



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

FEB 21 2001

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) SECTION XI, INSERVICE INSPECTION
(ISI) PROGRAM RELIEF REQUEST 1-ISI-07 THROUGH 1-ISI-12**

The purpose of this letter is to request relief from ASME
Section XI Code requirements which were identified in the Unit 1
Cycle 3 refueling outage.

TVA committed in the ASME Section XI ISI Summary Report - Third
Refueling Cycle, dated December 5, 2000, to submit six relief
requests for ISI components examined during that inspection
because 100 percent Code coverage could not be achieved. The
required examination coverage could not be obtained. The
required examination was performed to the extent practical
within the design limitations of each component. Because
conformance to the code requirement is impractical to implement
due to design restrictions, relief is being requested in
accordance with 10 CFR 50.55a(g)(5)(iii).

Enclosure 1 provides the request for relief, 1-ISI-07,
concerning the centrifugal charging pump integrally welded
attachments. Enclosure 2 provides the request for relief,
1-ISI-08, for the steam generator 1 nozzle-to-safe end welds.
Enclosure 3 provides the request for relief, 1-ISI-09, for the
residual heat exchanger shell-to-flange weld. Enclosure 4

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U.S. Nuclear Regulatory Commission

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provides the relief request, 1-ISI-10, for the boron injection tank integrally welded attachments. Enclosure 5 provides the relief request, 1-ISI-11, for the boron injection tank shell-to-head welds. Enclosure 6 provides the relief request, 1-ISI-12, for the boron injection tank nozzle-to-vessel welds. Supporting material is provided in the attachments to each of the enclosures.

Enclosure 7 provides the TVA procedure N-GP-28, "Calculation of ASME Code Coverage for Section XI NDE Examinations." This procedure was used to calculate the code coverage achieved for each component examined.

If you have any questions concerning the above relief request, 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
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Spring City, Tennessee 37381

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U.S. Nuclear Regulatory Commission
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U.S. Nuclear Regulatory Commission
Region II
Sam Nunn Atlanta Federal Center
61 Forsyth St., SW, Suite 23T85
Atlanta, Georgia 30303

ENCLOSURE 1

WATTS BAR NUCLEAR PLANT UNIT 1
INSERVICE INSPECTION PROGRAM
REQUEST FOR RELIEF 1-ISI-07

ENCLOSURE 1

WATTS BAR NUCLEAR PLANT UNIT 1
FIRST 10-YEAR INTERVAL
REQUEST FOR RELIEF, 1-ISI-07

SUMMARY:

This request for relief addresses integrally welded attachments on Centrifugal Charging Pump 1A-A. The design configuration of the subject attachment welds precludes 100% surface examination of the required area for the weld CCPH-1A-A-IA (four integrally welded lug attachments to the pump casing). A liquid penetrant surface examination was performed on accessible areas to the maximum extent practical, given the physical limitations of the subject welds. The design configuration limits surface examination to approximately 84% of integrally welded attachments CCPH-1A-A-IA.

A similar physical limitation was experienced at TVA's Sequoyah Nuclear Plant. Requests for Relief (1-ISI-12 and 2-ISI-12) were granted by the NRC in a letter dated September 12, 2000.

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

I. COMPONENT:

Centrifugal Charging Pump Integrally Welded Attachment
Reference ISI drawing ISI-0118-C-01, (Attachment 1) identifier
CCPH-1A-A-IA.

II. CODE REQUIREMENT:

Code Case N-509, Table 2500-1, Examination Category C-C,
Item Number C3.30, requires Surface Examination.

III. CODE REQUIREMENTS FROM WHICH RELIEF IS REQUESTED:

Surface Examination Coverage of Essentially 100% of
Integrally Welded Attachments as defined in Figure 2500-5
(Attachment 2).

IV. BASIS FOR RELIEF:

The design configuration of the centrifugal charging pump and integrally welded attachments, precludes a surface examination of the required area of the integrally welded attachments to CCPH-1A-A-IA. The design configuration limits surface examination to approximately 84% of the required examination area.

ENCLOSURE 1

WATTS BAR NUCLEAR PLANT UNIT 1
FIRST 10-YEAR INTERVAL
REQUEST FOR RELIEF, 1-ISI-07

V. ALTERNATIVE EXAMINATION:

A liquid penetrant examination was performed on accessible areas to the extent practical given the physical limitations of the subject integrally welded attachments.

VI. JUSTIFICATION FOR THE GRANTING OF RELIEF:

The design configuration of the integrally welded attachments precludes surface examination of essentially 100% of the required examination area. Reference Examination Report R-0569 (Attachment 3) for location and sketch of inaccessible area. In order to examine the welds in accordance with the code requirement, the centrifugal charging pump would require extensive redesign and modification to allow access to the bottom side of the attachment lugs. Connecting piping would have to be disconnected and the pump disassembled and lifted to allow access to the remaining 16% examination area. The weld joint detail consists of a full penetration weld with fillet weld reinforcement. The attachment is welded all around with a fillet weld. The bottom side of the attachment is inaccessible due to a support which bolts the pump to the supporting frame. The total surface examination coverage for integral attachment welds CCPH-1A-A-IA was approximately 84% of the required code coverage. Other NDE techniques were considered; but, due to the location of the inaccessible area, the same limitations would be encountered.

Performing a surface examination of essentially 100% of the required area of integrally welded attachments CCPH-1A-A-IA would be impractical. In addition, it is impractical to perform other NDE examinations. The maximum extent practical surface examination of the weld area and adjacent metal of the subject weld provides reasonable assurance of an acceptable level of quality and safety. Significant degradation, if present, would have been detected during the surface examination that was performed on the subject integrally welded attachments. As a result, assurance of structural integrity for the integrally welded attachments is provided by the examination that was performed.

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

ENCLOSURE 1

WATTS BAR NUCLEAR PLANT UNIT 1
FIRST 10-YEAR INTERVAL
REQUEST FOR RELIEF, 1-ISI-07

VII. IMPLEMENTATION SCHEDULE:

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

ENCLOSURE 1

WATTS BAR NUCLEAR PLANT UNIT 1
FIRST 10-YEAR INTERVAL
REQUEST FOR RELIEF, 1-ISI-07

Attachment 1	ISI Drawing ISI-0118-C-01
Attachment 2	ASME Section XI, 1989 Edition, Figure IWC-2500-5
Attachment 3	Examination Report R-0569

ENCLOSURE 1
ATTACHMENT 1

REQUEST FOR RELIEF, 1-ISI-07
ISI DRAWING ISI-0118-C-01

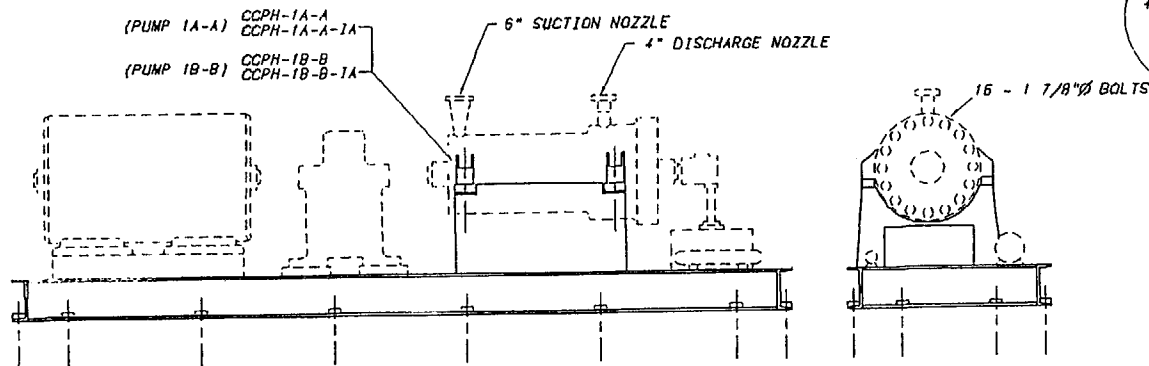
REFERENCE DRAWINGS
VENDOR TECHNICAL MANUAL
WBN-VTM-W120-0010

MATERIAL SPECIFICATIONS

PUMP CASING
SA 182 F 304
ASME CC-2 (EQUIVALENT)

NOTES:

1. THE PUMP FEET ARE BOLTED TO A COMMON SUPPORT.
2. THE PUMP FEET ARE INTEGRALLY WELDED TO THE CASING AND IDENTIFIED WITH A COMMON ID.
3. NOZZLE WELDS SHOWN ON PIPING WELD LOCATION DRAWING 1S1-0375-C-17
4. THIS DRAWING MAY NOT REPRESENT THE TRUE CONFIGURATION. REFER TO THE REFERENCED DRAWINGS FOR SPECIFIC DETAILS.



2	PHB	GLB	KEC	ROB	2-7-96
ADD MATERIAL SPECS. AND NOTE 4					
1	PHB	GLB	KEC	ROB	9-27-95
DELETE UNIT 1 10'S, VMC C-SIZE, REORIN TO CADAU, ADD -1A SUPPORT 10'S					
REV	BY	CHECKED	SUBMITTED	APPROVED	DATE
TENNESSEE VALLEY AUTHORITY					
WATTS BAR NUCLEAR PLANT					
UNIT 1					
CENTRIFUGAL CHARGING PUMP					
WELD AND SUPPORT LOCATIONS					
DRAWN: KEY		DATE: 9-2-83		SCALE: NOT TO SCALE	
CHECKED: JCC		APPROVED: JLO		CAD MAINTAINED DRAWING REV	
SUBMITTED:		1S1-0118-C-01		02	

ENCLOSURE 1
ATTACHMENT 2

REQUEST FOR RELIEF, 1-ISI-07
ASME SECTION XI, 1989 EDITION, FIGURE IWC-2500-5

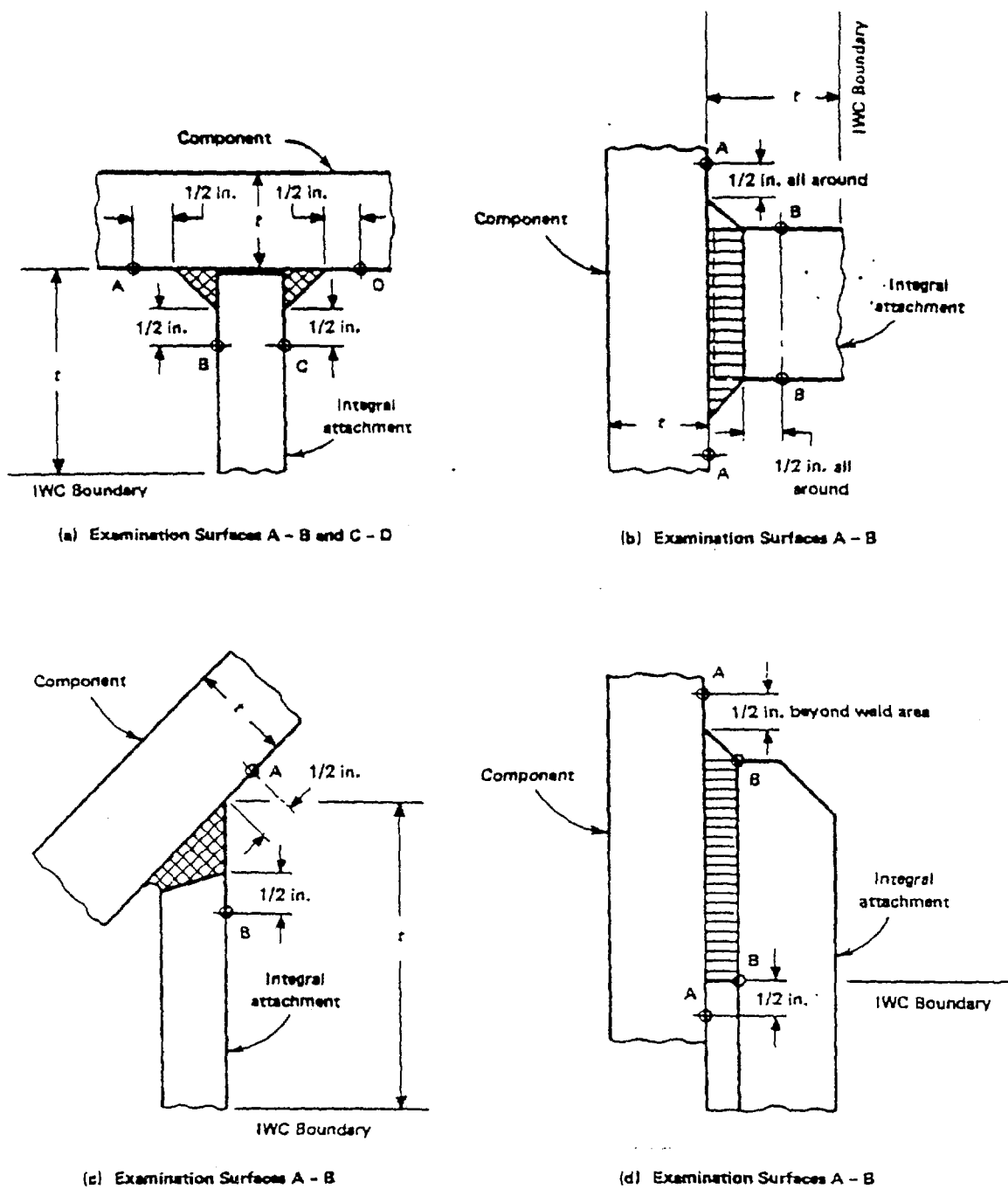


FIG. IWC-2500-5 INTEGRALLY WELDED ATTACHMENTS

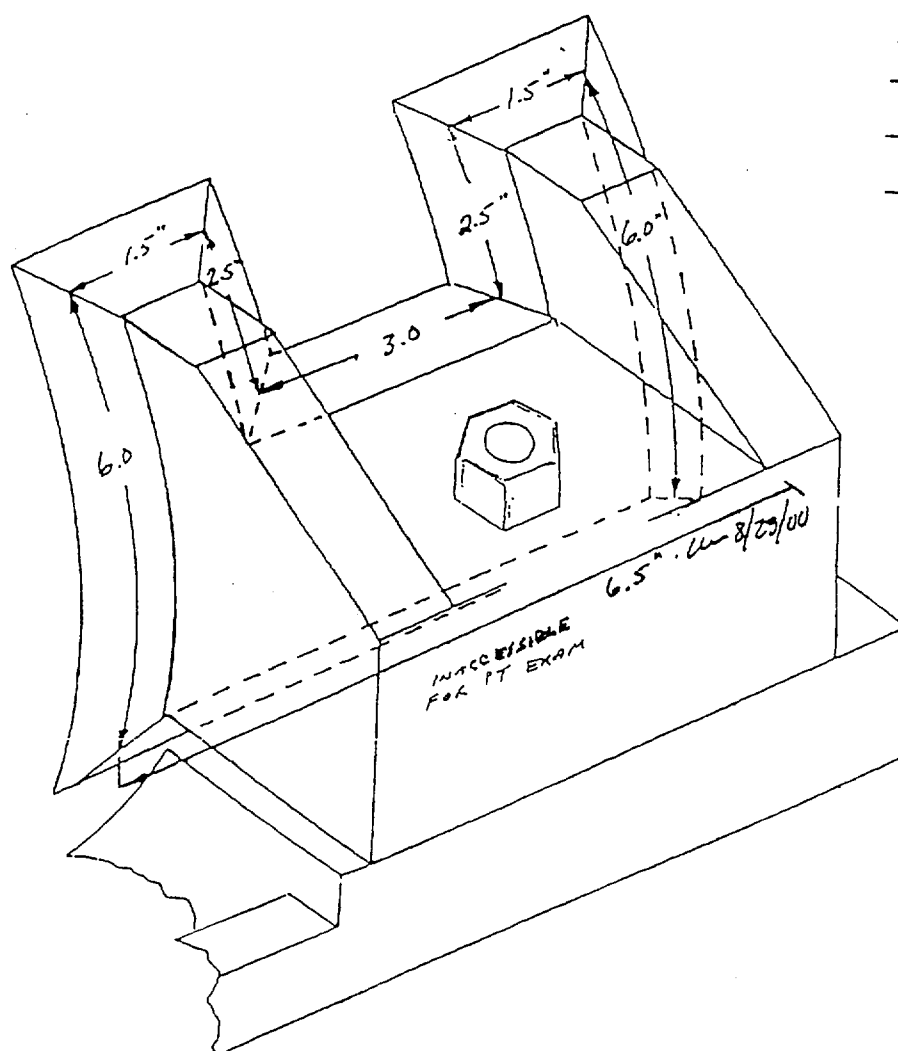
ENCLOSURE 1
ATTACHMENT 3

REQUEST FOR RELIEF, 1-ISI-07
EXAMINATION REPORT R-0569

TENNESSEE VALLEY AUTHORITY	RECORD OF LIQUID PENETRANT EXAM	REPORT NUMBER <u>R-0569</u>
PROJECT: <u>WBN</u> UNIT: <u>1</u> CYCLE: <u>03A</u> SYSTEM: <u>CVCS</u> WELD/COMPONENT ID: <u>CCPH-1A-A-1A</u> CONFIG.: <u>TPMPIWA</u> TO _____ PROCEDURE: <u>N-PT-9</u> REV.: <u>19</u> TC: <u>N/A</u> EXAMINATION CODE <u>89E-01</u> CODE CLASS: <u>2</u> CATEGORY: <u>C-C</u>		EXAMINATION DATE <u>08/23/00</u> START TIME <u>09:05</u> END TIME: <u>13:24</u> EXAM SURFACE: ID <input type="checkbox"/> OD <input checked="" type="checkbox"/> PRESERVICE <input type="checkbox"/> INSERVICE <input checked="" type="checkbox"/> REF. DRAWING NO.: <u>FC48590</u>
		ACCEPTANCE CRITERIA <input type="checkbox"/> APPDX. A <input checked="" type="checkbox"/> APPDX. B <input type="checkbox"/> OTHER: _____
METHOD OF EXAMINATION		
METHOD WATER-WASHABLE FLUORESCENT DYE: <input type="checkbox"/> POST-EMULSIFIABLE FLUORESCENT DYE: <input type="checkbox"/> SOLVENT-REMOVABLE FLUORESCENT DYE: <input type="checkbox"/> WATER-WASHABLE VISIBLE DYE: <input type="checkbox"/> POST-EMULSIFIABLE VISIBLE DYE: <input type="checkbox"/> SOLVENT REMOVABLE VISIBLE DYE: <input checked="" type="checkbox"/>	PENETRANT MATERIALS BRAND NAME: <u>MAGNAFLUX</u> PENETRANT <u>SKL-SP</u> BATCH: <u>94M05K</u> REMOVER: <u>SKC-S</u> BATCH: <u>98L07K</u> DEVELOPER: <u>SKD-S2</u> BATCH: <u>96J08K</u> <div style="text-align: center; border-top: 1px solid black; border-bottom: 1px solid black;"> BLACK LIGHT </div> METER S/N: <u>A</u> AL. DUE DATE: <u>A</u>	
PART TEMP: <u>95 °F</u> PYROMETER S/N: <u>522343</u> CAL. DUE DATE: <u>06/06/01</u>		
EXAMINATION RESULTS SATISFACTORY: <input checked="" type="checkbox"/> UNSATISFACTORY: <input type="checkbox"/> NOI NO.: <u>N/A</u> EXPLANATION OF EXAM RESULTS: <u>NO REPORTABLE CONDITIONS OBSERVED.</u> _____ _____ _____		
COMMENTS/LIMITATIONS: <u>APPROXIMATELY 84.4% ASME CODE COVERAGE ACHIEVED. TOTAL WELD LENGTH IS</u> <u>127" TOTAL LENGTH OF WELD EXAMINED 107.25" SEE ATTACHED DRAWINGS.</u>		
EXAMINER: <u>Casey L. La Toja</u> EXAMINER: <u>Matt Welch</u> REVIEWER: <u>W. B. Earnigh</u>	LEVEL: <u>II</u> LEVEL: <u>II</u> LEVEL: <u>III</u> DATE: <u>8-29-00</u>	
		ANI: <u>B. Earnigh</u> DATE: <u>9/13/00</u> PAGE: <u>1</u> OF <u>5</u>

R-0569

WBN 4/01



4" - RIGHT SIDE

CCPH-15-B-1A

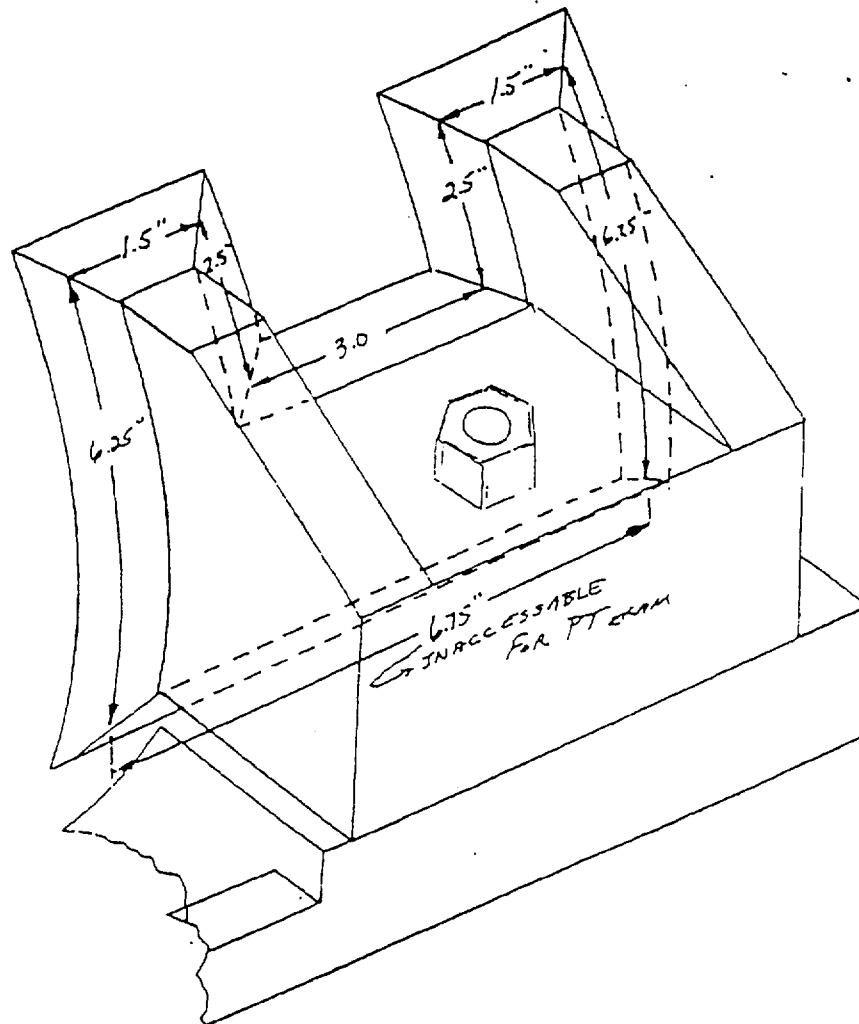
R-0163

OUTBOARD WEST

6.5"

2 1/2"

R-0569



4"

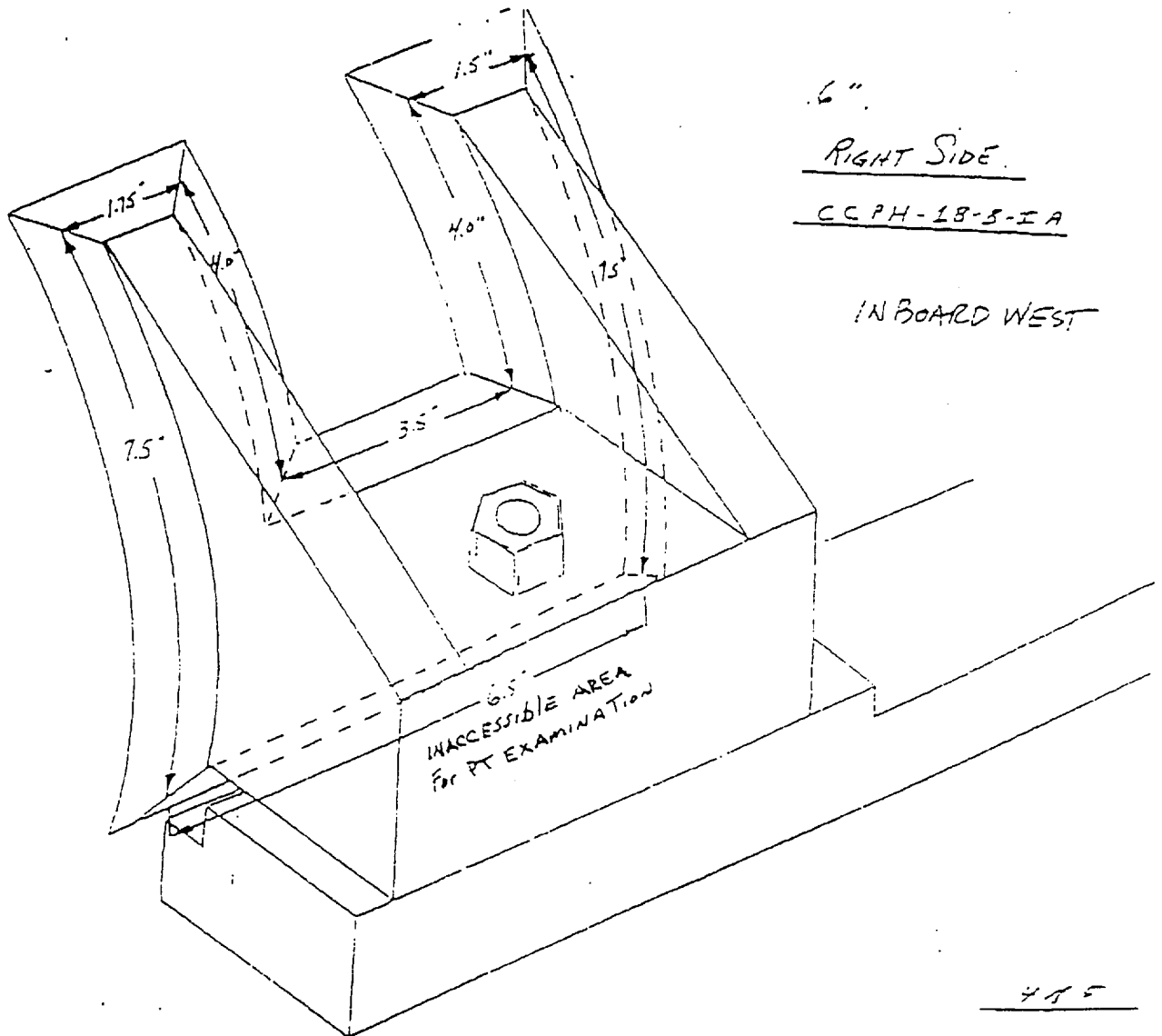
LEFT SIDE

CCPH-1B-8-2A

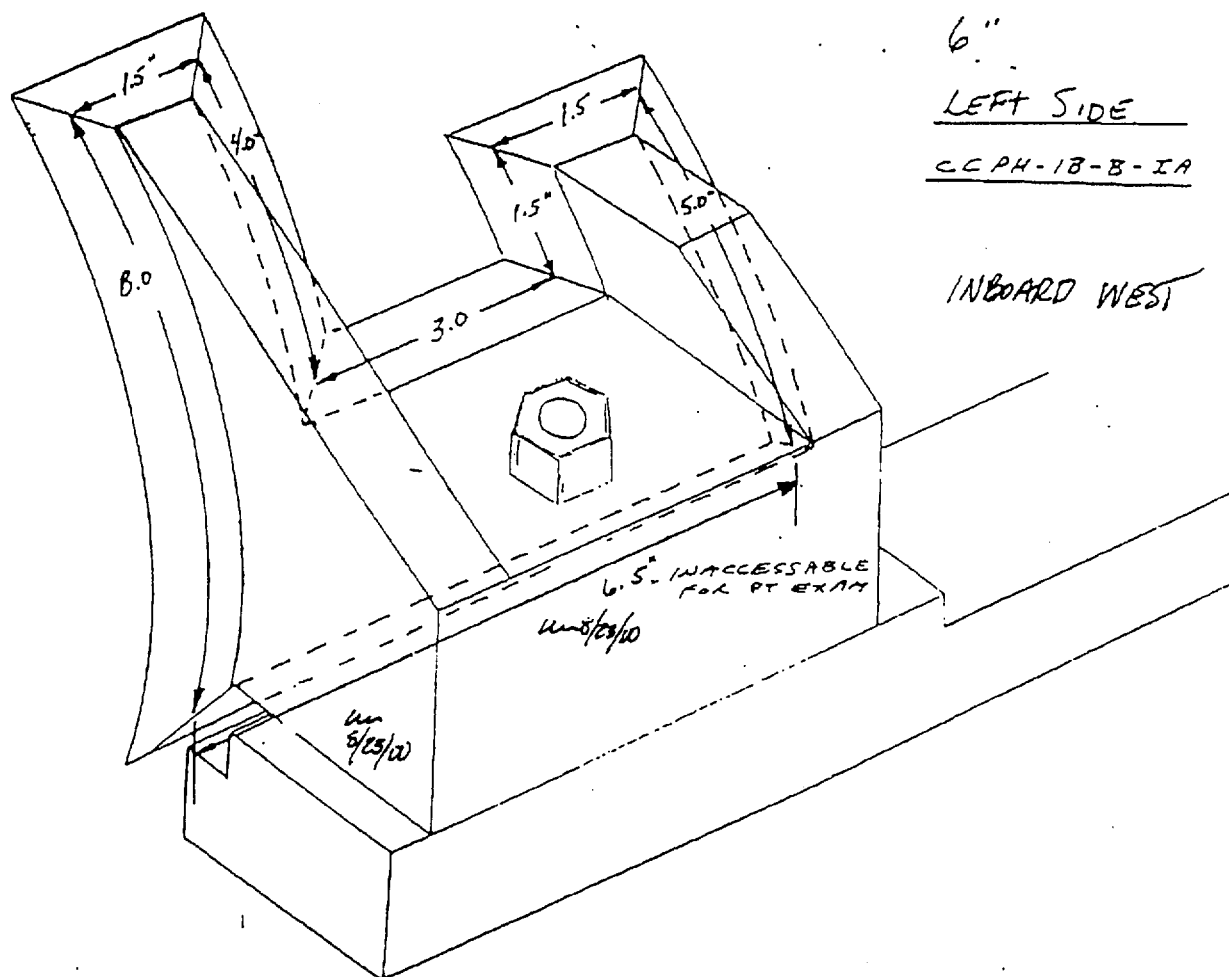
OUTBOARD WEST

315

R-0569



R-0569



6"
LEFT SIDE
CCPH-18-B-1A

INBOARD WEST

5-115

ENCLOSURE 2

WATTS BAR NUCLEAR PLANT UNIT 1
INSERVICE INSPECTION PROGRAM
REQUEST FOR RELIEF, 1-ISI-08

ENCLOSURE 2

WATTS BAR NUCLEAR PLANT UNIT 1 FIRST 10-YEAR INTERVAL REQUEST FOR RELIEF, 1-ISI-08

SUMMARY:

Volumetric examination of the two Steam Generator 1 nozzle-to-safe end butt welds during the Unit 1 Cycle 3 refueling outage resulted in less than essentially 100% of ASME code coverage being achieved due to geometric configurations of the steam generator nozzles and the material used for the main loop piping (CF8A). The geometric configuration of the nozzle prevents the performance of an ultrasonic scan from the generator side of the weld, thus preventing essentially 100% examination of the required lower one-third volume. An acceptable surface examination was performed on each of the two welds. Volumetric examination of this component is required in accordance with ASME Section XI Table IWB-2500-1, Examination Category B-F, Item Number B5.70. The lower one-third volume weld examination requirement is illustrated by Figure IWB-2500-8(c).

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

This Request for Relief for the steam generator 1 nozzles is similar to Request for Relief 1-ISI-05 which was submitted following examination of steam generator 2 and 3 nozzles during the cycle 2 refueling outage. Request for Relief 1-ISI-05 was approved by the NRC in their Safety Evaluation Report issued on March 24, 2000.

I. COMPONENT:

Steam generator 1 nozzle-to-safe end butt welds.
Reference ISI drawing CHM-2547-C-01, (Attachment 1) weld identifiers RCF-D1-2-SE and RCF-F1-1-SE

II. CODE REQUIREMENT:

ASME Section XI, 1989 Edition, Table IWB-2500-1, Examination Category B-F, Item Number B5.70, volumetric examination requirement as defined by Figure IWB-2500-8(c) (Attachment 2).

III. CODE REQUIREMENTS FROM WHICH RELIEF IS REQUESTED:

Relief is requested from performing the required volumetric examination on essentially 100% of the lower one-third volume of the steam generator 1 nozzle-to-safe end butt welds.

ENCLOSURE 2

WATTS BAR NUCLEAR PLANT UNIT 1 FIRST 10-YEAR INTERVAL REQUEST FOR RELIEF, 1-ISI-08

IV. BASIS FOR RELIEF:

The design configuration of the steam generator nozzles and the CF8A piping material precludes an ultrasonic examination of the required volume for the nozzle-to-safe end butt welds. The design configuration and piping material limits ultrasonic examination of the code required examination volume to approximately 61% on weld RCF-F1-1-SE (cold leg nozzle) and 65% on weld RCF-D1-2-SE (hot leg nozzle).

V. ALTERNATIVE EXAMINATION:

A volumetric examination of the lower one-third volume of the steam generator nozzle-to-safe end welds was performed on accessible areas to the extent practical given the geometric configuration and piping materials of the nozzle-to-safe end butt welds. The code required surface examinations were acceptable on 100% of the weld length for these welds during the Cycle 3 refueling outage.

VI. JUSTIFICATION FOR THE GRANTING OF RELIEF:

The geometric configuration of the steam generator hemispherical chamber and nozzle and piping material precludes ultrasonic examination of essentially 100% of the required examination volume. The nozzles are integrally cast with the hemispherical chamber as shown on the Proprietary Westinghouse drawings, EDSK-351101B, EDSK-351097B, and EDSK-351098B which were provided by TVA's letter to NRC dated August 31, 1999 concerning Request for Relief, 1-ISI-5, for WBN. The hemispherical chamber is a SA-216, Gr. WCC casting, clad with austenitic stainless steel. The nozzles have buttered 308L safe ends. The main loop reactor coolant piping connections to the nozzle safe end are static cast SA-351, CF8A elbows. The geometric configuration of the steam generator side of the weld joint prevents an ultrasonic scan from the nozzle side and the piping materials prevents two-directional coverage from the pipe side, thus precluding full volume examination. A representation of the achievable examination volume for the nozzle-to-safe end welds is depicted on each of the ultrasonic examination reports (Attachment 3).

ASME Section XI requires that the examination volume C-D-E-F as depicted on Figure IWB-2500-8(c) be examined by four scan directions, two normal to the weld and two parallel to the weld. Due to the anisotropic coarse grain structure of cast stainless CF8A materials, the examination was limited to the $\frac{1}{2}$ vee technique using refracted longitudinal wave search units

ENCLOSURE 2

WATTS BAR NUCLEAR PLANT UNIT 1 FIRST 10-YEAR INTERVAL REQUEST FOR RELIEF, 1-ISI-08

with a beam angle of 45 degrees. All welds received 100% one direction coverage from the elbow side with the sound beam directed toward the steam generator. No scans were performed from the steam generator side due to the nozzle taper interference, therefore, 0% coverage was obtained from this direction. Scans parallel to the weld were performed to the extent that loss of search unit contact occurred on the steam generator side of the weld. All welds were previously conditioned during preservice inspection to maximize search unit coupling and provide access to the maximum extent precluding the nozzle configuration. Based on the extent of coverage obtained, it is reasonable to assure that flaws originating from the inner diameter would be detected to the degree comparable with industry standards.

WCAP-13670, "Handbook on Flaw Evaluation For Sequoyah Units 1 and 2 Primary Coolant System Piping," dated November 1993, and authored by W. H. Bamford, D. E. Prager, R. Brice-Nash, states that Westinghouse plants have no history of pipe cracking failure in the reactor coolant primary loop with exception of Iconel welds. For stress corrosion cracking (SCC) to occur, the following three conditions must exist simultaneously: high tensile stresses, a susceptible material (these welds contain no Iconel), and a corrosive environment. The potential for SCC is minimized in Westinghouse pressurized water reactors by material selection and prevention of a corrosive environment.

Radiographic examination of the nozzle-to-safe end weld as an alternative volumetric examination method was also determined to be impractical due to radiation exposure and lack of access from the inside diameter of the nozzle. During refueling outages, access to the steam generator head is provided through the primary manway to perform steam generator tube eddy current testing. Nozzle dams are inserted in the hot and cold legs to allow reactor coolant water to be raised within the hot and cold legs and the reactor vessel above the manway elevation while performing the eddy current testing. However, insertion of the nozzle dams blocks access to the nozzle-to-safe end welds. During the cycle 3 refueling outage, radiation exposure measured at the bottom of steam generator 1 bowl was 3.6 Rem on the hot leg side and 6.0 Rem on the cold leg side. It is estimated that set-up for radiographic examination of the nozzle-to-safe end welds with the nozzle dams removed would take 2 men approximately 3 hours for each nozzle, with approximately 1 hour required inside the bowl. Radiographic personnel would receive a dose of approximately 3.6 to 6 Rem for each nozzle-to-safe end weld radiographic

ENCLOSURE 2

WATTS BAR NUCLEAR PLANT UNIT 1 FIRST 10-YEAR INTERVAL REQUEST FOR RELIEF, 1-ISI-08

set-up. This dose does not include additional exposure for nozzle dam manipulation, nor exposure outside the steam generator head or inside the reactor vessel cavity while reactor coolant water is below the hot and cold legs. Radiography from the outside surface of the weld is also impractical due to a combination of the pipe wall thickness and volume of water inside the pipe.

During the preservice inspection, examination volume for these two welds was also reported to be limited and the welds were included in Preservice Inspection Program Request for Relief ISI-4. Approval was obtained in NRC's Safety Evaluation Report for Watts Bar Nuclear Plant Units 1 and 2, (NUREG-0847) Supplement 10, Appendix Z, Section 3.4. Request for Relief 1-ISI-05 was submitted following examination of steam generators 2 and 3 nozzles during the Cycle 2 refueling outage. Request for Relief 1-ISI-05 was approved by the NRC in a Safety Evaluation issued on March 24, 2000. There are two remaining nozzle-to-safe end welds required to be examined prior to the end of the first ten year interval. It is anticipated that based on the results of these examinations and the preservice examinations, code required examination coverage is not expected to be obtained for the remaining nozzle-to-safe end welds. Based upon actual coverage obtained following examination of those two remaining welds, it may be necessary to submit an additional relief request for those welds.

Conformance with the referenced code requirement is impractical, Due to the combined effect of the high percentage of ultrasonic examination coverage (61% and 65%), and 100% surface examination coverage. Therefore, it is requested that relief be granted in accordance with 10CFR 50.55a(g)(5)(iii) for the first inspection interval.

VII. IMPLEMENTATION SCHEDULE:

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

ENCLOSURE 2

WATTS BAR NUCLEAR PLANT
FIRST 10-YEAR INTERVAL
REQUEST FOR RELIEF, 1-ISI-08
LIST OF ATTACHMENTS

Attachment 1 ISI Drawing CHM-2547-C-01

Attachment 2 ASME Section XI, 1989 Edition, Figure IWB-2500-8(c),
Similar and Dissimilar Metal Welds in Components and
Piping

Attachment 3 Examination Data Reports

Liquid Penetrant Examination Report R-0606 for Weld
RCF-D1-2-SE

Liquid Penetrant Examination Report R-0607 for Weld
RCF-F1-1-SE

Ultrasonic Examination Report R-0672 for Weld RCF-F1-
1-SE

Ultrasonic Examination Report R-0673 for Weld RCF-D1-
2-SE

ENCLOSURE 2
ATTACHMENT 1

REQUEST FOR RELIEF 1-ISI-08
ISI DRAWING CHM-2547-C-01

REFERENCE DRAWINGS
SK. 304-1 SHEETS 1 THRU 12

MATERIAL SPECIFICATIONS

PRESSURIZER SURGE LINE
NOM. PIPE SIZE-1 1/2"
SCH. 160 SA-376 SML'S

HOT LEG 20-10 4 31" 2 37" M.W.

SA351 CF-8A

31°10, 2.48° M.V.
SA-351 CF-8A

COLD LEG 27 4:10 2 21 - H. W.

SMO.135N000 MOUNTED
YR-FD 155-Y5
SA-357 CBA

6" SCH. 160 SA 403 WP 304S

14" SCH. 140 SA 403 WP 316 S

ASME CC-1 (EQUIVALENT)

B	PHB	KEC	EOL	RDB
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PREVIOUS INDICES COMBINING ACIE 1 & 2 AND REVISIONS
ACI-02-2, ACI-02-1, ACI-FJ-1, ACI-04-1
TO WELOS ACI-02-2, ACI-01-2, ACI-FI-1, MODIFY NUMBER
ACI-03-2, ACI-01-2, ACI-FI-1, ACI-FI-1, ACI-FI-1, ACI-FI-1

7 PHB KEC GLR RUB
TO BRANCH MATERIAL SPECS & 31" ID, ADD BRANCH

PHD

S		DND	T	BHD	T	KEC	I	GLD	
---	--	-----	---	-----	---	-----	---	-----	--

1	RPG	JAA	JCG	GLB
---	-----	-----	-----	-----

ADD SHEETS 3 & 4, MADE CAD AND MINOR CHANGES	JAA	JCC	CLD

ADD NOTE					
	BY	CHECKED	SUBMITTED	APPROVED	

TENNESSEE VALLEY AUTHORITY
 1000 MARKET STREET, N.W.
 ATLANTA, GEORGIA 30334

UNIT 1

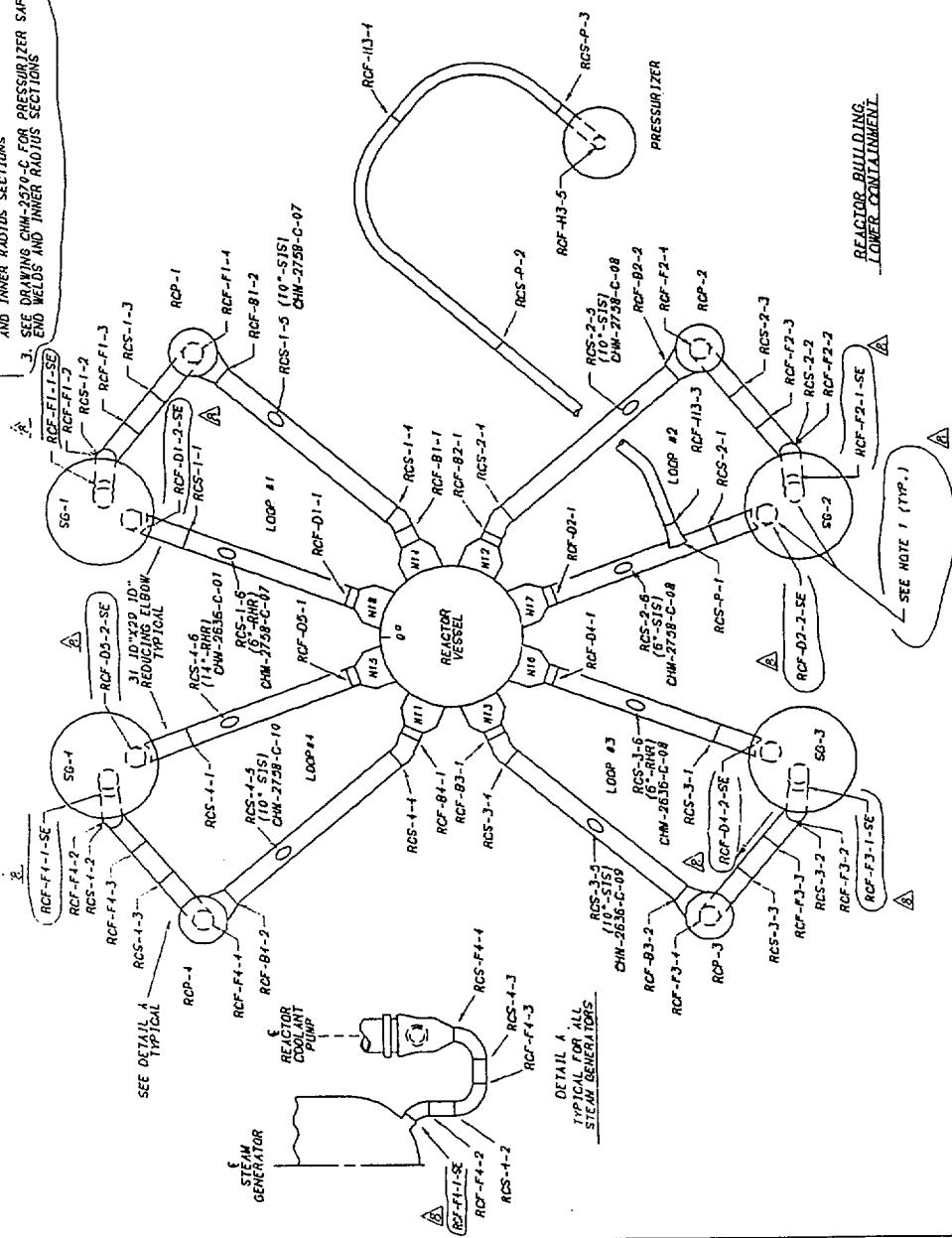
WELD LOCATIONS

NAME -	FLY	DATE	CAD NAME
CHECKED -		APPROVED - EFM	

03/11/2017

NOTES:

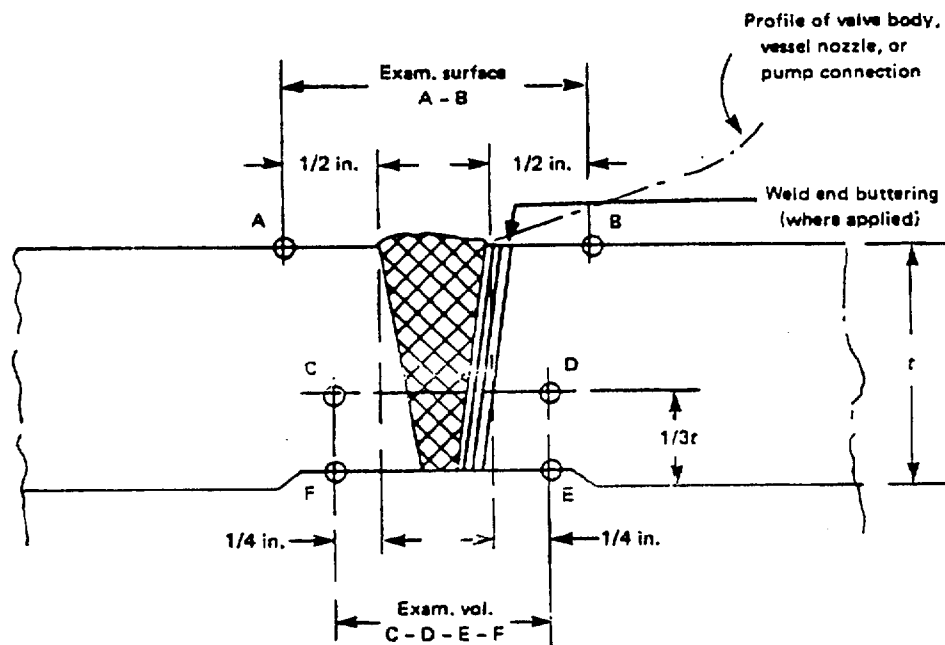
1. SEE DETAIL A ON DWG. CHW-2660-C, SHEET 1 FOR THE STEAM GENERATOR TO PIPING WELDS, SG SAFE END WELD DETAILS, AND INNER RADIUS SECTION. THE PIPE TO SG SAFE END WELD AND SG SAFE END TO SG NOZZLE WELD IS SECTION XJ AS SHOWN AND CATEGORIZED AS A DISSIMILAR WELD. EXAM CATEGORY B-1.
2. SEE DRAWING JST-0407-C FOR RV SAFE END WELDS AND INNER RADIUS SECTIONS.
3. SEE DRAWING CHW-2570-C FOR PRESSURIZER SAFE END WELDS AND INNER RADIUS SECTIONS.



DRAWN	REV	DATE	APPROVED	EPN	S&L	NOT TO SCALE
CHECKED:						
SUBMITTED:						
CHM-2347-C-01						OB

ENCLOSURE 2
ATTACHMENT 2

REQUEST FOR RELIEF 1-ISI-08
ASME SECTION XI, 1989, FIGURE IWB-2500-8(c)



(c) NPS 4 or Larger

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

ENCLOSURE 2
ATTACHMENT 3

REQUEST FOR RELIEF 1-ISI-08
EXAMINATION DATA REPORTS

TENNESSEE VALLEY AUTHORITY	RECORD OF LIQUID PENETRANT EXAM	REPORT NUMBER <u>R-0606</u>
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PROJECT: <u>WBN</u> UNIT: <u>1</u> CYCLE: <u>03</u>	EXAMINATION DATE <u>9-14-00</u>
SYSTEM: <u>SG</u>	START TIME <u>1405</u> END TIME: <u>1450</u>
WELD/COMPONENT ID: <u>RCF-D1-2-SE</u>	EXAM SURFACE: ID <input type="checkbox"/> OD <input checked="" type="checkbox"/>
CONFIG.: <u>PCSE</u> TO <u>VNOZ</u>	PRESERVICE <input type="checkbox"/> INSERVICE <input checked="" type="checkbox"/>
PROCEDURE: <u>N-PT-9</u> REV.: <u>19</u> TC: <u>N/A</u>	REF. DRAWING NO.: <u>CHM-2547-C-01</u>
EXAMINATION CODE <u>89E-01</u>	ACCEPTANCE CRITERIA
CODE CLASS: <u>1</u> CATEGORY: <u>B-F</u>	<input type="checkbox"/> APPDX. A <input checked="" type="checkbox"/> APPDX. B
	<input type="checkbox"/> OTHER:

METHOD OF EXAMINATION

METHOD	PENETRANT MATERIALS
WATER-WASHABLE FLUORESCENT DYE: <input type="checkbox"/>	BRAND NAME: <u>MAGNAFLUX</u>
POST-EMULSIFIABLE FLUORESCENT DYE: <input type="checkbox"/>	PENETRANT <u>SKL-SP</u> BATCH: <u>94-M05K</u>
SOLVENT-REMOVABLE FLUORESCENT DYE: <input type="checkbox"/>	REMOVER: <u>SKC-S</u> BATCH: <u>98-L07K</u>
WATER-WASHABLE VISIBLE DYE: <input type="checkbox"/>	DEVELOPER: <u>SKD-S2</u> BATCH: <u>96-J08K</u>
POST-EMULSIFIABLE VISIBLE DYE: <input type="checkbox"/>	BLACK LIGHT
SOLVENT REMOVABLE VISIBLE DYE: <input checked="" type="checkbox"/>	METER S/N: <u>N/A</u>
	AL. DUE DATE: <u>N/A</u>

PART TEMP: 91 °F PYROMETER S/N: 531989 CAL. DUE DATE: 6-6-01

EXAMINATION RESULTS SATISFACTORY: ☒ UNSATISFACTORY: ☐ NOINO.: N/A

EXPLANATION OF EXAM RESULTS:

NRI

COMMENTS/LIMITATIONS:

EXAMINER: <u>Dickens Michael</u>	LEVEL: <u>II</u>	ANI: <u>5/16/00</u>
EXAMINER: <u>N/A</u>	LEVEL: <u>N/A</u>	DATE: <u>9-16-00</u>
REVIEWER: <u>Vimbentley</u>	LEVEL: <u>III</u> DATE: <u>9-16-00</u>	PAGE: <u>OF</u>

TENNESSEE VALLEY AUTHORITY	RECORD OF LIQUID PENETRANT EXAM	REPORT NUMBER <u>R-0607</u>
PROJECT: <u>WBN</u> UNIT: <u>1</u> CYCLE: <u>03</u> SYSTEM: <u>SG</u> WELD/COMPONENT ID: <u>RCF-F1-1-SE</u> CONFIG.: <u>VNOZ</u> TO <u>PC,SE</u> PROCEDURE: <u>N-PT-9</u> REV.: <u>19</u> TC: <u>N/A</u> EXAMINATION CODE <u>89E-01</u> CODE CLASS: <u>1</u> CATEGORY: <u>B-F</u>		EXAMINATION DATE <u>9-14-00</u> START TIME <u>1245</u> END TIME: <u>1330</u> EXAM SURFACE: ID <input type="checkbox"/> OD <input checked="" type="checkbox"/> PRESERVICE <input type="checkbox"/> INSERVICE <input checked="" type="checkbox"/> REF. DRAWING NO.: <u>CHM-2547-C-C</u>
		ACCEPTANCE CRITERIA <input type="checkbox"/> APPDX. A <input checked="" type="checkbox"/> APPDX. B <input type="checkbox"/> OTHER:
METHOD OF EXAMINATION		
METHOD WATER-WASHABLE FLUORESCENT DYE: <input type="checkbox"/> POST-EMULSIFIABLE FLUORESCENT DYE: <input type="checkbox"/> SOLVENT-REMOVABLE FLUORESCENT DYE: <input type="checkbox"/> WATER-WASHABLE VISIBLE DYE: <input type="checkbox"/> POST-EMULSIFIABLE VISIBLE DYE: <input type="checkbox"/> SOLVENT REMOVABLE VISIBLE DYE: <input checked="" type="checkbox"/>	PENETRANT MATERIALS BRAND NAME: <u>MAGNAFLUX</u> PENETRANT <u>SKL-SP</u> BATCH: <u>94-M05K</u> REMOVER: <u>SKC-S</u> BATCH: <u>98-L05K</u> <div style="text-align: right; font-size: small;">Dem 9 15 00</div> DEVELOPER: <u>SKD-S2</u> BATCH: <u>96-J08K</u> <div style="text-align: center;"> BLACK LIGHT </div> METER S/N: <u>N/A</u> AL. DUE DATE: <u>N/A</u>	
PART TEMP: <u>91 °F</u> PYROMETER S/N: <u>531989</u> CAL. DUE DATE: <u>6-6-01</u>		
EXAMINATION RESULTS SATISFACTORY: <input checked="" type="checkbox"/> UNSATISFACTORY: <input type="checkbox"/> NOI NO.: <u>N/A</u> EXPLANATION OF EXAM RESULTS: <u>NRI</u> <hr/> <hr/> <hr/> COMMENTS/LIMITATIONS: <hr/> <hr/> <hr/>		
EXAMINER: <u>Dickens Michael</u> EXAMINER: <u>N/A</u> REVIEWER: <u>11 AMB Welling</u>	LEVEL: <u>II</u> LEVEL: <u>N/A</u> LEVEL: <u>IT</u> DATE: <u>9-19-00</u>	ANI: <u>5/67A</u> DATE: <u>9-16-00</u> PAGE: <u> </u> OF

TENNESSEE VALLEY AUTHORITY

EXAMINATION
SUMMARY AND
RESOLUTION SHEET

REPORT NO.

R-0672

PROJECT: WRN UNIT: 1SYSTEM: STEAM GENERATORWELD I.D.: RCF-FI-1-SECONFIG: S.G. NOZZLE TO: ELBOWFLOW
→PROCEDURE: N- 33 REV.: B TC: N/ANDE METHOD: ☒ UT ☒ PT ☒ MT ☒ VTEXAMINER: DAVID M. GRIESEL LV: IIEXAMINER: N/A LV: N/AEXAMINER: N/A LV: N/AEXAMINER: N/A LV: N/ACAL SHT NO'S: N/A

DATA ASSOCIATED WITH MANUAL ULTRASONIC
EXAMINATION OF WELD # RCF-FI-1-SE, STEAM GENERATOR
NOZZ. TO SAFE END WELD. PERFORMED TO ASME SECTION XI.

EXAMINATION PERFORMED USING A 45° R.L. TRANSDUCER
IN THE AX AND CIRC. DIRECTIONS

COVERAGE WAS LIMITED DUE TO NOZZLE CONFIGURATION.
NO SCAN 3 AND LIMITED COVERAGE ON SCAN'S 5 & 6

61% TOTAL COVERAGE
SEE ATTACHED COVERAGE PLOT.

EVALUATOR: DAVID M. GRIESELLEVEL: IIDATE: 9-14-00CONCURRENCE: M. BentleyLEVEL: IIIDATE: 9-16-00ANII B. EarringDATE: 9/22/00PAGE 1 OF 6

TENNESSEE MILITARY
AUTHORITY

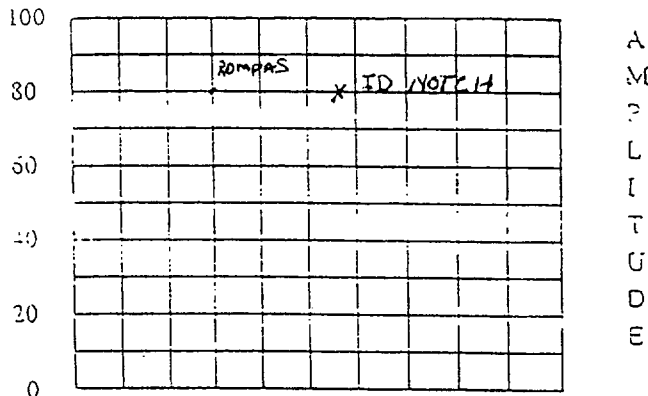
DATA SHEET

REPORT NUMBER:

R-0672

CT: WBA UNIT: 1 CYCLE: CALIBRATION DATE: 9-14-00
 E. PROCEDURE: N-UT-33 REV: 8 TC: N/A CALIBRATION BLOCK NO.: W.B. 60 TEMP: 68 °F
 INSTRUMENT: K.B. DUE DATE: 6-21-01 SIMULATOR BLOCK NO: 93-5720
 MODEL TYPE: KSN 50 SERIAL NO.: 604050 THERMOMETER S/N: 531985 DUE DATE: 6-01-00
 TRANSDUCER MANUF: KBA 16-21192-1111 COUPLANT ULTRAGEL 11 BATCH: 00125
 S/N 111819 SIZE: 1.0" FREQ: 1.0 MHz EXAM TYPE: SHEAR ☒ LONG ☒ RL ☒
 CABLE TYPE: R6-58 LENGTH: 6' inches

DAC



DISPLAY WIDTH: 7.0 inches

REFLECTOR: Rompas GAIN: 48 dB

AMPLITUDE: 80 % METAL PATH: 2.0 "

VERIFICATION TIMES 1) 2043 2) 2110 3) 2135 4) 2255 5) 2310 6) 2310 7) 2310 8) 2310 9) 2310

* PDI QUALIFIED INSTRUMENT SETTINGS:

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

LINEARITY CHECK

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

COMMENTS: NONE

WELDS/ITEMS EXAMINED:

RCF-DI-2-SE

RCF-FI-1-SE

N/A

N/A

EXAMINER:
DAVID M. GRIESEL
1/1/1
L: II

EXAMINER:
N/A
LEVEL:

REVIEWER:
W. B. BENTLEY
LEVEL: III DATE: 9-19-00

ANTI: B. E. EMMETT
DATE: 9/22/00
PG: 2 OF 6

TENNESSEE VALLEY
AUTHORITY

DIGITAL ULTRASOUND

DATA SHEET

REPORT NUMBER:

R-0672

TEST: W.B.N. UNIT: 2 CYCLE: 03 CALIBRATION DATE: 9-14-00
 PROCEDURE: N-UT-33 REV: 8 TC: N/A CALIBRATION BLOCK NO.: W.B. 60 TEMP: 68°F
 INSTRUMENT: K.B. DUE DATE: 6-21-01 SIMULATOR BLOCK NO: 93-5720
 MODEL TYPE: USN 50 SERIAL NO.: 604050 THERMOMETER S/N: 531985 DUE DATE: 5-01-01
 TRANSDUCER MANUF: KBA 1E-2497 COUPLANT ULTRAGEL II BATCH: 00125
 S/N 411817 SIZE: 1.0" FREQ: 1.0 MHz EXAM TYPE: SHEAR ☒ LONG ☒ RL ☒
 CABLE TYPE: R6-58 LENGTH: 6' inches

ANGLE VERIFICATION

DAC

BLOCK TYPE: ROMPUS

S/N: 93-5720

NOMINAL ANGLE: 45°

ACTUAL ANGLE: 45°

100

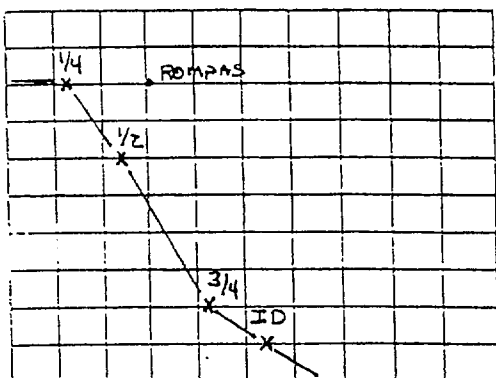
80

60

40

20

0



A
M
P
L
I
T
U
D
E

DISPLAY WIDTH: 7.0 inches

REFLECTOR: ROMPUS GAIN: 42 dB

AMPLITUDE: 80 % METAL PATH: 2" "

VERIFICATION TIMES 1) 2020 2) 2040 3) 2113 4) 2133 5) 2153 6) 2213 7) 2233 8) 2253 9) 2313

INSTRUMENT SETTINGS

REFLECTOR			REFERENCE	MEMORY
SCAN DIRECT.	NTCH	SDH	SENSITIVITY	NUMBER
AXIAL	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	48 dB	2
CIRC	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	N/A dB	N/A
FREQ: 1.0 MHz			REFLECT: 48 %	
ANGLE: 45°			DAMPING: FIXED	ohms
DELAY: 12.33 msec			PULSER: 100V	
ZERO: 14.146 msec			FILTER: FIXED	*
VELOCITY: 2054 msec			REP RATE: HIGH	
RANGE: 2.0 inches			TOF: <input checked="" type="checkbox"/> PEAK <input checked="" type="checkbox"/> FLANK	
RECTIFIER: FIXED			POWER: BATT.	
DUAL: <input checked="" type="checkbox"/> ON <input checked="" type="checkbox"/> OFF			TCG: <input checked="" type="checkbox"/> ON <input checked="" type="checkbox"/> OFF	

CALIBRATION TIMES

INITIAL TIME: 20:10 FINAL TIME: 22:05

* PDI QUALIFIED INSTRUMENT SETTINGS:

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

LINEARITY CHECK

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

COMMENTS: NONE

WELDS/ITEMS EXAMINED:

RCF-DI-2-SE

RCF-FI-1-SE

N/A

N/A

EXAMINER:

DAVID M. GRIEBEL

EXAMINER:

N/A

REVIEWER:

W. Bentley

ATTN: B. Eamigh

DATE: 9/22/00

LEVEL: II

LEVEL:

LEVEL: III DATE: 9-19-00 PG.: 3 OF 6

TVA 19670 (NP 7/92)

TVA

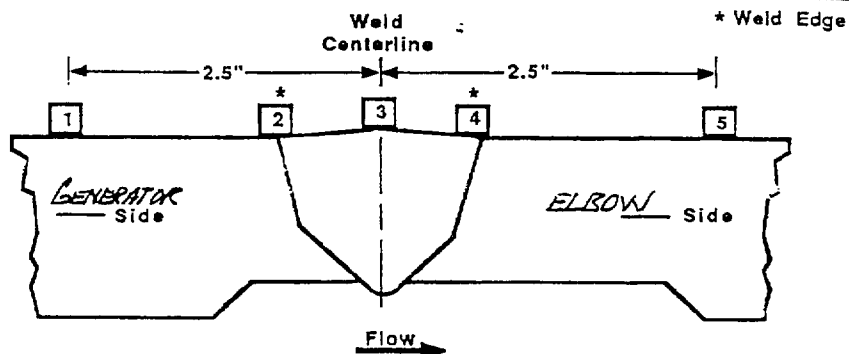
WALL THICKNESS
PROFILE SHEET

REPORT NO:

R-0672

PROJECT: W.B.N.WELD NO: RCF-F1-1-SEUNIT: 1SYSTEM: STEAM GENERATORRecord Thickness Measurements As
Indicated, Including Weld Width,
Edge-To-Edge At 0°

Position	0°	90°	180°	270°
1	N/A			
2	N/A			
3	2.5		N/A	
4	2.5			
5	2.8			

CROWN HEIGHT: FLUSH DIAMETER: 36"CROWN WIDTH: 2.0" WELD LENGTH: 112.25"

SEE ATTACHED SKETCH SHEET

DAVID M. GRIEBEL
EXAMINER: 10/1/00
LEVEL: II
DATE: 9-14-00

REVIEWED BY: W. Bentley
LEVEL: III DATE: 9-19-00

AMH: B. Parnall
DATE: 9/22/00
PAGE 2 OF 6

TVA

Office of Nuclear Power

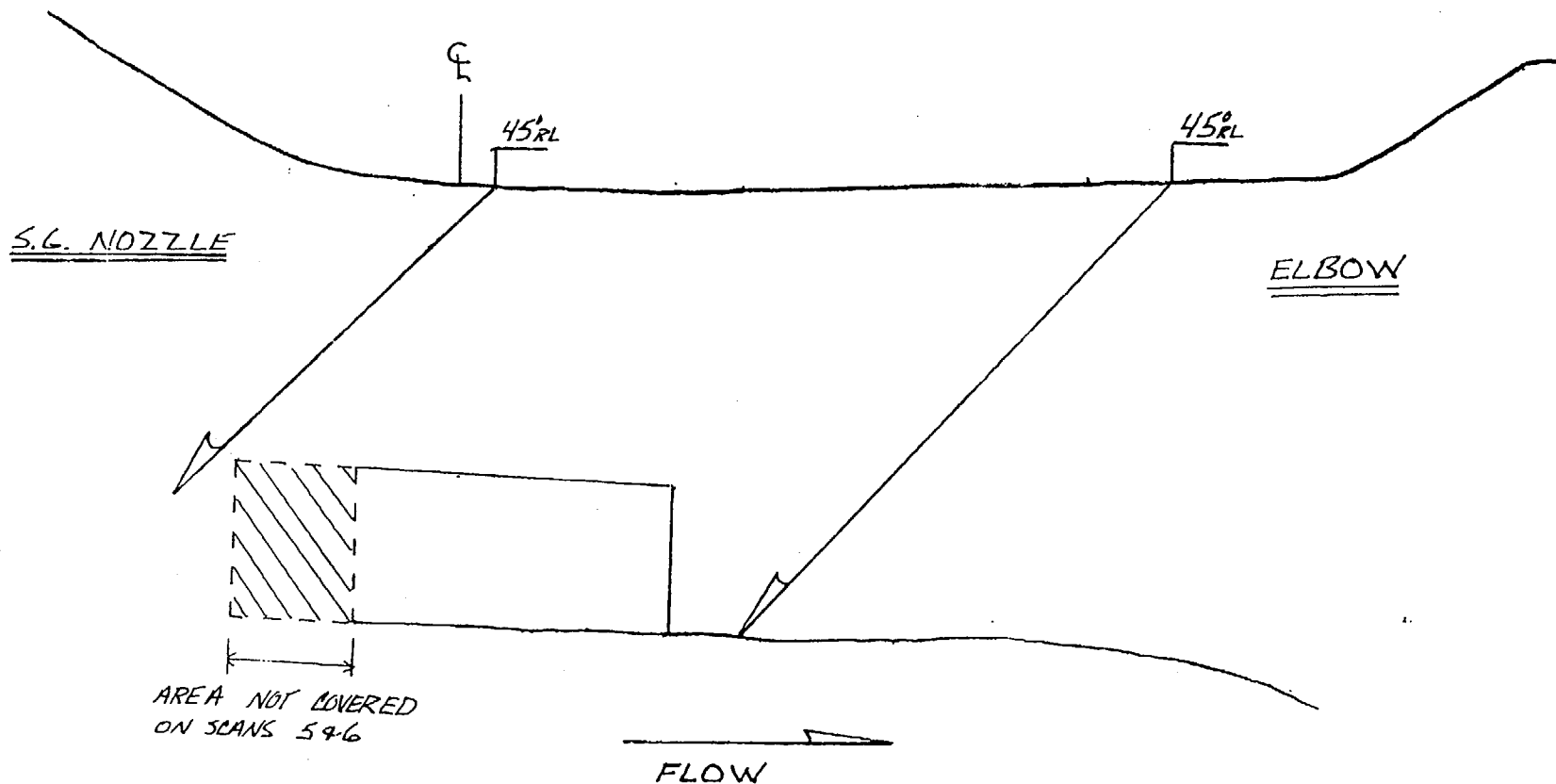
PROJECT: W. B. N. SYSTEM: STEAM GENERATOR

Unit: 1 WELD NO.: RCF-FI-1-SE

REPORT NO.:

R-0672

COVERAGE PLOT



BY: DAVID M. GRIESEL LEVEL: II DATE: 4-14-00 PAGE 6 OF 6

TENNESSEE VALLEY AUTHORITY	EXAMINATION SUMMARY AND RESOLUTION SHEET	REPORT NO. R- 0673
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PROJECT: <u>W.B.N.</u> UNIT: <u>1</u> SYSTEM: <u>STEAM GENERATOR</u> WELD I.D.: <u>RCF-DI-2-SE</u> CONFIG: <u>ELBOW</u> TO: <u>S.G. NOZZLE</u> <div style="text-align: center; margin: 5px;"> FLOW </div> PROCEDURE: N- <u>33</u> REV.: <u>8</u> TC: <u>N/A</u> NDE METHOD: <input checked="" type="checkbox"/> UT <input checked="" type="checkbox"/> PT <input checked="" type="checkbox"/> TMT <input checked="" type="checkbox"/> VVT	EXAMINER: <u>DAVID M. GRIESEL</u> LV: <u>II</u> EXAMINER: _____ LV: _____ EXAMINER: _____ LV: _____ EXAMINER: _____ LV: _____ CAL. SHT NO'S: <u>N/A</u>
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DATA ASSOCIATED WITH MANUAL ULTRASONIC
 EXAMINATION OF WELD # RCF-DI-2-SE
 STEAM GENERATOR NOZZLE TO SAFE END WELD.
 PERFORMED TO ASME SECTION XI.

EXAMINATION PERFORMED USING A 45° RL TRANSDUCER
 IN THE AX AND CIRC. DIRECTIONS.

NO SCAN 4, AND LIMITED COVERAGE ON SCANS
 5 AND 6 DUE TO NOZZLE CONFIGURATION.

65% TOTAL COVERAGE
 SEE ATTACHED COVERAGE PLOT.

EVALUATOR: <u>DAVID M. GRIESEL</u>	LEVEL: <u>II</u>	DATE: <u>9-14-00</u>	ANII <u>12.100000</u>
CONCURRENCE: <u>[Signature]</u>	LEVEL: <u>III</u>	DATE: <u>9-19-00</u>	DATE: <u>9/22/00</u>
			PAGE <u>1</u> OF <u>4</u>

TENNESSEE VALLEY AUTHORITY		DIGITAL ULTRASONIC CALIBRATION DATA SHEET		REPORT NUMBER: R-0673								
ECT: W.B.N. UNIT: 1		CYCLE: 03		CALIBRATION DATE: 9-14-00								
PROCEDURE: N-UT- 33		REV: 8		TC: N/A								
INSTRUMENT: K.B		DUE DATE: 6-21-01		SIMULATOR BLOCK NO: 93-5720								
MODEL TYPE: USN 50		SERIAL NO.: 604050		THERMOMETER S/N: 531985 DUE DATE: 5-01-01								
TRANSDUCER MANUF: KBA		E-24192		COUPLANT ULTRAGEL II BATCH: 00125								
S/N H1817 H1818		SIZE: 1.0"		FREQ: 1.0 MHz								
CABLE TYPE: R6-58		LENGTH: 6' inches		EXAM TYPE: <input checked="" type="checkbox"/> SHEAR <input checked="" type="checkbox"/> LONG <input checked="" type="checkbox"/> RL <input checked="" type="checkbox"/>								
ANGLE VERIFICATION												
BLOCK TYPE: ROMPUS				S/N: 93-5720								
NOMINAL ANGLE: 45°				ACTUAL ANGLE: 45°								
INSTRUMENT SETTINGS												
REFLECTOR			REFERENCE		MEMORY							
SCAN DIRECT.	NTCH	SDH	SENSITIVITY		NUMBER							
AXIAL	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	48 dB		2							
CIRC	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	N/A dB		N/A							
FREQ: 15.15 MHz			REJECT: 0 %									
ANGLE: 45° deg			DAMPING: FIXED ohms									
DELAY: 12.33 msec			PULSER: DUAL *									
ZERO: 14.146 msec			FILTER: FIXED *									
VELOCITY: .2054 msec			REP RATE: HIGH									
RANGE: 7.0 inches			TOF: <input checked="" type="checkbox"/> PEAK <input checked="" type="checkbox"/> FLANK									
RECTIFIER: FIXED			POWER: RAT.									
DUAL: <input checked="" type="checkbox"/> ON <input checked="" type="checkbox"/> OFF			TCG: <input checked="" type="checkbox"/> ON <input checked="" type="checkbox"/> OFF									
CALIBRATION TIMES												
INITIAL TIME: 20:10			FINAL TIME: 21:05									
VERIFICATION TIMES 1) 2020 2) 2040 3) 2113 4) 2133 5) 6) 7) A 8) 9)												
* PDI QUALIFIED INSTRUMENT SETTINGS:												
VERIFY INSTRUMENT SETTINGS AND CALIBRATION SEQUENCE ARE IN ACCORDANCE WITH TABLE 2 OF THE APPLICABLE PDI QUALIFICATION IMPLEMENTATION PROCEDURE !												
LINEARITY CHECK												
VERTICAL	SIGNAL 1		100	90	80	70	60	50	40	30	20	
	SIGNAL 2		50	45	40	35	30	25	20	15	10	
ATTENUATOR	GAIN	SET	-6 dB		-12 dB		SET		+12		SET	+6
	AMP	80%	32 TO 48		16 TO 24		20 %		64 TO 96		40%	
			45 %		20 %				80 %		80 %	
COMMENTS: NONE						WELDS/ITEMS EXAMINED:						
N/A						RLC-DI-Z-SE						
						RLC-FI-1-SE						
						N/A						
EXAMINER: DAVID M. GRIEBEL			EXAMINER: N/A			REVIEWER: 11/11/00			AND: B. Fanning			
LEVEL: II			LEVEL:			DATE: 9/19/00			DATE: 9/22/00			
						PG.: 2 OF 6						

TENNESSEE VALLEY AUTHORITY		DIGITAL ULTRASONIC CALIBRATION DATA SHEET		REPORT NUMBER: R-0673																																																																																																																										
ECT: WBN UNIT: 1		CYCLE:		CALIBRATION DATE: 9-14-00																																																																																																																										
PROCEDURE: N-UT-33 REV: 8 TC: N/A				CALIBRATION BLOCK NO.: W.B. 60 TEMP: 68 °F																																																																																																																										
INSTRUMENT: K.B. DUE DATE: 6-21-01				SIMULATOR BLOCK NO: 93-5720																																																																																																																										
MODEL TYPE: USN 50 SERIAL NO.: 604050				THERMOMETER S/N: 531985 DUE DATE: 5-01-00																																																																																																																										
TRANSDUCER MANUF: KBA 16-21192-1144				COUPLANT ULTRAGEL 11 BATCH: 00125																																																																																																																										
S/N 111819 111820 SIZE: 1.0" FREQ: 1.0 MHz				EXAM TYPE: SHEAR <input checked="" type="checkbox"/> LONG <input checked="" type="checkbox"/> RL <input checked="" type="checkbox"/>																																																																																																																										
CABLE TYPE: R6-58 LENGTH: 6' inches				ANGLE VERIFICATION																																																																																																																										
DAC		BLOCK TYPE: ROMBUS		S/N: 93-5720																																																																																																																										
		NOMINAL ANGLE: 45°		ACTUAL ANGLE: 45°																																																																																																																										
<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;">100 80 60 40 20 0</div> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table> <div style="margin-left: 10px; text-align: right;">A M P L I T U D E</div> </div>																																																																																																																											INSTRUMENT SETTINGS			
REFLECTOR			REFERENCE		MEMORY																																																																																																																									
SCAN DIRECT. NTCH SDH			SENSITIVITY		NUMBER																																																																																																																									
AXIAL <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>			N/A dB		N/A																																																																																																																									
CIRC <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>			62 dB		3																																																																																																																									
FREQ: 3.3 MHz			REJECT: 0 %																																																																																																																											
ANGLE: 45° deg			DAMPING: FIXED ohms																																																																																																																											
DELAY: 12.33 msec			PULSER: DUAL *																																																																																																																											
ZERO: 14.146 msec			FILTER: FIXED *																																																																																																																											
VELOCITY: 2054 msec			REP RATE: HIGH																																																																																																																											
RANGE: 7.0 inches			TOF: <input type="checkbox"/> PEAK <input checked="" type="checkbox"/> FLANK																																																																																																																											
RECTIFIER: FULL			POWER: BATT.																																																																																																																											
DUAL: <input checked="" type="checkbox"/> ON <input checked="" type="checkbox"/> OFF			TCG: <input checked="" type="checkbox"/> ON <input checked="" type="checkbox"/> OFF																																																																																																																											
REF. REFLECTOR: ROMBUS GAIN: 48 dB		CALIBRATION TIMES																																																																																																																												
AMPLITUDE: 80 % METAL PATH: 2.0 "		INITIAL TIME: 20:10		FINAL TIME: 21:05																																																																																																																										
VERIFICATION TIMES		1) 2043 2) 2110 3) 2135 4) 2255 5) _____ 6) _____ 7) _____ 8) _____ 9) _____																																																																																																																												
* PDI QUALIFIED INSTRUMENT SETTINGS:																																																																																																																														
VERIFY INSTRUMENT SETTINGS AND CALIBRATION SEQUENCE ARE IN ACCORDANCE WITH TABLE 2 OF THE APPLICABLE PDI QUALIFICATION IMPLEMENTATION PROCEDURE !																																																																																																																														
LINEARITY CHECK																																																																																																																														
VERTICAL	SIGNAL 1		100	90	80	70	60	50	40	30	20																																																																																																																			
	SIGNAL 2		50	45	40	35	30	25	20	15	10																																																																																																																			
ATTENUATOR	GAIN	SET	-6 dB			-12 dB			SET																																																																																																																					
	AMP	80%	32 TO 48			16 TO 24			20 %																																																																																																																					
			45 %			20 %			80%																																																																																																																					
COMMENTS: NONE			WELDS/ITEMS EXAMINED:																																																																																																																											
N/A			RCF - D1-2 - SE																																																																																																																											
			RCF - F1-1 - SE																																																																																																																											
			N/A																																																																																																																											
EXAMINER: DAVID M. GIBBEL <i>7/11/00</i>		EXAMINER: N/A		REVIEWER: <i>[Signature]</i>		ANTI: 13 <i>[Signature]</i>		DATE: 9/12/00																																																																																																																						
LEVEL: I		LEVEL:		LEVEL: III DATE: 9-19-00		PG.: 3 OF 6																																																																																																																								

REPORT NO.
R- 0673

CALIBRATION SHEET NO.	C- <u>W/A</u>	C- <u>N/A</u>
EXAMINATION ANGLE	<u>45°</u> DEG.	<u>N/A</u> DEG.
CIRC. SCAN SENSITIVITY	<u>65</u> dB	<u>N/A</u> dB
AXIAL SCAN SENSITIVITY	<u>54</u> dB	<u>N/A</u> dB

[illegible]

REMARKS/LIMITATIONS: NO SCAN 4 DUE TO NOZZLE CONFIGURATION
SCAN LIMITATION - SCAN'S 5-6 DUE TO NOZZLE CONFIGURATION

DATE: 7-19-00

ANII	B. Earnight
DATE:	7/22/00
PAGE	4 OF 6

TVA

WALL THICKNESS
PROFILE SHEET

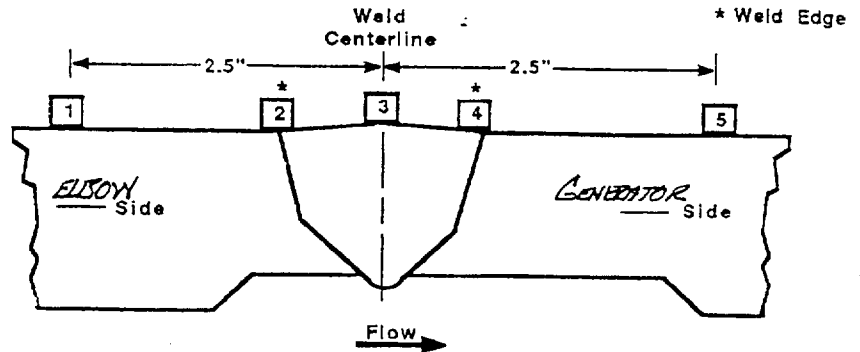
REPORT NO:

R-0673

PROJECT: W.B.N.WELD NO: RLF-DI-Z-SEUNIT: 1SYSTEM: STEAM GENERATOR

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

Position	0°	90°	180°	270°
1	2.8		N/A	
2	2.6		N/A	
3	2.5			
4		N		
5			A	

CROWN HEIGHT: FLUSHDIAMETER: 36.0"CROWN WIDTH: 2.0"WELD LENGTH: 113.5"

SEE ATTACHED SKETCH SHEET

EXAMINER: DAVID GRIEDERREVIEWED BY: [Signature]ANII: [Signature]LEVEL: IILEVEL: IIIDATE: 9-19-00DATE: 9/22/00DATE: 9-14-00PAGE 5 OF 6

TVA

Office of Nuclear Power

PROJECT: W. D. N.

SYSTEM: STEAM GENERATOR

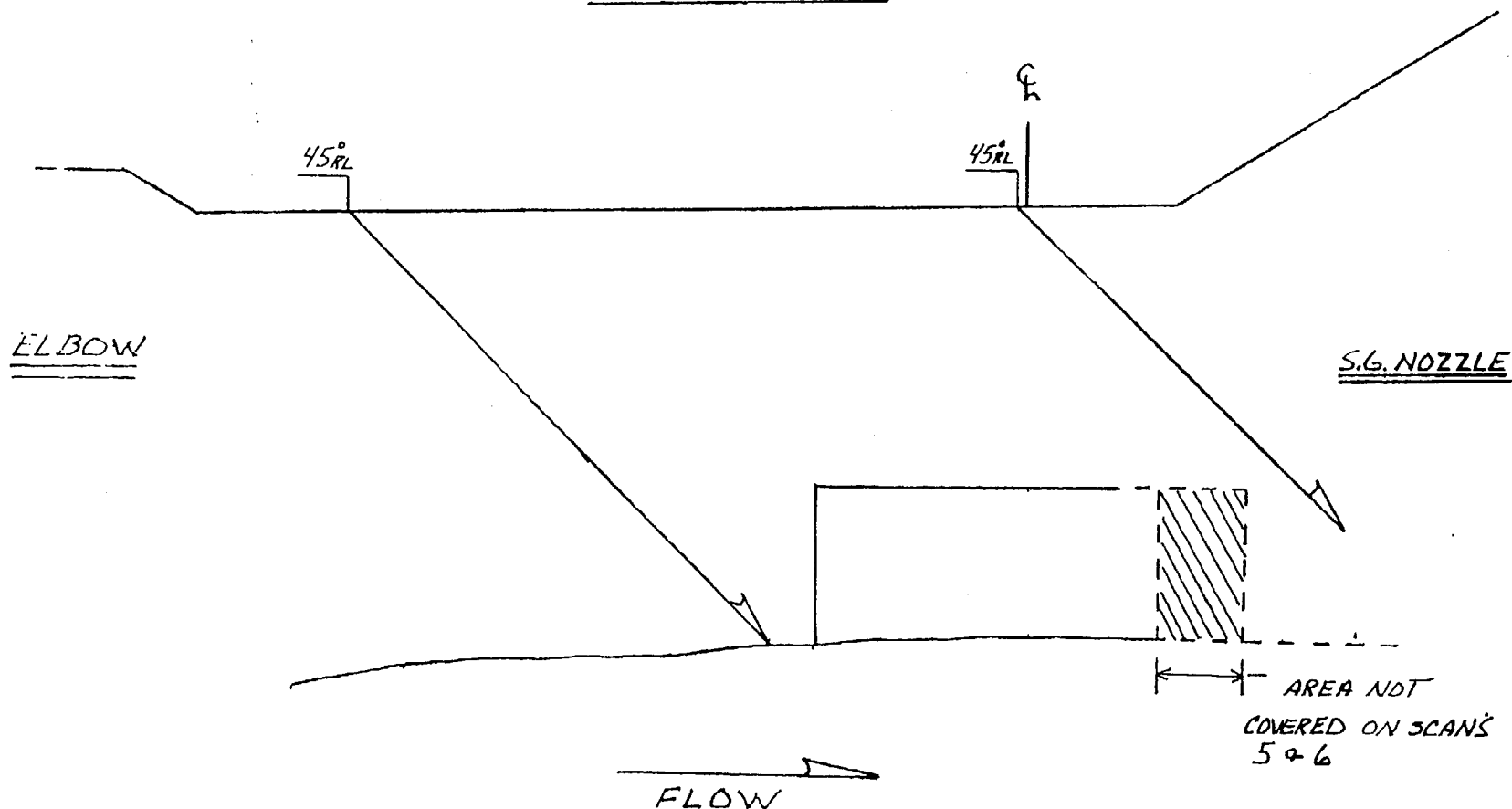
REPORT NO.:

Unit: 1

WELD NO.: RCF-DI-Z-SE

R-0673

COVERAGE PLOT



BY: DAVID M. GRIEBEL

LEVEL: II

DATE: 9-14-00

PAGE

6 OF 6

ENCLOSURE 3

WATTS BAR NUCLEAR PLANT UNIT 1
INSERVICE INSPECTION PROGRAM
REQUEST FOR RELIEF, 1-ISI-09

ENCLOSURE 3

WATTS BAR NUCLEAR PLANT
FIRST 10-YEAR INTERVAL
REQUEST FOR RELIEF, 1-ISI-09

SUMMARY:

Due to design configuration of the Residual Heat Removal (RHR) Heat Exchanger, volumetric examination of the shell-to-flange weld during the Unit 1 Cycle 3 outage resulted in less than essentially 100% of ASME code coverage being achieved. The location of the nozzle welds and support pads relative to the shell-to-flange weld is configured in a such manner that performance of an ultrasonic scan is limited to approximately 77% of the required examination volume. Volumetric examination of this weld is required in accordance with ASME Section XI Table IWC-2500-1, Examination Category C-A, Item Number C1.10. The full volume weld examination requirement is illustrated by Figure IWC-2500-1.

Conformance to the code requirement is impractical to implement due to physical restrictions, therefore, relief is requested in accordance with 10CFR50.55a(g) (5) (iii).

I. COMPONENT:

Residual Heat Removal Heat Exchanger Shell-to-Flange Weld
Reference ISI Drawing CHM-2662-C-01, (Attachment 1), weld
identifier RHRHX-2-1A

II. CODE REQUIREMENT:

ASME Section XI, 1989 Edition, Table IWC-2500-1, Examination Category C-A, Item Number C1.10, volumetric examination requirement as defined by Figure IWC-2500-1 (Attachment 2).

III. CODE REQUIREMENTS FROM WHICH RELIEF IS REQUESTED:

Relief is requested from performing the required volumetric examination on essentially 100% of the full volume of the RHR heat exchanger shell-to-flange weld.

IV. BASIS FOR RELIEF:

The design configuration of the RHR heat exchanger shell-to-flange weld precludes an ultrasonic examination of the required volume for the shell-to-flange weld. The location of the nozzle welds and support pads relative to the shell-to-flange weld is configured in such a manner that performance of an ultrasonic scan is limited to approximately 77% of the required examination volume.

ENCLOSURE 3

WATTS BAR NUCLEAR PLANT
FIRST 10-YEAR INTERVAL
REQUEST FOR RELIEF, 1-ISI-09

V. ALTERNATIVE EXAMINATION:

A volumetric examination of the full volume of the RHR heat exchanger shell-to-flange weld was performed on accessible areas to the extent practical given the design configuration of the shell-to-flange weld.

VI. JUSTIFICATION FOR THE GRANTING OF RELIEF:

Due to design configuration of the RHR heat exchanger, volumetric examination of the shell-to-flange weld during the Unit 1 Cycle 3 outage resulted in less than essentially 100% of ASME code coverage being achieved. The location of the nozzle welds and support pads relative to the shell-to-flange weld is configured in a such manner that performance of an ultrasonic examination is limited to approximately 77% of the required volume. Volumetric examination of this weld is required in accordance with ASME Section XI Table IWC-2500-1, Examination Category C-A, Item Number C1.10. The full volume weld examination requirement is illustrated by Figure IWC-2500-1.

Vendor drawing BEU-17811 (Attachment 3), View A-A provides a depiction of the nozzle and support pad configuration relative to the shell-to-flange weld. Vendor drawing D-17811 provides dimensions of the nozzle and support pad in the respective details. As noted, the outside diameter of the nozzle is 18-1/2 inches and the width of the support pad is 18 inches. These are mounted on the 22-5/16 inches wide shell. Ultrasonic scanning from the shell side of the shell-to-flange weld near the nozzles and support pads is limited. The limited area is shown on Examination Report R-0574 (Attachment 4).

This limitation was also documented during the preservice inspection period on preservice request for relief ISI-15 which was authorized in NRC's Safety Evaluation Report for Watts Bar Nuclear Plant (NUREG-0847), Supplement Number 10, Appendix Z, issued October 1992.

Conformance to the code requirement is impractical to implement due to physical restrictions, therefore, relief is requested in accordance with 10CFR50.55a(g) (5) (iii).

IMPLEMENTATION SCHEDULE:

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

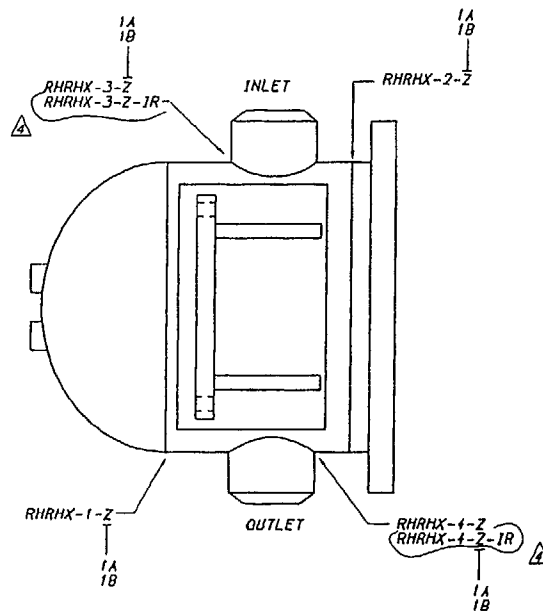
ENCLOSURE 3

WATTS BAR NUCLEAR PLANT
FIRST 10-YEAR INTERVAL
REQUEST FOR RELIEF, 1-ISI-09
LIST OF ATTACHMENTS

- Attachment 1. ISI Drawing CHM-2662-C-01
- Attachment 2. ASME Section XI, 1989 Edition, Figure IWC-2500-1,
Vessel Circumferential Welds
- Attachment 3. Vendor Drawing BEU-17811 and D-17811
- Attachment 4. Ultrasonic Examination Report R-0574 for Weld RHRHX-
2-1A

ENCLOSURE 3
ATTACHMENT 1

REQUEST FOR RELIEF, 1-ISI-09
ISI DRAWING CHM-2662-C-01



REFERENCE DRAWINGS

WBN-VTM-W120-2758 (VENDOR MANUAL)
48N1231-2

MATERIAL SPECIFICATIONS:

HEAD

1" THICK SA-240 TP 304

SHELL

1" THICK SA-240 TP 304

FITTINGS

SA-336 F 8

FLANGE

SA-336 F 8

ASME CC-2 (EQUIVALENT)

1	PHB	KEG	ILL	LLV	3-5-98
AD -IR TO NOZZLE WELD ID -3-F AND -3-Z					
3	PHB	GLB	KEC	III	2-7-98
ADDF SUPPORTS TO SHEET 2. CLARIFY WELD ID					
2	PHB	GLB	KEC	RDR	9-27-98
REORAIN TO CADAM, DELETE UNIT 1, ADD SUPPORT IDENTIFIER RESIZE BORDER TO C-SIZE. CLARIFY WELD IDENTIFIERS					
1	JAA	JCC		JTL	7-11-84
ADD MATERIAL SPECS					
REV	BY	CHECKED	SUBMITTED	APPROVED	DATE
TENNESSEE VALLEY AUTHORITY					
WATTS BAR NUCLEAR PLANT					
UNIT 1					
RESIDUAL HEAT REMOVAL HEAT EXCHANGER					
CHANNEL WELDS					
DRAWN	KEV	DATE	SCALE 1/4" TO SCALE		
CHECKED	DAD	APPROVED	GLB	CAD MAINTAINED DRAWING	1/1
SUBMITTED	CHM-2662-C-01				0-1

ENCLOSURE 3
ATTACHMENT 2

REQUEST FOR RELIEF, 1-ISI-09
ASME SECTION XI, 1989 EDITION, FIGURE IWC-2500-1

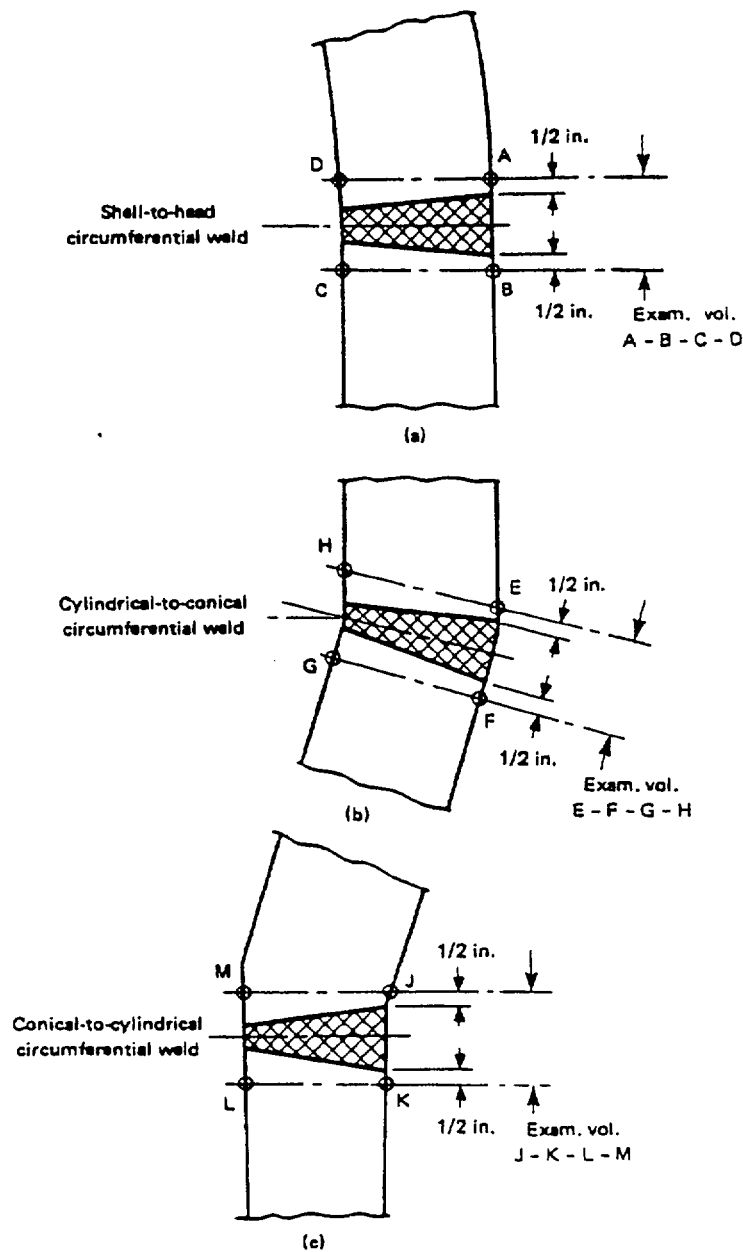


FIG. IWC-2500-1 VESSEL CIRCUMFERENTIAL WELDS

ENCLOSURE 3
ATTACHMENT 3

REQUEST FOR RELIEF, 1-ISI-09
VENDOR DRAWING BEU-17811 AND D-17811

118L1-0/5

MATERIAL LIST	
PART	SPECIFICATION
SHROUD	STL ASME SA-516-70
GUSSETTS	DO
CONE	DO
BUNDLE GUIDES	DO
CHAN. CYL	SINUS STL ASME SA-240 TP-304
CHAN. HL	DO
CHAN. FILL	DO
SHELL CYL	STL ASME SA-516-70
SHELL HL	DO
N/15	STL ASME SA-193-GR B7
N/15	STL ASME SA-194-GR 2H
GASKETS	TP-304 SINUS STL SPIRAL WOUND W/ CANADIAN ASB FILLER & STL SPIRAL WOUND W/ CANADIAN ASB FILLER
DISTRIBUTOR CYL	STL ASME SA-516-70

SCHEDULE OF OPENINGS FOR ONE UNIT ONLY

MIL NO	SIZE	SERIES & FIG	NECK	PROJ. COOR	REMARKS
N1	ONE 14"		REIN. NOZ. SA-336-FB (SEE DNG. NO. D-17811 FOR DETAIL)	6.5" NO	
N2	ONE 14"		REIN. NOZ. SA-336-FB (SEE DNG. NO. D-17811 FOR DETAIL)	6.5" NO	
N3	ONE 18"		150° WELDING NECK R.F. SA-105	7.0" YES	
N4	ONE 18"		150° WELDING NECK R.F. SA-105	5.8" YES	
AA	2		FULL GUSSET SECRET WELD COUP. SA-193-GR B7		
BB	ONE		FULL GUSSET PIPE COUP. SA-105		W/ SA-105 PLUG
CC	ONE		DRILL & TAP FOR PP		W/ SA-105 PLUG
DD	ONE		S.W. CONN.		
EE	4		FULL GUSSET PIPE COUP. SA-105		W/ SA-105 PLUG

INFORMATION ONLY

GENERAL NOTES

PW/RT CHANNEL: NO

RADIOGRAPH CHANNEL: YES FULL X-RAY (INCLUDING NOZ. TO CYL. WELDS)

JOINT EFFICIENCY: CHAN. 100% SHELL 85%



ENGINEERS AND FABRICATORS, CO.

HOUSTON, TEXAS 77008

NAME SHELL & CHANNEL DETAILS

REV	BY	DATE	DESCRIPTION
1	10-18-74	10-18-74	12100
2	10-18-74	10-18-74	12100
3	10-18-74	10-18-74	12100
4	10-18-74	10-18-74	12100
5	10-18-74	10-18-74	12100
6	10-18-74	10-18-74	12100
7	10-18-74	10-18-74	12100
8	10-18-74	10-18-74	12100
9	10-18-74	10-18-74	12100
10	10-18-74	10-18-74	12100
11	10-18-74	10-18-74	12100
12	10-18-74	10-18-74	12100
13	10-18-74	10-18-74	12100
14	10-18-74	10-18-74	12100
15	10-18-74	10-18-74	12100
16	10-18-74	10-18-74	12100
17	10-18-74	10-18-74	12100
18	10-18-74	10-18-74	12100
19	10-18-74	10-18-74	12100
20	10-18-74	10-18-74	12100
21	10-18-74	10-18-74	12100
22	10-18-74	10-18-74	12100
23	10-18-74	10-18-74	12100
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100	10-18-74	10-18-74	12100

WBN PAGE 110

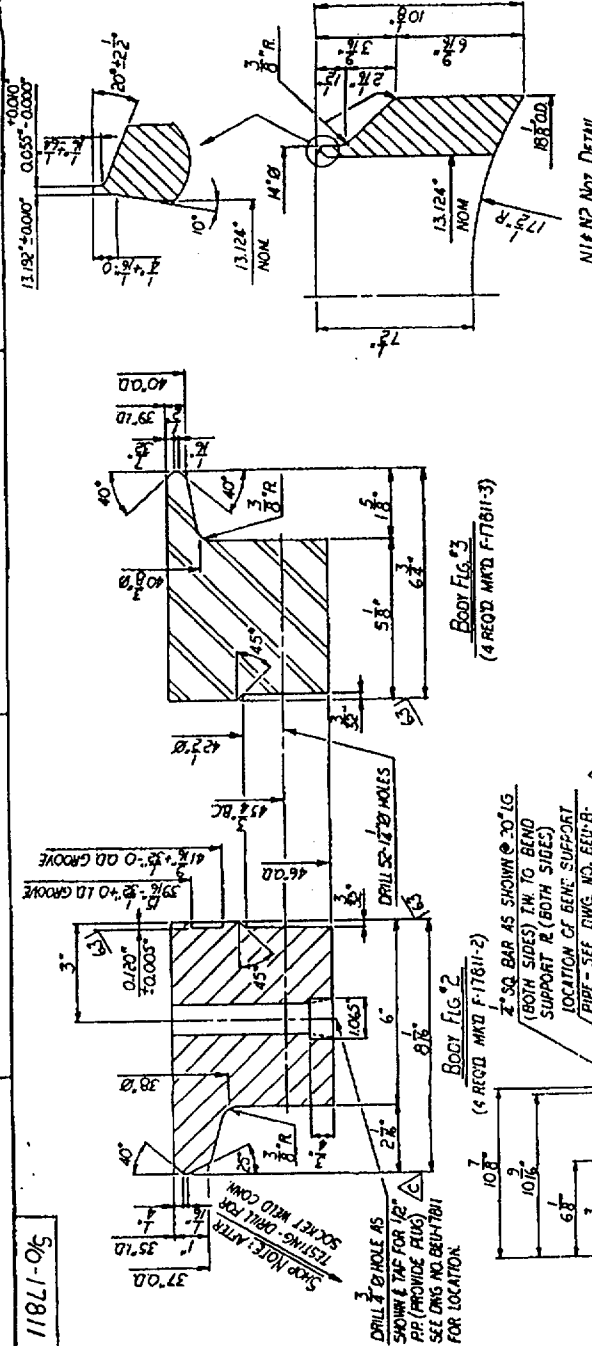
11871-06

FABRICATION NOTES:

- 1) WELD PAD TO CYL W/ WELD PROCEDURE #3
- 2) WELD GUSSETS TO BASE R W/ WELD PROCEDURE #1 (STOP 3/4" FROM PAD)
- 3) WELD GUSSETS & BASE R TO PAD W/ WELD PROCEDURE #7
- 4) [DT] ALL COMPLETED WELDS

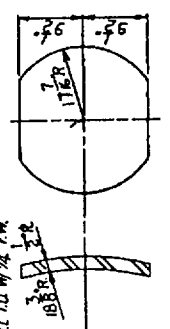
NOTE:

C/W SUPPORTS TOGETHER & TO CHAM W/ 1/2" C.F.W.



NOZZLE DETAIL (4 REQ'D)

NOTE: C/W IMP R TO SWELL L.D. W/ 1/4" F.W. [DT]



IMPACT DETAIL (4 REQ'D)

Body Fig. 2 (4 REQ'D W/ F-17811-2)

Body Fig. 3 (4 REQ'D W/ F-17811-3)

Body Fig. 4 (4 REQ'D W/ F-17811-4)

Body Fig. 5 (4 REQ'D W/ F-17811-5)

Body Fig. 6 (4 REQ'D W/ F-17811-6)

Body Fig. 7 (4 REQ'D W/ F-17811-7)

Body Fig. 8 (4 REQ'D W/ F-17811-8)

Body Fig. 9 (4 REQ'D W/ F-17811-9)

Body Fig. 10 (4 REQ'D W/ F-17811-10)

Body Fig. 11 (4 REQ'D W/ F-17811-11)

Body Fig. 12 (4 REQ'D W/ F-17811-12)

Body Fig. 13 (4 REQ'D W/ F-17811-13)

Body Fig. 14 (4 REQ'D W/ F-17811-14)

Body Fig. 15 (4 REQ'D W/ F-17811-15)

Body Fig. 16 (4 REQ'D W/ F-17811-16)

Body Fig. 17 (4 REQ'D W/ F-17811-17)

Body Fig. 18 (4 REQ'D W/ F-17811-18)

Body Fig. 19 (4 REQ'D W/ F-17811-19)

Body Fig. 20 (4 REQ'D W/ F-17811-20)

Body Fig. 21 (4 REQ'D W/ F-17811-21)

Body Fig. 22 (4 REQ'D W/ F-17811-22)

Body Fig. 23 (4 REQ'D W/ F-17811-23)

Body Fig. 24 (4 REQ'D W/ F-17811-24)

Body Fig. 25 (4 REQ'D W/ F-17811-25)

Body Fig. 26 (4 REQ'D W/ F-17811-26)

Body Fig. 27 (4 REQ'D W/ F-17811-27)

Body Fig. 28 (4 REQ'D W/ F-17811-28)

Body Fig. 29 (4 REQ'D W/ F-17811-29)

Body Fig. 30 (4 REQ'D W/ F-17811-30)

Body Fig. 31 (4 REQ'D W/ F-17811-31)

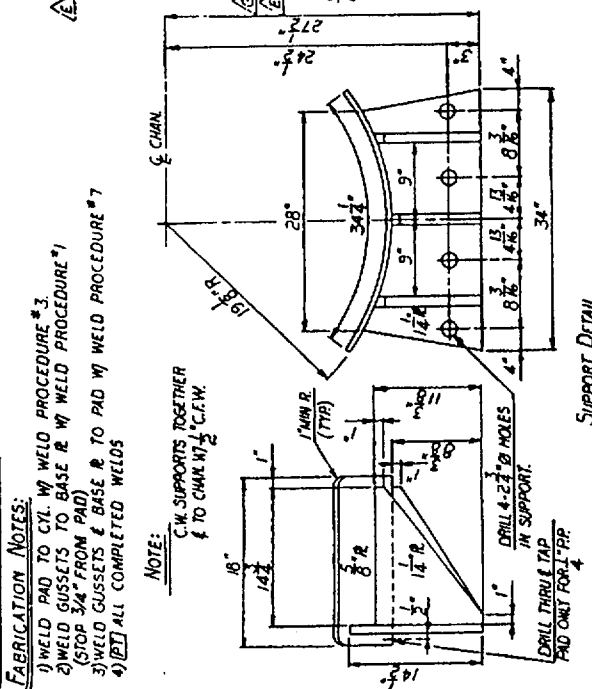
Body Fig. 32 (4 REQ'D W/ F-17811-32)

Body Fig. 33 (4 REQ'D W/ F-17811-33)

Body Fig. 34 (4 REQ'D W/ F-17811-34)

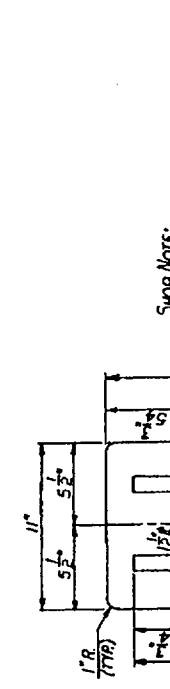
Body Fig. 35 (4 REQ'D W/ F-17811-35)

Body Fig. 36 (4 REQ'D W/ F-17811-36)



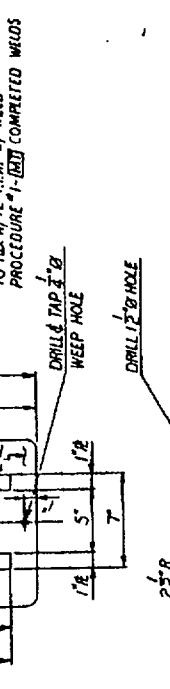
SUPPORT DETAIL (8 REQ'D)

NOTE: PAD TO BE DESIGNED TO FIT OLD OF NO-WELD SEISMIC LUG TO PAD W/ 1/2" C.F.W. & WELD PAD TO NO W/ 1/2" C.F.W. W/ WELD PROCEDURE #1 [DT] COMPLETED WELDS



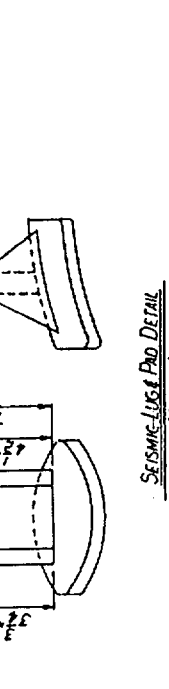
SEISMIC LUG & PAD DETAIL (8 REQ'D)

NOTE: USE 5-16 OZ BAGS OF SILICA GEL MIN IN EA. NOZ



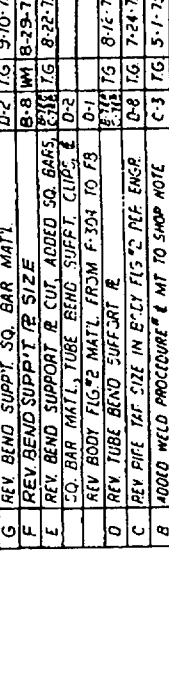
CHANNEL PROTECTIVE COVER (8 REQ'D)

NOTE: USE 5-16 OZ BAGS OF SILICA GEL MIN IN EA. NOZ



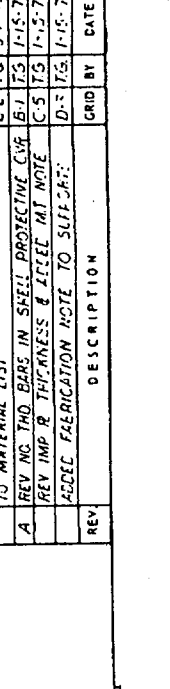
SWELL PROTECTIVE COVER (8 REQ'D)

NOTE: USE 5-16 OZ BAGS OF SILICA GEL MIN IN EA. NOZ



NOZZLE ATTACHMENT WELD

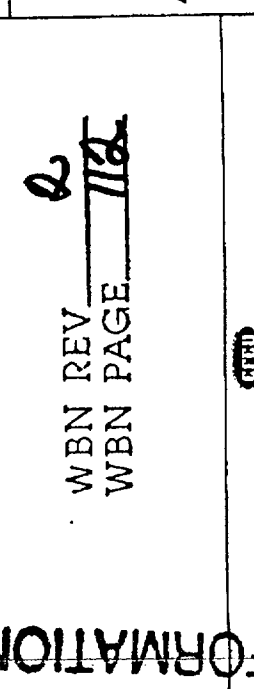
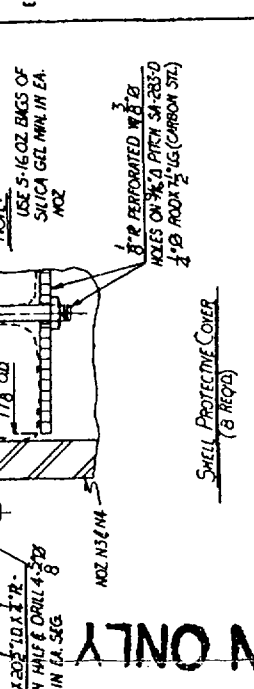
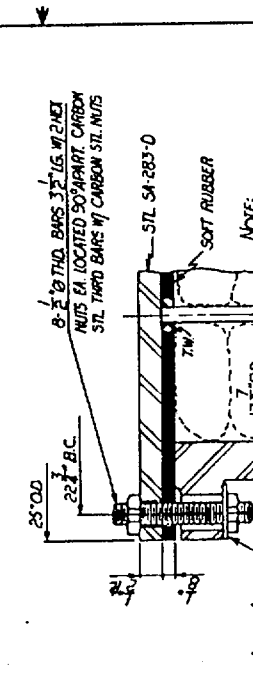
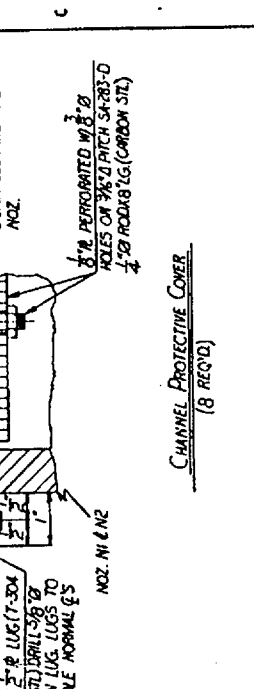
NOTE: CUT R TO DIMS. SHOWN AFTER ASSEMBLY



TYPICAL LONG & CIRCUM WELD DETAILS FOR DOUBLE BEVEL BUTT JOINTS

MATERIAL LIST

PART	SPECIFICATION
BOCT FIG. #2	STD STMS STL ASME SA-336 FB
BOCT FIG. #3	STD STL ASME SA-105
IMP R	STD STL ASME SA-36-70
SUPPORT BASE	DO
SUPPORT PAD	STD STL ASME SA-240-TP 304
SEISMIC LUGS	STD STL ASME SA-316-70
TUBE BEND SUPPORT R	DO
SEISMIC LUG GUSSETS	DO
SUPPORT GUSSETS	DO
BEND SUPPT SO BAH	STD STL ASME SA-283-C
TUBE BEND SUPPT CLIPS	STD STL ASME SA-283-C
C/W LUG TO KEY	DO



WBN REV 2 WBN PAGE 112

ENGINEERS AND FABRICATORS, CO.
HOUSTON, TEXAS 77008

MISCELLANEOUS DETAILS

REV	DESCRIPTION	DATE	GRID	BY	
1	ASSEMBLY	9-20-74	10B	NO	AM-R5666
2	WELD	12-10-74	10B	NO	AM-R5666

ENCLOSURE 3
ATTACHMENT 4

REQUEST FOR RELIEF, 1-ISI-09
EXAMINATION REPORT R-0574

TENNESSEE VALLEY AUTHORITY		EXAMINATION SUMMARY AND RESOLUTION SHEET		REPORT NUMBER: R-0574	
PROJECT: WBN UNIT: 01 CYCLE 03A			COMPONENT ID: RHRHX-2-1A		
EXAMINATION METHOD			SYSTEM: RHRS ISI DWG NO: CHM-2662-C-01		
MT <input type="checkbox"/>	PT <input type="checkbox"/>	UT <input checked="" type="checkbox"/>	VT <input type="checkbox"/>	CONFIGURATION	CATEGORY
PROCEDURE: N-UT-18		REV 13	TC: N/A	VSHELL TO VSHELL	C-A
EXAMINER: D. Gronewold		EXAMINER: J.G. Abbott		EXAMINER:	EXAMINER:
LEVEL: II		LEVEL: II		LEVEL:	LEVEL:
<p>An ultrasonic exam was performed on weld RHRHX-2-1A, a stainless steel shell to flange weld on the RHR heat exchanger.</p> <p>A 45 deg. shearwave with a 1 1/2 V calibration was used. Also a 60 deg. RI was used due to the limitations from the flange and the support pads.</p> <p>Root geometry was observed from both sides of the weld below recordable levels. No other indications were detected.</p> <p>77.4 % bidirectional coverage was achieved, see attached limitation sheet</p>					
RESOLUTION BY <i>Douglas Gronewold</i>		REVIEWED BY <i>W. Bentley</i>		ANI: <i>B. Eamigh</i>	
LEVEL: II DATE: 8-29-00		LEVEL: III DATE: 9-9-00		DATE: 7/16/00	
Page: 1 OF 10					

TENNESSEE VALLEY
 AUTHORITY

DIGITAL ULTRASONIC
 CALIBRATION
 DATA SHEET

REPORT NUMBER:
 R-0574

PROJECT: WBNP UNIT: 1
 PROCEDURE: N-UT-18 REV: 23 TC: ~/A
 INSTRUMENT: KB
 DUE DATE: 6-22-01
 MODEL TYPE: USN-50 SERIAL NO.: E24253
 TRANSDUCER MANUF: KBA
 S/N 0095DZ SIZE: .50" FREQ: 2.25 MHz
 CABLE TYPE: RG-174 LENGTH: 72 inches

CALIBRATION DATE: 8-29-00
 CALIBRATION BLOCK NO.: WB-15 TEMP: 72°F
 SIMULATOR BLOCK NO: 790391
 THERMOMETER S/N: 562781 DUE DATE: 6-6-01
 COUPLANT: ULTRAGEL II BATCH: 94125
 EXAM TYPE: SHEAR ☒ LONG ☐ RL ☐

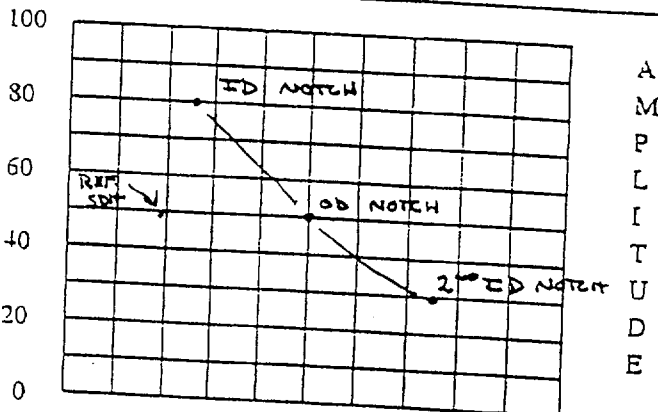
ANGLE VERIFICATION

BLOCK TYPE: RAMPAS S/N: 790391
 NOMINAL ANGLE: 45° ACTUAL ANGLE: 45°

INSTRUMENT SETTINGS

REFLECTOR			REFERENCE	MEMORY
SCAN DIRECT.	NTCH	SDH	SENSITIVITY	NUMBER
AXIAL	<input checked="" type="checkbox"/>	<input type="checkbox"/>	20.0 dB	2
CIRC	<input type="checkbox"/>	<input type="checkbox"/>	FAT BLOCK dB	
FREQ: 2.25	MHz	REJECT: 0	%	
ANGLE: 45	deg	DAMPING: FIXED	ohms	
DELAY: 5.219	msec	PULSER: HIGH	*	
ZERO: 5.381	msec	FILTER: FIXED	*	
VELOCITY: 1216	msec	REP RATE: FIXED		
RANGE: 5.727	inches	TOF: <input checked="" type="checkbox"/> PEAK <input type="checkbox"/> FLANK		
RECTIFIER: Fixed		POWER: BATT		
DUAL: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF		TCG: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF		

DAC



DISPLAY WIDTH: 5.727 inches

REFLECTOR: RAMPAS SDH GAIN: 26.0 dB
 AMPLITUDE: 49% METAL PATH: 1.04"

VERIFICATION TIMES: 1) 1225 2) 1245 3) 1305 4) 5) 6) 7) 8) 9)
 INITIAL TIME: 1030 FINAL TIME: 1400

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

LINEARITY CHECK

VERTICAL	SIGNAL 1		100	90	80	70	60	50	40	30	20
	SIGNAL 2		50	45	40	35	30	25	20	15	10
ATTENUATOR	GAIN	SET	-6 dB		-12 dB		SET		+12		SET
	AMP	80%	32 TO 48		16 TO 24		20%		64 TO 96		+6
COMMENTS: ARTICLE 5 SECTION V			40		20		80		40%		64 TO 96
DETERMINATION OF GAIN CORRECTION											80

WELDS/ITEMS EXAMINED:

RHXHX-1-1A
 RHXHX-2-1A

EXAMINER:

EXAMINER:

REVIEWER:

ANII: B. Camigh

DATE: 9/16/00

PG.: 2 OF 10

VEL: II

LEVEL: II

LEVEL: III DATE: 9-5-00

F₁ = 23
 RC = 4.6
 R = 31/2 = 15.5
 R/R_c = 15.5/4.6 = 4

NO GAIN CORRECTION REQUIRED. M. Bentley 9-5-00

TENNESSEE VALLEY
AUTHORITY

DIGITAL ULTRASONIC
CALIBRATION
DATA SHEET

REPORT NUMBER:
R-0574

PROJECT: WBWP UNIT: 1

CYCLE: 3

CALIBRATION DATE: 8-29-00

PROCEDURE: N-UT-18 REV: 23 TC: N/A
INSTRUMENT: K6 DUE DATE: 6-22-01

CALIBRATION BLOCK NO.: WB-15 TEMP: 72°F
SIMULATOR BLOCK NO.: 790391

MODEL TYPE: J5N-50 SERIAL NO.: E24253

THERMOMETER S/N: 562781 DUE DATE: 6-6-01

TRANSDUCER MANUF: RTD

COUPLANT ULTRAGEL II BATCH: 94125

S/N 99-1218 SIZE: 2(8x14) FREQ: 2.0 MHz

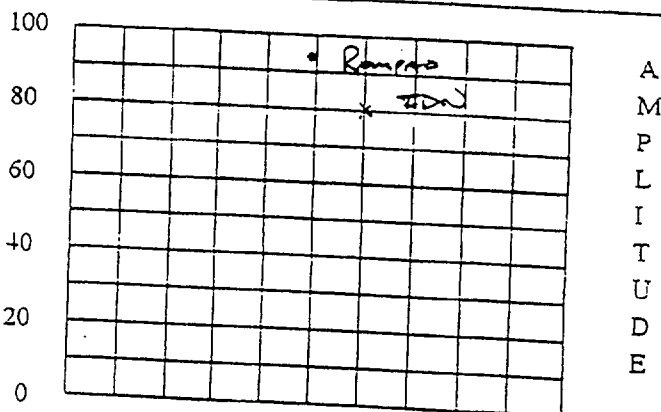
EXAM TYPE: SHEAR ☐ LONG ☐ RL ☒

CABLE TYPE: RG-174 LENGTH: 72 inches

ANGLE VERIFICATION

BLOCK TYPE: Romfas S/N: 790391
NOMINAL ANGLE: 60 ACTUAL ANGLE: 60

DAC



DISPLAY WIDTH: 3.242 inches

INSTRUMENT SETTINGS

REFLECTOR			REFERENCE	MEMORY
SCAN DIRECT.	NTCH	SDH	SENSITIVITY	NUMBER
AXIAL	<input checked="" type="checkbox"/>	<input type="checkbox"/>	56.0 dB	5
CIRC	<input type="checkbox"/>	<input type="checkbox"/>		
FREQ: 8.8 MHz			REJECT: 0%	
ANGLE: 60 deg			DAMPING: Fixed ohm	
DELAY: 9.211 msec			PULSER: Dual *	
ZERO: 9.213 msec			FILTER: Fixed *	
VELOCITY: 2402 msec			REP RATE: Fixed	
RANGE: 3.242 inches			TOF: <input checked="" type="checkbox"/> PEAK <input type="checkbox"/> FLANK	
RECTIFIER: Fixed			POWER: BATT.	
DUAL: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF			TCG: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF	

CALIBRATION TIMES

INITIAL TIME: 1045 FINAL TIME: 1410
1) 1305 2) 1315 3) 1330 4) 5) 6) 7) 8) 9)

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

LINEARITY CHECK

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

COMMENTS: Article 9, Section 3

WELDS/ITEMS EXAMINED:

DETERMINATION OF GAIN CORRECTION

$E_s = 252$

$R_c = 10$

$R = 37/2 = 18.5$

$R/R_c = 18.5/10 = 1.85$ NO GAIN CORRECTION REQUIRED

EXAMINED:

ayla Aronovich

EXAMINER:

John M. [Signature]

LEVEL: II

LEVEL: II

REVIEWER:

[Signature]

LEVEL: III DATE: 9-5-00

AND: B. Earring

DATE: 9/16/00

PG.: 3 OF 10

TVA

WALL THICKNESS
PROFILE SHEET

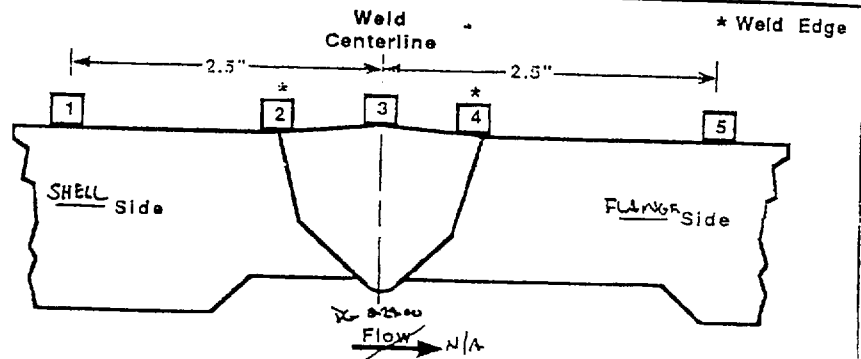
REPORT NO:

R-0574

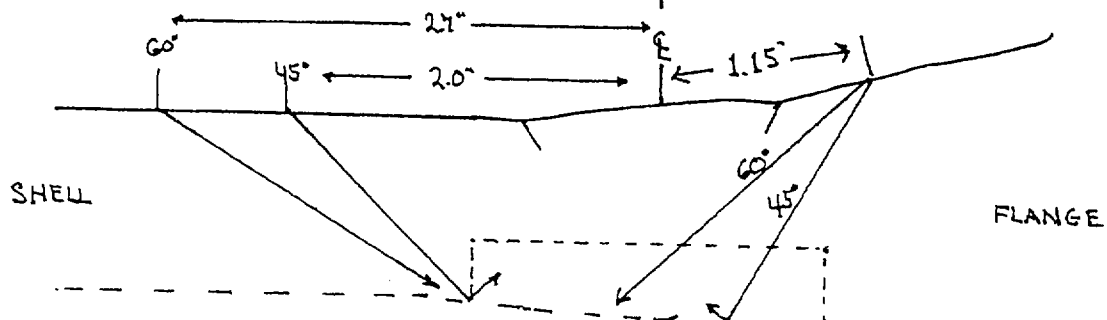
PROJECT: WBNWELD NO: RHRHX-2-1AUNIT: 1SYSTEM: RHR

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

Position	0°	90°	180°	270°
1	.99			
2	1.05			
3	1.175	N/A		
4	N/A			
5	N/A			

CROWN HEIGHT: .1"DIAMETER: 37"CROWN WIDTH: 1.4"WELD LENGTH: 116.5"CONTOUR
THICKNESSTAKEN @
11.0" 996

996 1.052 1.175 N/A
| | | |
TOE TOE

CONTOUR
TAKEN @
15.0"

PAD

SHELL

FLANGE

EXAMINER: Douglas M. MurrellREVIEWED BY: J. W. MurrellANII: B. EarnighLEVEL: IILEVEL: IIIDATE: 9-3-00DATE: 7/1/00DATE: 8-29-00PAGE 6 OF 10

R-0574

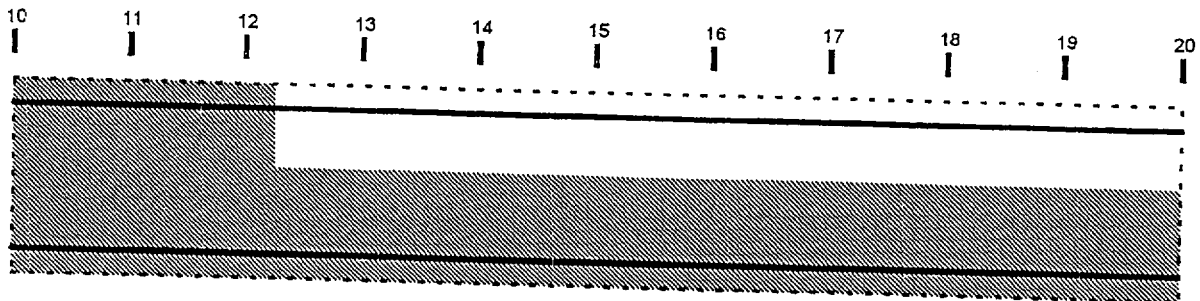
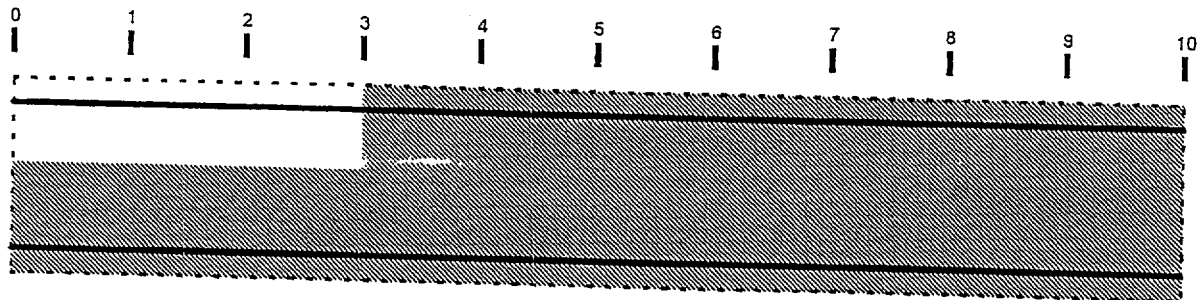
Weld # RHRHX-2-1A "Coverage Area"



22.6% of the weld with no coverage



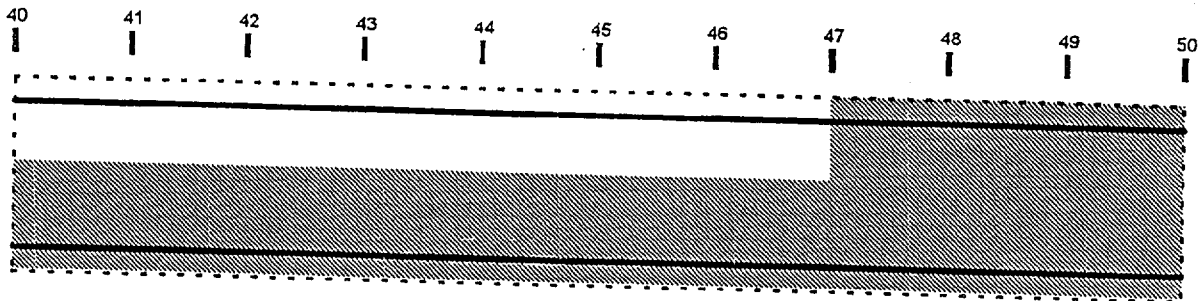
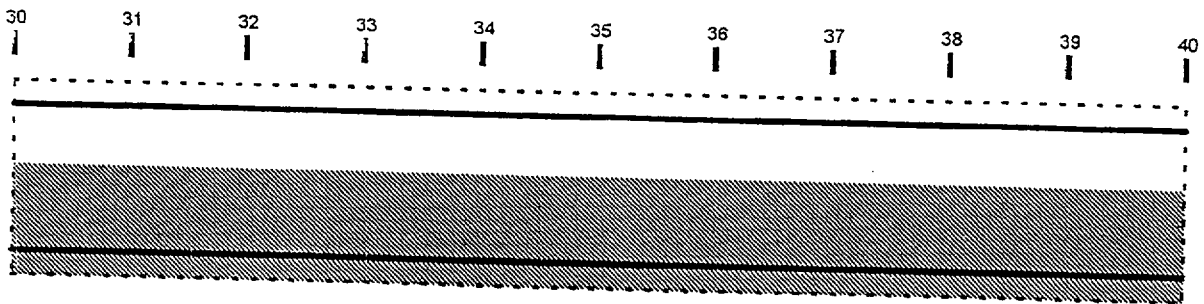
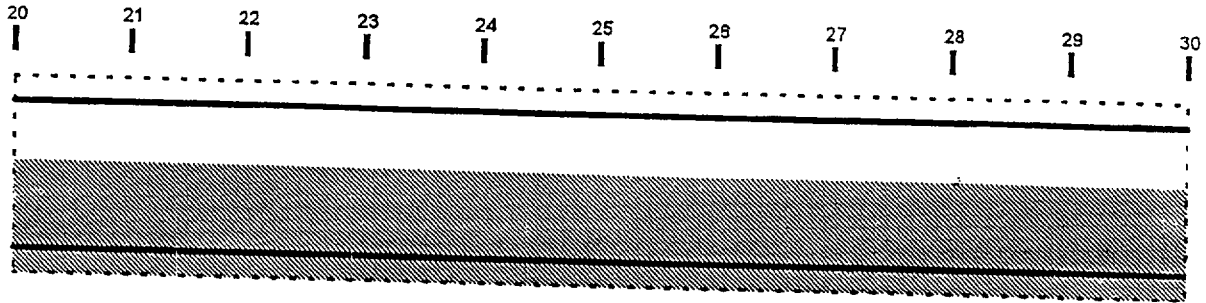
77.4% of the weld with Bi-directional coverage



Signatures 8-29-00

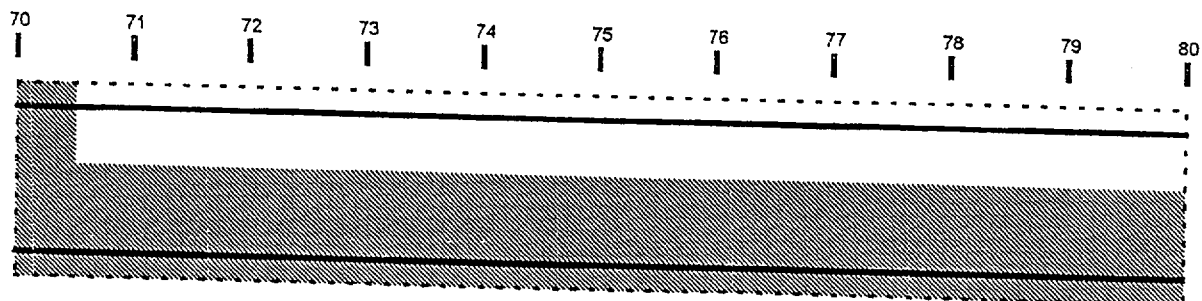
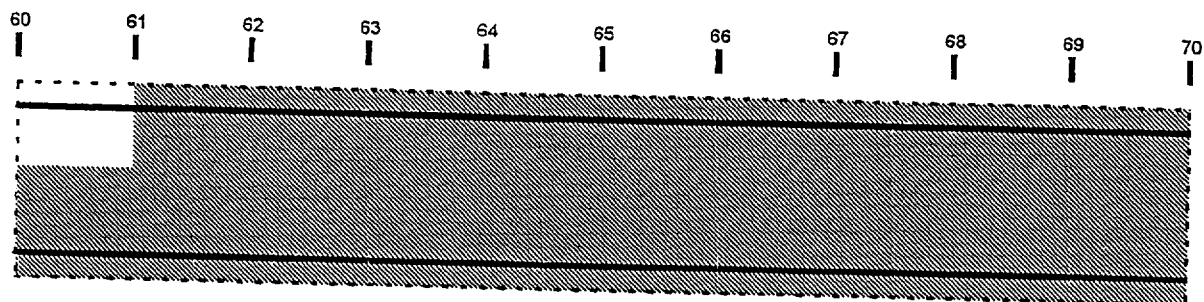
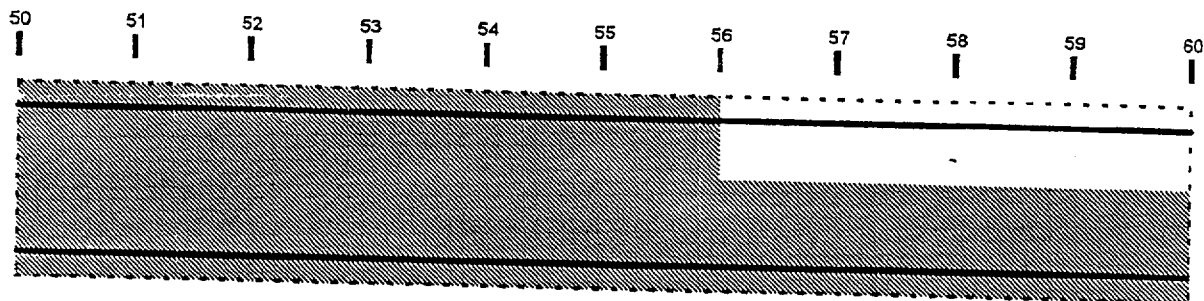
6 of 10

R-0574



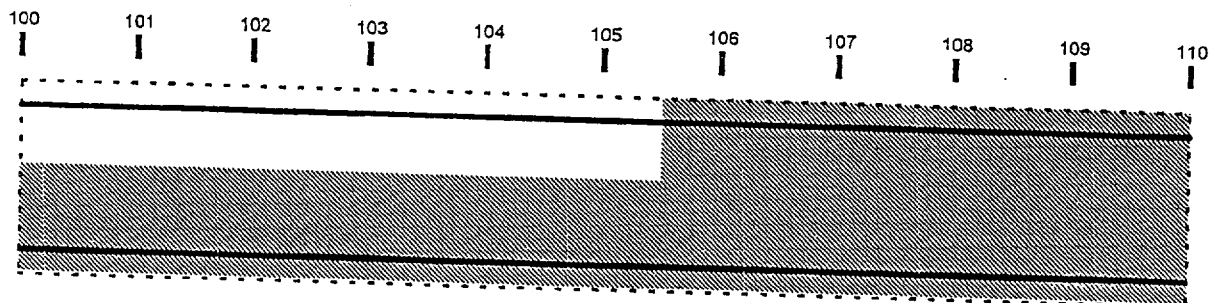
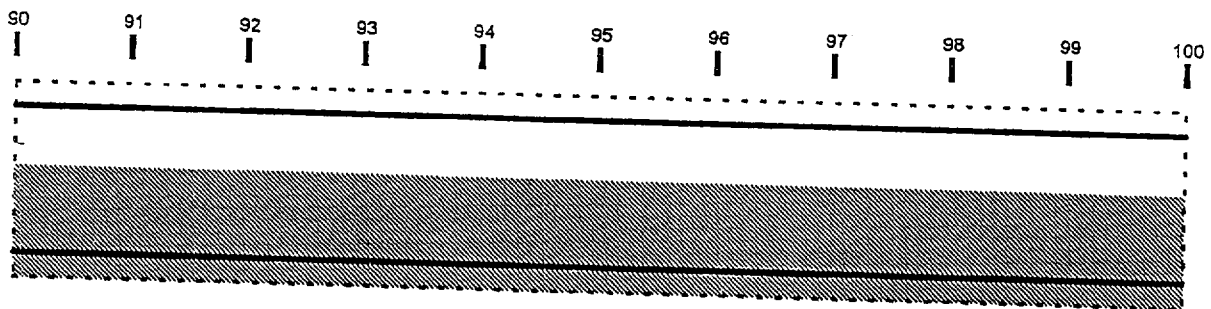
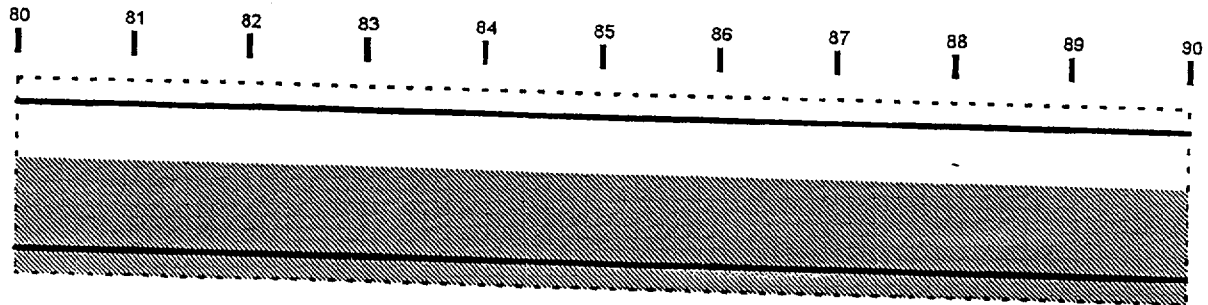
Doyle Annell 8-29-00

7 of 10



John A. ... 8-29-00

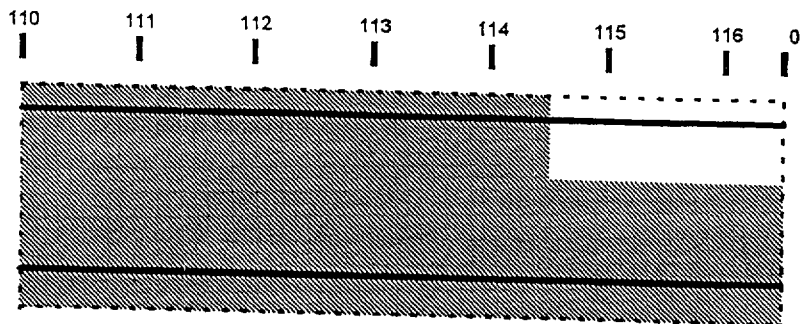
R-0574



D. J. Aronow 8-29-00

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R-0574



75 Renewal 8-29-00

10 of 10

ENCLOSURE 4

WATTS BAR NUCLEAR PLANT
INSERVICE INSPECTION PROGRAM
REQUEST FOR RELIEF, 1-ISI-10

ENCLOSURE 4

WATTS BAR NUCLEAR PLANT FIRST 10-YEAR INTERVAL REQUEST FOR RELIEF, 1-ISI-10

SUMMARY:

Due to configuration of the Boron Injection Tank support, surface examination of the integrally welded attachments during the Unit 1 Cycle 3 refueling outage resulted in less than essentially 100% of ASME code coverage being achieved. The tank is supported by four legs which are attached to the tank by four 16-inch X 12.5-inch pads welded directly to the shell. The pads are considered integrally welded attachments and are required to be examined by a surface method in accordance with Code Case N-509 Table 2500-1, Examination Category C-C, Item Number C3.10. The surface examination requirement is illustrated by Figure IWC-2500-5(b). As indicated on Drawing ISI-0053-C-01, the support leg covers the lower end of the pad preventing the surface examination on this portion of the weld. The examination resulted in approximately 78% of code required coverage being achieved on each of the 4 integrally welded attachments.

Conformance to the code requirement is impractical to implement due to physical restrictions, therefore, relief is requested in accordance with 10CFR50.55a(g) (5) (iii).

I. COMPONENT:

Boron Injection Tank Integrally Welded Attachments
Reference ISI Drawing ISI-0053-C-01 (Attachment 1),
identifiers BIT-5-IA, BIT-6-IA, BIT-7-IA, and BIT-8-IA.

II. CODE REQUIREMENT:

Code Case N-509, Table IWC-2500-1, Examination Category C-C, Item Number C3.10, surface examination requirement as defined by Figure IWC-2500-5 (Attachment 2).

III. CODE REQUIREMENTS FROM WHICH RELIEF IS REQUESTED:

Relief is requested from performing the required surface examination on essentially 100% of the examination surface of the Boron Injection Tank integrally welded attachments.

IV. BASIS FOR RELIEF:

The design configuration of the Boron Injection Tank integrally welded attachments preclude a surface examination of the required area. The design configuration limits the surface examination of the code required examination surface area to approximately 78% on each of the four integrally welded attachments.

ENCLOSURE 4

WATTS BAR NUCLEAR PLANT
FIRST 10-YEAR INTERVAL
REQUEST FOR RELIEF, 1-ISI-10

V. ALTERNATIVE EXAMINATION:

A surface examination of the boron injection tank integrally welded attachments was performed on accessible areas to the extent practical given the design configuration of the tank and attachment.

VI. JUSTIFICATION FOR THE GRANTING OF RELIEF:

Due to configuration of the boron injection tank support, surface examination of the integrally welded attachments during the Unit 1 Cycle 3 refueling outage resulted in less than essentially 100% of ASME Code coverage being achieved. The tank is supported by four legs which are attached to the tank by four 16-inch X 12.5-inch pads welded directly to the shell. The pads are considered integrally welded attachments and are required to be examined by a surface method in accordance with Code Case N-509 Table 2500-1, Examination Category C-C, Item Number C3.10. The surface examination requirement is illustrated by Figure IWC-2500-5(b). As indicated on ISI Drawing, ISI-0053-C-01, the support leg covers the lower end of the pad preventing the surface examination on this 12.5-inch portion of the weld. The examination resulted in approximately 78% of code required coverage being achieved on each of the 4 integrally welded attachments. A typical description of the limited examination area is documented on examination report R-0600 (Attachment 3).

It would be impractical to remove the support leg as the legs are welded directly to the support pad. Other examination methods were also considered but cannot be performed due to the access limitation.

Conformance to the code requirement is impractical to implement due to physical restrictions, therefore, relief is requested in accordance with 10CFR50.55a(g)(5)(iii).

VII. IMPLEMENTATION SCHEDULE:

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

ENCLOSURE 4

WATTS BAR NUCLEAR PLANT
INSERVICE INSPECTION PROGRAM
REQUEST FOR RELIEF, 1-ISI-10
LIST OF ATTACHMENTS

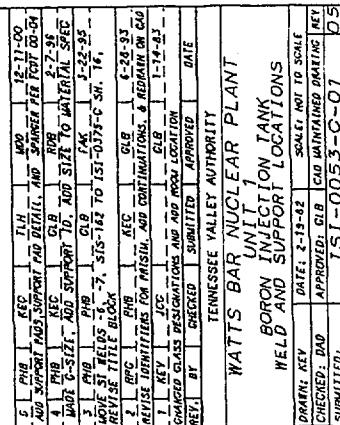
- Attachment 1. ISI-0053-C-01
- Attachment 2. ASME Section XI Figure IWC-2500-5, Integrally Welded Attachments
- Attachment 3. Examination Report R-0600 (typical of all four reports)

ENCLOSURE 4
ATTACHMENT 1

REQUEST FOR RELIEF, 1-ISI-10
ISI DRAWING ISI-0053-C-01

MATERIAL SPECIFICATIONS

ASME CC-2 (EQUIVALENT)



ENCLOSURE 4
ATTACHMENT 2

REQUEST FOR RELIEF, 1-ISI-10
ASME SECTION XI FIGURE IWC-2500-5

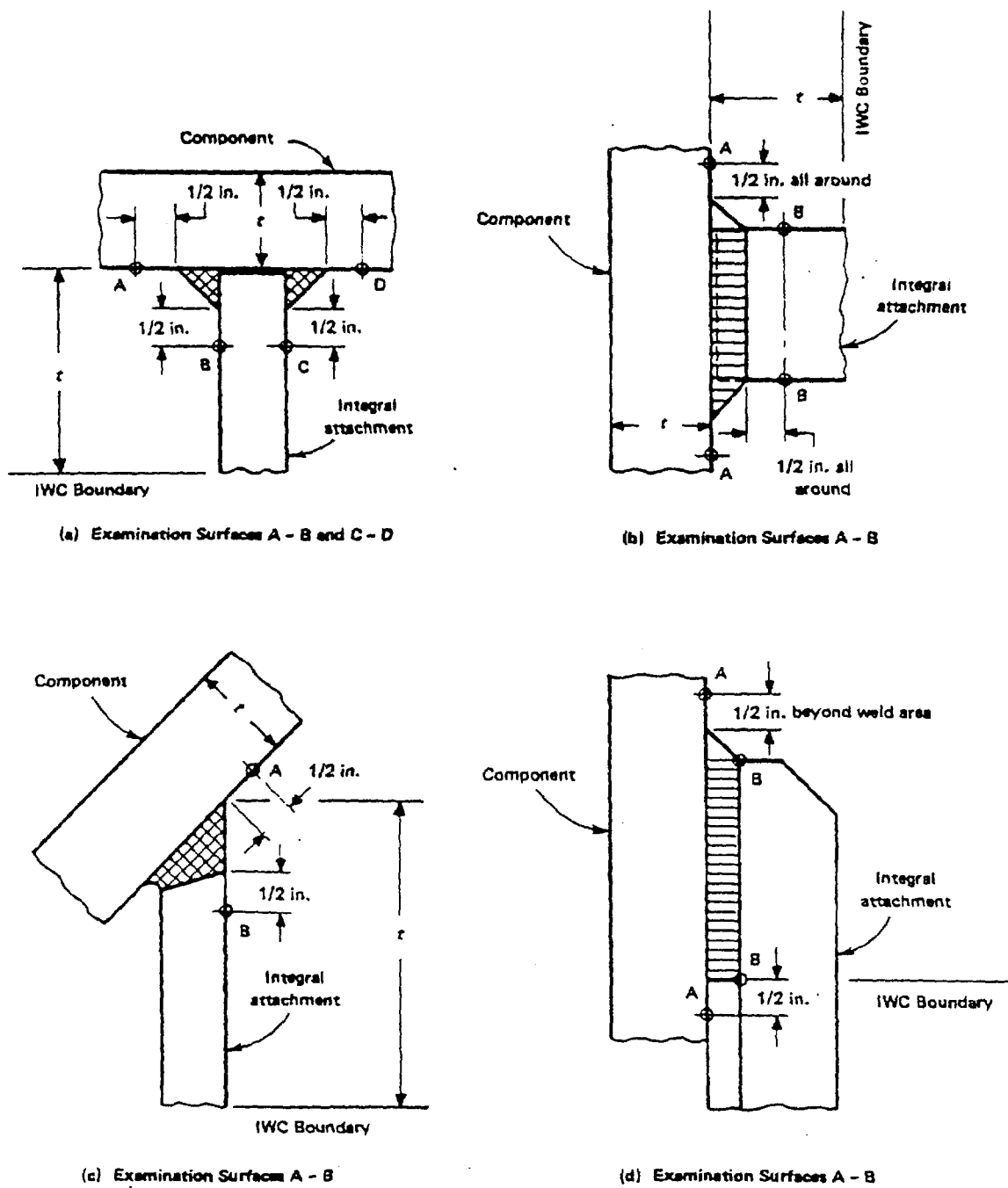


FIG. IWC-2500-5 INTEGRALLY WELDED ATTACHMENTS

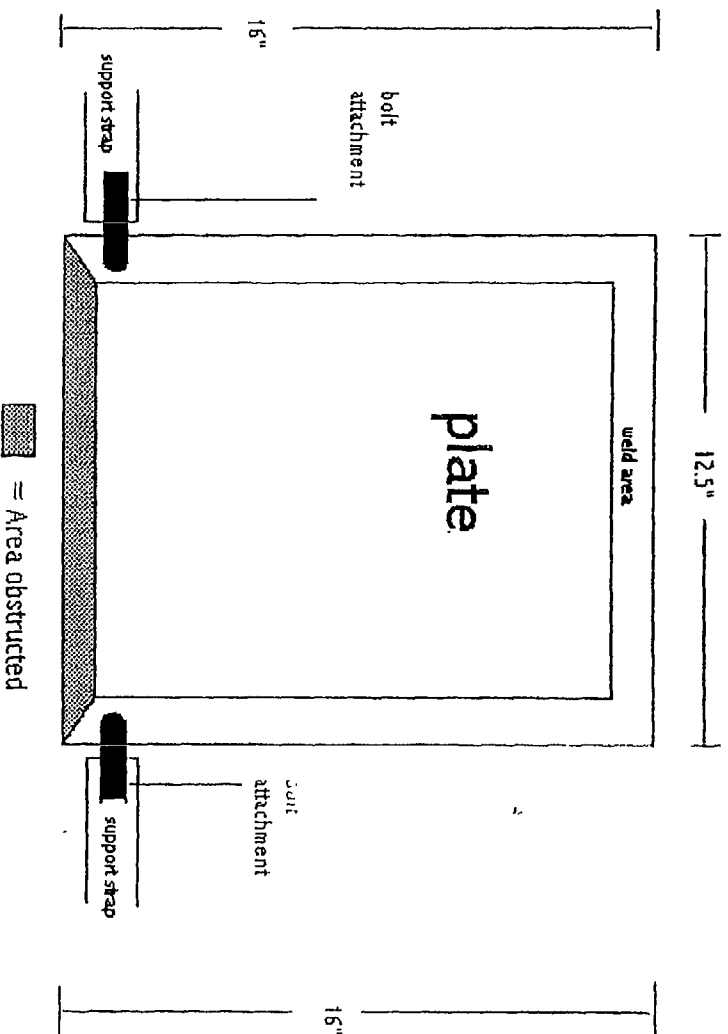
ENCLOSURE 4
ATTACHMENT 3

REQUEST FOR RELIEF, 1-ISI-10
EXAMINATION REPORT R-0600

TENNESSEE VALLEY AUTHORITY	RECORD OF LIQUID PENETRANT EXAM	REPORT NUMBER <u>R-0600</u>
PROJECT: <u>WBN</u> UNIT: <u>1</u> CYCLE: <u>03A</u> SYSTEM: <u>SIS</u> WELD/COMPONENT ID: <u>BIT-5-1A</u> CONFIG.: <u>VIWA</u> TO <u>VSHELL</u> PROCEDURE: <u>N-PT-9</u> REV.: <u>29</u> TC: <u>N/A</u> EXAMINATION CODE <u>89E-01</u> CODE CLASS: <u>2</u> CATEGORY: <u>C-C</u>		EXAMINATION DATE <u>Sept 8 2000</u> START TIME <u>0803</u> END TIME: <u>0945</u> EXAM SURFACE: ID <input type="checkbox"/> OD <input checked="" type="checkbox"/> PRESERVICE <input type="checkbox"/> INSERVICE <input checked="" type="checkbox"/> REF. DRAWING NO.: <u>WX1100E48</u>
		ACCEPTANCE CRITERIA <input type="checkbox"/> APPDX. A <input checked="" type="checkbox"/> APPDX. B <input type="checkbox"/> OTHER:
METHOD OF EXAMINATION		
METHOD WATER-WASHABLE FLUORESCENT DYE: <input type="checkbox"/> POST-EMULSIFIABLE FLUORESCENT DYE: <input type="checkbox"/> SOLVENT-REMOVABLE FLUORESCENT DYE: <input type="checkbox"/> WATER-WASHABLE VISIBLE DYE: <input type="checkbox"/> POST-EMULSIFIABLE VISIBLE DYE: <input type="checkbox"/> SOLVENT REMOVABLE VISIBLE DYE: <input checked="" type="checkbox"/>	PENETRANT MATERIALS BRAND NAME: <u>Magnaflux</u> PENETRANT <u>SKL-SP</u> BATCH: <u>94M05K</u> REMOVER: <u>SKC-S</u> BATCH: <u>98L07K</u> DEVELOPER: <u>SKD-S2</u> BATCH: <u>96J08K</u>	
	BLACK LIGHT	
	METER S/N: <u>N/A</u> AL. DUE DATE: <u>N/A</u>	
PART TEMP: <u>81 °F</u> PYROMETER S/N: <u>522343</u> CAL. DUE DATE: <u>06/06/01</u>		
EXAMINATION RESULTS SATISFACTORY: <input checked="" type="checkbox"/> UNSATISFACTORY: <input type="checkbox"/> NOI NO.: <u>N/A</u> EXPLANATION OF EXAM RESULTS: <u>No reportable indications.</u> COMMENTS/LIMITATIONS: 		
EXAMINER: <u>Carey L. Lora</u> EXAMINER: <u>TRANCE</u> REVIEWER: <u>W. B. Bentley</u>		LEVEL: <u>II</u> LEVEL: <u>TR</u> LEVEL: <u>III</u> DATE: <u>9.12.00</u>
		ANI: <u>SBH</u> DATE: <u>9-16-00</u> PAGE: <u>1</u> OF <u>2</u>

* DOCUMENT TRAINING

R-0600



LIMITATION DRAWING BIT-S-IA
APPROXIMATELY 78% OF CODE RE-
QUIRED COVERAGE ACHIEVED. LIMITATION
DUE TO CONFIGURATION.

1 of 2

Carley L. Doyle
Level II 9/8/2000

ENCLOSURE 5

WATTS BAR NUCLEAR PLANT
INSERVICE INSPECTION PROGRAM
REQUEST FOR RELIEF, 1-ISI-11

ENCLOSURE 5

WATTS BAR NUCLEAR PLANT
FIRST 10-YEAR INTERVAL
REQUEST FOR RELIEF, 1-ISI-11

SUMMARY:

Volumetric examination of the Boron Injection Tank shell-to-head welds during the Unit 1 Cycle 3 refueling outage resulted in less than essentially 100% of ASME code coverage being achieved due to the geometric configuration of the shell-to-head circumferential welds and the material of the shell (CF8A). The geometric configuration (taper) of the shell and the CF8A shell material prevents an effective scan from the shell side which prevents full examination coverage. Volumetric examination of this component is required in accordance with ASME Section XI Table IWC-2500-1, Examination Category C-A, Item Number C1.20. The full volume weld examination requirement is illustrated by Figure IWC-2500-1.

Conformance to the code requirement is impractical to implement due to physical restrictions, therefore, relief is requested in accordance with 10CFR50.55a(g) (5) (iii).

I. COMPONENT:

Boron Injection Tank Shell-to-Head Circumferential Welds -
Reference ISI Drawing CHM-0053-C-01 (Attachment 1),
identifiers BIT-2 and BIT-3.

II. CODE REQUIREMENT:

ASME Section XI, 1989 Edition, Table IWC-2500-1, Examination Category C-A, Item Number C1.20, volumetric examination requirement as defined by Figure IWC-2500-1 (Attachment 2).

III. CODE REQUIREMENTS FROM WHICH RELIEF IS REQUESTED:

Relief is requested from performing the required volumetric examination on essentially 100% of the full volume of the Boron Injection Tank shell-to-head circumferential welds.

IV. BASIS FOR RELIEF:

The geometric configuration (taper) of the shell and the CF8A shell material prevents an effective scan from the shell side which prevents full examination coverage. The design configuration limits ultrasonic examination of the code required examination volume to approximately 60% for weld BIT-2 and 63% for weld BIT-3.

ENCLOSURE 5

WATTS BAR NUCLEAR PLANT
FIRST 10-YEAR INTERVAL
REQUEST FOR RELIEF, 1-ISI-11

V. ALTERNATIVE EXAMINATION:

The code required 100% volumetric examination of the full volume of the boron injection tank shell-to-head circumferential welds was performed on accessible areas to the extent practical given the design configuration of the shell-to-head weld.

VI. JUSTIFICATION FOR THE GRANTING OF RELIEF:

The geometric configuration (taper) of the shell and the CF8A shell material prevents an effective scan from the shell side which prevents full examination coverage. Volumetric examination of this component is required in accordance with ASME Section XI Table IWC-2500-1, Examination Category C-A, Item Number C1.20. The full volume weld examination requirement is illustrated by Figure IWC-2500-1.

Vendor drawing E110048 Sheet 1 of 2 (Attachment 3) shows the shell-to-head configuration. As noted on Examination Reports R-0690 and R-0691 (Attachment 4), no scan was performed from the shell side of the weld. The shell material is SA-351, CF8A. With present technology, only a 45° RL large transducer scan is being performed on CF8A material. Due to the taper of the shell, i.e. the 3:1 minimum bevel due to wall thickness differences between the shell and head, the 45° scan would be ineffective. As described on the examination reports, approximately 60% code coverage for weld BIT-2 and 63% code coverage for weld BIT-3 was achieved on the required weld examination volume.

Conformance to the code requirement is impractical to implement due to physical restrictions, therefore, relief is requested in accordance with 10CFR50.55a(g)(5)(iii).

VII. IMPLEMENTATION SCHEDULE:

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

ENCLOSURE 5

WATTS BAR NUCLEAR PLANT
FIRST 10-YEAR INTERVAL
REQUEST FOR RELIEF, 1-ISI-11
LIST OF ATTACHMENTS

- Attachment 1. ISI Drawing ISI-0053-C-01
- Attachment 2. ASME Section XI Figure IWC-2500-1, Vessel
Circumferential Welds
- Attachment 3. Vendor Drawing 1100E48, Sheet 1
- Attachment 4. Examination Data Reports:
Ultrasonic Examination Report R-0690 for Weld BIT-2
Ultrasonic Examination Report R-0691 for Weld BIT-3

ENCLOSURE 5
ATTACHMENT 1

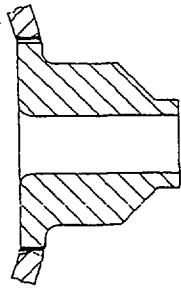
REQUEST FOR RELIEF, 1-ISI-11
ISI DRAWING ISI-0053-C-01

REFERENCE DRAWINGS
WESTINGHOUSE 1100E48
WEN E-2879 IC-74

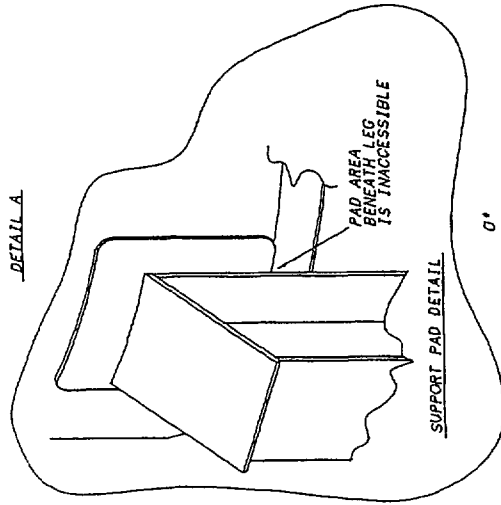
MATERIAL SPECIFICATIONS

TANK
SHELL
SA-351 CF8A
3.12" NOM.
HEADS
SA240 TP 304
2.00" NOM.
NOZZLES
6" SA182 F 304
BOLTING
STUDS
SA 193 GR. B7
2.50-6UN-24 X 13.50
NUTS
SA 193 GR. 2H
2.50-6UN-28 HVT.

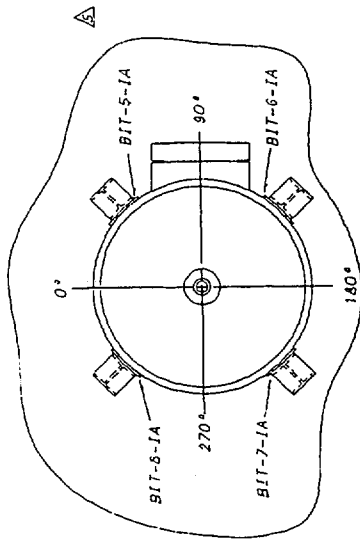
ASME CC-2 (EQUIVALENT)



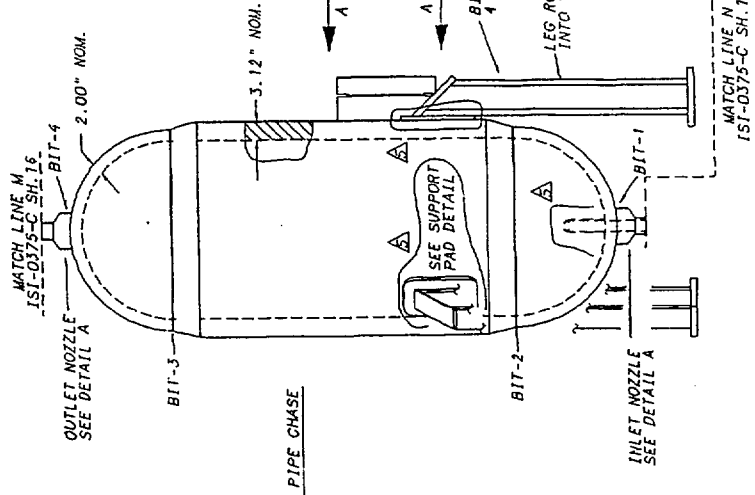
DETAIL A



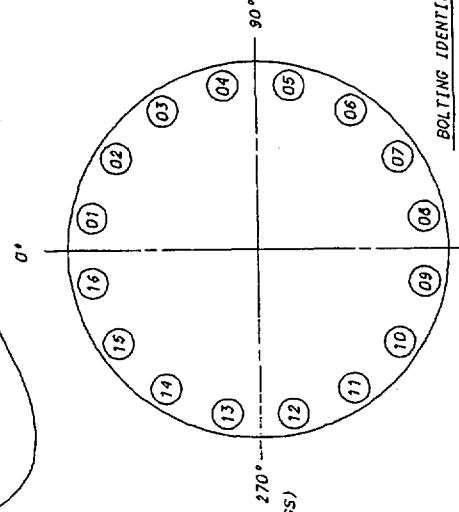
SUPPORT PAD DETAIL



INTEGRAL ATTACHMENTS



PIPE CHASE



BOLTING IDENTIFIER

BITUMCB-XX

180°

BOLTING LOCATIONS 01-16

SECTION A-A

5	PHB	KIC	TLH	MOD	12-31-00
4	PHB	KIC	TLH	MOD	12-31-00
3	PHB	KIC	TLH	MOD	12-31-00
2	PHB	KIC	TLH	MOD	12-31-00
1	PHB	KIC	TLH	MOD	12-31-00
0	PHB	KIC	TLH	MOD	12-31-00
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2	PHB	KIC	TLH	MOD	12-31-00
3	PHB	KIC	TLH	MOD	12-31-00
4	PHB	KIC	TLH	MOD	12-31-00
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6	PHB	KIC	TLH	MOD	12-31-00
7	PHB	KIC	TLH	MOD	12-31-00
8	PHB	KIC	TLH	MOD	12-31-00
9	PHB	KIC	TLH	MOD	12-31-00
10	PHB	KIC	TLH	MOD	12-31-00
11	PHB	KIC	TLH	MOD	12-31-00
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13	PHB	KIC	TLH	MOD	12-31-00
14	PHB	KIC	TLH	MOD	12-31-00
15	PHB	KIC	TLH	MOD	12-31-00
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17	PHB	KIC	TLH	MOD	12-31-00
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96	PHB	KIC	TLH	MOD	12-31-00
97	PHB	KIC	TLH	MOD	12-31-00
98	PHB	KIC	TLH	MOD	12-31-00
99	PHB	KIC	TLH	MOD	12-31-00
100	PHB	KIC	TLH	MOD	12-31-00

WATTS BAR NUCLEAR PLANT

UNIT 1

BORON INJECTION TANK

WELD AND SUPPORT LOCATIONS

DRAWN: KEY	DATE: 2-19-83	SCALE: NOT TO SCALE
CHECKED: PAD	APPROVED: GLB	CAD MANAGING DRAWING KEY
SUBMITTED:	IST-0053-C-01	DS

ENCLOSURE 5
ATTACHMENT 2

REQUEST FOR RELIEF, 1-ISI-11
ASME SECTION XI FIGURE IWC-2500-1

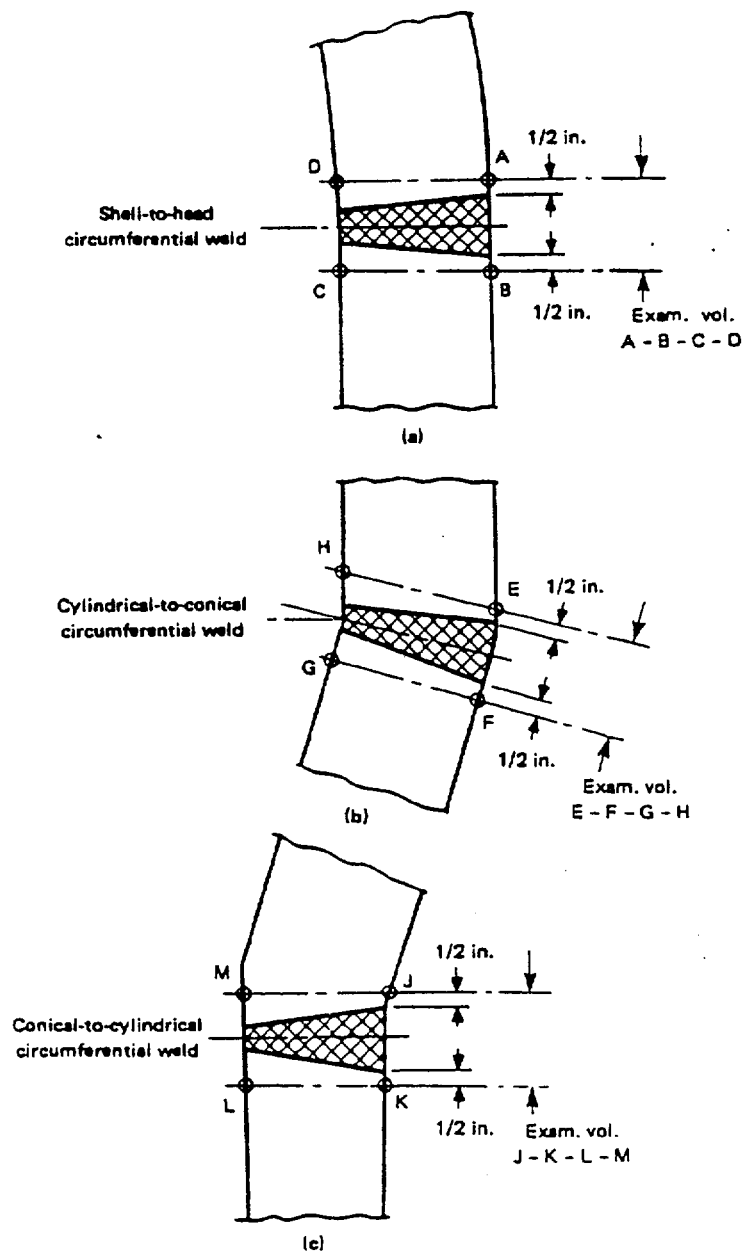


FIG. IWC-2500-1 VESSEL CIRCUMFERENTIAL WELDS

ENCLOSURE 5
ATTACHMENT 3

REQUEST FOR RELIEF, 1-ISI-11
VENDOR DRAWING 1100E48, SHEET 1

ITEM	DESCRIPTION	QTY	UNIT	PRICE	TOTAL
1	1/2" DIA. STEEL	1	LB	0.15	0.15
2	1/4" DIA. STEEL	1	LB	0.10	0.10
3	3/8" DIA. STEEL	1	LB	0.15	0.15
4	1/2" DIA. STEEL	1	LB	0.15	0.15
5	3/4" DIA. STEEL	1	LB	0.20	0.20
6	1" DIA. STEEL	1	LB	0.25	0.25
7	1 1/2" DIA. STEEL	1	LB	0.30	0.30
8	2" DIA. STEEL	1	LB	0.40	0.40
9	2 1/2" DIA. STEEL	1	LB	0.50	0.50
10	3" DIA. STEEL	1	LB	0.60	0.60
11	3 1/2" DIA. STEEL	1	LB	0.70	0.70
12	4" DIA. STEEL	1	LB	0.80	0.80
13	4 1/2" DIA. STEEL	1	LB	0.90	0.90
14	5" DIA. STEEL	1	LB	1.00	1.00
15	5 1/2" DIA. STEEL	1	LB	1.10	1.10
16	6" DIA. STEEL	1	LB	1.20	1.20
17	6 1/2" DIA. STEEL	1	LB	1.30	1.30
18	7" DIA. STEEL	1	LB	1.40	1.40
19	7 1/2" DIA. STEEL	1	LB	1.50	1.50
20	8" DIA. STEEL	1	LB	1.60	1.60
21	8 1/2" DIA. STEEL	1	LB	1.70	1.70
22	9" DIA. STEEL	1	LB	1.80	1.80
23	9 1/2" DIA. STEEL	1	LB	1.90	1.90
24	10" DIA. STEEL	1	LB	2.00	2.00
25	10 1/2" DIA. STEEL	1	LB	2.10	2.10
26	11" DIA. STEEL	1	LB	2.20	2.20
27	11 1/2" DIA. STEEL	1	LB	2.30	2.30
28	12" DIA. STEEL	1	LB	2.40	2.40
29	12 1/2" DIA. STEEL	1	LB	2.50	2.50
30	13" DIA. STEEL	1	LB	2.60	2.60
31	13 1/2" DIA. STEEL	1	LB	2.70	2.70
32	14" DIA. STEEL	1	LB	2.80	2.80
33	14 1/2" DIA. STEEL	1	LB	2.90	2.90
34	15" DIA. STEEL	1	LB	3.00	3.00
35	15 1/2" DIA. STEEL	1	LB	3.10	3.10
36	16" DIA. STEEL	1	LB	3.20	3.20
37	16 1/2" DIA. STEEL	1	LB	3.30	3.30
38	17" DIA. STEEL	1	LB	3.40	3.40
39	17 1/2" DIA. STEEL	1	LB	3.50	3.50
40	18" DIA. STEEL	1	LB	3.60	3.60
41	18 1/2" DIA. STEEL	1	LB	3.70	3.70
42	19" DIA. STEEL	1	LB	3.80	3.80
43	19 1/2" DIA. STEEL	1	LB	3.90	3.90
44	20" DIA. STEEL	1	LB	4.00	4.00
45	20 1/2" DIA. STEEL	1	LB	4.10	4.10
46	21" DIA. STEEL	1	LB	4.20	4.20
47	21 1/2" DIA. STEEL	1	LB	4.30	4.30
48	22" DIA. STEEL	1	LB	4.40	4.40
49	22 1/2" DIA. STEEL	1	LB	4.50	4.50
50	23" DIA. STEEL	1	LB	4.60	4.60
51	23 1/2" DIA. STEEL	1	LB	4.70	4.70
52	24" DIA. STEEL	1	LB	4.80	4.80
53	24 1/2" DIA. STEEL	1	LB	4.90	4.90
54	25" DIA. STEEL	1	LB	5.00	5.00
55	25 1/2" DIA. STEEL	1	LB	5.10	5.10
56	26" DIA. STEEL	1	LB	5.20	5.20
57	26 1/2" DIA. STEEL	1	LB	5.30	5.30
58	27" DIA. STEEL	1	LB	5.40	5.40
59	27 1/2" DIA. STEEL	1	LB	5.50	5.50
60	28" DIA. STEEL	1	LB	5.60	5.60
61	28 1/2" DIA. STEEL	1	LB	5.70	5.70
62	29" DIA. STEEL	1	LB	5.80	5.80
63	29 1/2" DIA. STEEL	1	LB	5.90	5.90
64	30" DIA. STEEL	1	LB	6.00	6.00
65	30 1/2" DIA. STEEL	1	LB	6.10	6.10
66	31" DIA. STEEL	1	LB	6.20	6.20
67	31 1/2" DIA. STEEL	1	LB	6.30	6.30
68	32" DIA. STEEL	1	LB	6.40	6.40
69	32 1/2" DIA. STEEL	1	LB	6.50	6.50
70	33" DIA. STEEL	1	LB	6.60	6.60
71	33 1/2" DIA. STEEL	1	LB	6.70	6.70
72	34" DIA. STEEL	1	LB	6.80	6.80
73	34 1/2" DIA. STEEL	1	LB	6.90	6.90
74	35" DIA. STEEL	1	LB	7.00	7.00
75	35 1/2" DIA. STEEL	1	LB	7.10	7.10
76	36" DIA. STEEL	1	LB	7.20	7.20
77	36 1/2" DIA. STEEL	1	LB	7.30	7.30
78	37" DIA. STEEL	1	LB	7.40	7.40
79	37 1/2" DIA. STEEL	1	LB	7.50	7.50
80	38" DIA. STEEL	1	LB	7.60	7.60
81	38 1/2" DIA. STEEL	1	LB	7.70	7.70
82	39" DIA. STEEL	1	LB	7.80	7.80
83	39 1/2" DIA. STEEL	1	LB	7.90	7.90
84	40" DIA. STEEL	1	LB	8.00	8.00
85	40 1/2" DIA. STEEL	1	LB	8.10	8.10
86	41" DIA. STEEL	1	LB	8.20	8.20
87	41 1/2" DIA. STEEL	1	LB	8.30	8.30
88	42" DIA. STEEL	1	LB	8.40	8.40
89	42 1/2" DIA. STEEL	1	LB	8.50	8.50
90	43" DIA. STEEL	1	LB	8.60	8.60
91	43 1/2" DIA. STEEL	1	LB	8.70	8.70
92	44" DIA. STEEL	1	LB	8.80	8.80
93	44 1/2" DIA. STEEL	1	LB	8.90	8.90
94	45" DIA. STEEL	1	LB	9.00	9.00
95	45 1/2" DIA. STEEL	1	LB	9.10	9.10
96	46" DIA. STEEL	1	LB	9.20	9.20
97	46 1/2" DIA. STEEL	1	LB	9.30	9.30
98	47" DIA. STEEL	1	LB	9.40	9.40
99	47 1/2" DIA. STEEL	1	LB	9.50	9.50
100	48" DIA. STEEL	1	LB	9.60	9.60
101	48 1/2" DIA. STEEL	1	LB	9.70	9.70
102	49" DIA. STEEL	1	LB	9.80	9.80
103	49 1/2" DIA. STEEL	1	LB	9.90	9.90
104	50" DIA. STEEL	1	LB	10.00	10.00
105	50 1/2" DIA. STEEL	1	LB	10.10	10.10
106	51" DIA. STEEL	1	LB	10.20	10.20
107	51 1/2" DIA. STEEL	1	LB	10.30	10.30
108	52" DIA. STEEL	1	LB	10.40	10.40
109	52 1/2" DIA. STEEL	1	LB	10.50	10.50
110	53" DIA. STEEL	1	LB	10.60	10.60
111	53 1/2" DIA. STEEL	1	LB	10.70	10.70
112	54" DIA. STEEL	1	LB	10.80	10.80
113	54 1/2" DIA. STEEL	1	LB	10.90	10.90
114	55" DIA. STEEL	1	LB	11.00	11.00
115	55 1/2" DIA. STEEL	1	LB	11.10	11.10
116	56" DIA. STEEL	1	LB	11.20	11.20
117	56 1/2" DIA. STEEL	1	LB	11.30	11.30
118	57" DIA. STEEL	1	LB	11.40	11.40
119	57 1/2" DIA. STEEL	1	LB	11.50	11.50
120	58" DIA. STEEL	1	LB	11.60	11.60
121	58 1/2" DIA. STEEL	1	LB	11.70	11.70
122	59" DIA. STEEL	1	LB	11.80	11.80
123	59 1/2" DIA. STEEL	1	LB	11.90	11.90
124	60" DIA. STEEL	1	LB	12.00	12.00
125	60 1/2" DIA. STEEL	1	LB	12.10	12.10
126	61" DIA. STEEL	1	LB	12.20	12.20
127	61 1/2" DIA. STEEL	1	LB	12.30	12.30
128	62" DIA. STEEL	1	LB	12.40	12.40
129	62 1/2" DIA. STEEL	1	LB	12.50	12.50
130	63" DIA. STEEL	1	LB	12.60	12.60
131	63 1/2" DIA. STEEL	1	LB	12.70	12.70
132	64" DIA. STEEL	1	LB	12.80	12.80
133	64 1/2" DIA. STEEL	1	LB	12.90	12.90
134	65" DIA. STEEL	1	LB	13.00	13.00
135	65 1/2" DIA. STEEL	1	LB	13.10	13.10
136	66" DIA. STEEL	1	LB	13.20	13.20
137	66 1/2" DIA. STEEL	1	LB	13.30	13.30
138	67" DIA. STEEL	1	LB	13.40	13.40
139	67 1/2" DIA. STEEL	1	LB	13.50	13.50
140	68" DIA. STEEL	1	LB	13.60	13.60
141	68 1/2" DIA. STEEL	1	LB	13.70	13.70
142	69" DIA. STEEL	1	LB	13.80	13.80
143	69 1/2" DIA. STEEL	1	LB	13.90	13.90
144	70" DIA. STEEL	1	LB	14.00	14.00
145	70 1/2" DIA. STEEL	1	LB	14.10	14.10
146	71" DIA. STEEL	1	LB	14.20	14.20
147	71 1/2" DIA. STEEL	1	LB	14.30	14.30
148	72" DIA. STEEL	1	LB	14.40	14.40
149	72 1/2" DIA. STEEL	1	LB	14.50	14.50
150	73" DIA. STEEL	1	LB	14.60	14.60
151	73 1/2" DIA. STEEL	1	LB	14.70	14.70
152	74" DIA. STEEL	1	LB	14.80	14.80
153	74 1/2" DIA. STEEL	1	LB	14.90	14.90
154	75" DIA. STEEL	1	LB	15.00	15.00
155	75 1/2" DIA. STEEL	1	LB	15.10	15.10
156	76" DIA. STEEL	1	LB	15.20	15.20
157	76 1/2" DIA. STEEL	1	LB	15.30	15.30
158	77" DIA. STEEL	1	LB	15.40	15.40
159	77 1/2" DIA. STEEL	1	LB	15.50	15.50
160	78" DIA. STEEL	1	LB	15.60	15.60
161	78 1/2" DIA. STEEL	1	LB	15.70	15.70
162	79" DIA. STEEL	1	LB	15.80	15.80
163	79 1/2" DIA. STEEL	1	LB	15.90	15.90
164	80" DIA. STEEL	1	LB	16.00	16.00
165	80 1/2" DIA. STEEL	1	LB	16.10	16.10
166	81" DIA. STEEL	1	LB	16.20	16.20
167	81 1/2" DIA. STEEL	1	LB	16.30	16.30
168	82" DIA. STEEL	1	LB	16.40	16.40
169	82 1/2" DIA. STEEL	1	LB	16.50	16.50
170	83" DIA. STEEL	1	LB	16.60	16.60
171	83 1/2" DIA. STEEL	1	LB	16.70	16.70
172	84" DIA. STEEL	1	LB	16.80	16.80
173	84 1/2" DIA. STEEL	1	LB	16.90	16.90
174	85" DIA. STEEL	1	LB	17.00	17.00
175	85 1/2" DIA. STEEL	1	LB	17.10	17.10
176	86" DIA. STEEL	1	LB	17.20	17.20
177	86 1/2" DIA. STEEL	1	LB	17.30	17.30
178	87" DIA. STEEL	1	LB	17.40	17.40
179	87 1/2" DIA. STEEL	1	LB	17.50	17.50
180	88" DIA. STEEL	1	LB	17.60	17.60
181	88 1/2" DIA. STEEL	1	LB	17.70	17.70
182	89" DIA. STEEL	1	LB	17.80	17.80
183	89 1/2" DIA. STEEL	1	LB	17.90	17.90
184	90" DIA. STEEL	1	LB	18.00	18.00
185	90 1/2" DIA. STEEL	1	LB	18.10	18.10
186	91" DIA. STEEL	1	LB	18.20	18.20
187	91 1/2" DIA. STEEL	1	LB	18.30	18.30
188	92" DIA. STEEL	1	LB	18.40	18.40
189	92 1/2" DIA. STEEL	1	LB	18.50	18.50
190	93" DIA. STEEL	1	LB	18.60	18.60
191	93 1/2" DIA. STEEL	1	LB	18.70	18.70
192	94" DIA. STEEL	1	LB	18.80	18.80
193	94 1/2" DIA. STEEL	1	LB	18.90	18.90
194	95" DIA. STEEL	1	LB	19.00	19.00
195	95 1/2" DIA. STEEL	1	LB	19.10	19.10
196	96" DIA. STEEL	1	LB	19.20	19.20
197	96 1/2" DIA. STEEL	1	LB	19.30	19.30
198	97" DIA. STEEL	1	LB	19.40	19.40
199	97 1/2" DIA. STEEL	1	LB	19.50	19.50
200	98" DIA. STEEL	1	LB	19.60	19.60
201	98 1/2" DIA. STEEL	1	LB	19.70	19.70
202	99" DIA. STEEL	1	LB	19.80	19.80
203	99 1/2" DIA. STEEL	1	LB	19.90	19.90
204	100" DIA. STEEL	1	LB	20.00	20.00

A - SHELL AND HEAD MATERIAL: SA-516 FOR SHELL AND SA-516 TYPE 304 FOR HEADS
B - FILLING MATERIAL: SA-102 FILL
C - STYLE OR TYPE 304 SET AND ASSEMBLY FILLER
D - SA 317 TYPE 316 STAINLESS (OR APPROVED EQUAL)
E - ALTERNATE MATERIAL: SA 304 OR C
F - ELECTRICAL GASKET CO., CROOK, N.J. (OR APPROVED EQUAL)
G - E.C. HISSING CO., PITTSBURGH, PA. (OR APPROVED EQUAL)
H - INSULATING MATERIAL MUST MEET REQUIREMENTS OF MC-3200

DESIGN SPECIFICATIONS:
CODE CLASS: LINE CODE SECTION 111, CLASS 2 CODE STAMP REQUIRED.
DESIGN & FABRICATION PER CODE CODE 801, VIII, DIV. 2

DESIGN PRESSURE:
INTERNAL: 275 PSIG
EXTERNAL: 275 PSIG
DESIGN TEMPERATURE: 300°F
MIN. INTERNAL VOLUME: 100 GAL.
WEIGHT (EST): 20,000 LBS
FILLING: 27,500 LBS
HYDROSTATIC TEST: HELD 30 MIN PER INCH OF THICKNESS OF SHELL.
SEE ①②③④⑤⑥⑦⑧⑨⑩⑪⑫⑬⑭⑮⑯⑰⑱⑲⑳㉑㉒㉓㉔㉕㉖㉗㉘㉙㉚㉛㉜㉝㉞㉟㊱㊲㊳㊴㊵㊶㊷㊸㊹㊺ FOR ADDITIONAL DESIGN REQUIREMENTS.

NOTES:
1. ALL WELDED JOINTS OF CATEGORIES 1 AND 2 SHALL BE TYPE LAP JOINTS UNLESS OTHERWISE SPECIFIED.
2. ALL WELDED JOINTS OF CATEGORIES 3 AND 4 SHALL BE TYPE BUTT JOINTS UNLESS OTHERWISE SPECIFIED.
3. ALL WELDED JOINTS OF CATEGORIES 5 AND 6 SHALL BE TYPE BUTT JOINTS UNLESS OTHERWISE SPECIFIED.
4. ALL WELDED JOINTS OF CATEGORIES 7 AND 8 SHALL BE TYPE BUTT JOINTS UNLESS OTHERWISE SPECIFIED.
5. ALL WELDED JOINTS OF CATEGORIES 9 AND 10 SHALL BE TYPE BUTT JOINTS UNLESS OTHERWISE SPECIFIED.
6. ALL WELDED JOINTS OF CATEGORIES 11 AND 12 SHALL BE TYPE BUTT JOINTS UNLESS OTHERWISE SPECIFIED.
7. ALL WELDED JOINTS OF CATEGORIES 13 AND 14 SHALL BE TYPE BUTT JOINTS UNLESS OTHERWISE SPECIFIED.
8. ALL WELDED JOINTS OF CATEGORIES 15 AND 16 SHALL BE TYPE BUTT JOINTS UNLESS OTHERWISE SPECIFIED.
9. ALL WELDED

ENCLOSURE 5
ATTACHMENT 4

REQUEST FOR RELIEF, 1-ISI-11
EXAMINATION DATA REPORTS

TENNESSEE VALLEY AUTHORITY		EXAMINATION SUMMARY AND RESOLUTION SHEET		REPORT NUMBER: R-0690	
PROJECT: WBN UNIT: 01 CYCLE 03A			COMPONENT ID: BIT-2		
EXAMINATION METHOD			SYSTEM: SIS ISI DWG NO: ISI-0053-C-01		
MT <input type="checkbox"/>	PT <input type="checkbox"/>	UT <input checked="" type="checkbox"/>	VT <input type="checkbox"/>	CONFIGURATION	
PROCEDURE: N-UT-77			REV 0	TC: N/A	CATEGORY
EXAMINER: D. Gronewold		EXAMINER: J. G. Abbott		EXAMINER: N/A	EXAMINER: N/A
LEVEL: II		LEVEL: II		LEVEL:	LEVEL:
<p>An Ultrasonic examination was performed on weld # BIT-2, a stainless steel bottom head to Vessel weld on the Boron injection tank.</p> <p>A 45 Deg. shearwave and a 60 Deg. RL with a 1/2V calibration were used for this examination. Also a 0 Deg. lamination scan was performed.</p> <p>No indications were detected.</p> <p>60% bidirectional code coverage was achieved by scanning over the weld.</p>					
RESOLUTION BY D. Gronewold		REVIEWED BY <i>[Signature]</i>		ANI: B. Earnigh	
LEVEL II DATE: 9-9-00		LEVEL: II DATE: 9-20-00		DATE: 9/23/00	
Page: 1 OF 7					

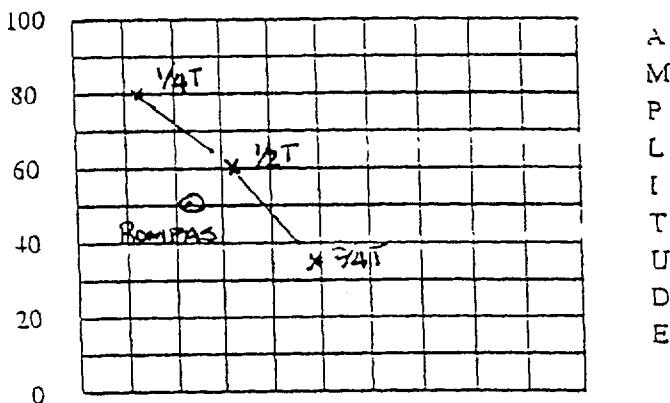
TENNESSEE VALLEY
AUTHORITY

DIGITAL ULTRASONIC
CALIBRATION
DATA SHEET

REPORT NUMBER:
R-0690

ECT: WBNP UNIT: 1 CYCLE: 3 CALIBRATION DATE: 9-9-00
 PROCEDURE: N-UT-77 REV: 0 TC: N/A CALIBRATION BLOCK NO.: WB-44 TEMP: 72 F
 INSTRUMENT: KB DUE DATE: 6-22-01 SIMULATOR BLOCK NO: 790391
 MODEL TYPE: USN-50 SERIAL NO.: E24253 THERMOMETER S/N: 562781 DUE DATE: 6-6-01
 TRANSDUCER MANUF: KBA COUPLANT ULTRAGEL BATCH: 00125
 S/N 011637 SIZE: 3.5x10 FREQ: 4 MHz EXAM TYPE: SHEAR ☐ LONG ☒ RL ☐
 CABLE TYPE: RG-174 LENGTH: 72 inches

DAC



DISPLAY WIDTH: 3.0 inches

REFLECTOR: ROMPAS SDH GAIN: 52 dB
 AMPLITUDE: 50 % METAL PATH: 737 "
 VERIFICATION TIMES 1) 0810 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	-12 dB	SET	+12	SET	+6			
	AMP	80%	32 TO 48	16 TO 24	20 %	64 TO 96	40%	64 TO 96			
			40	20		80		80			

COMMENTS: None WELDS/ITEMS EXAMINED:
 BIT-2

EXAMINER: [Signature] EXAMINER: [Signature] REVIEWER: [Signature] ANI: B. Earrigh
 DATE: 9/23/00 PG 2 OF 7

TENNESSEE VALLEY AUTHORITY		DIGITAL ULTRASONIC CALIBRATION DATA SHEET		REPORT NUMBER: R-0690									
PROJECT: WBNP UNIT: 1		CYCLE: 3		CALIBRATION DATE: 9-9-00									
PROCEDURE: N-UT-77		REV: 0 TC: N/A		CALIBRATION BLOCK NO.: WB-44 TEMP: 72 °F									
INSTRUMENT: KB		DUE DATE: 6-22-01		SIMULATOR BLOCK NO: 790391									
MODEL TYPE: USN-50		SERIAL NO.: E24253		THERMOMETER S/N: 562781 DUE DATE: 6-6-01									
TRANSDUCER MANUF: KBA		COUPLANT ULTRAGEL II BATCH: 00125											
S/N 00DAHM SIZE: .50"		FREQ: 1.5 MHz		EXAM TYPE: SHEAR <input checked="" type="checkbox"/> LONG <input type="checkbox"/> RL <input type="checkbox"/>									
CABLE TYPE: RG-174		LENGTH: 72 inches		ANGLE VERIFICATION									
DAC		BLOCK TYPE: RAMPAS		S/N: 790391									
		NOMINAL ANGLE: 45		ACTUAL ANGLE: 45									
<p>AMPLITUDE</p> <p>DISTANCE</p>		INSTRUMENT SETTINGS											
		REFLECTOR			REFERENCE		MEMORY						
		SCAN DIRECT.	NTCH	SDH	SENSITIVITY		NUMBER						
		AXIAL	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	22 dB		2						
		CIRC	<input type="checkbox"/>	<input type="checkbox"/>	SAME (FLAT BLOCK)								
		FREQ: 3.5 MHz		REJECT: 0 %									
		ANGLE: 45 deg		DAMPING: FIXED ohms									
		DELAY: 7.672 msec		PULSER: HIGH *									
		ZERO: 7.885 msec		FILTER: FIXED *									
		VELOCITY: .1227 msec		REP RATE: HIGH									
RANGE: 4.687 inches		TOF: <input checked="" type="checkbox"/> PEAK <input type="checkbox"/> FLANK											
RECTIFIER: FIXED		POWER: BATT											
DUAL: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF		TCG: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF											
CALIBRATION TIMES													
REFLECTOR: RAMPAS SDH GAIN: 22.0dB		INITIAL TIME: 0802		FINAL TIME: 0901									
AMPLITUDE: 45 %		METAL PATH: 1.05 "											
VERIFICATION TIMES		1) 0822	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	-12 dB	SET	+12	SET	+6				
		AMP	80%	32 TO 48	16 TO 24	20 %	64 TO 96	40%	64 TO 96				
				40	20			80		80			
COMMENTS:						WELDS/ITEMS EXAMINED:							
						BIT-2							
EXAMINER:		EXAMINER:		REVIEWER:		ANI: B. Earnigh							
						DATE: 9/23/00							
L: II		LEVEL: II		LEVEL: II		DATE: 9-20-00		PG.: 3		OF 7			

TENNESSEE VALLEY AUTHORITY		DIGITAL ULTRASONIC CALIBRATION DATA SHEET		REPORT NUMBER: R-0690								
PROJECT: WBNP UNIT: 1		CYCLE: 3		CALIBRATION DATE: 9-9-00								
PROCEDURE: N-UT-77 REV: 0 TC: N/A		CALIBRATION BLOCK NO.: WB-44		TEMP: 72 °F								
INSTRUMENT: KB DUE DATE: 6-22-01		SIMULATOR BLOCK NO.: 790391										
MODEL/TYPE: USN-50 SERIAL NO.: E24253		THERMOMETER S/N: 562781		DUE DATE: 6-6-01								
TRANSDUCER MANUF: SIGMA		COUPLANT ULTRAGEL II BATCH: 00125										
S/N 723A-94005 SIZE: 2(18x10) FREQ: 2 MHz		EXAM TYPE: <input type="checkbox"/> SHEAR <input type="checkbox"/> LONG <input type="checkbox"/> RL <input checked="" type="checkbox"/>										
CABLE TYPE: BG-174 LENGTH: 72 inches		ANGLE VERIFICATION										
DAC		BLOCK TYPE: Rompas		S/N: 790391								
		NOMINAL ANGLE: 60		ACTUAL ANGLE: 60								
<div style="display: flex; align-items: center;"> <div style="flex: 1;"> </div> <div style="flex: 0.2; text-align: center; font-size: small;"> A M P L I T U D E </div> </div> <p>DISPLAY WIDTH: 6.61 inches</p>		INSTRUMENT SETTINGS										
		REFLECTOR			REFERENCE	MEMORY						
		SCAN DIRECT.	NTCH	SDH	SENSITIVITY	NUMBER						
		AXIAL	<input type="checkbox"/>	<input checked="" type="checkbox"/>	47 dB	3						
		CIRC	<input type="checkbox"/>	<input type="checkbox"/>	SAME dB	(FLAT BLOCK)						
		FREQ: BB MHz			REJECT: 0 %							
		ANGLE: 60 deg			DAMPING: FIXED ohms							
		DELAY: 8.859 msec			PULSER: HIGH *							
		ZERO: 8.873 msec			FILTER: FIXED *							
		VELOCITY: 2295 msec			REP RATE: HIGH							
RANGE: 6.61 inches			TOF: <input checked="" type="checkbox"/> PEAK <input type="checkbox"/> FLANK									
RECTIFIER: FIXED			POWER: BATT									
DUAL: <input checked="" type="checkbox"/> ON <input type="checkbox"/> OFF			TCG: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF									
CALIBRATION TIMES												
INITIAL TIME: 0805			FINAL TIME: 0902									
VERIFICATION TIMES		1) 0840	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			-12 dB			SET	+12	SET	+6
	AMP	80%	32 TO 48			16 TO 24			20 %	64 TO 96	40%	64 TO 96
			40			20			80			80
COMMENTS: NOTCH CAN NOT BE SEEN @ 47 DB,						WELDS/ITEMS EXAMINED:						
SET @ 80% @ 69 DB.						BIT-2						
EXAMINER:		EXAMINER:		REVIEWER:		ATTN: B. Earnigh						
						DATE: 9/23/00						
L: II		LEVEL: II		LEVEL: II		PG.: 4 OF 7						

TENNESSEE VALLEY AUTHORITY				ULTRASONIC PIPING EXAMINATION DATA SHEET				REPORT NUMBER: R-0690			
PROJECT: WBN UNIT: 1				CYCLE: 3		EXAMINATION DATE: 9-9-00					
PROCEDURE: N-UT-77				REV: 0		TC: N/A		START TIME: 0810		END TIME: 0902	
SYSTEM: SIS				EXAM SURFACE <input type="checkbox"/> ID <input checked="" type="checkbox"/> OD							
COMPONENT ID: BIT-2				MATL. TYPE: <input type="checkbox"/> CS <input checked="" type="checkbox"/> SS <input type="checkbox"/> CSCL <input checked="" type="checkbox"/> CCSS							
C ONFIGURATION <u>HEAD</u> TO <u>SHELL</u> FLOW \longrightarrow				SURFACE TEMP.: 84 °F				PYRO. NO.: 562781			
				CAL DUE DATE: 6-6-01							
				EXAM ANGLE		0°/45° DEG		60° DEG			
W ₀ REFERENCE: WELD 4				CIRC. SCAN SENSITIVITY		64/28 dB				dB	
L ₀ REFERENCE: MANWAY 4				AXIAL SCAN SENSITIVITY		64/28 dB				59 dB	

IND. NO.	L (in) FROM REF.			AT MAX AMP			MAX AMP %DAC	EXAM NO. 3-14	NOM. ANG.	N R I	IND. INFO: TYPE, DAMPING, ETC.
	L1	L MAX	L2	W MAX	MP MAX	D MAX					
							%	1+2	0°	✓	
							%	1	45°	✓	
							%	3	45°	✓	
							%	4	45°	✓	
							%	1	60°RL	✓	
							%	3	60°RL	✓	
							%	4	60°RL	✓	
							%				
							%				
							%				
							%				
							%				
							%				
							%				
							%				

REMARKS / LIMITATIONS: **SINGEL^{LE} SIDE EXAM DUE TO THE VESSEL SHELL BEING CCSS.**

EXAMINER: <i>[Signature]</i>	LEVEL: II	ANII: <i>B. Eamigh</i>
EXAMINER: <i>[Signature]</i>	LEVEL: II	DATE: 9/23/00
VIEWER: <i>[Signature]</i>	LEVEL: III	DATE: 9.20.00
		PAGE 5 OF 7

TVA

WALL THICKNESS
PROFILE SHEET

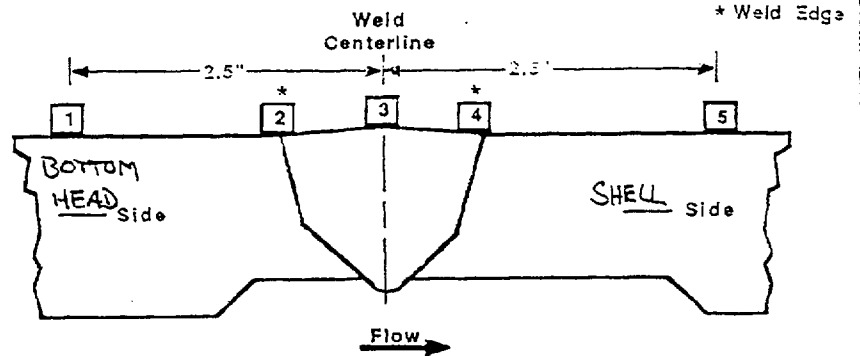
REPORT NO:

R-0690

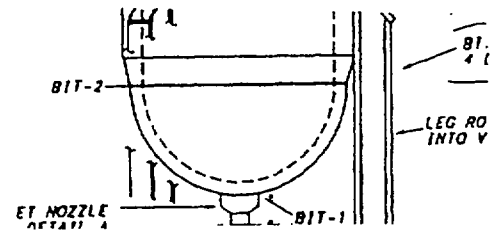
PROJECT: WBNPWELD NO: BIT-2UNIT: 1SYSTEM: SIS

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

Position	0°	90°	180°	270°
1	2.10			
2	1.93			
3	N/A		N/A	
4	N/A			
5	N/A			

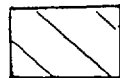
CROWN HEIGHT: .10" - .15"DIAMETER: 53" DIA.CROWN WIDTH: 2.8"WELD LENGTH: 164.5"

NO THICKNESS READINGS ACHIEVED ON WELD OR SHELL.



BOTTOM HEAD

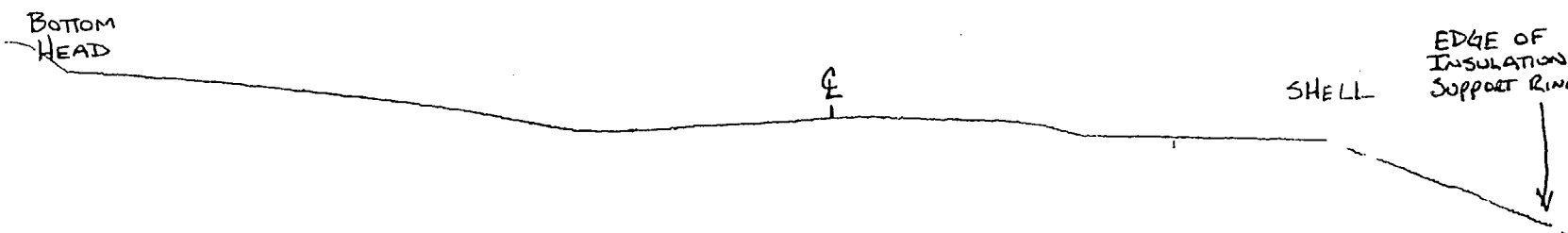
60° 45°

60%
COVERAGE= BIDIRECTIONAL
COVERAGE

SHELL

NO SCAN ON SHELL 9106
DUE TO MATERIAL
SA-391 CFBA.
AT PRESENT TECHNOLOGY
THE ONLY EXAM BEING
PERFORMED ON CFBA
MATERIAL IS 45° RL
LARGE TRANSDUCERS.
DUE TO THE "TAPER"
THE 45° WOULD BE
INEFFECTIVE.

EXAMINER: D. J. AronowREVIEWED BY: M. B. AronowANII: B. EarnestLEVEL: IILEVEL: IIIDATE: 9-20-00DATE: 9/23/00DATE: 9-9-00PAGE: 6OF: 7

TVA Office of Nuclear Power	PROJECT: <u>WBNP</u> SYSTEM: <u>SIS</u> Unit: <u>1 C3</u> WELD NO.: <u>BIT-2</u>	REPORT NO.: <u>R-0690</u>
		
BY: <u>Douglas Meneuold</u> LEVEL: <u>II</u> DATE: <u>9-9-00</u> PAGE <u>7</u> OF <u>7</u>		

TENNESSEE VALLEY AUTHORITY		EXAMINATION SUMMARY AND RESOLUTION SHEET		REPORT NUMBER: R-0691	
PROJECT: WBN UNIT: 01 CYCLE 03A			COMPONENT ID: BIT-3		
EXAMINATION METHOD			SYSTEM: SIS ISI DWG NO: ISI-0053-C-01		
MT <input type="checkbox"/>	PT <input type="checkbox"/>	UT <input checked="" type="checkbox"/>	VT <input type="checkbox"/>	CONFIGURATION	
PROCEDURE: N-UT-77			REV 0	TC: N/A	CATEGORY
VSHELL TO VSHELL			C-A		
EXAMINER: D. Gronewold		EXAMINER: J. G. Abbott		EXAMINER: N/A	
LEVEL: II		LEVEL: II		LEVEL:	
<p>An Ultrasonic examination was performed on weld # BIT-3, a stainless steel top head to Vessel weld on the Boron injection tank.</p> <p>A 45 Deg. shearwave and a 60 Deg. RI. with a 1/2V calibration were used for this examination. Also a 0 Deg. lamination scan was performed.</p> <p>No indications were detected.</p> <p>63% bidirectional code coverage was achieved by scanning over the weld.</p>					
RESOLUTION BY D. Gronewold		REVIEWED BY <i>[Signature]</i>		ANII: B. Earnigh	
LEVEL II DATE: 9-8-00		LEVEL: II DATE: 9-10-00		DATE: 9/23/00	
Page: 1 OF 7					

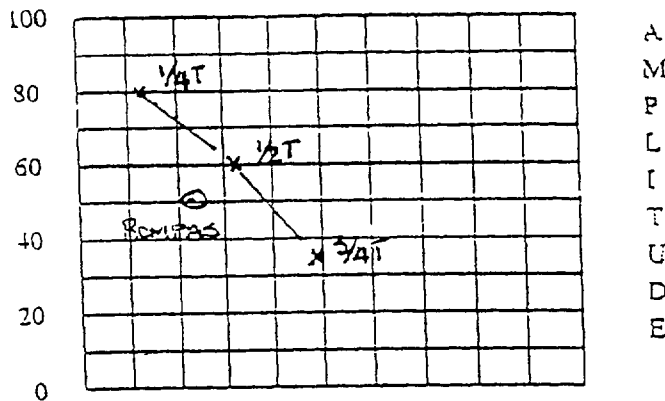
TENNESSEE VALLEY
AUTHORITY

DIGITAL ULTRASONIC
CALIBRATION
DATA SHEET

REPORT NUMBER:
R-0691

PROJECT: WBNP UNIT: 1 CYCLE: 3 CALIBRATION DATE: 9-8-00
 PROCEDURE: N-UT-77 REV: 0 TC: N/A CALIBRATION BLOCK NO.: WB-44 TEMP: 72 °F
 INSTRUMENT: KB DUE DATE: 6-22-01 SIMULATOR BLOCK NO: 790391
 MODEL TYPE: USN-50 SERIAL NO.: E24253 THERMOMETER S/N: 562781 DUE DATE: 6-6-01
 TRANSDUCER MANUF: KBA M960 COUPLANT ULTRAGEL BATCH: 00125
 S/N 01637 SIZE: 3.5x10 FREQ: 4 MHz EXAM TYPE: SHEAR ☐ LONG ☒ RL ☐
 CABLE TYPE: RG-174 LENGTH: 72 inches

DAC



DISPLAY WIDTH: 3.0 inches

REFLECTOR: Rompas SDH GAIN: 52 dB
 AMPLITUDE: 50 % METAL PATH: 737 "
 VERIFICATION TIMES 1) 1220 2) 1305 3) N/A 4) 5) 6) 7) 8) 9)

ANGLE VERIFICATION
 BLOCK TYPE: Rompas S/N: 790391
 NOMINAL ANGLE: 0 ACTUAL ANGLE: 0
 INSTRUMENT SETTINGS

REFLECTOR			REFERENCE	MEMORY
SCAN DIRECT.	NTCH	SDH	SENSITIVITY	NUMBER
AXIAL 0°	<input type="checkbox"/>	<input checked="" type="checkbox"/>	52 dB	1
CIRC	<input type="checkbox"/>	<input type="checkbox"/>	N/A dB	N/A

 FREQ: BB MHz REJECT: 0 %
 ANGLE: OFF deg DAMPING: FIXED ohms
 DELAY: 9.102 msec PULSER: HIGH *
 ZERO: 8.882 msec FILTER: FIXED *
 VELOCITY: .2266 msec REP RATE: HIGH
 RANGE: 3.0 inches TOF: ☒ PEAK ☐ FLANK
 RECTIFIER: FIXED POWER: BATT
 DUAL: ☒ ON ☐ OFF TCG: ☐ ON ☒ OFF

CALIBRATION TIMES

INITIAL TIME: 1210 FINAL TIME: 1405

* PDI QUALIFIED INSTRUMENT SETTINGS:

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

LINEARITY CHECK

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

COMMENTS:

WELDS/ITEMS EXAMINED:

BIT-3

EXAMINER:

EXAMINER:

REVIEWER:

ANII: B. Eamigh

DATE: 9/23/00

LEVEL: II

LEVEL: III

DATE: 9-20-00

PG.: 2 OF 7

TENNESSEE VALLEY AUTHORITY		DIGITAL ULTRASONIC CALIBRATION DATA SHEET		REPORT NUMBER: R-0691							
PROJECT: WBNP UNIT: 1		CYCLE: 3		CALIBRATION DATE: 9-8-00							
PROCEDURE: N-UT-77		REV: 0 TC: N/A		CALIBRATION BLOCK NO.: WB-44 TEMP: 72 °F							
INSTRUMENT: KB		DUE DATE: 6-22-01		SIMULATOR BLOCK NO: 790391							
MODEL/TYPE: USN-50		SERIAL NO.: E24253		THERMOMETER S/N: 562781 DUE DATE: 6-6-01							
TRANSDUCER MANUF: KPA		COUPLANT: ULTRAGEL II BATCH: 00125									
S/N: 0004HM SIZE: .50"		FREQ: 1.5 MHz		EXAM TYPE: SHEAR <input checked="" type="checkbox"/> LONG <input type="checkbox"/> RL <input type="checkbox"/>							
CABLE TYPE: RG-174		LENGTH: 72 inches		ANGLE VERIFICATION							
DAC		BLOCK TYPE: ROMPAS		S/N: 790391							
		NOMINAL ANGLE: 45		ACTUAL ANGLE: 45							
		INSTRUMENT SETTINGS									
		REFLECTOR			REFERENCE	MEMORY					
		SCAN DIRECT.	NTCH	SDH	SENSITIVITY	NUMBER					
		AXIAL	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	22 dB	2					
		CIRC	<input type="checkbox"/>	<input type="checkbox"/>	SAME (FLAT BLOCK)						
		FREQ:	33	MHz	REJECT:	0 %					
		ANGLE:	45	deg	DAMPING:	FIXED ohms					
		DELAY:	7.672	msec	PULSER:	HIGH *					
		ZERO:	7.885	msec	FILTER:	FIXED *					
		VELOCITY:	.1227	msec	REP RATE:	HIGH					
RANGE:	4.687	inches	TOF:	<input checked="" type="checkbox"/> PEAK <input type="checkbox"/> FLANK							
RECTIFIER:	FIXED		POWER:	BATT							
DUAL:	<input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF	TCG:	<input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF								
DISPLAY WIDTH: 4.687 inches REFLECTOR: ROMPAS SDH GAIN: 22.0 dB AMPLITUDE: 45 % METAL PATH: 1.05"		CALIBRATION TIMES									
		INITIAL TIME: 1210		FINAL TIME: 1405							
VERIFICATION TIMES		1) 1230	2) 1315	3) N/A	4) _____						
		5) _____	6) _____	7) _____	8) _____						
		9) _____									
* PDI QUALIFIED INSTRUMENT SETTINGS:											
VERIFY INSTRUMENT SETTINGS AND CALIBRATION SEQUENCE ARE IN ACCORDANCE WITH TABLE 2 OF THE APPLICABLE PDI QUALIFICATION IMPLEMENTATION PROCEDURE !											
LINEARITY CHECK											
VERTICAL	SIGNAL 1	100	90	80	70	60	50	40	30	20	
	SIGNAL 2	50	45	40	35	30	25	20	15	10	
ATTENUATOR	GAIN	SET	-6 dB	-12 dB	SET	+12	SET	+6			
	AMP	80%	32 TO 48	16 TO 24	20 %	64 TO 96	40%	64 TO 96			
			40	20		80		80			
COMMENTS:						WELDS/ITEMS EXAMINED:					
						BIT-3					
EXAMINER:		EXAMINER:		REVIEWER:		ANTI:		B. Eamig			
<i>Douglas H. Henslow</i>		<i>J. H. Henslow</i>		<i>W. H. Henslow</i>				DATE: 9/23/00			
L: II		LEVEL: II		LEVEL: III		DATE: 9-20-00		PG.: 3 OF 7			

TENNESSEE VALLEY AUTHORITY		DIGITAL ULTRASONIC CALIBRATION DATA SHEET		REPORT NUMBER: R-0691	
PROJECT: WBNP UNIT: 1		CYCLE: 3		CALIBRATION DATE: 9-8-00	
CEDURE: N-UT-77 REV: 0 TC: N/A		CALIBRATION BLOCK NO.: WB-44 TEMP: 72 °F			
RUMENT: KB DUE DATE: 6-22-01		SIMULATOR BLOCK NO.: 790391			
MODEL TYPE: USN-50 SERIAL NO.: E24253		THERMOMETER S/N: 562781 DUE DATE: 6-6-01			
TRANSDUCER MANUF: SIGMA		COUPLANT ULTRAGEL II BATCH: 00125			
S/N 723A-94005 SIZE: 2(18x10) FREQ: 2 MHz		EXAM TYPE: <input type="checkbox"/> SHEAR <input type="checkbox"/> LONG <input type="checkbox"/> RL <input checked="" type="checkbox"/>			
CABLE TYPE: R4-174 LENGTH: 72 inches		ANGLE VERIFICATION			
DAC		BLOCK TYPE: RomPAS S/N: 790391			
		NOMINAL ANGLE: 60 ACTUAL ANGLE: 60			

DISPLAY WIDTH: **6.61** inches

REFLECTOR			REFERENCE	MEMORY
SCAN DIRECT.	NTCH	SDH	SENSITIVITY	NUMBER
AXIAL	<input type="checkbox"/>	<input checked="" type="checkbox"/>	47 dB	3
CIRC	<input type="checkbox"/>	<input type="checkbox"/>	SAME dB (FLAT BLOCK)	
FREQ: 2 MHz			REJECT: 0 %	
ANGLE: 60 deg			DAMPING: FIXED ohms	
DELAY: 8.859 msec			PULSER: HIGH "	
ZERO: 8.873 msec			FILTER: FIXED "	
VELOCITY: .2295 msec			REP RATE: HIGH	
RANGE: 6.61 inches			TOF: <input checked="" type="checkbox"/> PEAK <input type="checkbox"/> FLANK	
RECTIFIER: FIXED			POWER: BATT	
DUAL: <input checked="" type="checkbox"/> ON <input type="checkbox"/> OFF			TCG: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF	

REFLECTOR: RomPAS SDH GAIN: 47 dB		CALIBRATION TIMES	
LITUDE: 65 % METAL PATH: 1.45 "		INITIAL TIME: 12.14 FINAL TIME: 1407	
VERIFICATION TIMES	1) 1250 2) 1335 3) N/A 4) 5) 6) 7) 8) 9) 		

* PDI QUALIFIED INSTRUMENT SETTINGS:

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

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

COMMENTS: Notch CAN NOT BE SEEN @ 47 DB, SET @ 30% @ 69 DB.		WELDS/ITEMS EXAMINED: BIT-3	

EXAMINER: <i>Douglas Gensworth</i> L: II	EXAMINER: <i>John G. Galt</i> LEVEL: II	REVIEWER: <i>W. Bentley</i> LEVEL: III DATE: 9.10.00	ANALYST: <i>B. E. Smith</i> DATE: 9/23/00 PG.: 4 OF 7
---	--	--	---

TENNESSEE VALLEY AUTHORITY				ULTRASONIC PIPING EXAMINATION DATA SHEET				REPORT NUMBER: R-0691			
PROJECT: WBN UNIT: 1				CYCLE: 3				EXAMINATION DATE: 9-8-00			
PROCEDURE: N-UT-77				REV: 0 TC: N/A				START TIME: 1305 END TIME: 1400			
SYSTEM: SIS								EXAM SURFACE <input type="checkbox"/> ID <input checked="" type="checkbox"/> OD			
COMPONENT ID: BIT-3								MATERIAL TYPE: <input type="checkbox"/> CS <input checked="" type="checkbox"/> SS <input type="checkbox"/> CSCL <input checked="" type="checkbox"/> CCSS			
CONFIGURATION SHELL TO HEAD FLOW →				SURFACE TEMP.: 84 °F				PYRO. NO.: 562781			
				CAL DUE DATE: 6-6-01							
				EXAM ANGLE		0/45° DEG		60° DEG			
W0 REFERENCE:				CIRC. SCAN SENSITIVITY				64/28 dB		dB	
L0 REFERENCE:				AXIAL SCAN SENSITIVITY				64/28 dB		59 dB	
IND. NO.	L (in) FROM REF.			AT MAX AMP			MAX AMP %DAC	EXAM NO. 3-14	NOM. ANG.	N R I	IND. INFO: TYPE, DAMPING, ETC.
	L1	L MAX	L2	W MAX	MP MAX	D MAX					
							%	1+2	0°	✓	
							%	2	45°	✓	
							%	3	45°	✓	
							%	4	45°	✓	
							%	2	60°RL	✓	
							%	3	60°RL	✓	
							%	4	60°RL	✓	
							%				
							%				
							%				
							%				
							%				
							%				
							%				
REMARKS / LIMITATIONS: SINGLE SIDE EXAM DUE TO THE VESSEL SHELL BEING CCSS.											
EXAMINER: [Signature] LEVEL: II ANII: B. Earnigh											
EXAMINER: [Signature] LEVEL: II DATE: 9/23/00											
VIEWER: [Signature] LEVEL: III DATE: 9-20-00 PAGE 5 OF 7											

TVA

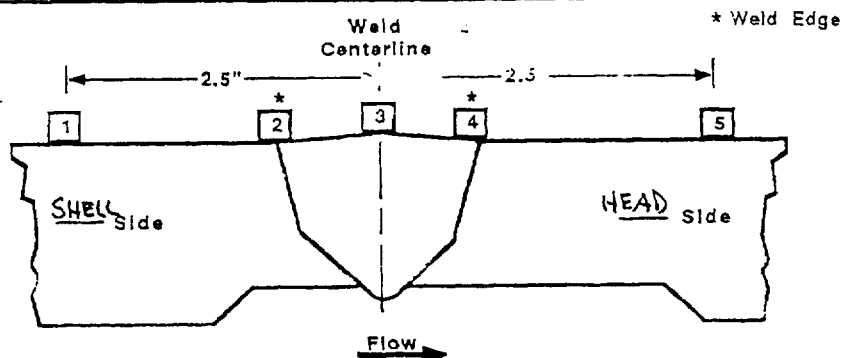
WALL THICKNESS
PROFILE SHEET

REPORT NO:

R-0691

PROJECT: WBNPWELD NO: BIT-3UNIT: 1SYSTEM: SISRecord Thickness Measurements As
Indicated, Including Weld Width,
Edge-To-Edge At 0°

Position	0°	90°	180°	270°
1	N/A			
2	N/A			
3	N/A		N/A	
4	1.8			
5	2.1			

CROWN HEIGHT: 1'DIAMETER: 53"CROWN WIDTH: 2.5'WELD LENGTH: 164.5"OUTLET NOZZLE
SEE DETAIL A

BIT-3

BIT-4

2.00" NOM.

3.12" NOM.

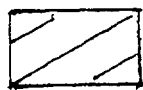
SHELL

NO SCAN ON SHELL
SIDE DUE TO SEVERE
TAPER AND SHELL
MATERIAL OF C-28
SA-351 CF8A

HEAD

45°

60°

BIDIRECTIONAL
COVERAGE63%
COVERAGEEXAMINER: Dough AvenardREVIEWED BY: W. BentleyANII: B. EamighLEVEL: IILEVEL: III DATE: 9-20-00DATE: 9/23/00DATE: 9-8-00PAGE 6 OF 7

TVA Office of Nuclear Power	PROJECT: <u>WBN</u>	SYSTEM: <u>SIS</u>	REPORT NO.: <u>R-0691</u>
	Unit: <u>1</u>	WELD NO.: <u>BIT-3</u>	
<div style="text-align: center;"><p>← N/A →</p><p>188"</p><p>2.1" (3.00" FROM TOE)</p></div>			
RING IS 6.75" FROM WELD E			
BY: <u>Douglas A. renewed</u>	LEVEL: <u>II</u>	DATE: <u>9-8-00</u>	PAGE <u>7</u> OF <u>7</u>

ENCLOSURE 6

WATTS BAR NUCLEAR PLANT UNIT 1
INSERVICE INSPECTION PROGRAM
REQUEST FOR RELIEF, 1-ISI-12

ENCLOSURE 6

WATTS BAR NUCLEAR PLANT UNIT 1 FIRST 10-YEAR INTERVAL REQUEST FOR RELIEF 1-ISI-12

SUMMARY:

Volumetric examination of the boron injection tank nozzle-to-head welds during the Unit 1 Cycle 3 refueling outage resulted in less than essentially 100% of ASME code coverage being achieved due to configuration of the nozzles. The configuration of the nozzles prevents ultrasonic examination from the nozzle side, thus preventing full coverage of the required lower one-third examination volume. Volumetric examination of this component is required in accordance with ASME Section XI Table IWC-2500-1, Examination Category C-B, Item Number C2.21. The lower one-third volume weld examination requirement is illustrated by Figure IWC-2500-4(a).

Conformance to the code requirement is impractical to implement due to physical restrictions, therefore, relief is requested in accordance with 10CFR50.55a(g) (5) (iii).

I. COMPONENT:

Boron Injection Tank Nozzle-to-Head Welds - Reference ISI Drawing ISI-0053-C-01 (Attachment 1), weld identifiers BIT-1 and BIT-4.

II. CODE REQUIREMENT:

ASME Section XI, 1989 Edition, Table IWC-2500-1, Examination Category C-B, Item Number C2.21, volumetric examination requirement as defined by Figure IWC-2500-4(a) (Attachment 2).

III. CODE REQUIREMENTS FROM WHICH RELIEF IS REQUESTED:

Relief is requested from performing the required volumetric examination on essentially 100% of the lower one-third volume of the boron injection tank nozzle-to-head welds.

IV. BASIS FOR RELIEF:

The design configuration of the boron injection tank nozzle-to-head welds preclude a full volumetric examination of the required volume for the weld. The design configuration limits ultrasonic examination of the code required examination volume to approximately 80%.

V. ALTERNATIVE EXAMINATION:

The code required 100% volumetric examination of the lower one-third volume of the boron injection tank nozzle-to-head weld was performed on accessible areas to the extent practical given

ENCLOSURE 6

WATTS BAR NUCLEAR PLANT UNIT 1 FIRST 10-YEAR INTERVAL REQUEST FOR RELIEF 1-ISI-12

the design configuration of the shell-to-flange weld. The code required surface examination was performed on both welds and was acceptable as documented on examination reports R-0578 and R-0583 (Attachment 4).

VI. JUSTIFICATION FOR THE GRANTING OF RELIEF:

Volumetric examination of the boron injection tank nozzle-to-head welds during the Unit 1 Cycle 3 refueling outage resulted in less than essentially 100% of ASME code coverage being achieved due to configuration of the nozzles. The configuration of the nozzles prevents ultrasonic examination from the nozzle side, thus preventing full coverage of the required lower one-third examination volume. Volumetric examination of this component is required in accordance with ASME Section XI Table IWC-2500-1, Examination Category C-B, Item Number C2.21. The lower one-third volume weld examination requirement is illustrated by Figure IWC-2500-4(a).

The nozzles are shown in detail on Vendor Drawing 1100E48 Sheet 2 of 2, details F and S (Attachment 3. As noted on examination reports R-0689 and R-0692 (Attachment 4), no ultrasonic scans were performed from the nozzle side of the weld due to the nozzle configuration. A 100% bi-directional coverage was achieved with a 45° scan by scanning over the weld onto the nozzle side. The design configuration limits ultrasonic examination of the code required examination volume to approximately 80%. No indications were detected. The code required surface examination was performed on the welds and was acceptable as documented on examination reports R-0578 and R-0583 (Attachment 4).

Conformance to the code requirement is impractical to implement due to physical restrictions, therefore, relief is requested in accordance with 10CFR50.55a(g) (5) (iii).

VII. IMPLEMENTATION SCHEDULE:

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

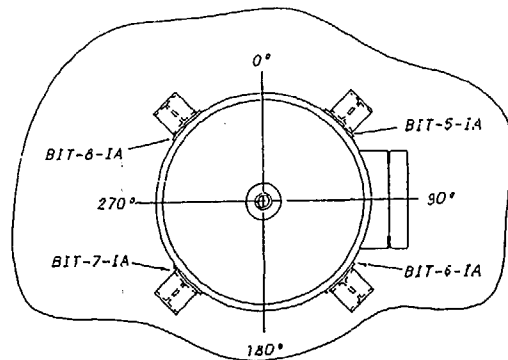
ENCLOSURE 6

WATTS BAR NUCLEAR PLANT UNIT 1
FIRST 10-YEAR INTERVAL
REQUEST FOR RELIEF 1-ISI-12
LIST OF ATTACHMENTS

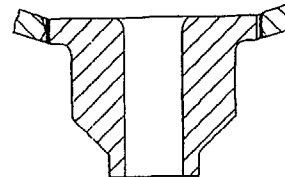
- Attachment 1. ISI Drawing ISI-0053-C-01
- Attachment 2. ASME Section XI Figure IWC-2500-4(a), Nozzle-to-Vessel Welds
- Attachment 3. Vendor Drawing 1100E48, Sheet 2
- Attachment 4. Examination Data Reports:
- Liquid Penetrant Examination Report R-0578 for Weld BIT-4.
 - Liquid Penetrant Examination Report R-0583 for Weld BIT-1.
 - Ultrasonic Examination Report R-0689 for Weld BIT-1.
 - Ultrasonic Examination Report R-0692 for Weld BIT-4

ENCLOSURE 6
ATTACHMENT 1

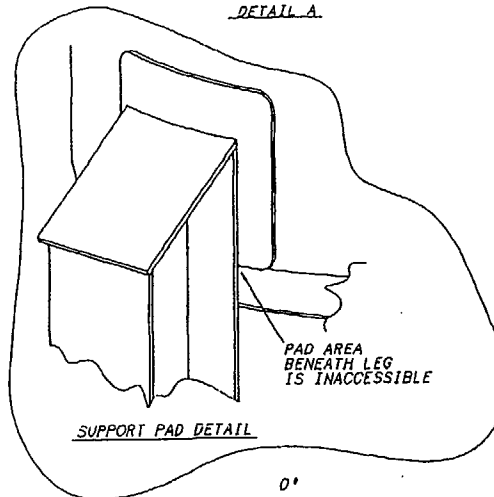
REQUEST FOR RELIEF 1-ISI-12
ISI DRAWING ISI-0053-C-01



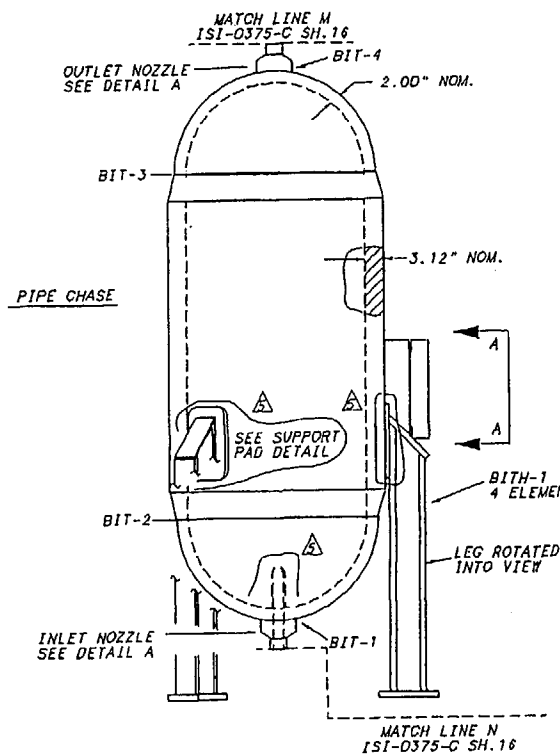
INTEGRAL ATTACHMENTS



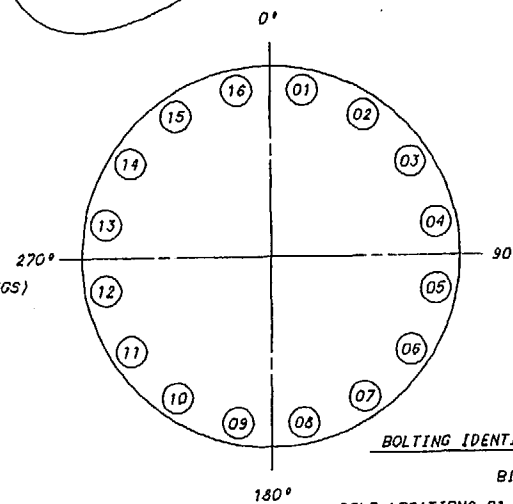
DETAIL A



SUPPORT PAD DETAIL



PIPE CHASE



BOLTING IDENTIFIER

SECTION A-A

REFERENCE DRAWINGS
WESTINGHOUSE 110DE48
WSN E-2879 IC-74

MATERIAL SPECIFICATIONS

TANK

SHELL
SA-351 CF8A
3.12" NOM.
HEADS
SA240 TP 304
2.00" NOM

NOZZLES
6", SA182 F 304

BOLTING

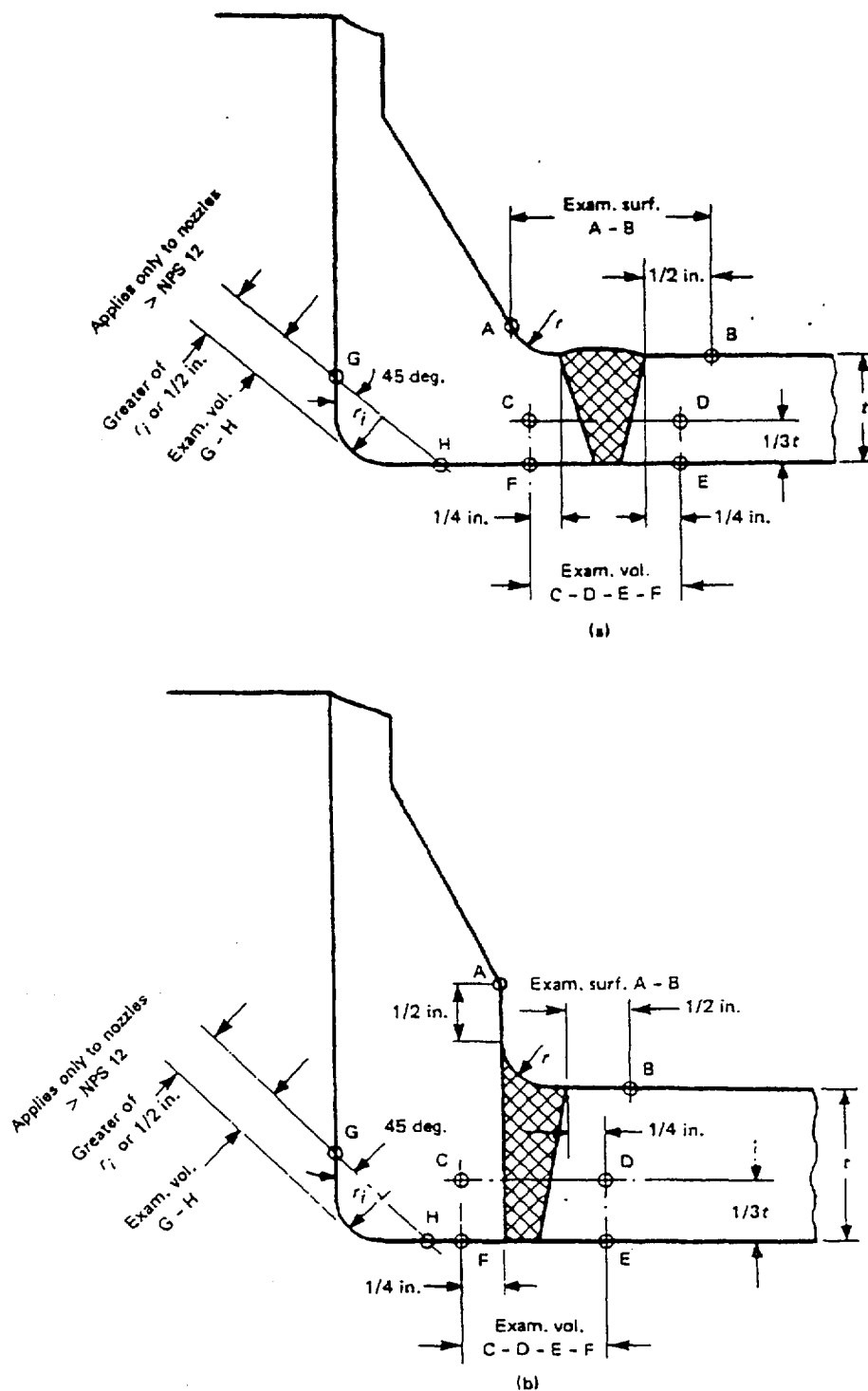
STUDS
SA 193 GR. B7
2.50-8UN-2A X 13.50
NUTS
SA 193 GR. 2H
2.50-8UN-2B HVY.

ASME CC-2 (EQUIVALENT)

5	PHB	KEC	ILH	WDD	12-11-00	
ADD SUPPORT PADS, SUPPORT PAD DETAIL, AND SPARGER PER FOOT 00-04						
4	PHB	KEC	GLB	RDB	2-7-98	
MADE C-SIZE, ADD SUPPORT ID, ADD SIZE TO MATERIAL SPEC						
3	PHB	PHB	GLB	FAK	3-22-95	
MOVE ST HELPS -6, -7, STS-162 TO ISI-0375-C SH. 16, REVISE TITLE BLOCK						
2	APC	PHB	KEC	GLB	6-28-93	
REVISE IDENTIFIERS FOR PRISM, ADD CONTINUATIONS, & REDRAW ON CAD						
1	KEY	JCC	GLB		1-14-83	
CHANGED CLASS DESIGNATIONS AND ADD ROOM LOCATION						
REV.	BY	CHECKED	SUBMITTED	APPROVED	DATE	
TENNESSEE VALLEY AUTHORITY						
WATTS BAR NUCLEAR PLANT						
UNIT 1						
BORON INJECTION TANK						
WELD AND SUPPORT LOCATIONS						
DRAWN: KEY	DATE: 2-18-82	SCALE: NOT TO SCALE				
CHECKED: DAD	APPROVED: GLB	CAD MAINTAINED DRAWING		REV		
SUBMITTED:	ISI-0053-C-07					05

ENCLOSURE 6
ATTACHMENT 2

REQUEST FOR RELIEF 1-ISI-12
ASME SECTION XI FIGURE IWC-2500-4(a)

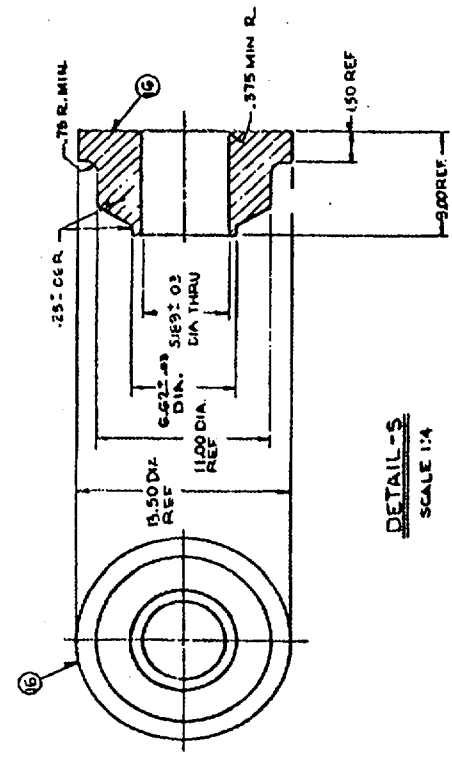


GENERAL NOTE: Nozzle sizes over NPS 4; vessel thickness over 1/2 in.

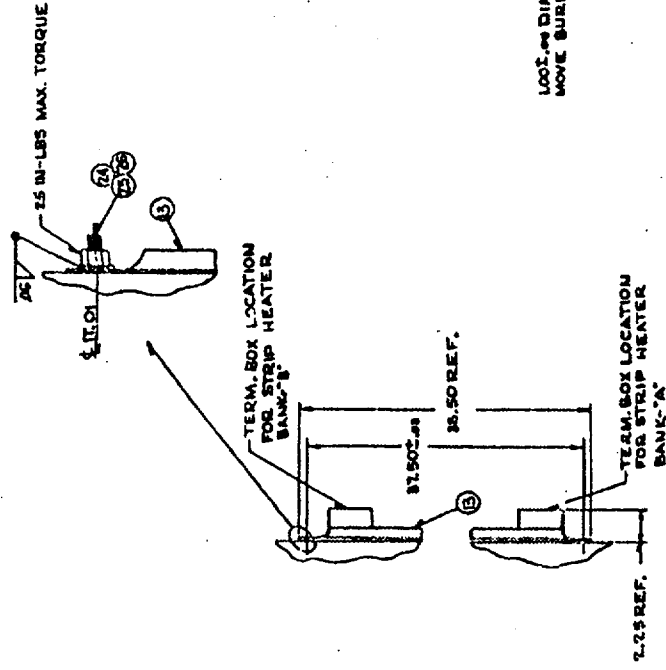
FIG. IWC-2500-4 NOZZLE-TO-VESSEL WELDS

ENCLOSURE 6
ATTACHMENT 3

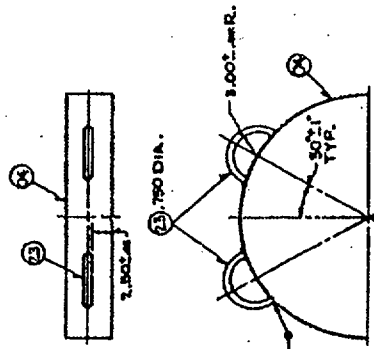
REQUEST FOR RELIEF 1-ISI-12
VENDOR DRAWING 1100E48, SHEET 2



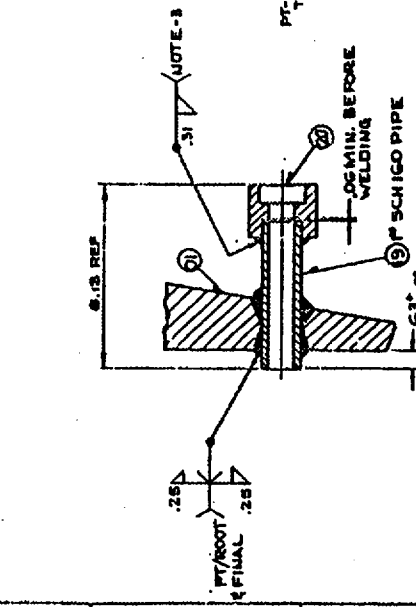
DETAIL-S
SCALE 1:4



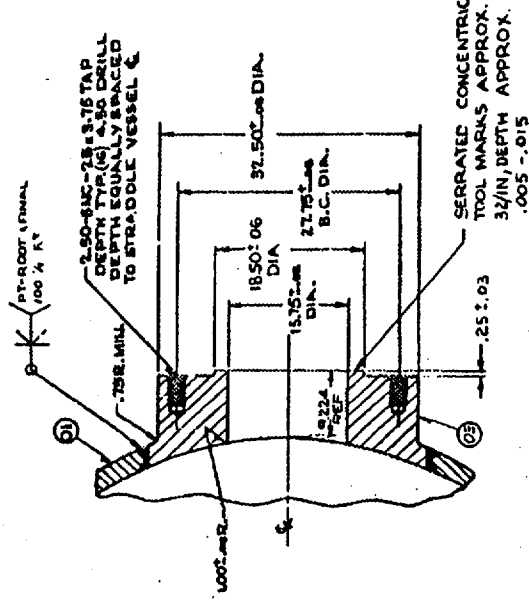
DETAIL-P
SCALE 1:4



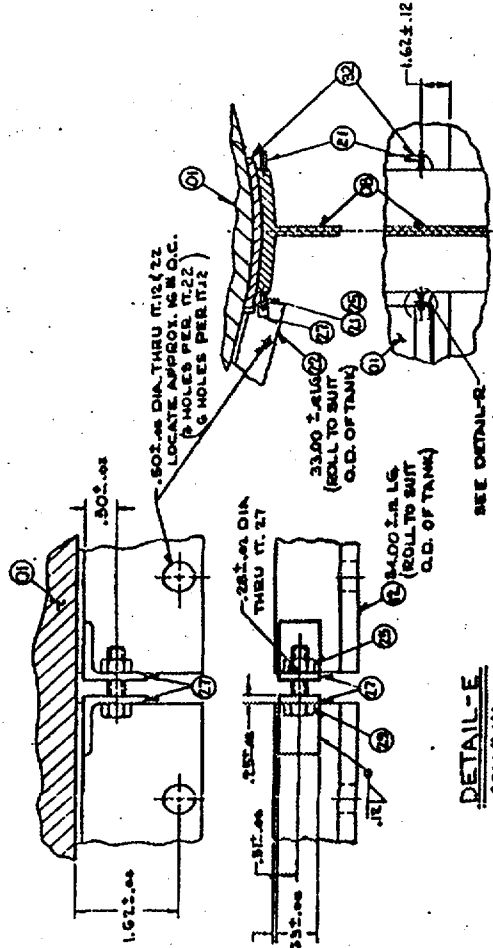
DETAIL - D
SCALE 1:8



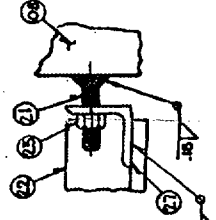
SECTION G-6
SCALE 1:2



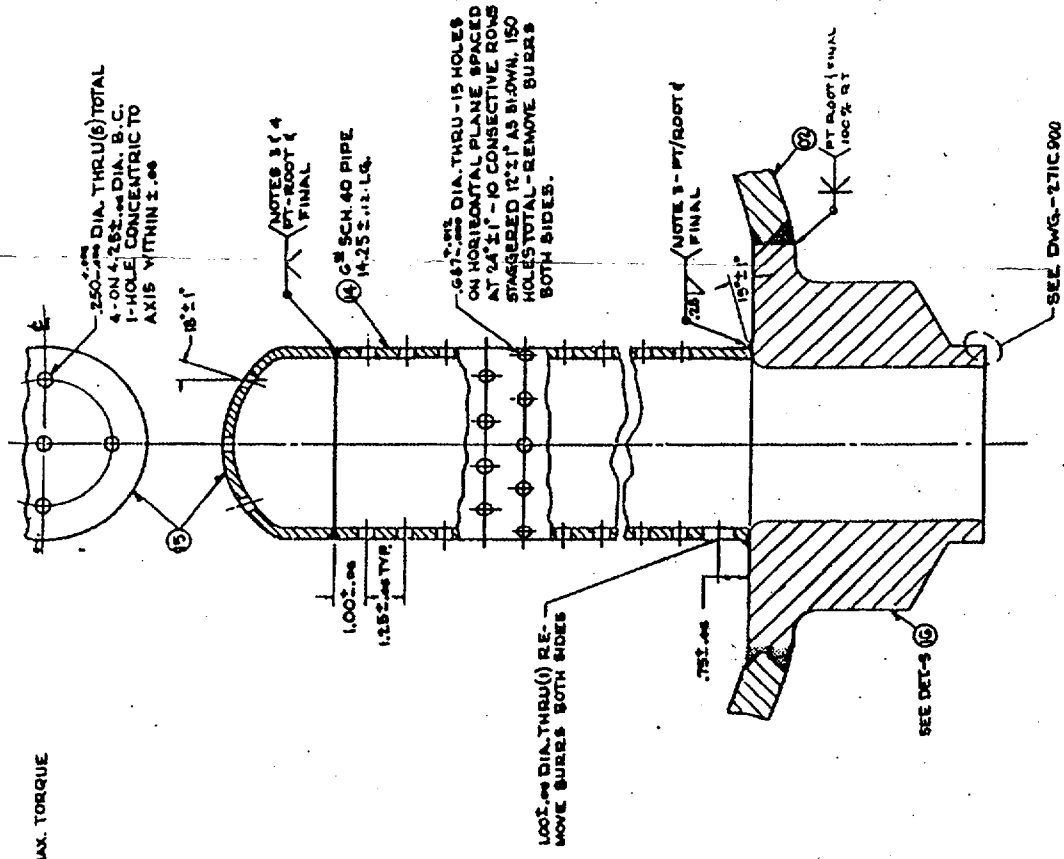
SECTION H-H
SCALE 1:8



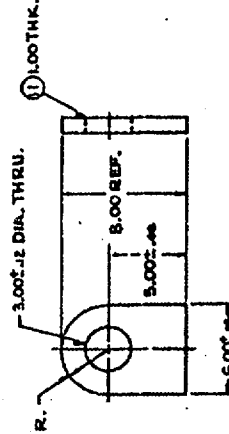
DETAIL-E
SCALE 1:1



DETAIL - R
SCALE 1:1



INLET CONNECTION AS SHOWN
OUTLET CONNECTION LESS ITS. H41B
DETAIL-F
SCALE 1:2



DETAIL-B
SCALE 1:4

[illegible]

ENCLOSURE 6
ATTACHMENT 4

REQUEST FOR RELIEF 1-ISI-12
EXAMINATION DATA REPORTS

TENNESSEE VALLEY AUTHORITY	RECORD OF LIQUID PENETRANT EXAM	REPORT NUMBER <u>R-0578</u>
PROJECT: <u>WBN</u> UNIT: <u>1</u> CYCLE: <u>03A</u> SYSTEM: <u>SIS</u> WELD/COMPONENT ID: <u>BIT-4</u> CONFIG.: <u>VHEAD</u> TO <u>VNOZ</u> PROCEDURE: <u>N-PT-9</u> REV.: <u>19</u> TC: <u>N/A</u> EXAMINATION CODE <u>89E-01</u> CODE CLASS: <u>2</u> CATEGORY: <u>C-B</u>		EXAMINATION DATE <u>7 SEPT 2000</u> START TIME <u>0915</u> END TIME: <u>0958</u> EXAM SURFACE: ID <input type="checkbox"/> OD <input checked="" type="checkbox"/> PRESERVICE <input type="checkbox"/> INSERVICE <input checked="" type="checkbox"/> REF. DRAWING NO.: <u>WX1100E48</u>
		ACCEPTANCE CRITERIA <input type="checkbox"/> APPDX. A <input checked="" type="checkbox"/> APPDX. B <input type="checkbox"/> OTHER:
METHOD OF EXAMINATION		
METHOD WATER-WASHABLE FLUORESCENT DYE: <input type="checkbox"/> POST-EMULSIFIABLE FLUORESCENT DYE: <input type="checkbox"/> SOLVENT-REMOVABLE FLUORESCENT DYE: <input type="checkbox"/> WATER-WASHABLE VISIBLE DYE: <input type="checkbox"/> POST-EMULSIFIABLE VISIBLE DYE: <input type="checkbox"/> SOLVENT REMOVABLE VISIBLE DYE: <input checked="" type="checkbox"/>	PENETRANT MATERIALS BRAND NAME: <u>MAGNAFLUX</u> PENETRANT <u>SKL-SP</u> BATCH: <u>94M05K</u> REMOVER: <u>SKC-S</u> BATCH: <u>98L07K</u> DEVELOPER: <u>SKD-S2</u> BATCH: <u>96J08K</u> <div style="text-align: center;"> BLACK LIGHT </div> METER S/N: <u>N/A</u> AL. DUE DATE: <u>N/A</u>	
PART TEMP: <u>86 °F</u> PYROMETER S/N: <u>522343</u> CAL. DUE DATE: <u>06/06/01</u>		
EXAMINATION RESULTS SATISFACTORY: <input checked="" type="checkbox"/> UNSATISFACTORY: <input type="checkbox"/> NOI NO.: <u>N/A</u> EXPLANATION OF EXAM RESULTS: <u>No reportable indications observed.</u> COMMENTS/LIMITATIONS: 		
EXAMINER: <u>Carney L. Le Roy</u> LEVEL: <u>II</u> TRANSEE * EXAMINER: <u>R. M. B. C.</u> LEVEL: <u>TR.</u> <u>WMB 9/8/00</u> REVIEWER: <u>WMB</u> LEVEL: <u>III</u> DATE: <u>9.8.00</u> <u>* DOCUMENT EXPERIENCE</u>		ANII: <u>B. Esmigh</u> DATE: <u>9/15/00</u> PAGE: OF

TENNESSEE VALLEY AUTHORITY	RECORD OF LIQUID PENETRANT EXAM	REPORT NUMBER <u>R-0583</u>
-------------------------------	------------------------------------	--------------------------------

PROJECT: <u>WBN</u> UNIT: <u>1</u> CYCLE: <u>03A</u>	EXAMINATION DATE <u>09/6/00</u>
SYSTEM: <u>SIS</u>	START TIME <u>09:32</u> END TIME: <u>10:23</u>
WELD/COMPONENT ID: <u>BIT-1</u>	EXAM SURFACE: ID <input type="checkbox"/> OD <input checked="" type="checkbox"/>
CONFIG.: <u>VNOZ TO VHEAD</u>	PRESERVICE <input type="checkbox"/> INSERVICE <input checked="" type="checkbox"/>
PROCEDURE: <u>N-PT-9</u> REV.: <u>19</u> TC: <u>N/A</u>	REF. DRAWING NO.: <u>WX1100E48</u>
EXAMINATION CODE <u>89E-01</u>	ACCEPTANCE CRITERIA
CODE CLASS: <u>2</u> CATEGORY: <u>C-B</u>	<input type="checkbox"/> APPDX A <input checked="" type="checkbox"/> APPDX B
	<input type="checkbox"/> OTHER:

METHOD OF EXAMINATION	
METHOD	PENETRANT MATERIALS
WATER-WASHABLE FLUORESCENT DYE: <input type="checkbox"/>	BRAND NAME: <u>MAGNAFLUX</u>
POST-EMULSIFIABLE FLUORESCENT DYE: <input type="checkbox"/>	PENETRANT <u>SKL-SP</u> BATCH: <u>94M05K</u>
SOLVENT-REMOVABLE FLUORESCENT DYE: <input type="checkbox"/>	REMOVER: <u>SKC-S</u> BATCH: <u>98L07K</u>
WATER-WASHABLE VISIBLE DYE: <input type="checkbox"/>	DEVELOPER: <u>SKD-S2</u> BATCH: <u>96J08K</u>
POST-EMULSIFIABLE VISIBLE DYE: <input type="checkbox"/>	BLACK LIGHT
SOLVENT REMOVABLE VISIBLE DYE: <input checked="" type="checkbox"/>	METER S/N: _____
	AL. DUE DATE: _____

PART TEMP: <u>81 °F</u>	PYROMETER S/N: <u>522343</u>	CAL. DUE DATE: <u>06/06/01</u>
-------------------------	------------------------------	--------------------------------

EXAMINATION RESULTS SATISFACTORY: <input checked="" type="checkbox"/> UNSATISFACTORY: <input type="checkbox"/> NOI NO.: <u>N/A</u>
EXPLANATION OF EXAM RESULTS: <u>NO REPORTABLE CONDITIONS OBSERVED.</u>
COMMENTS/LIMITATIONS:

EXAMINER: <u>Carley L. La Rosa</u> LEVEL: <u>II</u>	ANII: <u>B. Ewing</u>
EXAMINER: <u>Sam M. Bile</u> LEVEL: <u>TR</u>	DATE: <u>9/16/00</u>
REVIEWER: <u>W. Bentley</u> LEVEL: <u>III</u> DATE: <u>9-6-00</u>	PAGE: _____
* DOCUMENTED TRAINING ONLY	OF

TENNESSEE VALLEY AUTHORITY		EXAMINATION SUMMARY AND RESOLUTION SHEET		REPORT NUMBER: R-0689	
PROJECT: WB UNIT: 01		CYCLE 03A		COMPONENT ID: BIT-1	
EXAMINATION METHOD		SYSTEM: SIS		ISI DWG NO: ISI-0053-C-01	
MT <input type="checkbox"/>	PT <input type="checkbox"/>	UT <input checked="" type="checkbox"/>	VT <input type="checkbox"/>	CONFIGURATION:	CATEGORY
PROCEDURE: N-UT-77		REV 0		TC: N/A	
EXAMINER: <u>D. GONNEWOLD</u>		EXAMINER: <u>J. G. ABBOTT</u>		EXAMINER:	
LEVEL: II		LEVEL: II ^{TEN} 11-1-00		LEVEL:	
				VNOZ TO VNOZ V HEAD	
				C-B	

AN ULTRASONIC EXAMINATION WAS PERFORMED
ON WELD BIT-1, A STAINLESS STEEL NOZZLE
TO HEAD WELD ON THE BORON INJECTION TANK.

A 45° SHEARWAVE AND A 60° L WITH 1/2 V CALIBRATIONS
ALSO A 0° LAMINATION SCAN WAS PERFORMED.

ALL SCANS WERE PERFORMED ACROSS THE WELD.

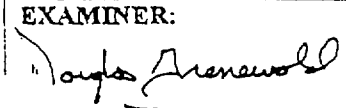

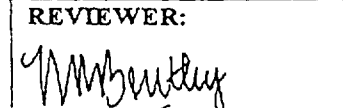
NO INDICATIONS WERE DETECTED.

100% BIDIRECTIONAL COVERAGE WAS ACHIEVED WITH 45°
BY SCANNING OVER THE WELD ON TO THE
NOZZLE SIDE.

80% COVERAGE ACHIEVED ON THE BIT TANK VESSEL NOZZLE
TO HEAD WELD. ^{WMB} 9-20-00

RESOLUTION BY: <u>D. Gonnevold</u>	REVIEWED BY: <u>WMB</u>	ANII: <u>B. Camigh</u>
LEVEL: II DATE: 9-7-00	LEVEL: II DATE: 9-20-00	DATE: 9/22/00
		Page: 1 OF 6

TENNESSEE VALLEY AUTHORITY		DIGITAL ULTRASONIC CALIBRATION DATA SHEET		REPORT NUMBER: R-0689									
PROJECT: W3NP UNIT: 1		CYCLE: 3		CALIBRATION DATE: 9-7-00									
PROCEDURE: WCT-17		REV: 0 TC: N/A		CALIBRATION BLOCK NO.: WB-44 TEMP: 72 F									
INSTRUMENT: KB		DUE DATE: 6-22-01		SIMULATOR BLOCK NO.: 790391									
MODEL TYPE: USN-50		SERIAL NO.: E24253		THERMOMETER S/N: 562781 DUE DATE: 6-6-01									
TRANSDUCER MANUF: KBA / MSEB		COUPLANT ULTRAGEL BATCH: 00125											
S/N 01637 SIZE: 3.5x10		FREQ: 4 MHz		EXAM TYPE: <input type="checkbox"/> SHEAR <input checked="" type="checkbox"/> LONG <input type="checkbox"/> RL <input type="checkbox"/>									
CABLE TYPE: RG-174		LENGTH: 72 inches		ANGLE VERIFICATION									
DAC		BLOCK TYPE: Rompas		S/N: 790391									
		NOMINAL ANGLE: 0		ACTUAL ANGLE: 0									
<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;">100 80 60 40 20 0</div> <div style="border: 1px solid black; width: 300px; height: 200px; position: relative;"> <div style="position: absolute; top: 10%; left: 10%;">x 1/4T</div> <div style="position: absolute; top: 40%; left: 20%;">x 1/2T</div> <div style="position: absolute; top: 70%; left: 30%;">x 3/4T</div> <div style="position: absolute; top: 45%; left: 10%;">Rompas</div> </div> <div style="margin-left: 10px; text-align: center;">A M P L I T U D E</div> </div> <p style="margin-top: 10px;">DISPLAY WIDTH: 3.0 inches</p>		INSTRUMENT SETTINGS											
		REFLECTOR			REFERENCE	MEMORY							
		SCAN DIRECT	NTCH	SDH	SENSITIVITY	NUMBER							
		AXIAL 0°	<input type="checkbox"/>	<input checked="" type="checkbox"/>	52 dB	1							
		CIRC	<input type="checkbox"/>	<input type="checkbox"/>	N/A dB	N/A							
		FREQ: BB MHz			REJECT: 0 %								
		ANGLE: OFF deg			DAMPING: Fixed ohms								
		DELAY: 9.102 msec			PULSER: HIGH *								
		ZERO: 8.882 msec			FILTER: Fixed *								
		VELOCITY: .2266 msec			REP RATE: HIGH								
RANGE: 3.0 inches			TOF: <input checked="" type="checkbox"/> PEAK <input type="checkbox"/> FLANK										
RECTIFIER: Fixed			POWER: BATT										
DUAL: <input checked="" type="checkbox"/> ON <input type="checkbox"/> OFF			TCG: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF										
CALIBRATION TIMES													
REF. REFLECTOR: Rompas		SDH GAIN: 52 dB		INITIAL TIME: 0830 FINAL TIME: 1355									
AMPLITUDE: 50 %		METAL PATH: 737 "		VERIFICATION TIMES									
				1) 1215 2) 1310 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		-12 dB		SET		+12		SET	+6	
	AMP	80%	32 TO 48		16 TO 24		20 %		64 TO 96		40%	64 TO 96	
			40		20				80			80	
COMMENTS: NONE						WELDS/ITEMS EXAMINED:							
						BIT-1							
EXAMINER:		EXAMINER:		REVIEWER:		ANII: B. Earnigh							
 VEL: II		 LEVEL: II		 LEVEL: III		DATE: 9/22/00							
						PG.: 2 OF 6							

TENNESSEE VALLEY AUTHORITY		DIGITAL ULTRASONIC CALIBRATION DATA SHEET		REPORT NUMBER: R-0689									
PROJECT: WBNP UNIT: 1		CYCLE: 3		CALIBRATION DATE: 9-7-00									
PROCEDURE: N-UT-77		REV: 0 TC: N/A		CALIBRATION BLOCK NO.: WB-44 TEMP: 72 °F									
INSTRUMENT: KB		DUE DATE: 6-22-01		SIMULATOR BLOCK NO: 790391									
MODEL/TYPE: USN-50		SERIAL NO.: E24253		THERMOMETER S/N: 562781 DUE DATE: 6-6-01									
TRANSDUCER MANUF: KBA		COUPLANT: ULTRAGEL II BATCH: 00125											
S/N: 00DAHM		SIZE: .50" FREQ: 1.5 MHz		EXAM TYPE: SHEAR <input checked="" type="checkbox"/> LONG <input type="checkbox"/> RL <input type="checkbox"/>									
CABLE TYPE: BG-174		LENGTH: 72 inches		ANGLE VERIFICATION									
DAC		BLOCK TYPE: ROMPAS		S/N: 790391									
		NOMINAL ANGLE: 45		ACTUAL ANGLE: 45									
<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;">100 80 60 40 20 0</div> <div style="border: 1px solid black; width: 200px; height: 150px; position: relative;"> <div style="position: absolute; top: 10%; left: 10%;">x 1/4T</div> <div style="position: absolute; top: 35%; left: 20%;">x 1/2T</div> <div style="position: absolute; top: 40%; left: 15%;">o ROMPAS</div> <div style="position: absolute; top: 40%; left: 40%;">x 3/4T</div> <div style="position: absolute; top: 40%; left: 50%;">x Notch</div> <div style="position: absolute; top: 60%; left: 70%;">x 5/4T</div> </div> <div style="margin-left: 10px; text-align: center;">A M P L I T U D E</div> </div>		INSTRUMENT SETTINGS											
		REFLECTOR			REFERENCE	MEMORY							
		SCAN DIRECT.	NTCH	SDH	SENSITIVITY	NUMBER							
		AXIAL	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	22 dB	2							
		CIRC	<input type="checkbox"/>	<input type="checkbox"/>	SAME (FLAT BLOCK)								
		FREQ: BB MHz			REJECT: 0 %								
		ANGLE: 45 deg			DAMPING: FIXED ohms								
		DELAY: 7.672 msec			PULSER: HIGH *								
		ZERO: 7.885 msec			FILTER: FIXED *								
		VELOCITY: .1227 msec			REP RATE: HIGH								
RANGE: 4.687 inches			TOF: <input checked="" type="checkbox"/> PEAK <input type="checkbox"/> FLANK										
RECTIFIER: FIXED			POWER: BATT										
DUAL: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF			TCG: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF										
CALIBRATION TIMES													
INITIAL TIME: 0910			FINAL TIME: 1356										
VERIFICATION TIMES		1) 1216	2) 1335	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			-12 dB			SET	+12	SET	+6	
	AMP	80%	32 TO 48			16 TO 24			20 %	64 TO 96	40%	64 TO 96	
			40			20				80			80
COMMENTS: NONE						WELDS/ITEMS EXAMINED:							
						BIT-1							
EXAMINER:		EXAMINER:		REVIEWER:		ANII: B. Earnigh							
 VEL: II		 LEVEL: II		 LEVEL: III DATE: 9-10-00		DATE: 9/22/00							
						PG.: 3 OF 6							

TENNESSEE VALLEY AUTHORITY		DIGITAL ULTRASONIC CALIBRATION DATA SHEET		REPORT NUMBER: R-0689									
OBJECT: <u>WBNP UNIT: 1</u>		CYCLE: <u>3</u>		CALIBRATION DATE: <u>9-7-00</u>									
PROCEDURE: <u>N-UT-77</u> REV: <u>0</u> TC: <u>N/A</u>		CALIBRATION BLOCK NO.: <u>WB-44</u> TEMP: <u>72 °F</u>											
INSTRUMENT: <u>KB</u> DUE DATE: <u>6-22-01</u>		SIMULATOR BLOCK NO.: <u>790391</u>											
MODEL/TYPE: <u>USN-50</u> SERIAL NO.: <u>524253</u>		THERMOMETER S/N: <u>562781</u> DUE DATE: <u>6-6-01</u>											
TRANSDUCER MANUF: <u>SIGMA</u>		COUPLANT <u>ULTRAGEL II</u> BATCH: <u>00125</u>											
S/N <u>223A-94005</u> SIZE: <u>2(18x10)</u> FREQ: <u>2</u> MHz		EXAM TYPE: <input checked="" type="checkbox"/> SHEAR <input type="checkbox"/> LONG <input type="checkbox"/> RL <input checked="" type="checkbox"/>											
CABLE TYPE: <u>BG-174</u> LENGTH: <u>72</u> inches		ANGLE VERIFICATION											
DAC		BLOCK TYPE: <u>ROMPA3</u>		S/N: <u>790391</u>									
		NOMINAL ANGLE: <u>60</u>		ACTUAL ANGLE: <u>60</u>									
<div style="display: flex; align-items: center;"> <div style="flex: 1;"> </div> <div style="flex: 0.2; text-align: center;"> A M P L I T U D E </div> </div>		INSTRUMENT SETTINGS											
		REFLECTOR			REFERENCE	MEMORY							
		SCAN DIRECT.	NTCH	SDH	SENSITIVITY	NUMBER							
		AXIAL	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<u>47</u> dB	<u>3</u>							
		CIRC	<input type="checkbox"/>	<input type="checkbox"/>	<u>SAME</u> dB	<u>(FLAT BLOCK)</u>							
		FREQ: <u>38</u> MHz			REJECT: <u>0</u> %								
		ANGLE: <u>60</u> deg			DAMPING: <u>FIXED</u> ohms								
		DELAY: <u>8.859</u> msec			PULSER: <u>HIGH</u> *								
		ZERO: <u>8.873</u> msec			FILTER: <u>FIXED</u> *								
		VELOCITY: <u>.2295</u> msec			REP RATE: <u>HIGH</u>								
RANGE: <u>6.61</u> inches			TOF: <input checked="" type="checkbox"/> PEAK <input type="checkbox"/> FLANK										
RECTIFIER: <u>FIXED</u>			POWER: <u>BATT</u>										
DUAL: <input checked="" type="checkbox"/> ON <input type="checkbox"/> OFF			TCG: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF										
REF. REFLECTOR: <u>ROMPA3 SDH</u> GAIN: <u>47</u> dB		CALIBRATION TIMES											
AMPLITUDE: <u>65</u> % METAL PATH: <u>1.45</u> "		INITIAL TIME: <u>0935</u>		FINAL TIME: <u>1357</u>									
VERIFICATION TIMES		1) <u>1217</u>	2) <u>1325</u>	3)	4)								
		5)	6)	7)	8)								
		9)											
* PDI QUALIFIED INSTRUMENT SETTINGS:													
VERIFY INSTRUMENT SETTINGS AND CALIBRATION SEQUENCE ARE IN ACCORDANCE WITH TABLE 2 OF THE APPLICABLE PDI QUALIFICATION IMPLEMENTATION PROCEDURE !													
LINEARITY CHECK													
VERTICAL	SIGNAL 1		100	90	80	70	60	50	40	30	20		
	SIGNAL 2		50	45	40	35	30	25	20	15	10		
ATTENUATOR	GAIN	SET	-6 dB			-12 dB			SET	+12	SET	+6	
	AMP	80%	32 TO 48			16 TO 24			20 %	64 TO 96	40%	64 TO 96	
			40			20				80			
COMMENTS: <u>NOTCH CAN NOT BE SEEN @ 47 DB,</u>						WELDS/ITEMS EXAMINED:							
<u>SET @ 80% @ 69 DB.</u>						<u>BIT-1</u>							
EXAMINER:		EXAMINER:		REVIEWER:		ANI: <u>B Earnigh</u>							
<u>Douglas Greenwell</u>		<u>John M. White</u>		<u>W. Bentley</u>		DATE: <u>9/22/00</u>							
LEVEL: <u>II</u>		LEVEL: <u>II</u>		LEVEL: <u>II</u> DATE: <u>9-20-00</u>		PG.: <u>4</u> OF <u>6</u>							

[illegible]

TVA

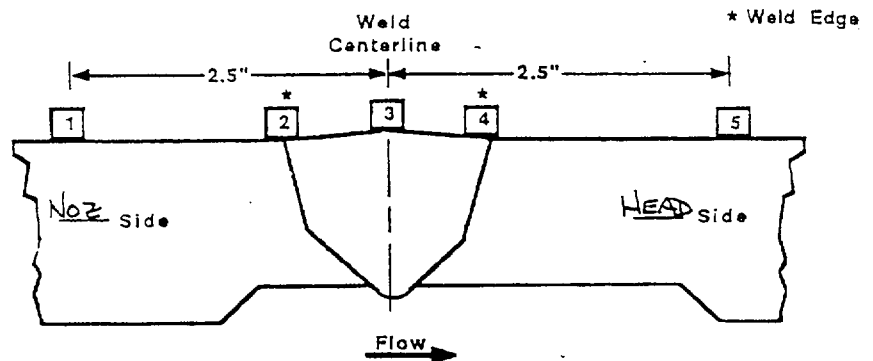
WALL THICKNESS
PROFILE SHEET

REPORT NO:

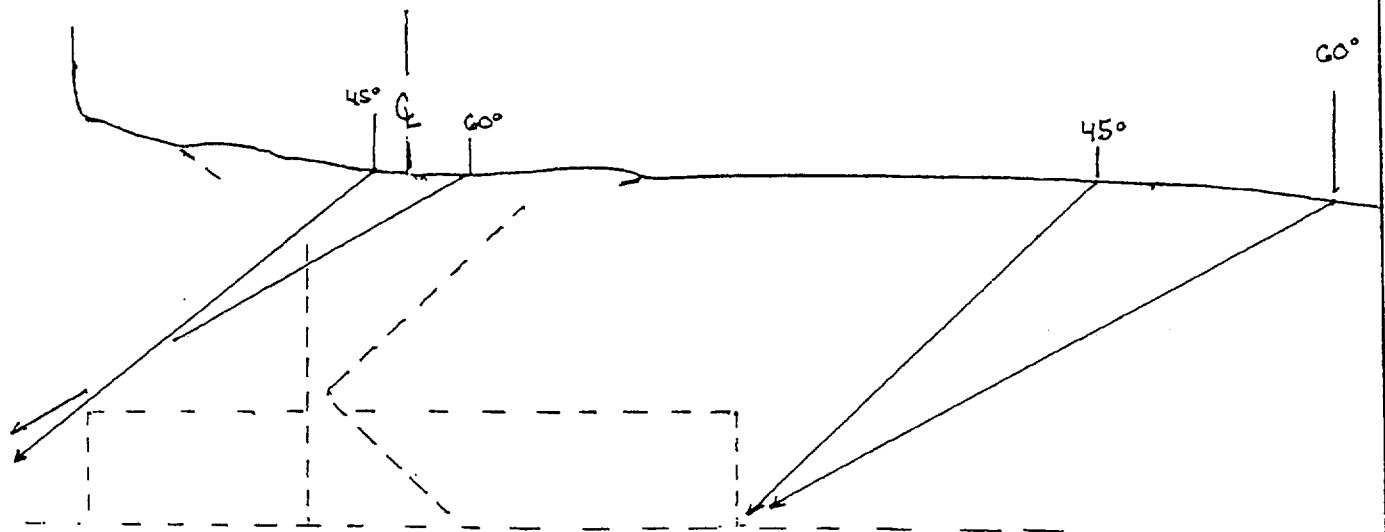
R-0689

PROJECT: WBNPWELD NO: BIT-1UNIT: 1 C3SYSTEM: SISRecord Thickness Measurements As
Indicated, Including Weld Width,
Edge-To-Edge At 0°

Position	0°	90°	180°	270°
1	N/A			
2	N/A			
3	N/A			
4	1.90			
5	1.90			

CROWN HEIGHT: .10" - .20"DIAMETER: 10" DIA NozCROWN WIDTH: 2.4"WELD LENGTH: 44.25"

No THICKNESS READING ACHIEVED ON WELD OR Noz. SIDE.



100% COVERAGE 45°

EXAMINER:

LEVEL: IIDATE: 9-8-00

REVIEWED BY:

LEVEL: IIIDATE: 9.20.00

DATE:

PAGE

6

OF

6

TENNESSEE VALLEY AUTHORITY		EXAMINATION SUMMARY AND RESOLUTION SHEET		REPORT NUMBER: R-0692	
PROJECT: WB UNIT: 01 CYCLE 03A			COMPONENT ID: BIT-4		
EXAMINATION METHOD			SYSTEM: SIS		ISI DWG NO: ISI-0053-C-01
MT <input type="checkbox"/>	PT <input type="checkbox"/>	UT <input checked="" type="checkbox"/>	VT <input type="checkbox"/>	CONFIGURATION:	CATEGORY
PROCEDURE: N-UT-77		REV 0	TC: N/A	NOZ. VHEAD TO VHEAD	C-B
EXAMINER: J. G. ABBOTT		EXAMINER: D. GRANEWOLD		EXAMINER: <i>WLB 9-20-00</i>	EXAMINER:
LEVEL: II		LEVEL: II		N/A	N/A
LEVEL:		LEVEL:		LEVEL:	LEVEL:

AN ULTRASONIC EXAMINATION WAS PERFORMED
ON WELD #BIT-4, A STAINLESS STEEL HEAD TO
NOZZEL WELD ON THE BORON INJECTION TANK

A 45° SHEARWAVE AND A 60° RL WITH 1/2 V CALIBRATIONS
WERE USED FOR THIS EXAM. ALSO A 0° LAMINATION SCAN
WAS PERFORMED.

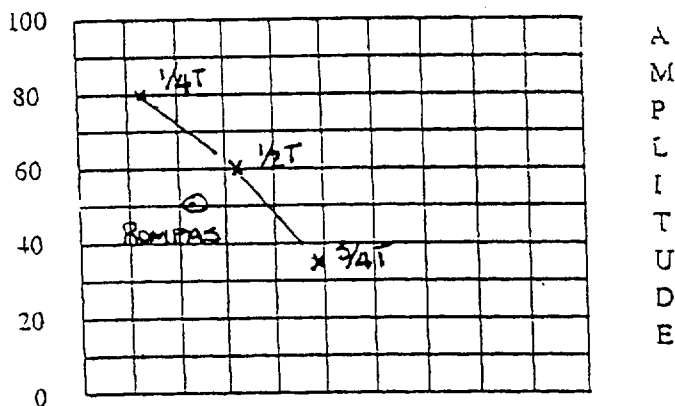
NO INDICATIONS WERE DETECTED.

100% BIDIRECTIONAL COVERAGE WAS ACHIEVED WITH 45°
BY SCANNING OVER THE WELD AND ONTO THE
NOZZEL SIDE.

80% COVERAGE ACHIEVED ON THE BITANK VESSEL
NOZZLE TO HEAD WELD. *WLB 9-20-00*

RESOLUTION BY: <i>D. Graneuold</i>	REVIEWED BY: <i>WLB</i>	ANII: <i>B. tamigh</i>
LEVEL: II DATE: 9-8-00	LEVEL: II DATE: 9-20-00	DATE: 9/23/00
		Page: 1 OF 6

TENNESSEE VALLEY AUTHORITY		DIGITAL ULTRASONIC CALIBRATION DATA SHEET		REPORT NUMBER: R-0692	
JECT: WBWP UNIT: 1		CYCLE: 3		CALIBRATION DATE: 9-8-00	
EDURE: N-UT-77		REV: 0 TC: N/A		CALIBRATION BLOCK NO.: WB-44 TEMP: 72 °F	
INSTRUMENT: KB		DUE DATE: 6-22-01		SIMULATOR BLOCK NO: 790391	
MODEL TYPE: USN-50		SERIAL NO.: E24253		THERMOMETER S/N: 562731 DUE DATE: 6-6-01	
TRANSDUCER MANUF: KBA		M568		COUPLANT ULTRAGEL BATCH: 00125	
S/N 01637		SIZE: 3.5x10 FREQ: 4 MHZ		EXAM TYPE: <input type="checkbox"/> SHEAR <input checked="" type="checkbox"/> LONG <input type="checkbox"/> RL <input type="checkbox"/>	
CABLE TYPE: RG-174		LENGTH: 72 inches		ANGLE VERIFICATION	
DAC		BLOCK TYPE: Rompas		S/N: 790391	
		NOMINAL ANGLE: 0		ACTUAL ANGLE: 0	



DISPLAY WIDTH: **3.0** inches

INSTRUMENT SETTINGS				
REFLECTOR			REFERENCE	MEMORY
SCAN DIRECT.	NTCH	SDH	SENSITIVITY	NUMBER
AXIAL 0°	<input type="checkbox"/>	<input checked="" type="checkbox"/>	52 dB	1
CIRC	<input type="checkbox"/>	<input type="checkbox"/>	N/A dB	N/A
FREQ: BB MHZ			REJECT: 0 %	
ANGLE: OFF deg			DAMPING: Fixed ohms	
DELAY: 9.102 msec			PULSER: HIGH *	
ZERO: 8.882 msec			FILTER: Fixed *	
VELOCITY: .2266 msec			REP RATE: HIGH	
RANGE: 3.0 inches			TOF: <input checked="" type="checkbox"/> PEAK <input type="checkbox"/> FLANK	
RECTIFIER: Fixed			POWER: BATT	
DUAL: <input checked="" type="checkbox"/> ON <input type="checkbox"/> OFF			TCG: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF	

REFLECTOR: Rompas SDH GAIN: 52 dB		CALIBRATION TIMES (1405)	
AMPLITUDE: 20 % METAL PATH: 737 "		INITIAL TIME: 1210 FINAL TIME: 1405	
VERIFICATION TIMES	1) 1220 2) 1305 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 !

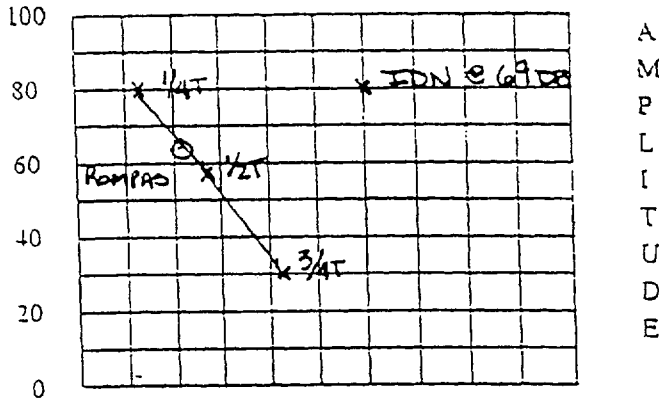
LINEARITY CHECK										
VERTICAL	SIGNAL 1	100	90	80	70	60	50	40	30	20
	SIGNAL 2	50	45	40	35	30	25	20	15	10
ATTENUATOR	GAIN	SET	-6 dB	-12 dB	SET	+12	SET	+6		
	AMP	80%	32 TO 48	16 TO 24	20 %	64 TO 96	40%	64 TO 96		
			40	20		80		80		

COMMENTS:	WELDS/ITEMS EXAMINED:
	BIT-4

EXAMINER: <i>Douglas Hensel</i>	EXAMINER: <i>John D. Abbott</i>	REVIEWER: <i>W. H. Bentley</i>	ATTN: B. Earnigh
II	II	III	DATE: 9/23/00
		9-20-00	2 6

TENNESSEE VALLEY AUTHORITY		DIGITAL ULTRASONIC CALIBRATION DATA SHEET		REPORT NUMBER: R-0692							
PROJECT: WBNP UNIT: 1		CYCLE: 3		CALIBRATION DATE: 9-8-00							
PROCEDURE: N-UT-77		REV: 0 TC: N/A		CALIBRATION BLOCK NO.: WB-44 TEMP: 72 °F							
INSTRUMENT: KB		DUE DATE: 6-22-01		SIMULATOR BLOCK NO: 790391							
MODEL TYPE: USN-50		SERIAL NO.: E24253		THERMOMETER S/N: 562731 DUE DATE: 6-6-01							
TRANSDUCER MANUF: KBA		COUPLANT: ULTRAGEL II BATCH: 00125									
S/N: 0004HM SIZE: .50"		FREQ: 1.5 MHz		EXAM TYPE: SHEAR <input checked="" type="checkbox"/> LONG <input type="checkbox"/> RL <input type="checkbox"/>							
CABLE TYPE: RG-174		LENGTH: 72 inches		ANGLE VERIFICATION							
DAC		BLOCK TYPE: RAMPAS		S/N: 790391							
		NOMINAL ANGLE: 45		ACTUAL ANGLE: 45							
<div style="display: flex; align-items: center;"> <div style="flex: 1;"> </div> <div style="flex: 0.2; text-align: center; font-weight: bold;">A M P L I T U D E</div> </div> <p>DISPLAY WIDTH: 4.687 inches</p> <p>REFLECTOR: RAMPAS SDH GAIN: 22.0dB</p> <p>AMPLITUDE: 45 % METAL PATH: 1.05 "</p>		INSTRUMENT SETTINGS									
		REFLECTOR			REFERENCE	MEMORY					
		SCAN DIRECT.	NTCH	SDH	SENSITIVITY	NUMBER					
		AXIAL	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	22 dB	2					
		CIRC	<input type="checkbox"/>	<input type="checkbox"/>	SAME (FLAT BLOCK)						
		FREQ: 1.5 MHz			REJECT: 0 %						
		ANGLE: 45 deg			DAMPING: FIXED ohms						
		DELAY: 7.672 msec			PULSER: HIGH *						
		ZERO: 7.885 msec			FILTER: FIXED *						
		VELOCITY: 1227 msec			REP RATE: HIGH						
RANGE: 4.687 inches			TOF: <input checked="" type="checkbox"/> PEAK <input type="checkbox"/> FLANK								
RECTIFIER: FIXED			POWER: BATT								
DUAL: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF			TCG: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF								
CALIBRATION TIMES											
INITIAL TIME: 1212			FINAL TIME: 1406								
VERIFICATION TIMES		1) 1230	2) 1315	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	-12 dB	SET	+12	SET	+6			
	AMP	80%	32 TO 48	16 TO 24	20 %	64 TO 96	40%	64 TO 96			
			40	20		80		80			
COMMENTS:						WELDS/ITEMS EXAMINED:					
						BIT-4					
EXAMINER:		EXAMINER:		REVIEWER:		ANTI: B. Earnigh					
						DATE: 9/23/00					
L: II		LEVEL: II		LEVEL: II		DATE: 9-20-00					

TENNESSEE VALLEY AUTHORITY		DIGITAL ULTRASONIC CALIBRATION DATA SHEET		REPORT NUMBER: R-0692								
PROJECT: WBNP UNIT: 1		CYCLE: 3		CALIBRATION DATE: 9-8-00								
PROCEDURE: N-UT-77		REV: 0 TC: N/A		CALIBRATION BLOCK NO.: WB-44 TEMP: 72 °F								
INSTRUMENT: KB		DUE DATE: 6-22-01		SIMULATOR BLOCK NO: 790391								
MODEL TYPE: USN-50		SERIAL NO.: E24253		THERMOMETER S/N: 562781 DUE DATE: 6-6-01								
TRANSDUCER MANUF: SIGA MA		COUPLANT ULTRAGEL II BATCH: 00125										
S/N 123A-94005 SIZE: 2(18x1.5)		FREQ: 2 MHz		EXAM TYPE: <input type="checkbox"/> SHEAR <input type="checkbox"/> LONG <input checked="" type="checkbox"/> RL								
CABLE TYPE: R4-174		LENGTH: 72 inches		ANGLE VERIFICATION								
DAC		BLOCK TYPE: RomPAS		S/N: 790391								
		NOMINAL ANGLE: 60		ACTUAL ANGLE: 60								
INSTRUMENT SETTINGS												
REFLECTOR				REFERENCE								
SCAN DIRECT.		NTCH		SDH								
AXIAL		<input type="checkbox"/>		<input checked="" type="checkbox"/>								
CIRC		<input type="checkbox"/>		<input type="checkbox"/>								
FREQ: BB MHz				REJECT: 0 %								
ANGLE: 60 deg				DAMPING: FIXED ohms								
DELAY: 8.859 msec				PULSER: HIGH *								
ZERO: 8.873 msec				FILTER: FIXED *								
VELOCITY: .2295 msec				REP RATE: HIGH								
RANGE: 6.61 inches				TOF: <input checked="" type="checkbox"/> PEAK <input type="checkbox"/> FLANK								
RECTIFIER: FIXED				POWER: BATT								
DUAL: <input checked="" type="checkbox"/> ON <input type="checkbox"/> OFF				TCG: <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF								
CALIBRATION TIMES												
INITIAL TIME: 1214				FINAL TIME: 1407								
VERIFICATION TIMES		1) 1250 2) 1335 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	-12 dB		SET		+12		SET		+6
	AMP	80%	32 TO 48	16 TO 24		20 %		64 TO 96		40%		64 TO 96
			40	20				80				80
COMMENTS: NOTCH CAN NOT BE SEEN @ 47 DB.						WELDS/ITEMS EXAMINED:						
SET @ 80% @ 69 DB.						BIT-A						
EXAMINER:		EXAMINER:		REVIEWER:		AND:						
<i>Douglas S. Senechal</i>		<i>John B. [Signature]</i>		<i>W. B. [Signature]</i>		<i>B. E. [Signature]</i>		DATE: 9/23/00		PG.: 4 OF 6		
LEVEL: II		LEVEL: II		DATE: 9.20.00								



DISPLAY WIDTH: **6.61** inches

REFLECTOR: **RomPAS SDH** GAIN: **47** dB

AMPLITUDE: **65** % METAL PATH: **1.45** "

VERIFICATION TIMES 1) 1250 2) 1335 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	-12 dB		SET		+12		SET		+6
	AMP	80%	32 TO 48	16 TO 24		20 %		64 TO 96		40%		64 TO 96
			40	20				80				80

COMMENTS: **NOTCH CAN NOT BE SEEN @ 47 DB.** WELDS/ITEMS EXAMINED:

SET @ 80% @ 69 DB.

BIT-A

EXAMINER:

Douglas S. Senechal

LEVEL: **II**

EXAMINER:

John B. [Signature]

LEVEL: **II**

REVIEWER:

W. B. [Signature]

LEVEL: **II** DATE: **9.20.00**

AND:

B. E. [Signature]

DATE: **9/23/00**

PG.: **4** OF **6**

TENNESSEE VALLEY AUTHORITY				ULTRASONIC PIPING EXAMINATION DATA SHEET				REPORT NUMBER: R-0692			
PROJECT: WBN UNIT: 1				CYCLE: 3				EXAMINATION DATE: 9-8-00			
PROCEDURE: N-UT-77				REV: 0				TC: N/A			
SYSTEM: SIS				EXAM SURFACE <input type="checkbox"/> ID <input checked="" type="checkbox"/> OD							
COMPONENT ID: BIT-4				MATL. TYPE: <input type="checkbox"/> CS <input checked="" type="checkbox"/> SS <input type="checkbox"/> CSCL <input type="checkbox"/> CCSS							
C ONFIGURATION				SURFACE TEMP.: 72 °F				PYRO. NO.: 562781			
HEAD TO NOZZEL <div style="text-align: center;"> FLOW → </div>				CAL DUE DATE:							
W ₀ REFERENCE: WELD E				CIRC. SCAN SENSITIVITY				64/28 dB		59 dB	
L ₀ REFERENCE: E OF MANWAY				AXIAL SCAN SENSITIVITY				64/28 dB		59 dB	

IND. NO.	L (in) FROM REF.			AT MAX AMP			MAX AMP %DAC	EXAM NO. 3-14	NOM. ANG.	N R I	IND. INFO: TYPE, DAMPING, ETC.
	L1	L MAX	L2	W MAX	MP MAX	D MAX					
—							%	2	0°	✓	LAMINATION SCAN
—							%	3	45°	✓	
—							%	5	45°	✓	
—							%	6	45°	✓	
—							%	3	60°_{RL}	✓	
—							%	5	60°_{RL}	✓	
—							%	6	60°_{RL}	✓	
—							%				
—							%				
—							%				
—							%				
—							%				
—							%				
—							%				
—							%				

REMARKS / LIMITATIONS: **ONE SIDED EXAMINATION DUE TO NOZZEL V_E**
CONFIGURATION. **WBN 9-20-00**

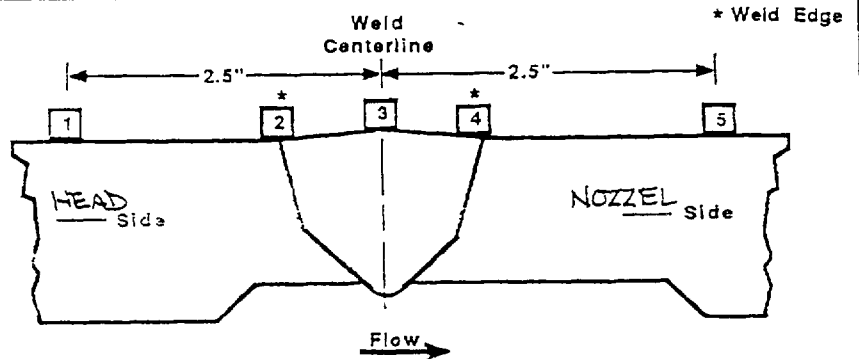
EXAMINER: <i>John H. Alt</i>	LEVEL: II	ANII: 9/23/00 <i>B. Carney</i>
EXAMINER: <i>Douglas Greenwald</i>	LEVEL: II	DATE: 9-8-00
VIEWER: <i>W. Bentley</i>	LEVEL: III	DATE: 9-20-00
		PAGE 5 OF 6

TVA	WALL THICKNESS PROFILE SHEET	REPORT NO: R-0692
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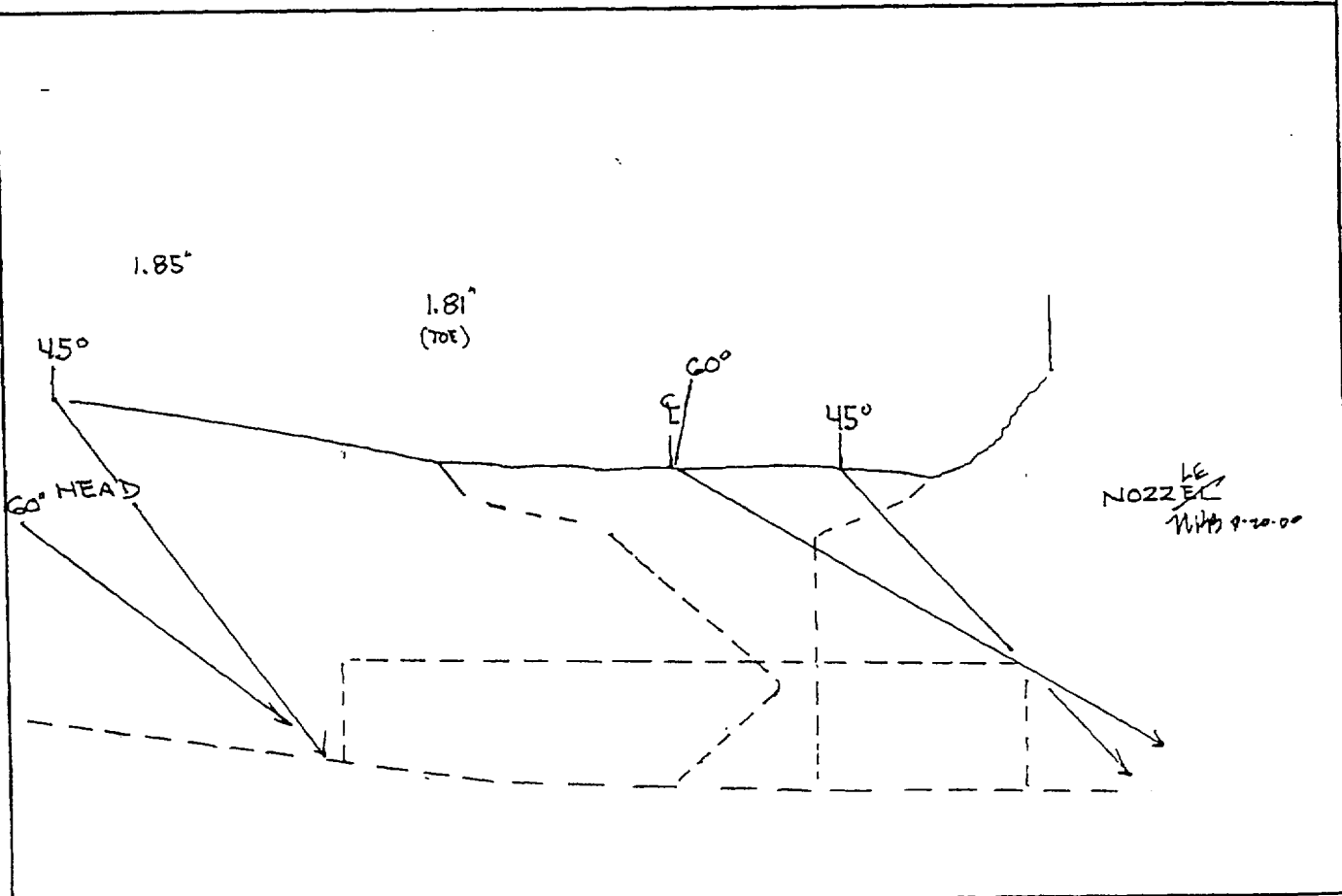
PROJECT: <u>WBN</u> UNIT: <u>1</u>	WELD NO: <u>BIT-4</u> SYSTEM: <u>SIS</u>
---------------------------------------	---

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

Position	0°	90°	180°	270°
1	1.85			
2	1.81			
3	N/A		N/A	
4	N/A			
5	N/A			



CROWN HEIGHT: <u>.1</u>	DIAMETER: <u>13.5</u>
CROWN WIDTH: <u>2.75</u>	WELD LENGTH: <u>44.25</u>



EXAMINER: <u>Jaigle Monnewald</u> LEVEL: <u>II</u> DATE: <u>9-8-00</u>	REVIEWED BY: <u>[Signature]</u> LEVEL: <u>III</u> DATE: <u>9-20-00</u>	ANII: <u>B. Earnish</u> DATE: <u>9/23/00</u> PAGE <u>6</u> OF <u>6</u>
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W47 001018 001

ENCLOSURE 7

CALCULATION OF ASME CODE COVERAGE
FOR SECTION XI NDE EXAMINATIONS

"QUALITY RELATED"

Prepared By: Joel W. Whitaker Date: 10/18/00

Technical Review: N. R. Bentley NDE Level III, Date: 10/18/00

ISO Approval: W. E. Freeman Date: 10/18/00

Rev. No.	Date	Description
0	4/3/96	Initial issue.
1	8/15/97	Incorporate TC 97-09.
2	10/18/00	General revision to incorporate 10CFR50.55a ruling change which implements Appendix VIII

1.0 Scope

The scope of this procedure is to provide generic guidelines for calculating the ASME Section XI code coverage and augmented examination coverage obtained during volumetric and surface examinations. This procedure incorporates the requirements of Code Case N-460 and NRC Information Notice 98-42. This procedure is not applicable for calculating the examination coverage for RPV examinations performed in accordance with Appendix VIII.

2.0 Purpose

This procedure applies to the calculation of ASME Section XI Code coverage for vessel welds (excluding the RPV welds performed in accordance with Appendix VIII) piping welds, and integral attachments. This procedure applies when performing surface or volumetric examinations and may be used as a guide when calculating the examination coverage for preservice and inservice examinations. Coverage limitations may be due to an obstruction, interference, geometric configuration or other applicable reason.

3.0 References

- 3.1 ASME Section XI 1989 Edition
- 3.2 ASME Code Case N-460
- 3.3 10CFR 50.55a, as amended by the Federal Register Notice, Vol. 64, No. 183, dated September 22, 1999 (Final Rule)- Implementation of Appendix VIII as executed by the Performance Demonstration Initiative (PDI) Program Description Document, Rev. 1, Change 1.
- 3.4 Guideline for the Implementation of Appendix VIII and 10CFR 50.55a, Rev. D, April 18, 2000
- 3.5 NRC Information Notice 98-42

4.0 Definitions

- 4.1 Examination Coverage- The percentage of the examination surface or volume obtained during the performance of the examination.
- 4.2 Examination Surface- The surface of the weld and base material required to be examined by ASME Section XI or other requirement using a surface examination method.
- 4.3 Examination Volume- The volume of weld and base material required to be examined by ASME Section XI or other requirement using a volumetric examination method.
- 4.4 Scan Limitation- the inability to scan the surface(s) as required by procedure due to interferences.

- 4.5 Surface Limitation- the inability to perform a surface examination of the required surface(s) because of an interference.
- 4.6 Volumetric Limitation- the inability to examine the required volume because of the geometric configuration, a physical interference, or a metallurgical condition of the material being examined.

5.0 General

- 5.1 During the performance of inservice inspections, ASME Section XI requires examination coverage to be essentially 100% of the weld area or volume. For examination coverage less than 100%, TVA has implemented ASME Code Case N-460 which states that when the entire examination volume or area cannot be examined due to interference by another component or part geometry, a reduction in examination coverage for Class 1 or Class 2 welds may be accepted provided the reduction in coverage for that weld is less than 10%. (NRC Information Notice 98-42 further defines the >90% rule to include all welds and other areas required by ASME Section XI.
- 5.2 Surface examinations are typically conducted on the weld area plus a defined amount of base material on each side of the weld. Volumetric examinations specify a particular volume to be examined. The Section XI required examination volume or surface examination area for each type of weld is depicted in figures of IWB-2500 or IWC-2500 as applicable. As depicted for piping welds, volume width generally constitutes the weld plus $1/4t$ on each side while volume thickness generally constitutes the lower $1/3$ of the piping thickness for the length of the weld. The exception normally includes code category B-O which includes the weld plus $1/2$ inch and full volume for the length of the weld. As depicted, for vessel welds, the volume width generally constitutes the weld plus $1/2t$ on each side of the weld while volume thickness generally constitutes the entire component thickness (i.e. full volume). The volume changes with variations in weld configuration (e.g. transition between different pipe thickness or vessel weld configurations).

Note: Risk-Informed (RI) programs require larger volumes in certain areas.

- 5.3 The required examination volume or area shall be verified prior to calculation of the limitation.

6.0 Documenting and Calculating Examination Coverage

- 6.1 While performing a surface or ultrasonic examination, the NDE Examiner shall make every attempt to examine 100 percent of the examination area or volume.
- 6.2 When practical, the two beam path directions for ultrasonic examinations should be performed from two sides of the weld or additional angles employed in order to maximize coverage.
- 6.3 If 100% percent of the examination surface or volume cannot be examined, the NDE Examiner should perform the following under the direction of the inspection coordinator or the NDE Level III:

- 6.3.1 Perform additional examinations with higher angles in order to maximize cover for ultrasonic exams.
- 6.3.2 Perform another surface method (i.e., PT in lieu of MT) in order to maximize coverage.
- 6.3.3 Perform alternative NDE methods if applicable.
- 6.4 The examiner shall accurately document all limitations, obstructions, interferences, geometric configurations or other applicable reasons for not obtaining the required code coverage.
- 6.5 The examiner shall document the limitation on a sketch. Examination coverage estimates may be performed by the examiner or the reviewer.

7.0 Calculation Basis

- 7.1 Volumetric Examinations- Piping Welds and Vessels 2 inches and less in thickness
 - a) For welds with access from both sides, each of the four required scans are equal to 25% .
 - b) For welds with access from one side only due to interference/configuration (e.g. pipe to valve), the axial scan (scan 3 or 4) equals 50% and the circumferential scans (scan 5 and 6) each equal 25% for total of 100%.
 - c) Examination volume coverage may be increased as previously discussed or by use of refracted longitudinal wave techniques on stainless steel or dissimilar metal welds. Use of refracted longitudinal waves to penetrate stainless steel weld material will increase the examination volume coverage by the amount depicted on the examination coverage drawing.
 - d) The effects of adjacent component interferences (e.g. welded lug attachments) along the weld length are also taken into account with the reduction in coverage identified as a percentage of reduced volume.

8.0 Surface Examinations - Piping Welds And Integral Attachments

- 8.1 Examination area coverage calculations are based upon one of the following suppositions:
 - a) The total examination area is calculated, typically length x width, then the total area of limitation or interference is subtracted from the total examination area.
 - b) The area of achieved coverage is divided by the total examination area for percentage of examination achieved.

9.0 Ultrasonic Examinations - Vessel Welds

NOTE: THIS IS NOT APPLICABLE FOR APPENDIX VIII EXAMINATIONS OF THE RPV WELDS.

9.1 Examination volume coverage calculations are based upon the following suppositions:

a) To achieve full examination coverage nine different scans are required for a typical vessel weld or nozzle examination. The following may be used for other vessel configurations:

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

9.2 The examination volume achieved for each above examination scan shall be obtained and documented on a percentage basis. This calculation considers the required examination volume required per the ASME Section XI Code.

a) The total examination coverage may be calculated by averaging the examination volume coverage for all nine scans.

10.0 PDI Implementation for Piping Welds

10.1 Where examination from both sides is not possible, full coverage credit may be claimed from a single side for ferritic welds provided the examiner is qualified for single sided examination. Current technology is not capable of reliably detecting or sizing flaws on the far side of an austenitic weld for configurations common to US nuclear applications. Therefore, examination of austenitic material welds shall be performed from both sides or a scan limitation shall be documented.

10.2 The NDE Level III shall make an evaluation in the Weld Resolution document regarding total examination coverage (best effort) as calculated above in Section 7.0. In addition, a coverage evaluation which considers the PDI Implementation Guideline shall also be indicated in the Weld Resolution sheet. These two coverage evaluations shall be reported to the ISI Programs Engineer for incorporation into the Relief Request.

10.3 Typically a one-sided austenitic weld examination with no circumferential restrictions would be indicated as 75% examination coverage or 50% if circumferential scans were limited to one side.

NOTE: These requirements do not apply to augmented examinations of piping welds.

11.0 Responsibilities

- 11.1 The examiner or designee shall document the amount of code coverage obtained after all necessary steps to perform additional examinations has been completed in order to maximize coverage. The documentation shall become part of the examination weld data package.
- 11.2 The documentation may be reviewed by another individual with the same or higher NDE certification.
- 11.3 The NDE Level III or data reviewer may review the calculations in order to verify that the information is accurate and correct.
- 11.4 The NDE Level III may recalculate the examination coverage to obtain a more accurate value of the examination surface or volume examined. The calculation shall be documented on the exam report.
- 11.5 The NDE Level III may require an alternate examination technique or method, or request that the interference be removed. For nozzle examinations, supplemental scans from the nozzle bore or flange face may provide complete coverage of the weld.
- 11.6 If the examination coverage indicates less than 90 percent of the required examination volume or surface, the site ISI Program Engineer shall be notified.
- 11.7 The site ISI supervisor shall ensure that examination results are accurately documented and incorporate results into a Request for Relief if necessary.

U.S. Nuclear Regulatory Commission

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FEB 21 2001

PLP:RNM

Enclosures

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