Tennessee Valley Authority, Post Office Box 2000, Soddy-Daisy, Tennessee 37384-2000

May 13, 2003

10 CFR 50.50a(g)(5)(iii)

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

Gentleman:

In the Matter of	)	Docket Nos. 50-327
Tennessee Valley Authority	)	50-328

SEQUOYAH NUCLEAR PLANT (SQN) - AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME) SECTION XI INSERVICE INSPECTION (ISI) PROGRAM - RELIEF REQUESTS

Pursuant to 10 CFR 50.55a(g)(5)(iii), TVA is submitting five requests for relief from ASME Code requirements. The relief requests are associated with ISI activities performed during SQN's first and second periods of the second ISI interval. Three relief requests are for Unit 1 and two relief requests are for Unit 2.

The relief requests are based on limitations that preclude full code examination of ASME Class 1 and 3 welds. Code examination of the welds is limited due to design configurations.

The relief requests are submitted in accordance with 10 CFR 50.55a(g)(5)(iii). TVA requests that NRC provide approval in accordance with 10 CFR 50.55a(g)(6)(i).

The SQN ISI Program is currently in the second 10-year ISI interval. TVA is in the process of planning inspection activities for the end of the second 10-year interval (i.e., Cycle 13 refueling outages for both units). NRC response is requested by June 2004 to support scheduling of ISI activities during the cycle 13 refueling outages.

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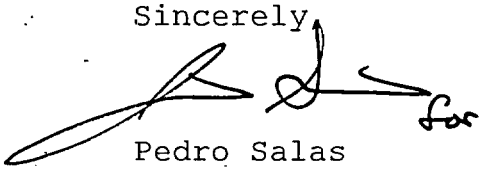
Enclosure 1 provides the Unit 1 specific request for relief. Enclosure 2 provides the requests for relief common to both units. Enclosure 3 provides examination data reports for each relief request. Enclosure 4 provides ISI drawings. Enclosure 5 provides a limitation drawing typical of Unit 1 and Unit 2 for Essential Raw Cooling Water strainer. Enclosure 6 provides pipe support drawing 1-SIH-801. Enclosure 7 provides TVA's procedure for calculation of the ASME code coverage for Section XI nondestructive examinations.

There are no commitments contained in this letter. This letter is being sent in accordance with NRC RIS 2001-05. If you have any questions about this change, please telephone me at (423) 843-7170 or J. D. Smith at (423) 843-6672.

Sincerely,



Pedro Salas
Licensing and Industry Affairs Manager

Enclosures
cc (Enclosures):
Mr. Michael L. Marshall, Jr., Senior Project Manager
U.S. Nuclear Regulatory Commission
Mail Stop O-8G9A
One White Flint North
11555 Rockville Pike
Rockville, Maryland 20852-2739

ENCLOSURE 1

SEQUOYAH NUCLEAR PLANT (SQN)

AMERICAN SOCIETY OF MECHANICAL ENGINEERS

(ASME)

REQUEST FOR RELIEF

FOR UNIT 1

1-ISI-23

Request for Relief 1-ISI-23

Executive Summary:

TVA is requesting relief from the ASME code to address the circumferential pressure retaining piping weld RHRF-107 in the residual heat removal (RHR) system. The design configuration of the subject piping precludes a 100% ultrasonic examination of the required weld volume. These physical examination limitations occur when the 1989 Code examination requirements are applied in areas of components constructed and fabricated to early plant physical designs. Based on the issue date of SQN's Unit 1 construction permit (May 27, 1970), SQN is exempt from the code requirements for providing original design and examination access as allowed in 10 CFR 50.55a(g)(4).

An inservice ultrasonic examination was performed on accessible areas to the maximum extent practical, given the physical limitations of the subject weld. The design configuration used limits the best effort ultrasonic examination to approximately 72%. Performance of an ultrasonic examination of essentially 100% of the subject circumferential pressure retaining weld, would be impractical. The maximum extent practical ultrasonic examination of the subject weld provides reasonable assurance of an acceptable level of quality and safety because the information and data obtained from the volume examined provides sufficient information to judge the overall integrity of the welds.

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

Unit:	1
System:	RHR - System 74
Component:	One Piping Circumferential Pressure Retaining Weld.
ASME Code Class:	ASME Code Class 1 (Equivalent)

Section XI Edition:	1989 Edition; 1995 Edition with 1996 Addenda; 10 CFR 50.55a(b)(2)(xv)(A); WCAP-14572, Revision 1-NP-A; and WCAP-14572, Revision 1-NP-A, Supplement 1
Code Table:	WCAP-14572, Table 4.1-1
Examination Category:	R-A, Risk - Informed Piping Examinations
Examination Item No:	R1.11, Elements Subject to Thermal Fatigue R1.16, Elements Subject to Intergranular Stress Corrosion Cracking (IGSCC)
Code Requirement:	WCAP-14572, Table 4.1-1, Examination Category R-A, Item Nos. R1.11 and R1.16, requires Volumetric Examination
Code Requirement From Which Relief is Requested:	Volumetric Examination Coverage of Essentially 100 Percent
List of Items Associated With the Relief Request:	RHRF-107, Piping Circumferential Weld

Basis for Relief:

The design configuration of the RHR piping and piping support location precludes an ultrasonic examination of the required volume of the subject weld RFRF-107 because of interference of a permanent piping support. The design configuration limits ultrasonic examination to approximately 72% of weld RHRF-107 for the required examination areas as calculated in accordance with TVA Procedure N-GP-28.

Alternative Examinations:

In lieu of the code required 100% volumetric examination, a best effort ultrasonic examination was performed on accessible areas to the maximum extent practical, given the physical limitations of the subject weld. Refer to attached examination data report.

Justification for the Granting of Relief:

The design configuration used in the fabrication of the subject piping in conjunction with the permanent rigid pipe support (1-SIH-801) precludes ultrasonic examination of essentially 100% of the required examination volume. In order to examine the welds in accordance with the code requirements, the RHR system pipe support would require extensive modification. RHRF-107 is limited at two locations due to a permanent rigid support (1-SIH-801) plate which limits the access from the elbow side for a total of 8 inches. One plate is located on the inside radius of the elbow and is approximately 5 inches in length. The other plate is located on the outside radius of the elbow and is approximately 3 inches in length. The design configuration limits the best effort ultrasonic examination to approximately 72% for weld RHRF-107. The subject weld was examined using application of the best available ultrasonic technology.

Radiographic examination as an alternate volumetric examination method was determined to be impractical because the same plates that limit ultrasonic examination also obstruct film placement.

Examination of similar components provides reasonable assurance that significant degradation, if present, would have been detected.

Performance of an ultrasonic volumetric examination of essentially 100% of the required volume of pressure retaining circumferential welds RHRF-107 (pipe to elbow) in the RHR piping is impractical. As previously discussed, TVA determined that it would be impractical to attempt other volumetric examinations in order to increase examination coverage. The maximum extent practical ultrasonic examination of the weld and adjacent material and the code required VT-2 examination for leakage will provide reasonable assurance of an acceptable level of quality and

safety. Significant degradation, if present, would be detected during the ultrasonic and VT-2 examinations that are performed on the subject weld. As a result, reasonable assurance of structural integrity for this weld is provided by the examinations that were performed.

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

Implementation Schedule:

This request for relief is applicable to SQN's second 10-year inspection interval for SQN Unit 1. Weld RHRF-107 for Unit 1 was examined in the second period.

References:

Enclosure 3 - Examination Data Report: R7785

Enclosure 4 - ISI Program Drawings:
CHM-2336-C-06 weld isometric
CHM-2435-C-06 support isometric

Enclosure 6 - Pipe Support Drawing:
1-1-H20-0801 for support 1-SIH-801

Enclosure 7 - Non Destructive Examination Procedure N-GP-28 "Calculation of ASME Code Coverage for Section XI NDE Examinations"

ENCLOSURE 2

SEQUOYAH NUCLEAR PLANT (SQN)

AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)

REQUEST FOR RELIEF

FOR UNITS 1 AND 2

1/2-ISI-24
1/2-ISI-25

Request for Relief 1-ISI-24 and 2-ISI-24

Executive Summary:

TVA is requesting relief from the ASME code to address the Unit 1 and Unit 2 pressurizer support skirt integral attachment welds. The design configuration of the pressurizer support skirt precludes a 100% surface examination of the required area. These physical examination limitations occur when the 1989 Code examination requirements are applied in areas of components constructed and fabricated to early plant physical designs. Based on the issue date of SQN's construction permit (May 27, 1970), SQN is exempt from the code requirements for providing original design and examination access as allowed in 10 CFR 50.55a(g)(4).

An inservice surface examination was performed on accessible areas to the maximum extent practical, given the physical limitations of the subject welds. The design configuration limits the best effort surface examination to approximately 50% on both pressurizer welds. Performance of a surface examination of essentially 100% of the subject integral attachment welds, would be impractical. The maximum extent practical surface examination of the subject welds and a supplemental ultrasonic examination of the inaccessible area provide reasonable assurance of an acceptable level of quality and safety because the information and data obtained from the area and volume examined provide sufficient information to judge the overall integrity of the welds.

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

Unit:	1 and 2
System:	Reactor Coolant System (System 68) - Pressurizer
Components:	Integral Attachments for Vessels (Pressurizer Support Skirt)
ASME Code Class:	ASME Code Class 1 (Equivalent)
Section XI Edition:	1989 Edition
Code Table:	IWB-2500-1

Request for Relief 1-ISI-24 and 2-ISI-24 (continued)

Examination Category:	B-H (ASME Code Case N-509, Category B-K)
Examination Item No.:	B8.20 (ASME Code Case N-509, Item No. B10.10)
Code Requirement:	Code examination-figure IWB-2500-13 which requires a surface examination of areas A-B and C-D of the pressurizer support skirt to vessel weld.
Code Requirements From Which Relief is Requested:	Requirement to perform a surface examination of the pressurizer support skirt weld examination area C-D, as illustrated in Figure IWB-2500-13 (inaccessible surface area).
List of Items Associated With the Relief Request:	Pressurizer Support Skirt Weld No. RCW-23A (Unit 1) and RCW-23 (Unit 2)

Basis For Relief:

The design configuration of the pressurizer support skirt precludes a surface examination of the required area (examination area C-D illustrated in Figure IWB-2500-13). This area is not accessible for surface examination due to the location, configuration, and close proximity of the 78 immersion heaters extending from the bottom head. The design configuration limits surface examination to approximately 50% of weld RCW-23 for Unit 1 and 50% of weld RCW-23A for Unit 2 of the required examination areas as calculated in accordance with TVA Procedure N-GP-28.

Alternative Examination:

In lieu of the code required 100% surface examination on both sides of the pressurizer support skirt integral attachment welds, a 100% surface examination on surface A-B as illustrated in Figure IWB-2500-13 and a best effort ultrasonic volumetric examination for surface C-D as illustrated in Figure IWB-2500-13 was performed on both welds. Refer to attached examination reports.

Justification for the Granting of Relief:

The design configuration of the pressurizer support skirt precludes surface examination of essentially 100% of the required examination area. In order to examine the welds in accordance with the code requirements, the pressurizer would require extensive modification.

The examination requirement is a surface based on the weld configuration. The weld configuration for SQN Unit 1 and 2 pressurizer support skirts is illustrated in code Figure IWB-2500-13, and requires a surface examination of areas A-B and C-D, (the outside and inside surfaces, respectively).

This design configuration of the subject pressurizer support skirt to pressurizer integral attachment weld precludes surface examination of surface C-D as illustrated in Figure IWB-2500-13.

The examination area C-D in Figure IWB-2500-13 is not accessible for surface examination due to the location, configuration and close proximity of the 78 immersion heaters extending from the bottom head. Physical access by the examiner is limited because of high radiation levels and obstructions due to the immersion heaters and the related wiring. The magnetic particle examination (yoke) cannot be used due to the space restrictions. The dye penetrant examination would require a very thorough cleaning of the weld and adjacent base material. The preparation of the weld would potentially require using techniques such as manual wire brushing since power tools may not fit into the limited space area.

The design configuration limits surface examination to 50% (examination of areas A-B only) for both welds.

Radiological dose rate in these areas (bottom head) may be approximately 40 to 45 mr/hour. It is conservatively estimated that approximately 32 man-hours would be required (2 people 8 hours to remove/assemble scaffolding, 2 people x 4 hours to remove/assemble insulation and 2 people x 4 hours to perform the examination, if it was accessible). A total of 1.28 roentgen equivalent-man (REM) could be received by all involved personnel.

The ultrasonic volumetric examination of the inaccessible area was performed using a 45- and 60-degree shear wave examination resulting in 100% examination coverage of the

pressurizer support skirt weld examination area C-D, as illustrated in Figure IWB-2500-13 (inaccessible surface area). Performance of a surface examination of essentially 100% of the required surface of the pressurizer support skirt weld is impractical. A surface examination on surface A-B as illustrated in Figure IWB-2500-13 and a ultrasonic volumetric examination for the inaccessible surface was performed on the subject weld. These examinations provide reasonable assurance of an acceptable level of quality and safety because the weld surface and the weld volume examined provides sufficient information to judge the overall integrity of the weld.

The proposed alternative volumetric examination of the inaccessible area has been evaluated and judged technically acceptable by the NRC Staff for use at TVA's Brown's Ferry Nuclear plant, Units 2 and 3, for the reactor pressure vessel support skirt weld. Therefore, an acceptable level of quality and safety will be achieved and public health and safety will not be endangered by utilizing the proposed alternative volumetric examination of the inaccessible areas in lieu of the prescribed surface examination requirements of the ASME Code.

Compliance with the ASME Code, will result in unusual difficulty and radiation exposure to personnel without any compensating increase in the level of quality or safety. The proposed alternative will provide an acceptable level of quality and safety

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

Implementation Schedule:

This request for relief is applicable to the second 10-year ISI Interval for SQN Unit 1 and Unit 2. Weld RCW-23A for Unit 1 and RCW-23 for Unit 2 were examined in the second period.

References:

Letter from Richard P. Correia, NRC to J.A. Scalice, TVA, dated June 19, 2000, "Brown's Ferry Nuclear Plant Units 2 and 3, Relief Request 2-ISI-10 and 3-ISI-9, Alternatives for Examination of Inaccessible Reactor Pressure Vessel Support Skirt Welds (TAC Nos. MA6408 and MA 8423)" (L44 020604 001)

Enclosure 3 - Examination Data Reports:
R7811 and R7819 (Unit 1)
R6432 and R6436 (Unit 2)

Enclosure 4 - ISI Program Drawings:
ISI-0394-C-01 (Unit 1)
ISI-0396-C-01 (Unit 2)

Enclosure 7 - Non Destructive Examination Procedure N-GP-28, "Calculation of ASME Code Coverage for Section XI NDE Examinations"

Request for Relief 1-ISI-25 and 2-ISI-25

Executive Summary:

TVA is requesting relief from the ASME code to address the Unit 1 and Unit 2 the essential raw cooling water (ERCW) system strainer support A1A-A Unit 1 and A2A-A Unit 2 integral attachment. The design configuration of the ERCW strainer to support interval attachment weld precludes a 100% visual VT-3 examination of the required area. These physical examination limitations occur when the 1989 Code examination requirements are applied in areas of components constructed and fabricated to early plant physical designs. Based on the date of SQN's construction permit (May 27, 1970), SQN is exempt from the code requirements for providing original design and examination access as allowed in 10 CFR 50.55a(g)(4).

An inservice visual examination was performed on accessible areas to the maximum extent practical, given the physical limitations of the subject welds. The design configuration limits visual examination to approximately 75% on both welds. Performance of a visual examination of essentially 100% of the subject integral attachment welds, would be impractical. The maximum extent practical visual examination of the subject welds provides reasonable assurance of an acceptable level of quality and safety because the information and data obtained from the area examined provides sufficient information to judge the overall integrity of the welds.

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

Unit :	1 and 2
System:	ERCW System (System 67)
Components:	ERCW Strainer Support Integral Attachment Weld
ASME Code Class:	ASME Code Class 3 (Equivalent)
Section XI Edition:	1989 Edition
Code Table:	IWD-2500-1
Examination Category:	D-A, Systems in Support of Reactor Shutdown Function (ASME Code Case N-509 Integral Attachments for

Request for Relief 1-ISI-25 and 2-ISI-25 (continued)

	Class 3 Vessels, Piping, Pumps and Valves)
Examination Item No.:	ASME Section XI Item Number D1.20, Integral Attachment - Component Supports and Restraints (ASME Code Case N-509, Item No. D1.10)
Code Requirement:	ASME Section XI, Table IWD-2500-1, Examination Category D-A, Item Number D1.20, Requires VT-3 Examination (ASME Section XI Code Case N-509 Item No. D1.10 Requires VT-1 Examination)
Code Requirement From Which Relief Is Requested:	Visual VT-3 Examination Coverage of Essentially 100% of the ERCW Strainer Support Integral Attachment Weld
List of Items Associated With the Relief Request:	ERCWSH-05-IA, Integral Attachment Weld (Unit 1) ERCWSH-11-IA, Integral Attachment Weld (Unit 2)

Basis for Relief:

The design configuration of the ERCW strainer support precludes a complete visual VT-3 examination of the required area for the integral attachment weld ERCWSH-05-IA (Unit 1) and ERCWSH-11-IA (Unit 2). These areas are not accessible for visual examination due to the location and configuration between the strainer and the concrete floor. The design configuration and location limits visual examination to approximately 75% of weld ERCWSH-05-IA for Unit 1 and 75% of weld ERCWSH-11-IA for Unit 2 of the required examination areas as calculated in accordance with TVA Procedure N-GP-28.

Alternative Examination:

In lieu of the code required 100% VT-3 visual examination, a VT-1 visual examination of the ERCW strainer integral attachment weld was performed on accessible areas to the maximum extent practical given the physical limitations. Refer to attached examination reports.

Justification for the Granting Of Relief:

The design configuration of the subject weld (partial penetration), Item No.5 (base plate) to Item No.1 (strainer) precludes visual examination of essentially 100% of the required examination area. In order to visually examine the weld in accordance with the code requirement, the ERCW strainer would require extensive disassembly in order to access the inside surface of the strainer. In order to dissemble the subject strainer, a temporary monorail is required to be installed due to limited overhead clearance.

The physical arrangement of the ERCW Strainer is composed of 16 integral lug (Item No.30) attachments that support the strainer body No.1 to a base plate connection (Item No.5). As part of the integral attachment, the base plate assembly (Item No.5) is attached to the strainer body (Item No.1) by a partial penetration weld from the inside surface for 360 degrees and a fillet weld 360 degrees around the outer circumference for 360 degrees. Each of the 16 attachment lugs and outer base plate to strainer body welds are accessible from the outside surface. The inside surface partial penetration weld does not allow access for visual examination. The amount of examination coverage when considered in total weld length examined was determined to be approximately 75%.

Radiographic examination from the outside surface as an alternate volumetric examination method was determined to be impractical due to the support attachments affecting radiographic quality. Performing radiographic examination from the inside surface of the ERCW strainer would require placing a radiographic source near the center of the component. The ERCW strainer would require complete extensive disassembly and being taken out of service for an extended period of time. Radiographic quality would be compromised due to the support attachments and the subject contrast effects from conditions associated with a partial penetration weld (i.e., butt joint match lines would mask indication due to the partial penetration condition). Thus, additional radiography from the inner surface, to gain any additional coverage, are also impractical.

Performance of an ultrasonic volumetric examination to supplement the required coverage was also deemed to be impractical. The design configuration of the partial penetration weld is not amenable for the detection of

circumferential flaws due to the partial penetration condition (i.e., discrimination of weld flaws is masked due to the partial penetration weld geometry). In addition, the fillet weld impedes the search unit position from the outside surface such that the ultrasonic beam cannot be oriented for detection of radial oriented flaws. The support attachments are 1 inch thick welded lugs equally stationed at 16 positions around the strainer. The lug attachments, along with 5 equally spaced bolt holes, would in addition interfere with the sound beam from being directed to the inner-weld region.

Performing a surface examination from the inside was determined to be impractical due to the same reasons as the visual examination.

The more detailed VT-1 visual examination was performed in lieu of the VT-3 examination.

The high percentage (75%) of the VT-1 visual examination of the subject weld areas and adjacent base metal was obtained. This examination coverage provides reasonable assurance of an acceptable level of quality and safety. The weld areas examined provide sufficient information to judge the overall integrity of the weld. Significant degradation, if present, would be detected during the VT-1 visual examination of the subject weld.

As a result, assurance of structural integrity for these welds is provided by the examinations that were performed.

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

Implementation Schedule:

This request for relief is applicable to the second 10-year ISI interval for SQN Unit 1 and Unit 2. Weld ERCWSH-05-IA for Unit 1 and ERCWSH-11-IA for Unit 2 were examined in the first period.

References:

Enclosure 3 - Examination Data Reports:
R7152 Unit 1
R5762 Unit 2

Enclosure 4 - ISI Program Drawing:
ISI-0285-C-01 (Unit 1)
ISI-0268-C-01 (Unit 2)

Enclosure 5 - Examination Limitation Drawing Typical of Unit 1 and Unit 2

Enclosure 7 - Nondestructive Examination Procedure N-GP-28, "Calculation of ASME Code Coverage for Section XI NDE Examinations"

ENCLOSURE 3

EXAMINATION DATA REPORTS

Request for Relief Nos.	Examination Data Reports
1-ISI-23	R7785
1-ISI-24	R7811 R7819
2-ISI-24	R6432 R6436
1-ISI-25	R7152
2-ISI-25	R5762

RECORD OF VT-1 EXAMINATION

DATE	PROCEDURE N-VT-1, REV.	REPORT NO.
9-22-97	26	R-5762

DRAWING NO.: 151-0268-A R-02 DIRECT ☒ REMOTE ☐

COMPONENT IDENTIFICATION:	SYSTEM:
ERCWSH-11TA	EECWS

REMOTE VISUAL AID: N/A

PLANT ☐ BFN ☒ SQN ☐ WBN ☐ BLN ☐ UNIT 1 ☒ UNIT 2 ☐ UNIT 3 CYCLE 8 ☒ INSERVICE ☐ PRESERVICE

EXAMINATION RESULTS

ATTRIBUTE	~~B-I-1/B-I-2~~ D-A 10-2-97 ACC. (√)	REJ. (√)	ATTRIBUTE	B-M-2/B-N-2 ACC. (√)	REJ. (√)
CRACKS	✓		CRACKS		
WEAR	✓		WEAR		
CORROSION	✓		CORROSION N/A		
EROSION	✓		EROSION		
PHYSICAL DAMAGE	✓		PHYSICAL DAMAGE		

EXPLANATION OF UNSATISFACTORY RESULTS: N/A

REMARKS: EXAMINATION LIMITED DUE TO INACCESSIBLE PARTIAL PENETRATION WELD. WELD LENGTH OF INACCESSIBLE WELD = 115" TOTAL WELD LENGTH = ~~453~~ SS 9-22-97 454" (2 ROUND SEAMS @ 115" AND 16 LUGS @ 14" EACH). PERCENT EXAMINED = 75% (339"/453") (See Attached)

EXAMINED BY: M.S.SESSOMS / J.C.MASSEY John C. Massey	LEVEL II	
REVIEWED BY:	DATE 9/24/97	
ANII REVIEWED BY: Tom McGinn	DATE 10/2/97	

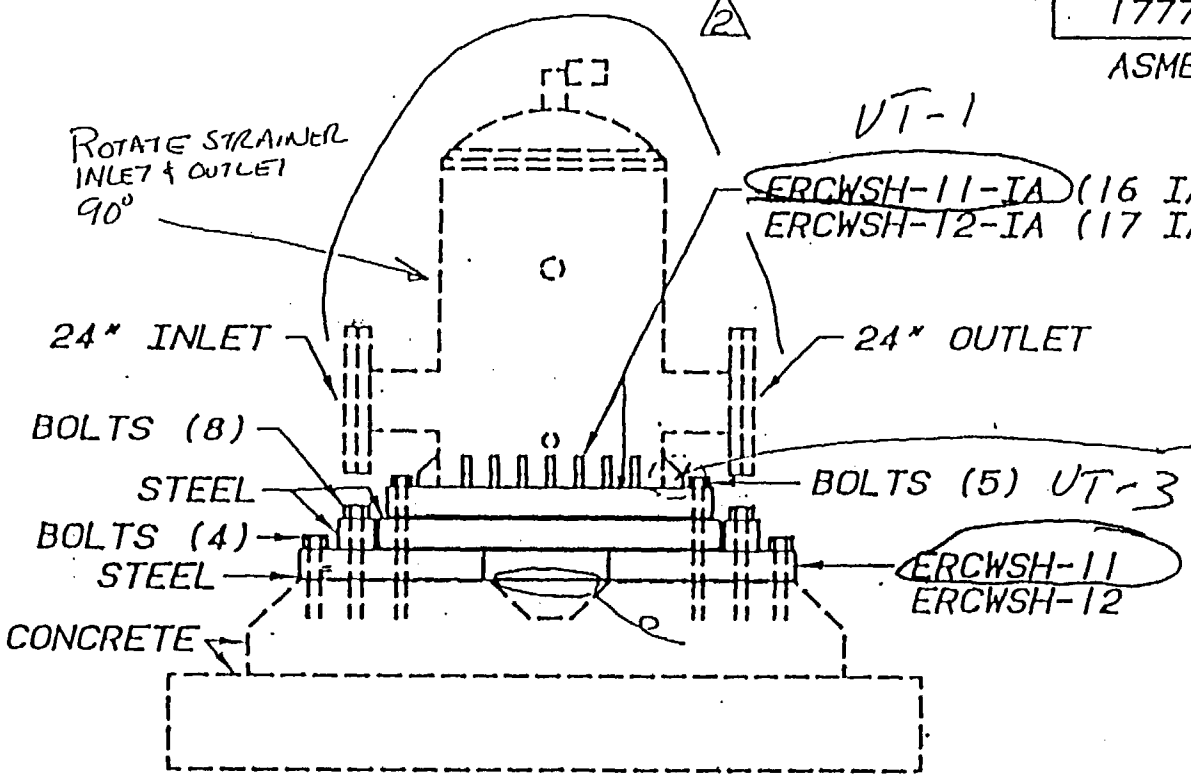
TVA 7904F (NP 10/92)

1 of 2

TRANSMITTAL NUMBER 97-10

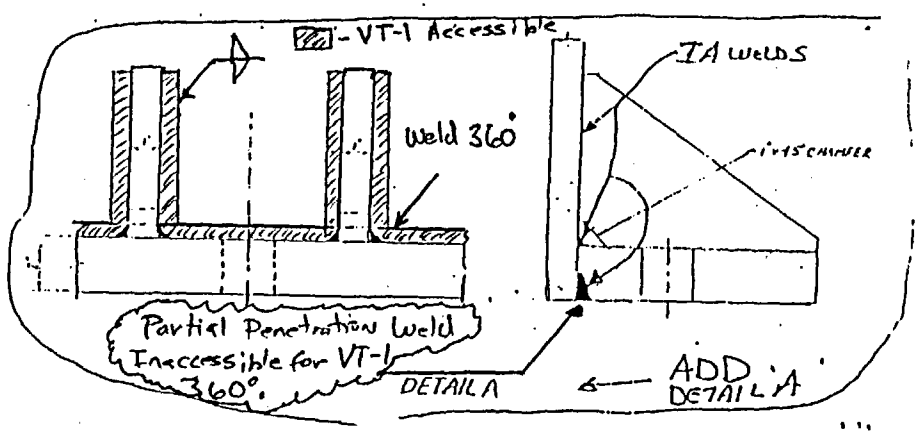
REFERENCE DRAWINGS
37W206-7
CONTRACT NO. 76K36-820061 (N2M-499)
17661
17771-1, 2 AND 3.

ASME CC-3 (EQUIVALENT)



NOTE: FOR CONFIGURATION SEE ISI-0158-C SH. 1.

ERCWSH-11 — CORRESPONDS TO STRAINER A2A-A
ERCWSH-12 — CORRESPONDS TO STRAINER B2B-B



REV.	BY	CHECKED	SUBMITTED	APPROVED	DATE
2	RPG	[illegible]	DCG	[illegible]	1-4-93
DASH OUTLINE OF STRAINER					
1	RPG	PHB	JCG	GLB	12-17-91
CORRECT NO. OF IA'S, & MOVE TO CADAM					

TENNESSEE VALLEY AUTHORITY

SEQUOYAH NUCLEAR PLANT UNIT 2
ESSENTIAL RAW COOLING WATER SYSTEM STRAINER SUPPORT DETAIL

DRAWN: RPG	DATE: 10-16-87	SCALE: NTS	CADAM/ISICMP
CHECKED: MRA	APPROVED: GLB	SHEET 1 OF 1	REV
SUBMITTED: CE		ISI-0268-A	02

R-5762

2-27

TENNESSEE VALLEY AUTHORITY	RECORD OF MAGNETIC PARTICAL	REPORT NUMBER R-6432

PROJECT: SQN UNIT: 2 CYCLE: 11
SYSTEM: PZR
WELD/COMPONENT I.D.: RCW-23
CONFIG.: VIWASK TO:
PROCEDURE: N-MT-6 REV 24 TC N/A
EXAMINATION CODE: 89E-02
CODE CLASS: 1 CATEGORY: B-K

EXAMINATION DATE: 04/25/2002
EXAM SURFACE: ☐ ID ☑ OD
PRESERVICE ☐
INSERVICE ☑
REFERENCE DWG NO: ISI-0396-C-01

ACCEPTANCE CRITERIA
☐ APPDX. A ☑ APPDX. B
☐ OTHER

METHOD OF MAGNETIZATION

EXAMINATION MEDIUM: Magnaflux COLOR: Red 8A BATCH NO.: N/A

YOKE Y5 ☐ Y6 ☑	PRODS: AC ☐ DC ☐	COILS: AC ☐ DC ☐
OTHER: N/A	EQUIP TYPE:	EQUIP TYPE:
EQUIP S/N: 538069	EQUIP S/N:	EQUIP S/N:
CAL. DUE DATE N/A	CAL. DUE DATE	CAL. DUE DATE:
POLE SPACING: 6 inches	PROD SPACING: inches	COIL TURNS:
TEST WEIGHT S/N: 901470	MAG. CURRENT: amps	MAG. CURRENT: amps

THERMOMETER S/N: N/A CALIBRATION DUE DATE N/A

BLACK LIGHT METER S/N: N/A CALIBRATION DUE DATE N/A

INTENSITY VERIFICATION TIME	INIT.: N/A	1) N/A	2) N/A	3) N/A

EXAMINATION RESULTS: SATISFACTORY ☑ UNSATISFACTORY ☐ NOI NO.: N/A

EXPLANATION OF EXAM RESULTS

NRI

COMMENTS / LIMITATIONS

No limitations were encounted. Pre & Post illumination check ok. Illumination card s/n 012.

NO LIMITATIONS ON OD SURFACE. ID SURFACE INACCESSIBLE, UT PERFORMED OD ID

EXAMINER: Stephen Williams Stephen Williams LEVEL: II SEE REPORT # R-6436

EXAMINER: Michael Gagnier Michael Gagnier LEVEL: II

REVIEWER: W M Bentley LEVEL: III DATE: 4-25-02

ANII: Mitchell

DATE: 5/8/02

PAGE: 1 OF 1

TENNESSEE VALLEY AUTHORITY	EXAMINATION SUMMARY AND RESOLUTION SHEET	REPORT NUMBER: R-6436

PROJECT: *SQN* UNIT: *2* CYCLE *11*				COMPONENT ID: *RCW-23*	
EXAMINATION METHOD				SYSTEM: PZR	ISI DWG NO: *ISI-0396-C-01*
MT ☐	PT ☐	UT ☑	VT ☐	CONFIGURATION	CATEGORY
PROCEDURE: *N-UT-7*	REV *13*	TC: *N/A*		*VIWASK TO*	*B-K*

EXAMINER: *Paul Valden*	EXAMINER: *Angela Tucker*	EXAMINER: *David Packer*	EXAMINER:
LEVEL: *II*	LEVEL: *II*	LEVEL: *II*	LEVEL:

Total coverage calculated to be approximately *100* %

This report contains the data associated with weld RCW-23 a Pressurizer support skirt attachment weld. Examination of this weld is in accordance with the ASME Section XI Code requirements.

A 45° shear 1 1/4 V-path examination was performed in 2 directions perpendicular and 2 directions parallel to the weld. This examination is a supplemental examination performed in lieu of MT for the ID surface not accessible. A 60° shear wave examination was also performed to assure full examination volume coverage.

Weld crown geometry was observed 360° at varying amplitudes.

No limitations were noted for this examination.

MT OF OD SURFACE - SEE REPORT # R-6432

RESOLUTION BY	REVIEWED BY	ANII:
LEVEL II DATE: 4/25/02	LEVEL: III DATE: 4-28-02	DATE: 5/9/02
		Page: 1 OF 5

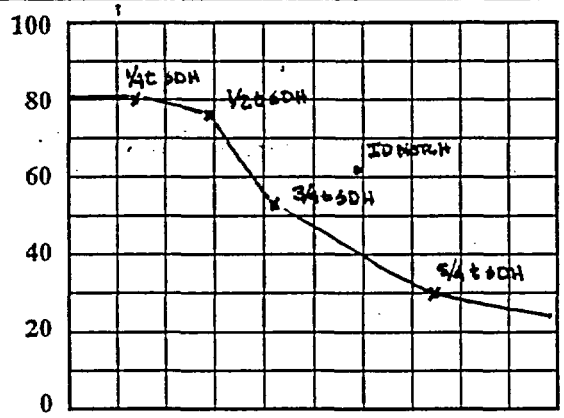
TENNESSEE VALLEY AUTHORITY	DIGITAL ULTRASONIC CALIBRATION DATA SHEET	REPORT NUMBER R-6436

PROJECT *SQN* UNIT/CYCLE *2 / 11*
PROCEDURE: *N-UT-7* REV: *13* TC: *N/A*

TRANSDUCER
MANUFACTURER *KBA*
MODEL: *SWS* S/N *J15205*
SIZE: *0.5x1.0"* FREQ: *2.25* MHz
SHAPE: *Rectangl* # ELEMENTS: *1* # CONS: *0*
CABLE TYPE *RG-58* LENGTH: *6'*

MODE: ☑ SHEAR ☐ LONG ☐ RL

DAC



DISPLAY WIDTH *7.00* inches

CALIBRATION DATE: *4/25/02*
CALIBRATION BLOCK NO. *SQ-40* TEMP: *79* °F
SIMULATOR BLOCK: *Rompas*
THERMOMETER S/N *573207* DUE DATE *10/1/02*
COUPLANT: *Ultragel II* BATCH: *95-325*

ANGLE VERIFICATION
BLOCK TYPE: *IIW* S/N: *790609*
NOMINAL ANGLE *45°* ACTUAL ANGLE *45°*

INSTRUMENT
MANUFACTURER *Krautkramer* DUE DATE *6/8/02*
MODEL NO.: *USN-52L* S/N: *E30216*

INSTRUMENT SETTINGS

REFLECTOR			REFERENCE SENSITIVITY	MEMORY NUMBER
SCAN DIRECT.	NTC	SDH		
AXIAL	☐	☑	*34.0* dB	*48*
CIRC.	☐	☐	*N/A* dB	*N/A*

FREQ: *2.0-8.0* MHz REJECT: *0* % *
ANGLE: *45* deg DAMPING: *1000* ohms *
DELAY *0.000* msec PULSER: *SINGLE* *
ZERO: *12.918* msec
VELOCITY *.1277* msec PRR/PRF: *HIGH* *
RANGE: *7.00* inches TOF: *PEAK*
DISP. MODE: *FULL WAVE** POWER: *BATTERY*

REF. REFLECTOR: *NSH / FSH* GAIN: *34.0* dB
AMPLITUDE: *45 / 30* % METAL PATH: *.45" / 1.05"*

CALIBRATION TIMES
INITIAL TIME: *1312* FINAL TIME *1536*

VERIFICATION TIMES	1)	2)	3)	4)	5)	6)	7)	8)	9)
	1350	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*

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

LINEARITY CHECK

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

COMMENTS	WELD / ITEMS EXAMINED
	RCW-23

EXAMINER: *Paul Valden* LVL.: *II*
EXAMINER: *Angela Tucker / David Tucker* LVL.: *II / II*
REVIEWER: LVL.: *III* DATE: *4-28-02*

ANII: *R Bockwood*
DATE: *5/9/02*

ACCESS: FORMS DATABASE 10-27-01

TENNESSEE VALLEY AUTHORITY	DIGITAL ULTRASONIC CALIBRATION DATA SHEET	REPORT NUMBER R-6436

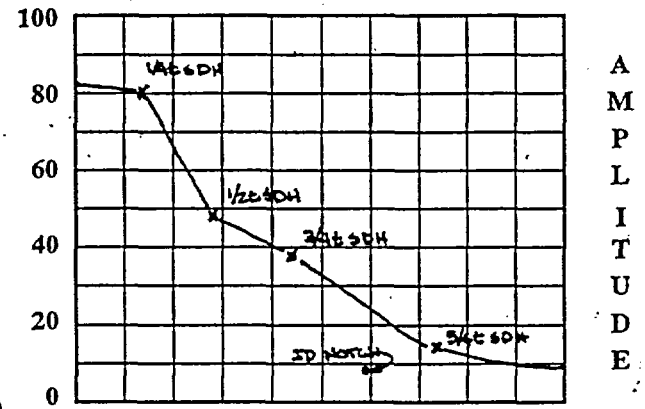
PROJECT *SQN* UNIT/CYCLE *2 / 11*
PROCEDURE: *N-UT-7* REV: *13* TC: *N/A*

TRANSDUCER

MANUFACTURER *KBA*
MODEL: *SWS* S/N *J15204*
SIZE: *0.5x1.0"* FREQ: *2.25* MHz
SHAPE: *Rectangl* # ELEMENTS: *1* # CONS: *0*
CABLE TYPE *RG-58* LENGTH: *6'*

MODE: ☑ SHEAR ☐ LONG ☐ RL

DAC



DISPLAY WIDTH *10.00* inches

CALIBRATION DATE: *4/25/02*
CALIBRATION BLOCK NO: *SQ-40* TEMP: *79* °F
SIMULATOR BLOCK: *Rompas*
THERMOMETER S/N *573207* DUE DATE *10/1/02*
COUPLANT: *Ultragel II* BATCH: *95-325*

ANGLE VERIFICATION

BLOCK TYPE: *IIW* S/N: *790609*
NOMINAL ANGLE *60°* ACTUAL ANGLE *60°*

INSTRUMENT

MANUFACTURER *Krautkramer* DUE DATE *6/8/02*
MODEL NO.: *USN-52L* S/N: *E30216*

INSTRUMENT SETTINGS

REFLECTOR			REFERENCE SENSITIVITY	MEMORY NUMBER
SCAN DIRECT.	NTC	SDH		
AXIAL	☐	☑	*40.0* dB	*49*
CIRC.	☐	☐	*N/A* dB	*N/A*

FREQ: *2.0-8.0* MHz REJECT: *0* % *
ANGLE: *60* deg DAMPING: *1000* ohms *
DELAY *0.000* msec PULSER: *SINGLE* *
ZERO: *15.590* msec
VELOCITY *.1222* msec PRR/PRF: *HIGH* *
RANGE: *10.00* inches TOF: *PEAK*
DISP. MODE: *FULL WAVE** POWER: *BATTERY*

REF. REFLECTOR: *NSH / FSH* GAIN: *40.0* dB
AMPLITUDE: *35 / 50* % METAL PATH: *.65" / 1.45"*

CALIBRATION TIMES

INITIAL TIME: *1313* FINAL TIME *1535*

VERIFICATION TIMES	1)	2)	3)	4)	5)	6)	7)	8)	9)
	1455	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*

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

LINEARITY CHECK

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

COMMENTS	WELD / ITEMS EXAMINED
	RCW-23

EXAMINER: *Paul Valden* LVL.: *II*
EXAMINER: *Angela Tucker / David Tucker* LVL.: *II / II*
REVIEWER: LVL.: *III* DATE: *4-28-02*

ANII: *M Lockwood*
DATE: *5/9/02*
PAGE *3* OF *5*

ACCESS: FORMS DATABASE 10-27-01

TENNESSEE VALLEY AUTHORITY	MANUAL ULTRASONIC PIPING EXAMINATION DATA SHEET	REPORT NUMBER R-6436

ROJECT: *SQN* UNIT/CYCLE *2 / 11*
SYSTEM *PZR*
WELD I.D.: *RCW-23*
CONFIG.: *VIWASK* TO
FLOW

EXAMINATION DATE *4/25/02*
START TIME: *1350* END TIME: *1515*
EXAM SURFACE ☐ID ☑OD
MATERIAL TYPE: ☑CS ☐SS ☐CSCL ☐CCSS
SURFACE TEMP. *80* PYRO NO. *573207*

PROCEDURE: *N-UT-7* REV: *13* TC: *N/A*
Wo REFERENCE: *C/L of Transition (See Attached Dwg.)*
Lo REFERENCE: *Z Azmith Pad 0 stamp*

EXAMINATION ANGLE	45 DEG.	60 DEG.
AXIAL SCAN SENSITIVITY	50.0 dB	64.0 dB
CIRC. SCAN SENSITIVITY	50.0 dB	N/A dB

IND NO.	L (in) FROM REF.			AT MAX/AMP			MAX AMP %DAC	EXAM NO. 3-14	NOM. ANG.	NRI	INDICATION INFORMATION: TYPE, DAMPING, ETC.
	L1	L Max	L2	W MAX	MP MAX	D MAX					
N/A								3	45°s	☑	
1	*	204"	*	1.8"	2.4"	1.7"	90	4	45°s	☐	* See Note Below
N/A								5	45°s	☑	
N/A								6	45°s	☑	
N/A								3	60°s	☑	
2	*	204"	*	2.7"	4.0"	2.0"	90	4	60°s	☐	* See Note Below

REMARKS/LIMITATIONS

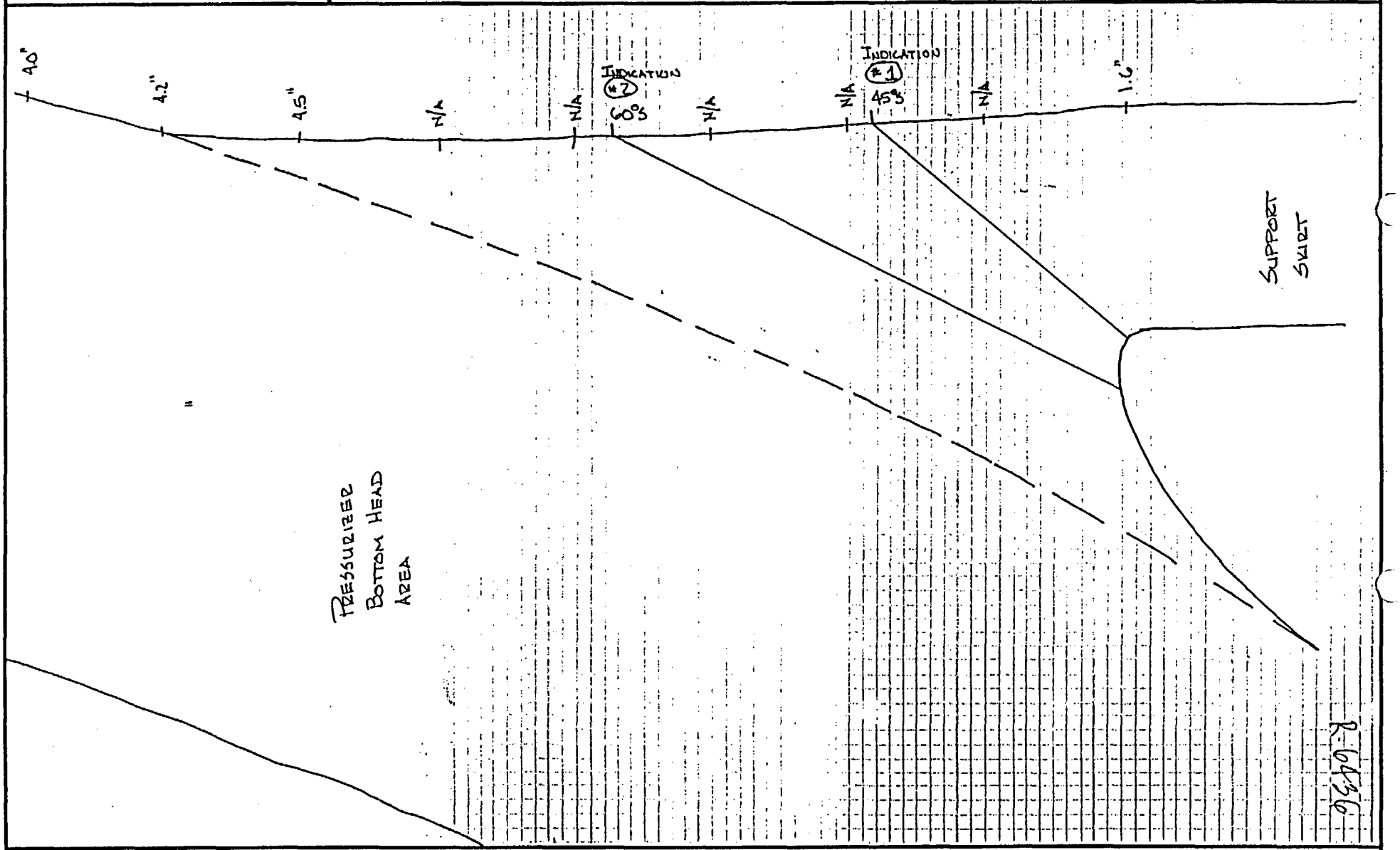
** Indications noted above can be observed 360° at varying amplitudes. Maintained a 5% to 20% ID roll throughout examination.*

EXAMINER: *Paul Valden* LEVEL: *II*
EXAMINER: *Angela Tucker* LEVEL: *II*
REVIEWED BY: LEVEL: *III* DATE: *4-28-02*

ANII: *M Cochran*
DATE: *5/9/02*
PAGE *4* OF *5*

ACCESS: FORMS DATABASE 10/18/01

TVA Office of Nuclear Power	PROJECT: SQN SYSTEM: PZR Unit: 2/11 WELD NO.: RCW-23	REPORT NO.: R.6436



BY: Paul Valdez LEVEL: II DATE: 4/25/02 PAGE 5 OF 5

TVA 19669 (ONP-6-88)

Mike Wood 5/1/02

TENNESSEE VALLEY AUTHORITY
RECORD OF VISUAL EXAMINATION

EXAM DATE: 8-25-98 PROCEDURE: N-VT-1, REV: 26 TC: 97-25 REPORT NUMBER: R-7152

PLANT: SQNP UNIT: 1 CYCLE: 9 INSERVICE ☒ PRESERVICE ☐

COMPONENT ID: ERCWSH-05-1A MODIFIED PORTION ONLY: YES ☐ NO ☒

DRAWING NO: 151-0285-C-01 SYSTEM: ERCWS CODE CATEGORY: D-A

COMPONENT TYPE: SUPPORT ☐ BOLTING ☐ PUMP/VALVE ☐ INTEGRAL ATTACH (IA) ☒

TYPE OF VISUAL EXAM: VT-1 ☒ VT-3 ☐ DIRECT ☒ REMOTE ☐ VISUAL AID(S): Flashlight, Mirror

ATTRIBUTE	ACCEPT	REJECT	N/A
DEFORMED OR SHEARED BOLTS/STUDS/THREADS (VT-1)	☐	☐	☒
CORROSION (VT-1)	☒	☐	☐
LOOSE BOLTING (VT-1)	☐	☐	☒
THREAD ENGAGEMENT (VT-1)	☐	☐	☒
COOLANT LEAKAGE (VT-1)	☒	☐	☐
CRACKS/FRACTURES (VT-1,3)	☒	☐	☐
STRUCTURAL DISTORTION/ DEGRADATION (VT-1,3)	☒	☐	☐
PHYS. DAMAGE/ DISPLACEMENT (VT-1,3)	☒	☐	☐
LOOSE/MISSING PARTS (VT-1,3)	☒	☐	☐
DEBRIS/CORROSION OF MACHINED SURFACES (VT-3)	☐	☐	☒
WEAR/EROSION/CORROSION (VT-3)	☐	☐	☒
FUNCTIONAL ADEQUACY (VT-3)	☐	☐	☒
FREEDOM OF MOTION (VT-3)	☐	☐	☒
VERIFICATION OF SETTING (VT-3)	☐	☐	☒
LOSS OF INTEGRITY (VT-3)	☐	☐	☒
CLEARANCE VERIFICATION (VT-3)	☐	☐	☒

SUPPORT TYPE:
☐ RIGID SUPPORT ☐ CONSTANT FORCE
☐ VARIABLE SPRING ☐ SNUBBER

DUAL SPRING / SNUBBER
YES ☐ NO ☐

Mfg:
Type:
Model:
Size:
Range: (1)
Setting: (1) N/A
Range: (2)
Setting: (2)

Temp:
Pyro. No.:

BOLTING:
INPLACE: ☐ REMOVED: ☐
DISASSEMBLED: ☐

REMARKS: Limited examination due to inaccessible weld Ref ISI Report R-5762 (attached) max 8-25-98. App. 75% Coverage achieved. Unit 1 & Unit 2 assemblies are the same. See Attached Drawing

NOI NUMBER N/A WORK DOCUMENT: N/A

EXAMINER: Robert E. Hardaway LEVEL: II DATE: 8-25-98

EXAMINER: [signature] LEVEL: II DATE: 8-25-98

REVIEWER: [signature] LEVEL: III DATE: 8/28/98

ANII REVIEW: [signature] DATE: 9-24-98

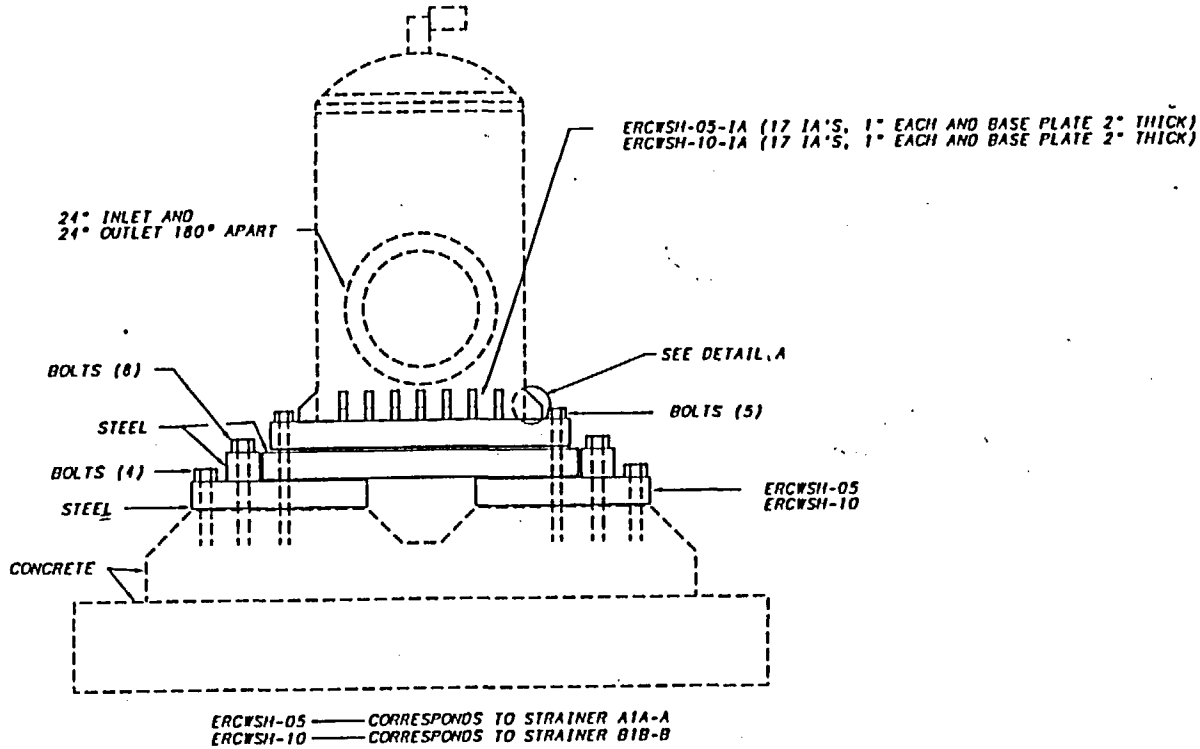
1 of 2

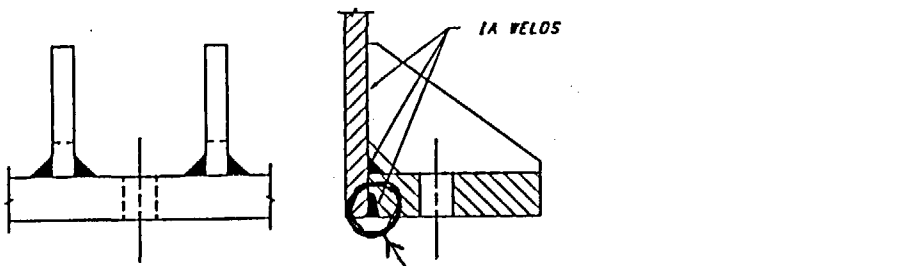
TVA/ISO REV1
04/01/1998

REFERENCE DRAWINGS
37W206-7
CONTRACT NO. 76K36-820061 (N2M-499)
17661
17771-1, -2 AND -3
ASME CC-3 (EQUIVALENT)

NOTES:

1. FOR CONFIGURATION SEE ISI-0123-C-01 & -02
2. THIS DWG SUPERCEDES ISI-0285-A-01.





REV	BY	CHECKED	SUBMITTED	APPROVED	DATE

TENNESSEE VALLEY AUTHORITY

SEQUOYAH NUCLEAR PLANT
UNIT 1
ESSENTIAL RAW COOLING WATER SYSTEM
STRAINER SUPPORT DETAIL

DRAWN: RPG	DATE: 6/11	SCALE: NOT TO SCALE
CHECKED: [illegible]	APPROVED: [illegible]	CAD MAINTAINED DRAWING
SUBMITTED: [illegible]	ISI-0285-C-01	REV 00

2 of 2

TENNESSEE VALLEY AUTHORITY	EXAMINATION SUMMARY AND RESOLUTION SHEET	REPORT NUMBER: R-7785

PROJECT: *SQN* UNIT: *1* CYCLE *11*				COMPONENT ID: *RHRF-107*	
EXAMINATION METHOD				SYSTEM: RHRS	ISI DWG NO: *CHM-2336-C-06*
MT ☐	PT ☐	UT ☑	VT ☐	CONFIGURATION	CATEGORY
PROCEDURE: *N-UT-64*	REV *4*	TC: *00-18 00-21*		*PC,PIPE TO PE,EL*	*R-A*
EXAMINER: *JAMES M. BULLEN*	EXAMINER: *TOMMY E. JACKSON*	EXAMINER: N/A	EXAMINER: N/A		
LEVEL: *II*	LEVEL: *II*	LEVEL:	LEVEL:		

Total coverage calculated to be approximately ~~63.96~~ 72 %
JWW 10/29/01

THIS REPORT CONTAINS THE DATA ASSOCIATED WITH RHRF-107 A PIPE TO ELBOW CONFIGURATION IN ACCORDANCE WITH RISK INFORMED REQUIREMENTS.

A 45 DEGREE SHEAR WAVE, FULL V-PATH EXAMINATION WAS PERFORMED FROM 2 DIRECTIONS PERPENDICULAR AND 2 DIRECTIONS PARALLEL TO THE WELD.

THERE WERE NO RECORDABLE INDICATIONS.

THE EXAMINATION WAS LIMITED DUE TO PROXIMITY OF LUGS WELDED ON THE WHIP RESTRAINT.

Best Effort Coverage: 72%

ASME Section XI Coverage: ~~72%~~ 100% * JWW 11/19/01

* Coverage does not consider the inherent limitations associated with the Performance Demonstration Initiative (PDI) for one side access.
JWW 11/19/01

RESOLUTION BY	REVIEWED BY	ANII:
James M. Bullen JAMES M. BULLEN	JWW	DATE: 11/9/01
LEVEL *II* DATE: *10-26-01*	LEVEL: III DATE: 10-29-01	Page: 1 OF 5

ACCESS: FORMS DATABASE R-10/04/01

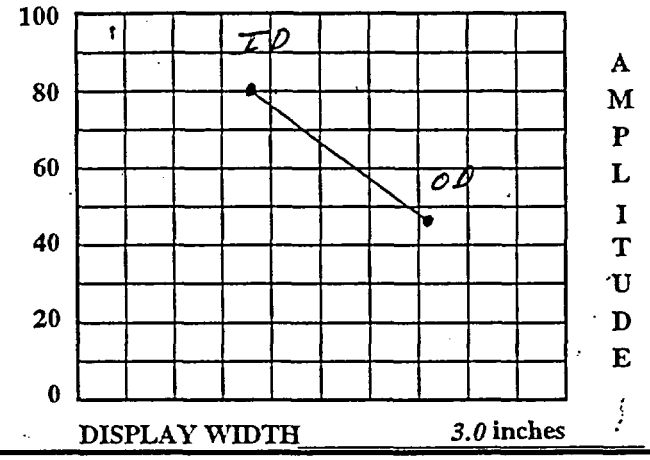
TENNESSEE VALLEY AUTHORITY	DIGITAL ULTRASONIC CALIBRATION DATA SHEET	REPORT NUMBER R-7785

PROJECT SQN UNIT/CYCLE 1 / 11
PROCEDURE: N-UT-64 REV: 4 TC: 00-18 00-21

TRANSDUCER

MANUFACTURER KBA
MODEL: COMP-G S/N 00D8KK
SIZE: .375" FREQ: 1.5 MHz
SHAPE: Round # ELEMENTS: 1 # CONS: 0
CABLE TYPE RG-174 LENGTH: 72"
MODE: ☑ SHEAR ☐ LONG ☐ RL

DAC



DISPLAY WIDTH 3.0 inches

CALIBRATION DATE: 10-26-01
CALIBRATION BLOCK NO. SQ-7 TEMP: 73.4 °F
SIMULATOR BLOCK: N/A
THERMOMETER S/N E27489 DUE DATE 6-15-02
COUPLANT: Ultragel II BATCH: 95325

ANGLE VERIFICATION

BLOCK TYPE: Rompas S/N: 93-5719
NOMINAL ANGLE 45° ACTUAL ANGLE 45°

INSTRUMENT

MANUFACTURER Krautkramer DUE DATE 6-15-02
MODEL NO.: USN-52L S/N: E30219

INSTRUMENT SETTINGS

REFLECTOR			REFERENCE SENSITIVITY	MEMORY NUMBER
SCAN DIRECT.	NTC	SDH		
AXIAL	☑	☐	25 dB	8
CIRC.	☑	☐	33 dB	8

FREQ: 2.0-8.0 MHz REJECT: 0 %
ANGLE: 45 deg DAMPING: 1000 ohms
DELAY 0.000 msec PULSER: SINGLE *
ZERO: 6.164 msec
VELOCITY .1249 msec PRR/PRF: HIGH
RANGE: 3.000 inches TOF: PEAK
DISP. MODE: FULL WAVE POWER: BATTERY

REF. REFLECTOR: N/A GAIN: N/A dB
AMPLITUDE: N/A % METAL PATH: N/A

CALIBRATION TIMES

INITIAL TIME: 1244 FINAL TIME 1727

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

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

LINEARITY CHECK

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

COMMENTS	WELD / ITEMS EXAMINED
N/A	RHRF-107

EXAMINER: James M. Bullen JAMES M. BULLEN LVL.: II
EXAMINER: Tommy E. Jackson TOMMY E. JACKSON LVL.: II
REVIEWER: [signature] LVL.: III DATE: 10-29-01

ANII: [signature]
DATE: 11/9/01

ACCESS: FORMS DATABASE 10-18-01

TENNESSEE VALLEY AUTHORITY	MANUAL ULTRASONIC PIPING EXAMINATION DATA SHEET	REPORT NUMBER R-7785

PROJECT: SQN UNIT/CYCLE 1 / 11
SYSTEM RHRS
WELD I.D.: RHRF-107
CONFIG.: PC,PIPE TO PE,EL
FLOW →
PROCEDURE: N-UT-64 REV: 4 TC: 00-18 00-21
Wo REFERENCE: WELD CENTER LINE
Lo REFERENCE: Outside Radius of EL

EXAMINATION DATE 10-26-01
START TIME: 1610 END TIME: 1705
EXAM SURFACE ☐ID ☑OD
MATERIAL TYPE: ☐CS ☑SS ☐CSCL ☐CCSS
SURFACE TEMP. 78° PYRO NO. E27489

EXAMINATION ANGLE	45 DEG.	N/A DEG.
AXIAL SCAN SENSITIVITY	37 dB	N/A dB
CIRC. SCAN SENSITIVITY	39 dB	N/A dB

IND NO.	L (in) FROM REF.			AT MAX AMP			MAX AMP % DAC	EXAM NO. 3-14	NOM. ANG.	NRI	INDICATION INFORMATION: TYPE, DAMPING, ETC.
	L1	L Max	L2	W MAX	MP MAX	D MAX					
								3	45	☑	
								4	45	☑	
								5	45	☑	
								6	45	☑	

REMARKS/LIMITATIONS
NO EXAM AT 90 DEG. AND 270 DEG. DUE TO PROXIMITY OF 5" X 5" LUGS WELDED ON WHIP RESTRAINT.
MAINTAINED 5%-20% ID ROLL WHILE PERFORMING EXAMINATION.

EXAMINER: James M. Butler JAMES M. BUTLER LEVEL: II
EXAMINER: Tommy E. Jackson TOMMY E. JACKSON LEVEL: II
REVIEWED BY: M Bentley LEVEL: III DATE: 10-29-01

ANII: Blackwood
DATE: 11/9/01
PAGE 3 OF 5

ACCESS: FORMS DATABASE 10/18/01

TVA

WALL THICKNESS PROFILE SHEET

REPORT NO: R-1785

PROJECT: SQN

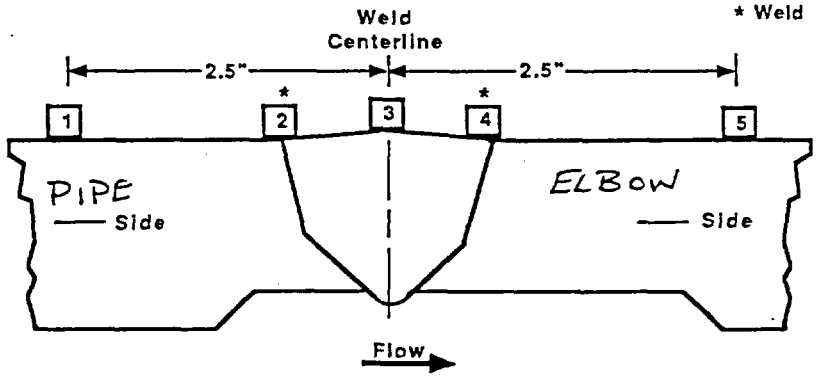
UNIT: 1

WELD NO: RHRF-107

SYSTEM: RHRS

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

Position	0°	90°	180°	270°
1	.90"			
2	.88"			"
3	.94"			"
4	.92"			
5	1.14	"	"	



CROWN HEIGHT: FLUSH

CROWN WIDTH: .90"

DIAMETER: 8.0"

WELD LENGTH: 27.75"

COVERAGE 45°/S

FLOW

PIPE

ELBOW

℄

EXAMINER: James M Bunker

LEVEL: II

DATE: 10-26-01

REVIEWED BY: MMB

LEVEL: III DATE: 10-29-01

ANII: [signature]

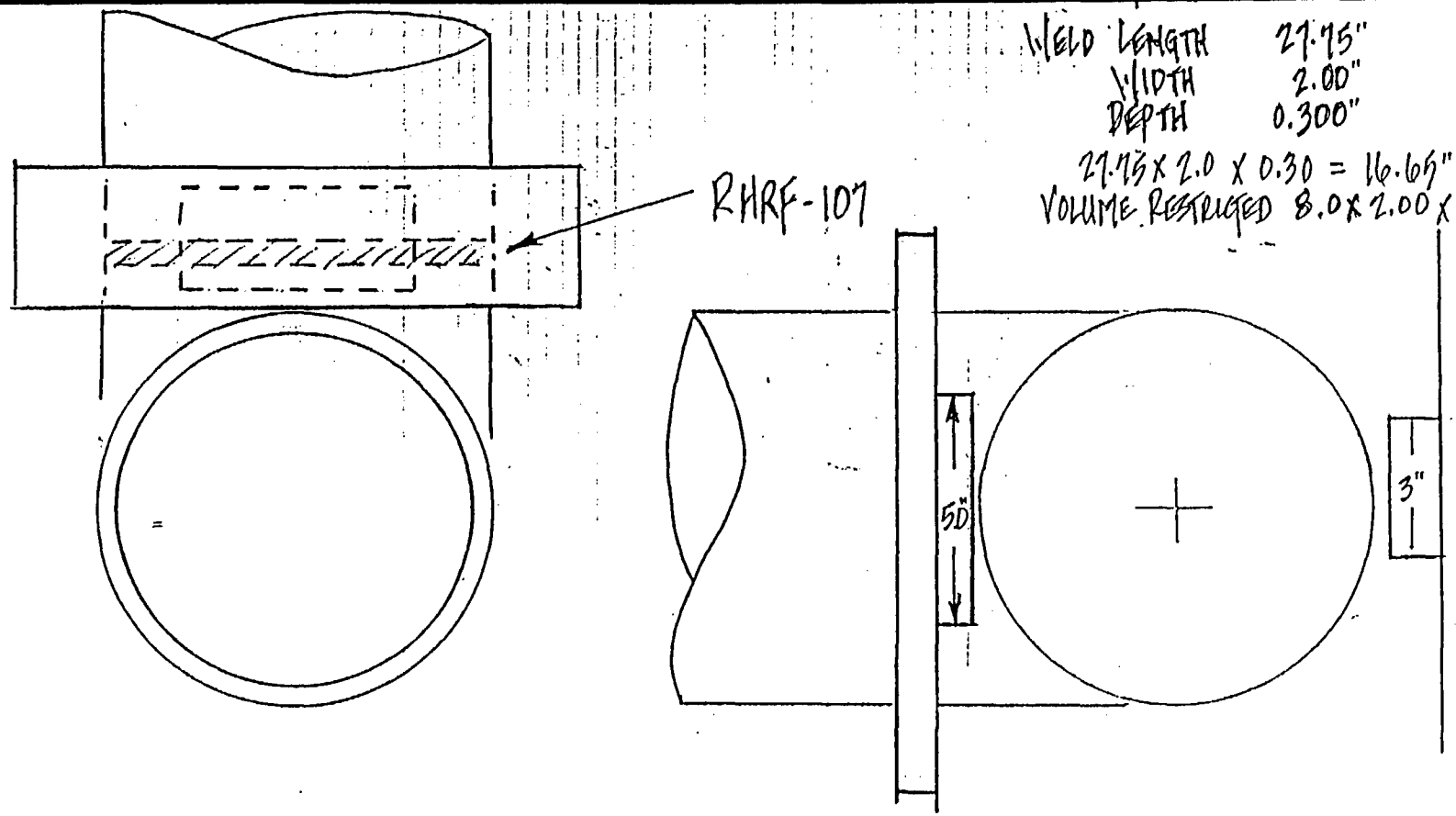
DATE: 11/9/01

PAGE 4 OF 5

TVA 19668 (NP-5-89)

1-108-999-44

TVA Office of Nuclear Power	PROJECT: SQN SYSTEM: RHRS Unit: 1 WELD NO.: RHRF-107	REPORT NO.: R-7785'



WELD LENGTH 27.75"
WIDTH 2.00"
DEPTH 0.300"

27.75 x 2.0 x 0.30 = 16.65"
VOLUME RESTRICTED 8.0 x 2.00 x 0.3 = 4.80"
4.8" ÷ 16.65" =
2.28 OR 28%

72% COVERAGE OBTAINED.
TWB
10-29-01

BY: Roger Bentley LEVEL: III DATE: 10-29-01 PAGE 5 OF 5

TVA 19669 (ONP-6-88)

Hockwood

TENNESSEE VALLEY AUTHORITY	RECORD OF MAGNETIC PARTICAL	REPORT NUMBER R-7811

PROJECT: SQN UNIT: 1 CYCLE: 11
SYSTEM: PZR
WELD/COMPONENT I.D. RCW-23A
CONFIG.: VIWASK TO:
PROCEDURE: N-MT-6 REV 24 TC n/a
EXAMINATION CODE: 89E-02
CODE CLASS: 1 CATEGORY B-K

EXAMINATION DATE: 11/02/2001
EXAM SURFACE: ☐ ID ☑ OD
PRESERVICE ☐ INSERVICE ☑
VISUAL CARD S/N: 085
REFERENCE DWG NO: ISI-0394-C-01

ACCEPTANCE CRITERIA
☐ APPDX. A ☑ APPDX. B
☐ OTHER n/a

METHOD OF MAGNETIZATION

EXAMINATION MEDIUM: Dry Powder COLOR: Gray BATCH NO.: 94H077

YOKE Y5 ☐ Y6 ☑	PRODS: AC ☐ DC ☐	COILS: AC ☐ DC ☐
OTHER: n/a	EQUIP TYPE: n/a	EQUIP TYPE: n/a
EQUIP S/N: US-TVA538069	EQUIP S/N: n/a	EQUIP S/N: n/a
CAL. DUE DATE n/a	CAL. DUE DATE n/a	CAL. DUE DATE n/a
POLE SPACING: 6 inches	PROD SPACING: n/a inches	COIL TURNS: n/a
TEST WEIGHT S/N USTVA901470	MAG. CURRENT: n/a amps	MAG. CURRENT: n/a amps

THERMOMETER S/N n/a CALIBRATION DUE DATE n/a
BLACK LIGHT OR LIGHT METER S/N: n/a CALIBRATION DUE DATE n/a
INTENSITY VERIFICATION TIME | INIT.: 1435 11-2-01 | 1) 1540 11-2-01 | 2) n/a | 3) n/a

EXAMINATION RESULTS: SATISFACTORY ☑ UNSATISFACTORY ☐ NOI NO.: N/A

EXPLANATION OF EXAM RESULTS
No Recordable Indications

COMMENTS / LIMITATIONS
~~No Limitations~~ 11/28/01 Inside surface inaccessible due to configuration. 50% total coverage achieved. 11/28/01 (Ref R-7819 For Supplemental UT)

ILLUMINATION CHECK ADEQUATE: ☑ MT POWDER CHECK ADEQUATE: ☑

EXAMINER: Jason Polisensky LEVEL: II
EXAMINER: Micheal Gagnier LEVEL: II
REVIEWER: LEVEL: III DATE: 11-2-01

ANII:
DATE: 11/11/01
PAGE: 1 OF 1

ACCESS: FORMS DATABASE 10-22-01

TENNESSEE VALLEY AUTHORITY	EXAMINATION SUMMARY AND RESOLUTION SHEET	REPORT NUMBER: R-7819

PROJECT: *SQN* UNIT: *1* CYCLE *11*				COMPONENT ID: *RCW-23A*	
EXAMINATION METHOD				SYSTEM: PZR	ISI DWG NO: *ISI-0394-C-01*
MT ☐	PT ☐	UT ☑	VT ☐	CONFIGURATION	CATEGORY
PROCEDURE: *N-UT-7*	REV *13*	TC: *N/A*		*VIWASK TO*	*B-K*

EXAMINER: *Carey LaSoya*	EXAMINER: *Jason Polisenski*	EXAMINER:	EXAMINER:
LEVEL: *II*	LEVEL: *II*	LEVEL:	LEVEL:

Total coverage calculated to be approximately *100* %

This report contains the data associated with weld RCW-23A a Presurizer support skirt attachment weld. Examination of this weld is in accordance with the ASME Section XI Code requirements.

A 45 degree shear wave 1 1/4 V-path examination was performed in 2 directions perpendicular and in 2 directions parallel to the weld. This examination is a supplemental examination performed in lieu of MT for the ID surface not accessible. A 60 degree shear wave examination was also performed to assure full examination volume coverage.

Weld crown geometry was observed 360 degrees around, at varing amplitudes with both the 45 and the 60 degree examinations.

No limitations were noted for this examination.

ASME SECTION XI REQUIRES A SURFACE EXAMINATION OF THE PRESSURIZER SUPPORT SKIRT DESIGN AT SQN. BECAUSE THE "BACK-SIDE" OF THE WELD IS INACCESSIBLE FOR SURFACE EXAMINATION SQN HAS ELECTED TO SUPPLEMENT THE SURFACE EXAM WITH A VOLUMETRIC EXAMINATION OF THE "BACK SURFACE" TO ENSURE NO CRACKING IS PRESENT ON THE WELD. RFR WILL BE SUBMITTED. 11-4-01

RESOLUTION BY: Carey LaSoya	REVIEWED BY	ANII:
LEVEL II DATE: 11-3-01	LEVEL: III DATE: 11-4-01	DATE: 11/11/01
		Page: 1 OF 8

ACCESS: FORMS DATABASE R-10/04/01

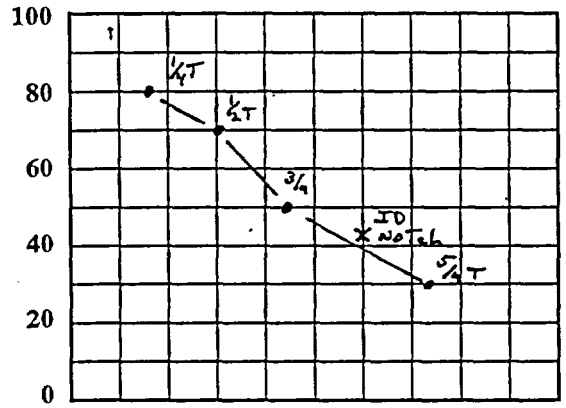
TENNESSEE VALLEY AUTHORITY	DIGITAL ULTRASONIC CALIBRATION DATA SHEET	REPORT NUMBER R-7819

PROJECT *SQN* UNIT/CYCLE *1 / 11*
PROCEDURE: *N-UT-7* REV: *13* TC: *N/A*

TRANSDUCER

MANUFACTURER *KBA*
MODEL: *MSWS* S/N *J15205*
SIZE: *0.5x1.0"* FREQ: *2.25* MHz
SHAPE: *Rectangl* # ELEMENTS: *1* # CONS: *0*
CABLE TYPE *RG-174* LENGTH: *120"*
MODE: ☑ SHEAR ☐ LONG ☐ RL

DAC



DISPLAY WIDTH *7.0* inches

CALIBRATION DATE: *10-3/01* *WMB 11-14-01*
CALIBRATION BLOCK NO. *SQ-40* TEMP: *73 °F*
SIMULATOR BLOCK: *N/A*
THERMOMETER S/N *E27489* DUE DATE *6/15/02*
COUPLANT: *Ultragel II* BATCH: *95325*

ANGLE VERIFICATION

BLOCK TYPE: *IIW* S/N: *797714*
NOMINAL ANGLE *45°* ACTUAL ANGLE *44°*

INSTRUMENT

MANUFACTURER *Krautkramer* DUE DATE *6/14/02*
MODEL NO.: *USN-52L* S/N: *E30217*

INSTRUMENT SETTINGS

REFLECTOR			REFERENCE SENSITIVITY	MEMORY NUMBER
SCAN DIRECT.	NTC	SDH		
AXIAL	☐	☑	*32.8* dB	*10*
CIRC.	☐	☐	*N/A* dB	*N/A*

FREQ: *2.0-8.0* MHz REJECT: *0* %
ANGLE: *44* deg DAMPING: *1000* ohms
DELAY *0* msec PULSER: *SINGLE* *
ZERO: *11.534* msec
VELOCITY *.1261* msec PRR/PRF: *HIGH*
RANGE: *7.0* inches TOF: *PEAK*
DISP. MODE: FULL WAVE POWER: *BATTERY*

REF. REFLECTOR: *N* GAIN: dB
AMPLITUDE: % METAL PATH:

CALIBRATION TIMES

INITIAL TIME: *08:20* FINAL TIME *15:35*

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

COMMENTS	WELD / ITEMS EXAMINED
Supplemental Examination.	*RCW-23A*

EXAMINER: *Carey LaSoya* LVL.: *II*
EXAMINER: *Jason Polisensky* LVL.: *II*
REVIEWER: LVL.: *III* DATE: *11-4-01*

ANII: *M Blackwood*
DATE: *11/11/01*
PAGE *7* OF *8*

ACCESS: FORMS DATABASE 10-27-01

TENNESSEE VALLEY AUTHORITY	DIGITAL ULTRASONIC CALIBRATION DATA SHEET	REPORT NUMBER R-7819

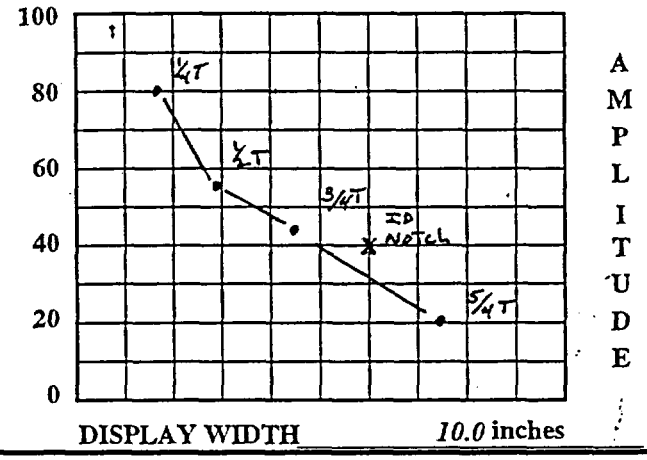
PROJECT *SQN* UNIT/CYCLE *1 / 11*
PROCEDURE: *N-UT-7* REV: *13* TC: *N/A*

TRANSDUCER

MANUFACTURER *KBA*
MODEL: *MSWS* S/N *J15204*
SIZE: *0.5x1.0"* FREQ: *2.25* MHz
SHAPE: *Round* (RECT.) # ELEMENTS: *1* # CONS: *0*
CABLE TYPE *RG-174* LENGTH: *120"*
MODE: ☑ SHEAR ☐ LONG ☐ RL

OK 11-2-01

DAC



DISPLAY WIDTH *10.0* inches

CALIBRATION DATE: *11/3/01*
CALIBRATION BLOCK NO. *SQ-40* TEMP: *73 °F*
SIMULATOR BLOCK: *N/A*
THERMOMETER S/N *E27489* DUE DATE *6/15/02*
COUPLANT: *Ultragel II* BATCH: *95325*

ANGLE VERIFICATION

BLOCK TYPE: *IIW* S/N: *797714*
NOMINAL ANGLE *60°* ACTUAL ANGLE *59°*

INSTRUMENT

MANUFACTURER *Krautkramer* DUE DATE *6/14/02*
MODEL NO.: *USN-52L* S/N: *E30217*

INSTRUMENT SETTINGS

REFLECTOR			REFERENCE SENSITIVITY	MEMORY NUMBER
SCAN DIRECT.	NTC	SDH		
AXIAL	☐	☑	*40* dB	*11*
CIRC.	☐	☐	*N/A* dB	*N/A*

FREQ: *2.0-8.0* MHz REJECT: *0* %
ANGLE: *59* deg DAMPING: *1000* ohms
DELAY *0* msec PULSER: *SINGLE* *
ZERO: *15.319* msec
VELOCITY *.1266* msec PRR/PRF: *HIGH*
RANGE: *10.0* inches TOF: *PEAK*
DISP. MODE: *FULL WAVE* POWER: *BATTERY*

REF. REFLECTOR: *N/A* GAIN: *N/A* dB
AMPLITUDE: *N/A* % METAL PATH: *N/A*

CALIBRATION TIMES

INITIAL TIME: *08:15* FINAL TIME *15:30*

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

COMMENTS	WELD / ITEMS EXAMINED
Supplemental Examination	*RCW-23A*

EXAMINER: *Carey LaSoya* LVL.: *II*
EXAMINER: *Jason Polisensky* LVL.: *II*
REVIEWER: LVL.: *III* DATE: *11-4-01*

ANII: *M Hackwood*
DATE: *11/11/01*
PAGE *3* OF *8*

ACCESS: FORMS DATABASE 10-27-01

TENNESSEE VALLEY AUTHORITY	MANUAL ULTRASONIC PIPING EXAMINATION DATA SHEET	REPORT NUMBER R-7819

PROJECT: *SQN* UNIT/CYCLE *1 / 11*
SYSTEM *PZR*
WELD I.D.: *RCW-23A*
CONFIG.: *VIWASK* TO
FLOW →

EXAMINATION DATE *10/3/01* *MMB 11/14/01*
START TIME: *09:05* END TIME: *10:30*
EXAM SURFACE ☐ID ☑OD
MATERIAL TYPE: ☑CS ☐SS ☐CSCL ☐CCSS
SURFACE TEMP. *78* PYRO NO. *E27489*

PROCEDURE: *N-UT-7* REV: *13* TC: *N/A*
Wo REFERENCE: *C/L of Transition (see attached drw.*
Lo REFERENCE: *Z Azmith Pad 0 stamp*

EXAMINATION ANGLE	*45* DEG.	*60* DEG.
AXIAL SCAN SENSITIVITY	*44.8* dB	*52* dB
CIRC. SCAN SENSITIVITY	*44.8* dB	*N/A* dB

IND NO.	L (in) FROM REF.			AT MAX AMP			MAX AMP % DAC	EXAM NO. 3-14	NOM. ANG.	NRI	INDICATION INFORMATION: TYPE, DAMPING, ETC.
	L1	L Max	L2	W MAX	MP MAX	D MAX					
								1	45	☑	
1	*	71.0	*	2.5	2.6	1.85	100	2	45	☐	weld crown geometry
								3	45	☑	
								4	45	☑	
2	*	71.0	*	4.0	3.8	1.9	80	2	60	☐	weld crown geometry

REMARKS/LIMITATIONS

**Indications noted above can be observed 360 degrees around, at varying amplitudes. Scanning performed with an ID roll maintained at 5 to 20 % FSH.*

EXAMINER: *Carey LaSoya* *Carey LaSoya* LEVEL: *II*
EXAMINER: *Jason Polisensky* *Jason Polisensky* LEVEL: *II*
REVIEWED BY: *MMB* LEVEL: *III* DATE: *11-4-01*

ANII: *Woodard*
DATE: *11/11/01*
PAGE *4* OF *8*

ACCESS: FORMS DATABASE 10/18/01

TENNESSEE VALLEY AUTHORITY	BEAM SPREAD AND RESOLUTION DATA SHEET	REPORT NO. R- 1819

PROJECT: SQN UNIT: 1

SEARCH UNIT

MANUFACTURER KBA

SIZE: .5X1.0 FREQ.: 2.25 MhZ

S/N: J15205 NOM. ANGLE 45

MEASURED ANGLE: 44 DEG.

BEAM SPREAD: 9° @ 3/4T, SDH DEG.

BEAM SPREAD DATE: 11/1/01

PROCEDURE: N-UT- 7 REV. 13 TC N/A

CALIBRATION SHEET NO. C- N/A

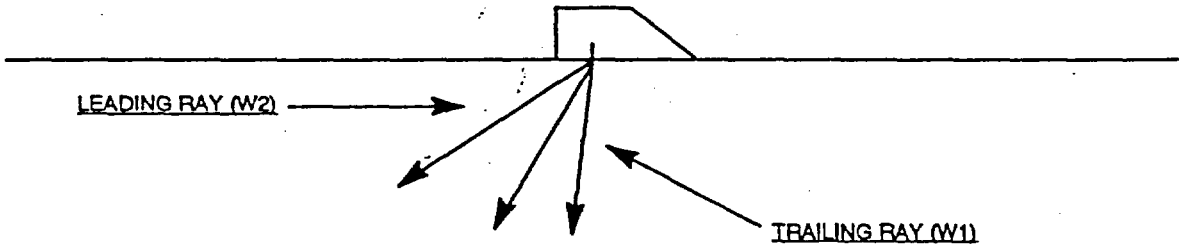
UT INSTRUMENT

MANUFACTURER: KRAUTKRAMER

MODEL NUMBER: USN-52L

SERIAL NUMBER: E21664

HOLE POSITION	TRAILING RAY (W1)				W MAX		LEADING RAY (W2)			
	20% DAC		50% DAC		100% DAC		50% DAC		20% DAC	
	W	MP	W	MP	W	MP	W	MP	W	MP
1/4T	.5	.84	.65	.95	.8	1.1	.95	1.2	1.05	1.20
1/2T	1.3	1.9	1.4	2.0	1.55	2.2	1.7	2.25	1.85	2.35
3/4T	2.05	2.9	2.15	3.0	2.35	3.25	2.6	3.4	2.75	3.50



R.G. 1.150 RESOLUTION VERIFICATION

NEAR SURFACE REFLECTOR: 1/4T SIDE DRILL HOLE DEPTH: 3/4 IN. SIZE: 3/16"

FAR SURFACE REFLECTOR: 3/4T SIDE DRILL HOLE DEPTH: 2 1/4 IN. SIZE: 3/16"

SCANNING (REFLECTORS PROVIDE 50% DAC SIGNALS AT SCANNING SPEED: ☑ YES ☐ NO

REMARKS: N/A

EXAMINER: JASON POLISENSKY LEVEL: II

EXAMINER: CAREY LaSOYA LEVEL: II

REVIEWED BY: LEVEL: III DATE: 11-4-01

ANII DATE: 11/11/01

PAGE 5 OF 8

TVA 19670A (NP 7/92)

TENNESSEE VALLEY AUTHORITY	BEAM SPREAD AND RESOLUTION DATA SHEET	REPORT NO. R- 7819

PROJECT: SQN UNIT: 1

SEARCH UNIT

MANUFACTURER KBA

SIZE: .5x1.0 FREQ.: 2.25 MhZ

S/N: J15204 NOM. ANGLE 60

MEASURED ANGLE: 59 DEG.

BEAM SPREAD: 6° @ 3/4T SDH DEG.

BEAM SPREAD DATE: 11/1/01

PROCEDURE: N-UT- 7 REV. 13 TC N/A

CALIBRATION SHEET NO. C- N/A

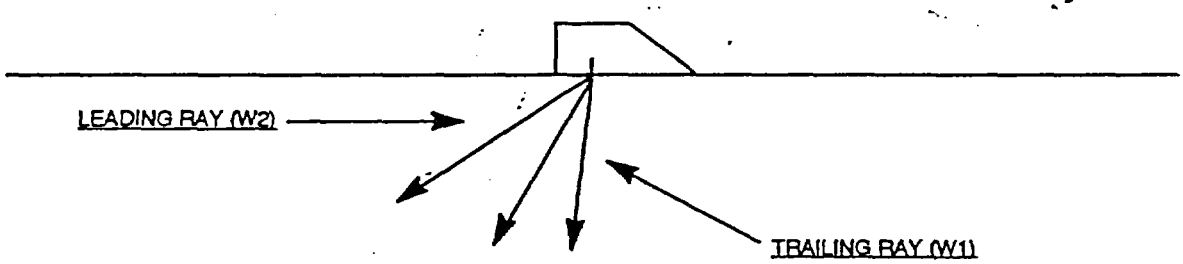
UT INSTRUMENT

MANUFACTURER: KRAUTKRAMER

MODEL NUMBER: USN 52L

SERIAL NUMBER: E21664

HOLE POSITION	TRAILING RAY (W1)				W MAX		LEADING RAY (W2)			
	20% DAC		50% DAC		100% DAC		50% DAC		20% DAC	
	W	MP	W	MP	W	MP	W	MP	W	MP
1/4T	.95	1.15	1.1	1.3	1.3	1.5	1.65	1.8	1.85	1.9
1/2T	2.2	2.5	2.4	2.6	2.6	3.0	3.15	3.4	3.30	3.5
3/4T	3.4	3.9	3.75	4.3	3.9	4.4	4.05	4.5	4.35	4.9



R.G. 1.150 RESOLUTION VERIFICATION--

NEAR SURFACE REFLECTOR: 1/4T SIDE DRILL HOLE DEPTH: 3/4 IN. SIZE: 3/16"

FAR SURFACE REFLECTOR: 3/4T SIDE DRILL HOLE DEPTH: 2 1/4 IN. SIZE: 3/16"

SCANNING (REFLECTORS PROVIDE 50% DAC SIGNALS AT SCANNING SPEED: ☑ YES ☐ NO

REMARKS: N/A

EXAMINER: JASON POLISENSKY Jason Polisensky LEVEL: II

EXAMINER: CAREY LaSOYA Carey LaSoya LEVEL: II

REVIEWED BY: MMB LEVEL: III DATE: 11-4-01

ANII [signature] DATE: 11/11/01

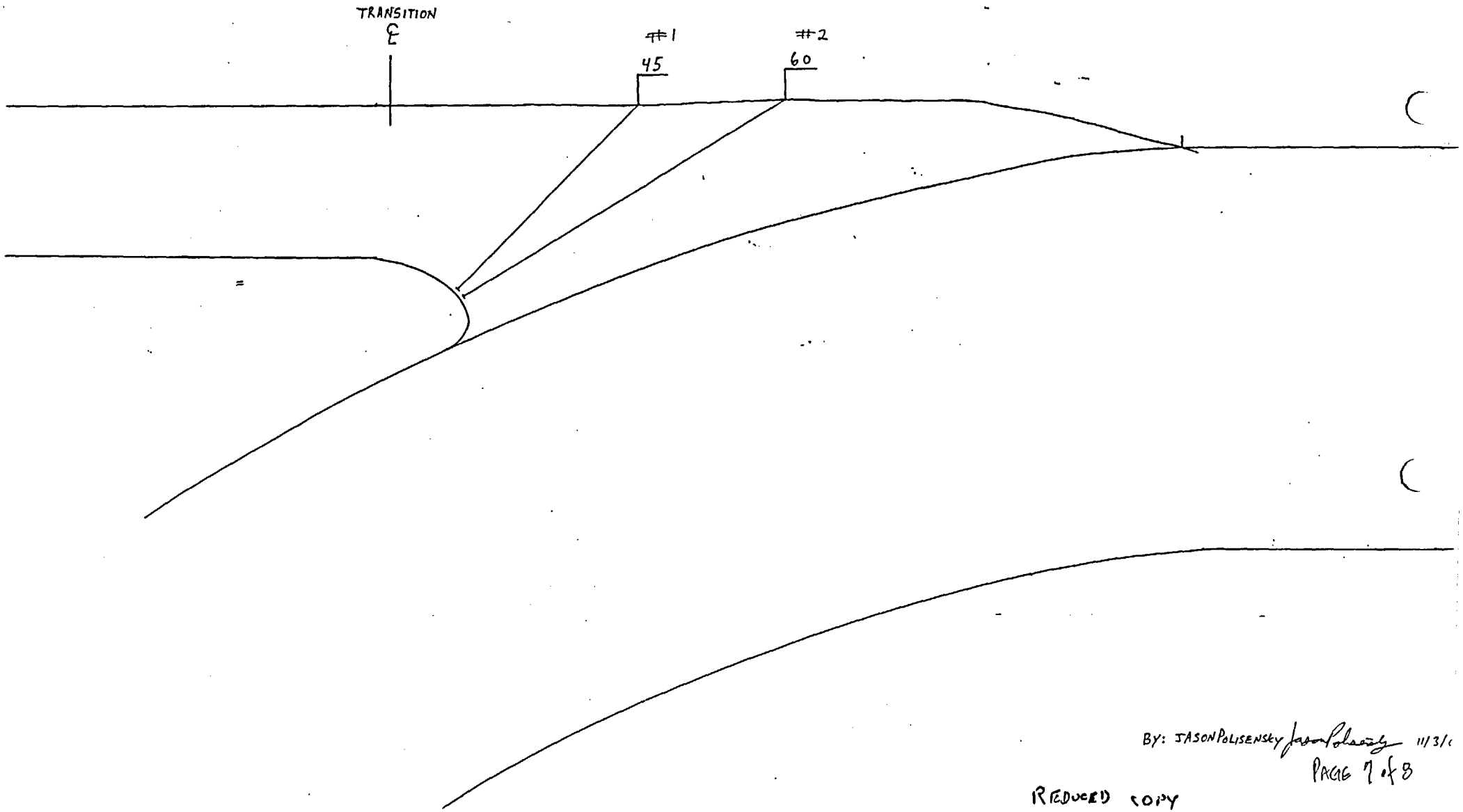
PAGE 6 OF 8

TVA 19670A (NP 7/92)

K-7819

INDICATION PLOT SHEET

WELD : RCW-23A

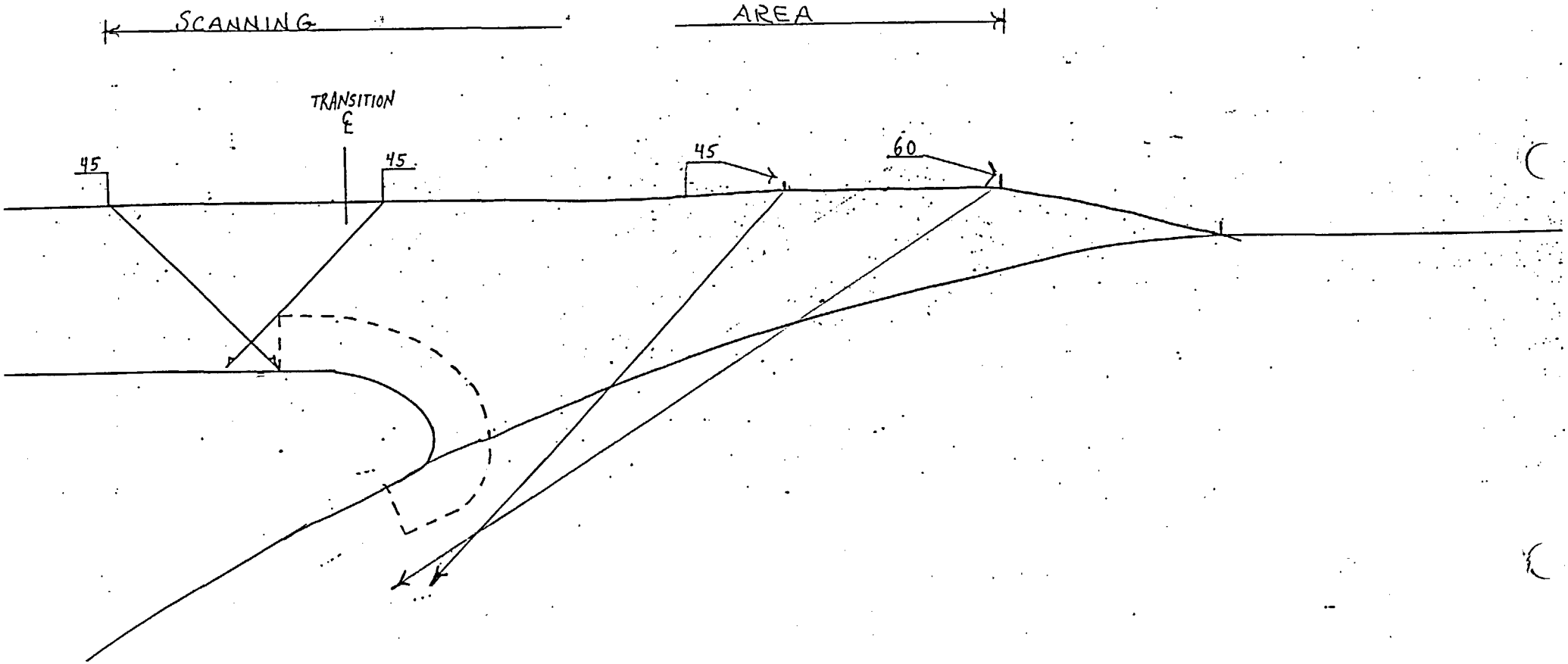


BY: JASON POLISENSKY 11/3/

REDUCED COPY

COVERAGE PLOT SHEET

WELD: RCW-23A



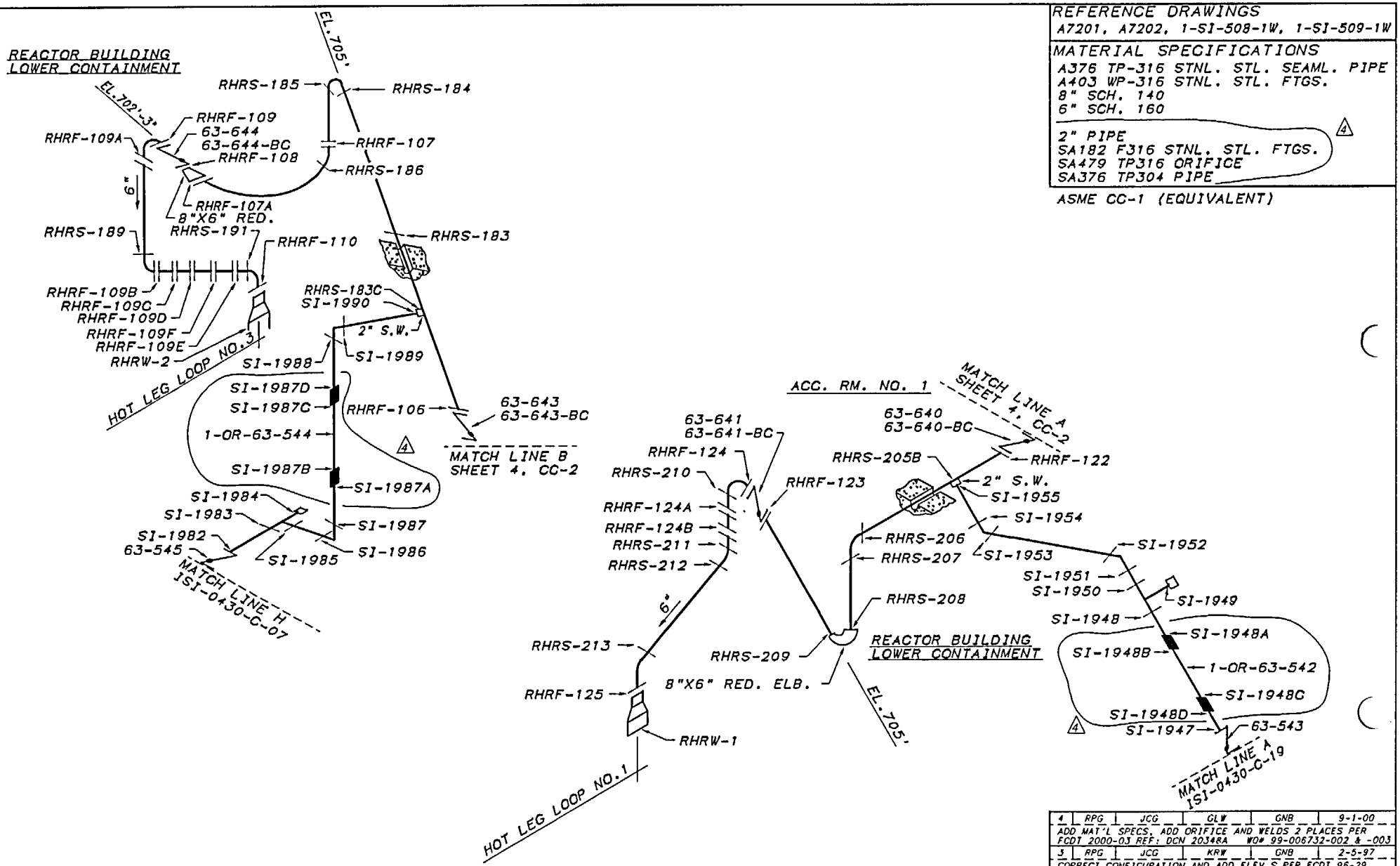
REDUCED COPY

BY: JASON POLISENSKY 11/3/01
11/3-01

ENCLOSURE 4

ISI PROGRAM DRAWINGS

Request for Relief Nos.	ISI Program Drawings
1-ISI-23	CHM-2336-C-06 CHM-2435-C-06
1-ISI-24	ISI-0394-C-01
2-ISI-24	ISI-0396-C-01
1-ISI-25	ISI-0285-C-01
2-ISI-25	ISI-0268-C-01

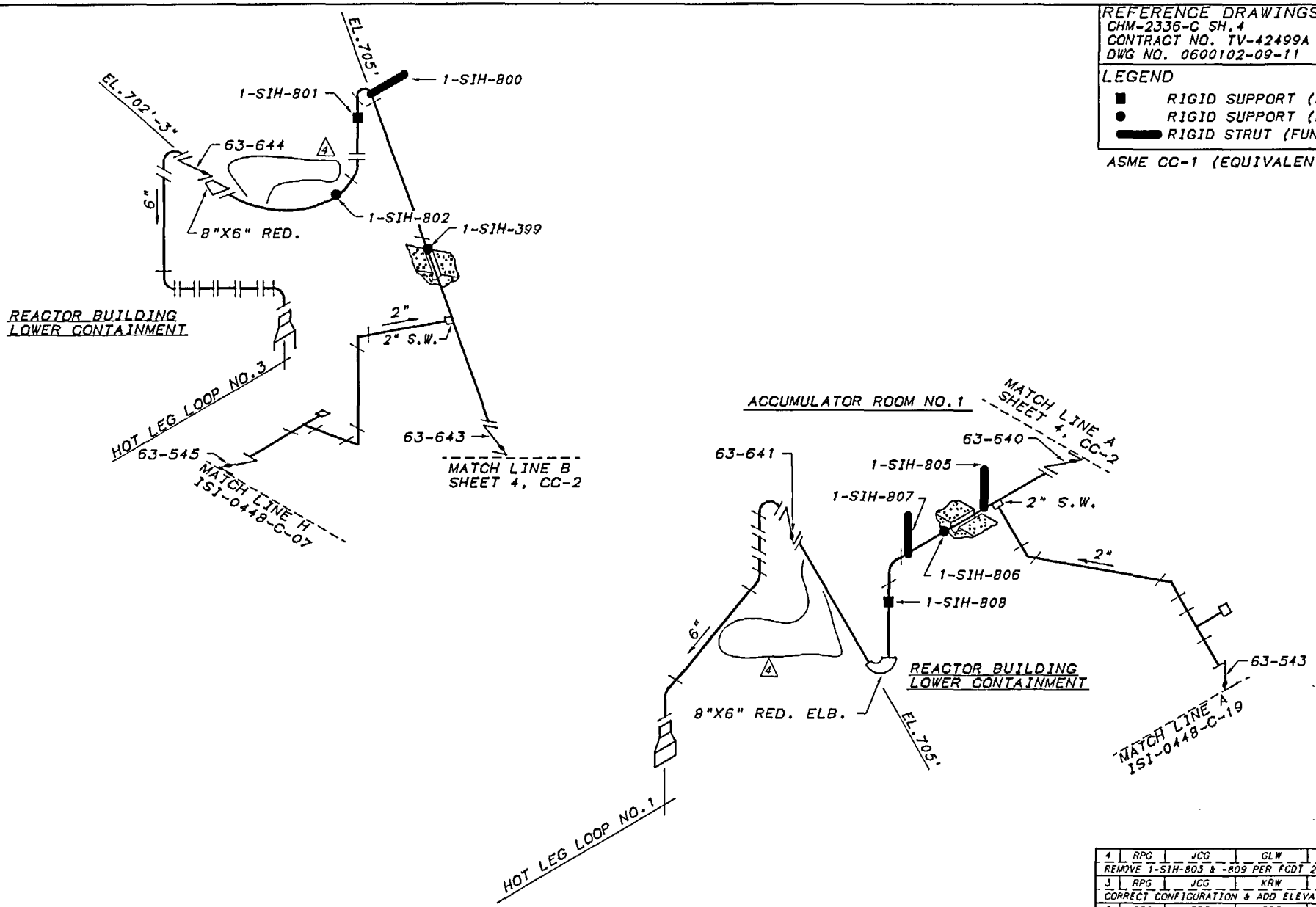


REV	BY	CHECKED	SUBMITTED	APPROVED	DATE
4	RPG	JCG	GLW	GNB	9-1-00
ADD MAT'L SPECS, ADD ORIFICE AND WELDS 2 PLACES PER FCDT 2000-03 REF: DCN 20348A WO# 99-006732-002 & -003					
3	RPG	JCG	KRW	GNB	2-5-97
CORRECT CONFIGURATION AND ADD ELEV.S PER FCDT 96-29					
2	RPG	EDC	FRS	GLW	12-16-95
ADD MATCH LINE H PER FCDT 94-19. ADD MATCH LINE A. CORRECT CONFIG.					
1	PHB	EDC	JCG	GLB	12-9-91
ADD BOLTED CONNECTIONS, CHANGE DWG. TITLE					

TENNESSEE VALLEY AUTHORITY

SEQUOYAH NUCLEAR PLANT
UNIT 1
RESIDUAL HEAT REMOVAL SYSTEM
HOT LEG LOOPS #1 & 3 WELD LOCATIONS

DRAWN: RPG	DATE: 8-30-91	SCALE: NOT TO SCALE
CHECKED: PHB	APPROVED: RWE	CAD MAINTAINED DRAWING REV
SUBMITTED: EDC	CHM-2336-C-06	04



REFERENCE DRAWINGS
CHM-2336-C SH.4
CONTRACT NO. TV-42499A
DWG NO. 0600102-09-11

LEGEND
- RIGID SUPPORT (FUNCTION A)
- RIGID SUPPORT (FUNCTION B)
- RIGID STRUT (FUNCTION A)

ASME CC-1 (EQUIVALENT)

REV	BY	CHECKED	SUBMITTED	APPROVED	DATE
4	RPG	JCG	GLW	GNB	9-1-00
	REMOVE 1-SIH-803 & -809 PER FCDT 2000-05, REF: DCN M13832				
3	RPG	JCG	KRW	GNB	2-5-97
	CORRECT CONFIGURATION & ADD ELEVATIONS PER FCDT 96-28				
2	RPG	EDC	FRS	GLW	12-16-95
	ADD MATCH LINES A & H PER FCDT 94-18, ADD SUPPORT FUNCTION, CORRECT CONFIGURATION.				
1	PHB	EDC	JCG	GLB	12-7-91
	DELETE 1-SIH-810, MOD. TITLE				

TENNESSEE VALLEY AUTHORITY

SEQUOYAH NUCLEAR PLANT
UNIT 1
RESIDUAL HEAT REMOVAL SYSTEM SUPPORT LOCATIONS

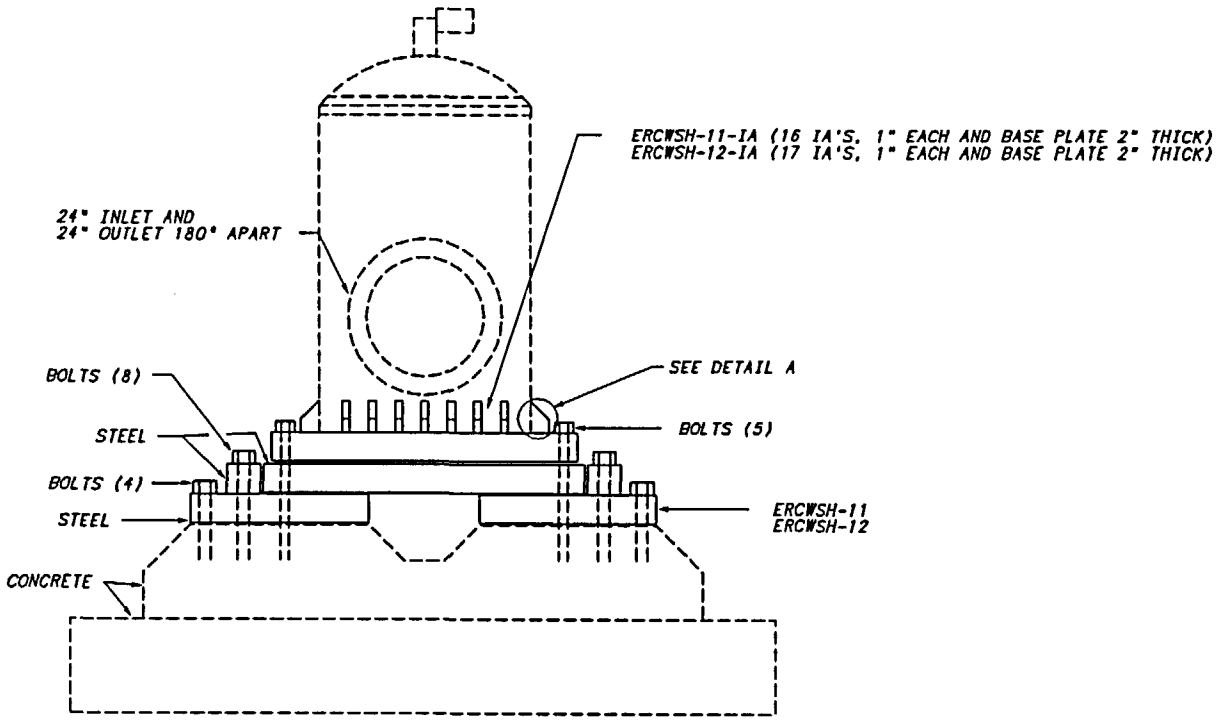
DRAWN: RPG	DATE: 9-4-91	SCALE: NOT TO SCALE
CHECKED: PHB	APPROVED: GLB	CAD MAINTAINED DRAWING
SUBMITTED: EDC	CHM-2435-C-06	04

REFERENCE DRAWINGS
37W206-7
CONTRACT NO. 76KJ6-820061 (N2M-499)
17661
17771-1, -2 AND -3 △2

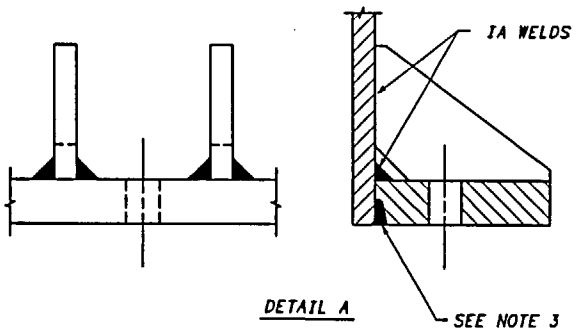
ASME CC-3 (EQUIVALENT)

NOTES:

1. FOR CONFIGURATION SEE ISI-0158-C-01
2. THIS DWG SUPERCEDES ISI-0268-A-01.
3. INACCESSIBLE PARTIAL PENETRATION WELD. △2



ERCWSH-11 ——— CORRESPONDS TO STRAINER A2A-A
ERCWSH-12 ——— CORRESPONDS TO STRAINER B2B-B



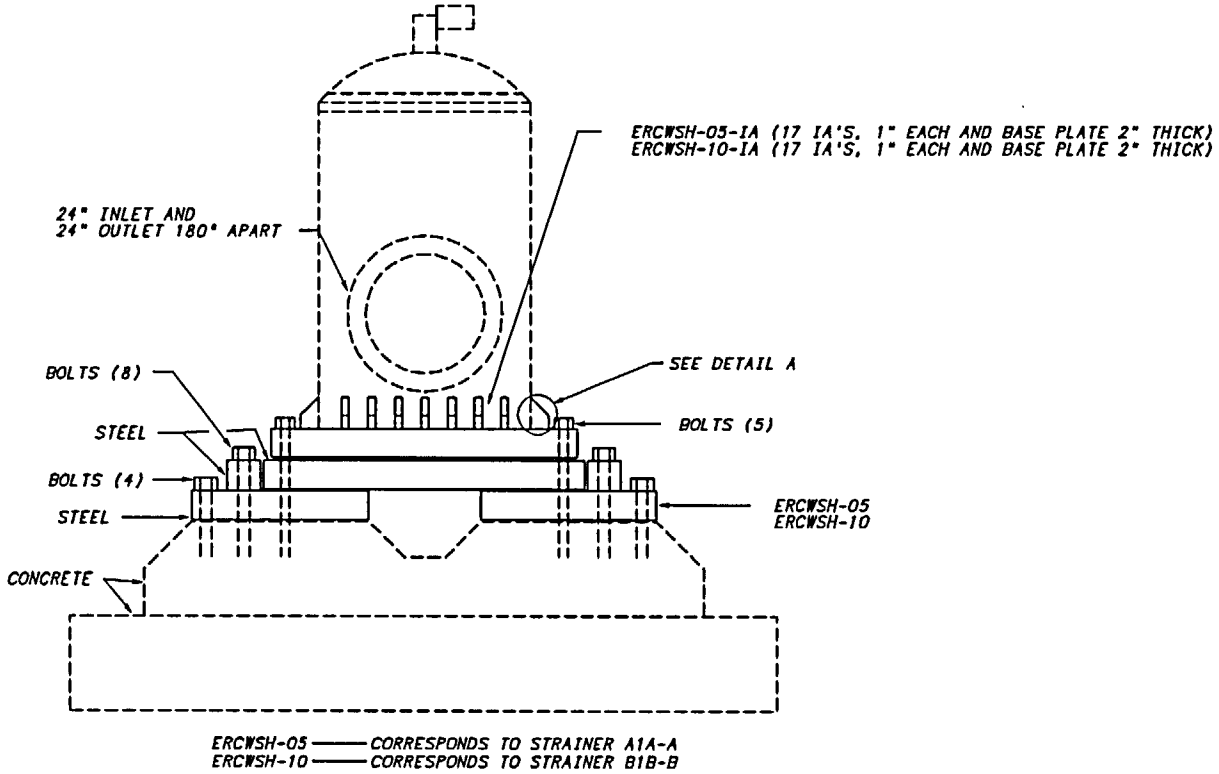
DETAIL A

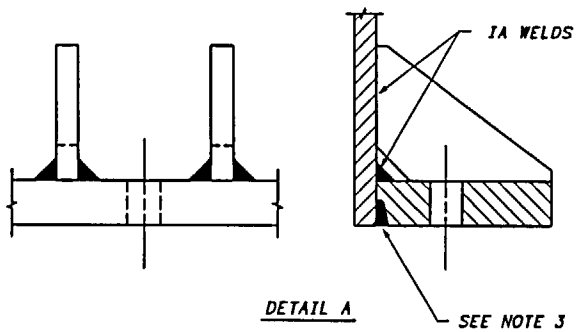
REV	BY	CHECKED	SUBMITTED	APPROVED	DATE
2	RPG	JCG	CLW	GNB	10-4-02
CHANGE NOTE 3 PER FCDT 2002-04					
1	RPG	JCG	CLW	GNB	7-22-99
ADD REFERENCES AND NOTE 3 PER FCDT 98-21					

TENNESSEE VALLEY AUTHORITY

SEQUOYAH NUCLEAR PLANT
UNIT 2
ESSENTIAL RAW COOLING WATER SYSTEM
STRAINER SUPPORT DETAIL

DRAWN: RPG	DATE: 3-5-98	SCALE: NOT TO SCALE
CHECKED: JCG	APPROVED: GNB	CAD MAINTAINED DRAWING
SUBMITTED: KRW	ISI-0268-C-01	REV 02





REFERENCE DRAWINGS
37W206-7
CONTRACT NO. 76K36-820061 (N2M-499)
17661
17771-1, -2 AND -3

ASME CC-3 (EQUIVALENT)

NOTES:

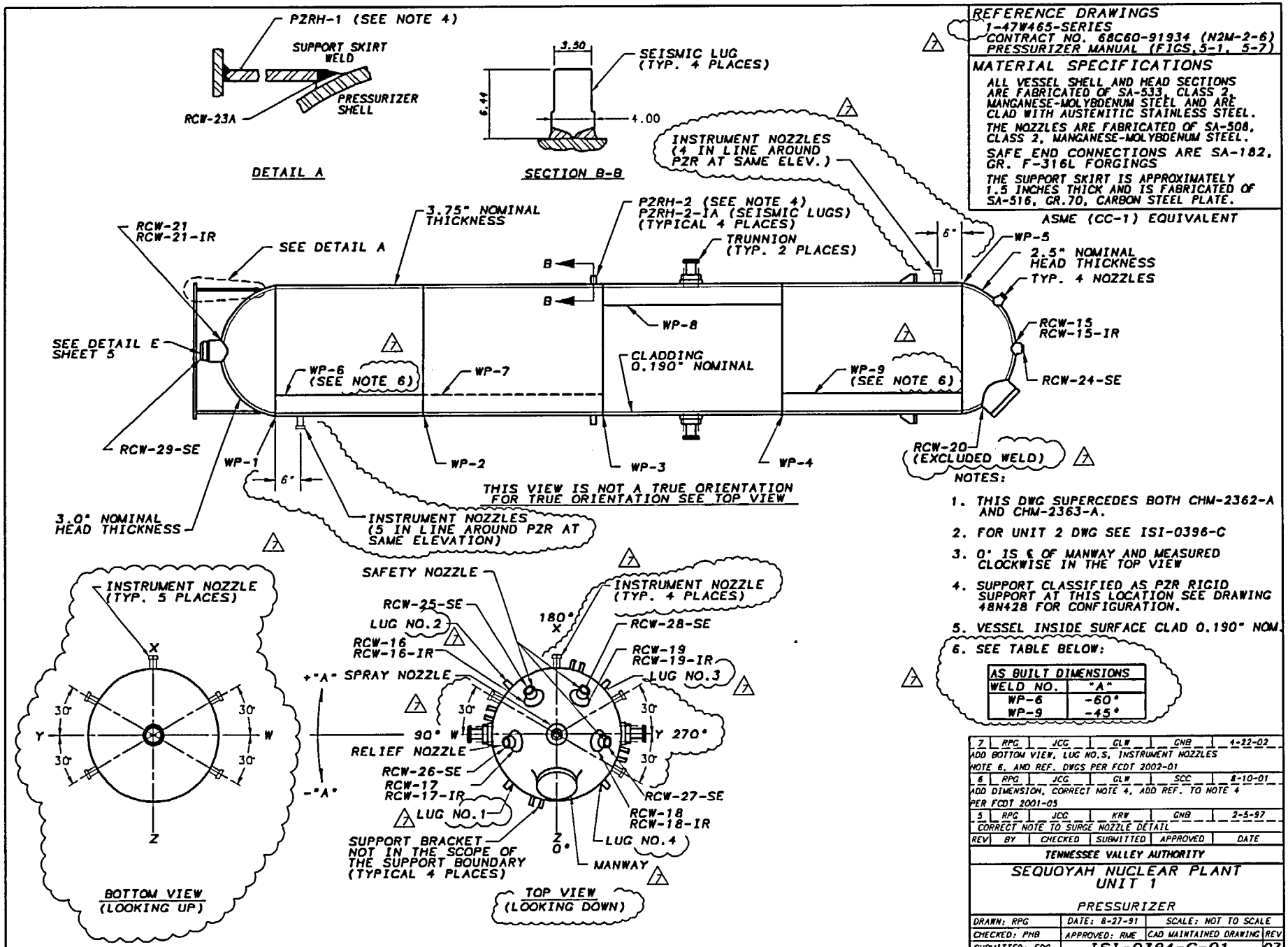
1. FOR CONFIGURATION SEE ISI-0123-C-01 & -02
2. THIS DWG SUPERCEDES ISI-0285-A-01.
3. INACCESSIBLE PARTIAL PENETRATION WELD.

REV	BY	CHECKED	SUBMITTED	APPROVED	DATE
2	RPG	JCG	CLW	CNB	10-4-02
CHANGE NOTE 3 PER FCDT 2002-04					
1	RPG	JCG	CLW	CNB	7-22-99
ADD REFERENCES AND NOTE 3 PER FCDT 98-21					

TENNESSEE VALLEY AUTHORITY

SEQUOYAH NUCLEAR PLANT
UNIT 1
ESSENTIAL RAW COOLING WATER SYSTEM
STRAINER SUPPORT DETAIL

DRAWN: RPG	DATE: 3-5-98	SCALE: NOT TO SCALE	
CHECKED: JCG	APPROVED: CNB	CAD MAINTAINED DRAWING	REV
SUBMITTED: KRW	ISI-0285-C-01		02



REFERENCE DRAWINGS

1-47W465-SERIES
CONTRACT NO. 68C60-91934 (N2M-2-6)
PRESSURIZER MANUAL (FIGS.5-1, 5-7)

MATERIAL SPECIFICATIONS

ALL VESSEL SHELL AND HEAD SECTIONS ARE FABRICATED OF SA-533, CLASS 2, MANGANESE-MOLYBDENUM STEEL AND ARE CLAD WITH AUSTENITIC STAINLESS STEEL.

THE NOZZLES ARE FABRICATED OF SA-508, CLASS 2, MANGANESE-MOLYBDENUM STEEL.

SAFE END CONNECTIONS ARE SA-182, GR. F-316L FORGINGS

THE SUPPORT SKIRT IS APPROXIMATELY 1.5 INCHES THICK AND IS FABRICATED OF SA-516, GR.70, CARBON STEEL PLATE.

ASME (CC-1) EQUIVALENT

NOTES:

1. THIS DWG SUPERCEDES BOTH CHM-2362-A AND CHM-2363-A.
2. FOR UNIT 2 DWG SEE ISI-0396-C
3. 0° IS ℄ OF MANWAY AND MEASURED CLOCKWISE IN THE TOP VIEW
4. SUPPORT CLASSIFIED AS PZR RIGID SUPPORT AT THIS LOCATION SEE DRAWING 48N428 FOR CONFIGURATION.
5. VESSEL INSIDE SURFACE CLAD 0.190" NOM.
6. SEE TABLE BELOW:

AS BUILT DIMENSIONS	
WELD NO.	"A"
WP-6	-60°
WP-9	-45°

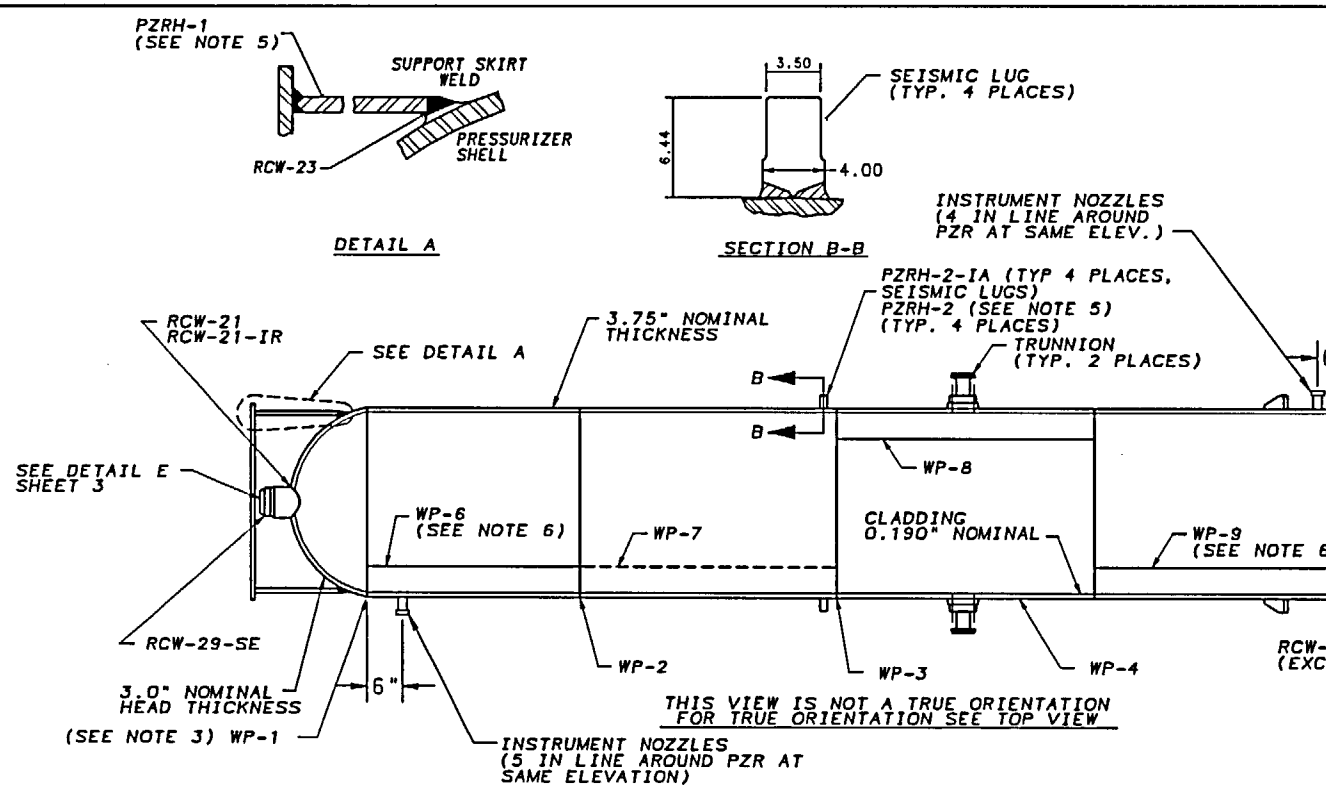
REV	BY	CHECKED	SUBMITTED	APPROVED	DATE
7	RPG	JCG	CLW	GNB	4-22-02
ADD BOTTOM VIEW, LUG NO.S, INSTRUMENT NOZZLES NOTE 6, AND REF. DWGS PER FCDT 2002-01					
6	RPG	JCG	CLW	SCC	8-10-01
ADD DIMENSION, CORRECT NOTE 4, ADD REF. TO NOTE 4 PER FCDT 2001-05					
5	RPG	JCG	KRW	GNB	2-5-97
CORRECT NOTE TO SURGE NOZZLE DETAIL					

TENNESSEE VALLEY AUTHORITY

SEQUOYAH NUCLEAR PLANT
UNIT 1

PRESSURIZER

DRAWN: RPG	DATE: 8-27-91	SCALE: NOT TO SCALE
CHECKED: PMB	APPROVED: RME	CAD MAINTAINED DRAWING REV
SUBMITTED: EDC	ISI-0394-C-01	07



REFERENCE DRAWINGS
2-47W465-SERIES
CONTRACT NO. 68C60-91934 (N2M-2-6)
PRESSURIZER MANUAL (FIGS. 5-1, 5-7)

MATERIAL SPECIFICATIONS

ALL VESSEL SHELL AND HEAD SECTIONS ARE FABRICATED OF SA-533, CLASS 2, MANGANESE-MOLYBDENUM STEEL AND ARE CLAD WITH AUSTENITIC STAINLESS STEEL.

THE NOZZLES ARE FABRICATED OF SA-508, CLASS 2, MANGANESE-MOLYBDENUM STEEL.

SAFE END CONNECTIONS ARE SA-182, GR. F-316L FORGINGS

THE SUPPORT SKIRT IS APPROXIMATELY 1.5 INCHES THICK AND IS FABRICATED OF SA-516, GR.70, CARBON STEEL PLATE.

NOTES:

1. THIS DWG SUPERCEDES ISI-0308-A, ISI-0323-A, AND ISI-0299-B.
2. FOR UNIT 1 DWG SEE ISI-0394-C.
3. 0° IS ℄ OF MANWAY AND MEASURED CLOCKWISE IN THE TOP VIEW.
4. VESSEL INSIDE SURFACE CLAD - 0.190" NOMINAL.
5. SUPPORT CLASSIFIED AS PZR RIGID SUPPORT AT THIS LOCATION SEE DRAWING 48N428 FOR CONFIGURATION.
6. SEE TABLE BELOW:

AS BUILT DIMENSIONS	
WELD NO.	"A"
WP-6	-60°
WP-9	-45°

REV	BY	CHECKED	SUBMITTED	APPROVED	DATE
7	RPG	JCG	GLB	GNB	10-4-02
CORRECT SAFETY & RELIEF NOZZLE LOCATION PER FCDT 2002-02					
6	RPG	JCG	GLB	GNB	4-22-02
ADD BOTTOM VIEW, LUG NO.S, INSTRUMENT NOZZLES NOTE 6, AND REF. DWGS PER FCDT 2002-01					

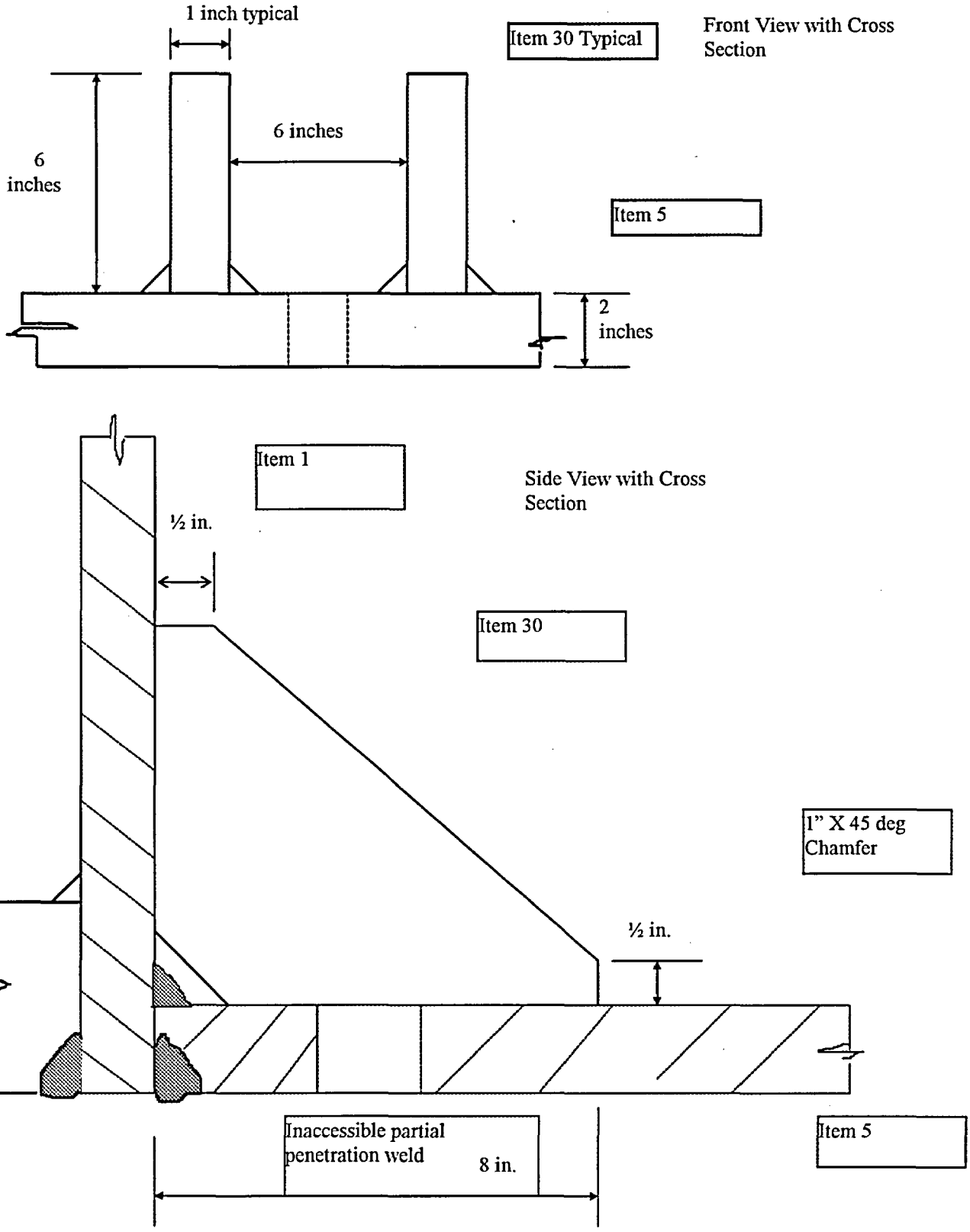
TENNESSEE VALLEY AUTHORITY

SEQUOYAH NUCLEAR PLANT
UNIT 2
PRESSURIZER

DRAWN: RPG	DATE: 12-9-91	SCALE: NOT TO SCALE
CHECKED: PMB	APPROVED: GLB	CAD MAINTAINED DRAWING
SUBMITTED: JCG	ISI-0396-C-01	07

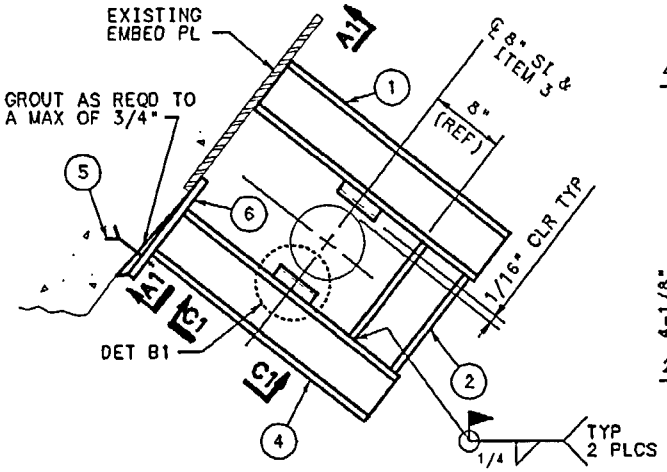
ENCLOSURE 5

Examination Limitation Drawing Typical of Unit 1 and Unit 2
Request for Relief 1/2-ISI-25

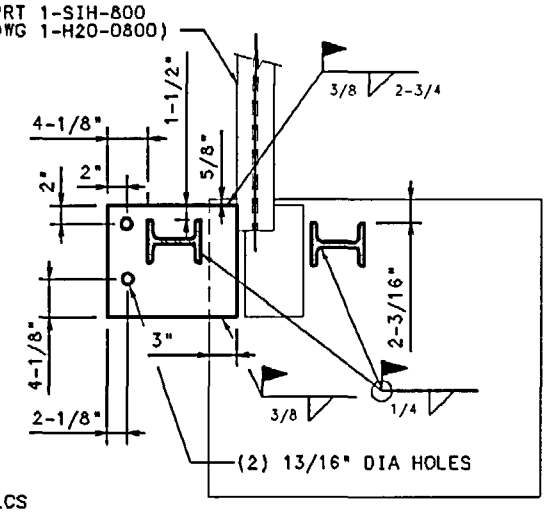


ENCLOSURE 6

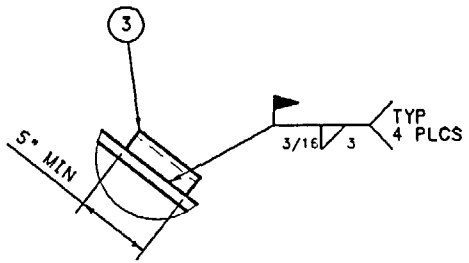
PIPE SUPPORT DRAWING
1-SIH-801
FOR REQUEST FOR RELIEF
1-ISI-23



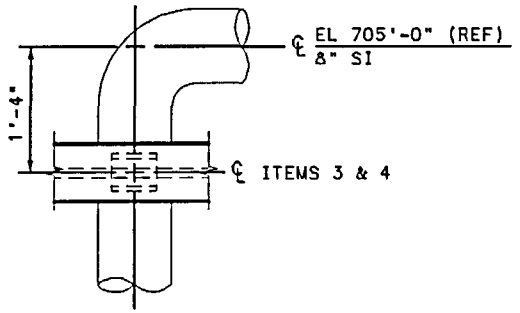
PLAN



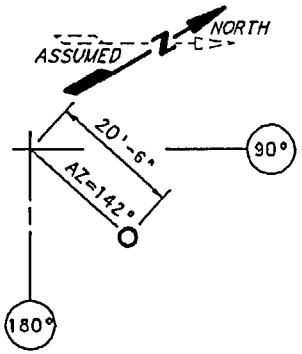
A1-A1



DET B1



C1-C1



LOCATION PLAN
FLOOR EL 679'-9-3/8"

SUPPORT NO: 1-S1H-801

NOTES:
1. FOR GENERAL NOTES SEE 47A050-SERIES.

REFERENCE DRAWINGS:
47W432-SERIES.....PIPING
0600102-09-11 CONTR TV-42499A...ISO
1-H20-0800 CONTR 71-92615.....SEC SPRT

ITEM	QTY	MATERIAL DESCRIPTION
1	1	W6 X 25 X 2'-6"
2	1	W6 X 25 X 1'-0-7/8"
3	2	C4 X 5.4 X LG AS REQD
4	1	W6 X 25 X 2'-5-1/2"
5	2	3/4" DIA SSD
6	1	PL 3/4 X 14 X 1'-2"

CALCULATION BRANCH/PROJECT IDENTIFIERS: 1SIH0801 0600104-09-11

BASIC ENGINEERS CONTRACT NO: 71-92615

REV	ECN/DCN	CHG DOC	DRWN	CHKD	APPD	DATE
0*	M00555A	N/A	SEE TITLE BLOCK			

INC: DCA M00555A-12 R1, -13 R0 & WALKDOWN DATA RIMS #B25 881011 837. DCA M00555A-13 R0 POSTED CHANGE TO CCD 1-1-H20-0801-02 R0 TO BE INCORPORATED ON CCD 1-1-H20-0801-01 R0. RENAME DCA M00555A-13 R0 POSTED CHANGE TO CCD 1-1-H20-0801-01 R0.

SCALE: NTS — EXCEPT AS NOTED

REACTOR BUILDING
UNIT 1

CATEGORY 2

MECHANICAL
SAFETY INJECTION SYSTEM
PIPE SUPPORTS

SEQUOYAH NUCLEAR PLANT
TENNESSEE VALLEY AUTHORITY
NUCLEAR ENGINEERING

Q

DESIGN		INITIAL ISSUE	ENGINEERING APPROVAL
DRAFTER K. NELSON	CHECKER	R0 ISSUE PER:DWG MADE A CCD FROM 1-H20-0801 AC-RA & AD-R907.	1 N/A
DESIGNER N/A	REVIEWER N/A	*ADDITIONAL INFO INC:	2
			3

ISSUED BY: N/A | DATE | 45 | M | CCD NO:1-1-H20-0801-01 R0

CADAM MAINTAINED DRAWING
THIS CONFIGURATION CONTROL DRAWING IS MAINTAINED BY THE SQN CAD UNIT AND IS PART OF THE TVA CADAM DATABASE.

DRAFTING SERVICES UNIT — COMPUTER GRAPHICS

ENCLOSURE 7

TVA' S PROCEDURE
FOR CALCULATION OF THE
ASME CODE COVERAGE
FOR THE SECTION XI

W47 010524 006 **QA RECORD**

CALCULATION OF ASME CODE COVERAGE FOR SECTION XI NDE EXAMINATIONS

"QUALITY RELATED"

Prepared By: Orig. signed by, Joel W. Whitaker Date: 5/24/01

Technical Review: Orig. signed by, N. Roger Bentley NDE Level III, Date: 5/24/01

ISO Approval: Orig. signed by, Frank C. Leonard Date: 5/24/01

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
3	5/24/01	Revised to upgrade procedure to ASME Section XI 1995 Edition with Addenda through 1996

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 Code Case N-460

3.2 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.

3.3 Guideline for the Implementation of Appendix VIII and 10CFR 50.55a, Rev. D, April 18, 2000

3.4 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) 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.

b) Estimates shall be derived by estimating coverage based on two-beam path direction coverage of the complete examination. Each scan direction equals 25% (downstream, up-steam, clockwise, counterclockwise.) (Reference Figure 1)

c) 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 0F 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 exam 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.

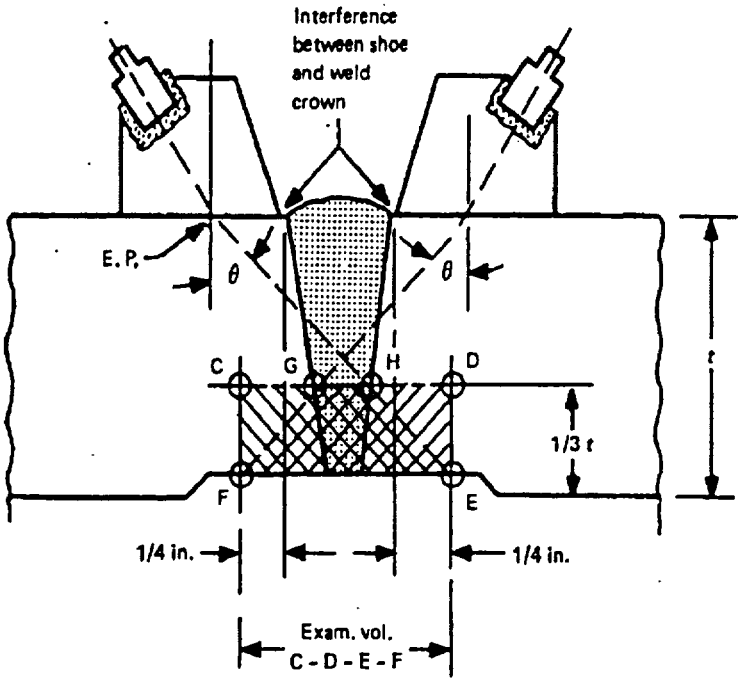
11.4 The NDE Level III may recalculate the examination coverage to obtain a more accurate value of the examination surface or volume examined. The calculation shall be documented on the exam report.

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.

III-3230 APPENDIX III — MANDATORY III-3310



GENERAL NOTE:
For this example of interference with a ½V examination applied from both sides, only the E-F-G-H portion of the examination volume receives two direction coverage, while volumes C-G-F and H-D-E receive one direction coverage. In this case, the examination beam path shall be increased to ¾V (O.D. to I.D. and back towards O.D. for ½t) to provide the required two direction coverage over the examination volume. Use of a ¾V examination beam path (O.D. to I.D. to ½t) provides additional beam path (past ½t) to help in obtaining required coverage when examination part thickness t increases.

FIG. III-3230-1 EXAMPLE OF PHYSICAL RESTRICTIONS TO THE WELD EXAMINATION

Figure 1

LA 990627 005

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

June 19, 2000

Mr. J. A. Scalice
Chief Nuclear Officer
and Executive Vice President
Tennessee Valley Authority
6A Lookout Place
1101 Market Street
Chattanooga, Tennessee 37402-2801

SUBJECT: BROWNS FERRY NUCLEAR PLANT UNITS 2 AND 3, RELIEF REQUESTS 2-ISI-10 AND 3-ISI-9, ALTERNATIVES FOR EXAMINATION OF INACCESSIBLE REACTOR PRESSURE VESSEL SUPPORT SKIRT WELDS (TAC NOS. MA6408 AND MA8423)

Dear Mr. Scalice:

By letter dated March 24, 2000, the Tennessee Valley Authority requested relief from certain surface examination requirements of the 1986 Edition of Section XI of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (Code) for the second 10-year inservice inspection interval at Browns Ferry Nuclear Power Plant, Units 2 and 3. The surface examination requirements pertain to the reactor vessel support skirt welds. Instead of the required surface examination from both sides of the skirt welds, the licensee proposed an alternative. The alternative is a surface examination of reactor pressure vessel support skirt welds and a best-effort ultrasonic testing examination of the opposite weld surfaces.

The U.S. Nuclear Regulatory Commission staff has reviewed the request for relief. Based on its evaluation, the staff concludes that the proposed alternative will provide an acceptable level of quality and safety. Pursuant to Title 10, *Code of Federal Regulations*, Part 50, Section 55a(a)(3)(i), the staff authorizes the proposed alternative. The staff's safety evaluation is enclosed.

This completes the staff's activities related to your relief request of March 24, 2000. If you have any questions, please contact the Browns Ferry project manager at 301-415-3026.

Sincerely,

Richard P. Correia

Richard P. Correia, Chief, Section 2
Project Directorate II
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos. 50-260 and 50-296

Enclosure: Safety Evaluation

cc w/encl: See next page

RECEIVED
JUN 27 2000
CORPORATE LICENSING

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

USE OF ALTERNATIVE TO CERTAIN SURFACE INSPECTION REQUIREMENTS

TENNESSEE VALLEY AUTHORITY

BROWNS FERRY NUCLEAR POWER PLANT, UNITS 2 AND 3

DOCKET NOS. 50-260 AND 50-296

1.0 INTRODUCTION

The inservice inspection of the American Society of Mechanical Engineers (ASME) Code Class 1, 2, and 3 components shall be performed in accordance with Section XI of the ASME Boiler and Pressure Vessel Code (Code) and applicable addenda as required by Title 10, *Code of Federal Regulations* (10 CFR), Section 50.55a(g), except where alternatives have been authorized by the Commission pursuant to 10 CFR 50.55a(a)(3). It is stated, in part, in 10 CFR 50.55a(a)(3), that alternatives to the Code requirements may be used providing the licensee demonstrates that: (i) the proposed alternatives would provide an acceptable level of quality and safety, or (ii) compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

Pursuant to 10 CFR 50.55a(g)(4), ASME Code Class 1, 2, and 3 components (including supports) shall meet the requirements, except the design and access provisions and the preservice examination requirements, set forth in the ASME Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," to the extent practical within the limitations of design, geometry, and materials of construction of the components. The regulations require that inservice examination of components and system pressure tests conducted during the second 10-year interval and subsequent intervals comply with the requirements in the latest edition and addenda of Section XI of the ASME Code incorporated by reference in 10 CFR 50.55a(b) on the date 12 months prior to the start of the 120-month interval, subject to the limitations and modifications listed therein. The components (including supports) may meet the requirements set forth in subsequent editions and addenda of the ASME Code incorporated by reference in 10 CFR 50.55a(b) subject to the limitations and modifications listed therein and subject to Commission approval.

By letter dated March 24, 2000, the Tennessee Valley Authority, the licensee, requested relief from certain surface examination requirements of the 1986 Edition of Section XI of the ASME Code for the second 10-year inservice inspection interval at Browns Ferry Nuclear Power Plant (BFN), Units 2 and 3. The surface examination requirements pertain to the reactor vessel support skirt welds. Instead of the required surface examination from both sides of the skirt welds, the licensee proposed an alternative. The alternative is a surface examination of the

ENCLOSURE

reactor pressure vessel (RPV) support skirt welds and a best-effort ultrasonic testing (UT) examination of the surface of the welds.[1]

2.0 CODE REQUIREMENTS FOR WHICH RELIEF IS REQUESTED

The licensee requested relief from the requirements of the 1986 Edition with no addenda of Section XI of the ASME Code, Table IWB-2500-1, Examination Category B-H, Item B8.10 for the surface or volumetric examination as applicable based on the configuration of the support skirt to vessel welds: RPV-SUPP-2-1-IA and RPV-SUPP-3-1-IA. The weld configuration and examination area are illustrated in the ASME Code, Section XI, Figure IWB-2500-13. This corresponds to Figure 1 of Code Case N-323-1, and is depicted in this safety evaluation as Figure 1 (attached).

2.1 Licensee's Basis for Relief

The reactor pressure vessels (RPVs) at BFN are supported on cylindrical skirts that are welded to the bottom RPV heads as shown in Figure 1. The Code requires that both surfaces of the weld be examined. An examination of the outside weld surface is readily accomplished with minimal, if any, hindrance. However, examination of the inside weld surface is difficult. The only access into the skirt is through an 18-inch opening. Inside the skirt, the weld and bottom RPV head are covered by insulation. The tasks of removing this insulation, preparing the weld surface for examination, and performing the examination are hindered by limited maneuverability in the confined space within the skirt. The confined space also houses the control rod drive mechanisms (CRDMs) that are attached to the bottom RPV head. The CRDMs further contribute to the limited maneuverability. Because of these limitations, the time needed to complete an examination of the weld surface would expose inspection personnel to high radiation dosages. The licensee estimated that the total radiation to personnel involved with preparing and examining the weld surface would total 11.2 rem.

The licensee proposes to perform a best-effort ultrasonic (UT) examination from the outside (accessible) weld surface to detect service related flaws on the inside weld surface. The best-effort UT examination would replace the required inside surface examination. The licensee believes that this alternative would provide an acceptable level of quality and safety.

Furthermore, the licensee's request indicates that there are no known failures of support skirt welds. Based on the limited access and absence of bulletins or reported failures of the inside surface on the support skirt weld, the licensee believes that the benefits derived from this examination do not warrant exposing examiners to the associated high-radiation doses.

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[1]The licensee proposed use of ASME Code Case N-323-1 and a best-effort UT examination from the accessible side of the RPV support skirt welds. The staff has not endorsed Code Case N-323-1 in Regulatory Guide 1.147. Instead of citing Code Case N-323-1, the staff has restated the proposed alternative in autonomous terminology, so as not to connote endorsement of the code case.

2.2 Licensee's Proposed Alternative to Code Requirements

The licensee's proposed alternative is to perform a surface examination of the outside surface (considered the accessible surface) and a best-effort UT examination of the inside surface of the support skirt welds identified as: RPV-SUPP-2-1-IA (BFN Unit 2), and RPV-SUPP-3-1-IA (BFN Unit 3).

3.0 EVALUATION

The licensee has requested approval of alternative examinations for its skirt welds. The alternative is necessitated by the narrow access through the skirt and the obstruction in the confined area inside the skirt under the bottom head. The working area inside the skirt under the bottom head limits maneuverability and exposes examiners to high radiation levels.

The ASME Code specifies different examination requirements for the skirt weld configurations depicted in Figures 1 and 2. The Code requires surface examinations of both the outside and inside welded surfaces for the Figure 1 configuration. The inside examination requires personnel entry to the area inside the skirt. For the Figure 2 configuration, the Code allows (1) a surface examination for the accessible side, and (2) a volumetric examination from the accessible side of the inaccessible side. This does not necessitate personnel entry to the area inside the skirt.

The skirt weld configuration at BFN is shown in Figure 3. This configuration is a hybrid of Figures 1 and 2. Instead of performing surface examinations from both sides of the welds in accordance with the Code requirements applicable to the Figure 1 configuration, the licensee proposes to perform (a) a surface examination on the outside surface (accessible) of the welds and, (b) a best-effort UT examination of the inside surface of the welds, from the outside surface.

This licensee's proposed alternative for its Figure 3 skirt welds is similar to the Code requirements applicable to the Figure 2 configuration. The Figure 3 configuration can, to a significant extent, be volumetrically examined from the outside surface, as is the case for the Figure 2 configuration. The weld volume capable of being examined is through wall and at or near the inside weld surface. Therefore, any crack propagating from the inside weld surface would be detectable. The staff believes that a best-effort examination, in combination with the outside surface examination of the skirt weld will provide reasonable assurance of structural integrity and an acceptable level of quality and safety.

4.0 CONCLUSION:

The staff concludes that the proposed alternative described above will provide an acceptable level of quality and safety. Pursuant to 10 CFR 50.55a(a)(3)(i), the staff hereby authorizes the proposed alternative as described in Section 3.0 above. The proposed alternative is authorized by law and will not endanger life or property or the common defense and security and is otherwise in the public interest.

Principle Contributor: D. Naujock, NRR

Date: June 19, 2000

Attachment: Figures 1, 2 and 3

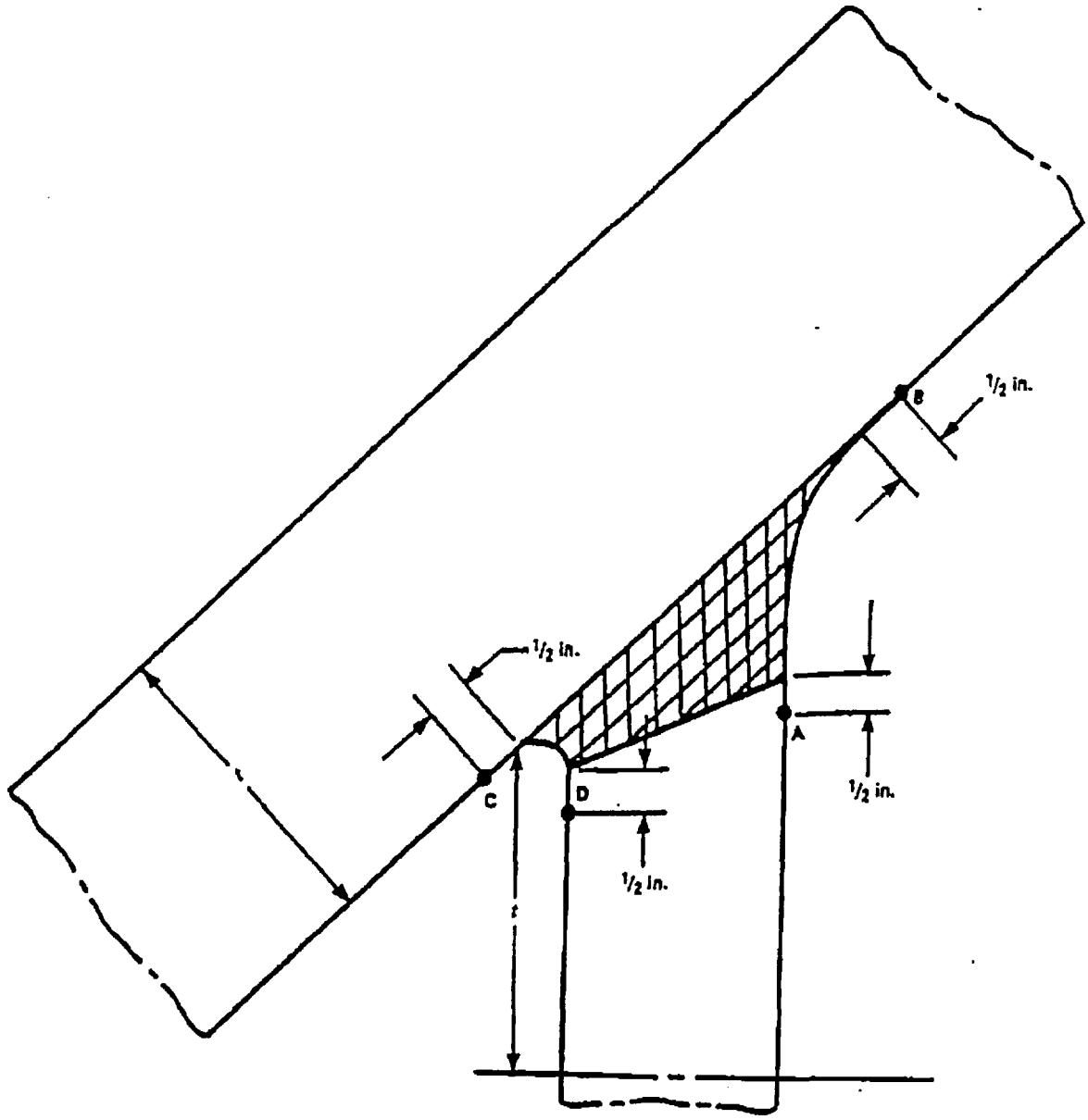

FIGURE 1

(ASME Code, Section XI, Figure IWB-2500-13)

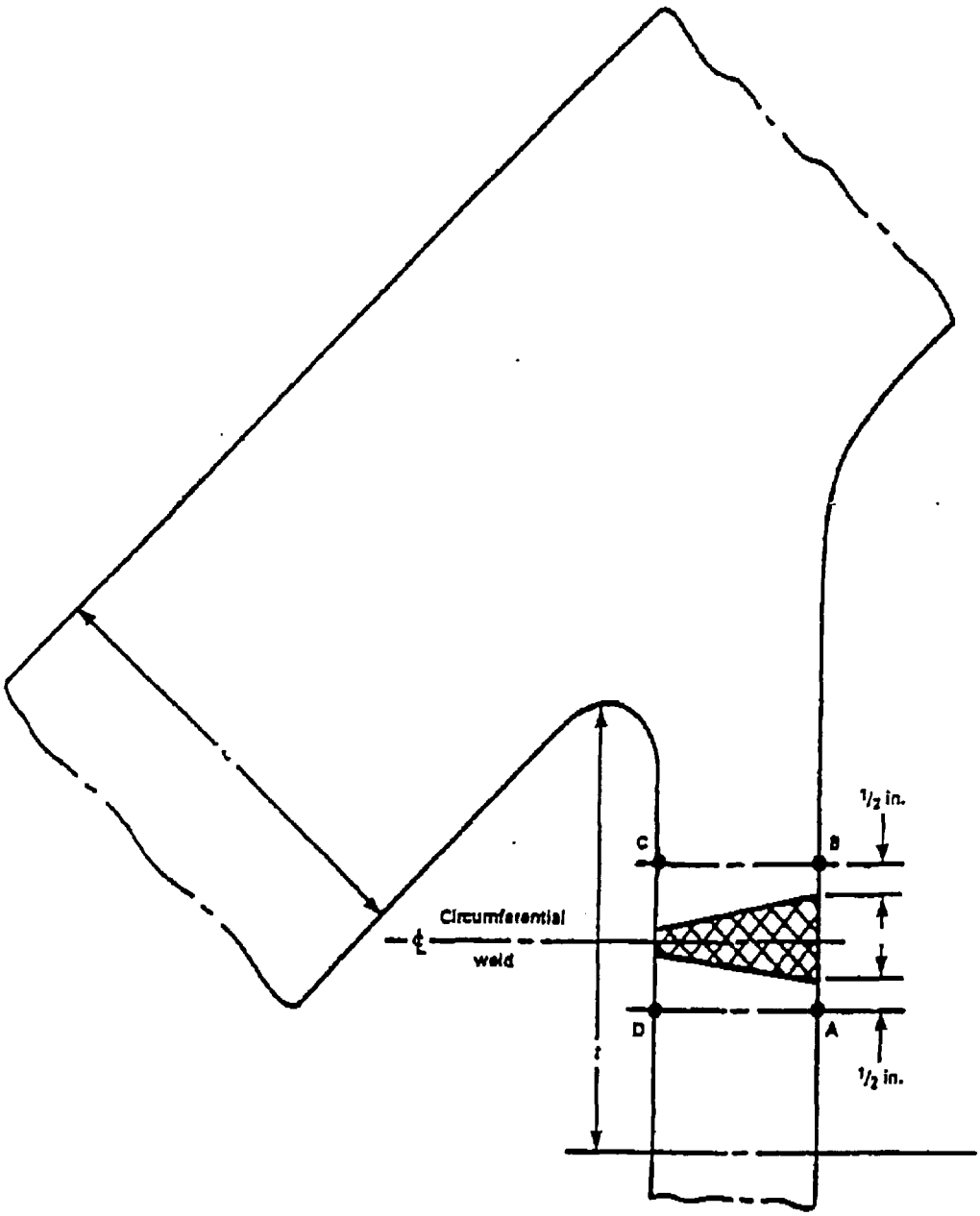

FIGURE 2

(ASME Code, Section XI, Figure IWB-2500-14)

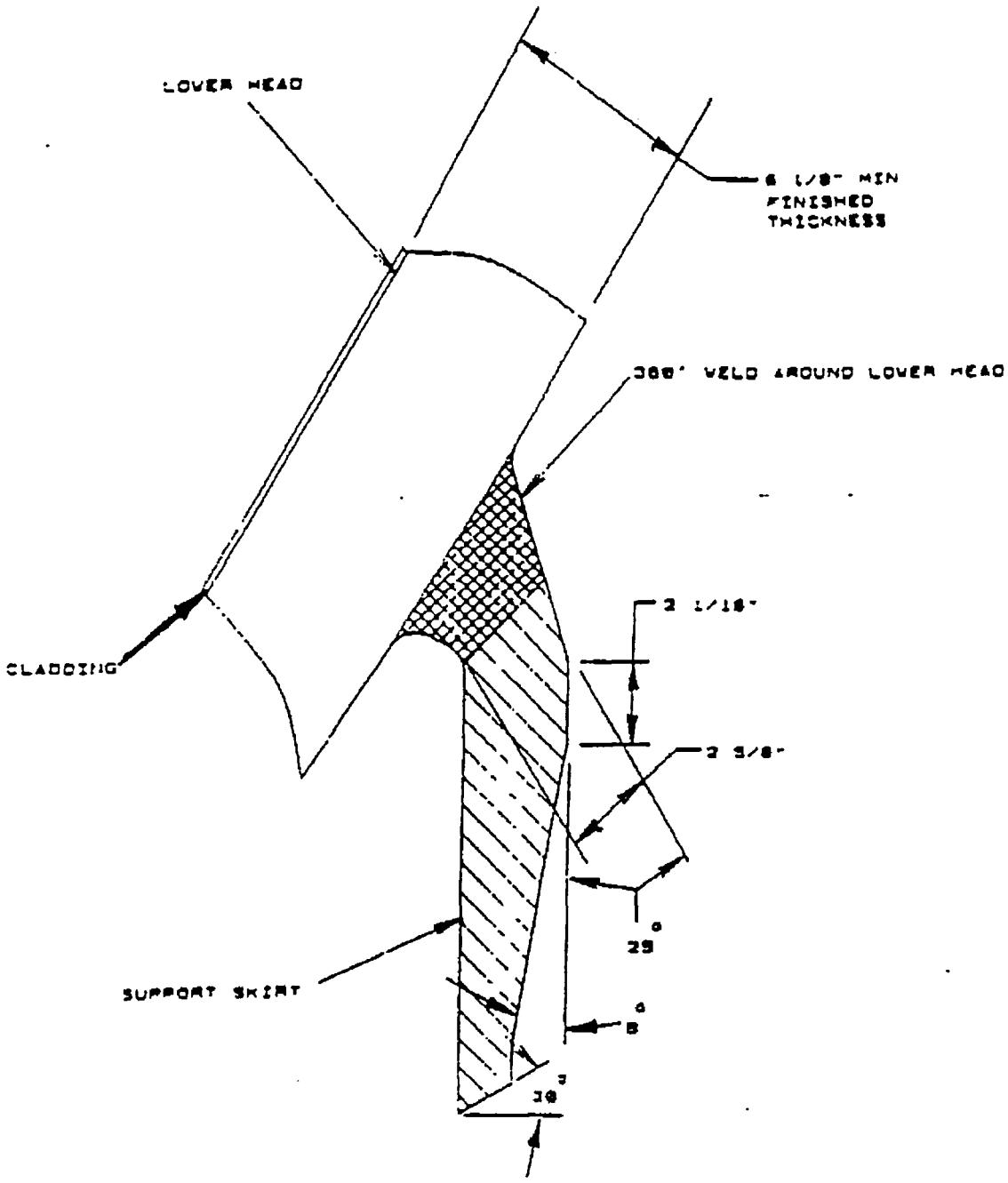

FIGURE 3
(BROWNS FERRY)

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