Tennessee Valley Authority, Post Office Box 2000, Spring City, Tennessee 37381-2000

MAR 19 2004

10 CFR 50.55a

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

Gentlemen:

In the Matter of) Docket No.50-390
Tennessee Valley Authority)

WATTS BAR NUCLEAR PLANT (WBN) UNIT 1 - AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME) INSERVICE INSPECTION (ISI) PROGRAM REQUEST FOR RELIEF 1-ISI-14 AND 1-ISI-15

The purpose of this letter is to request relief from ASME Section XI Code required examinations due to limitations which were identified in the WBN Unit 1 Cycle 5 refueling outage. These requests for relief are being submitted in accordance with 10 CFR 50.55a(g)(5)(iii).

TVA stated in the ASME Section XI ISI Summary Report for the Fifth Refueling Cycle dated January 14, 2004, that two requests for relief were required to be written for components examined during the inspection and those requests would be submitted under separate letter. The required examination coverage could not be achieved due to configuration of the pressurizer nozzle-to-vessel welds and safety injection system piping welds.

Enclosure 1 provides Request for Relief 1-ISI-14 for the pressurizer nozzle-to-vessel welds.

Enclosure 2 provides Request for Relief 1-ISI-15 for the safety injection system piping welds.

A047

MAR 19 2004

There are no regulatory commitments being tracked from this letter. If you have any questions concerning these relief requests, please contact me at (423) 365-1824.

Sincerely,

P. L. Pace
Manager, Site Licensing
and Industry Affairs

Enclosures
cc (Enclosures):
NRC Resident Inspector
Watts Bar Nuclear Plant
1260 Nuclear Plant Road
Spring City, Tennessee 37381

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U.S. Nuclear Regulatory Commission
Region II
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Atlanta, Georgia 30303

ENCLOSURE 1

WATTS BAR NUCLEAR PLANT (WBN) UNIT 1
AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)
FIRST TEN YEAR INSERVICE INSPECTION INTERVAL

REQUEST FOR RELIEF, 1-ISI-14

ENCLOSURE 1

WATTS BAR NUCLEAR PLANT (WBN) UNIT 1
AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)
FIRST TEN YEAR INSERVICE INSPECTION INTERVAL
REQUEST FOR RELIEF, 1-ISI-14

I. Summary:

This request for relief addresses the pressurizer nozzle full penetration welds. The design configuration of the pressurizer nozzle to vessel welds precludes a 100 percent ultrasonic examination of the required volume for the spray nozzle-to-vessel weld WP-11 and the four safety/relief nozzle-to-vessel welds WP-12, WP-13, WP-14 and WP-15. These physical examination limitations occur when the 1989 Code examination requirements are applied in areas of components constructed and fabricated to early plant physical designs.

An ultrasonic examination was performed on accessible areas to the maximum extent practical, given the physical limitations for welds WP-11, WP-12, WP-13, WP-14 and WP-15 during the Unit 1 Cycle 5 Refueling Outage. The design configuration limits ultrasonic examination to approximately 68 percent for the five welds. It was concluded that performance of an ultrasonic examination of essentially 100 percent of full penetration welds in the pressurizer nozzle to vessel welds, WP-11, WP-12, WP-13, WP-14 and WP-15, would be impractical. The performance of the ultrasonic examination of the subject welds to the maximum extent practical provides reasonable assurance of an acceptable level of quality and safety because the information and data obtained from the volume examined provides sufficient information to judge the overall integrity of the welds. The WBN Code of Record is ASME Section XI, 1989 Edition. Therefore pursuant to 10 CFR 50.55a(g)(5)(iii), it is recommended that relief be granted, for the first inspection interval.

The WBN pressurizer is of the same design as TVA's Sequoyah Nuclear Plant's (SQN) Units 1 and 2 pressurizers. SQN has experienced the similar examination coverage during inservice inspection of these nozzles. NRC approved Sequoyah Nuclear Plant's request for relief 1/2-ISI-09, (Nozzle RCW-15 which is equivalent to WBN's spray nozzle WP-11), in a safety evaluation dated February 9, 2000. SQN's relief requests 1/2-ISI-19, which is the same as WBN's safety/relief nozzles WP-12 through WP 15, was approved by NRC in a safety evaluation dated August 8, 2003.

ENCLOSURE 1

WATTS BAR NUCLEAR PLANT (WBN) UNIT 1
AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)
FIRST TEN YEAR INSERVICE INSPECTION INTERVAL
REQUEST FOR RELIEF, 1-ISI-14

II. Component:

Five Pressurizer Nozzle Welds - Examination Category B-D
Weld Identifiers WP-11, WP-12, WP-13, WP-14, WP-15.

Reference ISI drawing CHM-2570-C-01 (Attachment 1)

III. Code Requirement:

ASME Section XI, 1989 Edition, Table IWB-2500-1, Examination Category B-D, Item Number B3.110, Pressurizer Nozzle-to-Vessel Welds.

Examination requirement as defined by Figure IWB-2500-7(b). (Attachment 2)

IV. Code Requirements From Which Relief Is Requested:

Relief is requested from performing the required volumetric examination on essentially 100 percent of the full volume of the pressurizer nozzle-to-vessel welds.

V. Basis for Relief:

The design configuration of the pressurizer precludes an ultrasonic examination of the required volume for the following nozzle-to-vessel welds: WP-11, WP-12, WP-13, WP-14 and WP-15. The design configuration limits ultrasonic examination to approximately 68 percent of the required examination volume as calculated in the Examination Reports (See Attachment 3).

VI. Alternative Examination:

In lieu of the code required 100 percent ultrasonic examination, an ultrasonic examination was performed on accessible areas to the maximum extent practical, given the physical limitations of the pressurizer nozzle-to-vessel welds. (See Attachment 3 Examination Data Reports).

VII. Justification For The Granting Of Relief:

1) The design configuration of the subject nozzle-to-vessel welds precludes ultrasonic examination of essentially 100 percent of the required examination volume. In order to examine the welds in accordance with the code

requirements, the pressurizer would require extensive design modifications. The physical arrangement of the subject nozzle welds in conjunction with the close curvature of the outside wall surfaces of the nozzle precludes effective ultrasonic examination from the nozzle side.

Scans normal to the weld from the head side were not obstructed allowing complete coverage of the weld from one side. Examination coverage from the one side provides reasonable assurance that no flaws parallel to the weld are present. In addition, approximately 76 percent of the required ultrasonic examination volume for flaws transverse to the weld was performed from the vessel head side. Total combined examination coverage of welds WP-11, WP-12, WP-13, WP-14 and WP-15 is approximately 68 percent of the code required volume.

2) Radiographic examination as an alternate volumetric examination method was determined to be impractical due the thickness of the component. Gaining access to the in-side surface of the pressurizer to place radiographic film would require extensive personnel protection due to high radiation and contamination levels. The pressurizer manway would have to be removed, decontamination performed, and specialized scaffolding erected to gain access. The additional code coverage gained by radiography and/or ultrasonic from the inner surface are impractical when weighed against the radiological concerns. WBN has not opened the pressurizer manway since beginning operation and does not have a history of radiological conditions inside the pressurizer. The estimated radiological conditions referenced in SQN's similar request for relief were determined to be the following:

35-40 rad/hour beta (uncorrected)
10-12 rem/hour gamma
1 rad/hour per 100 square centimeters

Maximum stay time to maintain exposure to < 1 rem is approximately 5 minutes. Special clothing, including respiratory protection, would be required for protection from the extremely high contamination levels and from the high beta dose rate. Industrial safety would also be a major concern (heat stress, confined space, and

climbing/falling hazards). Estimates are based on actual experience inside primary components such as steam generators.

3) Percentage sampling approach of ASME Section XI code, in combination with examinations performed on similar items provides reasonable assurance that significant degradation if present would have been detected.

It is concluded that performing an ultrasonic volumetric examination of essentially 100 percent of full penetration welds in the pressurizer nozzle-to-vessel welds WP-11, WP-12, WP-13, WP-14 and WP-15, would be impractical. In addition, it would be impractical to perform other volumetric examinations which may increase examination coverage. A maximum extent practical ultrasonic examination of the subject welds provides reasonable assurance of an acceptable level of quality and safety. It is concluded that significant degradation, if present, would have been detected during an ultrasonic examination performed to the maximum extent possible, of the subject welds. As a result, reasonable assurance of component structural integrity has been provided.

Therefore pursuant to 10CFR50.55a(g)(5)(iii), it is recommended that relief be granted, for the first inspection interval.

VIII. Implementation Schedule:

This Request for Relief is applicable to WBN's first inspection interval.

ENCLOSURE 1

WATTS BAR NUCLEAR PLANT (WBN) UNIT 1
AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)
FIRST TEN YEAR INSERVICE INSPECTION INTERVAL
REQUEST FOR RELIEF, 1-ISI-14

List of Attachments

Attachment 1 Weld Location ISI drawing CHM-2570-C-01

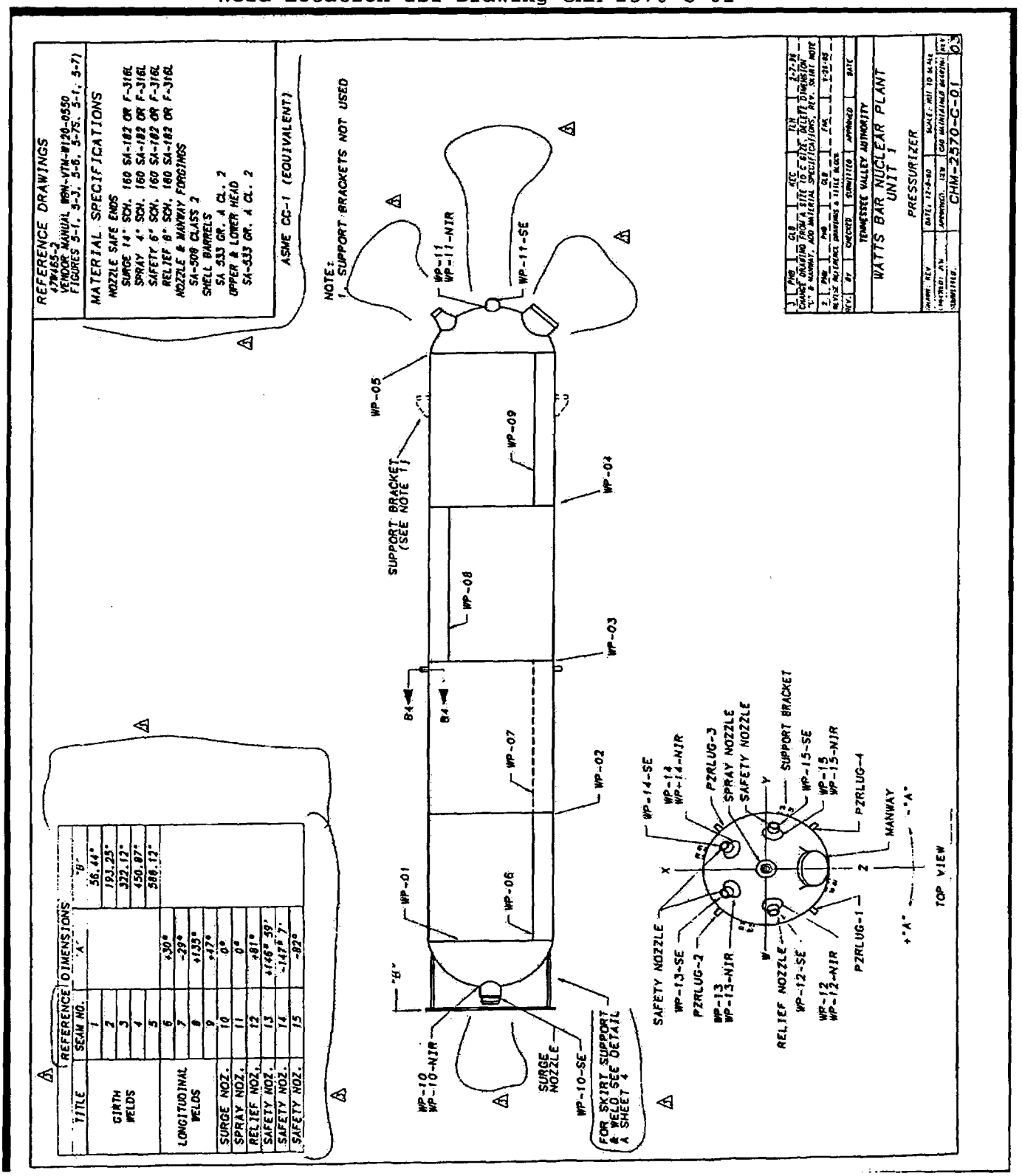
Attachment 2 ASME Section XI, 1989 Edition, Figure IWB-2500-7(b), Nozzle In Shell or Head

Attachment 3 Examination Data Reports
WP-11 - Report R0875
WP-12 - Report R0876
WP-13 - Report R0877
WP-14 - Report R0878
WP-15 - Report R0879

ENCLOSURE 1
ATTACHMENT 1

WATTS BAR NUCLEAR PLANT (WBN) UNIT 1
INSERVICE INSPECTION PROGRAM

REQUEST FOR RELIEF, 1-ISI-14
Weld Location ISI Drawing CHM-2570-C-01

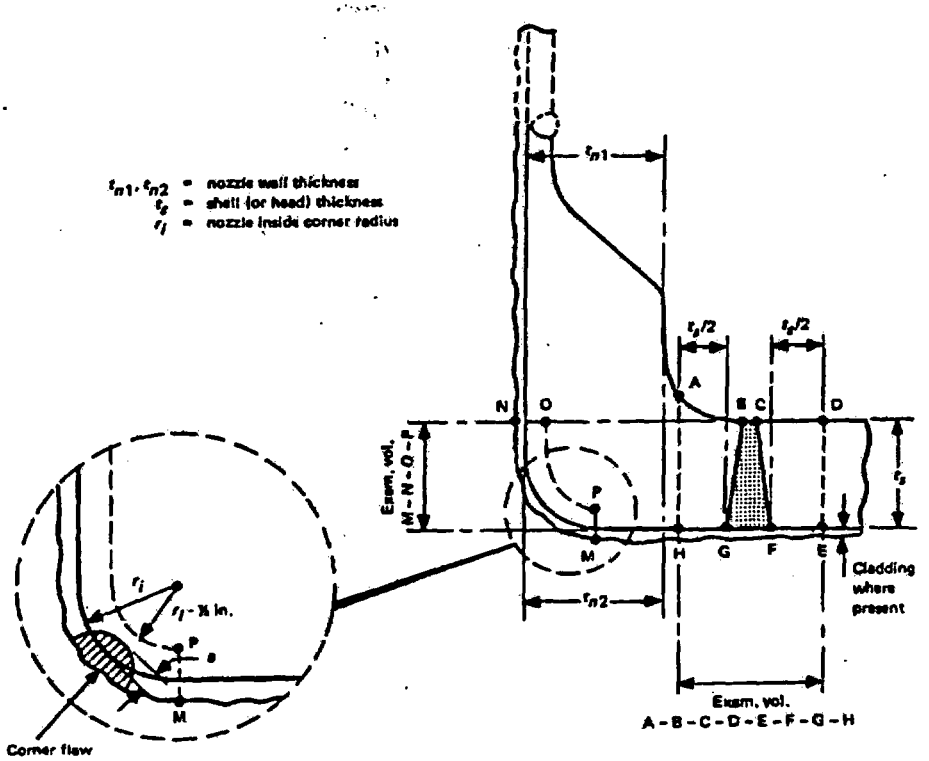


E1A1-1

ENCLOSURE 1
ATTACHMENT 2

WATTS BAR NUCLEAR PLANT (WBN) UNIT 1
INSERVICE INSPECTION PROGRAM

REQUEST FOR RELIEF, 1-ISI-14
FIGURE IWB-2500-7(b) NOZZLE IN SHELL OR HEAD



EXAMINATION REGION (Note (1))	EXAMINATION VOLUME (Note (2))
Shell (or head) adjoining region	C-D-E-F
Attachment weld region	B-C-F-G
Nozzle cylinder region	A-B-G-H
Nozzle inside corner region	M-N-O-P

NOTES:
(1) Examination regions are identified for the purpose of differentiating the acceptance standards in IWB-3512.
(2) Examination volumes may be determined either by direct measurements on the component or by measurements based on design drawings.

FIG. IWB-2500-7(b) NOZZLE IN SHELL OR HEAD
(Examination Zones in Flange Type Nozzles Joined by Full Penetration Butt Welds)

ENCLOSURE 1
ATTACHMENT 3

WATTS BAR NUCLEAR PLANT (WBN) UNIT 1
FIRST TEN YEAR INSERVICE INSPECTION INTERVAL
REQUEST FOR RELIEF, 1-ISI-14

EXAMINATION DATA REPORTS
WP-11 - Report R0875
WP-12 - Report R0876
WP-13 - Report R0877
WP-14 - Report R0878
WP-15 - Report R0879

TENNESSEE VALLEY AUTHORITY	EXAMINATION SUMMARY AND RESOLUTION SHEET	REPORT NUMBER: R0875

PROJECT: *WBN* UNIT: *1* CYCLE *05*				COMPONENT ID: *WP-11*	
EXAMINATION METHOD				SYSTEM: PZR	ISI DWG NO: *CHM-2570-C-01*
MT ☐	PT ☐	UT ☑	VT ☐	CONFIGURATION:	CATEGORY
PROCEDURE: *N-UT-19*	REV *14*	TC: *N/A*		*VHEAD TO VNOZ*	*B-D*
EXAMINER: *Kenneth R. Smith*	EXAMINER: *N/A*			EXAMINER: *N/A*	EXAMINER: *N/A*
LEVEL: *II*	LEVEL: *N/A*			LEVEL: *N/A*	LEVEL: *N/A*

Total coverage calculated to be approximately 83.25 % (2 ANGLE, 2 DIRECTION)
68.1% sww 4/20/03

This report contains the ultrasonic examination data associated with weld #WP-11

0,45 and 60 degree,2.25 Mhz transducers were used.

The configuration resulted in scan limitations,an additional scan was performed looking away from the nozzle to obtain additional coverage,designated scan #9(-).See attached sketch

No reportable indications were detected.

RESOLUTION BY:	REVIEWED BY:	ANII:
Kenneth R. Smith		B. Eamigh
LEVEL II DATE: 9-19-03	LEVEL: III DATE: 9/20/03	DATE: 9/25/03
		Page: 1 OF 8

ACCESS: FORMS DATABASE R-10/04/01

TENNESSEE VALLEY AUTHORITY	DIGITAL ULTRASONIC CALIBRATION DATA SHEET	REPORT NUMBER R0875

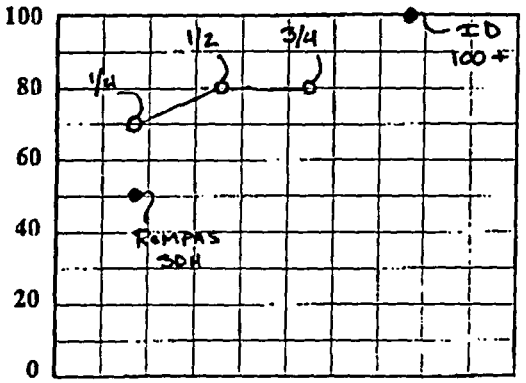
PROJECT *WBN* UNIT/CYCLE *1 / 05*
PROCEDURE: *N-UT-19* REV: *14* TC: *N/A*

TRANSDUCER

MANUFACTURER *KBA*
MODEL: *GAMMA* S/N *J08204SP*
SIZE: *1.0"* FREQ: *2.25* MHz
SHAPE: *Round* # ELEMENTS: *1* # CONS: *0*
CABLE TYPE *RG-174* LENGTH: *6'*

MODE: ☐ SHEAR ☑ LONG ☐ RL

DAC



DISPLAY WIDTH *4.0* inches

REF. REFLECTOR: *Rompas SDH* GAIN: *20* dB
AMPLITUDE: *50* % METAL PATH: *.728*

CALIBRATION DATE: *9-18-03*
CALIBRATION BLOCK NO. *WB-55* TEMP: *78* °F
SIMULATOR BLOCK: *Rompas*
THERMOMETER S/N: *522352* DUE DATE: *6-16-04*
COUPLANT: *Ultragel II* BATCH: *00225*

ANGLE VERIFICATION

BLOCK TYPE: *N/A* S/N: *N/A*
NOMINAL ANGLE: *0°* ACTUAL ANGLE *0°*

INSTRUMENT

MANUFACTURER: *Krautkramer* DUE DATE *5-27-04*
MODEL NO.: *USN-52L* S/N: *E30217*

INSTRUMENT SETTINGS

REFLECTOR SCAN DIRECT.	NTC	SDH	REFERENCE SENSITIVITY	MEMORY NUMBER
AXIAL	☐	☑	*26* dB	*32*
CIRC.	☐	☐	*N/A* dB	*N/A*

FREQ: *2.0-8.0* MHz REJECT: *0* %
ANGLE: *0* deg DAMPING: *1000* ohms
DELAY: *0.039* msec PULSER: *SINGLE*
ZERO: *1.172* msec
VELOCITY *.2352* msec PRR/PRF: *HIGH*
RANGE: *4.0* inches TOF: *PEAK*
DISP. MODE: *FULL WAV* POWER: *BATTERY*

CALIBRATION TIMES

INITIAL TIME: *22:00* FINAL TIME: *04:20*

VERIFICATION TIMES 1) *00:58* 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

WP-11

NRI

EXAMINER: *Kenneth R. Smith* LVL.: *II*
EXAMINER: *N/A* LVL.: *N/A*
REVIEWER: *[signature]* LVL: *II* DATE: *9/2003*

ANII: *B. Esmich*
DATE: *9/25/03*
PAGE *1* OF *8*

TENNESSEE VALLEY AUTHORITY	DIGITAL ULTRASONIC CALIBRATION DATA SHEET	REPORT NUMBER R0875

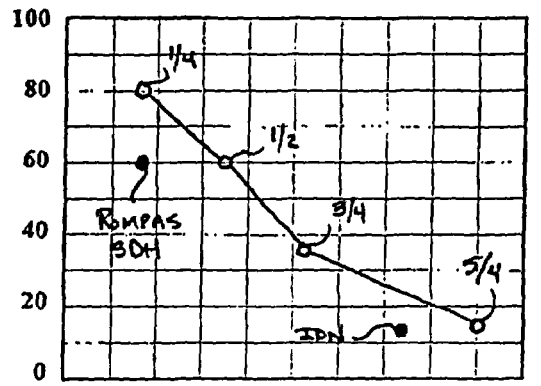
PROJECT *WBN* UNIT/CYCLE *1/ 05*
PROCEDURE: *N-UT-19* REV: *14* TC: *N/A*

TRANSDUCER

MANUFACTURER *KBA*
MODEL: *GAMMA* S/N *J15203*
SIZE: *0.5x1.0"* FREQ: *2.25* MHz
SHAPE: *Rectangle* # ELEMENTS: # CONS: *0*
CABLE TYPE *RG-174* LENGTH: *6'*

MODE: ☑ SHEAR ☐ LONG ☐ RL

DAC



DISPLAY WIDTH *6.0* inches

REF. REFLECTOR: *Rompas SDH* GAIN: *38* dB
AMPLITUDE: *60* % METAL PATH: *1.063*

CALIBRATION DATE: *9-18-03*
CALIBRATION BLOCK NO. *WB-55* TEMP: *78* °F
SIMULATOR BLOCK: *Rompas*
THERMOMETER S/N: *522352* DUE DATE: *6-16-04*
COUPLANT: *Ultragel II* BATCH: *00225*

ANGLE VERIFICATION

BLOCK TYPE: *Rompas* S/N: *791413*
NOMINAL ANGLE: *45°* ACTUAL ANGLE *45°*

INSTRUMENT

MANUFACTURER: *Krautkramer* DUE DATE *5-27-04*
MODEL NO.: *USN-52L* S/N: *E30217*

INSTRUMENT SETTINGS

REFLECTOR SCAN DIRECT.	NTC	SDH	REFERENCE SENSITIVITY	MEMORY NUMBER
AXIAL	☐	☑	*34* dB	*30*
CIRC.	☐	☐	*N/A* dB	*N/A*

FREQ: *2.0-8.0* MHz REJECT: *0* %
ANGLE: *45* deg DAMPING: *1000* ohms
DELAY: *-0.008* msec PULSER: *SINGLE* *
ZERO: *13.871* msec
VELOCITY *.1326* msec PRR/PRF: *HIGH*
RANGE: *6.0* inches TOF: *PEAK*
DISP. MODE: *FULL WAV* POWER: *BATTERY*

CALIBRATION TIMES

INITIAL TIME: *22:20* FINAL TIME: *04:25*

VERIFICATION TIMES 1) *01:48* 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*	
TTENUATOR	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

-7 db BTWN. 3/4 + 5/4 SDH's

LIMITED SCAN, SEE ATTACHED SKETCH

NRI

WELD / ITEMS EXAMINED

WP-11

EXAMINER: *Kenneth R. Smith* LVL: *II*
EXAMINER: *N/A* LVL.: *N/A*
REVIEWER: *for M. E. Hatcher* LVL: *III* DATE: *9/26/03*

ANII: *B. Eanigh*
DATE: *9/25/03*
PAGE *3* OF *8*

ACCESS: FORMS DATABASE 10-27-04

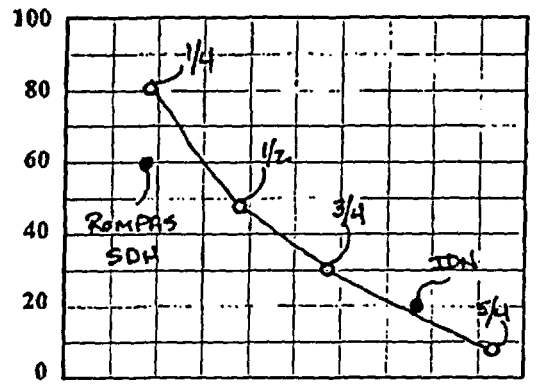
TENNESSEE VALLEY AUTHORITY	DIGITAL ULTRASONIC CALIBRATION DATA SHEET	REPORT NUMBER R0875

PROJECT *WBN* UNIT/CYCLE *1/ 05*
PROCEDURE: *N-UT-19* REV: *14* TC: *N/A*

TRANSDUCER

MANUFACTURER *KBA*
MODEL: *GAMMA* S/N *JI5204*
SIZE: *0.5x1.0"* FREQ: *2.25* MHz
SHAPE: *Rectangle* # ELEMENTS: *1* # CONS: *0*
CABLE TYPE *RG-174* LENGTH: *6'*
MODE: ☑ SHEAR ☐ LONG ☐ RL

DAC



DISPLAY WIDTH *8.5* inches

REF. REFLECTOR: *Rompas SDH* GAIN: *44* dB
AMPLITUDE: *60* % METAL PATH: *1.532*

CALIBRATION DATE: *9-18-03*
CALIBRATION BLOCK NO. *WB-55* TEMP: *78°F*
SIMULATOR BLOCK: *Rompas*
THERMOMETER S/N: *522352* DUE DATE: *6-16-04*
COUPLANT: *Ultragel II* BATCH: *00225*

ANGLE VERIFICATION

BLOCK TYPE: *Rompas* S/N: *791413*
NOMINAL ANGLE: *60°* ACTUAL ANGLE *60°*

INSTRUMENT

MANUFACTURER: *Krautkramer* DUE DATE *5-27-04*
MODEL NO.: *USN-52L* S/N: *E30217*

INSTRUMENT SETTINGS

REFLECTOR			REFERENCE SENSITIVITY	MEMORY NUMBER
SCAN DIRECT.	NTC	SDH		
AXIAL	☐	☑	*41* dB	*31*
CIRC.	☐	☐	*N/A* dB	*N/A*

FREQ: *2.0-8.0* MHz REJECT: *0* %
ANGLE: *60* deg DAMPING: *1000* ohms
DELAY: *0.00* msec PULSER: *SINGLE* *
ZERO: *16.404* msec
VELOCITY *.1292* msec PRR/PRF: *HIGH*
RANGE: *8.5* inches TOF: *PEAK*
DISP. MODE: *FULL WAV* POWER: *BATTERY*

CALIBRATION TIMES

INITIAL TIME: *22:45* FINAL TIME: *04:15*

VERIFICATION TIMES 1) *02:48* 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	
TTENUATOR	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

-11 db BTWN 3/4 AND 5/4 SDH'S

LIMITED SCAN, SEE ATTACHED SKETCH

NRI

WELD / ITEMS EXAMINED

WP-11

EXAMINER: *Kenneth R. Smith* LVL.: *II*
EXAMINER: *N/A* LVL.: *N/A*
REVIEWER: *[signature]* LVL.: *III* DATE: *9/20/03*

ANII: *B. Eanigh*
DATE: *9/25/03*
PAGE *4* OF *8*

TENNESSEE VALLEY AUTHORITY	MANUAL ULTRASONIC VESSEL EXAMINATION DATA SHEET	REPORT NUMBER R0875

PROJECT WBN UNIT/CYCLE 1/5
SYSTEM: PZR
WELD I.D.: WP-11
CONFIG.: Head TO Nozzle
FLOW →
PROCEDURE: N-UT-19 REV: 14 TC: N/A

Wo REFERENCE: HEAD SIDE WELD TOE
Lo REFERENCE: "O" STAMP
SURFACE TEMP.: 76 °F
PYRO. SERIAL NO.: 522352

EXAMINATION DATE 9-19-03
START TIME: 00:58 END TIME: 04:00

ANGLE	SCAN SENSITIVITY
0°	MIN 32 dB
45°	40-46 dB
60°	47-53 dB

RESULTS: (SCAN NUMBER)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
INDICATION RECORDED (Y/N)	N/A							N/A	N	N	N	N/A							N/A

IND NO.	MAX AMP	SCAN NO.	ANG.	100% (1/2 MAX) Mp1	W1	L1	50% Mp1	W1	L1	20% Mp1	W1	L1	MAX Mp	W	L	20% Mp2	W2	L2	50% Mp2	W2	L2	100% (1/2 MAX) Mp2	W2	L2
													N/A											

REMARKS/LIMITATIONS NRI

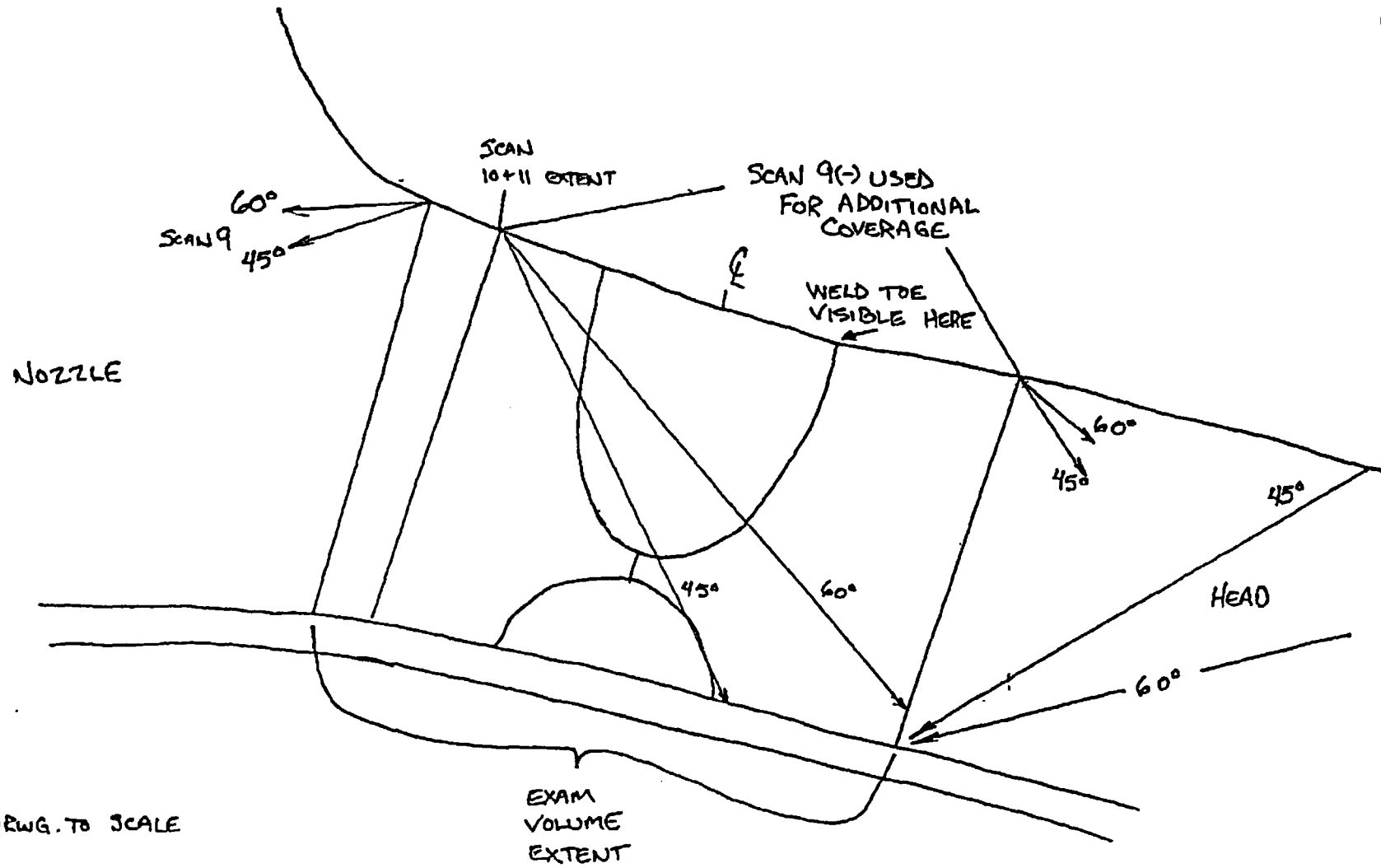
EXAMINER: Kenneth R. Smith LEVEL: II
EXAMINER: N/A LEVEL: N/A

REVIEWED BY: [signature] LEVEL: III DATE: 9/10/03

ANII: B. Farmer DATE: 9/25/03 PAGE 1 OF 2

ACCESS. FORMS DATABASE 10/3/00

TVA Office of Nuclear Power	PROJECT: WBN SYSTEM: PZR Unit: 1 / CYCLE 5 WELD NO.: WP-11	REPORT NO.: RO875



BY: Kenneth R. Smith LEVEL: II DATE: 9-19-03 PAGE 6 OF 10

TVA 19669 (ONP-6-88)

TVA Office of Nuclear Power	PROJECT: WBN SYSTEM: Pressurizer Unit: 1 WELD NO.: see below WP-11	REPORT NO.: R0875

Safety and Relief Coverage Calculation

~~WP-12~~, WP-13, WP-14, WP-18 WP-11

Reference CHM-2570-C-06 — 9/22/03

Total Area = $(3.8 \times 2.5) + [(.9 \times .5)].5 = 9.725$"

0, 45 $\overleftarrow{P}$, 45 $\overrightarrow{P}$, 60 $\overleftarrow{P}$ 60 $\overrightarrow{P}$ = 2.35" Limitation

$= \frac{9.725 - 2.35}{9.725} \times 100 = 75.8\%$ Coverage

$45\uparrow_T = [.9 \times .55].5 = .2475$" Limitation

$\frac{9.725 - .2475}{9.725} \times 100 = 97.5\%$ Coverage

$60\uparrow_T = [1.1 \times 1].5 = .55$" Limitation

$\frac{9.725 - .55}{9.725} \times 100 = 94.3\%$ Coverage

$60\downarrow_T = \frac{(1.4 \times 2.1).5}{9.725} \times 100 = 15.1\%$ Coverage

$45\downarrow T = \frac{(2.5 \times 2.1).5}{9.725} \times 100 = 27\%$ Coverage

0 — 75.8

45 - 75.8

45 - 75.8

60 - 75.8

60 - 75.8

45↑ - 97.5

45↓ - 15.1

60↑ - 94.3

60↓ - 27

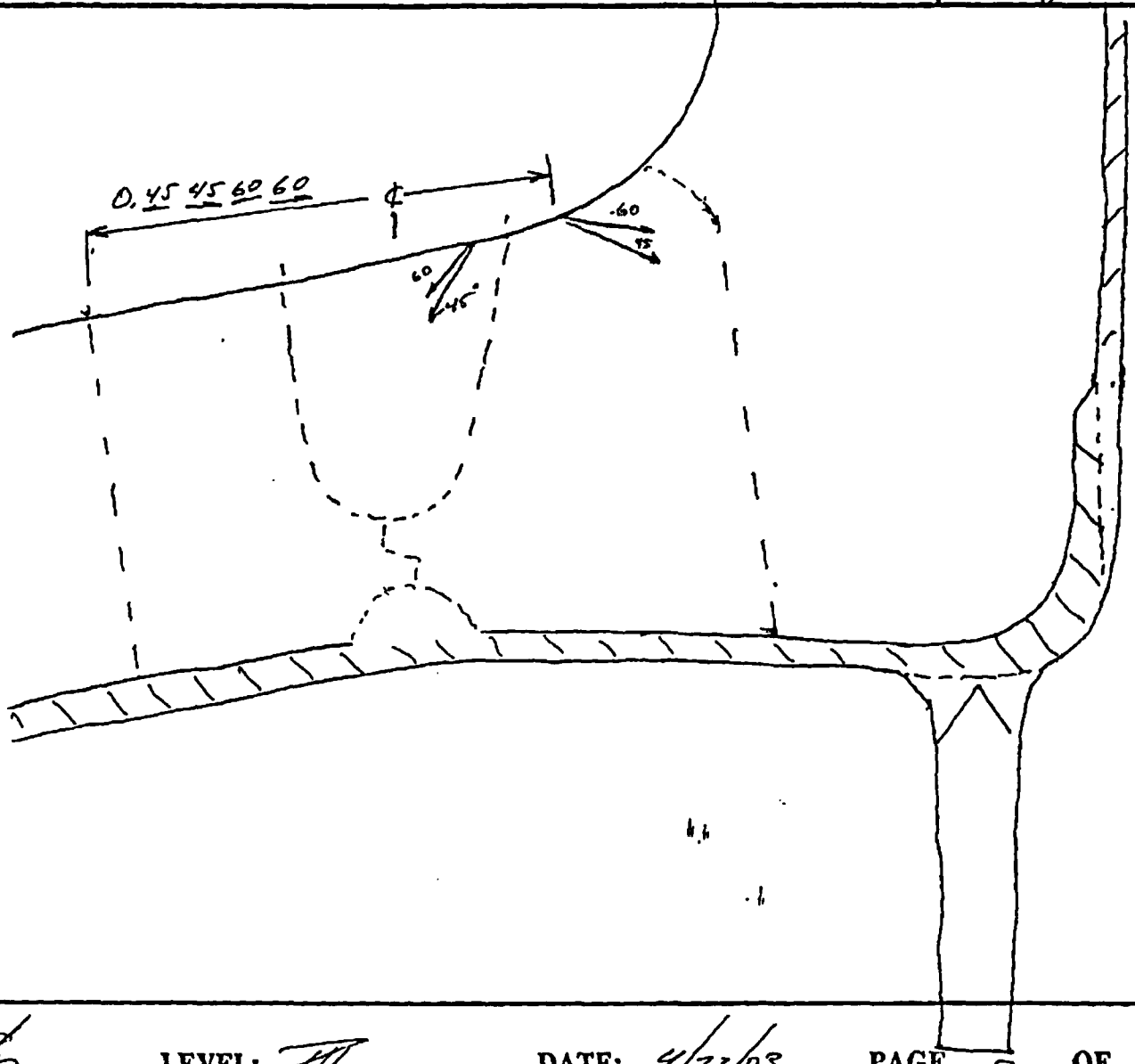
612.9/9 = 68.1%

Bi-directional Coverage

BY:	LEVEL:	DATE: 9/22/03	PAGE 2	OF 2

TVA 19669 (ONP-6-88)

TVA Office of Nuclear Power	PROJECT: WBN SYSTEM: Pressurizer Unit: 1 WELD NO.: ~~WP-1~~ 2 WP-11	REPORT NO.: R0875



BY: _____ LEVEL: III DATE: 4/23/03 PAGE 8 OF 8

TVA 19669 (ONP-6-88)

TENNESSEE VALLEY AUTHORITY	EXAMINATION SUMMARY AND RESOLUTION SHEET	REPORT NUMBER: R0876

PROJECT: *WBN* UNIT: *1*	CYCLE *05*			COMPONENT ID: *WP-12*	
EXAMINATION METHOD				SYSTEM: PZR	ISI DWG NO: *CHM-2570-C-01*
MT ☐	PT ☐	UT ☑	VT ☐	CONFIGURATION:	CATEGORY
PROCEDURE: *N-UT-19*	REV *14*	TC: *N/A*		*VHEAD TO NOZZLE*	*B-D*
EXAMINER: Kenneth R. Smith	EXAMINER: *N/A*			EXAMINER: *N/A*	EXAMINER: *N/A*
LEVEL: *II*	LEVEL: *N/A*			LEVEL: *N/A*	LEVEL: *N/A*

Total coverage calculated to be approximately ~~81.5~~ 68.1% ~~(2 ANGLE, 2 DIRECTION)~~ SWW 9/23/03

This report contains the ultrasonic examination data associated with weld #WP-12

0,45 and 60 degree ,2.25 Mhz transducers were used.

The configuration resulted in scan limitations,an additional scan was performed looking away from the nozzle to obtain additional coverage,designated scan#9(-).See attached sketch

No reportable indications were detected.

RESOLUTION BY:	REVIEWED BY:	ANII:
Kenneth R. Smith	Joel A. Watkins	B. Eamigh
LEVEL II DATE: 9-19-03	LEVEL: III DATE: 9/23/03	DATE: 9/25/03
		Page: 1 OF 8

TENNESSEE VALLEY AUTHORITY	DIGITAL ULTRASONIC CALIBRATION DATA SHEET	REPORT NUMBER R0876

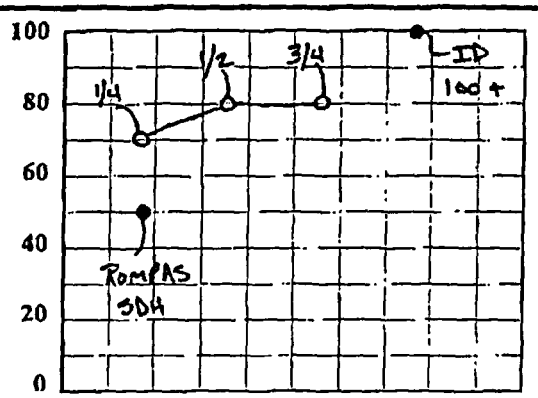
PROJECT *WBN* UNIT/CYCLE *1/ 05*
PROCEDURE: *N-UT-19* REV: *14* TC: *N/A*

TRANSDUCER

MANUFACTURER *KBA*
MODEL: *GAMMA* S/N *J082048P*
SIZE: *1.0"* FREQ: *2.25 MHz*
SHAPE: *Round* # ELEMENTS: *1* # CONS: *0*
CABLE TYPE *RG-174* LENGTH: *6'*

MODE: ☐ SHEAR ☑ LONG ☐ RL

DAC



DISPLAY WIDTH *4.0* inches

CALIBRATION DATE: *9-18-03*
CALIBRATION BLOCK NO. *WB-55* TEMP: *78°F*
SIMULATOR BLOCK: *Rompas*
THERMOMETER S/N: *522352* DUE DATE: *6-16-04*
COUPLANT: *Ultragel II* BATCH: *00225*

ANGLE VERIFICATION

BLOCK TYPE: *N/A* S/N: *N/A*
NOMINAL ANGLE: *0°* ACTUAL ANGLE *0°*

INSTRUMENT

MANUFACTURER: *Krautkramer* DUE DATE *5-27-04*
MODEL NO.: *USN-52L* S/N: *E30217*

INSTRUMENT SETTINGS

REFLECTOR SCAN DIRECT.	NTC	SDH	REFERENCE SENSITIVITY	MEMORY NUMBER
AXIAL	—	✓	*26* dB	*32*
CIRC.	—	—	*N/A* dB	*N/A*

FREQ: *2.0-8.0* MHz REJECT: *0* %
ANGLE: *0* deg DAMPING: *1000* ohms
DELAY: *0.039* msec PULSER: *SINGLE*
ZERO: *1.172* msec
VELOCITY *.2352* msec PRR/PRF: *HIGH*
RANGE: *4.0* inches TOF: *PEAK*
DISP. MODE: *FULL WAV* POWER: *BATTERY*

REF. REFLECTOR: *Rompas SDH* GAIN: *20* dB
AMPLITUDE: *50* % METAL PATH: *.728*

CALIBRATION TIMES

INITIAL TIME: *22:00* FINAL TIME: *04:20*

VERIFICATION TIMES	1)	2)	3)	4)	5)	6)	7)	8)	9)
	00:58	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*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*

TTENUATOR	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

NRI

WELD / ITEMS EXAMINED

WP-12

EXAMINER: Kenneth R. Smith LVL.: *II*
EXAMINER: *N/A* LVL.: *N/A*
REVIEWER: [signature] LVL: II DATE: 9/20/03

ANII: B. Esmiol
DATE: 9/25/03
PAGE 2 OF 9

ACCESS: FORMS DATABASE 10-27-01

TENNESSEE VALLEY AUTHORITY	DIGITAL ULTRASONIC CALIBRATION DATA SHEET	REPORT NUMBER R0876

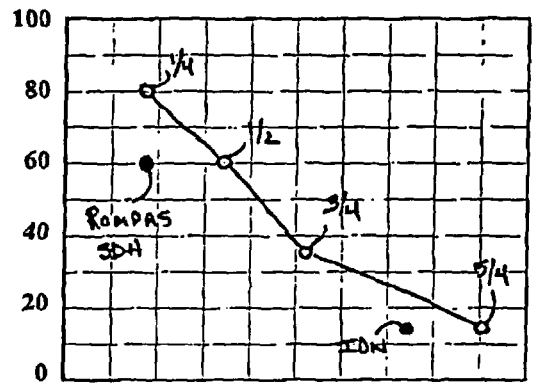
PROJECT *WBN* UNIT/CYCLE *1/ 05*
PROCEDURE: *N-UT-19* REV: *14* TC: *N/A*

TRANSDUCER

MANUFACTURER *KBA*
MODEL: *GAMMA* S/N *J15203*
SIZE: *0.5x1.0"* FREQ: *2.25* MHz
SHAPE: *Rectangle* # ELEMENTS: *1* # CONS: *0*
CABLE TYPE *RG-174* LENGTH: *6'*

MODE: ☑ SHEAR ☐ LONG ☐ RL

DAC



DISPLAY WIDTH *6.0* inches

CALIBRATION DATE: *9-18-03*
CALIBRATION BLOCK NO. *WB-55* TEMP: *78°F*
SIMULATOR BLOCK: *Rompas*
THERMOMETER S/N: *522352* DUE DATE: *6-16-04*
COUPLANT: *Ultragel II* BATCH: *00225*

ANGLE VERIFICATION

BLOCK TYPE: *Rompas* S/N: *791413*
NOMINAL ANGLE: *45°* ACTUAL ANGLE *45°*

INSTRUMENT

MANUFACTURER: *Krautkramer* DUE DATE *5-27-04*
MODEL NO.: *USN-52L* S/N: *E30217*

INSTRUMENT SETTINGS

REFLECTOR SCAN DIRECT.	NTC	SDH	REFERENCE SENSITIVITY	MEMORY NUMBER
AXIAL	☐	☑	*34* dB	*30*
CIRC.	☐	☐	*N/A* dB	*N/A*

FREQ: *2.0-8.0* MHz REJECT:= *0* %
ANGLE: *45* deg DAMPING: *1000* ohms
DELAY: *-0.008* msec PULSER: *SINGLE*
ZERO: *13.871* msec
VELOCITY *.1326* msec PRR/PRF: *HIGH*
RANGE: *6.0* inches TOF: *PEAK*
DISP. MODE: *FULL WAV* POWER: *BATTERY*

REF. REFLECTOR: *Rompas SDH* GAIN: *38* dB
AMPLITUDE: *60* % METAL PATH: *1.063*

CALIBRATION TIMES

INITIAL TIME: *22:20* FINAL TIME: *04:25*

VERIFICATION TIMES 1) *01:48* 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*	
TTENUATOR	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

-7 db DIFF. BTWN. 3/4 AND 5/4 SDH
LIMITED SCAN, SEE ATTACHED SKETCH
NRT

WELD/ITEMS EXAMINED

WP-12

EXAMINER: *Kenneth R. Smith* LVL.: *II*
EXAMINER: *N/A* LVL.: *N/A*
REVIEWER: *[signature]* LVL.: *III* DATE: *9/25/03*

ANII: *B. Eanish*
DATE: *9/25/03*
PAGE *3* OF *8*

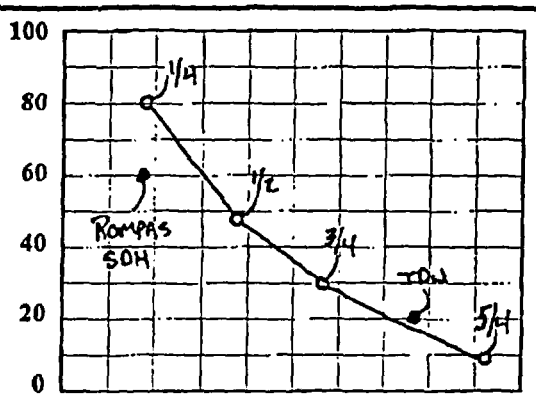
ACCESS-FORMS-DATABASE-10-27-01

TENNESSEE VALLEY AUTHORITY	DIGITAL ULTRASONIC CALIBRATION DATA SHEET	REPORT NUMBER R10076

PROJECT *WBN* UNIT/CYCLE *1 / 05*
PROCEDURE: *N-UT-19* REV: *14* TC: *N/A*

TRANSDUCER
MANUFACTURER *KBA*
MODEL: *GAMMA* S/N *JI5204*
SIZE: *0.5x1.0"* FREQ: *2.25* MHz
SHAPE: *Rectangle* # ELEMENTS: *1* # CONS: *0*
CABLE TYPE *RG-174* LENGTH: *6'*
MODE: ☑ SHEAR ☐ LONG ☐ RL

DAC



DISPLAY WIDTH *8.5* inches

REF. REFLECTOR: *Rompas SDH* GAIN: *44* dB
AMPLITUDE: *60* % METAL PATH: *1.532*

CALIBRATION DATE: *9-18-03*
CALIBRATION BLOCK NO. *WB-55* TEMP: *78°F*
SIMULATOR BLOCK: *Rompas*
THERMOMETER S/N: *522352* DUE DATE: *6-16-04*
COUPLANT: *Ultragel II* BATCH: *00225*

ANGLE VERIFICATION
BLOCK TYPE: *Rompas* S/N: *791413*
NOMINAL ANGLE: *60°* ACTUAL ANGLE *60°*

INSTRUMENT
MANUFACTURER: *Krautkramer* DUE DATE *5-27-04*
MODEL NO.: *USN-52L* S/N: *E30217*

INSTRUMENT SETTINGS

SCAN DIRECT.	REFLECTOR NTC	REFLECTOR SDH	REFERENCE SENSITIVITY	MEMORY NUMBER
AXIAL	☐	☑	*41* dB	*31*
CIRC.	☐	☐	*N/A* dB	*N/A*

FREQ: *2.0-8.0* MHz REJECT:= *0* %
ANGLE: *60* deg DAMPING: *1000* ohms
DELAY: *0.00* msec PULSER: *SINGLE*
ZERO: *16.404* msec
VELOCITY *.1292* msec PRR/PRF: *HIGH*
RANGE: *8.5* inches TOF: *PEAK*
DISP. MODE: *FULL WAV* POWER: *BATTERY*

CALIBRATION TIMES
INITIAL TIME: *22:45* FINAL TIME: *04:15*

VERIFICATION TIMES 1) *02:48* 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*	
TTENUATOR	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
-11 db BTWN. 3/4 AND 5/4 SDH
LIMITED SCAN, SEE ATTACHED SKETCH
NRI

WELD / ITEMS EXAMINED
WP-12

EXAMINER: *Kenneth R. Smith* LVL.: *II*
EXAMINER: *N/A* LVL.: *N/A*
REVIEWER: *[signature]* LVL.: *II* DATE: *9/26/03*

ANII: *B. Eanigh*
DATE: *9/25/03*
PAGE *4* OF *8*

TENNESSEE VALLEY AUTHORITY	MANUAL ULTRASONIC VESSEL EXAMINATION DATA SHEET	REPORT NUMBER
		R0876

PROJECT WBN UNIT/CYCLE 1/5
SYSTEM: PZR
WELD I.D.: WP-12
CONFIG.: TO FLOW →
PROCEDURE: N-UT-19 REV: 14 TC: N/A

Wo REFERENCE: HEAD SIDE WELD TOE
Lo REFERENCE: "O" STAMP
SURFACE TEMP.: 76 °F
PYRO. SERIAL NO.: 522352

EXAMINATION DATE 9-19-03
START TIME: 00:58 END TIME: 04:00

ANGLE	SCAN SENSITIVITY
0°	MIN. 32 dB
45°	40-46 dB
60°	47-53 dB

RESULTS: (SCAN NUMBER)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
INDICATION RECORDED (Y/N)	N/A							N/A				N/A							N/A

IND NO.	MAX AMP	SCAN NO.	ANG.	100% (1/2 MAX) Mp1	W1	L1	50% Mp1	W1	L1	20% Mp1	W1	L1	MAX Mp	W	L	20% Mp2	W2	L2	50% Mp2	W2	L2	100% (1/2 MAX) Mp2	W2	L2
													N/A											

REMARKS/LIMITATIONS NRI

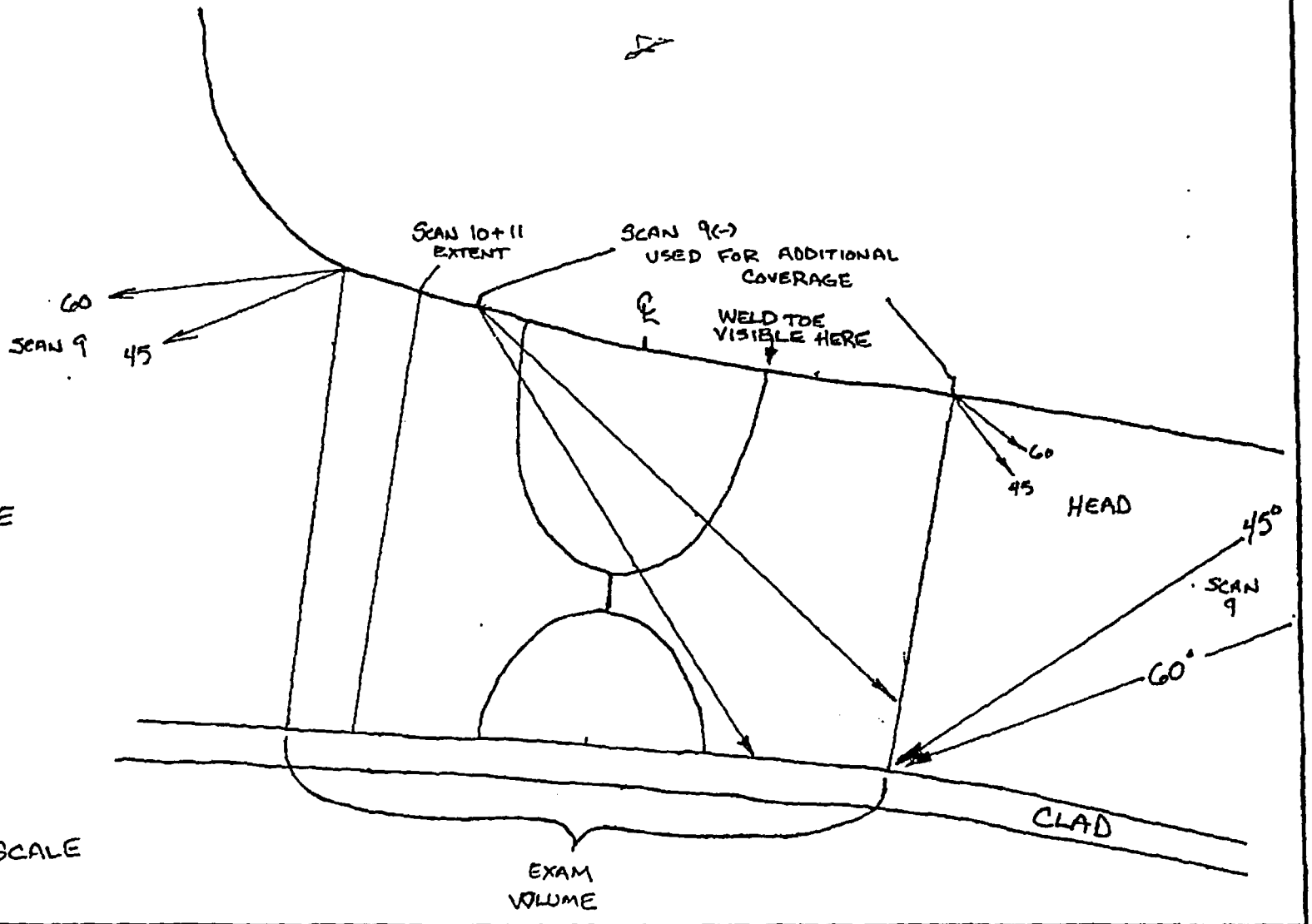
EXAMINER: Kenneth R. Smith LEVEL: II
EXAMINER: N/A LEVEL: N/A

REVIEWED BY: [signature]
LEVEL: III DATE: 9/30/03

ANII: B. Eamigh
DATE: 9/25/03 PAGE 5 OF 6

ACCESS: FORMS DATABASE 10/3/00

TVA Office of Nuclear Power	PROJECT: WBN SYSTEM: PZR Unit: 1 / CYCLE 5 WELD NO.: WP-12	REPORT NO.: R0876



DRWG. TO SCALE

BY: Kenneth R. Smith LEVEL: II DATE: 9-19-03 PAGE 6 OF 9

TVA 19669 (ONP-G-88)

TVA Office of Nuclear Power	PROJECT: WBN SYSTEM: Pressurizer Unit: 1 WELD NO.: see below	REPORT NO.: R0876

Safety and Relief Coverage Calculation
(WP-12,) WP-13, WP-14, WP-15

Reference CHM-2570-C-06

Total Area = $(3.8 \times 2.5) + [(.9 \times .5)] .5 = 9.725"$

0, 45 P, 45 P, 60 P 60 P = 2.35" Limitation

$= \frac{9.725 - 2.35}{9.725} \times 100 = 75.8\%$ Coverage

$45\uparrow_T = [.9 \times .55] .5 = .2475"$ Limitation

$\frac{9.725 - .2475}{9.725} \times 100 = 97.5\%$ Coverage

$60\uparrow_T = [1.1 \times 1] .5 = .55"$ Limitation

$\frac{9.725 - .55}{9.725} \times 100 = 94.3\%$ Coverage

$60\downarrow_T = \frac{(1.4 \times 2.1) .5}{9.725} \times 100 = 15.1\%$ Coverage

$45\downarrow T = \frac{(2.5 \times 2.1) .5}{9.725} \times 100 = 27\%$ Coverage

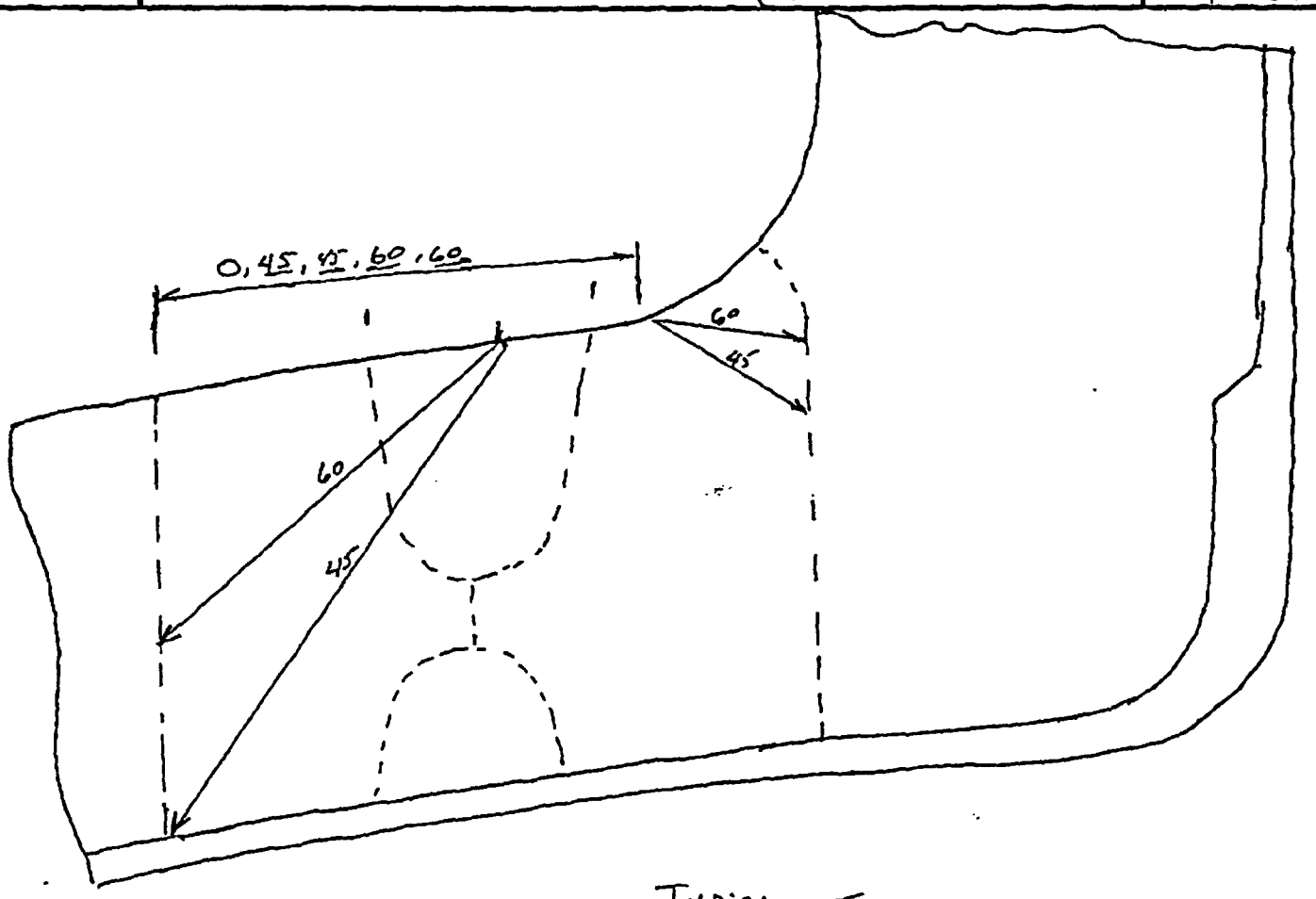
0 — 75.8
45 - 75.8
45 - 75.8
60 - 75.8
60 - 75.8
45↑ - 97.5
45↓ - 15.1
60↑ - 94.3
60↓ - 27

612.9/9 = 68.1%

Bi-directional Coverage

BY:	LEVEL: III	DATE: 9/22/03	PAGE 2	OF 8

TVA Office of Nuclear Power	PROJECT: WBN SYSTEM: Pressurizer Unit: 1 WELD NO.: WP-12, WP-13, WP-14, WP-15	REPORT NO.: R0876



Typical Scan

Scan stops taken from Field Data

Reference CHM-2570-C-06

BY: [signature] LEVEL: III DATE: 9/23/03 PAGE 8 OF 8

TENNESSEE VALLEY AUTHORITY	EXAMINATION SUMMARY AND RESOLUTION SHEET	REPORT NUMBER: R0877

PROJECT: *WBN* UNIT: *1* CYCLE *05*				COMPONENT ID: *WP-13*	
EXAMINATION METHOD				SYSTEM: PZR	ISI DWG NO: *CHM-2570-C-01*
MT ☐	PT ☐	UT ☑	VT ☐	CONFIGURATION:	CATEGORY
PROCEDURE: *N-UT-19*	REV *14*	TC: *N/A*		*VHEAD TO NOZZLE*	*B-D*
EXAMINER: Kenneth R. Smith	EXAMINER: *N/A*			EXAMINER: *N/A*	EXAMINER: *N/A*
LEVEL: *II*	LEVEL: *N/A*			LEVEL: *N/A*	LEVEL: *N/A*

Total coverage calculated to be approximately ~~81.5~~ 68.1 % ~~(2 ANGLE, 2 DIRECTION)~~ 3WW 9/23/03

This report contains the ultrasonic examination data associated with weld #WP-13

0,45 and 60 degree 2.25 Mhz transducers were used.

The configuration resulted in scan limitations,an additional scan was performed looking away from the nozzle to obtain additional coverage,designated scan #9(-). See attached sketch

No reportable indications were detected.

RESOLUTION BY:	REVIEWED BY:	ANII:
Kenneth R. Smith	Gal Whitaker	B. Eamigh
LEVEL: II DATE: 9-19-03	LEVEL: III DATE: 9/23/03	DATE: 9/24/03
		Page: 1 OF 9

ACCESS: FORMS DATABASE R-10/04/01

TENNESSEE VALLEY AUTHORITY	DIGITAL ULTRASONIC CALIBRATION DATA SHEET	REPORT NUMBER R0877

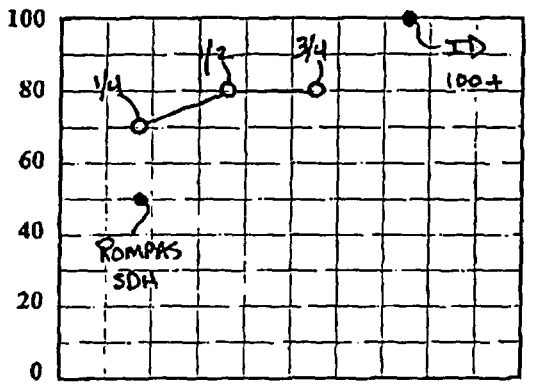
PROJECT *WBN* UNIT/CYCLE *1 / 05*
PROCEDURE: *N-UT-19* REV: *14* TC: *N/A*

TRANSDUCER

MANUFACTURER *KBA*
MODEL: *GAMMA* S/N *J082045P*
SIZE: *1.0"* FREQ: *2.25 MHz*
SHAPE: *Round* # ELEMENTS: *1* # CONS: *0*
CABLE TYPE *RG-174* LENGTH: *6'*

MODE: ☐ SHEAR ☑ LONG ☐ RL

DAC



DISPLAY WIDTH *4.0* inches

CALIBRATION DATE: *9-18-03*
CALIBRATION BLOCK NO. *WB-55* TEMP: *78°F*
SIMULATOR BLOCK: *Rompas*
THERMOMETER S/N: *522352* DUE DATE: *6-16-04*
COUPLANT: *Ultragel II* BATCH: *00225*

ANGLE VERIFICATION

BLOCK TYPE: *N/A* S/N: *N/A*
NOMINAL ANGLE: *0°* ACTUAL ANGLE *0°*

INSTRUMENT

MANUFACTURER: *Krautkramer* DUE DATE *5-27-04*
MODEL NO.: *USN-52L* S/N: *E30217*

INSTRUMENT SETTINGS

REFLECTOR			REFERENCE SENSITIVITY	MEMORY NUMBER
SCAN DIRECT.	NTC	SDH		
AXIAL	☐	☑	*26* dB	*32*
CIRC.	☐	☐	*N/A* dB	*N/A*

FREQ: *2.0-8.0* MHz REJECT:= *0* %
ANGLE: *0* deg DAMPING: *1000* ohms
DELAY: *0.039* msec PULSER: *SINGLE*
ZERO: *1.172* msec
VELOCITY *.2352* msec PRR/PRF: *HIGH*
RANGE: *4.0* inches TOF: *PEAK*
DISP. MODE: *FULL WAV* POWER: *BATTERY*

REF. REFLECTOR: *Rompas SDH* GAIN: *20* dB
AMPLITUDE: *50 %* METAL PATH: *0.728*

CALIBRATION TIMES

INITIAL TIME: *22:00* FINAL TIME: *04:20*

VERIFICATION TIMES	1)	2)	3)	4)	5)	6)	7)	8)	9)
	00:58	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*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*	
TTENUATOR	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*			*8-*

COMMENTS

NRI

WELD / ITEMS EXAMINED

WP-13

EXAMINER: *Kenneth R. Smith* LVL.: *II*
EXAMINER: *N/A* LVL.: *N/A*
REVIEWER: *[signature]* LVL: *III* DATE: *9/29/03*

ANII: *B. Eamigh*
DATE: *9/29/03*
PAGE *2* OF *3*

TENNESSEE VALLEY AUTHORITY	DIGITAL ULTRASONIC CALIBRATION DATA SHEET	REPORT NUMBER R0877

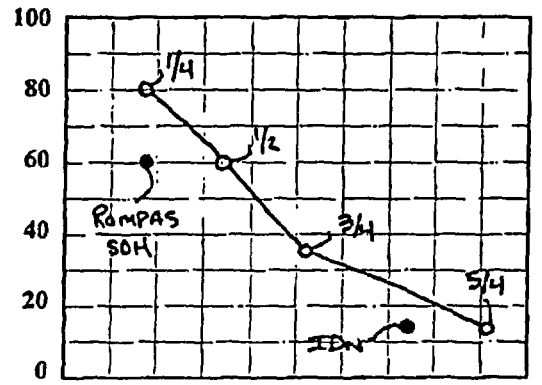
PROJECT *WBN* UNIT/CYCLE *1/ 05*
PROCEDURE: *N-UT-19* REV: *14* TC: *N/A*

TRANSDUCER

MANUFACTURER *KBA*
MODEL: *GAMMA* S/N *J15203*
SIZE: *0.5x1.0"* FREQ: *2.25 MHz*
SHAPE: *Rectangle* # ELEMENTS: *1* # CONS: *0*
CABLE TYPE *RG-174* LENGTH: *6'*

MODE: ☑ SHEAR ☐ LONG ☐ RL

DAC



DISPLAY WIDTH *6.0* inches

CALIBRATION DATE: *9-18-03*
CALIBRATION BLOCK NO. *WB-55* TEMP: *78°F*
SIMULATOR BLOCK: *Rompas*
THERMOMETER S/N: *522352* DUE DATE: *6-16-04*
COUPLANT: *Ultragel II* BATCH: *00225*

ANGLE VERIFICATION

BLOCK TYPE: *Rompas* S/N: *791413*
NOMINAL ANGLE: *45°* ACTUAL ANGLE *45°*

INSTRUMENT

MANUFACTURER: *Krautkramer* DUE DATE *5-27-04*
MODEL NO.: *USN-52L* S/N: *E30217*

INSTRUMENT SETTINGS

REFLECTOR			REFERENCE SENSITIVITY	MEMORY NUMBER
SCAN DIRECT.	NTC	SDH		
AXIAL	☐	☑	*34* dB	*30*
CIRC.	☐	☐	*N/A* dB	*N/A*

FREQ: *2.0-8.0* MHz REJECT: *0* %
ANGLE: *45* deg DAMPING: *1000* ohms
DELAY: *-0.008* msec PULSER: *SINGLE*
ZERO: *13.871* msec
VELOCITY *.1326* msec PRR/PRF: *HIGH*
RANGE: *6.0* inches TOF: *PEAK*
DISP. MODE: *FULL WAV* POWER: *BATTERY*

REF. REFLECTOR: *Rompas SDH* GAIN: *38* dB
AMPLITUDE: *60* % METAL PATH: *1.063*

CALIBRATION TIMES

INITIAL TIME: *22:20* FINAL TIME: *04:25*

VERIFICATION TIMES 1) *01:48* 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 PDJ 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	
TTENUATOR	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	
	[illegible]	40		20		[illegible]	80	[illegible]		80	

COMMENTS

-7 db BTWN. 3/4 AND 5/4 SDH's

LIMITED SCAN, SEE ATTACHED SKETCH

NRT

WELD / ITEMS EXAMINED

WP-13

EXAMINER: Kenneth R. Smith LVL.: *II*
EXAMINER: *N/A* LVL.: *N/A*
REVIEWER: [signature] LVL.: II DATE: 9/26/03

ANII: B. Earnigh
DATE: 9/24/03

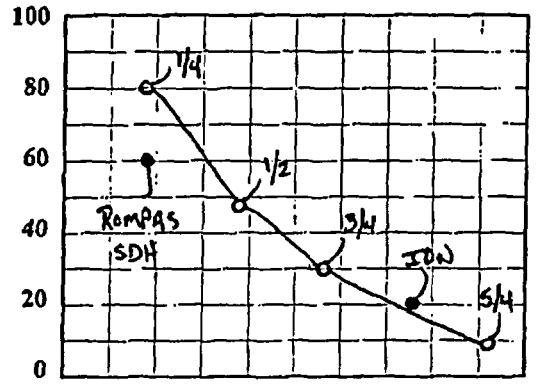
TENNESSEE VALLEY AUTHORITY	DIGITAL ULTRASONIC CALIBRATION DATA SHEET	REPORT NUMBER R0877

PROJECT *WBN* UNIT/CYCLE *1 / 05*
PROCEDURE: *N-UT-19* REV: *14* TC: *N/A*

TRANSDUCER

MANUFACTURER *KBA*
MODEL: *GAMMA* S/N *J15204*
SIZE: *0.5x1.0"* FREQ: *2.25* MHz
SHAPE: *Rectangle* # ELEMENTS: *1* # CONS: *0*
CABLE TYPE *RG-174* LENGTH:
MODE: ☑ SHEAR ☐ LONG ☐ RL

DAC



DISPLAY WIDTH *8.5* inches

REF. REFLECTOR: *Rompas SDH* GAIN: *44* dB
AMPLITUDE: *60* % METAL PATH: *1.532*

CALIBRATION DATE: *9-18-03*
CALIBRATION BLOCK NO. *WB-55* TEMP: *78°F*
SIMULATOR BLOCK: *Rompas*
THERMOMETER S/N: *522352* DUE DATE: *6-16-04*
COUPLANT: *Ultragel II* BATCH: *00225*

ANGLE VERIFICATION

BLOCK TYPE: *Rompas* S/N: *791413*
NOMINAL ANGLE: *60°* ACTUAL ANGLE *60°*

INSTRUMENT

MANUFACTURER: *Krautkramer* DUE DATE *5-27-04*
MODEL NO.: *USN-52L* S/N: *E30217*

INSTRUMENT SETTINGS

REFLECTOR SCAN DIRECT.	NTC	SDH	REFERENCE SENSITIVITY	MEMORY NUMBER
AXIAL	☐	☑	*41* dB	*31*
CIRC.	☐	☐	*N/A* dB	*N/A*

FREQ: *2.0-8.0* MHz REJECT:= *0* %
ANGLE: *60* deg DAMPING: *1000* ohms
DELAY: *0.00* msec PULSER: *SINGLE*
ZERO: *16.404* msec
VELOCITY *.1292* msec PRR/PRF: *HIGH*
RANGE: *8.50* inches TOF: *PEAK*
DISP. MODE: *FULL WAV* POWER: *BATTERY*

CALIBRATION TIMES

INITIAL TIME: *22:45* FINAL TIME: *04:15*

VERIFICATION TIMES	1)	2)	3)	4)	5)	6)	7)	8)	9)
	02:48	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*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	
TTENUATOR	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

-11 dB BTWN. 3/4 AND 5/4 SDH'S
LIMITED SCAN, SEE ATTACHED SKETCH
NRI

WELD / ITEMS EXAMINED

WP-13

EXAMINER: *Kenneth R. Smith* LVL.: *II*
EXAMINER: *N/A* LVL.: *N/A*
REVIEWER: *[signature]* LVL: *II* DATE: *9/25/03*

ANII: *B. Eamigh*
DATE: *9/24/03*
PAGE *4* OF *9*

TENNESSEE VALLEY AUTHORITY	MANUAL ULTRASONIC VESSEL EXAMINATION DATA SHEET	REPORT NUMBER RO877

PROJECT WBN UNIT/CYCLE 1/5
SYSTEM: PZR
WELD I.D.: WP-13
CONFIG.: _____ TO _____
FLOW →
PROCEDURE: N-UT-19 REV: 14 TC: N/A

Wo REFERENCE: HEAD SIDE WELD TOE
Lo REFERENCE: "0" STAMP
SURFACE TEMP.: 76 °F
PYRO. SERIAL NO.: 522352

EXAMINATION DATE 9-19-03
START TIME: 00:58 END TIME: 04:00

ANGLE	SCAN SENSITIVITY
0°	MIN. 32 dB
45°	40-46 dB
60°	47-53 dB

RESULTS: (SCAN NUMBER)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
INDICATION RECORDED (Y/N)	N/A	→						N/A				N/A	→					→	N/A

IND NO.	MAX AMP	SCAN NO.	ANG.	100% (1/2 MAX)			50%			20%			MAX			20%			50%			100% (1/2 MAX)		
				Mp1	W1	L1	Mp1	W1	L1	Mp1	W1	L1	Mp	W	L	Mp2	W2	L2	Mp2	W2	L2	Mp2	W2	L2
													N/A											

REMARKS/LIMITATIONS NRI

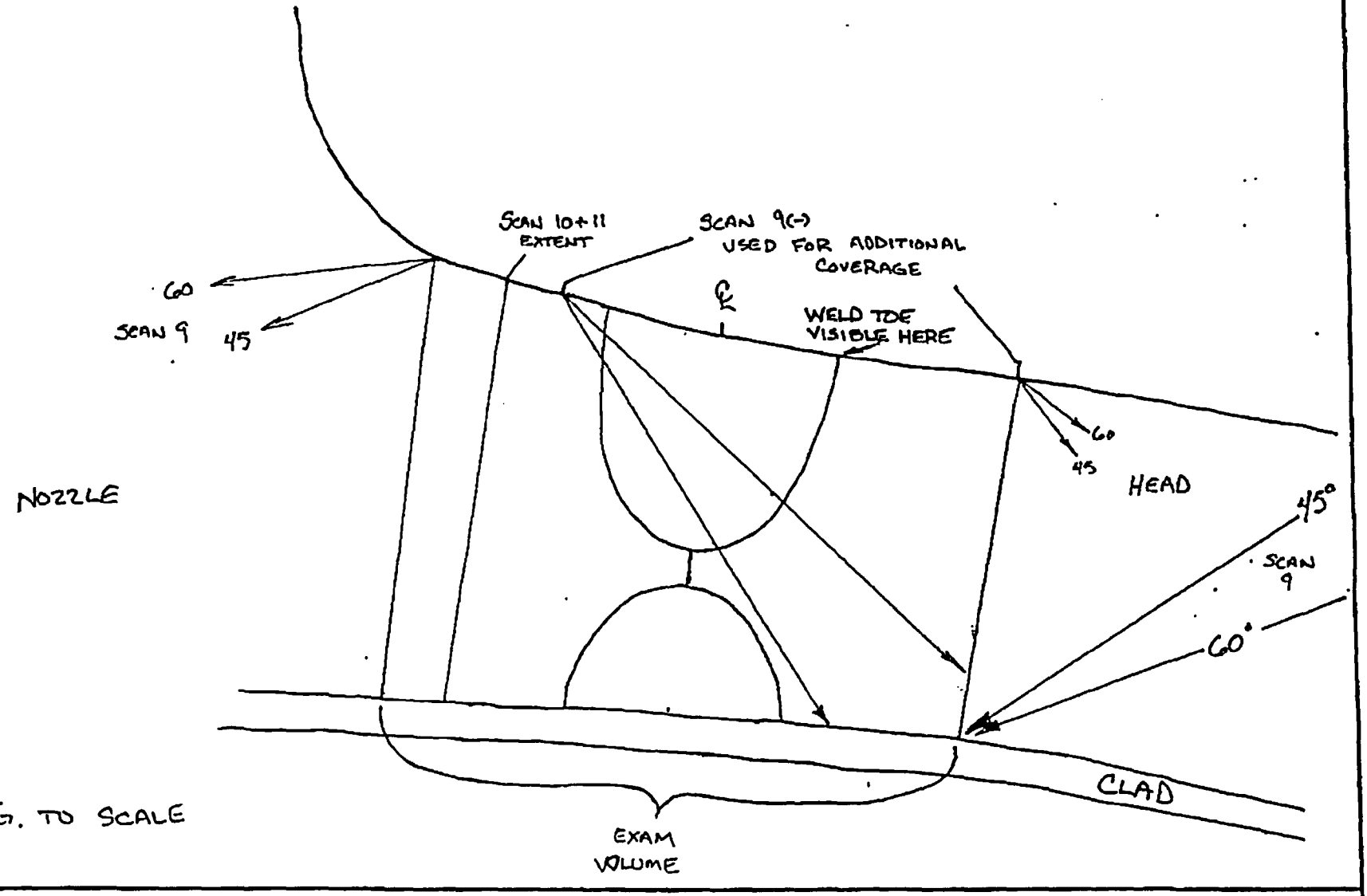
EXAMINER: Kenneth R. Smith LEVEL: II
EXAMINER: N/A LEVEL: N/A

REVIEWED BY: [signature] LEVEL: III DATE: 9/25/03

ANII: B Eanright
DATE: 9/24/03 PAGE 5 OF 5

ACCESS: FORMS DATABASE 10/3/00

TVA Office of Nuclear Power	PROJECT: WBN SYSTEM: PZR Unit: 1 / CYCLE 5 WELD NO.: WP-13	REPORT NO.: R0877



BY: Kenneth R. Smith LEVEL: II DATE: 9-19-03 PAGE 6 OF 9

TVA 19669 (ONP-6-88)

TVA Office of Nuclear Power	PROJECT: WBN SYSTEM: Pressurizer Unit: 1 WELD NO.: see Below	REPORT NO.: RO 877

Safety and Relief Coverage Calculation
WP-12, WP-13, WP-14, WP-15

Reference CHM-2570-C-06

Total Area = $(3.8 \times 2.5) + [(.9 \times .5)].5 = 9.725"$

0, 45 $\frac{45}{P}$, $\frac{45}{P}$, $\frac{60}{P}$ $\frac{60}{P}$ = 2.35" Limitation

$= \frac{9.725 - 2.35}{9.725} \times 100 = 75.8\%$ Coverage

$45\uparrow_T = [.9 \times .55].5 = .2475"$ Limitation

$\frac{9.725 - .2475}{9.725} \times 100 = 97.5\%$ Coverage

$60\uparrow_T = [1.1 \times 1].5 = .55"$ Limitation

$\frac{9.725 - .55}{9.725} \times 100 = 94.3\%$ Coverage

$60\downarrow_T = \frac{(1.4 \times 2.1).5}{9.725} \times 100 = 15.1\%$ coverage

$45\downarrow T = \frac{(2.5 \times 2.1).5}{9.725} \times 100 = 27\%$ Coverage

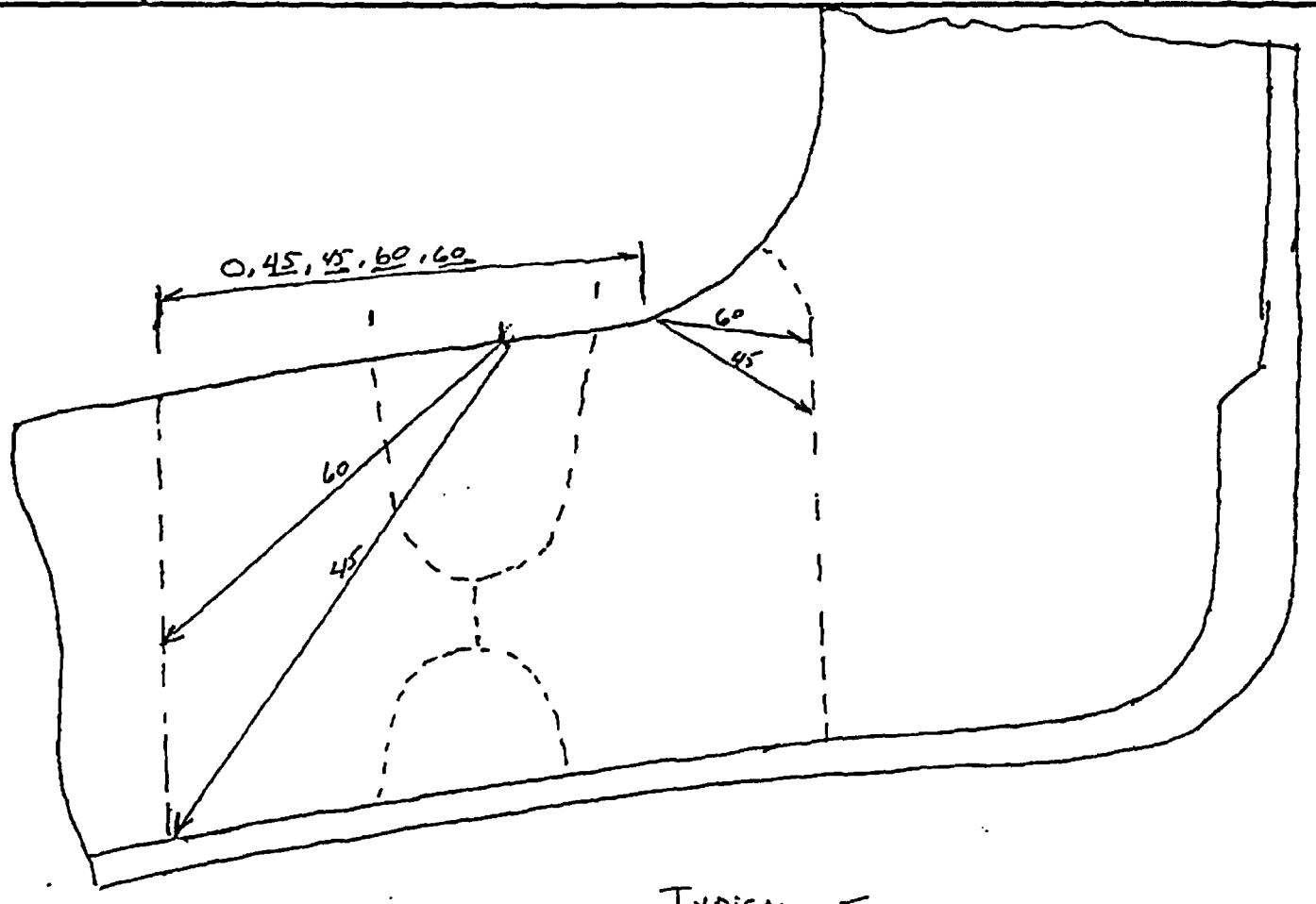
0 — 75.8
45 - 75.8
45 - 75.8
60 - 75.8
60 - 75.8
45↑ - 97.5
45↓ - 15.1
60↑ - 94.3
60↓ - 27

612.9/9 = 68.1%

Bi-directional Coverage

BY:	LEVEL:	DATE:	PAGE	OF
	III	9/22/03	7	20

TVA Office of Nuclear Power	PROJECT: WBN SYSTEM: Pressurizer Unit: 1 WELD NO.: WP-12, WP-13, WP-14, WP-15	REPORT NO.: R0877



Typical Scan

Scan stops taken from Field Data

Reference CHM-2570-C-06

BY: Joel Whitaker LEVEL: UT DATE: 9/23/03 PAGE 8 OF 8

TENNESSEE VALLEY AUTHORITY	EXAMINATION SUMMARY AND RESOLUTION SHEET	REPORT NUMBER: R0878

PROJECT: *WBN* UNIT: *1* CYCLE *05*				COMPONENT ID: *WP-14*	
EXAMINATION METHOD				SYSTEM: PZR	ISI DWG NO: *CHM-2570-C-01*
MT ☐	PT ☐	UT ☑	VT ☐	CONFIGURATION:	CATEGORY
PROCEDURE: *N-UT-19*	REV *14*	TC: *N/A*		*VHEAD TO VNOZ*	*B-D*
EXAMINER: Kenneth R Smith	EXAMINER: *N/A*			EXAMINER: *N/A*	EXAMINER: *N/A*
LEVEL: *II*	LEVEL: *N/A*			LEVEL: *N/A*	LEVEL: *N/A*

Total coverage calculated to be approximately ~~81.5~~ 69.1 % (~~2 ANGLE, 1 DIRECTION~~) JWW 9/23/03

This report contains the data associated with the ultrasonic examination of weld #WP-14

0,45 and 60 degree ,2.25 Mhz transducers were used.

The configuration resulted in scan limitations, an additional scan was performed looking away from the nozzle to obtain additional coverage , designated scan #9(-). See attached sketch

No reportable indications were detected.

RESOLUTION BY:	REVIEWED BY:	ANII:
Kenneth R. Smith		B. Eamigh
LEVEL II DATE: 9-19-03	LEVEL: II DATE: 9/20/03	DATE: 9/25/03
		Page: 1 OF 8

ACCESS: FORMS DATABASE R-10/04/01

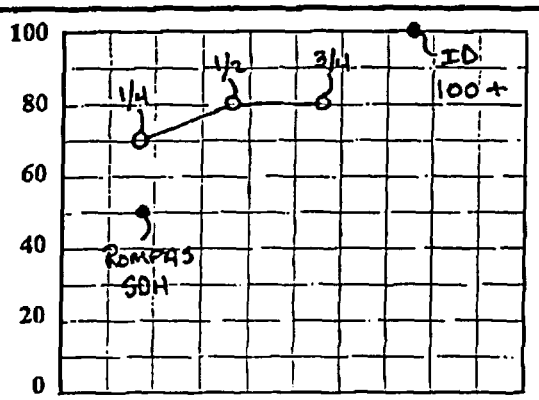
TENNESSEE VALLEY AUTHORITY	DIGITAL ULTRASONIC CALIBRATION DATA SHEET	REPORT NUMBER R0878

PROJECT: WBN UNIT/CYCLE: 1/05
PROCEDURE: N-UT-19 REV: 14 TC: N/A

TRANSDUCER

MANUFACTURER: KBA
MODEL: GAMMA S/N: J08204SP
SIZE: 1.0" FREQ: 2.25 MHz
SHAPE: Round # ELEMENTS: 1 # CONS: 0
CABLE TYPE: RG-174 LENGTH: 6'
MODE: ☐ SHEAR ☑ LONG ☐ RL

DAC



DISPLAY WIDTH: 4.0 inches

REF. REFLECTOR: Rompas SDH GAIN: 20 dB
AMPLITUDE: 50 % METAL PATH: .728

CALIBRATION DATE: 9-18-03
CALIBRATION BLOCK NO.: WB-55 TEMP: 78°F
SIMULATOR BLOCK: Rompas
THERMOMETER S/N: 522352 DUE DATE: 6-16-04
COUPLANT: Ultragel II BATCH: 00225

ANGLE VERIFICATION

BLOCK TYPE: N/A S/N: N/A
NOMINAL ANGLE: 0° ACTUAL ANGLE: 0°

INSTRUMENT

MANUFACTURER: Krautkramer DUE DATE: 5-27-04
MODEL NO.: USN-52L S/N: E30217

INSTRUMENT SETTINGS

REFLECTOR SCAN DIRECT.	NTC	SDH	REFERENCE SENSITIVITY	MEMORY NUMBER
AXIAL	☐	☑	26 dB	32
CIRC.	-	-	N/A dB	N/A

FREQ: 2.0-8.0 MHz REJECT: 0 %
ANGLE: 0.0 deg DAMPING: 1000 ohms
DELAY: 0.039 msec PULSER: SINGLE *
ZERO: 1.172 msec
VELOCITY .2352 msec PRR/PRF: HIGH
RANGE: 4.0 inches TOF: PEAK
DISP. MODE: FULL WAV POWER: BATTERY

CALIBRATION TIMES

INITIAL TIME: 22:00 FINAL TIME: 04:20

VERIFICATION TIMES: 1) 00:58 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	
TTENUATOR	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
NRI	WP-14

EXAMINER: Kenneth R. Smith LVL.: II
EXAMINER: N/A LVL.: N/A
REVIEWER: [signature] LVL.: II DATE: 9/25/03

ANII: B. Earnigh
DATE: 9/25/03
PAGE 2 OF 8

TENNESSEE VALLEY AUTHORITY	DIGITAL ULTRASONIC CALIBRATION DATA SHEET	REPORT NUMBER R0878

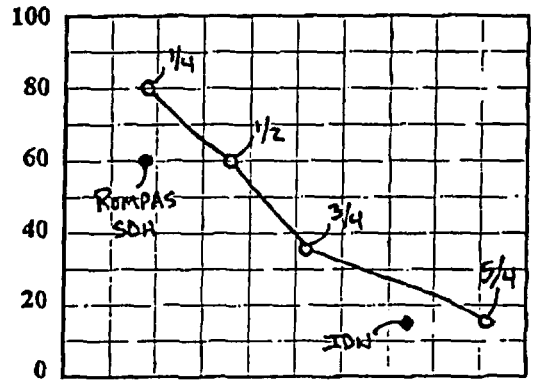
PROJECT *WBN* UNIT/CYCLE *1/ 05*
PROCEDURE: *N-UT-19* REV: *14* TC: *N/A*

TRANSDUCER

MANUFACTURER *KBA*
MODEL: *GAMMA* S/N *J15203*
SIZE: *0.5x1.0"* FREQ: *2.25* MHz
SHAPE: *Rectangle* # ELEMENTS: *1* # CONS: *0*
CABLE TYPE *RG-174* LENGTH: *6'*

MODE: ☑ SHEAR ☐ LONG ☐ RL

DAC



DISPLAY WIDTH *6.0* inches

CALIBRATION DATE: *9-18-03*
CALIBRATION BLOCK NO. *WB-55* TEMP: *78°F*
SIMULATOR BLOCK: *Rompas*
THERMOMETER S/N: *522352* DUE DATE: *6-16-04*
COUPLANT: *Ultragel II* BATCH: *00225*

ANGLE VERIFICATION

BLOCK TYPE: *Rompas* S/N: *791413*
NOMINAL ANGLE: *45°* ACTUAL ANGLE *45°*

INSTRUMENT

MANUFACTURER: *Krautkramer* DUE DATE *5-27-04*
MODEL NO.: *USN-52L* S/N: *E30217*

INSTRUMENT SETTINGS

REFLECTOR SCAN DIRECT.	NTC	SDH	REFERENCE SENSITIVITY	MEMORY NUMBER
AXIAL	☐	☑	*34* dB	*30*
CIRC.	☐	☐	*N/A* dB	*N/A*

FREQ: *2.0-8.0* MHz REJECT:= *0* %
ANGLE: *45* deg DAMPING: *1000* ohms
DELAY: *-0.008* msec PULSER: *SINGLE*
ZERO: *13.871* msec
VELOCITY *.1326* msec PRR/PRF: *HIGH*
RANGE: *6.0* inches TOF: *PEAK*
DISP. MODE: *FULL WAV* POWER: *BATTERY*

REF. REFLECTOR: *Rompas SDH* GAIN: *38* dB
AMPLITUDE: *60* % METAL PATH: *1.063*

CALIBRATION TIMES

INITIAL TIME: *22:20* FINAL TIME: *04:25*

VERIFICATION TIMES 1) *01:48* 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*

TTENUATOR	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

-7 db BTWN. 3/4 AND 5/4 SDH's
LIMITED SCAN, SEE ATTACHED SKETCH
NRI

WELD / ITEMS EXAMINED

WP-14

EXAMINER: *Kenneth R. Smith* LVL.: *II*
EXAMINER: *N/A* LVL.: *N/A*
REVIEWER: *[signature]* LVL.: *III* DATE: *9/25/03*

ANII: *B. Enright*
DATE: *9/25/03*
PAGE *3* OF *5*

TENNESSEE VALLEY AUTHORITY	DIGITAL ULTRASONIC CALIBRATION DATA SHEET	REPORT NUMBER R0878

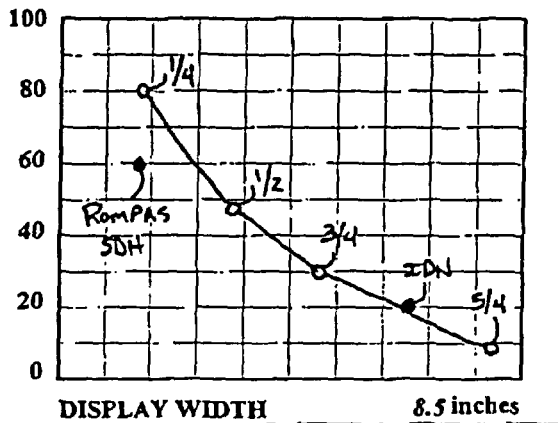
PROJECT *WBN* UNIT/CYCLE *1/ 05*
PROCEDURE: *N-UT-19* REV: *14* TC: *N/A*

TRANSDUCER

MANUFACTURER *KBA*
MODEL: *GAMMA* S/N *J15204*
SIZE: *0.5x1.0"* FREQ: *2.25* MHz
SHAPE: *Rectangle* # ELEMENTS: *1* # CONS: *0*
CABLE TYPE *RG-174* LENGTH: *6'*

MODE: ☑ SHEAR ☐ LONG ☐ RL

DAC



DISPLAY WIDTH *8.5* inches

REF. REFLECTOR: *Rompas SDH* GAIN: *44* dB
AMPLITUDE: *60* % METAL PATH: *1.532*

CALIBRATION DATE: *9-18-03*
CALIBRATION BLOCK NO. *WB-55* TEMP: *78°F*
SIMULATOR BLOCK: *Rompas*
THERMOMETER S/N: *522352* DUE DATE: *6-16-04*
COUPLANT: *Ultragel II* BATCH: *00225*

ANGLE VERIFICATION

BLOCK TYPE: *Rompas* S/N: *791413*
NOMINAL ANGLE: *60°* ACTUAL ANGLE *60°*

INSTRUMENT

MANUFACTURER: *Krautkramer* DUE DATE *5-27-04*
MODEL NO.: *USN-52L* S/N: *E30217*

INSTRUMENT SETTINGS

REFLECTOR			REFERENCE SENSITIVITY	MEMORY NUMBER
SCAN DIRECT.	NTC	SDH		
AXIAL	☐	☑	*41* dB	*31*
CIRC.	☐	☐	*N/A* dB	*N/A*

FREQ: *2.0-8.0* MHz REJECT: *0* %
ANGLE: *60* deg DAMPING: *1000* ohms
DELAY: *0.00* msec PULSER: *SINGLE*
ZERO: *16.404* msec
VELOCITY *.1292* msec PRR/PRF: *HIGH*
RANGE: *8.50* inches TOF: *PEAK*
DISP. MODE: *FULL WAV* POWER: *BATTERY*

CALIBRATION TIMES

INITIAL TIME: *22:45* FINAL TIME: *04:15*

VERIFICATION TIMES 1) *02:48* 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	
TTENUATOR	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:
-11 db BTWN. 3/4 + 5/4 SDH's
LIMITED SCAN, SEE ATTACHED SKETCH
NRI

WELD / ITEMS EXAMINED
WP-14

EXAMINER: Kenneth R. Smith LVL.: II
EXAMINER: N/A LVL.: N/A
REVIEWER: [signature] LVL.: III DATE: 9/26/03

ANII: B. Earnigh
DATE: 9/25/03
PAGE 4 OF 6

ACCESS: FORMS DATABASE 10-27-01

TENNESSEE VALLEY AUTHORITY	MANUAL ULTRASONIC VESSEL EXAMINATION DATA SHEET	REPORT NUMBER
		RO878

PROJECT WBN UNIT/CYCLE 1/5
SYSTEM: PZR
WELD I.D.: WP-14
CONFIG.: Head TO Nozzle
FLOW →
PROCEDURE: N-UT-19 REV: 14 TC: N/A

Wo REFERENCE: HEAD SIDE WELD TOE
Lo REFERENCE: "0" STAMP
SURFACE TEMP.: 76 °F
PYRO. SERIAL NO.: 522352

EXAMINATION DATE 9-19-03
START TIME: 00:58 END TIME: 04:00

ANGLE	SCAN SENSITIVITY
0°	MIN 32 dB
45°	40-46 dB
60°	47-53 dB

RESULTS: (SCAN NUMBER)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
INDICATION RECORDED (Y/N)	N/A							N/A				N/A							N/A

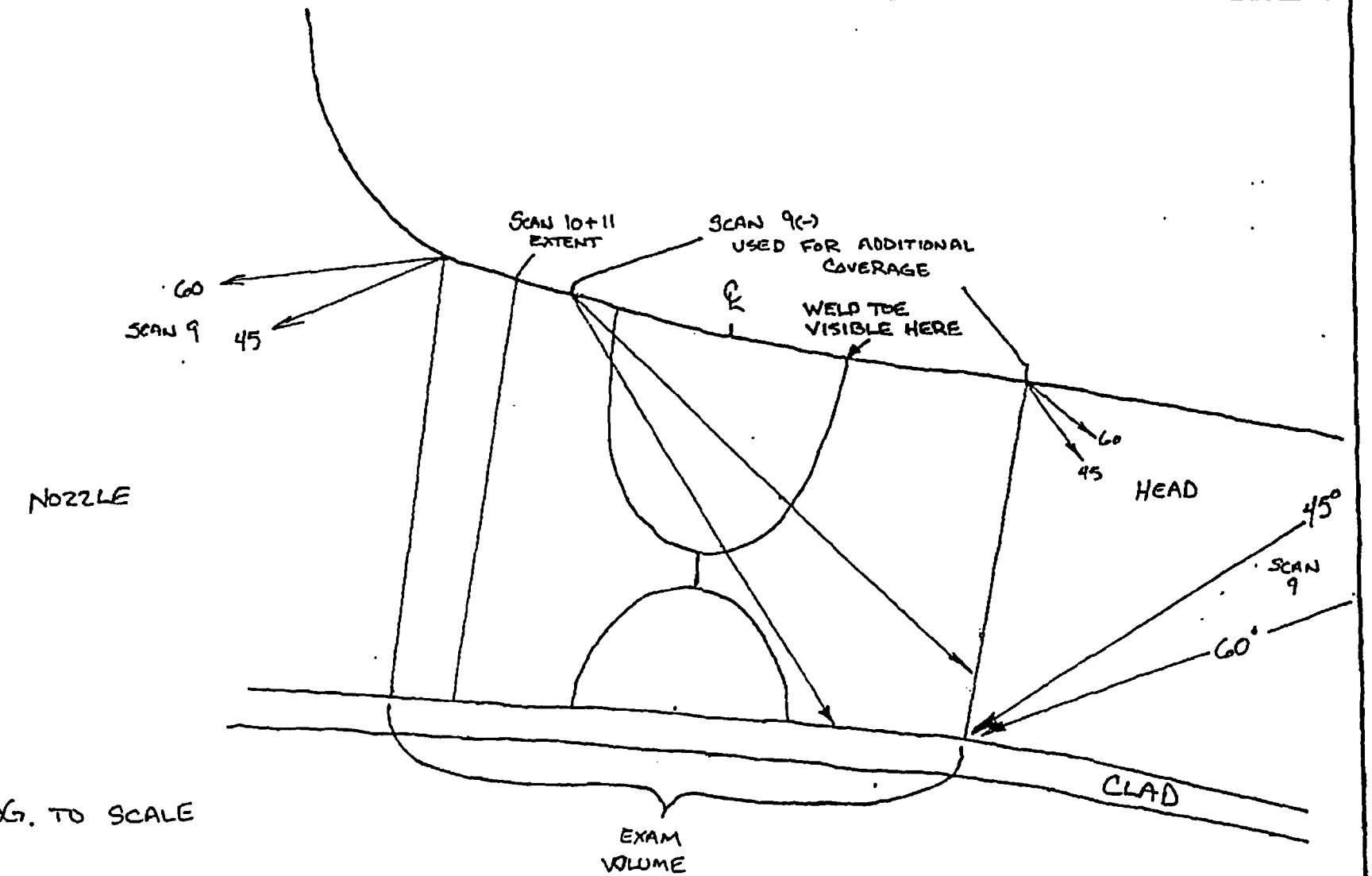
IND NO.	MAX AMP	SCAN NO.	ANG.	100% (1/2 MAX)			50%			20%			MAX			20%			50%			100% (1/2 MAX)		
				Mp1	W1	L1	Mp1	W1	L1	Mp1	W1	L1	Mp	W	L	Mp2	W2	L2	Mp2	W2	L2	Mp2	W2	L2
													N/A											

REMARKS/LIMITATIONS NRI

EXAMINER: Kenneth R Smith LEVEL: II	REVIEWED BY: [signature]	ANII: B. Eamigh
EXAMINER: N/A LEVEL: N/A	LEVEL: III DATE: 9/26/03	DATE: 9/25/03 PAGE 5 OF 8

ACCESS: FORMS DATABASE 10/3/00

TVA Office of Nuclear Power	PROJECT: WBN SYSTEM: PZR Unit: 1 / CYCLE 5 WELD NO.: WP-14	REPORT NO.: R0878



BY: Kenneth R. Smith LEVEL: III DATE: 9-19-03 PAGE 6 OF 8

TVA 19669 (ONP-6-88)

TVA Office of Nuclear Power	PROJECT: WBN SYSTEM: Pressurizer Unit: 1 WELD NO.: see below	REPORT NO.: R0878

Safety and Relief Coverage Calculation
WP-12, WP-13, WP-14, WP-15

Reference CHM-2570-C-06

Total Area = $(3.8 \times 2.5) + [(.9 \times .5)] .5 = 9.725"$

$0, \frac{45}{P}, \frac{45}{P}, \frac{60}{P}, \frac{60}{P}$ = 2.35" Limitation

$= \frac{9.725 - 2.35}{9.725} \times 100 = 75.8\%$ Coverage

$45\uparrow_T = [.9 \times .55] .5 = .2475"$ Limitation

$\frac{9.725 - .2475}{9.725} \times 100 = 97.5\%$ Coverage

$60\uparrow_T = [1.1 \times 1] .5 = .55"$ Limitation

$\frac{9.725 - .55}{9.725} \times 100 = 94.3\%$ Coverage

$60\downarrow_T = \frac{(1.4 \times 2.1) .5}{9.725} \times 100 = 15.1\%$ coverage

$45\downarrow T = \frac{(2.5 \times 2.1) .5}{9.725} \times 100 = 27\%$ Coverage

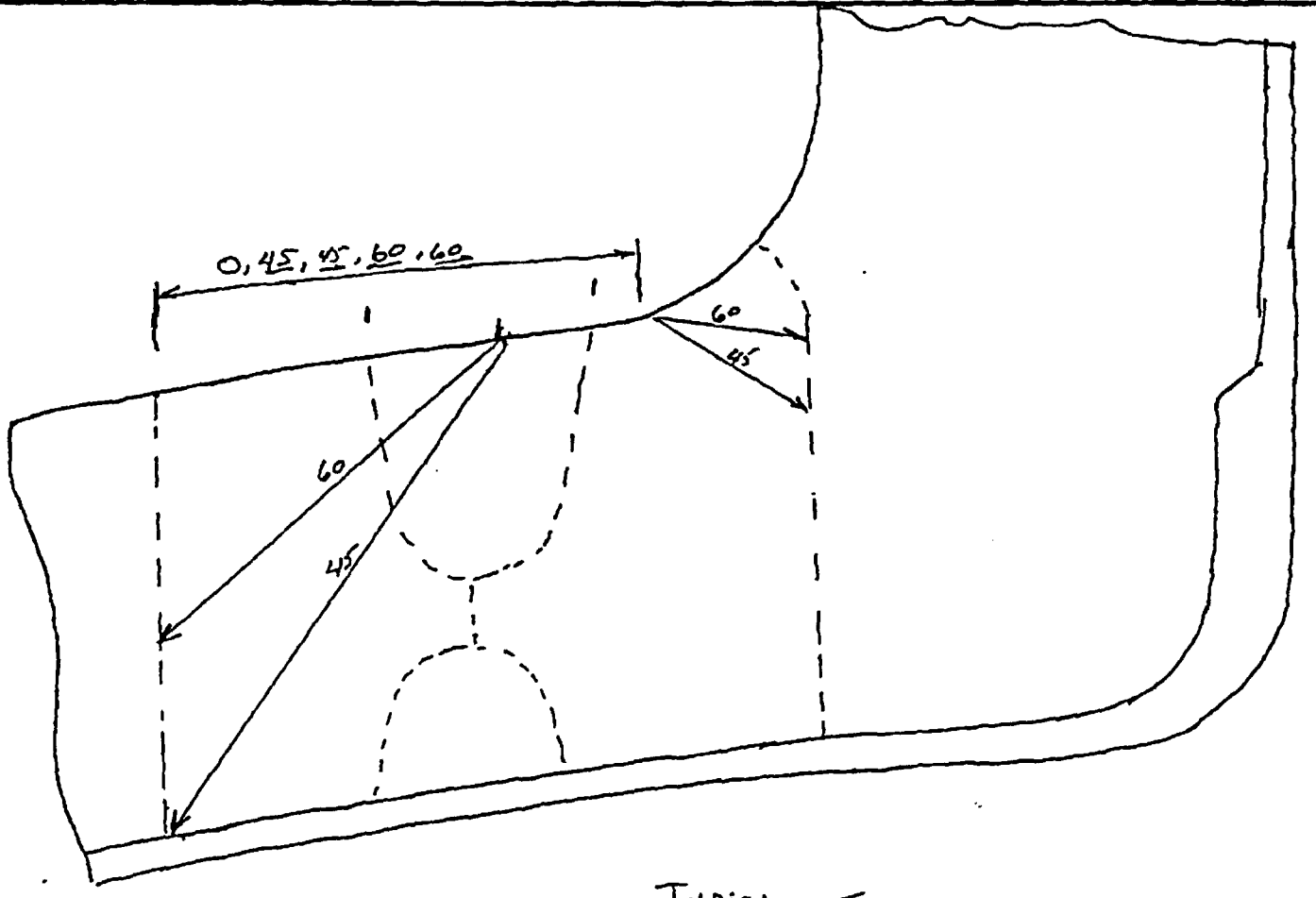
0 — 75.8
45 - 75.8
45 - 75.8
60 - 75.8
60 - 75.8
45↑ - 97.5
45↓ - 15.1
60↑ - 94.3
60↓ - 27

612.9/9 = 68.1 %

Bi-directional Coverage

BY:	LEVEL: III	DATE: 9/22/03	PAGE 2 OF 3

TVA Office of Nuclear Power	PROJECT: WBN SYSTEM: Pressurizer Unit: 1 WELD NO.: WP-12, WP-13, WP-14, WP-15	REPORT NO.: RO878



Typical Scan

Scan stops taken from Field Data

Reference CAM-2570-C-06

BY: [signature] LEVEL: III DATE: 9/23/03 PAGE 2 OF 2

TENNESSEE VALLEY AUTHORITY	EXAMINATION SUMMARY AND RESOLUTION SHEET	REPORT NUMBER: R0879

PROJECT: *WBN* UNIT: *1* CYCLE *05*				COMPONENT ID: *WP-15*	
EXAMINATION METHOD				SYSTEM: PZR	ISI DWG NO: *CHM-2570-C-01*
MT ☐	PT ☐	UT ☑	VT ☐	CONFIGURATION:	CATEGORY
PROCEDURE: *N-UT-19*	REV *14*	TC: *N/A*		*VHEAD TO VNOZ*	*B-D*
EXAMINER: Kenneth P. Smith	EXAMINER: *N/A*			EXAMINER: *N/A*	EXAMINER: *N/A*
LEVEL: *II*	LEVEL: *N/A*			LEVEL: *N/A*	LEVEL: *N/A*

Total coverage calculated to be approximately ~~81.5~~ 68.1 % ~~(2 ANGLE, 2 DIRECTION)~~ JMW 9/23/03

This report contains the ultrasonic examination data associated with weld #WP-15

0,45 and 60 degree ,2.25 Mhz transducers were used.

The configuration resulted in scan limitations,an additional scan was performed looking away from the nozzle to obtain additional coverage,designated scan #9(-).See attached sketch

No reportable Indications were detected.

RESOLUTION BY:	REVIEWED BY:	ANII:
Kenneth P. Smith	Joel Whitaker	B. Eamigh
LEVEL II DATE: 9-19-03	LEVEL: III DATE: 9/23/03	DATE: 9/29/03
		Page: 1 OF 4

ACCESS: FORMS DATABASE R-10/04/01

TENNESSEE VALLEY AUTHORITY	DIGITAL ULTRASONIC CALIBRATION DATA SHEET	REPORT NUMBER R0879

PROJECT *WBN* UNIT/CYCLE *1 / 05*
PROCEDURE: *N-UT-19* REV: *14* TC: *N/A*

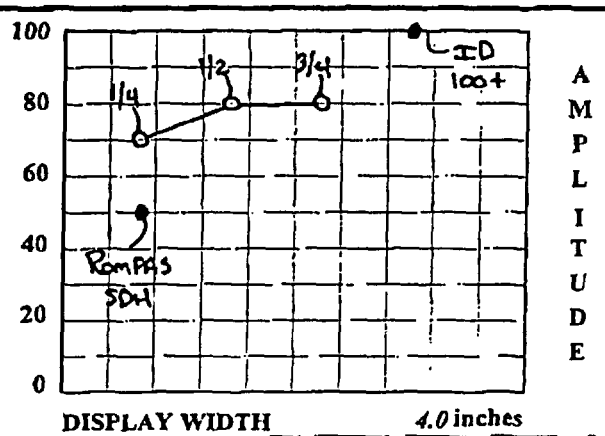
TRANSDUCER
MANUFACTURER *KBA*
MODEL: *GAMMA* S/N *J08204SP*
SIZE: *1.0"* FREQ: *2.25* MHz
SHAPE: *Round* # ELEMENTS: *1* # CONS: *0*
CABLE TYPE *RG-174* LENGTH: *6'*
MODE: ☐ SHEAR ☑ LONG ☐ RL

CALIBRATION DATE: *9-18-03*
CALIBRATION BLOCK NO. *WB-55* TEMP: *78°F*
SIMULATOR BLOCK: *Rompas*
THERMOMETER S/N: *522352* DUE DATE: *6-16-04*
COUPLANT: *Ultragel II* BATCH: *00225*

ANGLE VERIFICATION
BLOCK TYPE: *N/A* S/N: *N/A*
NOMINAL ANGLE: *0°* ACTUAL ANGLE *0°*

INSTRUMENT
MANUFACTURER: *Krautkramer* DUE DATE *5-27-04*
MODEL NO.: *USN-52L* S/N: *E30217*

DAC



DISPLAY WIDTH *4.0* inches

INSTRUMENT SETTINGS

REFLECTOR			REFERENCE SENSITIVITY	MEMORY NUMBER
SCAN DIRECT.	NTC	SDH		
AXIAL	☐	☑	*26* dB	*32*
CIRC.	☐	☐	*N/A* dB	*N/A*

FREQ: *2.0-8.0* MHz REJECT:= *0* %
ANGLE: *0* deg DAMPING: *1000* ohms
DELAY: *.039* msec PULSER: *SINGLE* *
ZERO: *1.172* msec
VELOCITY *.2352* msec PRR/PRF: *HIGH*
RANGE: *4.0* inches TOF: *PEAK*
DISP. MODE: *FULL WAV* POWER: *BATTERY*

REF. REFLECTOR: *Rompas SDH* GAIN: *20* dB
AMPLITUDE: *50 %* METAL PATH: *.728*

CALIBRATION TIMES
INITIAL TIME: *22:00* FINAL TIME: *04:20*

VERIFICATION TIMES 1) *00:58* 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	
TTENUATOR	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
NRI	WP-15

EXAMINER: *Kenneth R. Smith* LVL.: *II*
EXAMINER: *N/A* LVL.: *N/A*
REVIEWER: *[signature]* LVL.: *III* DATE: *9/26/03*

ANII: *B. Eanigh*
DATE: *9/27/03*
PAGE *2* OF *7*

ACCESS: FORMS DATABASE 10-27-01

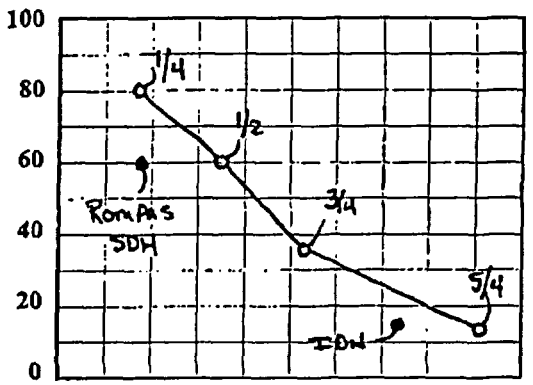
TENNESSEE VALLEY AUTHORITY	DIGITAL ULTRASONIC CALIBRATION DATA SHEET	REPORT NUMBER R0879

PROJECT *WBN* UNIT/CYCLE *1 / 05*
PROCEDURE: *N-UT-19* REV: *14* TC: *N/A*

TRANSDUCER

MANUFACTURER *KBA*
MODEL: *GAMMA* S/N *J15203*
SIZE: *0.5x1.0"* FREQ: *2.25* MHz
SHAPE: *Rectangle* # ELEMENTS: *1* # CONS: *0*
CABLE TYPE *RG-174* LENGTH: *6'*
MODE: ☑ SHEAR ☐ LONG ☐ RL

DAC



DISPLAY WIDTH *6.0* inches

CALIBRATION DATE: *9-18-03*
CALIBRATION BLOCK NO. *WB-55* TEMP: *78°F*
SIMULATOR BLOCK: *Rompas*
THERMOMETER S/N: *522352* DUE DATE: *6-16-04*
COUPLANT: *Ultragel II* BATCH: *00225*

ANGLE VERIFICATION

BLOCK TYPE: *Rompas* S/N: *791413*
NOMINAL ANGLE: *45°* ACTUAL ANGLE *45°*

INSTRUMENT

MANUFACTURER: *Krautkramer* DUE DATE *5-27-04*
MODEL NO.: *USN-52L* S/N: *E30217*

INSTRUMENT SETTINGS

REFLECTOR SCAN DIRECT.	NTC	SDH	REFERENCE SENSITIVITY	MEMORY NUMBER
AXIAL	☐	☑	*34* dB	*30*
CIRC.	☐	☐	*N/A* dB	*N/A*

FREQ: *2.0-8.0* MHz REJECT: *0* %
ANGLE: *45* deg DAMPING: *1000* ohms
DELAY: *-0.008* msec PULSER: *SINGLE*
ZERO: *13.871* msec
VELOCITY *.1326* msec PRR/PRF: *HIGH*
RANGE: *6.0* inches TOF: *PEAK*
DISP. MODE: *FULL WAV* POWER: *BATTERY*

REF. REFLECTOR: *Rompas SDH* GAIN: *38* dB
AMPLITUDE: *60 %* METAL PATH: *1.063*

CALIBRATION TIMES

INITIAL TIME: *22:20* FINAL TIME: *04:25*

VERIFICATION TIMES	1)	2)	3)	4)	5)	6)	7)	8)	9)
	01:48	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*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	
TTENUATOR	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**

-7 db BTWN. 3/4 AND 5/4 SDH'S *WP-15*

LIMITED SCAN, SEE ATTACHED SKETCH

NRI

EXAMINER: *Kenneth R. Smith* LVL.: *II*
EXAMINER: *N/A* LVL.: *N/A*
REVIEWER: *[signature]* LVL.: *II* DATE: *9/29/03*

ANII: *B. Emrich*
DATE: *9/29/03*
PAGE *3* OF *9*

ACCESS-FORMS DATABASE 10-27-01

TENNESSEE VALLEY AUTHORITY	DIGITAL ULTRASONIC CALIBRATION DATA SHEET	REPORT NUMBER R0879

PROJECT *WBN* UNIT/CYCLE *1 / 05*
PROCEDURE: *N-UT-19* REV: *14* TC: *N/A*

TRANSDUCER

MANUFACTURER *KBA*
MODEL: *GAMMA* S/N *J15204*
SIZE: *0.5x1.0"* FREQ: *2.25* MHz
SHAPE: *Rectangle* # ELEMENTS: *1* # CONS: *0*
CABLE TYPE *RG-174* LENGTH: *6'*

MODE: ☑ SHEAR ☐ LONG ☐ RL

CALIBRATION DATE: *9-18-03*
CALIBRATION BLOCK NO. *WB-55* TEMP: *78°F*
SIMULATOR BLOCK: *Rompas*
THERMOMETER S/N: *522352* DUE DATE: *6-16-04*
COUPLANT: *Ultragel II* BATCH: *00225*

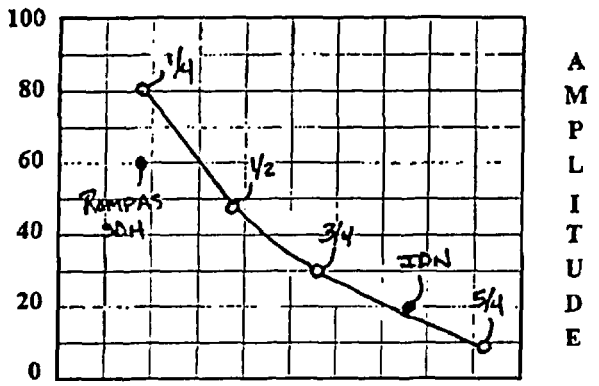
ANGLE VERIFICATION

BLOCK TYPE: *Rompas* S/N: *791413*
NOMINAL ANGLE: *60°* ACTUAL ANGLE *60°*

INSTRUMENT

MANUFACTURER: *Krautkramer* DUE DATE *5-27-04*
MODEL NO.: *USN-52L* S/N: *E30217*

DAC



DISPLAY WIDTH *8.5* inches

INSTRUMENT SETTINGS

REFLECTOR SCAN DIRECT.	NTC	SDH	REFERENCE SENSITIVITY	MEMORY NUMBER
AXIAL	☐	☑	*41* dB	*31*
CIRC.	☐	☐	*N/A* dB	*N/A*

FREQ: *2.0-8.0* MHz REJECT: = *0* %
ANGLE: *60* deg DAMPING: *1000* ohms
DELAY: *0.00* msec PULSER: *SINGLE*
ZERO: *16.404* msec
VELOCITY *.1292* msec PRR/PRF: *HIGH*
RANGE: *8.5* inches TOF: *PEAK*
DISP. MODE: *FULL WAV* POWER: *BATTERY*

REF. REFLECTOR: *Rompas SDH* GAIN: *44* dB
AMPLITUDE: *60* % METAL PATH: *1.532*

CALIBRATION TIMES

INITIAL TIME: *22:45* FINAL TIME: *04:15*

VERIFICATION TIMES 1) *02:48* 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	
TTENUATOR	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

-11 db. BTWN. 3/4 AND 5/4 SDH's

LIMITED SCAN, SEE ATTACHED SKETCH

NRI

WELD / ITEMS EXAMINED

WP-15

EXAMINER: *Kenneth R. Smith* LVL.: *II*
EXAMINER: *N/A* LVL.: *N/A*
REVIEWER: *[signature]* LVL: *III* DATE: *9/29/03*

ANII: *B. Eanigh*
DATE: *9/29/03*
PAGE *4* OF *8*

ACCESS: FORMS DATABASE 10-27-01

TENNESSEE VALLEY AUTHORITY	MANUAL ULTRASONIC VESSEL EXAMINATION DATA SHEET	REPORT NUMBER RO87-9

PROJECT WBN UNIT/CYCLE 1/5
SYSTEM: PZR
WELD I.D.: WP-15
CONFIG.: _____ TO _____
FLOW →
PROCEDURE: N-UT-19 REV: 14 TC: N/A

Wo REFERENCE: HEAD SIDE WELD TOE
Lo REFERENCE: "0" STAMP
SURFACE TEMP.: 76 °F
PYRO. SERIAL NO.: 522352

EXAMINATION DATE 9-19-03
START TIME: 00:58 END TIME: 04:00

ANGLE	SCAN SENSITIVITY
0°	MIN 52 dB
45°	40-46 dB
60°	47-53 dB

RESULTS: (SCAN NUMBER)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
INDICATION RECORDED (Y/N)	N/A							N/A				N/A							N/A

IND NO.	MAX AMP	SCAN NO.	ANG.	100% (1/2 MAX)			50%			20%			MAX			20%			50%			100% (1/2 MAX)		
				Mp1	W1	L1	Mp1	W1	L1	Mp1	W1	L1	Mp	W	L	Mp2	W2	L2	Mp2	W2	L2	Mp2	W2	L2
													N/A											

REMARKS/LIMITATIONS NRI

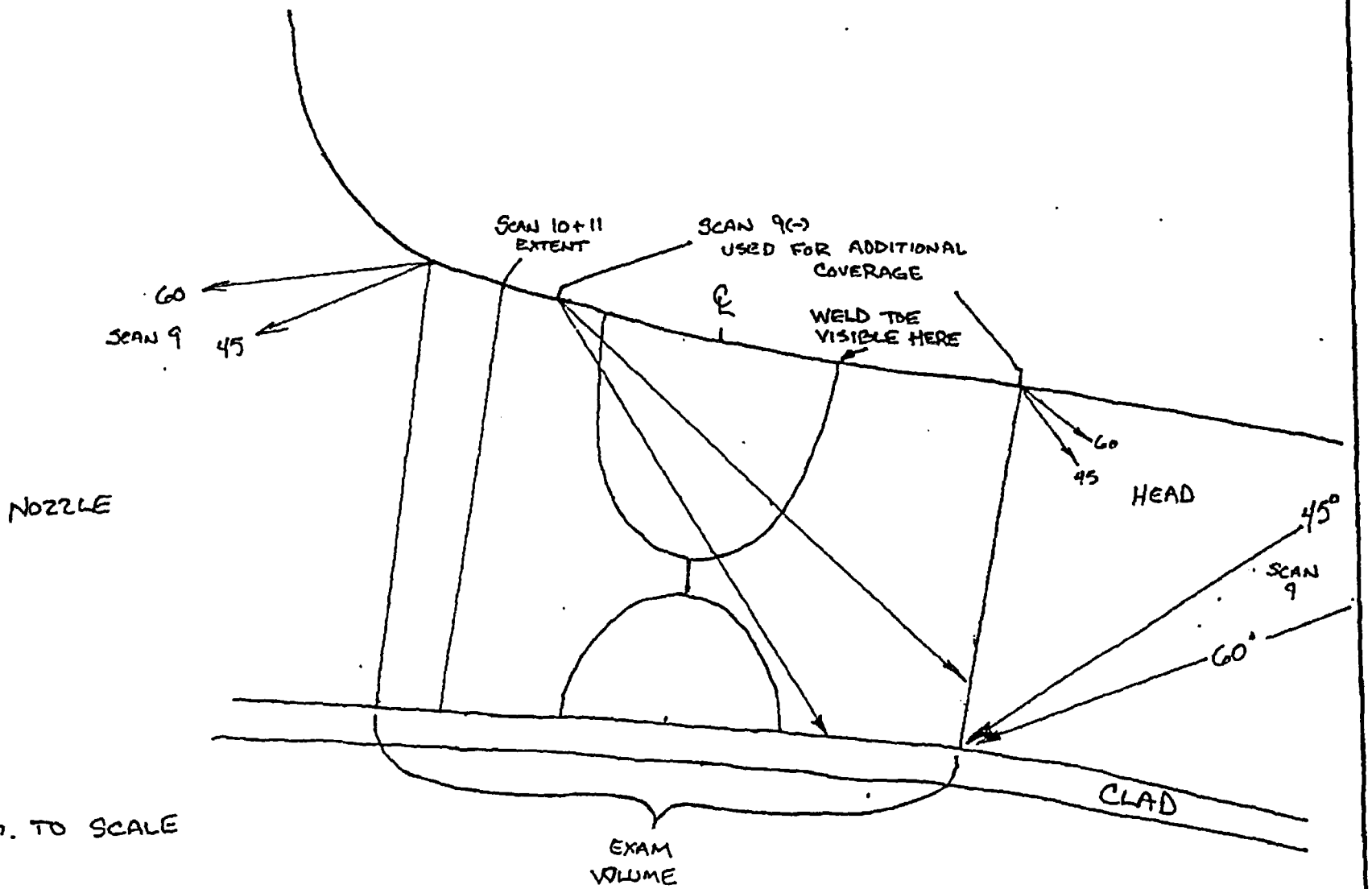
EXAMINER: Kenneth R. Smith LEVEL: II
EXAMINER: N/A LEVEL: N/A

REVIEWED BY: [signature]
LEVEL: II DATE: 9/20/03

ANII: B. Eamigh
DATE: 9/29/03 PAGE 1 OF 2

ACCESS: FORMS DATABASE 10/3/00

TVA Office of Nuclear Power	PROJECT: WBN SYSTEM: PZR Unit: 1 / CYCLE 5 WELD NO.: WP-15	REPORT NO.: RO879



BY: Kenneth R. Smith LEVEL: II DATE: 9-19-03 PAGE 6 OF 8

TVA 19669 (ONP-6-88)

TVA Office of Nuclear Power	PROJECT: WBN SYSTEM: Pressurizer Unit: 1 WELD NO.: see below	REPORT NO.: R0879

Safety and Relief Coverage Calculation
WP-12, WP-13, WP-14, WP-15

Reference CHM-2570-C-06

Total Area = $(3.8 \times 2.5) + [(.9 \times .5)].5 = 9.725"$

$0, \frac{45}{P}, \frac{45}{P}, \frac{60}{P}, \frac{60}{P}$ = 2.35" Limitation

$= \frac{9.725 - 2.35}{9.725} \times 100 = 75.8\%$ Coverage

$45\uparrow_T = [.9 \times .55].5 = .2475"$ Limitation

$\frac{9.725 - .2475}{9.725} \times 100 = 97.5\%$ Coverage

$60\uparrow_T = [1.1 \times 1].5 = .55"$ Limitation

$\frac{9.725 - .55}{9.725} \times 100 = 94.3\%$ Coverage

$60\downarrow_T = \frac{(1.4 \times 2.1).5}{9.725} \times 100 = 15.1\%$ Coverage

$45\downarrow T = \frac{(2.5 \times 2.1).5}{9.725} \times 100 = 27\%$ Coverage

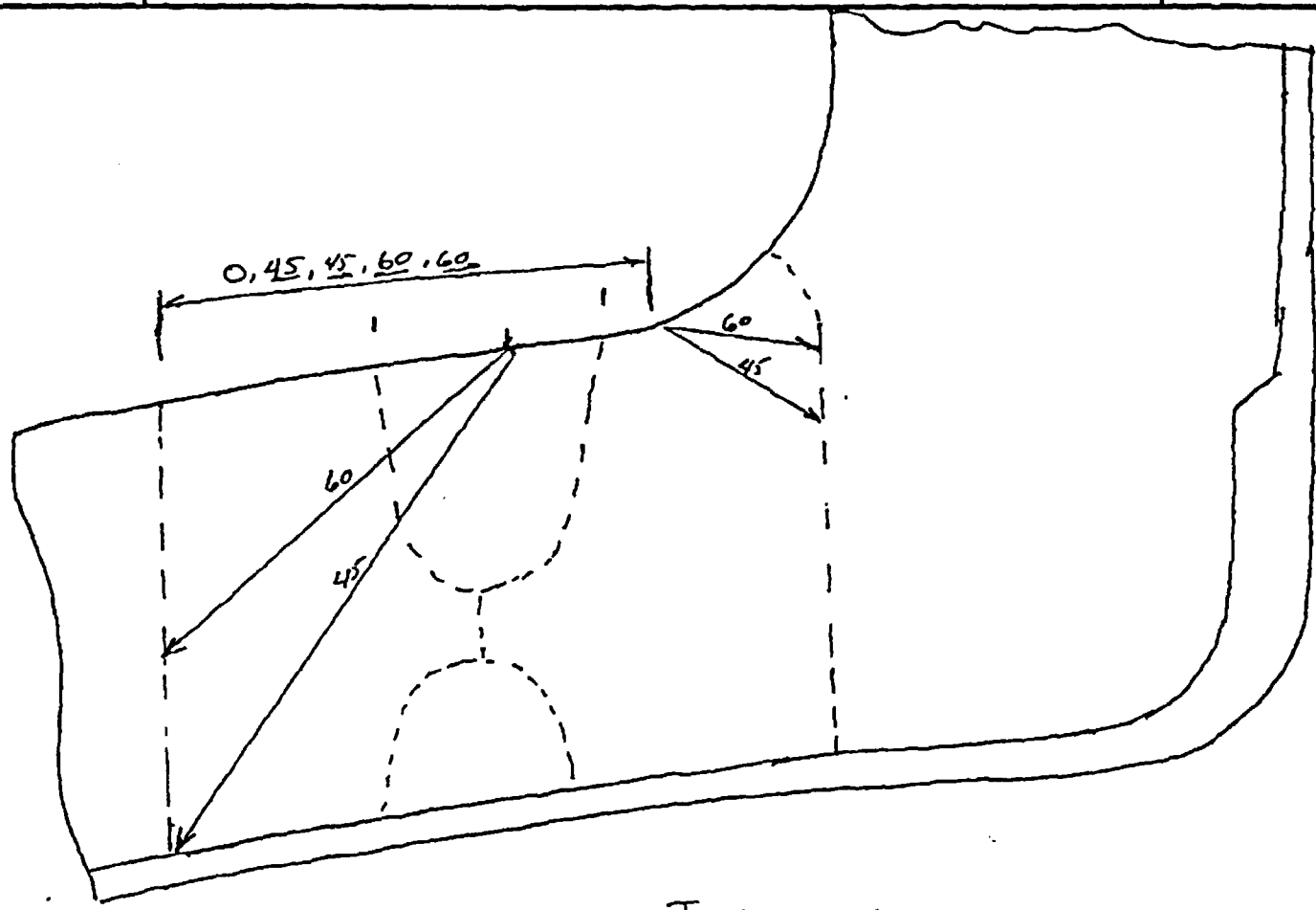
0 — 75.8
45 - 75.8
45 - 75.8
60 - 75.8
60 - 75.8
45↑ - 97.5
45↓ - 15.1
60↑ - 94.3
60↓ - 27

612.9/9 = 68.1 %

Bi-directional Coverage

BY:	LEVEL:	DATE:	PAGE	OF
		9/22/03	2	

TVA Office of Nuclear Power	PROJECT: WBN SYSTEM: Pressurizer Unit: 1 WELD NO.: WP-12, WP-13, WP-14, WP-15	REPORT NO.: R0879



SCAN stops taken from Field Data

TYPICAL SCAN

Reference CAM-2570-C-06

BY: [signature] LEVEL: III DATE: 9/23/03 PAGE 8 OF 9

TVA 19669 (ONP-6-88)

ENCLOSURE 2

WATTS BAR NUCLEAR PLANT (WBN) UNIT 1
AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)
FIRST TEN YEAR INSERVICE INSPECTION INTERVAL

REQUEST FOR RELIEF, 1-ISI-15

Enclosure 2

WATTS BAR NUCLEAR PLANT
AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)
FIRST TEN YEAR INSERVICE INSPECTION INTERVAL
REQUEST FOR RELIEF, 1-ISI-15

I. Summary:

This request for relief addresses safety injection system circumferential pressure retaining welds SIF-D086-02 and RHRF-D054-09. The design configuration of the subject austenitic piping welds provides single side access for examination. Single side access precludes meeting the examination requirements.

An ultrasonic examination, using the Performance Demonstration Initiative (PDI) procedures, was performed on accessible areas to the maximum extent practical, given the physical limitations and materials of the subject welds. The design configuration and materials used limits the best effort ultrasonic examination to approximately 50 percent for pipe to valve welds SIF-D086-02 and RHRF-D054-09. It was concluded that performance of an ultrasonic examination of essentially 100 percent of the lower one third of the subject circumferential pressure retaining welds would be impractical. The maximum extent practical ultrasonic examination of the subject welds provides reasonable assurance of an acceptable level of quality and safety because the information and data obtained from the volume examined provides sufficient information to judge the overall integrity of the welds. The WBN Code of Record is ASME Section XI, 1989 Edition. Therefore pursuant to 10 CFR 50.55a(g)(5)(iii), it is requested that relief be granted, for the first inspection interval.

II. Component:

One 6-inch Safety Injection System Piping Weld
One 8-inch Safety Injection System Piping Weld.

Reference ISI drawing CHM-2636-C-07 and ISI-0375-C-16 Weld Identifiers RHRF-D054-09 and SIF-D086-02, (See Attachment 1).

III. Code Requirement:

1989 Edition of ASME Section XI and WCAP–14572, *Westinghouse Owners Group Application of Risk-Informed Methods to Piping Inservice Inspection Topical Report*, Revision 1-NP-A, dated February 1999, Table 4.1-1, *Examination Category R-A, Risk-Informed Piping Examinations*, Item Number R1.11, *Elements Subject to Thermal Fatigue* (See Attachment 2). NRC approved the use of the WCAP for WBN in NRC's safety evaluation for the

Risk Informed Inservice Inspection Program dated January 24, 2002 (TAC No. MB 2082).

The examination requirement is defined in Figure IWB-2500-8(c) (Attachment 3).

IV. Code Requirements From Which Relief Is Requested:

Relief is requested from performing the required volumetric examination on essentially 100 percent of the lower one-third volume of the referenced welds.

V. Basis for Relief:

The 10 CFR 50.55a(b)(2)(xv)(A) requires that if access is available, the weld shall be scanned in each of the four directions (parallel and perpendicular to the weld) where accessible. Coverage credit may be taken for single side exams on ferritic piping. However, for austenitic piping, a procedure must be qualified with flaws on the inaccessible side of the weld. There are currently no qualified single side examination procedures for austenitic piping welds. Current technology is not capable of reliably detecting or sizing flaws on the far side of an austenitic weld for configurations common to United States nuclear applications. The PDI Program conforms to the 10 CFR 50.55a(b)(2)(xv)(A) regarding single side access for piping.

PDI Performance Demonstration Qualification Summary (PDQS) personnel certificates for austenitic piping list the limitation that single side examination is performed on a best effort basis. The best effort qualification is provided in place of a complete single side qualification to demonstrate that the examiners qualification and the subsequent weld examination is based on application of the best available technology.

When the examination area is limited to one side of an austenitic weld, examination coverage does not comply with 10 CFR 50.55a(b)(2)(xvi)(B) and full coverage credit may not be claimed.

The design configuration and materials used in fabrication of the subject safety injection system

welds precludes an ultrasonic examination of the required volume because there are no current qualified single side examination procedures that demonstrate equivalency to two-sided examination procedures on austenitic piping. The design configuration and material limits ultrasonic examination to the extent indicated:

Weld	Best Effort Coverage	ASME Section XI Coverage (NOTE 1)
SIF-D086-02	50%	100%
RHRF-D054-09	50%	100%

NOTE 1 - Coverage does not consider the inherent limitations associated with the PDI for one side access.

VI. Alternative Examination:

In lieu of the code required examination coverage and qualification demonstration requirements, a best effort ultrasonic examination was performed, as qualified through the PDI for Supplement 2 to ASME Section XI, Appendix VIII with demonstrated best effort for single side examination. Refer to the examination data reports in Attachment 4.

VII. Justification For The Granting Of Relief:

The best available techniques, as qualified through the PDI for Supplement 2 of Appendix VIII with demonstrated best effort for single side examination, were used from the accessible side of the weld.

(1) The design configuration and materials used in the fabrication of the subject piping welds precludes ultrasonic examination of essentially 100 percent of the required examination volume. In order to examine the welds in accordance with the code requirements, the safety injection system would require extensive modification.

The design configuration and materials used limits the best effort ultrasonic examination to approximately 50 percent for pipe to valve welds SIF-D086-02 and RHRF-D054-09.

The subject welds were examined using application of the best available ultrasonic technology currently qualified.

(2) Radiographic examination as an alternate volumetric examination method was determined to be impractical due to the material thickness variation and the ASME Section XI Code requiring an extended coverage (weld plus ½-inch of base material from the transition point). The radiographic density variation does not lend for compliance with ASME Section V, Nondestructive Examination, requirements without extensive radiographic exposures to obtain the density for the base material on the fitting (valve) side. The additional radiography required would increase personnel radiation exposure.

(3) A Risk-Informed approach provided by the WCAP-14572, in combination with examinations performed on similar items, provides reasonable assurance that significant degradation, if present, would have been detected.

Performance of an ultrasonic volumetric examination of essentially 100 percent of the required volume of pressure retaining circumferential welds SIF-D086-02 and RHRF-D054-09 would be impractical. As previously discussed, TVA determined that it would be impractical to attempt other volumetric examinations in order to increase examination coverage. The maximum extent practical ultrasonic examination of the subject welds provides reasonable assurance of an acceptable level of quality and safety. Significant degradation, if present, would have been detected during the best effort ultrasonic examination that was performed on the subject welds. As a result, reasonable assurance of operational readiness has been provided.

Therefore pursuant to 10 CFR 50.55a(g)(5)(iii), it is requested that relief be granted, for the first inspection interval.

WATTS BAR NUCLEAR PLANT
AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)
FIRST TEN YEAR INSERVICE INSPECTION INTERVAL
REQUEST FOR RELIEF, 1-ISI-15

VIII. Implementation Schedule:

This Request for Relief is applicable to WBN's first inspection interval.

Enclosure 2

WATTS BAR NUCLEAR PLANT
AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)
FIRST TEN YEAR INSERVICE INSPECTION INTERVAL
REQUEST FOR RELIEF, 1-ISI-15

List of Attachments

Attachment 1 Weld Location ISI drawing CHM-2636-C-07 and ISI-0375-C-16

Attachment 2 WCAP—14572, Westinghouse Owners Group Application of Risk-Informed Methods to Piping Inservice Inspection Topical Report, Revision 1-NP-A, dated February 1999, Table 4.1-1, Examination Category R-A, Risk-Informed Piping Examinations,

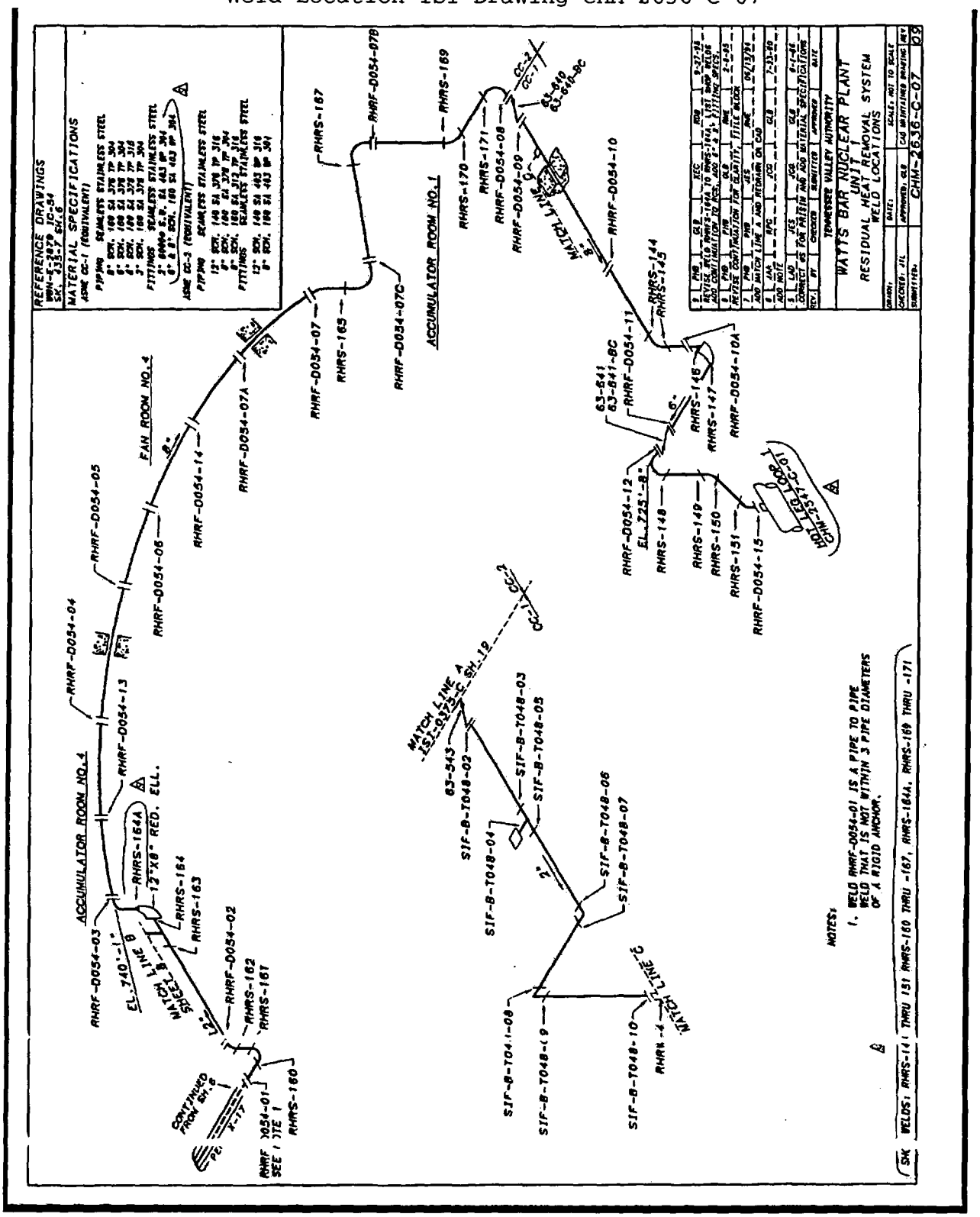
Attachment 3 ASME Section XI, 1989 Edition, Figure IWB-2500-8(c), Similar and Dissimilar Metal Welds in Components and Piping

Attachment 4 Examination Data Reports
SIF-D086-02 - Report R0899
RHRF-D054-09 - Report R0907

ENCLOSURE 2
ATTACHMENT 1

WATTS BAR NUCLEAR PLANT (WBN) UNIT 1
FIRST TEN YEAR INSERVICE INSPECTION INTERVAL

REQUEST FOR RELIEF, 1-ISI-15
Weld Location ISI Drawing CHM-2636-C-07



ENCLOSURE 2
ATTACHMENT 1

WATTS BAR NUCLEAR PLANT (WBN) UNIT 1
FIRST TEN YEAR INSERVICE INSPECTION INTERVAL

REQUEST FOR RELIEF, 1-ISI-15
Weld Location ISI Drawing ISI-0375-C-16

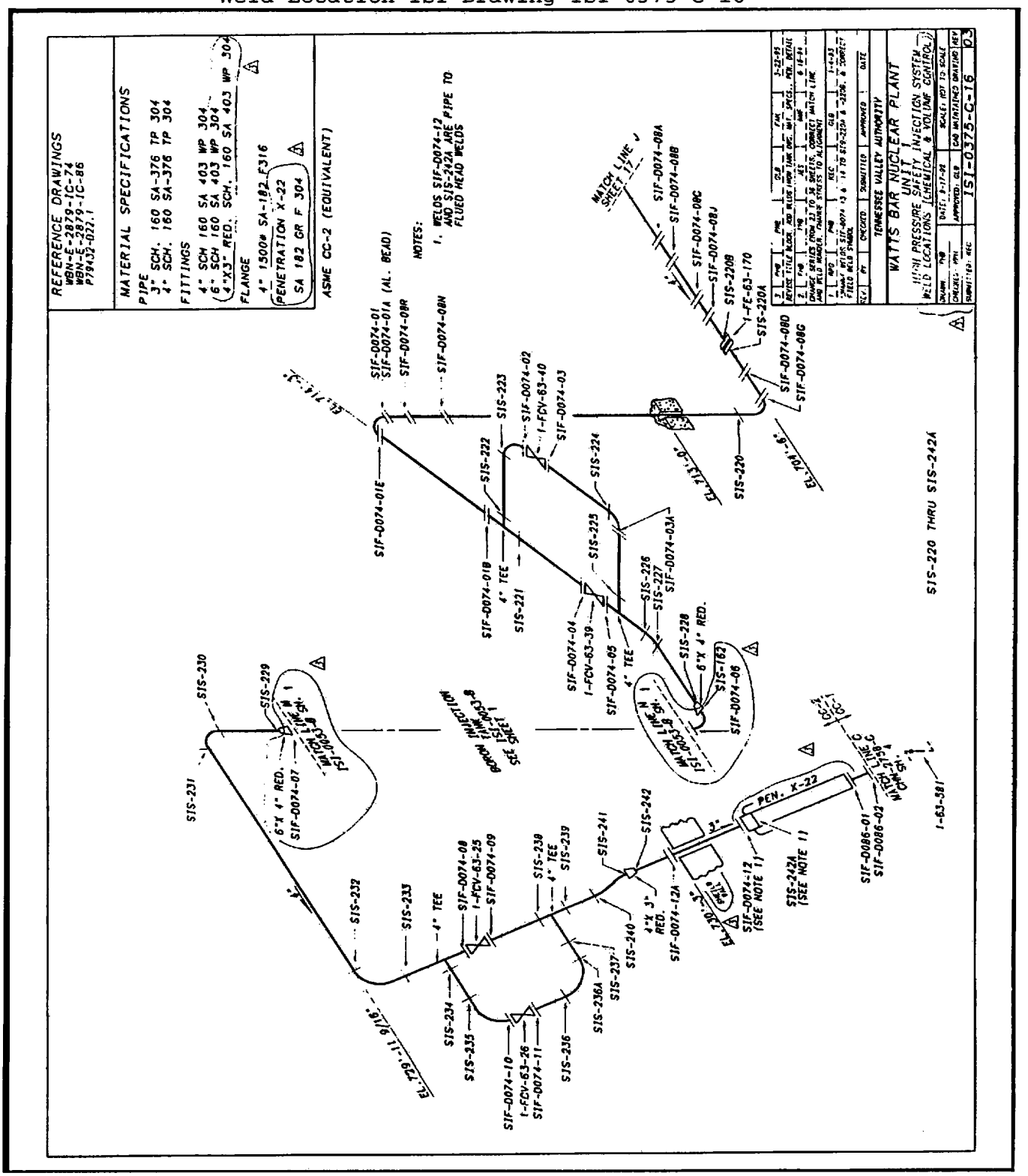


Table 4.1-1
EXAMINATION CATEGORY R-A, RISK-INFORMED PIPING EXAMINATIONS

Item No.	Parts Examined	Examination Requirement/ Fig. No.[2,10]	Examination Method	Acceptance Standard[10]	Extent[3] and Frequency		Deferral of Examination to End of Interval
					1st Interval	Successive[5] Intervals	
R1.10	High Safety-Significant Piping Structural Elements						
R1.11	Elements Subject to Thermal Fatigue	IWB-2500-8(c)[1] IWB-2500-9,10,11 IWC-2500-7(a)[1]	Volumetric	IWB-3514	Element[2,4]	Same as 1st	Not Permissible
R1.12	Elements Subject to High Cycle Mechanical Fatigue	IWB-2500-8(c)[1] IWB-2500-9,10,11 IWC-2500-7(a)[1]	Visual, VT-2[11]	IWB-3142	Each Refueling	Same as 1st	Not Permissible
R1.13	Elements Subject to Corrosive, Erosive, or Cavitation Wastage	Note 8	Volumetric[8] (for Internal Wastage) or Surface (for External Wastage)	IWB-3514 Note 8	Element[2] Element[2]	Same as 1st	Not Permissible
R1.14	Elements Subject to Crevice Corrosion Cracking	Note 7	Volumetric	IWB-3514	Element[2]	Same as 1st	Not Permissible
R1.15	Elements Subject to Primary Water Stress Corrosion Cracking (PWSCC)[6]	Note 7	Visual, VT-2[11]	IWB-3142	Each Refueling	Same as 1st	Not Permissible
R1.16	Elements Subject to Intergranular Stress Corrosion Cracking (IGSCC)	IWB-2500-8(c) IWB-2500-9,10,11	Volumetric	IWB-3514	Element[2]	Same as 1st	Not Permissible
R1.17	Elements Subject to Microbiologically Influenced Corrosion (MIC)	IWB-2500-8(c) IWB-2500-9,10,11	Visual, VT-3 Internal Surfaces or Volumetric[9]	Note 8	Element[2]	Same as 1st	Not Permissible
R1.18	Elements Subject to Flow Accelerated Corrosion (FAC)	Note 9	Note 9	Note 9	Note 9	Note 9	Note 9

E2A2-1

Table 4.1-1 (cont.)
EXAMINATION CATEGORY R-A, RISK-INFORMED PIPING EXAMINATIONS

Notes:

(1) The length for the examination volume shall be increased to include 1/2 in. beyond each side of the base metal thickness transition or counterbore.

(2) Includes all examination locations identified in accordance with the risk-informed selection process in Section 3.7.

(3) Includes 100% of the examination location. When the required examination volume or area cannot be examined due to interference by another component or part geometry, limited examinations shall be evaluated by the Expert Panel for acceptability. Areas with acceptable limited examinations, and their bases, shall be documented.

(4) The examination shall include any longitudinal welds at the location selected for examination in Note 2. The longitudinal weld examination requirements shall be met for both transverse and parallel flaws examination volume defined in Note 2.

(5) Initially-selected examination locations are to be examined in the same sequence during successive inspection intervals, to the extent practical.

(6) Applies to mill annealed Alloy 600 nozzle welds and heat affected zone (HAZ) without stress relief.

(7) The examination volume shall include the volume surrounding the weld, weld heat affected zone, and base metal, where applicable, in the crevice region. Examination should focus on detection of cracks initiating and propagating from the inner surface.

(8) The examination volume shall include base metal, welds and weld HAZ in the affected regions of carbon and low alloy steel, and the welds and weld HAZ of austenitic steel. Examinations shall verify the minimum wall thickness required. Acceptance criteria for localized thinning is in course of preparation. The examination method and examination region shall be sufficient to characterize the extent of the element degradation.

(9) In accordance with the Owner's existing FAC program.

(10) Paragraph and Figure numbers refer to the 1989 Edition.

(11) VT-2 examinations may be conducted during a system pressure test or a pressure test specific to that component/element.

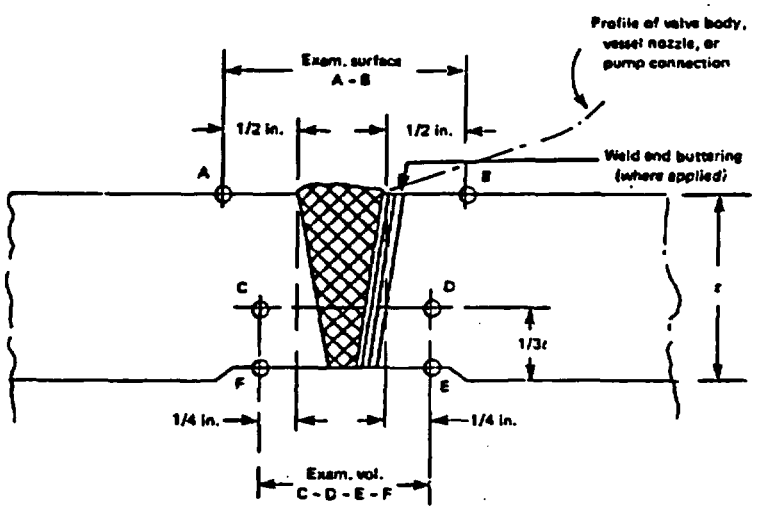
ENCLOSURE 2
ATTACHMENT 3

WATTS BAR NUCLEAR PLANT
FIRST TEN YEAR INSERVICE INSPECTION INTERVAL

WELD LOCATION ISI DRAWINGS
IWB-2500-8(c)

Fig. IWB-2500-8

1989 SECTION XI — DIVISION 1



(c) NPS 4 or Larger

FIG. IWB-2500-8 SIMILAR AND DISSIMILAR METAL WELDS IN COMPONENTS AND PIPING (CONT'D)

ENCLOSURE 2
ATTACHMENT 4

WATTS BAR NUCLEAR PLANT
FIRST TEN YEAR INSERVICE INSPECTION INTERVAL

EXAMINATION DATA REPORTS
SIF-D086-02 - Report R0899
RHRF-D054-09 - Report R0907

TENNESSEE VALLEY AUTHORITY	EXAMINATION SUMMARY AND RESOLUTION SHEET	REPORT NUMBER: R0899

PROJECT: *WBN* UNIT: *1* CYCLE *05*				COMPONENT ID: *SIF-D086-02*	
EXAMINATION METHOD				SYSTEM: SIS	ISI DWG NO: *ISI-0375-C-16*
MT ☐	PT ☐	UT ☑	VT ☐	CONFIGURATION:	CATEGORY
PROCEDURE: *N-UT-64*	REV *6*	TC: *N/A*		*PC,PIPE TO PC,VLV*	*R-A*
EXAMINER: *Kenneth R. Smith*	EXAMINER: *N/A*			EXAMINER: *N/A*	EXAMINER: *N/A*
LEVEL: *II*	LEVEL: *N/A*			LEVEL: *N/A*	LEVEL: *N/A*

Total coverage calculated to be approximately *50* %

This report contains the manual ultrasonic examination data associated with weld # SIF-D086-02, A 3", SS, pipe to valve configuration.

0.25", 2.25 Mhz, 45 & 70 degree shear wave transducers were used.

Limited examination volume coverage was achieved due to configuration, see attached sketch.

No recordable indications were detected.

RESOLUTION BY:	REVIEWED BY:	ANII:
Kenneth R. Smith	*[signature]*	*B. Emigh*
LEVEL *II* DATE: *9-23-03*	LEVEL: *III* DATE: *9/23/03*	DATE: *10/3/03*
		Page: *1* OF *5*

TENNESSEE VALLEY AUTHORITY	DIGITAL ULTRASONIC CALIBRATION DATA SHEET	REPORT NUMBER RO899

PROJECT *WBN* UNIT/CYCLE *1/05*
PROCEDURE: *N-UT-64* REV: *6* TC: *N/A*

TRANSDUCER

MANUFACTURER *KBA*
MODEL: *COMP-G* S/N *00Y7FF*
SIZE: *.25"* FREQ: *2.25* MHz
SHAPE: *Round* # ELEMENTS: *1* # CONS: *0*
CABLE TYPE *RG-174* LENGTH: *6'*
MODE: ☑ SHEAR ☐ LONG ☐ RL

CALIBRATION DATE: *9-23-03*
CALIBRATION BLOCK NO. *WB-11* TEMP: *78°F*
SIMULATOR BLOCK: *Rompas*
THERMOMETER S/N: *558270* DUE DATE: *12-9-03*
COUPLANT: *Ultragel II* BATCH: *01225*

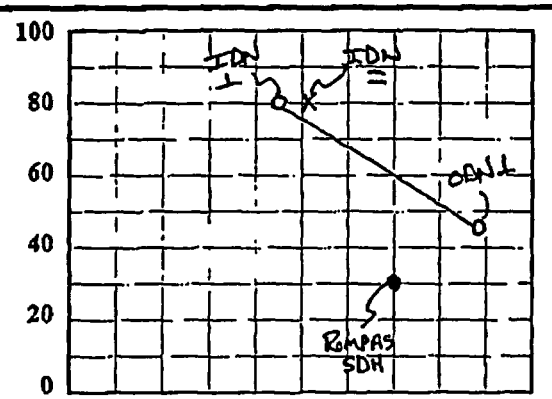
ANGLE VERIFICATION

BLOCK TYPE: *Rompas* S/N: *789631*
NOMINAL ANGLE: *45°* ACTUAL ANGLE *44°*

INSTRUMENT

MANUFACTURER: *Krautkramer* DUE DATE *5-27-04*
MODEL NO.: *USN-52L* S/N: *E30217*

DAC



DISPLAY WIDTH *1.50* inches

INSTRUMENT SETTINGS

SCAN DIRECT.	REFLECTOR NTC	REFLECTOR SDH	REFERENCE SENSITIVITY	MEMORY NUMBER
AXIAL	☑	—	*29* dB	*40*
CIRC.	☑	—	*41* dB	*40*

FREQ: *2.0-8.0* MHz REJECT:= *0* %
ANGLE: *44* deg DAMPING: *1000* ohms
DELAY: *-0.234* msec PULSER: *SINGLE* *
ZERO: *4.673* msec
VELOCITY *0.1233* msec PRR/PRF: *HIGH*
RANGE: *1.50* inches TOF: *PEAK*
DISP. MODE: *FULL WAV* POWER: *BATTERY*

REF. REFLECTOR: *Rompas SDH* GAIN: *35* dB
AMPLITUDE: *30* % METAL PATH: *1.041*

CALIBRATION TIMES

INITIAL TIME: *20:45* FINAL TIME: *23:25*

VERIFICATION TIMES	1)	2)	3)	4)	5)	6)	7)	8)	9)
	21:30	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*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	
TTENUATOR	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
Complete exam from pipe side only due to configuration, NRI	*SIF-D086-02*

EXAMINER: *Kenneth R. Smith* LVL.: *II* ANII: *B. Earnigh*
EXAMINED: *N/A* LVL: *N/A* DATE: *10/3/03*
REVIEWER: *[signature]* LVL: *III* DATE: *9/24/03* PAGE *2* OF *5*

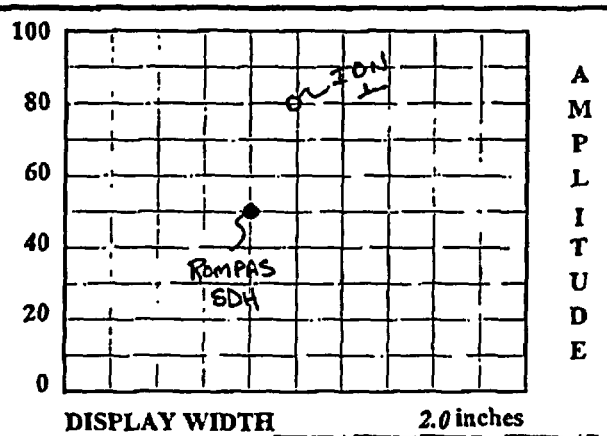
TENNESSEE VALLEY AUTHORITY	DIGITAL ULTRASONIC CALIBRATION DATA SHEET	REPORT NUMBER R0999

PROJECT *WBN* UNIT/CYCLE *1 / 05*
PROCEDURE: *N-UT-64* REV: *6* TC: *N/A*

TRANSDUCER
MANUFACTURER *KBA*
MODEL: *COMP-G* S/N *00Y7FF*
SIZE: *.25"* FREQ: *2.25* MHz
SHAPE: *Round* # ELEMENTS: *1* # CONS: *0*
CABLE TYPE *RG-174* LENGTH: *6'*

MODE: ☑ SHEAR ☐ LONG ☐ RL

DAC



DISPLAY WIDTH *2.0* inches

REF. REFLECTOR: *Rompas SDH* GAIN: *42* dB
AMPLITUDE: *50* % METAL PATH: *0.765*

CALIBRATION DATE: *9-23-03*
CALIBRATION BLOCK NO. *WB-11* TEMP: *78°F*
SIMULATOR BLOCK: *Rompas*
THERMOMETER S/N: *558270* DUE DATE: *12-9-03*
COUPLANT: *Ultragel II* BATCH: *10225*

ANGLE VERIFICATION
BLOCK TYPE: *Rompas* S/N: *789631*
NOMINAL ANGLE: *70°* ACTUAL ANGLE *67°*

INSTRUMENT
MANUFACTURER: *Krautkramer* DUE DATE *5-27-04*
MODEL NO.: *USN-52L* S/N: *E30217*

INSTRUMENT SETTINGS

REFLECTOR			REFERENCE SENSITIVITY	MEMORY NUMBER
SCAN DIRECT.	NTC	SDH		
AXIAL	☑	☐	*54* dB	*41*
CIRC.	☐	☐	*N/A* dB	*N/A*

FREQ: *2.0-8.0* MHz REJECT:= *0* %
ANGLE: *67* deg DAMPING: *1000* ohms
DELAY: *-0.328* msec PULSER: *SINGLE*
ZERO: *7.183* msec
VELOCITY *0.1234* msec PRR/PRF: *HIGH*
RANGE: *2.00* inches TOF: *PEAK*
DISP. MODE: *FULL WAV* POWER: *BATTERY*

CALIBRATION TIMES
INITIAL TIME: *21:00* FINAL TIME: *23:20*

VERIFICATION TIMES	1)	2)	3)	4)	5)	6)	7)	8)	9)
	21:43	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*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	
TTENUATOR	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**

Complete exam on pipe side only due to configiration, supplement to SIF-D086-02
45 degree for additional coverage and far side interigation, NRI

EXAMINER: *Kenneth R. Smith* LVL.: *II* ANII: *B. Earnigh*
EXAMINED: *N/A* LVL.: *N/A* DATE: *10/3/03*
REVIEWER: *[signature]* LVL.: *II* DATE: *9/24/03* PAGE *3* OF *5*

ACCESS: FORMS DATABASE 10-27-01

TENNESSEE VALLEY AUTHORITY	MANUAL ULTRASONIC PIPING EXAMINATION DATA SHEET	REPORT NUMBER R0899

PROJECT: WBN UNIT/CYCLE 1 / 05
SYSTEM: SIS
WELD I.D.: SIF-D086-02
CONFIG.: PC,PIPE TO PC,VLV
FLOW →
PROCEDURE: N-UT-64 REV: 6 TC: N/A
Wo REFERENCE: WELD CENTER LINE
Lo REFERENCE: TDC

EXAMINATION DATE 9-23-03
START TIME: 21:30 END TIME: 21:55
EXAM SURFACE ☐ID ☑OD
MATERIAL TYPE: ☐CS ☑SS ☐CSCL ☐CCSS
SURFACE TEMP. 73 F PYRO NO. 558270

EXAMINATION ANGLE	45 DEG.	70 DEG.
AXIAL SCAN SENSITIVITY	41 dB	48 dB
CIRC. SCAN SENSITIVITY	43 dB	N/A dB

IND NO.	L (In) FROM REF. L1	L Max	L2	AT MAX AMP W MAX	MP MAX	D MAX	MAX AMP % DAC	EXAM NO. 3-14	NOM. ANG.	NRI	INDICATION INFORMATION: TYPE, DAMPING, ETC.
								3	45	☑	
								5	45	☑	
								6	45	☑	
								3	70	☑	
										☐	
										☐	

REMARKS/LIMITATIONS
Examination limited to pipe side only due to configuration, no recordable indications were detected.
5 TO 20% NOISE LEVEL MAINTAINED

EXAMINER: Kenneth R. Smith LEVEL: II
EXAMINER: N/A LEVEL: N/A
REVIEWED BY: [signature] LEVEL: III DATE: 10/4/03

ANII: B. Eamigh
DATE: 10/3/03

TVA

WALL THICKNESS PROFILE SHEET

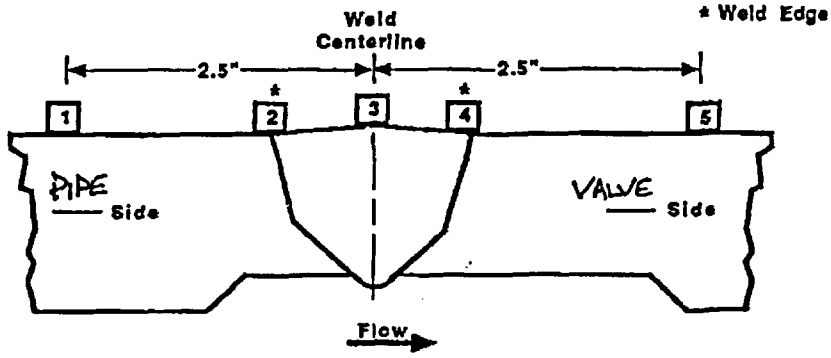
REPORT NO: R0899

PROJECT: WBN
UNIT: 1 / CYCLE 5

WELD NO: SIF-D086-02
SYSTEM: SIS

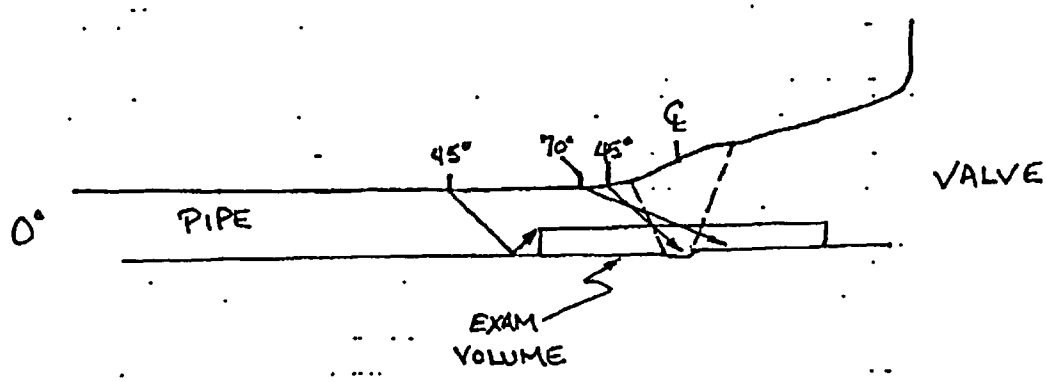
Record Thickness Measurements As Indicated, Including Weld Width, Edge-To-Edge At 0°

Position	0°	90°	180°	270°
1	0.409"			
2	0.391"			
3	0.554"		N/A	
4	0.624"			
5	N/A			



CROWN HEIGHT: FLUSH
CROWN WIDTH: 0.60"

DIAMETER: 3"
WELD LENGTH: 11.10"



EXAMINER: [signature] R. Smith
LEVEL: II
DATE: 9-23-03

REVIEWED BY: [signature]
LEVEL: III DATE:

B. Earnigh
DATE: 10/3/03

PAGE 5 OF 5

TVA 19668 (NP-5-89)

1-101-999-44

TENNESSEE VALLEY AUTHORITY	EXAMINATION SUMMARY AND RESOLUTION SHEET	REPORT NUMBER: R0907

PROJECT: *WBN* UNIT: *1*		CYCLE *05*		COMPONENT ID: *RHRF-D054-09*	
EXAMINATION METHOD				SYSTEM: SIS	ISI DWG NO: *CHM-2636-C-07*
MT ☐	PT ☐	UT ☑	VT ☐	CONFIGURATION:	CATEGORY
PROCEDURE: *N-UT-64*		REV *6*	TC: N/A	*PC,VLV TO PC,PIPE*	*R-A*
EXAMINER: Kenneth R. Smith		EXAMINER: *N/A*		EXAMINER: *N/A*	EXAMINER: *N/A*
LEVEL: *II*		LEVEL: *N/A*		LEVEL: *N/A*	LEVEL: *N/A*

Total coverage calculated to be approximately *50* **%**

This report contains the manual ultrasonic examination data associated with weld # RHRF-D054-09, an 8", SS, valve to pipe configuration.

A 0.375", 1.50 Mhz, 45 degree shear wave transducer and a 2.0 Mhz, 60 degree RL transducer were used.

The examination was performed from the pipe side only due to the configuration.

Root and counterbore geometry was seen 360 degrees with the 45 degree shear below recordable levels. Root geometry (recordable) and counterbore geometry (below recordable) was seen 360 degrees with the 60 degree RL.

RESOLUTION BY: Kenneth R. Smith	REVIEWED BY:	ANII: B. Eamigh
LEVEL II DATE: 9-24-03	LEVEL: II DATE: 9/25/03	DATE: 10/3/03
		Page: 1 OF 5

TENNESSEE VALLEY AUTHORITY	DIGITAL ULTRASONIC CALIBRATION DATA SHEET	REPORT NUMBER R0907

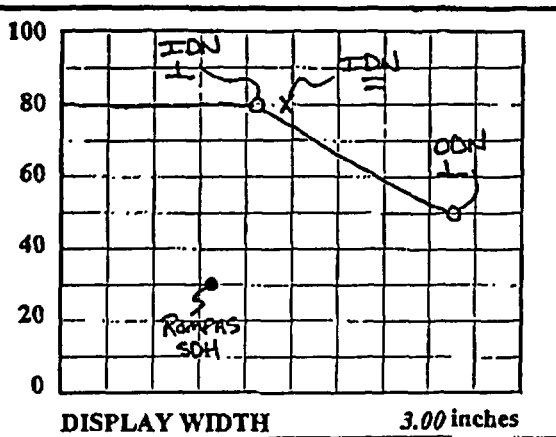
PROJECT *WBN* UNIT/CYCLE *1/ 05*
PROCEDURE: *N-UT-64* REV: *6* TC: *N/A*

TRANSDUCER

MANUFACTURER *KBA*
MODEL: *COMP-G* S/N ~~00X3DR~~ *00X03R* KBA-03
SIZE: *.375"* FREQ: *1.5* MHz
SHAPE: *Round* # ELEMENTS: *1* # CONS: *0*
CABLE TYPE *RG-174* LENGTH: *6'*

MODE: ☑ SHEAR ☐ LONG ☐ RL

DAC



DISPLAY WIDTH *3.00* inches

CALIBRATION DATE: *9-24-03*
CALIBRATION BLOCK NO. *WB-02* TEMP: *78°F*
SIMULATOR BLOCK: *Rompas*
THERMOMETER S/N: *558270* DUE DATE: *12-9-03*
COUPLANT: *Ultragel II* BATCH: *01225*

ANGLE VERIFICATION

BLOCK TYPE: *Rompas* S/N: *789631*
NOMINAL ANGLE: *45°* ACTUAL ANGLE *44°*

INSTRUMENT

MANUFACTURER: *Krautkramer* DUE DATE *5-27-03*
MODEL NO.: *USN-52L* S/N: *E30217*

INSTRUMENT SETTINGS

REFLECTOR			REFERENCE SENSITIVITY	MEMORY NUMBER
SCAN DIRECT.	NTC	SDH		
AXIAL	☑	☐	*24* dB	*8*
CIRC.	☑	☐	*33* dB	*8*

FREQ: *2.0-8.0* MHz REJECT:= *0* %
ANGLE: *44* deg DAMPING: *1000* ohms
DELAY: *-0.063* msec PULSER: *SINGLE*
ZERO: *5.786* msec
VELOCITY *0.1228* msec PRR/PRF: *HIGH*
RANGE: *3.00* inches TOF: *PEAK*
DISP. MODE: *FULL WAV* POWER: *BATTERY*

REF. REFLECTOR: *Rompas SDH* GAIN: *24* dB
AMPLITUDE: *30* % METAL PATH: *1.027*

CALIBRATION TIMES

INITIAL TIME: *21:05* FINAL TIME: *23:10*

VERIFICATION TIMES 1) *22:30* 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*	
TTENUATOR	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**

Exam from pipe side only due to configuration,root and counterbore RHRF-D054-09
geometry seen 360 degrees below recordable levels,NRI

EXAMINER: Kenneth R. Smith LVL.: *II*
EXAMINER: *N/A* LVL.: *N/A*
REVIEWER: [signature] LVL.: *III* DATE: *9/25/03*

ANII: B. Eanigh
DATE: *10/3/03*

TENNESSEE VALLEY AUTHORITY	DIGITAL ULTRASONIC CALIBRATION DATA SHEET	REPORT NUMBER R0907

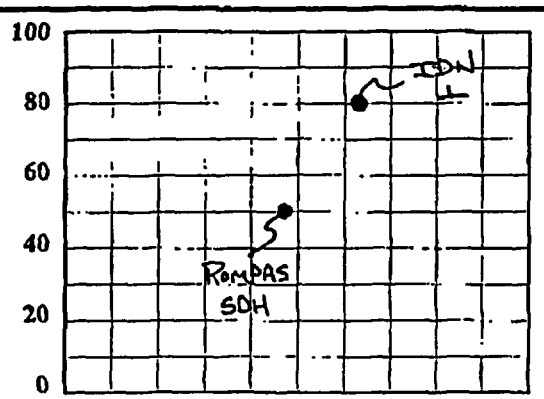
PROJECT *WBN* UNIT/CYCLE *1/ 05*
PROCEDURE: *N-UT-64* REV: *6* TC: *N/A*

TRANSDUCER

MANUFACTURER *MEGASONICS*
MODEL: *CGD* S/N *K2827*
SIZE: *0.25x0.5"* FREQ: *2.0* MHz
SHAPE: *Rectangle* # ELEMENTS: *2* # CONS: *0*
CABLE TYPE *RG-174* LENGTH: *2x6'*

MODE: ☐ SHEAR ☐ LONG ☑ RL

DAC



DISPLAY WIDTH *3.00* inches

CALIBRATION DATE: *9-24-03*
CALIBRATION BLOCK NO. *WB-02* TEMP: *78°F*
SIMULATOR BLOCK: *Rompas*
THERMOMETER S/N: *558270* DUE DATE: *12-9-03*
COUPLANT: *Ultragel II* BATCH: *01225*

ANGLE VERIFICATION

BLOCK TYPE: *Rompas* S/N: *789631*
NOMINAL ANGLE: *60°* ACTUAL ANGLE *60°*

INSTRUMENT

MANUFACTURER: *Krautkramer* DUE DATE *5-27-03*
MODEL NO.: *USN-52L* S/N: *E30217*

INSTRUMENT SETTINGS

REFLECTOR SCAN DIRECT.	NTC	SDH	REFERENCE SENSITIVITY	MEMORY NUMBER
AXIAL	☑	☐	*65* dB	*29*
CIRC.	☐	☐	*N/A* dB	*N/A*

FREQ: *2.0-8.0* MHz REJECT:= *0* %
ANGLE: *60* deg DAMPING: *1000* ohms
DELAY: *0.00* msec PULSER: *DUAL*
ZERO: *6.909* msec
VELOCITY *0.2317* msec PRR/PRF: *HIGH*
RANGE: *3.00* inches TOF: *PEAK*
DISP. MODE: *FULL WAV* POWER: *BATTERY*

REF. REFLECTOR: *Rompas SDH* GAIN: *49* dB
AMPLITUDE: *50 %* METAL PATH: *1.432*

CALIBRATION TIMES

INITIAL TIME: *21:15* FINAL TIME: *23:08*

VERIFICATION TIMES 1) *22:00* 2) *N/A* 3) *N/A* 4) *N/A* 5) *N/A* 6) *N/A* 7) *N/A* 8) *N/A* 9) *N/A*

***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

TTENUATOR	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

Supplement to 45 degree for far side interrogation, recordable root geometry seen 360 degrees, counterbore geometry 360 degrees below recordable levels.

WELD / ITEMS EXAMINED

RHRF-D054-09

EXAMINER: Kenneth R. Smith LVL.: *II* ANII: B. Eamigh
EXAMINER: *N/A* LVL.: *N/A* DATE: 10/3/03
REVIEWER: [signature] LVL.: II DATE: 9/26/03 PAGE *3* OF *5*

TENNESSEE VALLEY AUTHORITY	MANUAL ULTRASONIC PIPING EXAMINATION DATA SHEET	REPORT NUMBER R0907

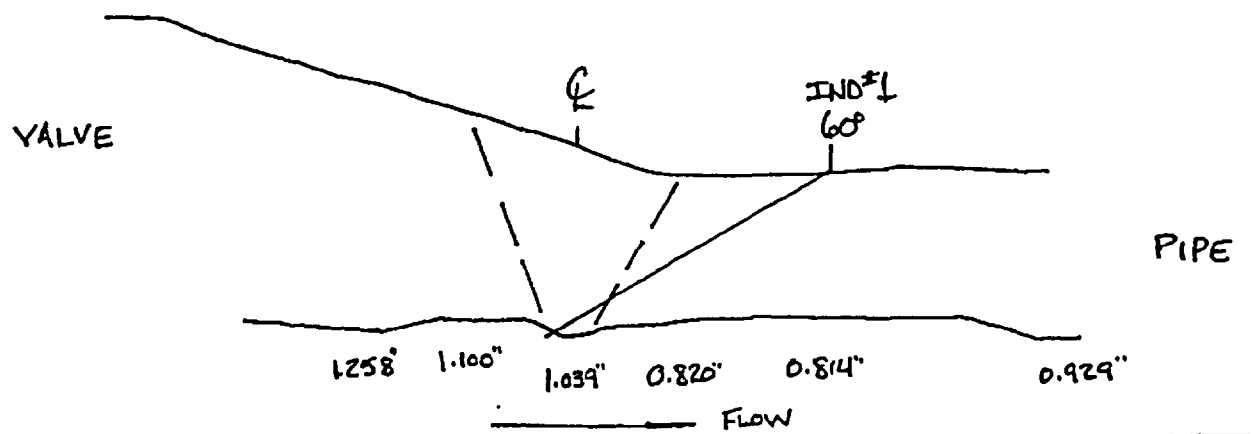
PROJECT: *WBN* UNIT/CYCLE *1 1 05*
SYSTEM: *SIS*
WELD I.D.: *RHRF-D054-09*
CONFIG.: *PC,VLV* TO *PC,PIPE*
FLOW →
PROCEDURE: *N-UT-64* REV: *6* TC: *N/A*
Wo REFERENCE: *WELD CENTER LINE*
Lo REFERENCE: *TDC*

EXAMINATION DATE *9-24-03*
START TIME: *21:50* END TIME: *22:50*
EXAM SURFACE ☐ID ☑OD
MATERIAL TYPE: ☐CS ☑SS ☐CSCL ☐CCSS
SURFACE TEMP. *64 F* PYRO NO. *558270*

EXAMINATION ANGLE	*45s* DEG.	*60RL* DEG.
AXIAL SCAN SENSITIVITY	*36* dB	*59* dB
CIRC. SCAN SENSITIVITY	*43* dB	*N/A* dB

IND NO.	L (In) FROM REF. L1	L Max	L2	AT MAX AMP W MAX	MP MAX	D MAX	MAX AMP % DAC	EXAM NO. 3-14	NOM. ANG.	NRI	INDICATION INFORMATION: TYPE, DAMPING, ETC.
								4	45	☑	
								5	45	☑	
								6	45	☑	
	*	5"ccw	*	1.40"	1.808"	.904"	200	4	60	—	Root geometry
										☐	
										☐	

T+C @ 270°



REMARKS/LIMITATIONS
Root geometry seen 360 degrees with 60 RL, verified with 0 degree
5 TO 20% NOISE LEVEL MAINTAINED

EXAMINER: Kenneth R. Smith LEVEL: II
EXAMINER: *N/A* LEVEL: *N/A*
REVIEWED BY: [signature] LEVEL: III DATE: 9/27/03

ANII: B. Eamigh
DATE: 10/3/03
PAGE 4 OF 5

ACCESS. FORMS DATABASE 10/18/01

TVA

WALL THICKNESS PROFILE SHEET

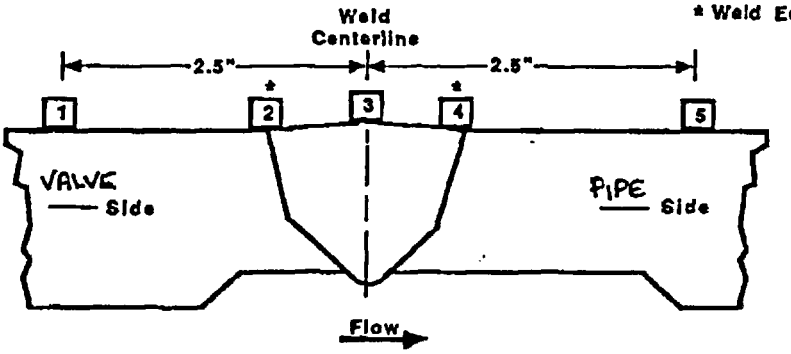
REPORT NO: R0907

PROJECT: WBN
UNIT: 1 / CYCLE 5

WELD NO: RHRF-D054-09
SYSTEM: SIS

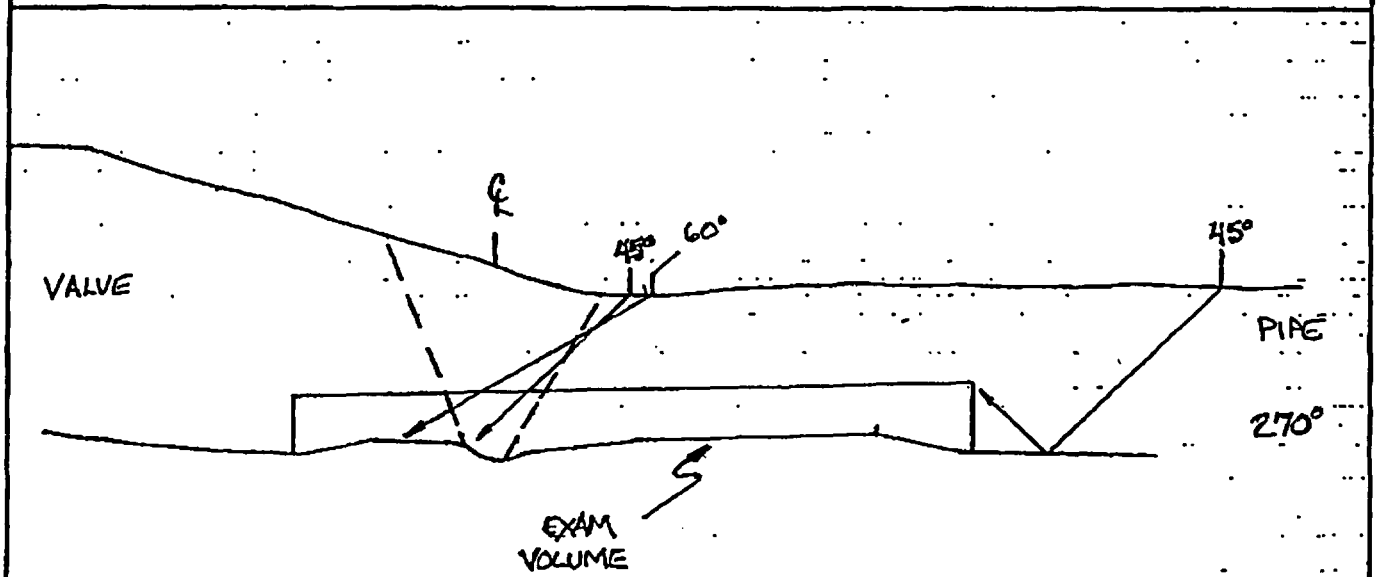
Record Thickness Measurements As Indicated, Including Weld Width, Edge-To-Edge At 0°

Position	0°	90°	180°	270°
1				N/A
2				1.158"
3		N/A		1.039"
4				.820"
5				.929"



CROWN HEIGHT: FLUSH
CROWN WIDTH: 1.20"

DIAMETER: 8.0"
WELD LENGTH: 26.5"



EXAMINER: [illegible]
LEVEL: II
DATE: 9-24-03

REVIEWED BY: [illegible]
LEVEL: [illegible] DATE: 9/25/03

B. Eamigh
DATE: 10/3/03

PAGE 5 OF 5