10 CFR 50.55a

Serial: RNP-RA/04-0043

April 16, 2004

United States Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2
DOCKET NO. 50-261/LICENSE NO. DPR-23

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION
FOR RELIEF REQUEST PERTAINING TO EXAMINATION COVERAGE
LESS THAN ESSENTIALLY 100 PERCENT (RELIEF REQUEST NO. 34)

Ladies and Gentlemen:

In accordance with 10 CFR 50.55a(g)(6)(i), Relief Request No. 34 was submitted for H. B. Robinson Steam Electric Plant (HBRSEP), Unit No. 2, by letter dated February 11, 2003. A request for additional information (RAI) was received from the NRC by letter dated November 6, 2003. A response to that RAI was provided by letter dated December 30, 2003. An additional RAI was received by letter dated March 5, 2004, with a requested response date of April 19, 2004.

The response to the additional RAI is provided in the attachments to this letter.

If you have any questions regarding this matter, please contact me.

Sincerely,

Original signed by
C. T. Baucom

C. T. Baucom
Supervisor – Licensing/Regulatory Programs

CAC/cac

Attachments:

I. Response to Request for Additional Information for Relief Request Pertaining to Examination Coverage Less than Essentially 100 Percent (Relief Request No. 34)
II. Coverage Data for Welds 202/01, 202/02, and 204/A02

c: Mr. L. A. Reyes, NRC, Region II
Mr. C. P. Patel, NRC, NRR
NRC Resident Inspector

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2

RESPONSE TO REQUEST FOR ADDITONAL INFORMATION FOR RELIEF REQUEST PERTAINING TO EXAMINATION COVERAGE LESS THAN ESSENTIALLY 100 PERCENT (RELIEF REQUEST NO. 34)

The following response to the request for additional information (RAI) is provided:

Requested Information:

2.1 Omitted Welds

Several welds included in original Relief Request 34 were omitted in the revision. In one case, it was stated that, upon further review of examination reports, the licensee determined that greater than 90-percent coverage had been obtained for certain welds; therefore, relief was not required. These welds are listed in Table 1 below. Please clarify that greater than 90-percent volumetric and surface, as applicable, examination coverage was obtained for the welds in Table 1 and how the decision to list these welds in the original request was reached.

Other welds appear to have been omitted in revised Relief Request 34 with no explanation. Please provide clarifying information as to why these welds listed in Table 2 were omitted.

Response:

The welds listed in Table 1 of the current RAI identify three Category B-A and two Category B-D welds that were subsequently deleted in the response to the first request for additional information. The original relief request submittal was based on information identified from vendor supplied reports. After further review of the examination data for these welds, it was identified that the examination coverage was greater than 90%. This conclusion was based on information contained in the vendor final report. During preparation of the original relief request, the review of the vendor final report appeared to indicate that the coverage was 90% for these specific welds. After further review of the report during preparation of the previous RAI response, it was subsequently determined that the examination coverage was greater than 90%. Therefore, the initial relief request unnecessarily included these welds.

The welds listed in Table 2 of the current RAI identify three Category C-A and five Category C-F-1 welds. After further review, it has been determined that the three Category C-A welds were omitted inadvertently. The information requested by the previous RAI is provided for these welds in Attachment II to this letter.

Detail pertaining to the omission of the five Category C-F-1 welds is provided as follows:

Weld 231/30 - Safety Injection System Pipe to Elbow Weld

This weld is part of the containment spray system, and is exempt from examination based on pipe wall thickness as described in ASME Section XI, IWC-2500. Twelve (12) containment spray system welds have been identified to be examined as part of the augmented examination of the containment spray system. Code credit is not needed for these augmented examinations. Therefore, this weld was deleted from the subsequent RAI response. These examinations are conducted on a "best effort basis" due to the thin pipe wall.

Welds 239/12, 239/13, 239/14, and 240/13 - Safety Injection System Pipe to Elbow Welds

These welds were originally identified as a limited examination with 51.9%, 42.4%, 41.1%, and 86.32% examination coverage achieved, as identified on the examination coverage report. These coverages were subsequently revised to 100% during review by a Level III NDE examiner, because the contour plot revealed that the weld crown was less than three times the thickness and a 70° transducer was utilized to increase coverage. Therefore, 100% coverage was credited as permitted by Performance Demonstration Initiative (PDI) letter, "PDI Piping Generic Procedure Expansion for 'As Welded' Condition," dated April 18, 2000.

Requested Information:

Finally, the welds listed in Table 3 below were omitted from the revised relief request with the following explanation:

> During the review process performed on the subject welds, it was identified that the ISI Program description included steam generator nozzle safe end welds. After further review, it appears that the steam generators were provided with a stainless steel build-up on the hot leg and cold leg nozzles and that there is no weld in this location. Therefore, these welds are not included in this RAI response and have been deleted from the ISI Program description.

Please provide clarifying information on the weld configuration as the result of steam generator replacement and provide the dates for when the steam generators were replaced pertaining to these nozzle-to-piping welds. Please clarify that no new welds have been included in the ISI Program Plan. Also, provide any information related to limitations for examining these Category B-J welds or B-F welds.

Table 3 Welds in Original Relief Request That do not Exist					
Drawing/ Weld	Code Category	Description	Item	Exam Coverage	Limitation/Comment
107/04	B-J	Hot Leg Loop "A" Elbow to Safe End	B9.11	75%	Weld/component configuration
107/05	B-J	Crossover Leg-Loop "A" Safe End to Elbow	B9.11	75%	Weld/component configuration
107A/04	B-J	Hot Leg Loop "B" Elbow to Safe End	B9.11	75%	Weld/component configuration
107A/05	B-J	Crossover Leg-Loop "B" Safe End to Elbow	B9.11	75%	Weld/component configuration
107B/04	B-J	Hot Leg Loop "C" Elbow to Safe End	B9.11	75%	Weld/component configuration
107B/05	B-J	Crossover Leg-Loop "C" Safe End to Elbow	B9.11	75%	Weld/component configuration

Response:

As stated in the previous RAI response, it has been determined that the steam generator nozzle welds each consist of one weld, not two welds as previously described in the ISI Program. These steam generator nozzle to reactor coolant loop elbow welds are configured with a buttered end preparation of the cast nozzle and are located between the nozzle and the cast elbow. Research into the initial examination requirements for these welds, as described in the original Technical Specifications (TS) for H. B. Robinson Steam Electric Plant (HBRSEP), Unit No. 2, shows that these welds were called "primary nozzle to safe-end welds" and the TS identified six total welds. When this information was transferred to the ISI Program for the 2nd interval in the early 1980's, it appears that these locations were categorized as two welds, possibly by counting the butter as a separate weld or possibly due to the incorrect belief that a "safe-end" spool-piece existed at these locations.

The steam generator reactor coolant system (RCS) nozzle welds remain in the original construction configuration and were not affected by the steam generator replacement that was conducted at HBRSEP, Unit No. 2, during the Steam Generator Replacement Outage that ended on January 8, 1985. The steam generator replacements conducted at HBRSEP, Unit No. 2, were replacements of the tube bundle section of the three steam generators. The steam generator RCS channel heads were cut just below the tube sheet and the new welds were placed at these locations. These new welds are Category B-B, Item No. B2.40, Tubesheet-to-Head Weld, and are examined in accordance with ASME Section XI, Table IWB-2500-1 requirements.

Prior to deletion of the six reactor coolant system Category B-J steam generator nozzle welds from the ISI Program, the total weld count for the Third Ten-Year ISI Interval,

Category B-J, was 727 welds. The HBRSEP, Unit No. 2, extent of examination requirement for Category B-J welds is 25%, based on 10 CFR 50.55a(b)(2)(ii), which allows facilities with an application for construction permit docketed prior to July 1, 1978, to determine the extent of examination for Code Class 1 piping welds in accordance with Table IWB-2500 of Section XI of the ASME Code in the 1974 Edition and addenda through the Summer 1975 Addenda. The Category B-J total welds and completed examination count for the Third Ten-Year ISI Interval are summarized as follows:

Item Number	Total	1st Period Completed Exams	2nd Period Completed Exams	3rd Period Completed Exams
B9.11	184	20	20	20
B9.21	139	13	14	15
B9.31	7	0	0	2
B9.32	20	1	1	2
B9.40	377	32	29	40
	727	66	64	79

With the deletion of the safe-end to elbow weld at each steam generator hot leg and cold leg (six welds deleted), the adjusted Category B-J totals are as follows:

Item Number	Total	1st Period Completed Exams	2nd Period Completed Exams	3rd Period Completed Exams
B9.11	178	18	18	18
B9.21	139	13	14	15
B9.31	7	0	0	2
B9.32	20	1	1	2
B9.40	377	32	29	40
	721	64	62	77

The minimum number of welds required to be completed at the end of the Third Ten-Year ISI Interval for Category B-J was 181 (25% of 721). The revision to the program resulted in 203 examinations counted as completed, as opposed to the original count of 209. The examination count of 203 remains in excess of the Code-required minimum of 181.

As previously indicated, the Fourth Ten-Year ISI Interval Program has been revised to remove the six Category B-J welds that were listed as steam generator nozzle welds. The six remaining "nozzle to elbow" welds (previously identified as nozzle to safe-end welds) at the steam generator hot leg and cold leg nozzle locations are identified as Category B-F, Item Number B5.70. These six weld locations are scheduled for surface and volumetric examination, one set of steam generator welds each period during the interval. The additional welds in the ISI Program were introduced approximately 20 years ago. Investigation of this situation has not revealed any other extra or missing welds. The extra welds did not cause any examinations to be conducted inappropriately.

Requested Information:

2.2 Request for Relief 34, Revision 1, Category B-D Examinations of Full-Penetration Welded Nozzles in Vessels

Based upon the drawings and descriptions provided by the licensee for welds 101A/29, 101A/31, and 101A/33, it is not clear why only 10 percent of the subject nozzle weld can be examined when scanning transverse to the weld. In addition, the licensee does not state whether the subject weld was examined from the nozzle bore during the first period of the third inspection interval. Clearly explain why only 10 percent of the weld can be examined in the transverse direction and provide additional information to support a determination of reasonable assurance for continued structural integrity.

Response:

The limitations relating to the transverse examinations of the hot leg reactor pressure vessel (RPV) nozzle to shell welds (101A/29, 101A/31, 101A/33) resulted in examination coverage that was reported as 10%. The reason for this low value is a combination of the physical obstruction presented by the nozzle integral extensions, the size of the transducers, and transducer mounting bracket. For these exams, a series of five (5) transducers are mounted on a crescent shaped bracket and are skewed to direct their respective beams towards the nozzle to shell weld in order to detect reflectors orientated transverse to the weld. However, due to the proximity of the weld to the outside diameter of the nozzle integral extension, the taper between the weld and the nozzle extension, and the narrow weld configuration (approximately 1 ½ inches), the transducer assembly is physically restricted from the weld inner diameter surface. Also, because the nozzle forging is inserted into a curved vessel, the weld extends away from the inside diameter of the vessel at an angle approximately 15 degrees greater than the vessel radius, which further complicates the examination. As with all estimations of examination coverage, it should be noted that the coverage calculation is based on a theoretical point extending from the centerline of the transducers to the outer surface of the vessel at an angle normal to the vessel inside diameter. This calculation does not reflect the actual amount of ultrasound that has interrogated the weld due to beam-spread.

Requested Information:

2.3 Request for Relief 34, Revision 1, Category B-G-1 Examinations of Pressure-Retaining Bolting

The licensee has requested relief from the 100-percent Code-required examination volume for reactor coolant pump stud No. 7. The licensee states that the lower 8 inches of the stud cannot be examined due to a taper in the stud design. Further, the licensee states that the limitation equates to only 0.36 percent of the overall examination volume for all studs in aggregate. We understand that this relief is no longer required. Please clarify your position.

Response:

The original relief request identified stud No. 7 for the reactor coolant pump (RCP) "C" as a limited examination based on the NDE datasheet, which stated that the examination of the lower eight (8) inches was restricted due to taper. This datasheet was located in the final report for the refueling outage (RO) performed, which was RO-15. Subsequent to the examination of stud No. 7 on May 5, 1995, eight (8) studs were replaced (stud Nos. 1, 2, 3, 4, 5, 6, 23, and 24) due to a main flange leak. After additional visual and magnetic particle examinations, three (3) additional studs were replaced (studs Nos. 7, 8, and 21). Preservice examinations were performed prior to installation of the studs. Based on this additional information, it has been determined that the ASME Section XI Code requirements have been met and that the examination of the installed components meet the applicable ASME Section XI Code requirements. Therefore, relief from the Code-required examination coverage is not being requested for RCP "C" stud No. 7.

Requested Information:

2.4 Confirm the end date for the H.B. Robinson third 10-year inspection interval was February 18, 2002.

Response:

As stated in the Inservice Inspection Program for the Fourth Ten-Year ISI Interval letter, dated August 17, 2001, the Fourth Ten-Year ISI Interval for HBRSEP, Unit No. 2, began on February 19, 2002. This confirms that the Third Ten-Year ISI Interval ended on February 18, 2002.

Requested Information:

2.5 Request for Relief 34, Revision 1, Examination Categories B-F, B-J, C-F-1, and C-F-2 Pressure-Retaining Welds in Piping

Clarify that 100 percent, with the exception noted for socket Weld 133/10, of the Code-required surface examinations were completed for all Class 1 and 2 dissimilar metal, austenitic, and ferritic piping welds included in Request for Relief 34. Briefly discuss any relevant indication, if observed, during the volumetric and surface examinations.

Response:

The required surface examinations for the HBRSEP, Unit No. 2, Third Ten-Year ISI Interval for ASME Section XI, Categories B-F, B-J, C-F-1, and C-F-2, were performed as required. The volumetric examinations were also performed and did not reveal any rejectable indications.

Note that the ASME Section XI Code-required surface examinations were not performed on the reactor vessel nozzles, Category B-F (six welds) and B-J (six welds). This was allowed in accordance with Relief Request No. 32 for the Third Ten-Year ISI Interval. These welds received an alternative VT-2 examination, which was approved by NRC letter dated June 6, 2001. The relief from surface examination requirements for these welds was needed due to physical limitations that restrict the ability to perform surface examinations on these welds.

During RO-15 in 1993, examination of reactor coolant pump seal injection system piping elbow socket weld 132/13 (Category B-J, Item No. B9.40) identified a one-half inch linear indication on the elbow. This indication exceeded the allowable acceptance criteria of the ASME Section XI Code. The indication was a shallow surface indication that was removed with a flapper wheel. A sample expansion was initiated and did not produce any further indications that exceeded the acceptance criteria of the ASME Section XI Code.

During RO-20 in 2001, high pressure safety injection system discharge piping elbow welds 239/18 and 239/19 were identified with indications. Both welds were examined in the as-welded condition. Examination of weld 239/18 identified three (3) straight linear indications 0.20 inch long separated by a 0.05 inch gap. The indication was not service induced and appeared to be a tooling mark. The indication was removed and the re-examination was satisfactory. The activity was documented on the NIS-2 Form and provided with the 90 day report for RO-20 in 2001, which was submitted to the NRC by letter dated August 10, 2001.

Examination of weld 239/19 identified a curvilinear indication 0.40 inch long. The indication was not service induced and appeared to be a lap formed during the welding process. The indication was removed and the re-examination was satisfactory. The activity was documented on the NIS-2 Form and provided with the 90 day report for RO-20 in 2001, which was submitted to the NRC by letter dated August 10, 2001.

As a result of the non-service induced indications identified on welds 239/18 and 239/19, a sample expansion was initiated in RO-20 as a conservative measure. The results of the sample expansion did not identify any additional indications. Welds 239/18 and 239/19 have been subsequently ground flush to allow for a complete PDI examination.

Requested Information:

2.6 Request for Relief 34, Revision 1, Examination Category C-C, Integral Attachments for Vessels, Piping, Pumps, and Valves

Briefly discuss whether relevant indications have been detected on the subject integrally welded attachments, and describe other attachment welds that have received full Code examinations.

Response:

A review of the NDE data associated with ASME Code Category C-C integral attachments that were examined during the Third Ten-Year ISI Interval did not reveal any relevant indications. Limited examinations were conducted to the maximum extent practical.

Significant effort was required to complete the examination of the "A" residual heat removal (RHR) heat exchanger support welds due to as-found, as-welded conditions, which resulted in the liquid penetrant being trapped between weld passes producing a masking condition. After grinding, blending, and re-welding on the two (2) support welds, satisfactory examination results were achieved.

Typical integrally welded piping attachments that received ASME Section XI Code-required examinations consisted of piping lugs, ears, stanchions, pads, and saddles. Components for which the Code-required examination coverage was achieved did not have physical limitations that prevented the Code-required surface area from being examined. The examinations for which Code-required examination coverage was not achieved, as identified in Relief Request No. 34, were due to physical access restrictions that did not allow access for liquid penetrant or magnetic particle examination.

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2

COVERAGE DATA FOR WELDS 202/01, 202/02, AND 204/A02

INSERVICE INSPECTION
DETERMINATION OF PERCENT COVERAGE WORKSHEET
(UT)

COMPONENT ID:	202/01	ASME CATEGORY:	C-A
ASME CODE FIGURE:	IWC-2500-1	ASME ITEM NUMBER:	C1.20
CONFIGURATION:	SHELL TO HEAD	% CRV ACHIEVED:	83.5%
PDI TECHNIQUE USED:	NO	EXAM DATE	4/27/01

45° SHEAR SCAN

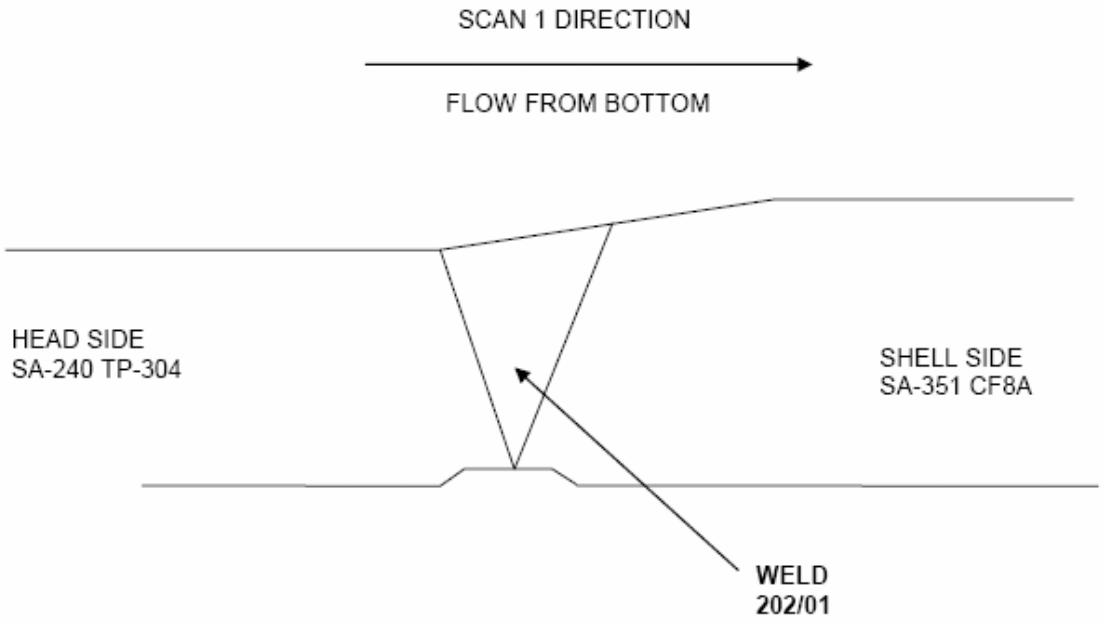
SCAN	% VOLUME ACHIEVED	LIMITATION
1	61%	COMPONENT CONFIGURATION, INSULATION RING AND SUPPORT LEGS
2	73%	COMPONENT CONFIGURATION, INSULATION RING AND SUPPORT LEGS
3	100%	COMPONENT CONFIGURATION, INSULATION RING AND SUPPORT LEGS
4	100%	COMPONENT CONFIGURATION, INSULATION RING AND SUPPORT LEGS

60° SHEAR SCAN

SCAN	% VOLUME ACHIEVED	LIMITATION
1	61%	COMPONENT CONFIGURATION, INSULATION RING AND SUPPORT LEGS
2	73%	COMPONENT CONFIGURATION, INSULATION RING AND SUPPORT LEGS
3	100%	COMPONENT CONFIGURATION, INSULATION RING AND SUPPORT LEGS
4	100%	COMPONENT CONFIGURATION, INSULATION RING AND SUPPORT LEGS

* See attached CRV plots for examination coverage

MATERIAL AND WELD IDENTIFICATION SHEET



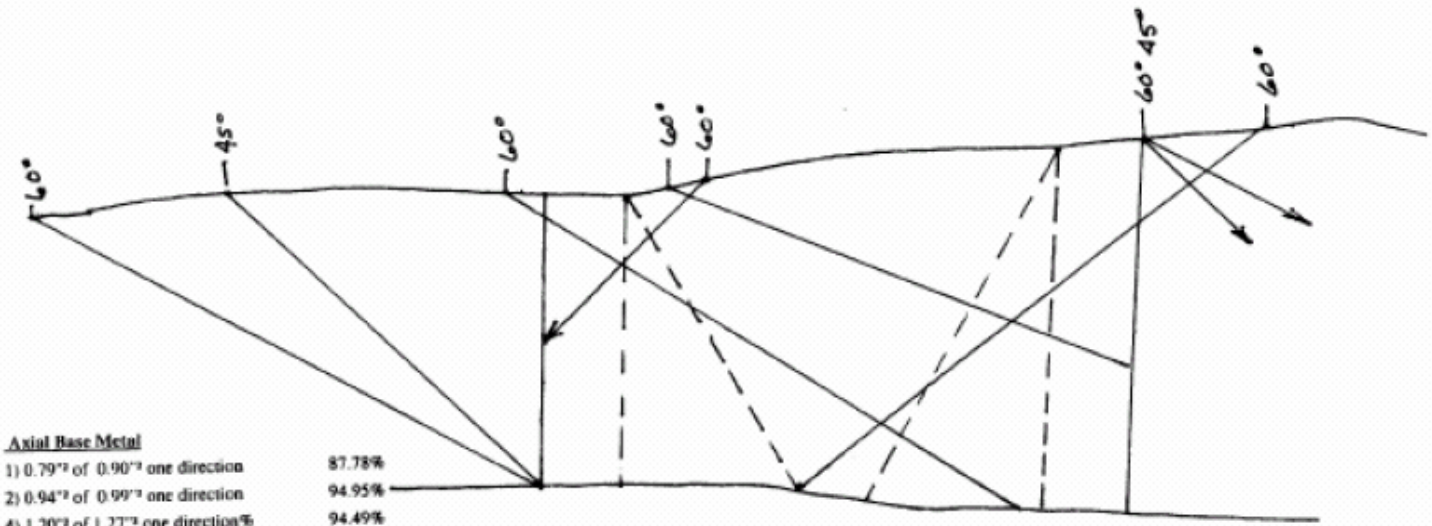
Washington

W.R. #

Client: H.B. ROBINSON Project: RO-20 System: SI 2080 Report No.:

Line No.: BIT Component I.D.: 202/01 Procedure: HBR-UT-86-5 Rev.: 1 Date: 4/28/01

Drawing No.: HBR2-10618 SHT.58 Rev.: 1 Search Unit Angle: 45° & 60° Mode: SHEAR



Axial Base Metal

1) 0.79"² of 0.90"² one direction	87.78%
2) 0.94"² of 0.99"² one direction	94.95%
4) 1.20"² of 1.27"² one direction%	94.49%
4) 0.70"² of 1.15"² one direction%	60.87%

Axial Weld Metal

1.20"² of 3.16"² Against Flow	37.97%
3.00"² of 3.16"² With Flow	94.94%

$\frac{C1 + C2 + W1 + W2 + B1}{5}$ $\frac{417.43\%}{5}$

$\frac{100\% + 100\% + 37.97\% + 94.94\% + 84.52\%}{5}$ 83.49% Total Required Volume Achieved

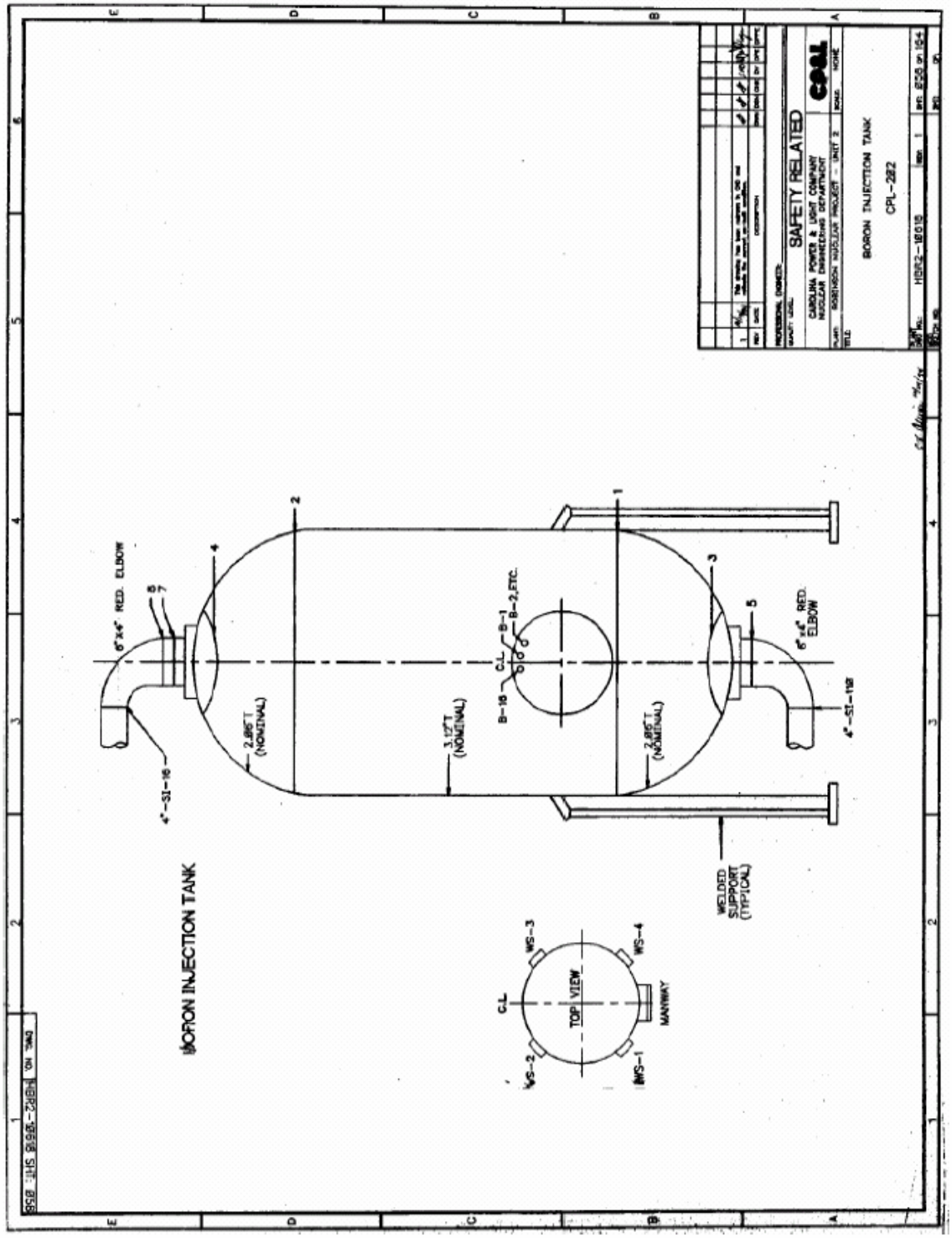
COVERAGE PLOT

Examiner: BRET FLESNER Level: II Date: 4/28/01 Examiner: N/A Level: N/A Date: N/A

Reviewer: (Washington) Level: III Date: 5-4-01 Reviewer: (Client) Level: III Date: 7/9/01

Reviewer: (ANII) Date: 7/9/01

☐ Refer to attached Ultrasonic Indication Data Sheet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SAFETY RELATED
CAROLINA POWER & LIGHT COMPANY
NUCLEAR ENGINEERING DEPARTMENT
BORON INJECTION TANK
CPL-282
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4"-SI-16
2.85"T (NOMINAL)
3.127" (NOMINAL)
C.L
B-1
B-2,ETC.
B-16
6"x4" RED. ELBOW
4"-SI-112
WELDED SUPPORT (TYPICAL)
TOP VIEW
WS-1
WS-2
WS-3
WS-4
MANWAY

Washington

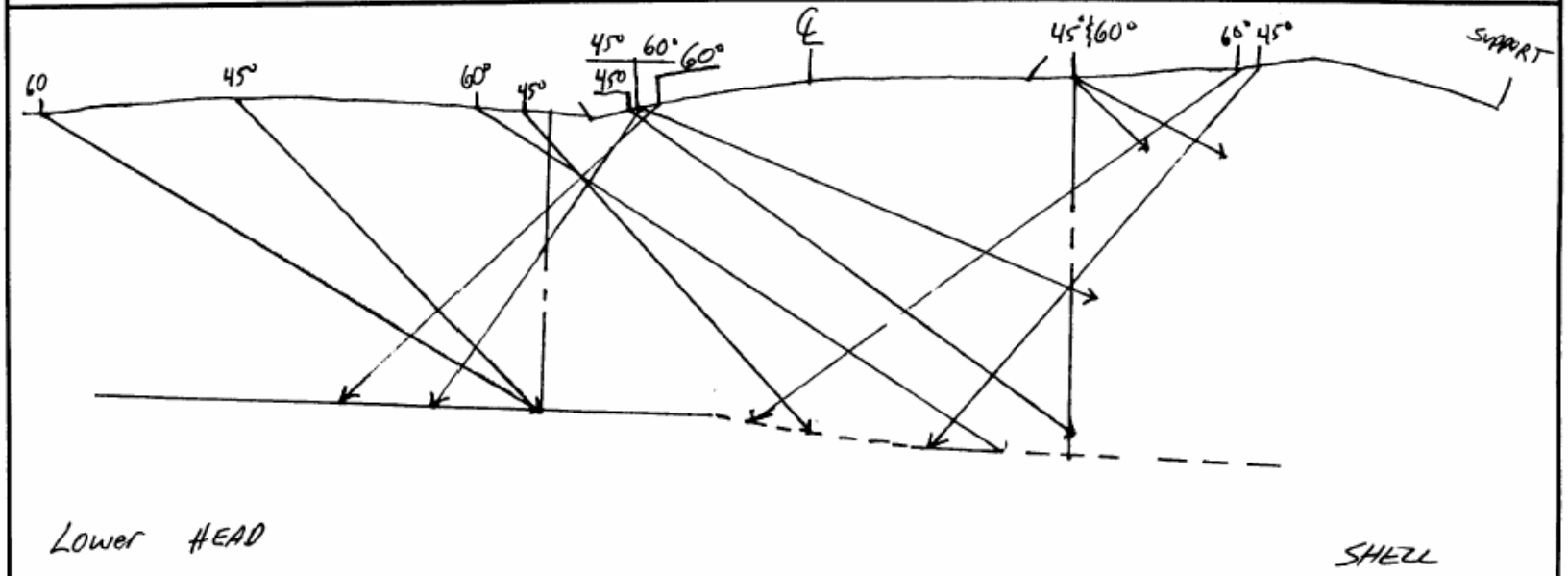
Page 6 of 13

W.R. #

Client: H.B. ROBINSON Project: RO-20 System: SI 2080 Report No.:

Line No.: BIT Component I.D.: 202/01 Procedure: HBR-UT-86-5 Rev.: 1 Date: 4/28/01

Drawing No.: HBR2-10618 SHT.58 Rev.: 1 Search Unit Angle: 45° & 60° Mode: SHEAR



COVERAGE PLOT

Examiner: BRET FLESNER Level: II Date 4/28/01 Examiner: N/A Level: N/A Date: N/A

Reviewer: (Washington) Level: III Date: 5-4-01 Reviewer: (Client) Level: III Date: 7/9/01

Reviewer: (ANII) Date: 7/9/01

☐ Refer to attached Ultrasonic Indication Data Sheet

Washington

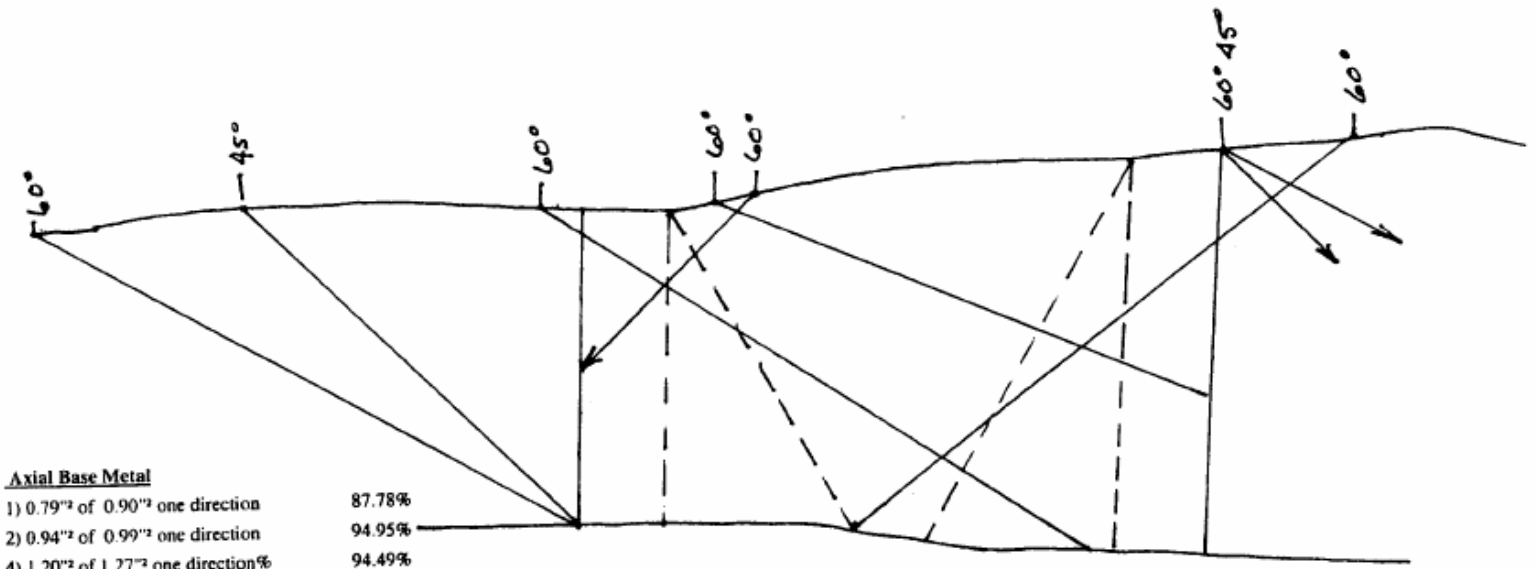
Page 7 of 13

W.R. #

Client: H.B. ROBINSON Project: RO-20 System: SI 2080 Report No.:

Line No.: BIT Component I.D.: 202/01 Procedure: HBR-UT-86-5 Rev.: 1 Date: 4/28/01

Drawing No.: HBR2-10618 SHT.58 Rev.: 1 Search Unit Angle: 45° & 60° Mode: SHEAR



Axial Base Metal

1) 0.79"² of 0.90"² one direction 87.78%
2) 0.94"² of 0.99"² one direction 94.95%
4) 1.20"² of 1.27"² one direction% 94.49%
4) 0.70"² of 1.15"² one direction% 60.87%

Axial Weld Metal

1.20"² of 3.16"² Against Flow 37.97%
3.00"² of 3.16"² With Flow 94.94%

$$\frac{C1 + C2 + W1 + W2 + B1}{5} = \frac{417.43\%}{5}$$

$$\frac{100\% + 100\% + 37.97\% + 94.94\% + 84.52\%}{5}$$

83.49% Total Required Volume Achieved

COVERAGE PLOT

Examiner: BRET FLESNER Level: II Date 4/28/01 Examiner: N/A Level: N/A Date: N/A

Reviewer: (Washington) Level: III Date: 5-9-01 Reviewer: (Client) Level: III Date: 7/9/01

Reviewer: (ANII) Date: 7/9/01

☐ Refer to attached Ultrasonic Indication Data Sheet

INSERVICE INSPECTION
DETERMINATION OF PERCENT COVERAGE WORKSHEET
(UT)

COMPONENT ID:	202/02	ASME CATEGORY:	C-A
ASME CODE FIGURE:	IWC-2500-1	ASME ITEM NUMBER:	C1.20
CONFIGURATION:	SHELL TO UPPER HEAD	% CRV ACHIEVED:	89%
PDI TECHNIQUE USED:	NO	EXAM DATE:	4/27/01

45° SHEAR SCAN

SCAN	% VOLUME ACHIEVED	LIMITATION
1	68%	COMPONENT CONFIGURATION
2	88%	COMPONENT CONFIGURATION
3	100%	COMPONENT CONFIGURATION
4	100%	COMPONENT CONFIGURATION

60° SHEAR SCAN

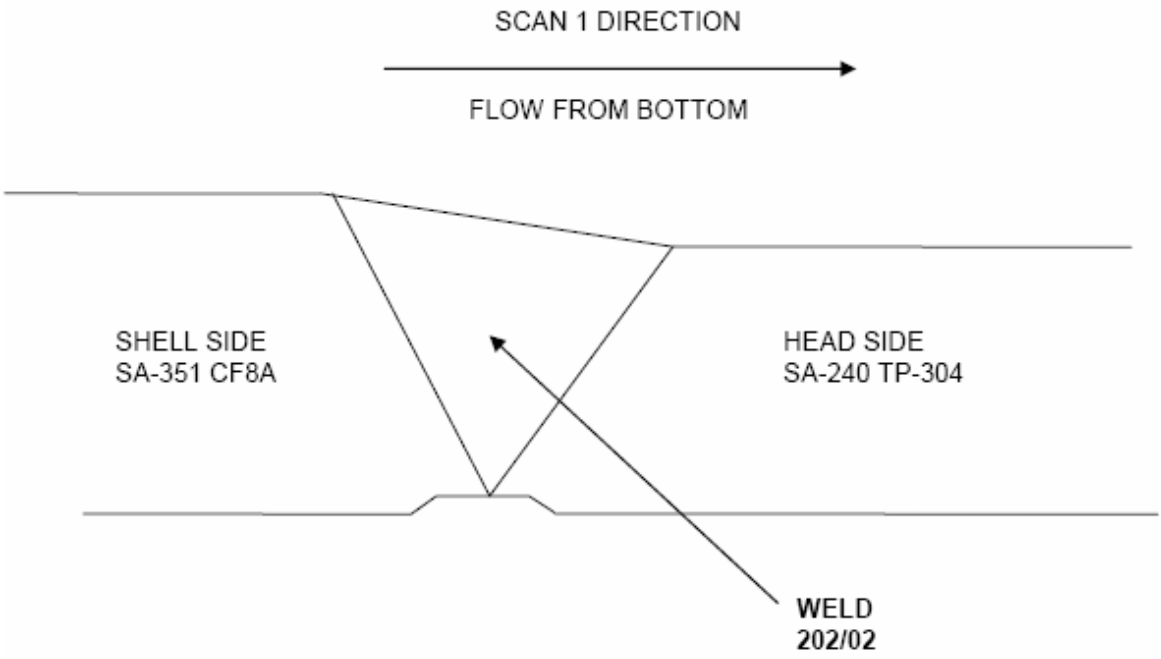
SCAN	% VOLUME ACHIEVED	LIMITATION
1	68%	COMPONENT CONFIGURATION
2	88%	COMPONENT CONFIGURATION
3	100%	COMPONENT CONFIGURATION
4	100%	COMPONENT CONFIGURATION

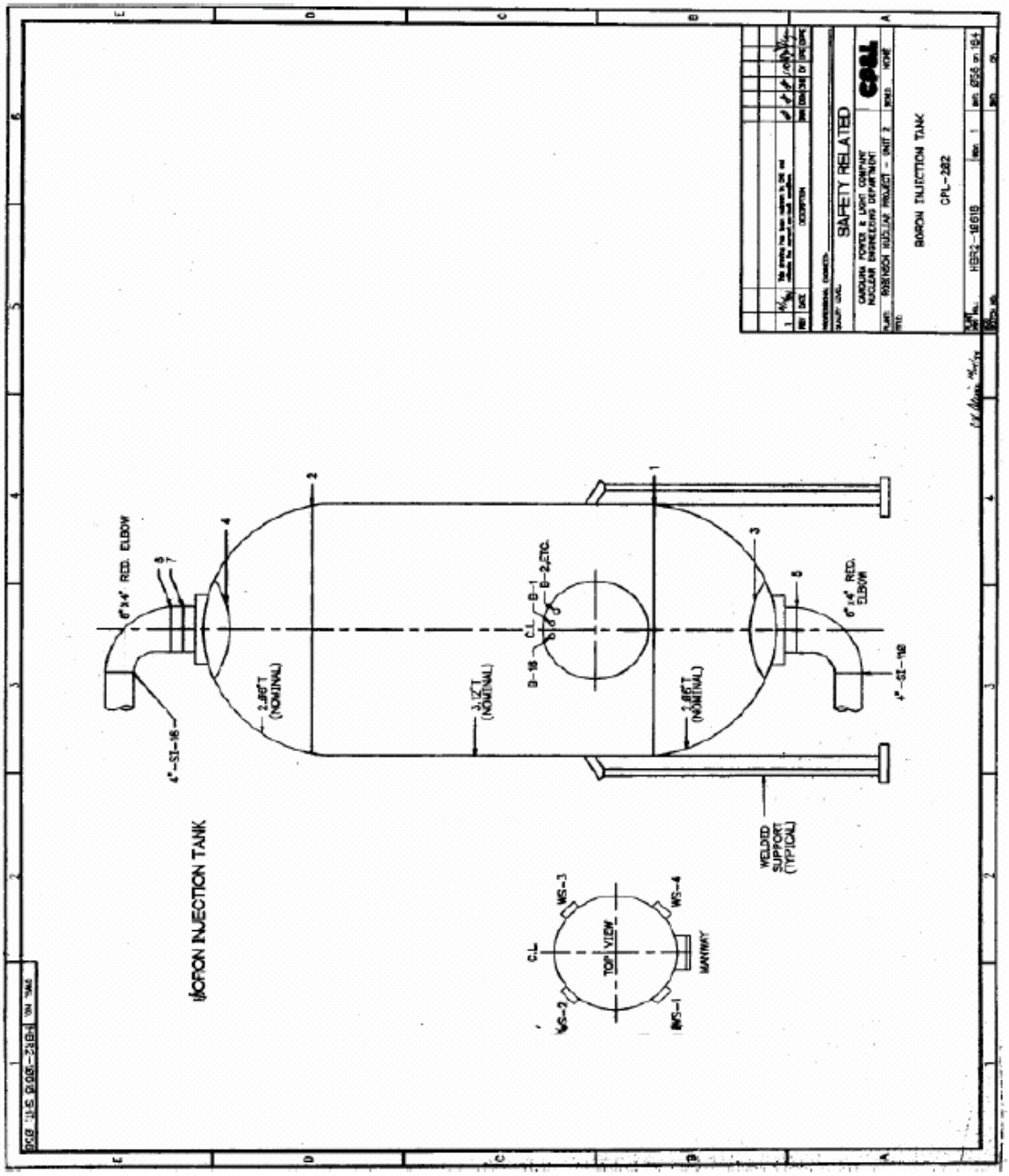
60° RL SCAN

SCAN	% VOLUME ACHIEVED	LIMITATION
1	68%	COMPONENT CONFIGURATION
2	88%	COMPONENT CONFIGURATION
3	100%	COMPONENT CONFIGURATION
4	100%	COMPONENT CONFIGURATION

* See attached CRV plots for examination coverage

MATERIAL AND WELD IDENTIFICATION SHEET




BORON INJECTION TANK
CPL-282
SAFETY RELATED
CAROLINA POWER & LIGHT COMPANY
NUCLEAR ENGINEERING DEPARTMENT
ROBINSON NUCLEAR PROJECT - UNIT 2
BORON INJECTION TANK
HBR2-16618
6" x 4" RED. ELBOW
4"-SI-152
2.8FT (NOMINAL)
3.1FT (NOMINAL)
3.8FT (NOMINAL)
WELDED SUPPORT (TYPICAL)
TOP VIEW
MANWAY
WS-1
WS-2
WS-3
WS-4

Washington

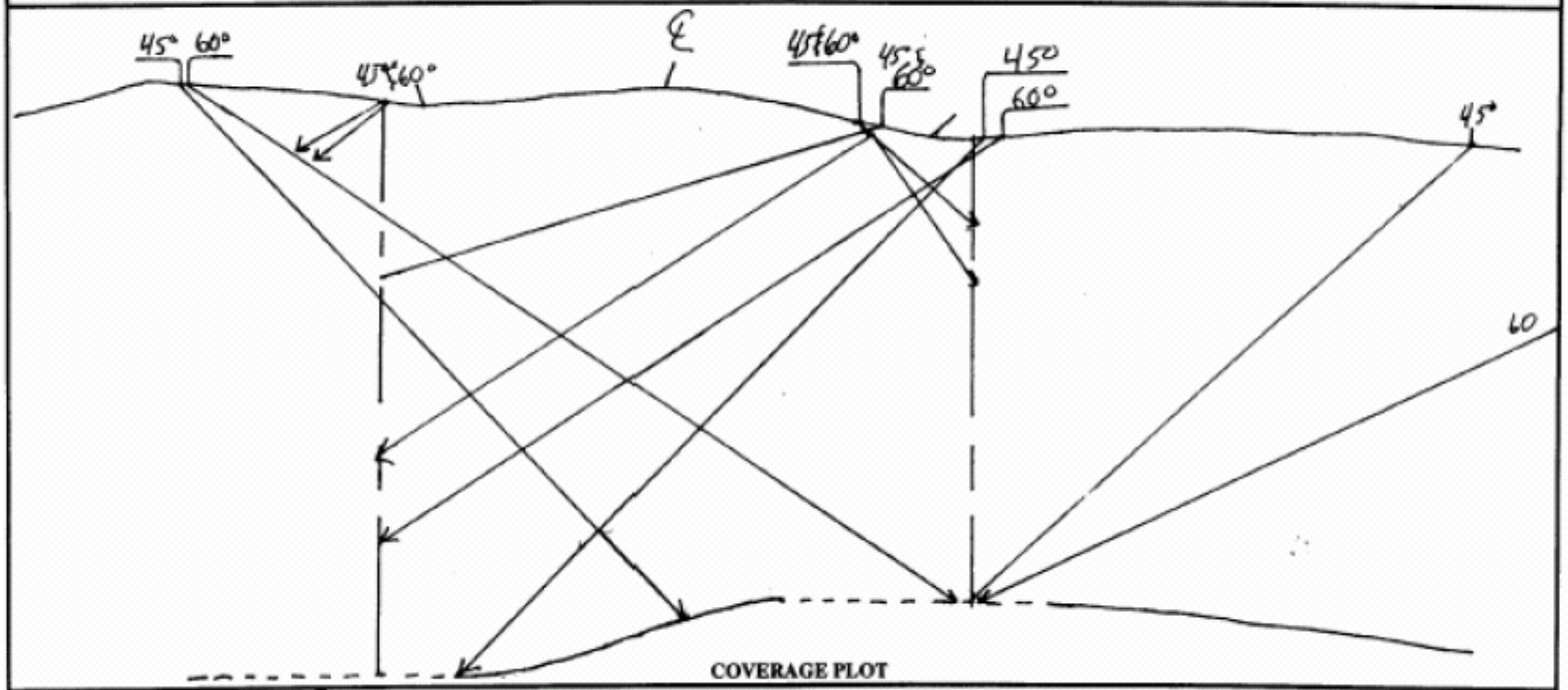
Page 6 of 11

W.R. #

Client: H.B. ROBINSON Project: RO-20 System: SI 2080 Report No.: 01-042

Line No.: BIT Component I.D.: 202/02 Procedure: HBR-UT-86-5 Rev.: 1 Date: 4/27/01

Drawing No.: HBR2-10618 SHT.58 Rev.: 1 Search Unit Angle: 45° & 60° Mode: SHEAR



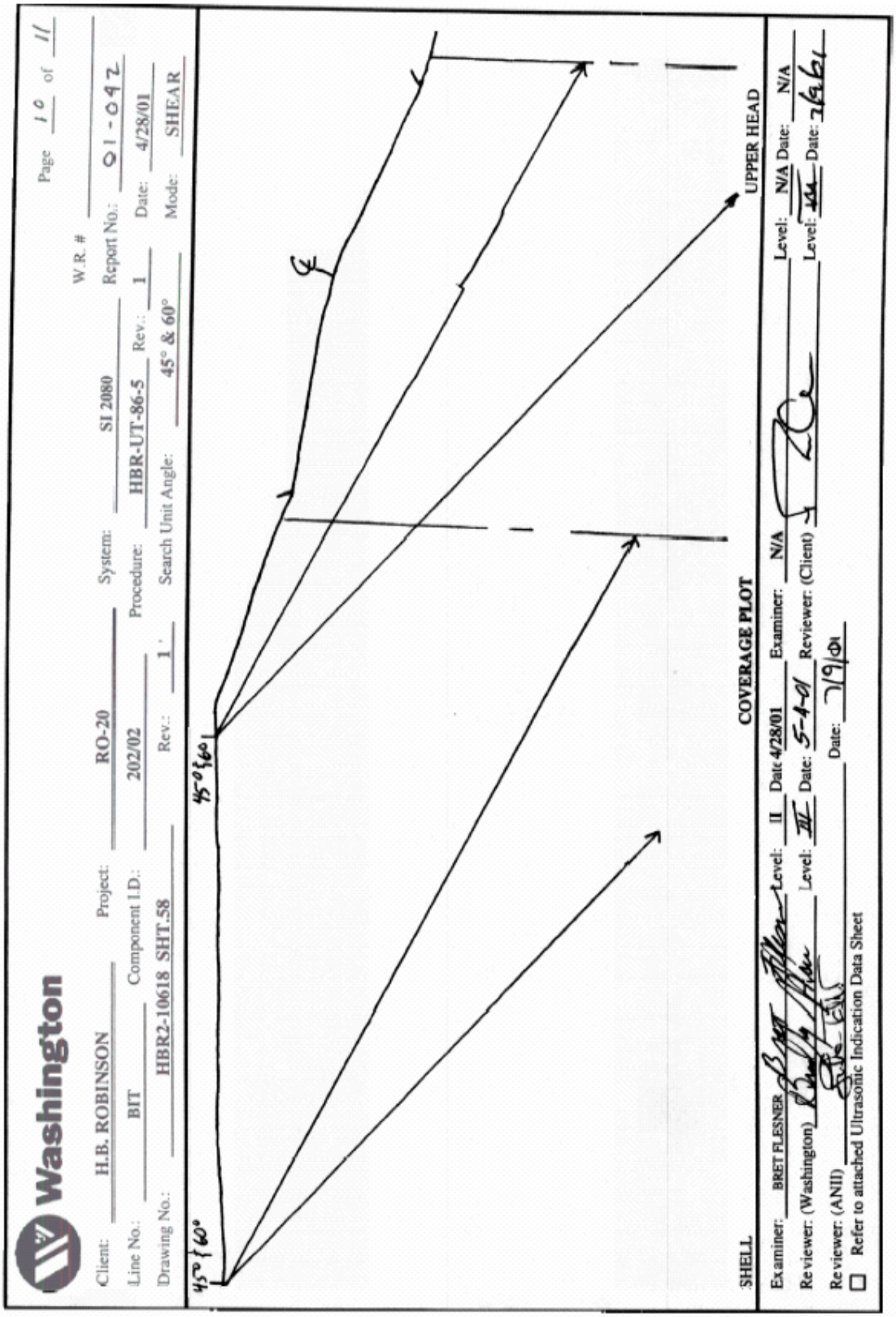
COVERAGE PLOT

Examiner: BRET FLESNER Level: II Date 4/27/01 Examiner: N/A Level: N/A Date: N/A

Reviewer: (Washington) Level: III Date: 5-9-01 Reviewer: (Client) Level: III Date: 7/9/01

Reviewer: (ANII) Date: 7/9/01

☐ Refer to attached Ultrasonic Indication Data Sheet


Washington
Page 10 of 11
Client: H.B. ROBINSON
Project: RO-20
System: SI 2080
W.R. #
Line No.: BIT
Component I.D.: 202/02
Procedure: HBR-UT-86-5
Rev.: 1
Report No.: 01-042
Drawing No.: HBR2-10618 SHT.58
Rev.: 1
Search Unit Angle: 45° & 60°
Date: 4/28/01
Mode: SHEAR
45°&60°
45°&60°
SHELL
UPPER HEAD
COVERAGE PLOT
Examiner: BRET FLESNER Level: II Date 4/28/01 Examiner: N/A Level: N/A Date: N/A
Reviewer: (Washington) Level: III Date: 5-4-01 Reviewer: (Client) Level: Date:
Reviewer: (ANII) Date: 7/9/01
Refer to attached Ultrasonic Indication Data Sheet

Washington

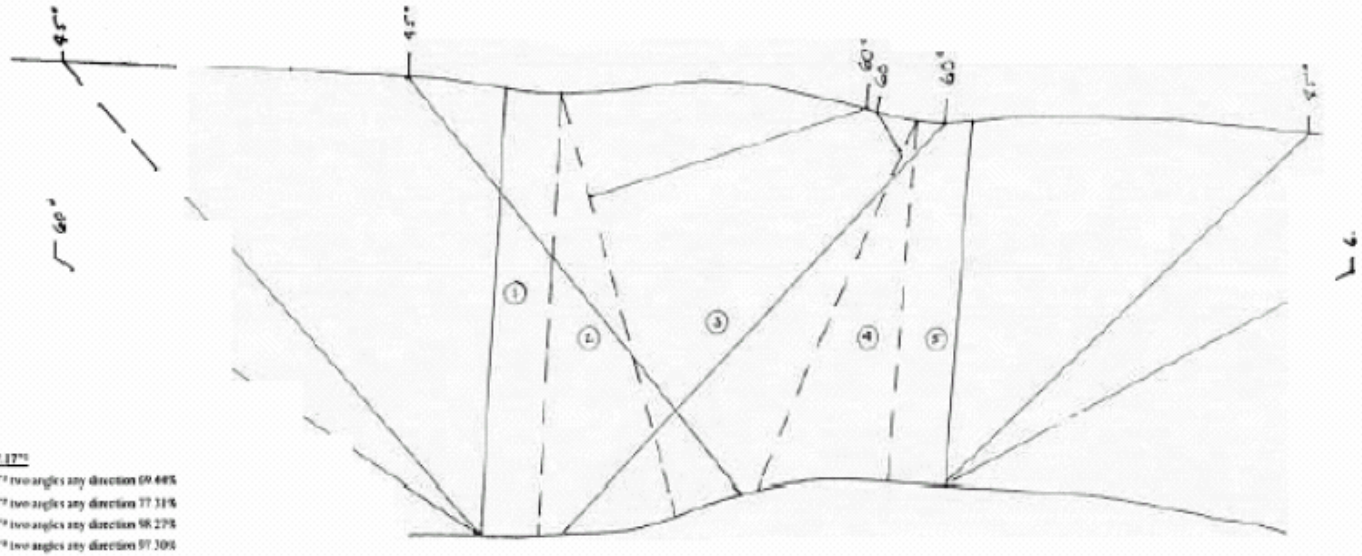
Page 12 of 12

W.R. #

Client: CP & L | Project: H.B. ROBINSON | System: SI 2080 | Report No.: 01-042

Line No.: BIT | Component I.D.: 202/02 | Procedure: HBR-UT-86-5 Rev.: 1 | Date: 4/27/01

Drawing No.: HBR2-10618 Sht. 58 | Rev.: 1 | Search Unit Angle: 45° & 60° | Mode: SHEAR



Base Metal = 7.17"

1) 1.25" of 1.80" two angles any direction 69.44%

2) 1.67" of 2.16" two angles any direction 77.31%

4) 1.70" of 1.73" two angles any direction 98.27%

5) 1.44" of 1.48" two angles any direction 97.30%

Weld Metal = 5.97"

5.93" of 5.97" = 99.33% With Flow

3.57" of 5.97" = 59.80% Against Flow

$$\frac{1 + (2 + W1 + W2) + 3I}{4}$$

$$\frac{100\% + 100\% + 99.33\% + 59.80\% + 83.58\%}{4}$$

484.71% / 5 = 88.94% Total Required Volume Achieved

Examiner: Brad Hoppe Level: II Date: 4-27-01 Examiner: N/A Level: N/A Date: N/A

Reviewer: (Washington) Level: III Date: 5-9-01 Reviewer: (Client) Level: III Date: 7/9/01

Reviewer: (ANI) Date: 7/5/01

☐ Refer to attached Ultrasonic Indication Data Sheet

INSERVICE INSPECTION
DETERMINATION OF PERCENT COVERAGE WORKSHEET
(UT)

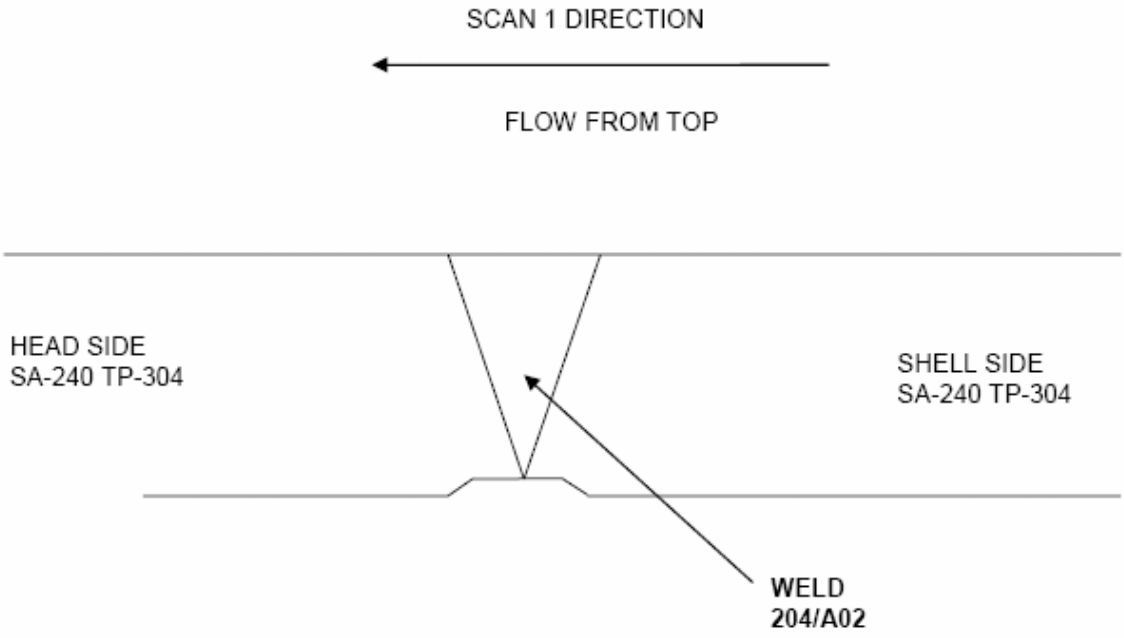
COMPONENT ID:	204/A02	ASME CATEGORY:	C-A
ASME CODE FIGURE:	IWC-2500-1	ASME ITEM NUMBER:	C1.20
CONFIGURATION:	SHELL TO HEAD	% CRV ACHIEVED:	68.30%
PDI TECHNIQUE USED:	NO	EXAM DATE:	9/30/99

45° SHEAR SCAN

SCAN	% VOLUME ACHIEVED	LIMITATION
1	41%	1/2V DUAL SIDED EXAM PERFORMED. EXAM LIMITED BY NOZZLES (2) AND SUPPORT INTEGRAL ATTACHMENTS (2).
2	80.4%	1/2V DUAL SIDED EXAM PERFORMED. EXAM LIMITED BY NOZZLES (2) AND SUPPORT INTEGRAL ATTACHMENTS (2).
3	75.8%	1/2V DUAL SIDED EXAM PERFORMED. EXAM LIMITED BY NOZZLES (2) AND SUPPORT INTEGRAL ATTACHMENTS (2).
4	75.8%	1/2V DUAL SIDED EXAM PERFORMED. EXAM LIMITED BY NOZZLES (2) AND SUPPORT INTEGRAL ATTACHMENTS (2).

* See attached CRV plots for examination coverage

MATERIAL AND WELD IDENTIFICATION SHEET

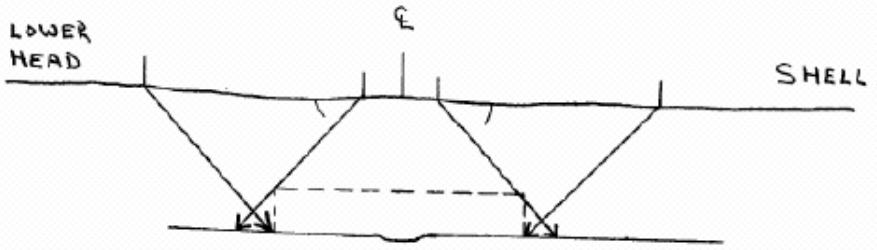


Raytheon
Engineers & Constructors

Page 6 of 8 Report No.: 99-002-1

45° CRV COVERAGE PLOT

COMPONENT NO.: 204/A02
RHR HEAT EXCHANGER "A"



Comments: SEE ATTACHED CRV CALCULATION SHEET FOR COVERAGE

Examiner / Level L-II Date 8-30-99
L-III 9-16-99
ANII 9-20-99 10-12-99

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Page 7 of 8 Report No.: 99-002-1

CRV CALCULATION SHEET

COMPONENT NO.: 204/A02
RHR HEAT EXCHANGER

133" TOTAL CIRCUMFERENTIAL MEASUREMENT
1.2" WELD CROWN WIDTH .25" BASE METAL EACH SIDE OF WELD

SCAN #1 ABOVE WELD AXIAL SCAN - LIMITATIONS OF 78.25" DUE TO SUPPORT LUGS AND NOZZLES, 78.25" ÷ 133" CIRC LENGTH = 59% RESTRICTED OR 41% COVERAGE ACHIEVED

SCAN #2 BELOW WELD AXIAL SCAN - LIMITATIONS OF 24.25" DUE TO SUPPORTS 24.25" ÷ 133" CIRC. LENGTH = 18.2% RESTRICTED OR 81.8% COVERAGE ACHIEVED

SCANS #3+4 CIRC SCANS C.W. AND C.C.W. - ABOVE WELD BASE METAL SCAN - LIMITATIONS OF 78.25" DUE TO SUPPORT LUGS AND NOZZLES 78.25" ÷ 133" = 58.8% RESTRICTED OR 41.2% COVERAGE ACHIEVED
WELD CROWN SCAN - LIMITATIONS OF 24.25" DUE TO SUPPORTS 24.25" ÷ 133" = 18.2% RESTRICTED OR 81.8% COVERAGE ACHIEVED
BELOW WELD CIRC SCAN ON BASE METAL - LIMITATION OF 24.25" DUE TO SUPPORTS 24.25" ÷ 133" = 18.2% RESTRICTED OR 81.8% COVERAGE ACHIEVED.

BREAKDOWN % OF SCANS 3 AND 4
.25" BASE METAL ABOVE WELD = 15% - 58.8% RESTRICTED = 6.2%
1.20" WELD CROWN WIDTH = 70% - 18.2% RESTRICTED = 57.3%
.25" BASE METAL BELOW WELD = 15% - 18.2% RESTRICTED = 12.3%
75.8%

75.8% COVERAGE ACHIEVED ON SCANS 3+4

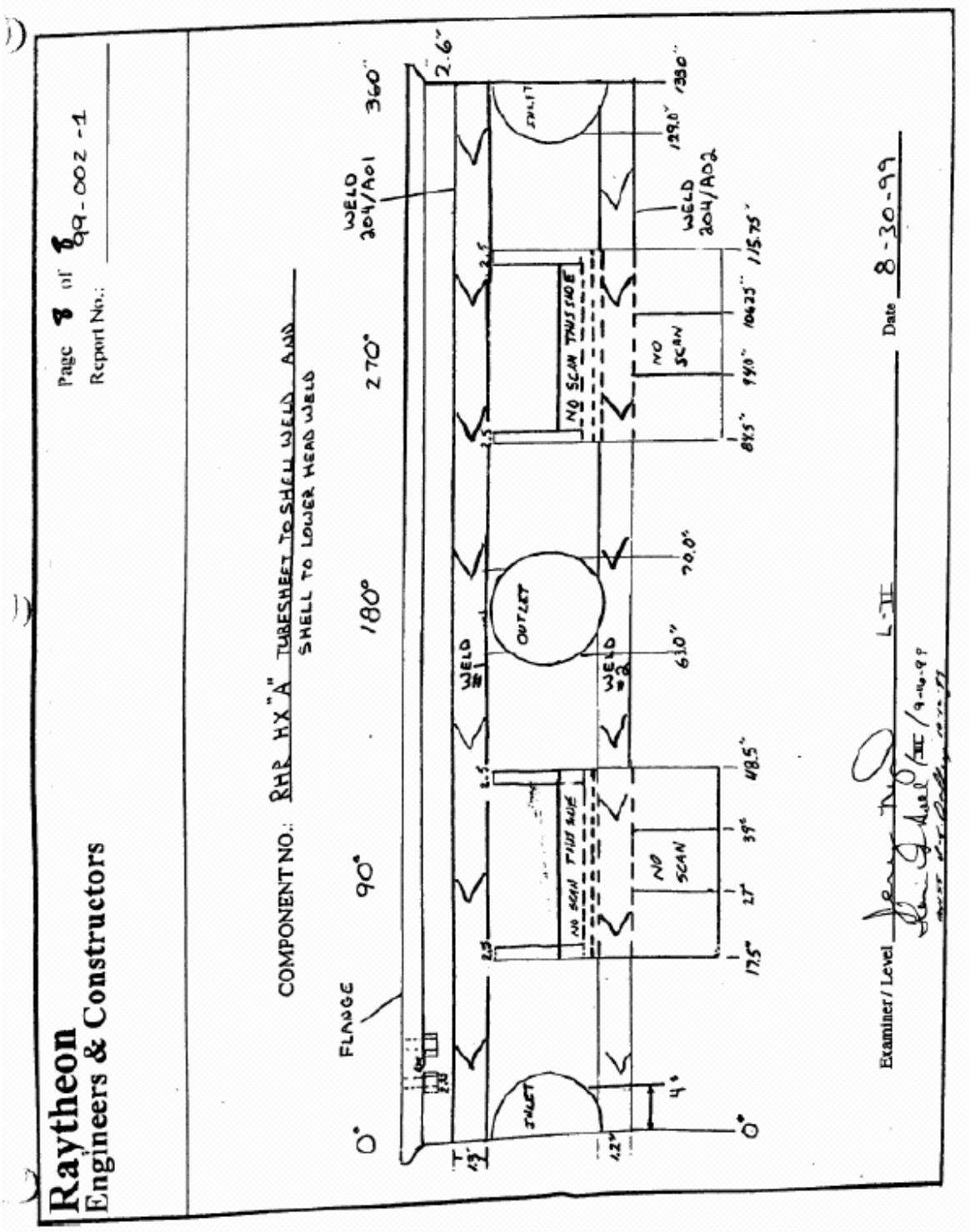
SCAN #1 - 41%
SCAN #2 - 80.4%
SCAN #3 - 75.8%
SCAN #4 - 75.8%
273 ÷ 4 = 68.3% ~~68.3%~~ CRV WAS ACHIEVED

UT LVL III 10/1/99

Examiner / Level L-III Date 8-30-99

9-16-99

10/12/99


Raytheon
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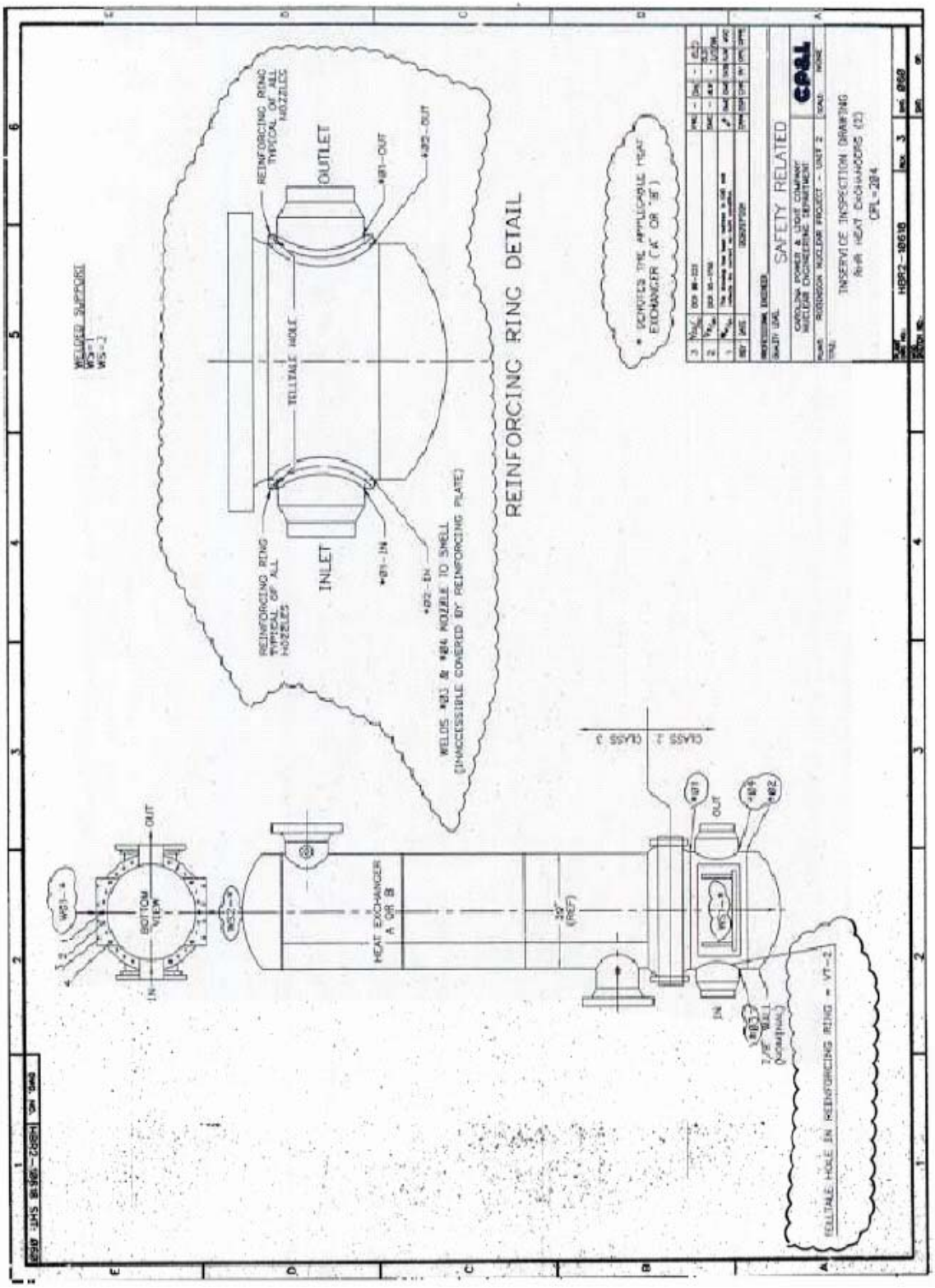
Page 1 of 1
Report No.: 99-002-1
COMPONENT NO.: RHR HX "A" TUBESHEET TO SHELL WELD AND SHELL TO LOWER HEAD WELD
FLANGE
0°
90°
180°
270°
360°
WELD 304/A01
WELD 304/A02
WELD #1
WELD #2
OUTLET
INLET
NO SCAN THIS SHOE
NO SCAN
2.6"
13"
4"
17.5"
39°
118.5"
61.0"
70.0°
84.5"
99.0"
104.25"
115.75"
129.0"
135.0"
Examiner / Level
Date 8-30-99


REINFORCING RING DETAIL
OUTLET
INLET
TELLTALE HOLE
REINFORCING RING TYPICAL OF ALL NOZZLES
#31-OUT
#32-OUT
#31-IN
#32-IN
WELDS #31 & #32 NOZZLE TO SHELL (INACCESSIBLE CONFIGD BY REINFORCING PLATE)
WELDED SUPPORT WS-1 WS-2
* DENOTES THE APPLICABLE HEAT EXCHANGER ('A' OR 'B')
SAFETY RELATED
CPSL
INSERVICE INSPECTION DRAWING
HEAT EXCHANGERS (2)
CPL-284
HB82-0010
HEAT EXCHANGER A OR B
BOTTOM VIEW
OUT
IN
#31
#32
#33
#34
CLASS 2
CLASS 3
TELLTALE HOLE IN REINFORCING RING - VT-2