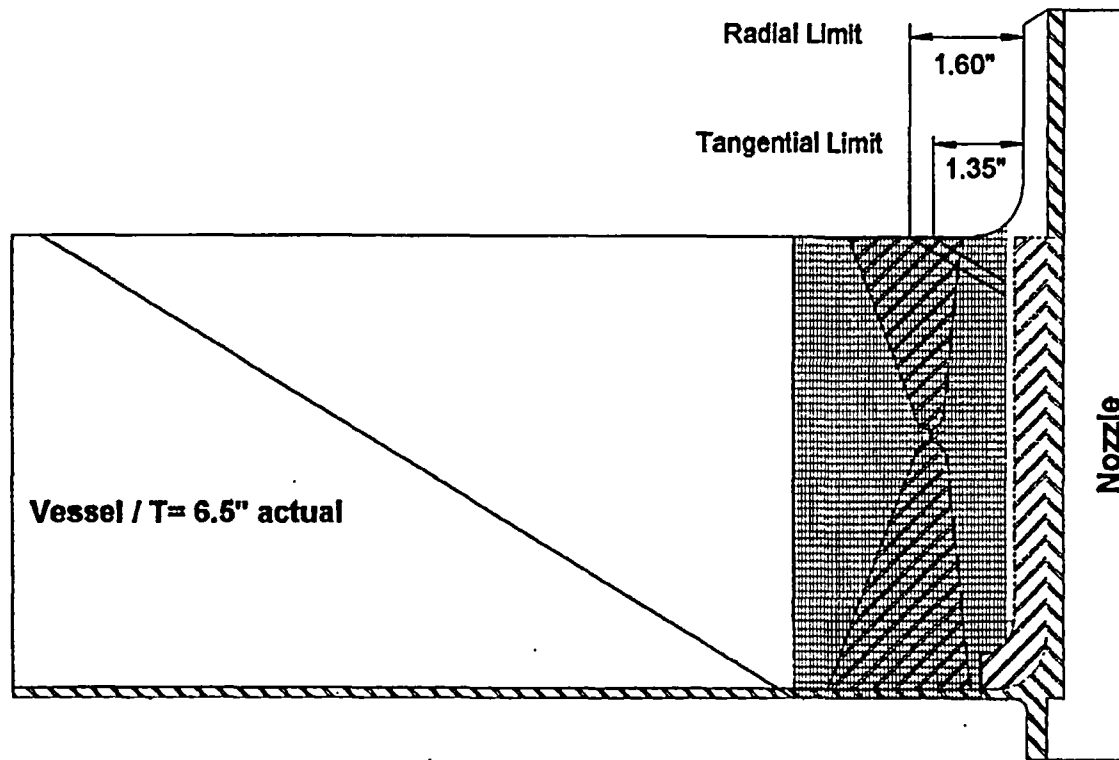
# Ultrasonic Examination Limitation/Coverage Sketch

Browns Ferry Unit - 3

N10 Liquid Control Nozzle Inner Radius/Nozzle to Shell Weld

Component No.: N10-NV

Legend	
	60 deg Radial
	60 deg Tangential
	Upper 85%
	Lower 15%
	Inner Radius



Examiner:	Level: II Date: 3-14-04	Examiner: N/A	Level: Date:
Reviewed By:	Date: 3-19-04	ANII:	Date: 3/29/04
		Page: 9 of 10	

1287 10329

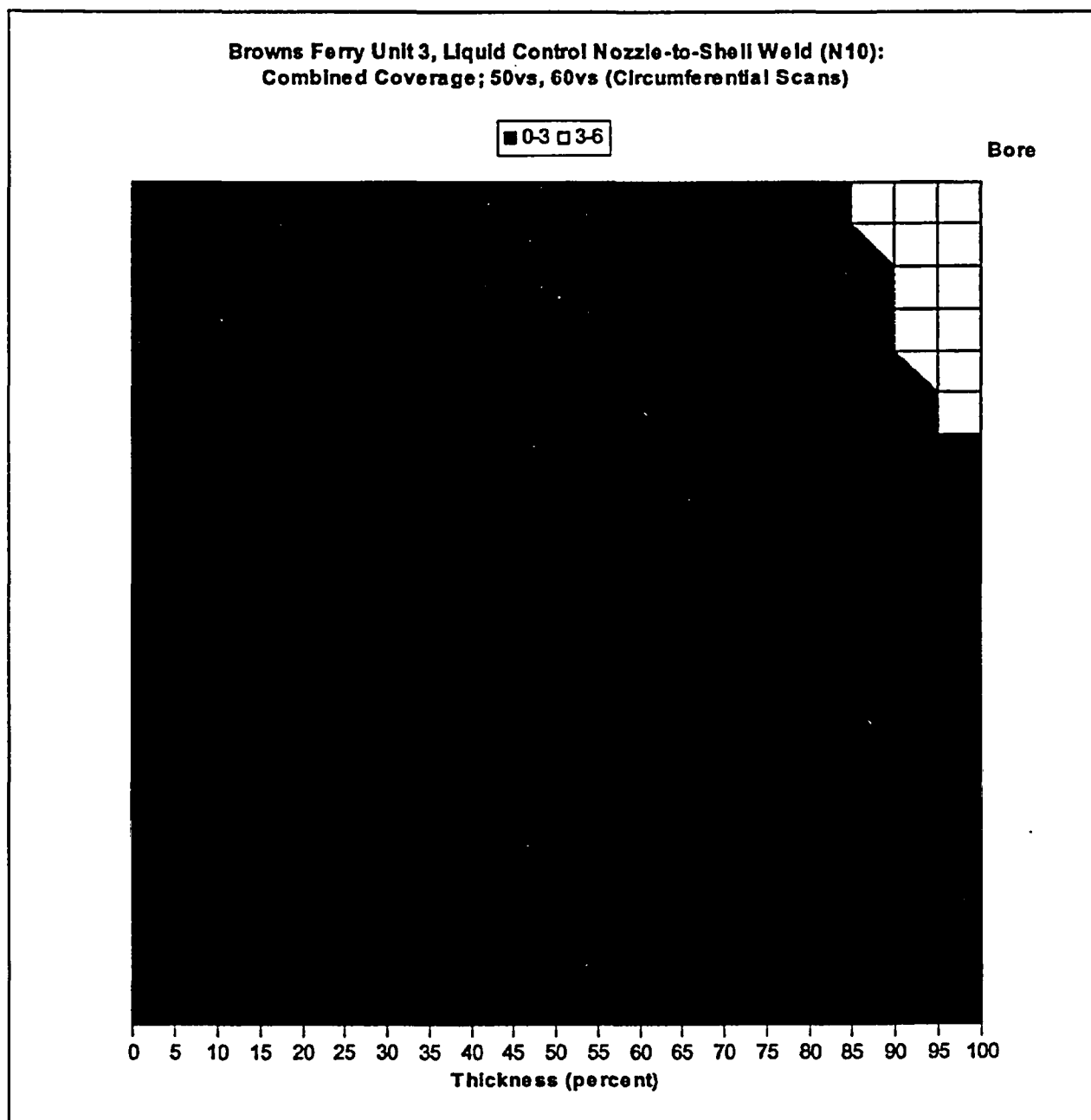


Figure 10. Browns Ferry Standby Liquid Control Nozzle-to-Shell Weld (N10): Summary Coverage Map; Union of Vessel Techniques, 50/(13 to 40)v and 60/(12 to 90)v.



## Attachment B

### Inspection Reports For RHR Piping Welds Listed In The Table Below

COMPONENT WELD	REPORT NUMBER	CYCLE NUMBER	EXAMINATION COVERAGE
DRHR-3-19	R-086	11	50%
DRHR-3-21	R-140	10	50%
TRHR-3-191	R-189	11	50%
RWCU-3-007-G004	R-081	11	50%

**Inspection Report R-086**  
**Weld DRHR-3-19**

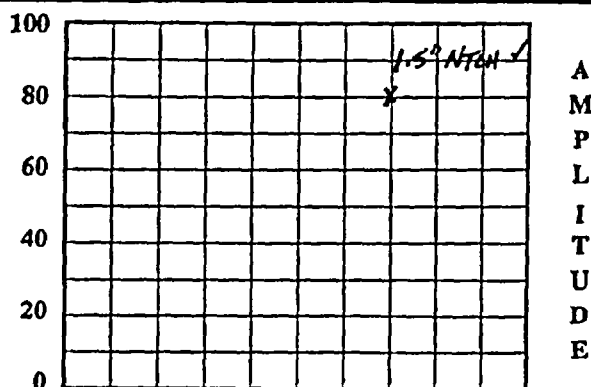
TENNESSEE VALLEY AUTHORITY		EXAMINATION SUMMARY AND		REPORT NUMBER: <i>R086</i>	
PROJECT: <i>BFN</i> UNIT: <i>3</i> CYCLE <i>11</i>			COMPONENT ID: <i>DRHR-3-19</i>		
EXAMINATION METHOD			SYSTEM: <i>RHRS</i> ISI DWG NO: <i>3-ISI-0330-C-01</i>		
MT <input type="checkbox"/>	PT <input type="checkbox"/>	UT <input checked="" type="checkbox"/>	VT <input type="checkbox"/>	CONFIGURATION	CATEGORY
PROCEDURE <i>N-UT-64</i>		REV <i>7</i>	TC <i>N/A</i>	TEE TO P	R-A
EXAMINER: <i>Dickey Michael</i>		EXAMINER:		EXAMINER:	EXAMINER:
<i>Dickey Michael</i>					
LEVEL: <i>II</i>		LEVEL:		LEVEL:	LEVEL:
<p>Total coverage calculated to be approximately <i>100 % ASME Code Coverage</i>  <i>50% 10 CFR 50.55(a) coverage achieved</i></p> <p>This report contains the UT data associated with the manual          Ultrasonic examination of weld <i>DRHR-3-19</i> for ASME Section XI          Category R-A Item number <i>RI.11</i> and <i>N40913</i> Risk Informed.  <i>3/4/04</i></p> <p>This exam was performed with 45° shear scans 4, 5 &amp; 6          and 60° RL scans 4</p> <p>There was No Recordable Indications with the 45° shear          ID geometry was observed below recordable.</p> <p>60° RL observed the previously recorded root geometry below          Recordable levels</p> <p>45° Exam was performed to maintain 5% to 20% ID Roll          60° RL Exam was performed to maintain 5% to 20% IC Noise</p> <p>This examination was performed with equipment procedures          and personnel qualified in accordance with ASME Section XI          Appendix VIII as amended by the Rule</p> <p>Ⓢ Single sided exam. Main Weld TV/NDE LIII 3/4/04</p>					
RESOLUTION BY <i>Dickey Michael</i> <i>Dickey Michael</i>		REVIEWED BY <i>Mark Willet</i>		ANII: <i>B. G. Tine</i>	
LEVEL <i>II</i> DATE <i>3 4 04</i>		LEVEL: <i>III</i> DATE <i>3/6/04</i>		DATE <i>3/29/04</i> Page: <i>1</i> OF <i>5</i>	

**TENNESSEE VALLEY  
AUTHORITY**
**DIGITAL ULTRASONIC  
CALIBRATION  
DATA SHEET**
**REPORT NUMBER**
R086

 PROJECT BFN UNIT/CYCLE 3/11  
 PROCEDURE: N-UT-64 REV: 7 TC: N/A

 MANUFACTURER KBA  
 MODEL: Comp G S/N 00FCYR  
 SIZE: .50" FREQ: 1.5 MH  
 SHAPE: Round # ELEMENTS: 1 # CONS: 0  
 CABLE TYPE RG 174 LENGTH: 6'

 MODE: ☒ SHEAR ☐ LONG ☐ RL

**DAC**

 DISPLAY WIDTH 2.0 inches

 REF. REFLECTOR: N/A GAIN: N/A dB

 AMPLITUDE: N/A % METAL PATH: N/A

 VERIFICATION TIMES 1) N/A 2) N/A 3) N/A 4) N/A 5) N/A 6) N/A 7) N/A 8) N/A 9) N/A

 CALIBRATION DATE: 3-4-04  
 CALIBRATION BLOCK NO. WB 85 TEMP: 73 °F  
 SIMULATOR BLOCK: Rompas

 THERMOMETER S/N 531992 DUE DATE 12-11-04  
 COUPLANT: Ultracel II BATCH: 790662

 BLOCK TYPE: Rompas S/N: 790662  
 NOMINAL ANGLE: 45° ACTUAL ANGLE 45°

 MANUFACTURER KBA DUE DATE 5-27-04  
 MODEL NO.: USN 521 S/N: E18733
**INSTRUMENT SETTINGS**

REFLECTOR			REFERENCE SENSITIVITY	MEMORY NUMBER
SCAN DIRECT.	NTC	SDH		
AXIAL	<input type="checkbox"/>	<input type="checkbox"/>	14 dB	16
CIRC.	<input type="checkbox"/>	<input type="checkbox"/>	14 dB	16
FREQ: <u>2-8</u> MH	REJECT: <u>= 0</u> %			
ANGLE: <u>45</u> deg	DAMPING: <u>1000</u> ohms			
DELAY <u>0.0</u> msec	PULSER: <u>Single</u> *			
ZERO: <u>6.121</u> msec	PRR/PRF: <u>High</u> ✓			
VELOCITY <u>.1216</u> msec	TOF: <u>N/A</u>			
RANGE: <u>3.0</u> inches	POWER: <u>N/A</u>			
DISP. MODE: <u>FULL WAV</u>				

**CALIBRATION TIMES**

 INITIAL TIME: 2120 FINAL TIME 0015

 VERIFICATION TIMES 1) N/A 2) N/A 3) N/A 4) N/A 5) N/A 6) N/A 7) N/A 8) N/A 9) N/A
**\*PDI QUALIFIED INSTRUMENT SETTINGS:**

VERIFY INSTRUMENT SETTINGS AND CALIBRATION SEQUENCE ARE IN ACCORDANCE WITH TABLE 2 OF THE APPLICABLE PDI QUALIFICATION IMPLEMENTATION PROCEDURE!

**LINEARITY CHECK**

VERTICAL	SIGNAL 1		100	90	80	70	60	50	40	30	20
	SIGNAL 2		50	45	40	35	30	25	20	15	10
ATTENUATOR	GAIN	SET	-6 dB	-12dB	SET	+12	SET	+6			
	AMP	80%	32 TO 48	16 TO 24	20%	64 TO 96	40%	64 TO 96			
			40%	20%		80%		80%			

**COMMENTS**
**WELD/ITEMS EXAMINED**
DRHR-3-19

 EXAMINER: Dickens Michael LVL: II

 EXAMINER: Walter LVL: III

 REVIEWER: Walter LVL: III

 DATE 3/6/04

 ANII: B. F. Tino

 DATE 5/29/04

 PAGE 2 OF 5

**TENNESSEE VALLEY  
AUTHORITY**

# DIGITAL ULTRASONIC CALIBRATION DATA SHEET

# REPORT NUMBER

ROSL

PROJECT BFN UNIT/CYCLE 3 / 11  
PROCEDURE: N-UT-64 REV: 7 TC: N/A

MANUFACTURER RTD /

MODEL: TLRA / S/N 85-630 /

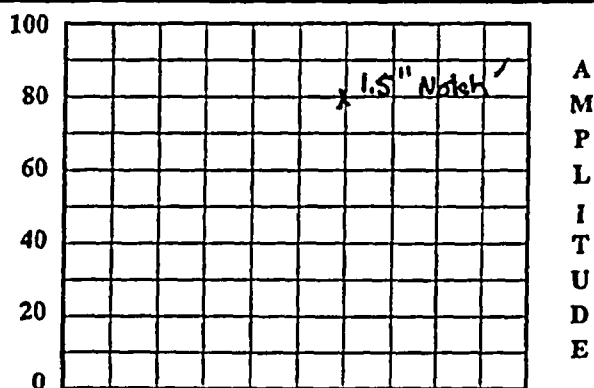
SIZE: 2 (10x18) / FREQ: 2 MH

SHAPE: Rect. # ELEMENTS: 2 # CONS: 0

CABLE TYPE RG 174 LENGTH: 6'

MODE: ☐ SHEAR ☐ LONG ☒ RL

## DAC



**DISPLAY WIDTH**      5.0    inches

REF. REFLECTOR: N/A GAIN: N/A dB

AMPLITUDE: N/A % METAL PATH: N/A

VERIFICATION TIMES	1) $\sim/A$	2)	3)	4)	5)	6)	7)	8)	9) $\sim/A$
--------------------	-------------	----	----	----	----	----	----	----	-------------

CALIBRATION DATE: 3-4-04  
CALIBRATION BLOCK NO. WB 85 TEMP: 73 °F  
SIMULATOR BLOCK: Rompas 790662  
THERMOMETER S/N 531992 DUE DATE 12-11-04  
COUPLANT: Ultracel II BATCH: 012251

BLOCK TYPE: Rompas S/N: 790662  
 NOMINAL ANGLE: 60° ACTUAL ANGLE 60°

INSTRUMENT	
MANUFACTURER <u>KBA</u>	DUE DATE <u>5-27-04</u>
MODEL NO.: <u>USN 52 L</u>	S/N: <u>E18733✓</u>

### INSTRUMENT SETTINGS

REFLECTOR			REFERENCE SENSITIVITY	MEMORY NUMBER
SCAN DIRECT.	NTC	SDH		
AXIAL	<input type="checkbox"/>	<input type="checkbox"/>	59 dB	15
CIRC.	<input type="checkbox"/>	<input type="checkbox"/>	N/A dB	N/A
FREQ: 2-8	MH		REJECT: 0	%
ANGLE: 60	deg		DAMPING: 1000	ohms
DELAY: 0.0	msec		PULSER: Dual	✓ *
ZERO: 9.559	msec		PRR/PRF: High	✓
VELOCITY: 2290	msec		TOF: N/A	
RANGE: 5.0	inches		POWER: N/A	
DISP. MODE: FULL WAV ✓				

## CALIBRATION TIMES

INITIAL TIME: 2115 FINAL TIME 0913

4)	5)	6)	7)	8)	9)
----	----	----	----	----	----

**\*PDI QUALIFIED INSTRUMENT SETTINGS:**

**VERIFY INSTRUMENT SETTINGS AND CALIBRATION SEQUENCE ARE IN ACCORDANCE WITH TABLE 2 OF THE APPLICABLE PDI QUALIFICATION IMPLEMENTATION PROCEDURE!**

### LINEARITY CHECK

VERTICAL	SIGNAL 1		100	90	80	70	60	50	40	30	20	
	SIGNAL 2		50	45	40	35	30	25	20	15	10	
ATTENUATOR	GAIN	SET	-6 dB		-12dB		SET		+12		SET	+6
	AMP	80%	32 TO 48		16 TO 24		20%		64 TO 96		40%	64 TO 96
			40%		20%				80%			80%

COMMENTS	WELD/ITEMS EXAMINED
----------	---------------------

**DRHR-3-19**

EXAMINER: Ricky Michael LVL.: II

EXAMINER: *u/A* LVL.:

REVIEWER: *Mark Welch* LVL.: *III*

ANII: B. F. Kio

DATE 3/29/04

PAGE 3 OF 5

TENNESSEE VALLEY AUTHORITY				MANUAL ULTRASONIC PIPING EXAMINATION DATA SHEET				REPORT NUMBER <u>R086</u>			
PROJECT: <u>BFN</u> UNIT/CYCLE <u>3/11</u>				EXAMINATION DATE <u>3-4-04</u>							
SYSTEM <u>RHRS</u>				START TIME: <u>2250</u> END TIME: <u>2348</u>							
WELD I.D.: <u>DRHR-3-19</u>				EXAM SURFACE <input type="checkbox"/> ID <input checked="" type="checkbox"/> OD							
CONFIG.: <u>TEE</u> TO <u>P</u>				MATERIAL TYPE: <input type="checkbox"/> CS <input checked="" type="checkbox"/> SS <input type="checkbox"/> CSCL <input type="checkbox"/> CCSS							
FLOW				SURFACE TEMP. <u>77°</u> PYRO NO. <u>531992</u>							
PROCEDURE: <u>N-UT-64</u> REV: <u>7</u> TC: <u>N/A</u>				EXAMINATION ANGLE		<u>45</u> DEG.		<u>60</u> DEG.			
W <sub>0</sub> REFERENCE: <u>Weld E</u>				AXIAL SCAN SENSITIVITY		<u>34</u> dB		<u>59</u> dB			
L <sub>0</sub> REFERENCE: <u>TDC</u>				CIRC. SCAN SENSITIVITY		<u>34</u> dB		<u>N/A</u> dB			
IND NO.	L (in) FROM REF.			AT MAX AMP			MAX AMP % DAC	EXAM NO. 3-14	NOM. ANG.	NRI	INDICATION INFORMATION: TYPE, DAMPING, ETC.
	L1	L Max	L2	W MAX	MP MAX	D MAX					
								4	45°	<input checked="" type="checkbox"/>	
								5	45°	<input checked="" type="checkbox"/>	
								6	45°	<input checked="" type="checkbox"/>	
								4	60°	<input checked="" type="checkbox"/>	Proximately recorded root geometry scan at below recordable levels
										<input type="checkbox"/>	
										<input type="checkbox"/>	
REMARKS/LIMITATIONS											
EXAMINER: <u>Dickens Michael</u> LEVEL: <u>II</u>											
EXAMINER: _____ LEVEL: _____											
REVIEWED BY: <u>Heath Wheel</u> LEVEL: <u>III</u> DATE <u>3/6/04</u>											
ANII: <u>B. F. Rio</u>											
DATE <u>3/29/04</u>											
PAGE <u>4</u> OF <u>5</u>											

TVA

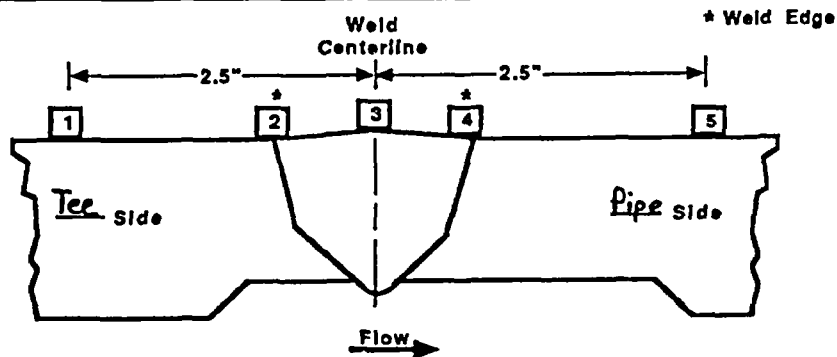
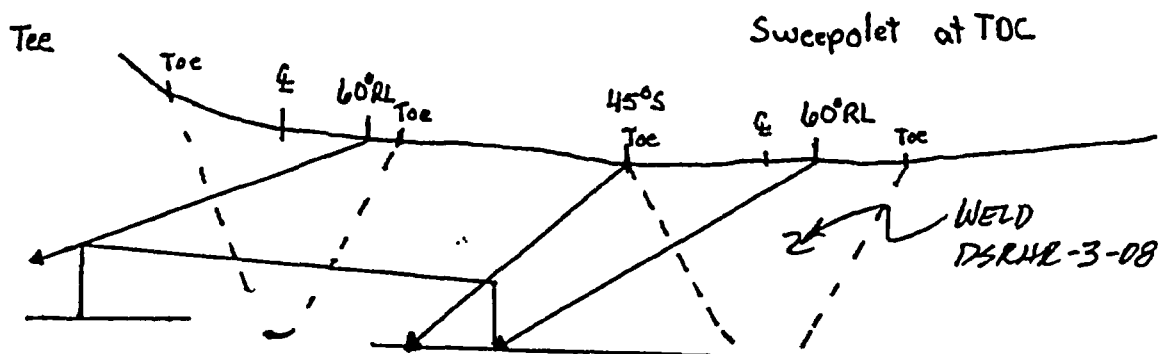
WALL THICKNESS  
PROFILE SHEET

REPORT NO:

R086

PROJECT: BFPWELD NO: DRHR-3-19UNIT: 3SYSTEM: RHRRecord Thickness Measurements As  
Indicated, Including Weld Width,  
Edge-To-Edge At 0°

Position	0°	90°	180°	270°
1	N/A			
2	1.050			
3	1.160			
4	1.152			
5	1.092			

CROWN HEIGHT: TaperedDIAMETER: 20"CROWN WIDTH: 1.3"WELD LENGTH: 63"Area Missed 6" Wide TOC 45° Shear, coverage obtained using 60°RL  
on 3/6/04

Previous T+C

EXAMINER: Dickey MichaelREVIEWED BY: Mark WhiteANII: B. F. RiceLEVEL: IILEVEL: IIIDATE: 3/6/04DATE: 3/29/04DATE: 3-4-04PAGE 5 OF 5

**Inspection Report R-140**  
**Weld DRHR-3-21**



00153

TENNESSEE VALLEY AUTHORITY		EXAMINATION SUMMARY AND RESOLUTION SHEET		REPORT NUMBER: <b>2140</b>	
PROJECT: BFN UNIT: 3		CYCLE: 10		COMPONENT ID: DRHR-3-21	
EXAMINATION METHOD				SYSTEM: RHR ISI DWG. NO. 3-ISI-0330-C-01	
MT <input type="checkbox"/>	PT <input type="checkbox"/>	UT <input checked="" type="checkbox"/>	VT <input type="checkbox"/>	CODE CLASS: 1	CATEGORY: R-A
PROCEDURE: N-UT-64		REV: 5	TC: N/A	CONFIG.: ELBOW	TO VALVE
EXAMINER: <i>Richard Money</i> Richard Money LEVEL: II		EXAMINER:  N/A LEVEL:		EXAMINER:  N/A LEVEL:	

Component # DRHR-3-21, a stainless steel elbow to valve weld, was ultrasonically examined utilizing a 45 degree shear wave and a 60 degree refracted longitudinal wave. Scans 3, 5, and 6, were performed utilizing a 1/2 node calibration. Single sided examination. All scans were performed maintaining a 5 to 20 % ID roll.

This examination satisfies the requirements of ASME Section XI *and URG 0313*  
Essentially 100 % of the ASME Section XI required volume was examined.  
50 % of 10CFR50.55a required volume examined.

This examination was performed with equipment, procedures, and personnel qualified in accordance with ASME Section XI, Appendix VIII as amended by the rule.

No recordable indications were observed.

RESOLUTION BY: <i>Richard Money</i> Richard Money LEVEL: II DATE: 3-31-2002		REVIEWED BY: <i>Darlene Duley</i> LEVEL: <i>II</i> DATE: <i>4-2-01</i>		ANII: <i>W. H. H. 4/17/02</i> DATE: <i>4/17/02</i> PG. <i>1</i> OF <i>5</i>	
--	--	--	--	---	--

00154

<b>TENNESSEE VALLEY AUTHORITY</b>		<b>DIGITAL ULTRASONIC CALIBRATION DATA SHEET</b>		<b>REPORT NUMBER:</b> <span style="font-size: 1.2em;">R140</span>									
PROJECT: <i>BFN</i> UNIT: <i>3</i> CYCLE: <i>10</i>		CALIBRATION DATE: <i>3-31-2002</i>											
PROC.: <i>N-UT-</i> <i>64</i> REV: <i>5</i> TC: <i>N/A</i>		CALIBRATION BLOCK NO.: <i>BF-87</i> ✓    TEMP: <i>76°F</i>											
INSTR. MFG: <i>Krautkramer</i> DUE DATE: <i>6-15-02</i>		SIMULATOR BLOCK NO: <i>83-3236</i>											
MODEL/TYPE: <i>USN-52L</i> M & TE NO.: <i>E21665</i>		THERMOMETER S/N: <i>562779</i> DUE DATE: <i>7-12-02</i>											
TRANSDUCER MFG: <i>KBA</i>		COUPLANT <i>Ultragel II</i> BATCH: <i>00325</i>											
S/N <i>00FCYT</i> SIZE: <i>0.5"</i> FREQ: <i>1.5</i> MHz		EXAM TYPE:    SHEAR <input checked="" type="checkbox"/> LONG <input type="checkbox"/> RL <input type="checkbox"/>											
CABLE TYPE: <i>RG-174</i> LENGTH: <i>72</i> inches		<b>ANGLE VERIFICATION</b>											
<b>DAC</b>		BLOCK TYPE: <i>Rompas</i>		S/N: <i>83-3236</i>									
		NOMINAL ANGLE: <i>45</i>		ACTUAL ANGLE: <i>43</i>									
<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;"> 100 80 60 40 20 0 </div> <div style="border: 1px solid black; width: 250px; height: 150px; position: relative;"> <div style="position: absolute; top: 10%; left: 10%; font-size: 0.8em;"> <i>10 NOTCHES</i>  <i>AX CIRC</i> </div> </div> <div style="margin-left: 10px; text-align: center;"> A M P L I T U D E </div> </div> <p style="margin-top: 10px;">DISPLAY WIDTH: <i>3.0</i> inches</p>		<b>INSTRUMENT SETTINGS</b>											
		<b>REFLECTOR</b>			<b>REFERENCE</b>		<b>MEMORY</b>						
		SCAN DIRECT.			SENSITIVITY		NUMBER						
		AXIAL			27.0 dB		1						
		CIRC			31.0 dB		1						
		*FREQ: <i>2-8</i> MHz			*REJECT: <i>0</i> %								
		ANGLE: <i>43</i> deg			*DAMPING: <i>1000</i> ohms								
		DELAY: <i>0.0</i> msec			*PULSER: <i>Single</i>								
		ZERO: <i>6.080</i> msec			FILTER: <i>N/A</i>								
		VELOCITY: <i>0.1210</i> msec			*REP RATE: <i>High</i>								
RANGE: <i>3.0</i> inches			TOF: <input type="checkbox"/> PEAK <input checked="" type="checkbox"/> FLANK										
*DISPLAY MODE: <i>Full</i>			POWER: <i>Battery</i>										
DUAL: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF			TCG: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF										
REF. REFLECTOR: <i>N/A</i>		GAIN: <i>N/A</i> dB		<b>CALIBRATION TIMES</b>									
AMPLITUDE: <i>N/A</i>		METAL PATH: <i>SD</i>		INITIAL TIME: <i>9:45</i>		FINAL TIME: <i>14:32</i>							
VERIFICATION TIMES		1) <i>N/A</i> 2) <i>N/A</i> 3) <i>N/A</i>		4) <i>N/A</i> 5) <i>N/A</i> 6) <i>N/A</i>		7) <i>N/A</i> 8) <i>N/A</i> 9) <i>N/A</i>							
<b>* PDI QUALIFIED INSTRUMENT SETTINGS:</b> <b>VERIFY INSTRUMENT SETTINGS AND CALIBRATION SEQUENCE ARE IN ACCORDANCE WITH TABLE 2</b> <b>OF THE APPLICABLE PDI QUALIFICATION IMPLEMENTATION PROCEDURE !</b>													
<b>LINEARITY CHECK</b>													
<b>VERTICAL</b>	SIGNAL 1		100	90	80	70	60	50	40	30	20		
	SIGNAL 2		50	45	40	35	30	25	20	15	10		
<b>ATTENUATOR</b>	GAIN	SET	-6 dB		-12 dB		SET		+12		SET	+6	
	AMP	80%	32 TO 48		16 TO 24		20 %		64 TO 96		40%	64 TO 96	
			40		20				80				
COMMENTS: <i>1/2 NODE CALIBRATION</i>								WELDS/ITEMS EXAMINED:					
								<i>DRHR-3-21</i>					
EXAMINER: <i>Richard Money</i> Richard Money LEVEL: <i>II</i>		EXAMINER:  N/A LEVEL:		REVIEWER: <i>Deane Eubank</i> LEVEL: <i>III</i> DATE: <i>4-20-01</i>				ANII: <i>Robert Todd</i> DATE: <i>4/17/02</i> PG.: <i>2</i> OF <i>5</i>					

00155

<b>TENNESSEE VALLEY AUTHORITY</b>			<b>DIGITAL ULTRASONIC CALIBRATION DATA SHEET</b>			<b>REPORT NUMBER:</b> <span style="font-size: 1.2em;">R140</span>						
PROJECT: <i>BFN</i> UNIT: <i>3</i> CYCLE: <i>10</i>			CALIBRATION DATE: <i>3-31-2002</i>									
PROC.: <i>N-UT-</i> <i>64</i> REV: <i>5</i> TC: <i>N/A</i>			CALIBRATION BLOCK NO.: <i>BF-87</i> TEMP: <i>76°F</i>									
INSTR. MFG: <i>Krautkramer</i> DUE DATE: <i>6-15-02</i>			SIMULATOR BLOCK NO: <i>83-3236</i>									
MODEL/TYPE: <i>USN-52L</i> M & TE NO.: <i>E21685</i>			THERMOMETER S/N: <i>562779</i> DUE DATE: <i>7-12-02</i>									
TRANSDUCER MFG: <i>KBA</i> <i>516mA</i> <i>PER D. T. 4/17/02</i>			COUPLANT <i>Ultragel</i> BATCH: <i>00325</i>									
S/N <i>223A94001</i> SIZE: <i>2(10X18)</i> FREQ: <i>2.0 MHz</i>			EXAM TYPE: SHEAR <input type="checkbox"/> LONG <input type="checkbox"/> RL <input checked="" type="checkbox"/>									
CABLE TYPE: <i>RG-174</i> LENGTH: <i>72 inches</i>			<b>ANGLE VERIFICATION</b>									
<b>DAC</b>			BLOCK TYPE: <i>Rompas</i>			S/N: <i>83-3236</i>						
			NOMINAL ANGLE: <i>60</i>			ACTUAL ANGLE: <i>59</i>						
<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;">100 80 60 40 20 0</div> <div style="border: 1px solid black; width: 200px; height: 150px; position: relative;"> <div style="position: absolute; top: 50%; left: 50%; transform: translate(-50%, -50%); font-size: 0.8em;">15 notch</div> </div> <div style="margin-left: 10px; text-align: center;">A M P L I T U D E</div> </div> <p style="margin-top: 10px;">DISPLAY WIDTH: 4.0 inches</p>			<b>INSTRUMENT SETTINGS</b>									
			<b>REFLECTOR</b>			<b>REFERENCE</b>		<b>MEMORY</b>				
			SCAN DIRECT.	NTCH	SDH	SENSITIVITY		NUMBER				
			AXIAL	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<i>57.0 dB</i>		<i>22</i>				
			CIRC	<input type="checkbox"/>	<input type="checkbox"/>	<i>N/A dB</i>		<i>N/A</i>				
			*FREQ: <i>2-8</i> MHz			*REJECT: <i>0</i> %						
			ANGLE: <i>59</i> deg			*DAMPING: <i>1000</i> ohms						
			DELAY: <i>0.0</i> msec			*PULSER: <i>Dual</i>						
			ZERO: <i>8.408</i> msec			FILTER: <i>N/A</i>						
			VELOCITY: <i>0.230</i> msec			*REP RATE: <i>High</i>						
RANGE: <i>4.0</i> inches			TOF: <input type="checkbox"/> PEAK <input checked="" type="checkbox"/> FLANK									
*DISPLAY MODE: <i>Full</i>			POWER: <i>Battery</i>									
DUAL: <input checked="" type="checkbox"/> ON <input type="checkbox"/> OFF			TCG: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF									
REF. REFLECTOR: <i>N/A</i> GAIN: <i>N/A</i> dB			<b>CALIBRATION TIMES</b>									
AMPLITUDE: <i>N/A</i> %    METAL PATH: <i>N/A"</i>			INITIAL TIME: <i>10:00</i>			FINAL TIME: <i>14:30</i>						
VERIFICATION TIMES    1) <i>N/A</i> 2) <i>N/A</i> 3) <i>N/A</i>			4) <i>N/A</i> 5) <i>N/A</i> 6) <i>N/A</i>			7) <i>N/A</i> 8) <i>N/A</i> 9) <i>N/A</i>						
<b>* PDI QUALIFIED INSTRUMENT SETTINGS:</b> <b>VERIFY INSTRUMENT SETTINGS AND CALIBRATION SEQUENCE ARE IN ACCORDANCE WITH TABLE 2</b> <b>OF THE APPLICABLE PDI QUALIFICATION IMPLEMENTATION PROCEDURE !</b>												
<b>LINEARITY CHECK</b>												
VERTICAL	SIGNAL 1		100	90	80	70	60	50	40	30	20	
	SIGNAL 2		50	45	40	35	30	25	20	15	10	
ATTENUATOR	GAIN	SET	-6 dB		-12 dB		SET		+12		SET	+6
	AMP	80%	32 TO 48		16 TO 24		20 %		64 TO 96		40%	64 TO 96
			40		20				80			80
COMMENTS: <i>1/2 NODE CALIBRATION</i>						WELDS/ITEMS EXAMINED:						
						<i>DRHR-3-21</i>						
EXAMINER: <i>Richard Money</i> Richard Money LEVEL: <i>II</i>			EXAMINER:  N/A LEVEL:			REVIEWER: <i>Darlene Culay</i> LEVEL: <i>IV</i> DATE: <i>4-2002</i>			ANL: <i>What Hall</i> DATE: <i>4/17/02</i> PG.: <i>3</i> OF <i>5</i>			

00156

[illegible]

00157

REPORT NO:

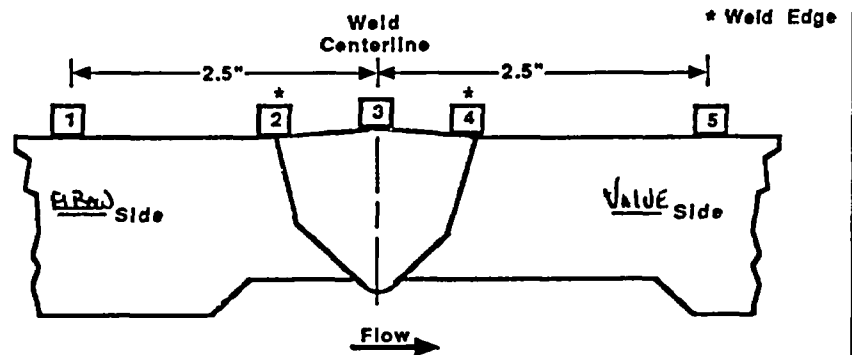
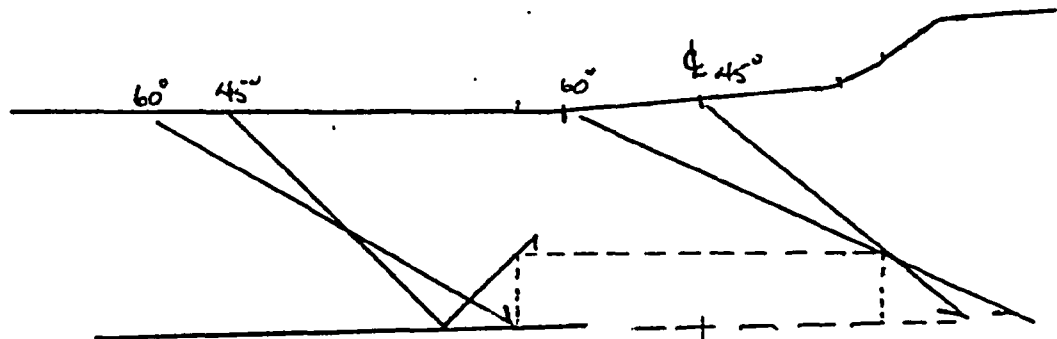
TVA

WALL THICKNESS  
PROFILE SHEET

R140

PROJECT: BNPWELD NO: DRHR-3-21UNIT: 3SYSTEM: RHRRecord Thickness Measurements As  
Indicated, Including Weld Width,  
Edge-To-Edge At 0°

Position	0°	90°	180°	270°
1	1.23			
2	1.19			
3	1.20			
4	N/A			
5	N/A			

CROWN HEIGHT: FlushDIAMETER: 20"CROWN WIDTH: 1.5"WELD LENGTH: 60.45"

THICKNESS &amp; CONTOUR DATA TAKEN from Previous DATA

EXAMINER: Richard HanyREVIEWED BY: De. Anne PruleyANII: Albert HallLEVEL: IILEVEL: IIIDATE: 4-2-02DATE: 4/17/02DATE: 3-31-2002PAGE: 5 OF 5

**Inspection Report R-189**  
**Weld TRHR-3-191**

00337 ✓

TENNESSEE VALLEY AUTHORITY		EXAMINATION SUMMARY AND RESOLUTION SHEET		REPORT NUMBER: <i>R189</i>	
PROJECT: BFN UNIT: 3		CYCLE: 11		COMPONENT ID: TRHR-3-191	
EXAMINATION METHOD				SYSTEM: RHR ISI DWG. NO: 3-ISI-0330-C-01	
MT <input type="checkbox"/>	PT <input type="checkbox"/>	UT <input checked="" type="checkbox"/>	VT <input type="checkbox"/>	CODE CLASS: 1	CATEGORY: R-A
PROCEDURE: N-82-UT		REV: 1	TC: NA	COFIG.: VALVE	to ELBOW
EXAMINER: EDWARD MAZYCK PER TEL-CON WHIP 3-17-04		EXAMINER:  NA		EXAMINER:  NA	EXAMINER:  NA
LEVEL:		LEVEL:		LEVEL:	LEVEL:

This report contains the data associated with the manual ultrasonic examination of the TRHR-3-191 Weld

The weld was examined with a 45, 60 degree RL and 45, 60 degree S transducers from the elbow side and recordable indications were observed which plotted to root geometry. The procedure utilized for this examination was N-UT-82 rev-1.

Examination volume combined coverage 100%.

*10CFR 50.55a coverage is 50% due to single side access and cast austenitic material of valve body. Main weld 4/6/04*

This examination satisfies the requirements of ASME Sec. XI, Category R-A, for item number R1.16C, also the exam volume required by procedure, and was performed using ASME Sec XI, Appendix VIII qualified personnel, procedures, and equipment as amended by the Final Rule.

*Reference RFR# 3-ISI-16, 4/28/04*

RESOLUTION BY: <i>Man Udeh</i>	REVIEWED BY: <i>Whip</i>	ANII: <i>Sal Thurl</i>
LEVEL: <i>III</i> DATE: 3/19/04	LEVEL: <i>II</i> DATE: 3-16-04	DATE: 3/29/04
		PG. 1 OF 10

00338

<b>TENNESSEE VALLEY AUTHORITY</b>			<b>DIGITAL ULTRASONIC CALIBRATION DATA SHEET</b>			<b>REPORT NUMBER:</b> <i>R189</i>						
PROJECT: BFN UNIT 3			CYCLE: 11			CALIBRATION DATE: 03/06/04						
PROC.: N-UT-82			REV:01 TC: N/A			CALIBRATION BLOCK NO.: BF-87 TEMP: 67° F						
INSTR. MFG: Staveley			DUE DATE: 5/11/04			SIMULATOR BLOCK NO: 7500551						
MODEL/TYPE: Sonic136			M & TE NO.: VH-8034			THERMOMETER S/N: VH-9058 DUE DATE: 04/06/04						
TRANSDUCER MFG: RTD / TRLA						COUPLANT Sonotrace BATCH: 01141						
S/N DB 34638 SIZE:2(10x18) FREQ: 2.0 MHz						EXAM TYPE: SHEAR <input type="checkbox"/> LONG <input type="checkbox"/> RL <input checked="" type="checkbox"/>						
CABLE TYPE: RG-174			LENGTH: 72 inches			<b>ANGLE VERIFICATION</b>						
<b>DAC</b>			BLOCK TYPE: Rompus			S/N: 7500551						
			NOMINAL ANGLE: 60RL°			ACTUAL ANGLE: 60RL°						
<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;"> 100 80 60 40 20 0 </div> <div style="border: 1px solid black; width: 200px; height: 150px; position: relative;"> <div style="position: absolute; top: 10%; left: 10%; font-size: 8px;">FAR SDH</div> <div style="position: absolute; top: 15%; left: 30%;">X</div> <div style="position: absolute; top: 15%; left: 40%; font-size: 8px;">2.0 NDTCH</div> <div style="position: absolute; top: 40%; left: 10%; font-size: 8px;">NEAR SDH</div> </div> <div style="margin-left: 10px; text-align: center;"> A M P L I T U D E </div> </div>			<b>INSTRUMENT SETTINGS</b>									
			<b>REFLECTOR</b>			<b>REFERENCE</b>		<b>MEMORY</b>				
			SCAN DIRECT. NTCH SDH			SENSITIVITY		NUMBER				
			AXIAL <input checked="" type="checkbox"/> <input type="checkbox"/>			65.0 dB		18				
			CIRC <input type="checkbox"/> <input type="checkbox"/>			N/A dB		N/A				
			*FREQ: 2.25 MHz			*REJECT: OFF %						
			ANGLE: 60RL° deg			*DAMPING: 500 ohms						
			DELAY: 1.30" msec			*PULSER: 250 $\mu$ s						
			ZERO: N/A msec			FILTER: 2						
			VELOCITY: 0.257" msec			*PRR/PRF: 4 KHz						
RANGE: 4.0' inches			TOF: <input checked="" type="checkbox"/> PEAK <input type="checkbox"/> FLANK									
*DISPLAY MODE: Dual			TCG: ON <input type="checkbox"/> OFF <input checked="" type="checkbox"/>									
REF. REFLECTOR: Near Hole			GAIN: 58.0 dB			<b>CALIBRATION TIMES</b>						
AMPLITUDE: 54%			METAL PATH: .36" Depth			INITIAL TIME: 1940 FINAL TIME: 0105						
VERIFICATION TIMES			1) 2135 2) 0005 3)			4) 5) 6) 7) 8) 9)						
<b>* PDI QUALIFIED INSTRUMENT SETTINGS:</b> <b>VERIFY INSTRUMENT SETTINGS AND CALIBRATION SEQUENCE ARE IN ACCORDANCE WITH TABLE 2</b> <b>OF THE APPLICABLE PDI QUALIFICATION IMPLEMENTATION PROCEDURE !</b>												
<b>LINEARITY CHECK</b>												
<b>VERTICAL</b>	SIGNAL 1		100	90	80	70	60	50	40	30	20	10
	SIGNAL 2		50	45	40	35	30	25	20	15	10	5
<b>ATTENUATOR</b>	GAIN	SET	-6 dB		-12 dB		SET		+12		SET	
	AMP	80	32-48		16-24		20		64-96		40	
			40		20		80		80			
<b>COMMENTS:</b>						<b>WELDS/ITEMS EXAMINED:</b>						
60° RL was used to perform axial scans.						TRHR-3-191						
Cal. Check was performed between transducer changes.						Valve to Elbow						
Far hole .76" depth @80% 58.0db												
Near hole .36" depth @54% 58.0db												
<b>EXAMINER:</b> Edward Mazyck <i>Edward Mazyck</i>			<b>EXAMINER:</b> <i>N/A</i>			<b>REVIEWER:</b> <i>[Signature]</i>			<b>ANIL:</b> <i>[Signature]</i>			
<b>LEVEL: II</b>			<b>LEVEL:</b>			<b>LEVEL: II</b> <b>DATE: 3/16/04</b>			<b>DATE: 3/29/04</b> <b>PG. 2 OF 10</b>			



00339

<b>TENNESSEE VALLEY AUTHORITY</b>			<b>DIGITAL ULTRASONIC CALIBRATION DATA SHEET</b>			<b>REPORT NUMBER:</b> <i>R189</i>						
PROJECT: BFN UNIT 3			CYCLE: 11			CALIBRATION DATE: 03/06/04						
PROC.: N-UT-82			REV:01 TC: N/A			CALIBRATION BLOCK NO.: BF-87 TEMP: 67° F						
INSTR. MFG: Staveley			DUE DATE: 5/11/04			SIMULATOR BLOCK NO: 7500551						
MODEL/TYPE: Sonic136			M & TE NO.: VH-8034			THERMOMETER S/N: VH-9058 DUE DATE: 04/06/04						
TRANSDUCER MFG: KBA / COMP-B						COUPLANT Sonotrace BATCH: 01141						
S/N DB 34739 SIZE: 0.5" FREQ: 1.5 MHz						EXAM TYPE: SHEAR <input checked="" type="checkbox"/> LONG <input type="checkbox"/> RL <input type="checkbox"/>						
CABLE TYPE: RG-174			LENGTH: 72 inches			<b>ANGLE VERIFICATION</b>						
			BLOCK TYPE: Rompus			S/N: 7500551						
<b>DAC</b>			NOMINAL ANGLE: 605°			ACTUAL ANGLE: 605°						
<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;"> 100 80 60 40 20 0 </div> <div style="border: 1px solid black; width: 280px; height: 180px; position: relative;"> <div style="position: absolute; top: 10%; left: 10%;">NEAR SDH</div> <div style="position: absolute; top: 15%; left: 25%;">TO NOTCH</div> <div style="position: absolute; top: 45%; left: 35%;">FAR SDH</div> </div> <div style="margin-left: 10px; text-align: center;"> A M P L I T U D E </div> </div>			<b>INSTRUMENT SETTINGS</b>									
			<b>REFLECTOR</b>			<b>REFERENCE</b>		<b>MEMORY</b>				
			SCAN DIRECT. NTCH SDH			SENSITIVITY		NUMBER				
			AXIAL <input checked="" type="checkbox"/> <input type="checkbox"/>			40.4 dB		16				
			CIRC <input type="checkbox"/> <input type="checkbox"/>			N/A dB		N/A				
			*FREQ: 2.25 MHz			*REJECT: OFF %						
			ANGLE: 60° deg			*DAMPING: 500 ohms						
			DELAY: 0.314" msec			*PULSER: 334 ps						
			ZERO: N/A msec			FILTER: 2						
			VELOCITY: 0.123" msec			*PRR/PRF: 4 KHz						
RANGE: 4.0" inches			TOF: <input type="checkbox"/> PEAK <input checked="" type="checkbox"/> FLANK									
*DISPLAY MODE: P E			TCG: ON <input type="checkbox"/> OFF <input checked="" type="checkbox"/>									
DISPLAY WIDTH: inches 2.0" Depth												
REF. REFLECTOR: Near Hole			GAIN: 36.0 dB			<b>CALIBRATION TIMES</b>						
AMPLITUDE: 80%			METAL PATH: .38" Depth			INITIAL TIME: 0200 FINAL TIME: 0610						
VERIFICATION TIMES			1) 2105 2) 2330 3)			4) 5) 6) 7) 8) 9)						
<b>* PDI QUALIFIED INSTRUMENT SETTINGS:</b> <b>VERIFY INSTRUMENT SETTINGS AND CALIBRATION SEQUENCE ARE IN ACCORDANCE WITH TABLE 2</b> <b>OF THE APPLICABLE PDI QUALIFICATION IMPLEMENTATION PROCEDURE !</b>												
<b>LINEARITY CHECK</b>												
VERTICAL	SIGNAL 1		100	90	80	70	60	50	40	30	20	10
	SIGNAL 2		50	45	40	35	30	25	20	15	10	5
ATTENUATOR	GAIN	SET	-6 dB		-12 dB		SET		+12		SET	
	AMP	80	32-48		16-24		20		64-96		40	
			40		20				80		80	
<b>COMMENTS:</b>						<b>WELDS/ITEMS EXAMINED:</b>						
60° shear was used to perform axial scans.						TRHR-3-191						
Cal. Check was performed between transducer changes.						Valve to Elbow						
Far Hole .80" depth @40% 36.0db												
Near hole .38" depth @80% 36.0db												
<b>EXAMINER:</b> Edward P. Mazyck <i>Edward P. Mazyck</i>			<b>EXAMINER:</b>  <i>N/A</i>			<b>REVIEWER:</b> <i>W. H. H.</i>			<b>ANI:</b> <i>Ed. H.</i>			
<b>LEVEL: II</b>			<b>LEVEL:</b>			<b>LEVEL: II</b> <b>DATE: 3-16-04</b>			<b>DATE: 3/29/04</b>			
									<b>PG. 3 OF 10</b>			

00340

<b>TENNESSEE VALLEY AUTHORITY</b>			<b>DIGITAL ULTRASONIC CALIBRATION DATA SHEET</b>			<b>REPORT NUMBER:</b> <i>R189</i>						
PROJECT: BFN UNIT 3			CYCLE: 11			CALIBRATION DATE: 03/06/04						
PROC.: N-UT-82			REV:01 TC: N/A			CALIBRATION BLOCK NO.: BF-87 TEMP: 67° F						
INSTR. MFG: Staveley			DUE DATE: 5/11/04			SIMULATOR BLOCK NO: 7500551						
MODEL/TYPE: Sonic136			M & TE NO.: VH-8034			THERMOMETER S/N: VH-9058 DUE DATE: 04/06/04						
TRANSDUCER MFG: RTD / TRLA						COUPLANT Sonotrace BATCH: 01141						
S/N DB 35359 SIZE: 2(15x25) FREQ: 2.0 MHz						EXAM TYPE: SHEAR <input type="checkbox"/> LONG <input type="checkbox"/> RL <input checked="" type="checkbox"/>						
CABLE TYPE: RG-174			LENGTH: 72 inches			<b>ANGLE VERIFICATION</b>						
<b>DAC</b>			BLOCK TYPE: Rompus			S/N: 7500551						
			NOMINAL ANGLE: 45RL°			ACTUAL ANGLE: 45RL°						
<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;">100 80 60 40 20 0</div> <div style="border: 1px solid black; width: 200px; height: 200px; position: relative;"> <div style="position: absolute; top: 10%; left: 10%;">FAR SDH</div> <div style="position: absolute; top: 15%; left: 25%;">SDH</div> <div style="position: absolute; top: 15%; left: 45%;">NOTCH</div> <div style="position: absolute; top: 25%; left: 10%;">NEAR SDH</div> </div> <div style="margin-left: 10px; text-align: center;">A M P L I T U D E</div> </div> <p style="margin-top: 10px;">DISPLAY WIDTH: inches 2.0" Depth</p>			<b>INSTRUMENT SETTINGS</b>									
			<b>REFLECTOR</b>			<b>REFERENCE</b>		<b>MEMORY</b>				
			SCAN DIRECT.	NTCH	SDH	SENSITIVITY		NUMBER				
			AXIAL	<input checked="" type="checkbox"/>	<input type="checkbox"/>	52.0 dB		19				
			CIRC	<input type="checkbox"/>	<input type="checkbox"/>	N/A dB		N/A				
			*FREQ: 2.25 MHz			*REJECT: OFF %						
			ANGLE: 45RL° deg			*DAMPING: 500 ohms						
			DELAY: 1.36" msec			*PULSER: 250 ns						
			ZERO: N/A msec			FILTER: 2						
			VELOCITY: 0.248" msec			*PRR/PRF: 4 KHz						
RANGE: 2.82" inches			TOF: <input checked="" type="checkbox"/> PEAK <input type="checkbox"/> FLANK									
*DISPLAY MODE: Dual			TCG: ON <input type="checkbox"/> OFF <input checked="" type="checkbox"/>									
REF. REFLECTOR: Near Hole			GAIN: 45.0 dB			<b>CALIBRATION TIMES</b>						
AMPLITUDE: 20%			METAL PATH: .34" Depth			INITIAL TIME: 1945 FINAL TIME: 0110						
VERIFICATION TIMES			1) 2210	2)	3)	4)	5)	6)	7)	8)	9)	
<b>* PDI QUALIFIED INSTRUMENT SETTINGS:</b> <b>VERIFY INSTRUMENT SETTINGS AND CALIBRATION SEQUENCE ARE IN ACCORDANCE WITH TABLE 2</b> <b>OF THE APPLICABLE PDI QUALIFICATION IMPLEMENTATION PROCEDURE !</b>												
<b>LINEARITY CHECK</b>												
VERTICAL	SIGNAL 1		100	90	80	70	60	50	40	30	20	10
	SIGNAL 2		50	45	40	35	30	25	20	15	10	5
ATTENUATOR	GAIN	SET	-6 dB	-12 dB	SET	+12	SET	+6				
	AMP	80	32-48	16-24	20	64-96	40	64-96				
			40	20		80		80				
<b>COMMENTS:</b>						<b>WELDS/ITEMS EXAMINED:</b>						
45° RL was used to perform axial scans.						TRHR-3-191						
Cal. Check was performed between transducer changes.						Valve to Elbow						
Far hole .74" depth @ 80% 45 db												
Near hole .34" depth @ 20% 45 db												
EXAMINER:			EXAMINER:			REVIEWER:			ANH: <i>Lat Flum</i>			
<i>Edward P. Mazyck</i>			<i>N/A</i>			<i>[Signature]</i>			DATE: 3/29/04			
LEVEL: II			LEVEL:			LEVEL: II DATE: 3-16-04			PG. 4 OF 10			

00341

<b>TENNESSEE VALLEY AUTHORITY</b>			<b>DIGITAL ULTRASONIC CALIBRATION DATA SHEET</b>			<b>REPORT NUMBER:</b> <i>R189</i>							
PROJECT: BFN UNIT 3			CYCLE: 11			CALIBRATION DATE: 03/06/04							
PROC.: N-UT-82			REV:01 TC: N/A			CALIBRATION BLOCK NO.: BF-87 TEMP: 67 ° F							
INSTR. MFG: Staveley			DUE DATE: 5-11-04			SIMULATOR BLOCK NO: 7500551							
MODEL/TYPE: Sonic136			M & TE NO.: VH-8034			THERMOMETER S/N: VH-9058 DUE DATE: 04-06-04							
TRANSDUCER MFG: RTD / TRLA						COUPLANT Sonotrace BATCH: 01141							
S/N DB 35258 SIZE:2(10x18)			FREQ: 1.0 MHz			EXAM TYPE: SHEAR <input type="checkbox"/> LONG <input type="checkbox"/> RL <input checked="" type="checkbox"/>							
CABLE TYPE: RG-174			LENGTH: 72 inches			<b>ANGLE VERIFICATION</b>							
<b>DAC</b>			BLOCK TYPE: Rompus			S/N: 7500551							
			NOMINAL ANGLE: 45RL°			ACTUAL ANGLE: 45RL°							
<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;">100 80 60 40 20 0</div> <div style="border: 1px solid black; width: 280px; height: 180px; position: relative;"> <div style="position: absolute; top: 10px; left: 10px; font-size: 8px;">NEAR SDH</div> <div style="position: absolute; top: 10px; left: 150px; font-size: 8px;">FAR SDH</div> <div style="position: absolute; top: 10px; left: 250px; font-size: 8px;">TO MATCH</div> </div> <div style="margin-left: 10px; writing-mode: vertical-rl; transform: rotate(180deg);">A M P L I T U D E</div> </div>			<b>INSTRUMENT SETTINGS</b>										
			<b>REFLECTOR</b>			REFERENCE		MEMORY					
			SCAN DIRECT.			NTCH		SDH		SENSITIVITY	NUMBER		
			AXIAL			<input type="checkbox"/>		<input type="checkbox"/>		N/A dB	N/A		
			CIRC			<input checked="" type="checkbox"/>		<input type="checkbox"/>		49.6 dB	20		
			*FREQ: 1.0			MHz		*REJECT: OFF		%			
			ANGLE: 45RL°			deg		*DAMPING: 500		ohms			
			DELAY: 1.35°			msec		*PULSER: 500		qs			
			ZERO: N/A			msec		FILTER: 3					
			VELOCITY: 0.248°			msec		*PRR/PRF: 2 KHz					
RANGE: 2.82°			inches		TOF: <input checked="" type="checkbox"/> PEAK <input type="checkbox"/> FLANK								
*DISPLAY MODE: Dual					TCG: ON <input type="checkbox"/> OFF <input checked="" type="checkbox"/>								
DISPLAY WIDTH: inches 2.0° Depth REF. REFLECTOR: Near Hole GAIN: 46.4 dB AMPLITUDE: 62% METAL PATH: .36° Depth VERIFICATION TIMES 1) 2305 2) 3) 4) 5) 6) 7) 8) 9)			<b>CALIBRATION TIMES</b>										
			INITIAL TIME: 2000 FINAL TIME: 0115 * PDI QUALIFIED INSTRUMENT SETTINGS: VERIFY INSTRUMENT SETTINGS AND CALIBRATION SEQUENCE ARE IN ACCORDANCE WITH TABLE 2 OF THE APPLICABLE PDI QUALIFICATION IMPLEMENTATION PROCEDURE !										
<b>LINEARITY CHECK</b>													
<b>VERTICAL</b>		SIGNAL 1		100	90	80	70	60	50	40	30	20	10
		SIGNAL 2		50	45	40	35	30	25	20	15	10	5
<b>ATTENUATOR</b>		GAIN	SET	-6 dB	-12 dB	SET	+12	SET	+6				
		AMP	80	32-48	16-24	20	64-96	40	64-96				
				40	20	80		80					
<b>COMMENTS:</b>						<b>WELDS/ITEMS EXAMINED:</b>							
45° RL was used to perform circumferential scans.						TRHR-3-191							
Cal. Check was performed between transducer change.						Valve to Elbow							
Far hole .76" depth @80% 46.4db													
Near hole .36" depth @62% 46.4db													
<b>EXAMINER:</b> Edward Mazyck <i>Edward Mazyck</i>			<b>EXAMINER:</b>  <i>1/A</i>			<b>REVIEWER:</b>  <i>W. H. [Signature]</i>			<b>ANII:</b> <i>Paul Flinn</i>				
<b>LEVEL:</b> II			<b>LEVEL:</b>			<b>LEVEL:</b> II <b>DATE:</b> 3-16-04			<b>DATE:</b> 3/29/04				
									<b>PG.</b> 5 OF 10				

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<b>TENNESSEE VALLEY AUTHORITY</b>			<b>DIGITAL ULTRASONIC CALIBRATION DATA SHEET</b>			<b>REPORT NUMBER:</b> <i>R189</i>							
PROJECT: BFN UNIT 3			CYCLE: 11			CALIBRATION DATE: 03/06/04							
PROC.: N-UT-82			REV:01 TC: N/A			CALIBRATION BLOCK NO.: BF-87 TEMP: 67 ° F							
INSTR. MFG: Staveley			DUE DATE: 5/11/04			SIMULATOR BLOCK NO: 7500551							
MODEL/TYPE: Sonic136			M & TE NO.: VH-8034			THERMOMETER S/N: VH-9058 DUE DATE: 04-06-04							
TRANSDUCER MFG: KBA / COMP-B						COUPLANT Sonotrace BATCH: 01141							
S/N DB 34739 SIZE: 0.5'			FREQ: 1.5 MHz			EXAM TYPE: SHEAR <input checked="" type="checkbox"/> LONG <input type="checkbox"/> RL <input type="checkbox"/>							
CABLE TYPE: R6-174			LENGTH: 72 inches			<b>ANGLE VERIFICATION</b>							
<b>DAC</b>			BLOCK TYPE: Rompus			S/N: 7500551							
			NOMINAL ANGLE: 45s°			ACTUAL ANGLE: 45s°							
			<b>INSTRUMENT SETTINGS</b>										
<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;">100 80 60 40 20 0</div> <div style="border: 1px solid black; width: 280px; height: 160px; position: relative;"> <div style="position: absolute; top: 10px; right: 10px; font-size: 8px;">TO NOTCH</div> <div style="position: absolute; top: 40px; left: 10px; font-size: 8px;">NEAR SDH</div> <div style="position: absolute; top: 40px; left: 200px; font-size: 8px;">FAR SDH</div> </div> <div style="margin-left: 10px; text-align: center;">A M P L I T U D E</div> </div>			<b>REFLECTOR</b>		<b>REFERENCE</b>		<b>MEMORY</b>						
			SCAN DIRECT.		NTCH		SDH		SENSITIVITY				
			AXIAL		<input type="checkbox"/>		<input type="checkbox"/>		N/A dB				
			CIRC		<input checked="" type="checkbox"/>		<input type="checkbox"/>		24.0 dB				
			*FREQ: 2.25		MHz		*REJECT: OFF		%				
			ANGLE: 45s°		deg		*DAMPING: 500		ohms				
			DELAY: 0.290"		msec		*PULSER: 334 ns						
			ZERO: N/A		msec		FILTER: 2						
			VELOCITY: 0.123"		msec		*PRR/PRF: 4 KHz						
			RANGE: 2.82"		inches		TOF: <input type="checkbox"/> PEAK <input checked="" type="checkbox"/> FLANK						
*DISPLAY MODE: P E				TCG: ON <input type="checkbox"/> OFF <input checked="" type="checkbox"/>									
REF. REFLECTOR: Near Hole			GAIN: 27.0 dB			<b>CALIBRATION TIMES</b>							
AMPLITUDE: 50%			METAL PATH: .36" Depth			INITIAL TIME: 1955 FINAL TIME: 0125							
VERIFICATION TIMES			1)2242 2) 3) 4) 5) 6) 7) 8) 9)										
* PDI QUALIFIED INSTRUMENT SETTINGS:													
VERIFY INSTRUMENT SETTINGS AND CALIBRATION SEQUENCE ARE IN ACCORDANCE WITH TABLE 2 OF THE APPLICABLE PDI QUALIFICATION IMPLEMENTATION PROCEDURE !													
<b>LINEARITY CHECK</b>													
VERTICAL		SIGNAL 1		100	90	80	70	60	50	40	30	20	10
		SIGNAL 2		50	45	40	35	30	25	20	15	10	5
ATTENUATOR		GAIN	SET	-6 dB		-12 dB		SET	+12		SET	+6	
		AMP	80	32-48		16-24		20	64-96		40	64-96	
				40		20			80			80	
COMMENTS:						WELDS/ITEMS EXAMINED:							
45° shear was used to perform circumferential scans.						TRHR-3-191							
Cal. Check was performed between transducer changes.						Valve to Elbow							
Far hole .76" depth @35% 27db													
Near hole .36" depth @ 50% 27db													
EXAMINER:			EXAMINER:			REVIEWER:			ANII: <i>Set Flaw</i>				
Edward P. Mazyck			<i>N/A</i>			<i>[Signature]</i>			DATE: 3/29/04				
LEVEL: II			LEVEL:			LEVEL: II DATE: 3/16/04			PG. 6 OF 10				

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TENNESSEE VALLEY AUTHORITY				ULTRASONIC PIPING EXAMINATION DATA SHEET				REPORT NUMBER: <i>R189</i>			
PROJECT: BFN		UNIT: 3		CYCLE: 11		EXAMINATION DATE: 03/06/04					
PROCEDURE: N-UT-82		REV: 1		TC: N/A		START TIME: 2243		END TIME: 2325			
SYSTEM: RHRS		ISI DWG. NO: 3-ISI-0330-C / Rev.01				EXAM SURFACE		<input type="checkbox"/> ID		<input checked="" type="checkbox"/> OD	
COMPONENT ID: TRHR-3-191						MATL. TYPE:		<input checked="" type="checkbox"/> CS		<input checked="" type="checkbox"/> SS <input type="checkbox"/> CSCL <input type="checkbox"/> CCSS	
CONFIGURATION VALVE TO ELBOW FLOW →						SURFACE TEMP.: 62 °F		PYRO. NO.: VH-9058			
						CAL DUE DATE: 04/06/04					
W <sub>0</sub> REFERENCE: SS/CS INTERFACE						EXAM ANGLE		45 RL DEG		45 Shear DEG	
L <sub>0</sub> REFERENCE: OUTSIDE RADIUS OF ELBOW						CIRC. SCAN SENSITIVITY		49.6 dB		24.0 dB	
						AXIAL SCAN SENSITIVITY		N/A dB		N/A dB	
IND. NO.	L (in) FROM REF.			AT MAX AMP			MAX AMP %DAC	EXAM NO. 3-14	NOM. ANG.	N R I	IND. INFO: TYPE, DAMPING, ETC.
	L1	L MAX	L2	W MAX	MP MAX	D MAX					
							%	5	45 RL	X	
							%	6	45 RL	X	
							%	5	45 S	X	
							%	6	45 S	X	
							%				
<b>REMARKS / LIMITATIONS:</b> 45°RL and 45°S where used to perform circumferential scans parallel to the weld and on the weld. No exam perform upstream due to component configuration. 100% coverage was achieved per procedure requirements.											
EXAMINER: Edward P. Mazyck <i>Edward P. Mazyck</i> LEVEL: II											
ANIL <i>Anil</i>											
EXAMINER: LEVEL: DATE: 3/24/04											
REVIEWER: <i>[Signature]</i> LEVEL: II DATE: 3-16-04											
PAGE 67 OF 10											

*WJH/14*

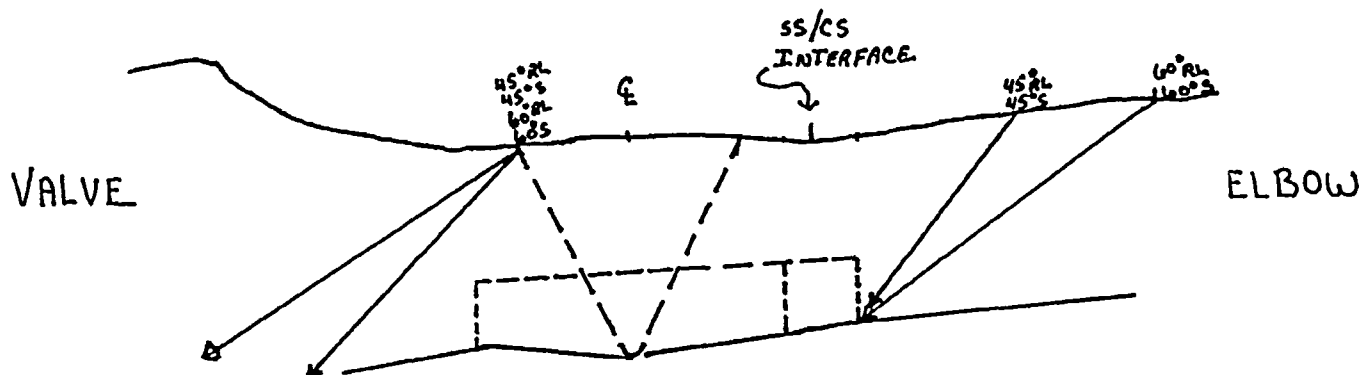
TENNESSEE VALLEY AUTHORITY				ULTRASONIC PIPING EXAMINATION DATA SHEET				REPORT NUMBER: <i>R189</i>			
PROJECT: BFN		UNIT: 3		CYCLE: 11		EXAMINATION DATE: 03/06/04					
PROCEDURE: N-UT-82		REV: 1		TC: N/A		START TIME: 2106		END TIME: 2133			
SYSTEM: RHRS		ISI DWG. NO: 3-ISI-0330-C / Rev.01				EXAM SURFACE		<input type="checkbox"/> ID		<input checked="" type="checkbox"/> OD	
COMPONENT ID: TRHR-3-191						MATL. TYPE:		<input checked="" type="checkbox"/> CS		<input checked="" type="checkbox"/> SS	
<b>CONFIGURATION</b> VALVE TO ELBOW FLOW →						SURFACE TEMP.: 62 °F		PYRO. NO.: VH-9058			
						CAL DUE DATE: 04/06/04					
						EXAM ANGLE		45 RL DEG		60 Shear DEG	
W <sub>0</sub> REFERENCE: SS/CS INTERFACE						CIRC. SCAN SENSITIVITY		N/A dB		N/A dB	
L <sub>0</sub> REFERENCE: OUTSIDE RADIUS OF ELBOW						AXIAL SCAN SENSITIVITY		52.0 dB		40.4 dB	
IND. NO.	L (in) FROM REF.			AT MAX AMP			MAX AMP %DAC	EXAM NO. 3-14	NOM. ANG.	N R I	IND. INFO: TYPE, DAMPING, ETC.
	L1	L MAX	L2	W MAX	MP MAX	D MAX					
1		31.5"		.6"	2.1"	1.05"	65%	4	60°s		Root geometry seen Intermittently 360° at and below recordable.
							%	4	45RL	X	
							%				
							%				
							%				
<b>REMARKS / LIMITATIONS:</b> 45°RL and 60°S where used to perform axial scans perpendicular to the weld and across the weld. No exam perform upstream due to component configuration.											
100% coverage was achieved per procedure requirements.											
EXAMINER: Edward P. Mazyck <i>Edward P. Mazyck</i>								LEVEL: II		ANI: <i>[Signature]</i>	
EXAMINER:								LEVEL:		DATE: 3/29/04	
REVIEWER: <i>[Signature]</i>								LEVEL: II		DATE: 3-16-04	
								PAGE 8		OF 10	

60345

<b>TENNESSEE VALLEY AUTHORITY</b>				<b>ULTRASONIC PIPING EXAMINATION DATA SHEET</b>				<b>REPORT NUMBER:</b> <i>R189</i>			
PROJECT: BFN		UNIT: 3		CYCLE: 11		EXAMINATION DATE: 03/06/04					
PROCEDURE: N-UT-82		REV: 1		TC: N/A		START TIME: 2137		END TIME: 2208			
SYSTEM: RHRS		ISI DWG. NO: 3-ISI-0330-C / Rev. 01				EXAM SURFACE		<input type="checkbox"/> ID		<input checked="" type="checkbox"/> OD	
COMPONENT ID: TRHR-3-191						MATL. TYPE:		<input checked="" type="checkbox"/> CS		<input checked="" type="checkbox"/> SS <input type="checkbox"/> CSCL <input type="checkbox"/> CCSS	
<b>CONFIGURATION</b> VALVE TO ELBOW FLOW $\longrightarrow$						SURFACE TEMP.: 62 °F		PYRO. NO.: VH-9058			
						CAL DUE DATE: 04/06/04					
						EXAM ANGLE		60RL DEG		N/A DEG	
W <sub>0</sub> REFERENCE: SS/CS INTERFACE						CIRC. SCAN SENSITIVITY		N/A dB		N/A dB	
L <sub>0</sub> REFERENCE: OUTSIDE RADIUS OF ELBOW						AXIAL SCAN SENSITIVITY		65.0 dB		N/A dB	
IND. NO.	L (in) FROM REF.			AT MAX AMP			MAX AMP %DAC	EXAM NO. 3-14	NOM. ANG.	N R I	IND. INFO: TYPE, DAMPING, ETC.
	L1	L MAX	L2	W MAX	MP MAX	D MAX					
1		31.25"		.4"	1.92"	.96"	60%	4	60RL	X	W-Max taken from SS/CS Interface. Root Geometry
							%				
							%				
							%				
							%				

<b>REMARKS / LIMITATIONS:</b> Indication #1 Root Geometry seen Intermittently 360° at and below recordable levels. Contour was taken on inside Radius of Elbow where indication was plotted.											
60°RL was used to perform axial scans perpendicular to the weld and on the weld.											
100% coverage was achieved per procedure requirements.											
EXAMINER: Edward P. Mazyck <i>Edward P. Mazyck</i>						LEVEL: II		ANI: <i>Paul Thiel</i>			
EXAMINER: <i>[Signature]</i>						LEVEL: <i>[Signature]</i>		DATE: 3/29/04			
REVIEWER: <i>[Signature]</i>						LEVEL: <i>[Signature]</i>		DATE: <i>[Signature]</i>		PAGE 98 OF 10	

*WJH/04*  
 3/19/04



Site: Browns Ferry / Unit - 3		Weld TRHR-3-191: Coverage Plot		Scale: 1" = 1"	
Examiner: <i>Edward P. Mazyck</i> Edward P. Mazyck		Level: II		Date: 03/06/04	
Reviewed By: <i>[Signature]</i>		Date: 3-16-04		Page: 10 of 10	
ANII: <i>[Signature]</i>		Date: 3/19/04			

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 2189



**Inspection Report R-081**  
**Weld RWCU-3-007-G004**

TENNESSEE VALLEY AUTHORITY		EXAMINATION SUMMARY AND RESOLUTION SHEET		REPORT NUMBER: <i>R081</i>	
PROJECT: BFN UNIT: 3		CYCLE: 11		COMPONENT ID: RWCU 3-007-G004	
EXAMINATION METHOD				SYSTEM: 069	
				ISI DWG. NO. 3-ISI-0332-C <i>3/24/04</i>	
MT <input type="checkbox"/>	PT <input type="checkbox"/>	UT <input checked="" type="checkbox"/>	VT <input type="checkbox"/>	CODE CLASS: 1	CATEGORY: <i>R-A</i>
PROCEDURE: N-UT-82		REV:1	TC:N/A	COFIG.: Pipe	TO Valve
EXAMINER: <i>W. Bentley</i>		EXAMINER: <i>N/A</i>		EXAMINER: <i>N/A</i>	EXAMINER: <i>N/A</i>
LEVEL: <i>III</i>		LEVEL:		LEVEL:	LEVEL:

Weld RWCU 3-007-G004 is a dissimilar metal weld consisting of a ferritic steel pipe, 4" schedule 80, welded to a stainless steel valve. The weld is category

RI and was examined in accordance with NUREG 0313 *(IG-500)*

*ASME Section RL Peak Unformed, category R-A, item R1.16A Max weld 3/4/04*

The examination was in accordance with NDE procedure N-UT-82 which incorporates PDI procedure PDI-UT-10, "Generic Procedure for the Ultrasonic Examination of Dissimilar Metal Piping Welds". Weld RWCU 3-007-G004

has a maximum thickness of 0.382" and a crown with <0.50" and contains no buttering. Therefore the primary mode of examination was shear wave as stated in the procedure paragraph 6.2.1, "the primary mode of propagation for components with material thickness <0.40" and widths (including buttering) equal to or less than 0.50" shall be shear". A 45 and 60-degree shear wave

examination was performed in 3 directions, one axially and two circumferential

A 70-degree shear wave examination was performed in one axial direction.

Additionally, a 45-degree RL wave examination was performed in one axial and two circumferential directions. The configuration of the valve prevents scans from the valve side.

To further ensure that there were no flaws in the examination area a supplemental examination, as permitted in the procedure paragraph 8.7, was performed utilizing a 60 and 70-degree RL wave examination in the axial direction.

The 70-degree shear wave examination identified a signal from the weld root and was observed 360-degrees along the welds at varying amplitudes.

100% ASME code coverage was achieved.

*50% 10CFR50 SS(a) coverage was achieved due to single sided exam Max weld 3/4/04 TIA/NDE III*

RESOLUTION BY: <i>Logan Bentley</i>		REVIEWED BY: <i>Darlene Dwyer</i>		ANII: <i>B.J. Rice</i>	
LEVEL: <i>III</i> DATE: <i>3-3-04</i>		LEVEL: <i>III</i> DATE: <i>3-4-04</i>		DATE: <i>3/26/04</i>	
				PG. 1 OF 16	

TVA

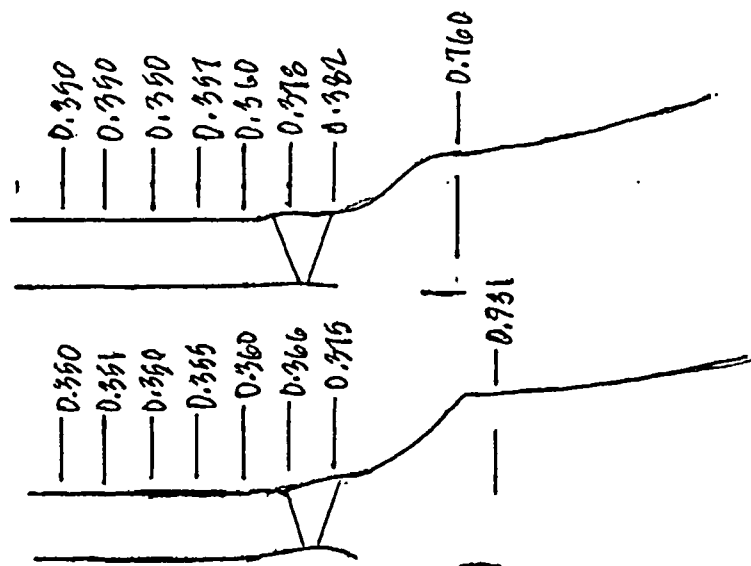
Office of Nuclear Power

PROJECT: BFN SYSTEM: 069

Unit: 1 WELD NO.: R/CU-3-007-G004

REPORT NO.:

R081



BY:

Logan Bentley

LEVEL:

III

DATE:

3.2.04

PAGE

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OF

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TVA

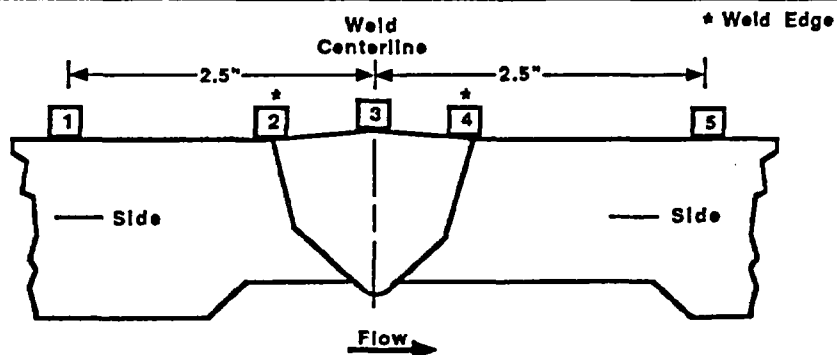
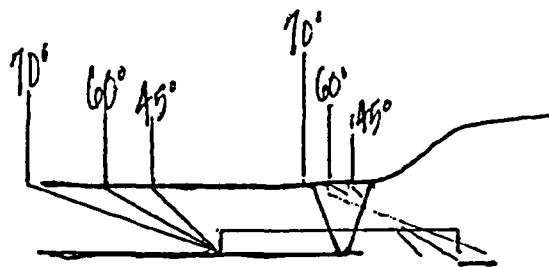
WALL THICKNESS  
PROFILE SHEET

REPORT NO:

R081

PROJECT: BEN  
UNIT: 3WELD NO: R1111-3-007-G004  
SYSTEM: 069Record Thickness Measurements As  
Indicated, Including Weld Width,  
Edge-To-Edge At 0°

Position	0°	90°	180°	270°
1				
2				
3				
4				
5				

CROWN HEIGHT: FLUSH DIAMETER: 4.5  
CROWN WIDTH: 0.30 WELD LENGTH: 14.25

Coverage Plots

EXAMINER: MM Bentley  
LEVEL: III  
DATE: 3.2.04REVIEWED BY: Debra Dwyer  
LEVEL: III DATE: 3.4.04ANII: B. J. Rio  
DATE: 3/29/04  
PAGE 3 OF 10

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TENNESSEE VALLEY AUTHORITY		DIGITAL ULTRASONIC CALIBRATION DATA SHEET		REPORT NUMBER: <b>R081</b>								
PROJECT: <b>BGN UNIT 3</b>		CYCLE: <b>11</b>		CALIBRATION DATE: <b>3-2-04</b>								
PROC.: <b>N-UT-02</b>		REV: <b>0</b>		TC: <b>N/A</b>								
INSTR. MFG: <b>KRAUTKRAMER</b>		DUE DATE: <b>10-7-04</b>		SIMULATOR BLOCK NO: <b>N/A</b>								
MODEL/TYPE: <b>USN 60</b>		M & TE NO.: <b>E36303</b>		THERMOMETER S/N: <b>522350</b>								
DUE DATE: <b>6-16-04</b>												
TRANSDUCER MFG: <b>KBA</b>		COMP: <b>G</b>		COUPLANT: <b>UTRAGEL II</b>								
BATCH: <b>03125 M</b>												
S/N: <b>00F8TD</b>		SIZE: <b>0.375</b>		FREQ: <b>2.25</b> MHz								
CABLE TYPE: <b>RG-174</b>		LENGTH: <b>72</b> inches		EXAM TYPE: <b>SHEAR</b> <input checked="" type="checkbox"/> <b>LONG</b> <input type="checkbox"/> <b>RL</b> <input type="checkbox"/>								
ANGLE VERIFICATION												
BLOCK TYPE: <b>DSC</b>				S/N: <b>A03671</b>								
NOMINAL ANGLE: <b>45°</b>				ACTUAL ANGLE: <b>45°</b>								
INSTRUMENT SETTINGS												
REFLECTOR			REFERENCE		MEMORY							
SCAN DIRECT.	NTCH	SDH	SENSITIVITY		NUMBER							
AXIAL	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<b>20</b> dB									
CIRC	<input type="checkbox"/>	<input type="checkbox"/>	dB									
*FREQ: <b>2.25</b> MHz			*REJECT: <b>0</b> %									
ANGLE: <b>45°</b> deg			*DAMPING: <b>1000</b> ohms									
DELAY: <b>8.0113</b> msec			*PULSER: <b>HIGH</b>									
ZERO: <b>0.015</b> msec			FILTER: <b>FIXED</b>									
VELOCITY: <b>0.1243</b> msec			*PRR/PRF: <b>AUTO HIGH</b>									
RANGE: <b>1.50</b> inches			TOP: <input checked="" type="checkbox"/> <b>PEAK</b> <input type="checkbox"/> <b>FLANK</b>									
*DISPLAY MODE: <b>FULL WAVE</b>			TCG: ON <input type="checkbox"/> OFF <input checked="" type="checkbox"/>									
CALIBRATION TIMES												
INITIAL TIME: <b>1219</b>			FINAL TIME: <b>1500</b>									
VERIFICATION TIMES												
1)		2)		3)								
4)		5)		6)								
7)		8)		9)								
* PDI QUALIFIED INSTRUMENT SETTINGS:												
VERIFY INSTRUMENT SETTINGS AND CALIBRATION SEQUENCE ARE IN ACCORDANCE WITH TABLE 2 OF THE APPLICABLE PDI QUALIFICATION IMPLEMENTATION PROCEDURE !												
LINEARITY CHECK												
VERTICAL	SIGNAL 1		100	90	80	70	60	50	40	30	20	10
	SIGNAL 2		50	<b>45</b>	<b>40</b>	<b>35</b>	<b>30</b>	<b>25</b>	<b>20</b>	<b>15</b>	<b>10</b>	<b>5</b>
ATTENUATOR	GAIN	SET	-6 dB	-12 dB	SET	+12	SET	+6				
	AMP	80	32-48	16-24	20	64-96	40	64-96				
			<b>40</b>	<b>20</b>		<b>80</b>		<b>80</b>				
COMMENTS: <b>* DISPLAY DELAY</b>						WELDS/ITEMS EXAMINED:						
<b>OK ON 1/2" THICKNESS NOTCH</b>						<b>KWCU 3-007-9004</b>						
EXAMINER:		EXAMINER:		REVIEWER:		ANII:						
<b>M. Bentley</b>		<b>N/A</b>		<b>Darlene Dooly</b>		<b>B. F. Rice</b>						
LEVEL: <b>III</b>		LEVEL:		LEVEL: <b>III</b>		DATE: <b>3-29-04</b>						
				DATE: <b>3-4-04</b>		PG. <b>4</b> OF <b>16</b>						

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[illegible]

TENNESSEE VALLEY AUTHORITY			DIGITAL ULTRASONIC CALIBRATION DATA SHEET			REPORT NUMBER: <i>R081</i>						
PROJECT: <i>BGN</i> UNIT <i>3</i> CYCLE: <i>11</i>			CALIBRATION DATE: <i>3-2-04</i>									
PROC.: <i>N-UT-82</i> REV: <i>01</i> TC: <i>N/A</i>			CALIBRATION BLOCK NO.: <i>11B-85</i> TEMP: <i>86</i> °F									
INSTR. MFG: <i>KEATINGER</i> DUE DATE: <i>10-7-04</i>			SIMULATOR BLOCK NO: <i>N/A</i>									
MODEL TYPE: <i>USN-60</i> M & TE NO.: <i>E-36303</i>			THERMOMETER S/N: <i>522390</i> DUE DATE: <i>6-16-04</i>									
TRANSDUCER MFG: <i>KBA COMP G</i>			COUPLANT <i>ULTRAGEL II</i> BATCH: <i>03125M</i>									
S/N <i>004870</i> SIZE: <i>0.375</i> FREQ: <i>2.25</i> MHz			EXAM TYPE: <input checked="" type="checkbox"/> SHEAR <input type="checkbox"/> LONG <input type="checkbox"/> RL <input type="checkbox"/>									
CABLE TYPE: <i>RG-174</i> LENGTH: <i>72</i> inches			ANGLE VERIFICATION									
DAC			BLOCK TYPE: <i>DSC</i>			S/N: <i>A 02611</i>						
			NOMINAL ANGLE: <i>60°</i>			ACTUAL ANGLE: <i>60°</i>						
<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;">100 80 60 40 20 0</div> <div style="border: 1px solid black; width: 200px; height: 150px; position: relative;"> <div style="position: absolute; top: 50%; left: 50%; transform: translate(-50%, -50%); font-size: 2em;">*</div> </div> <div style="margin-left: 10px; writing-mode: vertical-rl; transform: rotate(180deg);">A M P L I T U D E</div> </div> <p style="margin-top: 10px;">DISPLAY WIDTH: inches <i>1.900</i></p>			INSTRUMENT SETTINGS									
			REFLECTOR			REFERENCE		MEMORY				
			SCAN DIRECT.	NTCH	SDH	SENSITIVITY		NUMBER				
			AXIAL	<input type="checkbox"/>	<input type="checkbox"/>	<i>45</i> dB						
			CIRC	<input type="checkbox"/>	<input type="checkbox"/>	dB						
			*FREQ: <i>2.25</i> MHz			*REJECT: <i>0</i> %						
			ANGLE: <i>60°</i> deg			*DAMPING: <i>1000</i> ohms						
			DELAY: <i>9.9900</i> msec			*PULSER: <i>HIGH</i>						
			ZERO: <i>0.015</i> msec			FILTER: <i>FIXED</i>						
			VELOCITY: <i>0.1254</i> msec			*PRR/PRF: <i>Auto HIGH</i>						
RANGE: <i>1.900</i> inches			TOF: <input checked="" type="checkbox"/> PEAK <input type="checkbox"/> FLANK									
*DISPLAY MODE: <i>Full Wave</i>			TCG: ON <input type="checkbox"/> OFF <input checked="" type="checkbox"/>									
REF. REFLECTOR: <i>N</i> GAIN: dB			CALIBRATION TIMES									
AMPLITUDE: <i>A</i> METAL PATH:			INITIAL TIME: <i>1216</i>			FINAL TIME: <i>1455</i>						
VERIFICATION TIMES			1)	2)	3)	4)	5)	6)	7)	8)	9)	
* PDI QUALIFIED INSTRUMENT SETTINGS:												
VERIFY INSTRUMENT SETTINGS AND CALIBRATION SEQUENCE ARE IN ACCORDANCE WITH TABLE 2 OF THE APPLICABLE PDI QUALIFICATION IMPLEMENTATION PROCEDURE !												
LINEARITY CHECK												
VERTICAL	SIGNAL 1		100	90	80	70	60	50	40	30	20	10
	SIGNAL 2		50	<i>45</i>	<i>40</i>	<i>35</i>	<i>30</i>	<i>25</i>	<i>20</i>	<i>15</i>	<i>10</i>	<i>5</i>
ATTENUATOR	GAIN	SET	-6 dB	-12 dB		SET		+12	SET		+6	
	AMP	80	32-48	16-24		20		64-96	40		64-96	
			<i>40</i>	<i>20</i>				<i>80</i>			<i>60</i>	
COMMENTS: <i>* DISPLAY DELAY</i>						WELDS/ITEMS EXAMINED:						
<i>ON ON 1/2" THICKNESS NOTCH</i>						<i>RN CL 3-007-G004</i>						
EXAMINER: <i>Koger Bentley</i>			EXAMINER: <i>N/A</i>			REVIEWER: <i>Pauline Delog</i>			ANI: <i>B.F. Rice</i>			
LEVEL: <i>III</i>			LEVEL:			LEVEL: <i>III</i>			DATE: <i>3/29/04</i>			
						DATE: <i>3-4-04</i>			PG. <i>6</i> OF <i>16</i>			

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TENNESSEE VALLEY AUTHORITY				ULTRASONIC PIPING EXAMINATION DATA SHEET				REPORT NUMBER: <b>R081</b>			
PROJECT: <b>BFN</b> UNIT: <b>1</b> CYCLE: <b>11</b>				EXAMINATION DATE: <b>3-2-04</b>							
PROCEDURE: <b>IN-UT- B2</b> REV: <b>1</b> TC: <b>N/A</b>				START TIME: <b>1300</b> END TIME: <b>1600</b>							
SYSTEM: <b>DG9</b> ISI DWG. NO: <b>3-151-0332-C</b>				EXAM SURFACE <input type="checkbox"/> ID <input checked="" type="checkbox"/> OD							
COMPONENT ID: <b>RWCU 3-007-600A</b>				MATL. TYPE: <input checked="" type="checkbox"/> CS <input checked="" type="checkbox"/> SS <input type="checkbox"/> CSCL <input type="checkbox"/> CCSS							
<b>CONFIGURATION</b> <b>Pipe TO Valve</b> <b>FLOW →</b>				SURFACE TEMP.: <b>100 F</b> PYRO. NO.: <b>922350</b>							
				CAL DUE DATE: <b>10-16-04</b>							
				EXAM ANGLE <b>60 DEG</b> N <b>DEG</b>							
Wo REFERENCE: <b>WELD CENTER LINE</b>				CIRC. SCAN SENSITIVITY <b>53 dB</b> A <b>dB</b>							
Lo REFERENCE: <b>TOP DEAD CENTER</b>				AXIAL SCAN SENSITIVITY <b>53 dB</b> dB							
IND. NO.	L (in) FROM REF.			AT MAX AMP			MAX AMP %DAC	EXAM NO. 3-14	NOM. ANG.	N R I	IND. INFO: TYPE, DAMPING, ETC.
	L1	L MAX	L2	W MAX	MP MAX	D MAX					
							%	<b>3</b>	<b>60°S</b>	<input checked="" type="checkbox"/>	
							%	<b>4*</b>	<b>60°S</b>		
							%	<b>5</b>	<b>60°S</b>	<input checked="" type="checkbox"/>	
							%	<b>6</b>	<b>60°S</b>	<input checked="" type="checkbox"/>	
							%				
							%				
							%				
							%				
							%				
							%				
							%				
							%				
							%				
							%				
							%				
							%				
REMARKS / LIMITATIONS:											
<b>* NO SCAN A DUE TO CONFIGURATION</b>											
EXAMINER: <b>ROGER BENNEY</b> <i>[Signature]</i> LEVEL: <b>III</b>								ANI: <b>B.F. Rice</b>			
EXAMINER: <b>N/A</b> LEVEL: <b>N/A</b>								DATE: <b>3/29/04</b>			
REVIEWER: <b>[Signature]</b> LEVEL: <b>III</b>								PAGE <b>1</b> OF <b>16</b>			



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TENNESSEE VALLEY AUTHORITY				DIGITAL ULTRASONIC CALIBRATION DATA SHEET				REPORT NUMBER: <b>R081</b>													
PROJECT: <b>BFN UNIT 3</b> CYCLE: <b>11</b>				CALIBRATION DATE: <b>3-2-04</b>																	
PROC.: <b>N-UT-82</b> REV: <b>01</b> TC: <b>N/A</b>				CALIBRATION BLOCK NO.: <b>WB-85</b> TEMP: <b>86 °F</b>																	
INSTR. MFG: <b>KRAUTKRAMER</b> DUE DATE: <b>10-1-04</b>				SIMULATOR BLOCK NO: <b>N/A</b>																	
MODEL/TYPE: <b>USA 60</b> M & TE NO.: <b>E36303</b>				THERMOMETER S/N: <b>522360</b> DUE DATE: <b>6-16-04</b>																	
TRANSDUCER MFG: <b>KAA COMP G</b>				COUPLANT <b>ULTRAGEL II</b> BATCH: <b>D3125 M</b>																	
S/N <b>00F8TD</b> SIZE: <b>0.375</b> FREQ: <b>2.25</b> MHz				EXAM TYPE: <input checked="" type="checkbox"/> SHEAR <input type="checkbox"/> LONG <input type="checkbox"/> RL <input type="checkbox"/>																	
CABLE TYPE: <b>RQ-174</b> LENGTH: <b>72</b> inches				ANGLE VERIFICATION																	
DAC				BLOCK TYPE: <b>DSC</b>				S/N: <b>A 03671</b>													
				NOMINAL ANGLE: <b>70°</b>				ACTUAL ANGLE: <b>67°</b>													
<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;">100 80 60 40 20 0</div> <div style="border: 1px solid black; width: 200px; height: 150px; position: relative;"> <div style="position: absolute; top: 50%; left: 50%; transform: translate(-50%, -50%); font-size: 2em;">*</div> </div> <div style="margin-left: 10px; writing-mode: vertical-rl; transform: rotate(180deg);">A M P L I T U D E</div> </div> <p>DISPLAY WIDTH: inches <b>2.50</b></p>				INSTRUMENT SETTINGS																	
				REFLECTOR						REFERENCE		MEMORY									
				SCAN DIRECT.		NTCH		SDH		SENSITIVITY		NUMBER									
				AXIAL		<input type="checkbox"/>		<input type="checkbox"/>		<b>48</b> dB											
				CIRC		<input type="checkbox"/>		<input type="checkbox"/>		dB											
				*FREQ: <b>2.25</b> MHz						*REJECT: <b>0</b> %											
				ANGLE: <b>67°</b> deg						*DAMPING: <b>1000</b> ohms											
				DELAY: <b>7.5519</b> msec						*PULSER: <b>HIGH</b>											
				ZERO: <b>0.015</b> msec						FILTER: <b>FIXED</b>											
				VELOCITY: <b>0.1246</b> msec						*PRR/PRE: <b>AUTO HIGH</b>											
RANGE: <b>2.50</b> inches						TOF: <input checked="" type="checkbox"/> PEAK <input type="checkbox"/> FLANK															
*DISPLAY MODE: <b>FULL WAVE</b>						TCG: ON <input type="checkbox"/> OFF <input checked="" type="checkbox"/>															
REF. REFLECTOR: <b>N</b> GAIN: dB				CALIBRATION TIMES																	
AMPLITUDE: <b>A</b> METAL PATH:				INITIAL TIME: <b>1212</b>				FINAL TIME: <b>1457</b>													
VERIFICATION TIMES				1)		2)		3)		4)		5)		6)		7)		8)		9)	
* PDI QUALIFIED INSTRUMENT SETTINGS:																					
VERIFY INSTRUMENT SETTINGS AND CALIBRATION SEQUENCE ARE IN ACCORDANCE WITH TABLE 2 OF THE APPLICABLE PDI QUALIFICATION IMPLEMENTATION PROCEDURE !																					
LINEARITY CHECK																					
VERTICAL		SIGNAL 1		100	90	80	70	60	50	40	30	20	10								
		SIGNAL 2		50	<b>45</b>	<b>40</b>	<b>35</b>	<b>30</b>	<b>25</b>	<b>20</b>	<b>15</b>	<b>10</b>	<b>5</b>								
ATTENUATOR		GAIN	SET	-6 dB	-12 dB	SET		+12		SET		+6									
		AMP	80	32-48	16-24	20		64-96		40		64-96									
				<b>40</b>	<b>20</b>			<b>80</b>				<b>80</b>									
COMMENTS: <b>* DISPLAY DELAY</b>											WELDS/ITEMS EXAMINED:										
<b>0 CAL ON 1/2" THICKNESS NOTCH</b>											<b>KWCU 3-007-G004</b>										
EXAMINER:				EXAMINER:				REVIEWER:				ANII: <b>B. J. Rice</b>									
 LEVEL: <b>III</b>				LEVEL: <b>N/A</b>				 LEVEL: <b>III</b> DATE: <b>3-4-04</b>				DATE: <b>3/29/04</b>									
												PG. <b>8</b> OF <b>16</b>									

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TENNESSEE VALLEY AUTHORITY				ULTRASONIC PIPING EXAMINATION DATA SHEET				REPORT NUMBER: R081			
PROJECT: BEN		UNIT: 3		CYCLE: 11		EXAMINATION DATE: 3-2-04					
PROCEDURE: N-UT-B2		REV: 1		TC: N/A		START TIME: 1300		END TIME: 1500			
SYSTEM: D68		ISI DWG. NO: 3-151-0332-C				EXAM SURFACE		<input type="checkbox"/> ID		<input checked="" type="checkbox"/> OD	
COMPONENT ID: RINCU 3-007-G004						MATL. TYPE:		<input checked="" type="checkbox"/> CS		<input checked="" type="checkbox"/> SS <input type="checkbox"/> CSCL <input type="checkbox"/> CCSS	
<div>CONFIGURATION</div> <div>PIPE TO VALVE</div> <div>FLOW →</div>						SURFACE TEMP.: 100 °F		PYRO. NO.: 522360			
						CAL DUE DATE: 6-16-04					
						EXAM ANGLE		70° DEG		N DEG	
W <sub>0</sub> REFERENCE: 1/4" CENTER LINE						CIRC. SCAN SENSITIVITY		48 dB		A dB	
L <sub>0</sub> REFERENCE: TOP DEAD CENTER						AXIAL SCAN SENSITIVITY		N/A dB		dB	
IND. NO.	L (in) FROM REF.			AT MAX AMP			MAX AMP %DAC	EXAM NO. 3-14	NOM. ANG.	N <sup>o</sup> R I	IND. INFO: TYPE, DAMPING, ETC.
	L1	L MAX	L2	W MAX	MP MAX	D MAX					
1		6.5		0.15	1.00		50 %	3	70°s		Root Geometry*
							%	4*	70°s		
							%				
							%				
							%				
							%				
							%				
							%				
							%				
							%				
							%				
							%				
							%				
							%				
							%				
REMARKS / LIMITATIONS:											
* Root Geometry intermittent 360° at lower amplitudes											
* NO SCAN & DUE TO CONFIGURATION.											
EXAMINER: Roger Bernier / M. Bentley						LEVEL: III		ANII: B.F. Rio			
EXAMINER: N/A						LEVEL: N/A		DATE: 3/29/04			
REVIEWER: Pauline Daboy						LEVEL: III		DATE: 3-4-04		PAGE 9 OF 16	

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<b>TVA</b>	<b>WALL THICKNESS PROFILE SHEET</b>	REPORT NO: <b>R081</b>
PROJECT: <b>BFN</b>		WELD NO: <b>RWCU 3-007-G004</b>
UNIT: <b>3 Cycle II</b>		SYSTEM: <b>De9</b>

Record Thickness Measurements As Indicated, Including Weld Width, Edge-To-Edge At 0°

Position	0°	90°	180°	270°
<b>1</b>	0.35	0.35		
<b>2</b>	0.375	0.366		
<b>3</b>	0.362	0.375		
<b>4</b>	N/A	N/A		
<b>5</b>	0.76	0.93		

CROWN HEIGHT: **FLUSH**

CROWN WIDTH: **0.30**

DIAMETER: **4.5**

WELD LENGTH: **14.25**

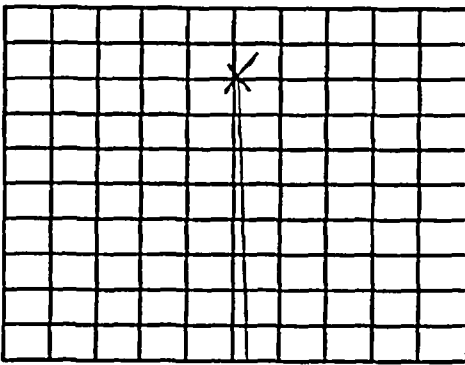
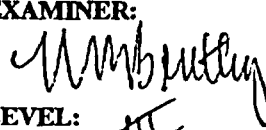
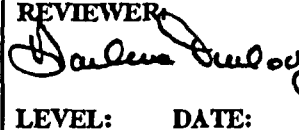
  

INDICATION  
#1

EXAMINER: <b>W. Bentley</b>	REVIEWED BY: <b>Donna Dooling</b>	ANN: <b>B. J. Rice</b>
LEVEL: <b>III</b>	LEVEL: <b>III</b>	DATE: <b>3/29/04</b>
DATE: <b>3.2.04</b>	DATE: <b>3.4.04</b>	PAGE <b>10</b> OF <b>16</b>

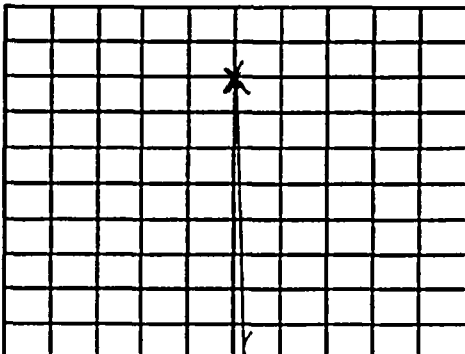

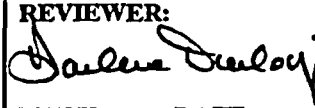
00256

TENNESSEE VALLEY AUTHORITY			DIGITAL ULTRASONIC CALIBRATION DATA SHEET			REPORT NUMBER: <b>R081</b>						
PROJECT: <b>BEN UNIT 3</b> <sup>1100</sup> CYCLE: <b>11</b>			CALIBRATION DATE: <b>3-2-04</b>									
PROC.: <b>N-11-82</b> REV: <b>01</b> TC: <b>N/A</b>			CALIBRATION BLOCK NO.: <b>11B-89</b> TEMP: <b>86 °F</b>									
INSTR. MFG: <b>KRAUTKRAMER</b> DUE DATE: <b>10-1-04</b>			SIMULATOR BLOCK NO: <b>N/A</b>									
MODEL/TYPE: <b>HSN 60</b> M & TE NO.: <b>E 36303</b>			THERMOMETER S/N: <b>922390</b> DUE DATE: <b>6-16-04</b>									
TRANSDUCER MFG: <b>RTD</b> TRLA (NOTE)			COUPLANT <b>WTRAGEL II</b> BATCH: <b>03129M</b>									
S/N <b>03-893</b> SIZE: <b>2(7x10)</b> FREQ: <b>2.0</b> MHz			EXAM TYPE: <input checked="" type="checkbox"/> SHEAR <input type="checkbox"/> LONG <input type="checkbox"/> RL <input checked="" type="checkbox"/>									
CABLE TYPE: <b>RG-174</b> LENGTH: <b>72</b> inches			ANGLE VERIFICATION									
DAC			BLOCK TYPE: <b>DSC</b>			S/N: <b>A03691</b>						
			NOMINAL ANGLE: <b>45°</b>			ACTUAL ANGLE: <b>45°</b>						
<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;">100 80 60 40 20 0</div>  <div style="margin-left: 10px; writing-mode: vertical-rl; transform: rotate(180deg);">A M P L I T U D E</div> </div>			INSTRUMENT SETTINGS									
			REFLECTOR			REFERENCE		MEMORY				
			SCAN DIRECT. NTCH SDH			SENSITIVITY		NUMBER				
			AXIAL <input type="checkbox"/> <input type="checkbox"/>			<b>41</b> dB						
			CIRC <input type="checkbox"/> <input type="checkbox"/>			dB						
			*FREQ: <b>2.25</b> MHz			*REJECT: <b>0</b> %						
			ANGLE: <b>45°</b> deg			*DAMPING: <b>1000</b> ohms						
			DELAY: <b>6.8981</b> msec			*PULSER: <b>HIGH</b>						
			ZERO: <b>0.015</b> msec			FILTER: <b>FIXED</b>						
			VELOCITY: <b>0.2279</b> msec			*PRR/PRF: <b>AUTO HIGH</b>						
RANGE: <b>1.240</b> inches			TOP: <input checked="" type="checkbox"/> PEAK <input type="checkbox"/> FLANK									
*DISPLAY MODE: <b>FULL WAVE</b>			TCG: ON <input type="checkbox"/> OFF <input checked="" type="checkbox"/>									
REF. REFLECTOR: <b>N</b> GAIN: dB			CALIBRATION TIMES									
AMPLITUDE: <b>A</b> METAL PATH:			INITIAL TIME: <b>1210</b>			FINAL TIME: <b>1510</b>						
VERIFICATION TIMES			1)	2)	3)	4)	5)	6)	7)	8)	9)	
* PDI QUALIFIED INSTRUMENT SETTINGS:												
VERIFY INSTRUMENT SETTINGS AND CALIBRATION SEQUENCE ARE IN ACCORDANCE WITH TABLE 2 OF THE APPLICABLE PDI QUALIFICATION IMPLEMENTATION PROCEDURE !												
LINEARITY CHECK												
VERTICAL	SIGNAL 1		100	90	80	70	60	50	40	30	20	10
	SIGNAL 2		50	<b>45</b>	<b>40</b>	<b>35</b>	<b>30</b>	<b>25</b>	<b>20</b>	<b>15</b>	<b>10</b>	<b>5</b>
ATTENUATOR	GAIN	SET	-6 dB	-12 dB	SET	+12	SET	+6				
	AMP	80	32-48	16-24	20	64-96	40	64-96				
			<b>40</b>	<b>20</b>		<b>80</b>		<b>80</b>				
COMMENTS: <b>* DISPLAY DELAY</b>						WELDS/ITEMS EXAMINED:						
NOTE: <b>FS=20MM SQUINT=10°</b>						<b>RWCU 3-007-G004</b>						
CAL ON 1/2" THICKNESS NOTCH												
EXAMINER:			EXAMINER:			REVIEWER:			ANH:			
			<b>N/A</b>						<b>B.F. Rio</b>			
LEVEL: <b>III</b>			LEVEL: <b>N/A</b>			LEVEL: <b>III</b> DATE: <b>3-4-04</b>			DATE: <b>3/25/04</b>			
						PG. <b>11</b> OF <b>16</b>						

00257

TENNESSEE VALLEY AUTHORITY				ULTRASONIC PIPING EXAMINATION DATA SHEET				REPORT NUMBER: R081			
PROJECT: BFN UNIT: 3 CYCLE: 11				EXAMINATION DATE: 3-2-04							
PROCEDURE: N-UT-82 REV: 1 TC: N/A				START TIME: 1300 END TIME: 1900							
SYSTEM: 069 ISI DWG. NO: 3-151-0332-C				EXAM SURFACE <input type="checkbox"/> ID <input checked="" type="checkbox"/> OD							
COMPONENT ID: B111A 3-007-600A				MATL. TYPE: <input checked="" type="checkbox"/> CS <input checked="" type="checkbox"/> SS <input type="checkbox"/> CSCL <input type="checkbox"/> CCSS							
CONFIGURATION PIPE TO VALVE FLOW →				SURFACE TEMP.: 100 °F PYRO. NO.: 522350							
				CAL DUE DATE: 6-16-04							
W <sub>0</sub> REFERENCE: WELD CENTER LINE				EXAM ANGLE: 45° RL DEG		N DEG					
L <sub>0</sub> REFERENCE: TOP DEAD CENTER				CIRC. SCAN SENSITIVITY: 56 dB		A dB					
				AXIAL SCAN SENSITIVITY: 56 dB		dB					
IND. NO.	L (in) FROM REF.			AT MAX AMP			MAX AMP %DAC	EXAM NO. 3-14	NOM. ANG.	N R I	IND. INFO: TYPE, DAMPING, ETC.
	L1	L MAX	L2	W MAX	MP MAX	D MAX					
							%	3	45° RL	✓	
							%	4*	45° RL		
							%	5	45° RL	✓	
							%	6	45° RL	✓	
							%				
							%				
							%				
							%				
							%				
							%				
							%				
							%				
							%				
							%				
							%				
REMARKS / LIMITATIONS:											
* NO SCAN 4 DUE TO CONFIGURATION.											
EXAMINER: ROGER BENTLEY W. Bentley				LEVEL: III				ANH: B.F. Rice			
EXAMINER: N/A				LEVEL: N/A				DATE: 3/29/04			
REVIEWER: J. Adams				LEVEL: III				DATE: 3-4-04			
								PAGE 12 OF 16			

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TENNESSEE VALLEY AUTHORITY			DIGITAL ULTRASONIC CALIBRATION DATA SHEET			REPORT NUMBER: <span style="font-size: 1.2em;">R081</span>						
PROJECT: <u>BPN UNIT 3</u>			CYCLE: <u>11</u>			CALIBRATION DATE: <u>3-2-04</u>						
PROC.: <u>N-UT-82</u> REV: <u>1</u> TC: <u>N/A</u>			CALIBRATION BLOCK NO.: <u>V1B-85<sup>0</sup></u> TEMP: <u>86 °F</u>									
INSTR. MFG: <u>KRAUTKRAMER</u> DUE DATE: <u>10.7.04</u>			SIMULATOR BLOCK NO: <u>N/A</u>									
MODEL/TYPE: <u>USN-60</u> M & TE NO.: <u>E36303</u>			THERMOMETER S/N: <u>522350</u> DUE DATE: <u>6.16.04</u>									
TRANSDUCER MFG: <u>RTD TRLA</u> (NOTE)			COUPLANT <u>ULTRAGEL II</u> BATCH: <u>03123M</u>									
S/N <u>03-896</u> SIZE: <u>2(7x10)</u> FREQ: <u>2.0</u> MHz			EXAM TYPE: <input checked="" type="checkbox"/> SHEAR <input type="checkbox"/> LONG <input type="checkbox"/> RL <input checked="" type="checkbox"/>									
CABLE TYPE: <u>RG-174</u> LENGTH: <u>72</u> inches			ANGLE VERIFICATION									
DAC			BLOCK TYPE: <u>DSC</u>			S/N: <u>A03671</u>						
			NOMINAL ANGLE: <u>60°</u>			ACTUAL ANGLE: <u>60°</u>						
<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;">100 80 60 40 20 0</div>  <div style="margin-left: 10px; text-align: center;">A M P L I T U D E</div> </div>			INSTRUMENT SETTINGS									
			REFLECTOR			REFERENCE		MEMORY				
			SCAN DIRECT.	NTCH	SDH	SENSITIVITY		NUMBER				
			AXIAL	<input type="checkbox"/>	<input type="checkbox"/>	57 dB						
			CIRC	<input type="checkbox"/>	<input type="checkbox"/>	dB						
			*FREQ: <u>2.25</u> MHz			*REJECT: <u>0</u> %						
			ANGLE: <u>60</u> deg			*DAMPING: <u>1000</u> ohms						
			DELAY: <u>1.0259</u> msec			*PULSER: <u>HIGH</u>						
			ZERO: <u>0.015</u> msec			FILTER: <u>FIXED</u>						
			VELOCITY: <u>0.2246</u> msec			*PRR/PRF: <u>AUTO HIGH</u>						
RANGE: <u>2.00</u> inches			TOF: <input checked="" type="checkbox"/> PEAK <input type="checkbox"/> FLANK									
*DISPLAY MODE: <u>FULL WAVE</u>			TCG: ON <input type="checkbox"/> OFF <input checked="" type="checkbox"/>									
REF. REFLECTOR: <u>N</u> GAIN: dB			CALIBRATION TIMES									
AMPLITUDE: <u>A</u> METAL PATH:			INITIAL TIME: <u>1217</u>			FINAL TIME: <u>1904</u>						
VERIFICATION TIMES			1)	2)	3)	4)	5)	6)	7)	8)	9)	
* PDI QUALIFIED INSTRUMENT SETTINGS: VERIFY INSTRUMENT SETTINGS AND CALIBRATION SEQUENCE ARE IN ACCORDANCE WITH TABLE 2 OF THE APPLICABLE PDI QUALIFICATION IMPLEMENTATION PROCEDURE !												
LINEARITY CHECK												
VERTICAL	SIGNAL 1		100	90	80	70	60	50	40	30	20	10
	SIGNAL 2		50	<u>40</u>	<u>40</u>	<u>36</u>	<u>30</u>	<u>27</u>	<u>20</u>	<u>15</u>	<u>10</u>	<u>5</u>
ATTENUATOR	GAIN	SET	-6 dB	-12 dB	SET	+12	SET	+6				
	AMP	80	32-48	16-24	20	64-96	40	64-96				
			<u>40</u>	<u>10</u>		<u>80</u>		<u>80</u>				
COMMENTS: <u>* DISPLAY DELAY</u>						WELDS/ITEMS EXAMINED:						
NOTE: <u>FS=25</u> <u>SQUINT=3°</u>						<u>RNCH 3-007-G004</u>						
<u>0 CAL ON 1/2" THICKNESS NOTCH</u>												
<u>SUPPLEMENTAL EXAM</u>												
EXAMINER:			EXAMINER:			REVIEWER:			ANII: <u>B. F. Rico</u>			
 LEVEL: <u>III</u>			LEVEL: <u>N/A</u>			 LEVEL: <u>III</u> DATE: <u>3-4-04</u>			DATE: <u>3/29/04</u>			
									PG. <u>13</u> OF <u>16</u>			

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[illegible]

00260

TENNESSEE VALLEY AUTHORITY		DIGITAL ULTRASONIC CALIBRATION DATA SHEET		REPORT NUMBER: <b>R081</b>							
PROJECT: <b>BFN UNIT 3</b>		CYCLE: <b>11</b>		CALIBRATION DATE: <b>3-2-04</b>							
PROC.: <b>N-UT-B2</b>		REV: <b>1</b>		CALIBRATION BLOCK NO.: <b>618-B5</b> TEMP: <b>86 F</b>							
INSTR. MFG: <b>KEAUTKRAMER</b>		DUE DATE: <b>10-7-04</b>		SIMULATOR BLOCK NO: <b>N/A</b>							
MODEL/TYPE: <b>US1-60</b>		M & TE NO.: <b>E-36303</b>		THERMOMETER S/N: <b>522360</b> DUE DATE: <b>6-16-04</b>							
TRANSDUCER MFG: <b>PTD TRLA (NTE)</b>		COUPLANT <b>ULTRAGEL-1</b> BATCH: <b>03125 M</b>									
S/N <b>03-909</b> SIZE: <b>2(1x10)</b>		FREQ: <b>2.0</b> MHz		EXAM TYPE: <input checked="" type="checkbox"/> SHEAR <input type="checkbox"/> LONG <input type="checkbox"/> RL <input checked="" type="checkbox"/>							
CABLE TYPE: <b>RG-174</b>		LENGTH: <b>72</b> inches		ANGLE VERIFICATION							
DAC		BLOCK TYPE: <b>DSC</b>		S/N: <b>A-03671</b>							
		NOMINAL ANGLE: <b>70</b>		ACTUAL ANGLE: <b>67°</b>							
<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;"> 100 80 60 40 20 0 </div> <div style="border: 1px solid black; width: 250px; height: 150px; position: relative;"> <div style="position: absolute; top: 50%; left: 50%; transform: translate(-50%, -50%); font-size: 2em;">*</div> </div> <div style="margin-left: 10px; text-align: center;"> A M P L I T U D E </div> </div>		INSTRUMENT SETTINGS									
		REFLECTOR			REFERENCE	MEMORY					
		SCAN DIRECT.	NTCH	SDH	SENSITIVITY	NUMBER					
		AXIAL	<input type="checkbox"/>	<input type="checkbox"/>	<b>69</b> dB						
		CIRC	<input type="checkbox"/>	<input type="checkbox"/>	dB						
		*FREQ: <b>2.25</b> MHz			*REJECT: <b>0</b> %						
		ANGLE: <b>67°</b> deg			*DAMPING: <b>000</b> ohms						
		DELAY: <b>6.7450</b> msec			*PULSER: <b>HIGH</b>						
		ZERO: <b>0.015</b> msec			FILTER: <b>FIXED</b>						
		VELOCITY: <b>0.2269</b> msec			*PRR/PRF: <b>AUTO HIGH</b>						
RANGE: <b>3.00</b> inches			TOP: <input checked="" type="checkbox"/> PEAK <input type="checkbox"/> FLANK								
*DISPLAY MODE: <b>FULL WAVE</b>			TCG: ON <input type="checkbox"/> OFF <input checked="" type="checkbox"/>								
REF. REFLECTOR: <b>N</b>		GAIN: dB		CALIBRATION TIMES							
AMPLITUDE: <b>A</b>		METAL PATH:		INITIAL TIME: <b>1211</b> FINAL TIME: <b>1919</b>							
VERIFICATION TIMES		1)	2)	3)	4)						
		5)	6)	7)	8)						
		9)									
* PDI QUALIFIED INSTRUMENT SETTINGS:											
VERIFY INSTRUMENT SETTINGS AND CALIBRATION SEQUENCE ARE IN ACCORDANCE WITH TABLE 2 OF THE APPLICABLE PDI QUALIFICATION IMPLEMENTATION PROCEDURE !											
LINEARITY CHECK											
VERTICAL	SIGNAL 1	100	90	80	70	60	50	40	30	20	10
	SIGNAL 2	50	<b>47</b>	<b>40</b>	<b>35</b>	<b>30</b>	<b>25</b>	<b>20</b>	<b>15</b>	<b>10</b>	<b>5</b>
ATTENUATOR	GAIN	SET	-6 dB	-12 dB	SET	+12	SET	+6			
	AMP	80	32-48	16-24	20	64-96	40	64-96			
			<b>40</b>	<b>40</b>		<b>80</b>		<b>80</b>			
COMMENTS: <b>* DISPLAY DELAY</b>						WELDS/ITEMS EXAMINED:					
NOTE: <b>FS = 25 SQUINT = 6°</b>						<b>RNCH 3-007-6004</b>					
① CAL ON 1/2" THICKNESS NOTCH											
SUPPLEMENTAL EXAM											
EXAMINER:		EXAMINER:		REVIEWER:		ANII:					
<b>Y. M. M. M. M. M.</b> LEVEL: <b>III</b>		<b>N/A</b> LEVEL:		<b>Barbara D. D. D.</b> LEVEL: <b>III</b>		<b>3-2-04</b> DATE:		<b>B. J. R. R. R.</b> DATE: <b>3/29/04</b>			
								PG. <b>15</b> OF <b>16</b>			



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