



South Texas Project Electric Generating Station P.O. Box 289 Wadsworth, Texas 77483

September 23, 2021
NOC-AE-21003841
STI: 35216096
10 CFR 50.55a

Attention: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001


South Texas Project
Units 1 and 2
Docket Nos. STN 50-498 and STN 50-499
Request for Relief from ASME Section XI Code Requirements for
Weld Examinations (Relief Request RR-ENG-3-25)

Pursuant to 10 CFR 50.55a(g)(5)(iii), STP Nuclear Operating Company (STPNOC) hereby requests NRC approval of the following request for the third ten-year inspection interval: relief from American Society of Mechanical Engineers (ASME) Section XI requirements for weld examination on the basis of impracticality. ASME Section XI Tables IWB-2500-1 and IWC-2500-1 require inservice inspection of Class 1 and Class 2 component welds by nondestructive examination. 100% examination coverage of these welds during the third ten-year inspection interval was impractical because of component configuration and geometry, and because of the limitations of the examination equipment and techniques used to perform these examinations.

The attached discussion includes a list of the affected welds for which relief is requested, the amount of coverage obtained, and the basis and justification for their acceptability. STPNOC requests NRC review and approval of this request by September 23, 2022.

There are no commitments in this letter.

If there are any questions regarding this matter, please contact Zachary Dibbern at (361) 972-4336 or me at (361) 972-7806.


Christopher Georgeson
General Manager, Engineering

Enclosure: STP Electric Generating Station Units 1 and 2 ASME Section XI 10 CFR 50.55a
Request for Relief Number RR-ENG-3-25

cc:

(paper copy)

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Enclosure
STP Electric Generating Station Units 1 and 2 ASME Section XI
10 CFR 50.55a Request for Relief Number RR-ENG-3-25

Enclosure

South Texas Project Electric Generating Station Units 1 and 2 American Society of Mechanical Engineers (ASME) Section XI 10 CFR 50.55a Request for Relief Number RR-ENG-3-25

In Accordance with 10 CFR 50.55a(g)(5)(iii)

--Inservice Inspection Impracticality--

I. ASME Code Component(s) Affected

The South Texas Project Electric Generating Station (STPEGS), Units 1 and 2, Class 1 and 2 welds with limited examinations that are included in this request for relief are for the Third Ten-Year Inservice Inspection Interval. The content of this request includes the insights gained from guidance provided in References 1 and 2, and the following Code Classes, Examination Categories, and Item Numbers apply.

Code Classes: 1 and 2

Examination Categories: B-B, B-D, C-G, and R-A

Item Numbers: B2.12, B2.40, B3.110, C1.30, C6.10, R1.11. and R2.20

II. Applicable Code Edition and Addenda

The applicable ASME Boiler and Pressure Vessel Code of Record ("Code") edition and addenda was ASME Section XI, *Rules for Inservice Inspection of Nuclear Power Plant Components*, 2004 Edition (Reference 3), and was used for the Third 10-Year Inservice Inspection (ISI) Interval at STP as modified by 10 CFR 50.55a. The Appendix VIII requirements and use of the Performance Demonstration Initiative (PDI) requirements at STP were in accordance with the 2001 Edition of Section XI, Reference 4 for the limited examinations contained in this request as conditioned by 10 CFR 50.55a(b)(2)(xv) and 10 CFR 50.55a(b)(2)(xxiv).

The STP Third 10-Year ISI Interval ended on September 24, 2020 for Units 1 and 2¹; all the limited examinations contained in this request are required to be submitted to the NRC on or before 12 months after this date.

¹ Unit 2 was originally scheduled to end on October 18, 2020; however the interval was reduced by 24 days to align both units ISI Fourth Interval.

III. Applicable Code Requirements

Exam Cat.	Item No.	Class 1 Weld Examination Coverage Requirements
B-B	B2.12	To include essentially 100% of the examination volume of one foot of one of the Pressurizer Longitudinal Head Welds per head as depicted in the applicable figure shown in Figure IWB-2500-2.
B-B	B2.40	To include essentially 100% of the examination volume of the Tubesheet-To-Head Weld as depicted in applicable figure shown in Figure IWB-2500-6.
B-D	B3.110	To include essentially 100% of the examination volume of the Pressurizer Nozzle-to-Vessel Welds as depicted in the applicable figure shown in Figures IWB-2500-7(a), (b), (c), or (d)

Exam Cat.	Item No.	Class 2 Weld Examination Coverage Requirements
C-G	C6.10	To include the surface area of the weld as depicted in Figure IWC-2500-8.

Exam Cat.	Item No.	Class 1 and 2 Piping Welds / Risk-Informed Inservice Inspection Program Coverage Requirements
R-A	R1.11	To include essentially 100% of the examination location potentially subject to thermal fatigue.
R-A	R1.20	To include essentially 100% of the examination location not subject to a degradation mechanism.

As previously defined in 10 CFR 50.55a(g)(6)(ii)(A)(2), now removed, and ASME Code Case N-460, Reference 5, as approved in Regulatory Guide 1.147, Revision 19, Reference 6, this Code Case was invoked for the required coverage associated with the welds in this request and states that essentially 100% equates to more than 90% of the examination volume or required surface area of each weld where the reduction in coverage is due to interference by another component or part geometry.

Limited Class 1 Welds

Table IWB-2500-1, Examination Category B-B, "Pressure Retaining Welds in Vessels Other Than the Reactor Vessels – Inspection Program B, "Item Nos.:

B2.12 limitations applied to the Shell F Longitudinal Weld (Unit 2 PRZ-2-L6)

B2.40 limitations applied to the Channel Head-To-Tubeplate (Unit 1 RSG-1A-T1 and Unit 2 RSG-2A-T1)

Table IWB-2500-1, Examination Category B-D, “Full Penetration Welded Nozzles in Vessels - Inspection Program B,” Item No.:

B3.110 limitations applied to a pressurizer nozzle-to-vessel weld (Unit 2 PRZ-2-N3 Safety Nozzle to Head).

Limited Class 2 Welds

Table IWC-2500-1, Examination Category C-G “Pressure Retaining Welds in Pumps and Valves,” Item No:

C6.10, limitations applied to the Containment Spray Pump 2A, weld CIAPCS-2A-PCW1. The limitation was due to the accessibility through the concrete opening.

Limited Class 1 and 2 Piping Welds / Risk-Informed Inservice Inspection Programs

Class 1 and 2 piping welds selected for examination during the third interval under the Risk-Informed Inservice Inspection (RI-ISI) Programs used for STP were examined in accordance with Relief Request RR-ENG-3-4 (Reference 7) and included the piping welds selected for examination under Examination Category R-A. The use of this relief request for STP was based on EPRI Report TR-112657 Rev. B-A “Revised Risk-Informed Inservice Inspection Evaluation Procedure” Reference 8.

Additional Examination Volume Requirements per EPRI Report TR-112657 – The Section Titled “Examination Method” (4.1 “Thermal Fatigue”) states “In contrast to mechanical fatigue, thermal fatigue cracking usually initiates as many small cracks and then one of the cracks becomes predominant.” It has been most commonly observed at or near the pipe-to-nozzle weld where the wall thickness is thinner due to a counterbore or previous grinding on the inside surface. Figure 4-2 “Examination Volume for Thermal Fatigue Cracking in Piping Welds NPS 4 or Larger” specifies the length of the examination volume shall be enough distance [approximately ¼ in.] to include each side of the base metal thickness transition or counterbore transition.

IV. Reason for Request

10 CFR 50.55a(g)(5)(iii), states: *ISI program update: Notification of impractical ISI Code requirements.*

“If the licensee has determined that conformance with a Code requirement is impractical for its facility the licensee must notify the NRC and submit, as specified in § 50.4, information to support the determinations.

Determinations of impracticality in accordance with this section must be based on the demonstrated limitations experienced when attempting to comply with the Code requirements during the inservice inspection interval for which the request is being submitted. Requests for relief made in

accordance with this section must be submitted to the NRC no later than 12 months after the expiration of the initial or subsequent 120-month inspection interval for which relief is sought.”

Pursuant to 10 CFR 50.55a(g)(5)(iii) above, the required submittal of this request for relief is due before September 24, 2021 because STP has determined that compliance with the code requirements of achieving essentially 100% coverage of the welds listed in this request is impractical to achieve. This request is based on actual demonstrated limitations experienced when attempting to comply with the code requirements in the performance of the examinations listed in this request.

V. Impracticality of Compliance

The construction permits for STP Unit 1 and 2 were issued on December 22, 1975 and falls under the provisions of 10 CFR 50.55a(g)(2)(ii), which were applied to components that are classified as ASME BPV Code Class 1, Class 2, and Class 3 and supports for components that are classified as ASME BPV Code Class 1, Class 2, and Class 3 must be designed and provided with the access necessary to perform the required preservice and inservice examinations set forth in editions and addenda of Section III or Section XI of the ASME BPV Code incorporated by reference in paragraph (a)(1) of this section (or the optional ASME BPV Code Cases listed in NRC Regulatory Guide 1.147, as incorporated by reference in paragraph (a)(3)(ii) of this section) applied to the construction of the particular component. Therefore, although the design of the plants has provided access for examinations to the extent practical, component design configurations with conditions resulting in examination limitations such as those from support interference, geometric configurations of welds and materials such as fittings or valve bodies made of cast stainless steel may not allow the full required examination volume or surface area coverage with the latest techniques available and thus this request for relief addresses those conditions. A typical example of such a condition is a valve-to-pipe weld where essentially 100% of the code required volume cannot be examined from the valve side of the weld and where a plant modification would be needed to provide this coverage. Details of examination restrictions and reductions in required examination coverage are provided in Attachment 1.

When examined, the welds listed in Attachment 1 of this request did not receive the required code volume or surface area coverage due to their component design configurations or interference by other items. These conditions resulted in scanning or surface area access limitations that prohibited obtaining essentially 100% examination coverage of the required examination volumes or surface areas, but when this situation occurred 100% of the accessible volumes or surface areas of each weld was covered.

Burden Caused by Compliance

To comply with the code required examination volumes or surface areas for obtaining essentially 100% coverage for the welds listed in this request for relief, the welds and their

associated components would have to be physically modified and/or disassembled beyond their current design. Overall, components and fittings associated with the welds listed in this request are constructed of standard design items and materials meeting typical national standards that specify required configurations and dimensions. To replace these items with items of alternate configurations or materials to enhance examination coverage would require unique redesign and fabrication. Because these items are in the Class 1 and 2 boundaries and for the Class 1 items that form a part of the reactor coolant pressure boundary, their redesign and fabrication would be an extensive effort based on the limitations that exist.

For the Class 1, Examination Category B-B, Item No. B2.12, "Unit 2 Shell F Longitudinal Seam Weld" PRZ-2-L6, limitation was caused due to the permanent insulation support ring.

For the Class 1, Examination Category B-B, Item No. B2.40, "Unit 1 Channel Head to Tubeplate Weld" and "Unit 2 Channel Head to Tubeplate Weld" RSG-2A-T1, limitations were caused due to ring support.

For the Class 1, Examination Category B-D, Item No. B3.110, "Unit 2 Safety Nozzle to Shell Weld" PRZ-2-N3, limitation was caused by the configuration of the nozzle. The examination was performed from the vessel OD and the examination could not be performed from the vessel side. To obtain the required coverage for this weld would require a design modification.

For the Class 2 Examination Category C-G, Item No.: C6.10 "Containment Spray Pump 2A, Weld" CIAPCS-2A-PCW1, limitation was due to the accessibility through the concrete opening

For the Class 1 piping welds examined per the RI-ISI Programs, the limitations listed in this request are typically limited by their design configurations or materials. The configurations of these welds or their materials only allow UT examination coverage from one side of the weld or limited coverage from a specific area or areas of one side of the weld and thus they would also require a design modification or replacement to obtain the required examination coverage.

Overall, it is not possible to obtain UT interrogation of greater than 90% of the required code examination volume or surface areas for the welds in this request without extensive weld or component design modifications. Examinations have been performed to the maximum extent possible and radiography is impractical due to the amount of work being performed in the areas on a 24-hour basis when the welds are available for examination. Using radiography would result in numerous work-related stoppages and increased exposure due to the shutdown and startup of other work in the areas. The water may need to be drained from systems or components where radiography is performed, which increases the radiation dose rates over a much broader area than the weld being examined. There is significant impracticality associated with the performance of weld or area modifications or the use of radiography in order to increase the examination coverage.

VI. Proposed Alternative and Basis for Use

Proposed Alternative

- 1) Periodic system pressure tests and VT-2 visual examinations will continue to be performed in accordance with ASME Section XI, Examination Category B-P, for Class 1 pressure retaining welds and items each refueling outage and Examination Category C-H for Class 2 pressure retaining welds and items each inspection period of Table IWB-2500-1 and Table IWC-2500-1, respectively.
- 2) Conduct required PT, MT or UT examinations to the maximum extent possible as required by ASME Section XI or the RI-ISI Programs.

Basis for Use

10 CFR 50.55a(g)(4) recognizes that throughout the service life of a nuclear power facility, components which are classified as ASME Code Class 1, Class 2, and Class 3 must meet the requirements set forth in the ASME Code to the extent practical within the limitations of design, geometry and materials of construction of the welds and items described in Attachment 1. When a component is found to have conditions which limit the required examination volume or surface area, STP is required to submit this information to the enforcement and regulatory authorities having jurisdiction at the plant site. This request for relief has been written to address areas where these types of conditions exist and where the required amount of coverage was reduced below the minimum acceptable. STP has performed the weld examinations listed in this request to the maximum extent possible for each of the welds identified with limitations in Attachment 1.

The Class 1 Examination Categories B-B, Pressure Retaining Welds in Vessels Other Than Reactor Vessels and B-D, Full Penetration Welded Nozzles In Vessels and the Class 1 Risk-Informed Piping Welds within the scope of this request are all located inside the containment. Even though their examination did not meet the essentially 100% code required volume coverage requirement, there is instrumentation in place to assure that early detection of any Reactor Coolant System (RCS) pressure boundary leakage is identified. This is accomplished by the leakage detection instrumentation inside the containment where the RCS leakage detection instrumentation is controlled by the unit's Technical Specifications. These instruments are used to quantify any unidentified leakage from the RCS and to meet the STP Technical Specifications Surveillance Requirements that have a Limiting Condition for Operation (LCO) in 3/4.4.6.

EPRI Report TR-112657 Rev. B-A "Revised Risk-Informed Inservice Inspection Evaluation Procedure," Section 6.4 addresses relief requests pertaining to limited examination coverage. The following requirements are to be met:

1. An existing relief request is no longer required if the piping element is not a RI-ISI selection. Such relief requests shall be formally withdrawn by the licensee.

The welds included in this relief request do not have an existing relief request.

2. An existing relief request is unaffected if the piping element is a RI-ISI selection and the examination volume remains unchanged.

The welds included in the relief request do not have an existing relief request.

3. An existing relief request may require modification if the piping element is a RI-ISI selection and the examination volume has been expanded (e.g. thermal fatigue).

The welds included in the relief request do not have an existing relief request.

4. A new relief request will be generated for any RI-ISI piping element selection for which greater than 90 percent examination coverage is not achieved.

EPRI Report TR-112657 Rev. B-A states: "It should be noted that is an existing ASME Section XI inspection location is partially examined and continues to be partially examined in the RI-ISI process, the amount of risk addressed by examination remains the same for that location. If a new RI-ISI inspection location is only partially examined, but was not previously required to be examined by Section XI, then the amount of risk addressed by examination of that location is still increased. It is not necessarily true that because you reduce examination totals, that a complete examination must be performed at the RI-ISI selected locations to maintain risk neutrality or improvement in the program. The impact of partial examinations on the overall risk contribution may be assessed and included in the basis for relief."

Evaluation of RI-ISI Limited Examinations

STP has reviewed each instance of limited examination coverage and taken the appropriate steps consistent with its impact on the basis of the EPRI Report TR-112657 Rev. B-A on risk. Acceptance of limited examinations or volumes shall not invalidate the results of the change-in-risk evaluation. Areas with acceptable limited examination and their bases, shall be documented. The change in risk acceptance criteria is $1E-7/1E-8$ CDF/LERF at the system level and $1E-6/1E-7$ total CDF/LERF for all systems. The "With POD Credit" column is the official result that must meet these criteria. The values represent "delta risk", the calculated difference in CDF/LERF that STP incurs due to using a risk-informed ISI versus a conventional Section XI inspection scope. Therefore, the requirement is that the delta-risk is less than the acceptance criteria, meaning a positive number is ok if it is less than $1E-7$ (for example) and any negative number is ok.

Below is a summary of the cumulative effect of the limited examinations.

UNIT 1

This Request identifies three Unit 1 piping welds with limited examination coverage (90% or less). Welds (4-CV-1120-BB1, Weld 2, 8-RH-1106-KB2, Weld 13, and 8-RH-1107-BB2, Weld 1) are addressed below, by system.

- Chemical and Volume Control (CVC) (Weld 4-CV-1120-BB1, Weld 2)

To conservatively quantify the effect on delta risk for Weld 2, the delta risk is adjusted by not crediting this CVC weld with limited examination coverage. The below table provides the delta risk with Weld 2 credited and with Weld 2 not credited. The columns under heading “Examined” are the delta risk with the weld included, the columns under heading “Not Examined” is the adjusted delta risk after removing the weld. As can be seen, the change is negligible and well below the acceptable limits of 1E-07 for CDF and 1E-08 for LERF. Therefore, a limited examination of this CVC weld is acceptable.

	CDF Impact	LERF Impact	Source of Delta Risk
	w/ POD	w/ POD	
CVC	Examined		
	-8.94E-10	-8.94E-11	Latest interval periodic update required by EPRI Report 112657 Rev. B-A
	Not Examined		
	6.00E-12	6.00E-13	Adjusted delta risk using the periodic update delta risk

- Residual Heat Removal (RH) (Weld 8-RH-1106-KB2, Weld 13 and 8-RH-1107-BB2, Weld 1)

To conservatively quantify the effect on delta risk for the two RH welds, the delta risk is adjusted by not crediting the two RH welds with limited examination coverage. The below table provides the delta risk with the two RH welds credited and with the two RH welds not credited. The columns under heading “Examined” are the delta risk with the welds included, the columns under heading “Not Examined” is the adjusted delta risk after removing the welds. As can be seen, the change is negligible and well below the acceptable limits of 1E-07 for CDF and 1E-08 for LERF. Therefore, a limited examination of these RH welds are acceptable.

	CDF Impact	LERF Impact	Source of Delta Risk
	w/ POD	w/ POD	
RH	Examined		Latest interval periodic update required by EPRI Report 112657 Rev. B-A
	-6.52E-10	-6.52E-11	
	Not Examined		Adjusted delta risk using the periodic update delta risk
	2.45E-09	2.45E-10	

- Cumulative Effect to Delta Risk for the One CVC Weld and Two RH Welds

The impact of the limited examination on the delta risk for the individual system is addressed above. The cumulative effect on the total delta risk is provided below. The columns under heading “Examined” are the delta risk with the three welds included, the columns under heading “Not Examined” is the adjusted delta risk after removing the three welds. As can be seen, the change is negligible and well below the acceptable limits of 1E-06 for CDF and 1E-07 for LERF. Therefore, a limited examination of the one CV Weld and two RH Welds is acceptable.

	CDF Impact	LERF Impact	Source of Delta Risk
	w/ POD	w/ POD	
Total	Examined		Latest interval periodic update required by EPRI Report 112657 Rev. B-A
	-3.08E-06	-2.28E-09	
	Not Examined		Adjusted delta risk using the periodic update delta risk
	-3.07E-06	-1.85E-9	

UNIT 2

This Request identifies four Unit 2 piping welds with limited examination coverage (90% or less). Welds (4-CV-2120-BB1, Weld 2, 8-RH-2106-KB2, Weld 13, 8-RH-2107-BB2 Weld 1, and 4-RC-2422-BB1, Weld 24) are addressed below, by system.

- Chemical and Volume Control (CVC) (Weld 4-CV-2120-BB1, Weld 2)

To conservatively quantify the effect on delta risk for Weld 2, the delta risk is adjusted by not crediting this CVC weld with limited examination coverage. The below table provides the delta risk with Weld 2 credited and with Weld 2 not credited. The columns under heading “Examined” are the delta risk with the weld included, the columns under heading “Not Examined” is the adjusted delta risk after removing the weld. As can be seen, the change is negligible and well below the acceptable limits of 1E-07 for CDF and 1E-08 for LERF. Therefore, a limited examination of this CVC weld is acceptable.

	CDF Impact	LERF Impact	Source of Delta Risk
	w/ POD	w/ POD	
CVC	Examined		
	-8.94E-10	-8.94E-11	Latest interval periodic update required by EPRI Report 112657 Rev. B-A
	Not Examined		
	6.00E-12	6.00E-13	Adjusted delta risk using the periodic update delta risk

- Residual Heat Removal (RH) (Weld 8-RH-2106-KB2, Weld 13 and 8-RH-2107-BB2, Weld 1)

To conservatively quantify the effect on delta risk for the two RH welds, the delta risk is adjusted by not crediting the two RH welds with limited examination coverage. The below table provides the delta risk with the two RH welds credited and with the two RH welds not credited. The columns under heading “Examined” are the delta risk with the welds included, the columns under heading “Not Examined” is the adjusted delta risk after removing the welds. As can be seen, the change is negligible and well below the acceptable limits of 1E-07 for CDF and 1E-08 for LERF. Therefore, a limited examination of these RH welds are acceptable.

	CDF Impact	LERF Impact	Source of Delta Risk
	w/ POD	w/ POD	
RH	Examined		
	6.52E-10	6.52E-11	Latest interval periodic update required by EPRI Report 112657 Rev. B-A
	Not Examined		
	2.45E-9	2.45E-10	Adjusted delta risk using the periodic update delta risk

- Reactor Coolant (RC) (Weld 4-RC-2422-BB1, Weld 24)

To conservatively quantify the effect on delta risk for Weld 24, the delta risk is adjusted by not crediting this RC weld with limited examination coverage. The below table provides the delta risk with Weld 24 credited and with Weld 24 not credited. The columns under heading “Examined” are the delta risk with the weld included, the columns under heading “Not Examined” is the adjusted delta risk after removing the weld. As can be seen, the change is negligible and well below the acceptable limits of 1E-07 for CDF and 1E-08 for LERF. Therefore, a limited examination of this CVC weld is acceptable.

	CDF Impact	LERF Impact	Source of Delta Risk
	w/ POD	w/ POD	
RC	Examined		
	-3.07E-06	-1.62E-09	Latest interval periodic update required by EPRI Report 112657 Rev. B-A
	Not Examined		
	-3.06E-06	-1.62E-09	Adjusted delta risk using the periodic update delta risk

- Cumulative Effect to Delta Risk for the One CVC Weld, Two RH Welds, and One RC weld.

The impact of the limited examination on the delta risk for the individual system is addressed above. The cumulative effect on the total delta risk is provided below. The columns under heading “Examined” are the delta risk with the four welds included, the columns under heading “Not Examined” is the adjusted delta risk after removing the four welds. As can be seen, the change is negligible and well below the acceptable limits of 1E-06 for CDF and 1E-07 for LERF. Therefore, a limited examination of the one CVC Weld, two RH Welds and one RC Weld is acceptable.

	CDF Impact	LERF Impact	Source of Delta Risk
	w/ POD	w/ POD	
Total	Examined		
	-3.08E-06	-2.28E-09	Latest interval periodic update required by EPRI Report 112657 Rev. B-A
	Not Examined		
	-3.06E-06	-1.85E-09	Adjusted delta risk using the periodic update delta risk

VII. Duration of Proposed Alternative

This request for relief is for the STP, Units 1 and 2, Third 10-Year ISI Intervals, which began on September 25, 2010 for Unit 1 and October 19, 2010 for Unit 2. Both Units Third 10-Year ISI Intervals ended on September 24, 2020.

VIII. Precedents

Note: Industry requests for relief due to impracticality associated with limited weld examinations are common and are filed by all licensees. Some of the more recent NRC approvals of requested relief that are aligned with Reference 1 are:

- (1) Millstone Power Station, Unit No. 2 – Relief Requests for Limited Coverage Examinations Performed in the Fourth 10-Year Inservice Inspection Interval (EPID L-2020-LLR-0024, EPID L-2020-LLR-0025, and EPID L-2020-LLR-0026) (Accession No. ML20312A001) dated December 10, 2020.
- (2) Millstone Power Station, Unit No. 3 – Relief Request for Limited Coverage Examinations Performed in the Third 10-Year Inservice Inspection Interval (EPID L-202-LLR-0027 through EPID L-202-LLR-0032) (Accession No. ML20312A002) dated December 10, 2020.
- (3) Perry Nuclear Power Plant, Unit No. 1 – Relief Request IR-062 Regarding Weld Examination Coverage for the Third Inservice Inspection Interval (EPID L-2020-LLR-0067) (Accession No. ML20252A026) dated September 18, 2020.
- (4) Nine Mile Point Nuclear Station, Unit 2 – Relief from the Requirements of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (EPID-L-2019-LLR-0099) (Accession No. ML2014141L053) dated June 2, 2020
- (5) Beaver Valley Power Station, Unit 2 – Relief Request 2-TYP-3-B3.110-1, 2-TYP-3-C2.21-1, 2-TYP-3-C1.30-1, and 2-TYP-3-RA-1 Regarding Weld Examination Coverage for the Third Inservice Inspection Interval (EPID L-2019-LLR-0082) (Accession No. ML20080J78)
- (6) Peach Bottom Atomic Power Station, Units 2 and 3 – Issuance of Relief Request RE: Limited Examination Coverage During Fourth 10-Year Inservice Inspection Interval (EPID L-2019-LLR-0103) (Accession No. ML20097D644) dated April 14, 2020.
- (7) Beaver Valley Power Station, Unit No. 1 – Relief Requests 1-TYP-4-C2.21-1 and 1-TYP-4-RA-1 Regarding Weld Examination Coverage for the Fourth Inservice Inspection Interval (EPID L-2019-LLR-0083) (Accession No. ML20079F816) dated March 26, 2020.

IX References

1. NRC presentation “Coverage Relief Requests”, Industry/NRC NDE Technical Information Exchange Public Meeting January 13-15, 2015, [ADAMS Accession No.: ML15013A266].
2. NRC presentation “Coverage Relief Request Update”, 2020 Industry/NRC NDE Technical Information Exchange Public Meeting. [ADAMS Accession No.: ML20009E155)
3. ASME Section XI, *Rules for Inservice Inspection of Nuclear Power Plant Components*, 2004 Edition.
4. ASME Section XI, *Rules for Inservice Inspection of Nuclear Power Plant Components*, Appendix VIII, Performance Demonstration for Ultrasonic Examination Systems, 2001 Edition.

5. ASME Code Case N-460, Alternative Examination Coverage for Class 1 and Class 2 Welds Section XI, Division 1.
6. NRC Regulatory Guide 1.147, Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1, Revision 19, Dated October 2019. [ADAMS Accession No.: ML19128A244]
7. Relief Request RR-ENG-3-4 "Request for Relief to apply an alternative to the ASME Section XI Code Requirements for Examination of Class 1 and Class 2 Piping Welds"
8. EPRI Report TR-112657 Rev. B-A "Revised Risk-Informed Inservice Inspection Evaluation Procedure"

Attachment 1

South Texas Project Electric Generating Station Units 1 and 2 American Society of Mechanical Engineers (ASME) Section XI 10 CFR 50.55a Request for Relief Number RR-ENG-3-25

In Accordance with 10 CFR 50.55a(g)(5)(iii)

--Inservice Inspection Impracticality--

Introduction

This attachment contains figures and tables as applicable that are used to depict the limitations and calculations used for obtained coverage, materials and product forms, with ultrasonic examination angles and wave modes used, any limited surface examinations and the examination results for the welds associated with this request for relief, including any applicable previous examination history used. The following Table 1 for STP identifies the welds within the scope of this request and summarizes the extent of examination coverage achieved for each weld.

Many of the welds listed were examined with different STP approved procedures and techniques during the span of the Third 10-Year ISI Interval and therefore not all the coverage calculations used are identical, but they are based on the actual NDE data reports that were provided for the examinations completed.

Table 1 – STP Units 1 and 2 Welds with Limitations, 3rd Interval

Unit No./ Weld Identification Number/ Seq. Number	Class, Category and Item No.	Weld Description	Material 1 and Product Form	Material 2 and Product Form	Examination Code Coverage Obtained²	Examination Limitations and Results	Normal Operating Conditions (Pressure/Temperature)	Applicable Tables and Figures
Unit 1 RSG-1A-T1 1.1	1 B-B B2.40	Steam Generator Channel Head-to- Tubeplate Weld	SA-508 Class 3a with SS Clad	SA-508 Class 3a with SS Clad	75.3%	Limitation due to ring support	2250psi/625°F	Figures 1.1-1, 1.1-2, 1.1-3, 1.1-4, 1.1-5, and 1.1-6
Unit 1 4-CV-1120- BB1 Weld 2 1.2	1 R-A R1.11	Chemical Volume and Control Pipe to Valve Weld	SA-376	SA-182 Type F316 or SA-351 Gr. CF8 or CF8M	50% single sided examination	Limitation due to Valve Configuration	2300psi/530°F	Table 1.2-1, Figures 1.2-1, and 1.2-2
Unit 1 8-RH-1106- KB2 Weld 13 1.3	2 R-A R1.11	Residual Heat Removal Pipe to Valve Weld	SA-376	SA-182 Type F316	37.5% single sided examination	Limitation due to Valve Configuration	411psi/296°F	Figures 1.3-1, 1.3-2, 1.3-3, 1.3-4, 1.3-5, and 1.3-6
Unit 1 8-RH-1107- BB2 Weld 1 1.4	2 R-A R1.11	Residual Heat Removal Valve to Pipe Weld	SA-182 Type F316	SA-376	37.5% single sided examination	Limitation due to Valve Configuration	367psi/296°F	Figures 1.4-1, 1.4-2, 1.4-3, 1.4-4, 1.4-5, and 1.4-6
Unit 2 PRZ-2-N3 2.1	1 B-D B3.110	Pressurizer Relief Nozzle to Shell Weld	SA-508 Class 2A	SA-533 Gr. A Class 2	73.63%	Limitation due to nozzle weld configuration	2250psi/653°F	Table 2.1-1, Figures 2.1-1 and 2.1-2
Unit 2 PRZ-2-L6 2.2	1 B-B B2.12	Pressurizer Shell F Longitudinal Seam Weld	SA-533 Gr. A Class 2	SA-533 Gr. A Class 2	85%	Limitation due to permanent insulation support ring	2250psi/653°F	Table 2.2-1, Figures 2.2-1, 2.2-2, 2.2-3, and 2.2-4
Unit 2 RSG-2A-T1 2.3	1 B-B B2.40	Steam Generator Channel Head-to- Tubeplate Weld	SA-508 Class 3a with SS Clad	SA-508 Class 3a with SS Clad	88%	Limitation due to ring support	2250psi/625°F	Figures 2.3-1, 2.3-2, 2.3-3, 2.3-4, 2.3-5, and 2.3-6

Table 1 – STP Units 1 and 2 Welds with Limitations, 3rd Interval

Unit No./ Weld Identification Number/ Seq. Number	Class, Category and Item No.	Weld Description	Material 1 and Product Form	Material 2 and Product Form	Examination Code Coverage Obtained ²	Examination Limitations and Results	Normal Operating Conditions (Pressure/Temperature)	Applicable Tables and Figures
Unit 2 4-CV-2120- BB1 Weld 2 2.4	1 R-A R1.11	Chemical Volume and Control Pipe to Valve Weld	SA-376 Gr. TP304	SA-182 Type F316 or SA-351 Gr. CF8 or CF8M	50% single sided examination	Limitation due to valve configuration	2300psi/530°F	Table 2.4-1, Figures 2.4-1 and 2.4-2
Unit 2 8-RH-2106- KB2 Weld 13 2.5	2 R-A R1.11	Residual Heat Removal Pipe to Valve Weld	SA-376 Gr. TP304	SA-182 Type F316 or SA-351 Gr. CF8 or CF8M	69% single sided examination	Limitation due to valve configuration	411psi/296°F	Table 2.5-1, Figures 2.5-1 and 2.5-2
Unit 2 8-RH-2107- BB2 Weld 1 2.6	2 R-A R1.11	Residual Heat Removal Valve to Pipe Weld	SA-182 Type F316 or SA-351 Gr. CF8 or CF8M	SA-376 Gr. TP304	69.3% single sided examination	Limitation due to valve configuration	367psi/296°F	Table 2.6-1, Figures 2.6-1 and 2.6-2
Unit 2 4-RC-2422 Weld 24 2.7	1 R-A R1.20	Reactor Coolant Pipe to Valve Weld	SA-376 Gr. TP304	SA-182 Type F316	50% single sided examination	Limitation due to valve configuration	2318psi/563°F	Table 2.7-1, Figures 2.7-1 and 2.7-2
Unit 2 CIAPCS-2A- PCW1 2.8	2 C-G C6.10	Containment Spray Pump Flange to Upper Case Weld	SA-182 Gr. F304	SA-182 Gr. F304	51.2%	Limitation due to concrete opening	42psi/262°F	Table 2.8-1, Figures 2.8-1, 2.8-2, and 2.8-3

1.1 Weld RSG-1A-T1, "Steam Generator Channel Head-to-Tubeplate"

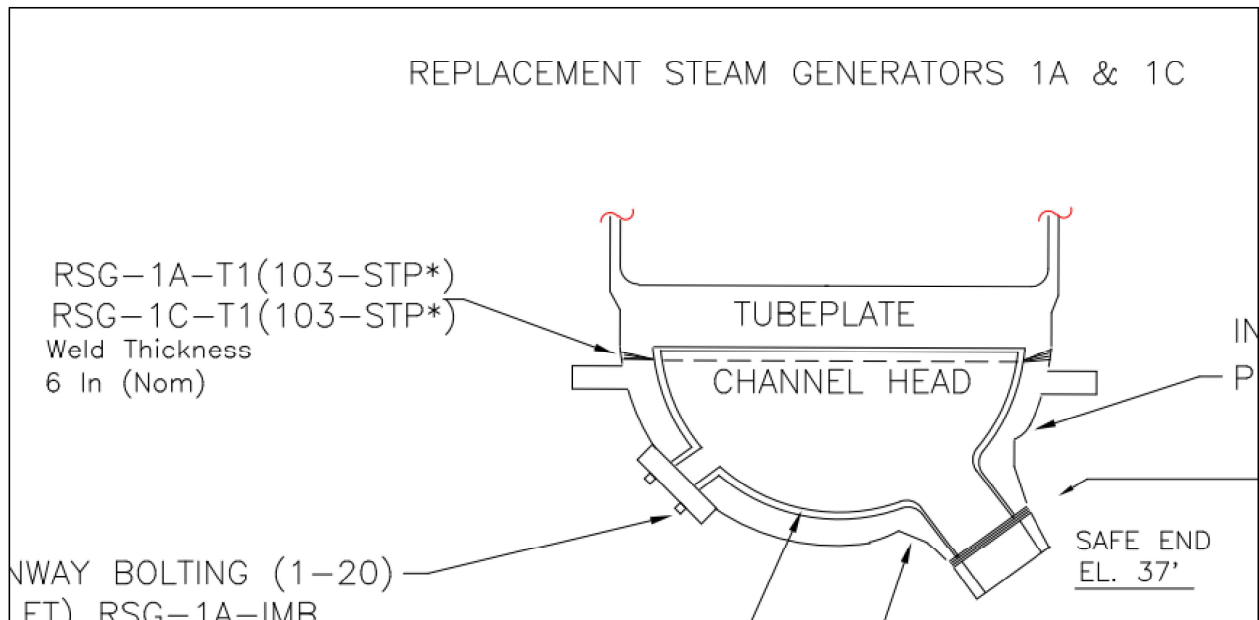
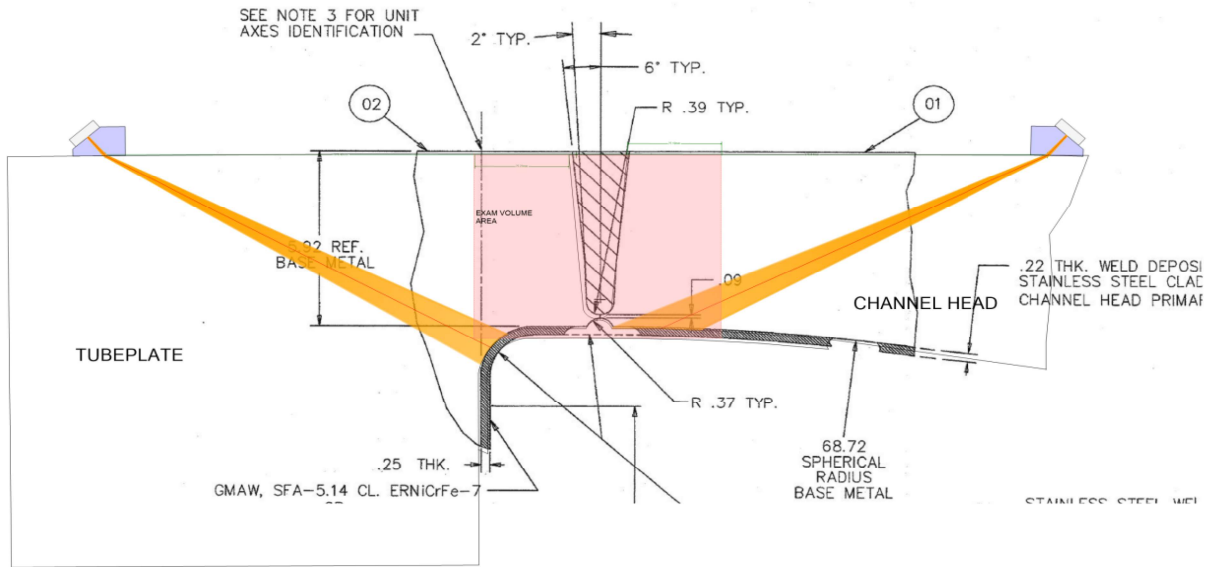


Figure 1.1-1 RSG-1A-T1 (Extracted from Reference DWG A-RSG-1R0)

This weld was UT examined in Inspection Period 3, during the 1RE21 refueling outage in 2018. The NDE data came from UT Report No.: UT-2018-095/096/097. The UT Code Required Volume (CRV) was determined based on ASME Section XI, Figure IWB-2500-6. The corresponding CRV as shown on that Figure is E-F-G-H. This volume was examined with 45°S and 60°S wave transducers. The UT examination was limited by the permanent insulation support ring resulting in total UT coverage of **75.3%** as described in Figures 1.1-2, 1.1-3, 1.1-4, 1.1-5, and 1.1-6. No recordable indications were detected during this scan.

Section V, Article 4 was used for this examination.



Note: Unit 1 CHANNEL HEAD TO TUBEPLATE weld RSG-1A-T1 Summary # 015920 Exam limitation. Total length weld inspected was 470.20" where 116" of examination area not inspected due to interference of insulation support. Support obstructed travel path on 45DEG and 60DEG transducers

354.06" / 470" x 100% = 75.3% EXAM COVERAGE

Piece

Length	Material	Shear Velocity	Compression Velocity
11938mm	Steel 1020	3.24mm/μs	5.89mm/μs

HAZ: 25% HAZ Width: 5mm

Conventional Probe: UT Probe

Index Offset: 376.84mm Scan Offset: 0mm Beam Angle: 61.25° Shear

Figure 1.1-2 RSG-1A-T1 Scan Coverage and Scan Summary

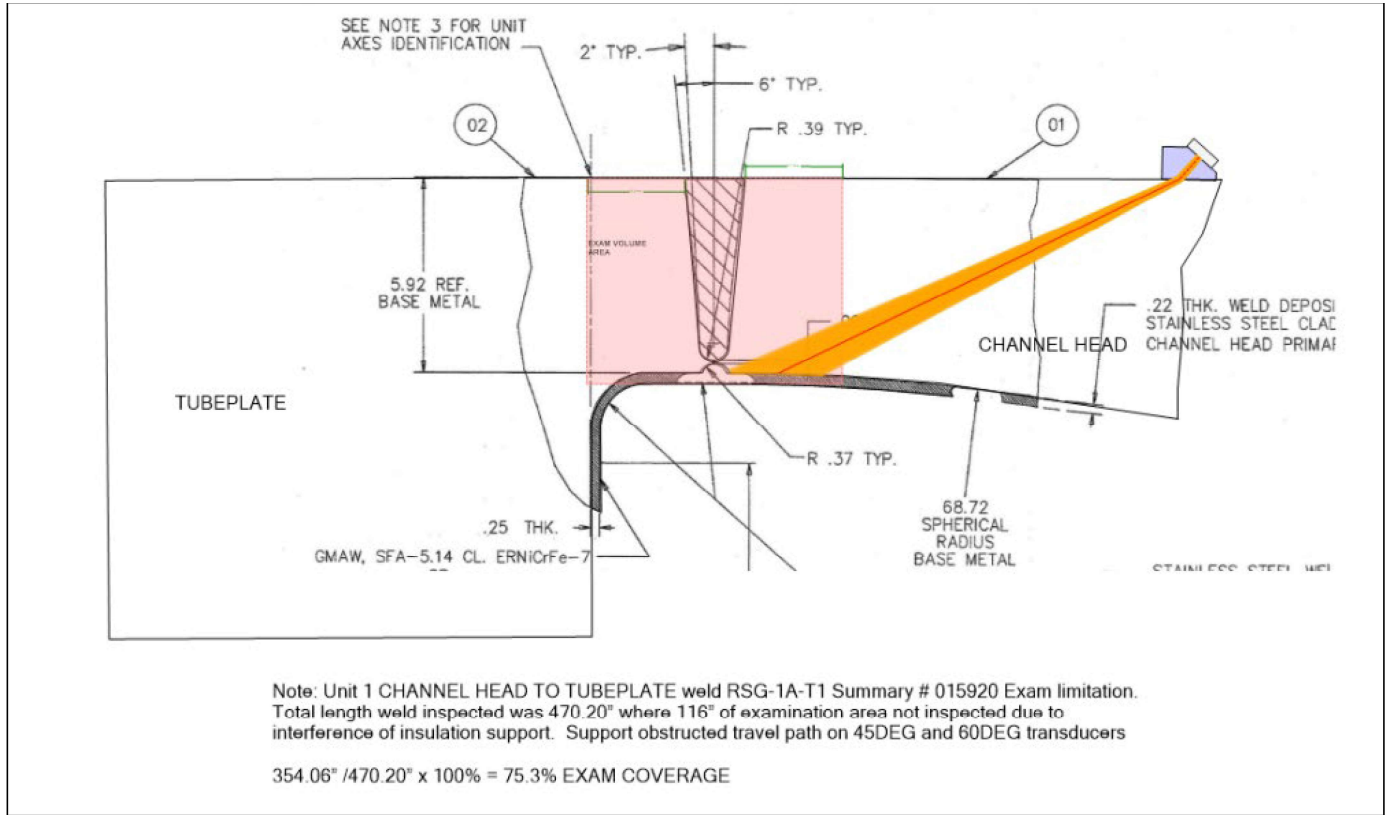


Figure 1.1-3 RSG-1A-T1 Examination Location and Coverage Map

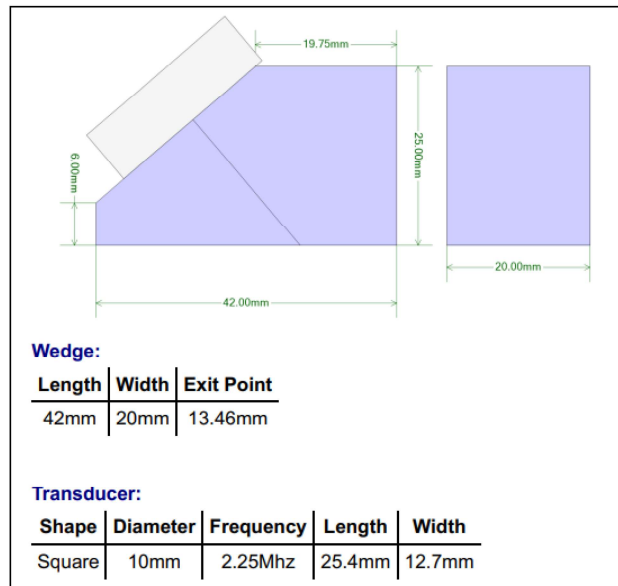


Figure 1.1-4 RSG-1A-T1 Examination Location and Coverage Map

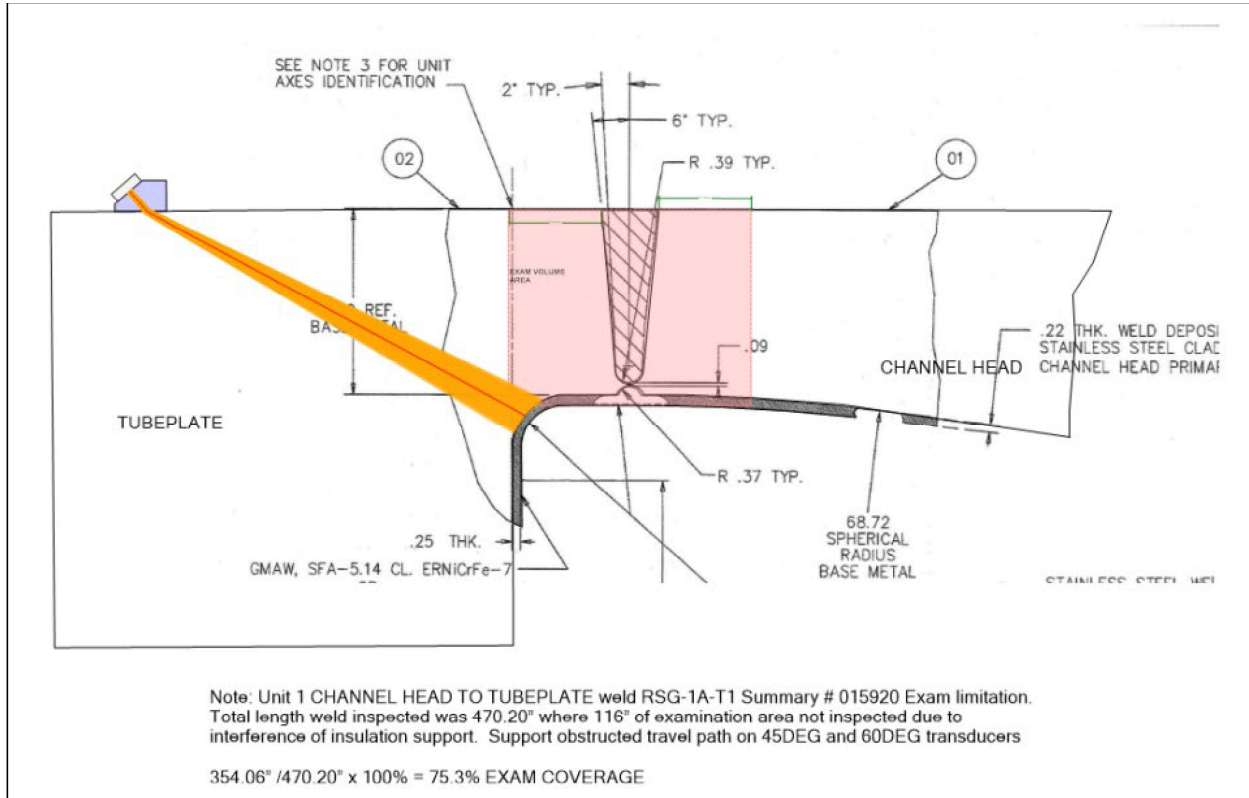


Figure 1.1-5 RSG-1A-T1 Examination Location and Coverage Map

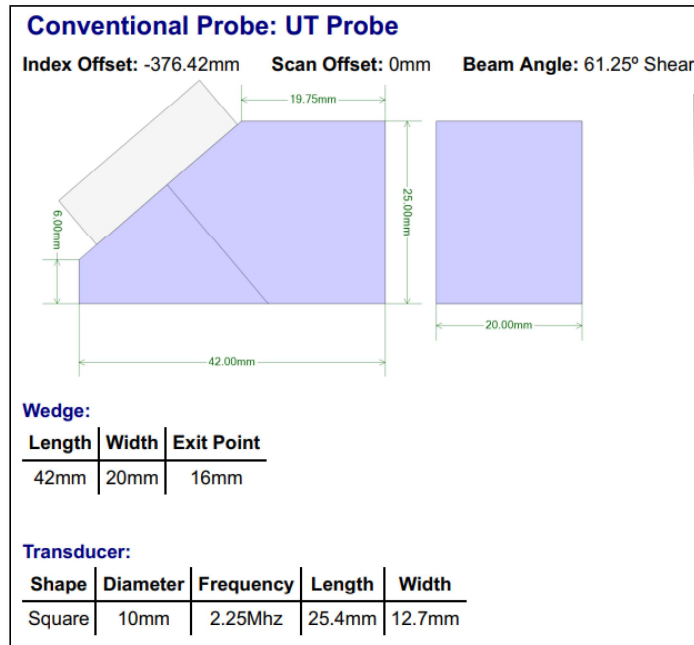


Figure 1.1-6 RSG-1A-T1 Examination Location and Coverage Map

1.2 Weld 4-CV-1120-BB1, Weld 2 “Chemical Volume and Control Pipe to Valve Weld”

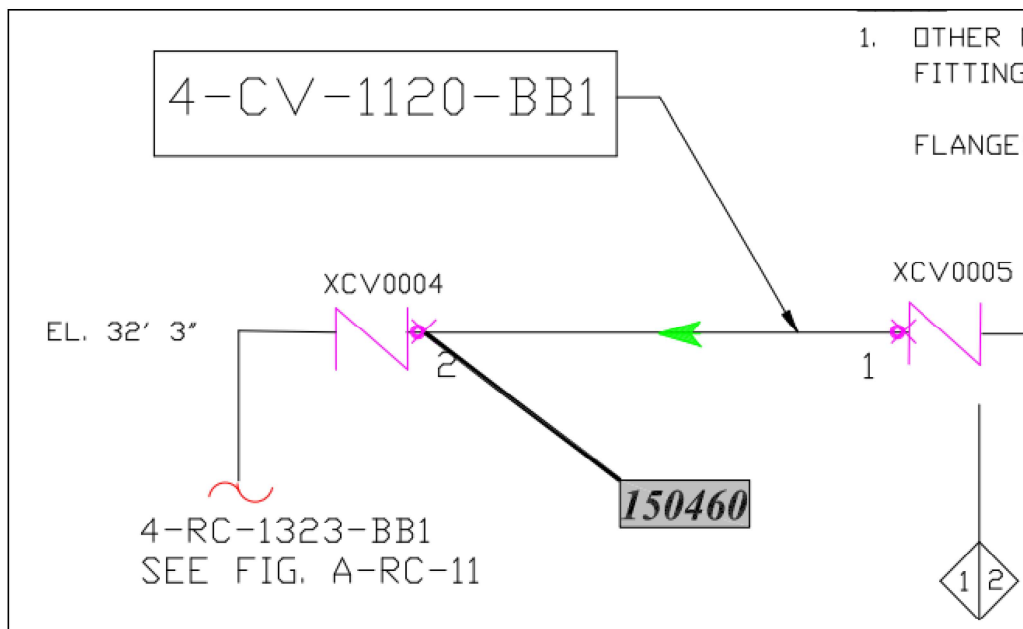


Figure 1.2-1 4-CV-1120-BB1, Weld 2 (Extracted from Reference DWG A-CV-2)

This weld was UT examined in Inspection Period 1, during the 1RE17 refueling outage in 2012. The NDE data came from UT Report No.: UT-2012-071. The UT Code Required Volume (CRV) was determined based on EPRI TR-112657, Figure 4-2 “Examination Volume for Thermal Fatigue Cracking in Piping Welds NPS 4 or Larger.” The corresponding CRV as shown on that Figure is A-B-C-D. This volume was examined with 45°S and 60°RL wave transducers. The UT examination was limited by the valve configuration resulting in total UT coverage of **50%** as described in Table 1.2-1 combined with Figure 1.2-2. No recordable indications were detected during this scan.

Section XI Appendices and Supplements used for this UT examination were Appendix VIII, Supplement 2.

ISI EXAMINATION COVERAGE		
NDE Record #	UT-2012-07 <i>do/28/13</i>	Summary # 150460
Examination Method/Type: UT EXAMINATION		
Description Of Limitation: EXAN LIMITATION DUE TO PIPE TO VALVE CONFIGURATION. EXAMINED FROM PIPE SIDE ONLY.		
Exam (Weld) Thickness (T): .61	Exam (Weld) With (W): .8	Exam (Weld) Length (L): 14.8
Examination Volume (EV): .23 X.14.8 X 1.8 = 6.13 EXAM VOLUME 23 X.14.8 X .9 = 3.06 AREA OF LIMITATION		
Examination Coverage (EC): 50% COVERAGE HAS BEEN OBTAINED See profile ATTACHED		
% Examination Coverage (% EC): 50%		

Table 1.2-1 4-CV-1120-BB1, Weld 2 Scan Coverage and Scan Summary

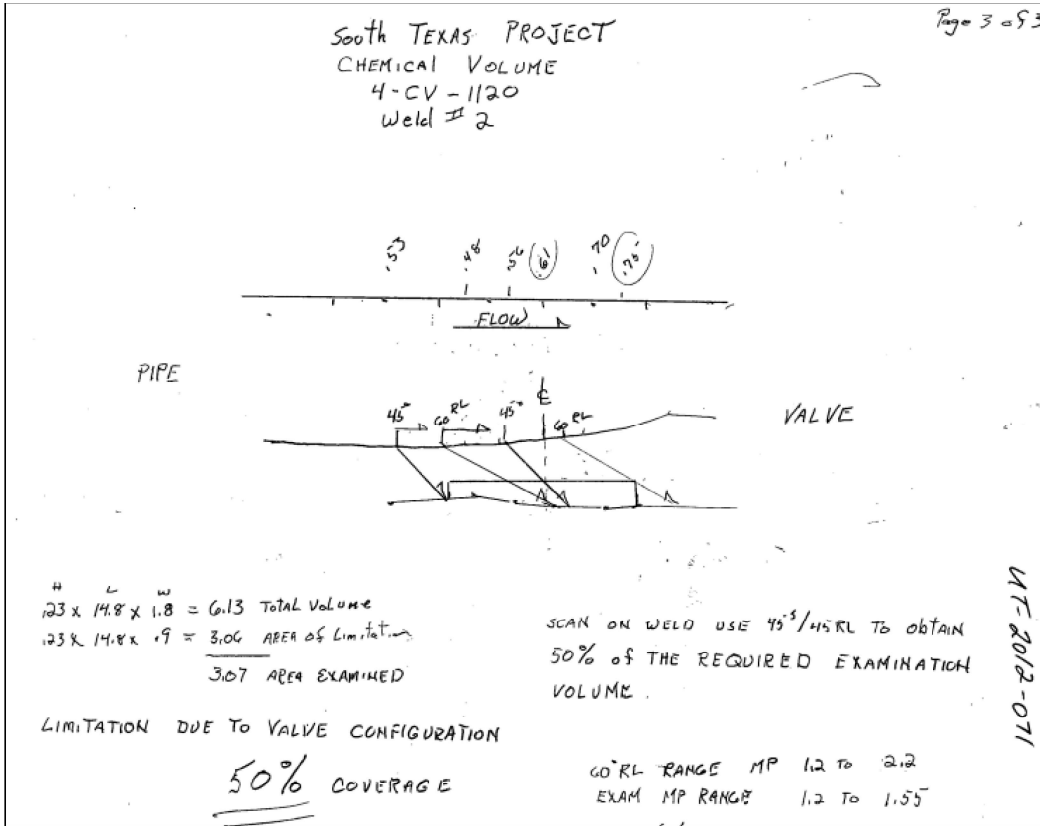


Figure 1.2-2 4-CV-1120-BB1, Weld 2 Examination Location and Coverage Map

1.3 Weld 8-RH-1006-KB2, Weld 13 “Residual Heat Removal Pipe to Valve Weld”

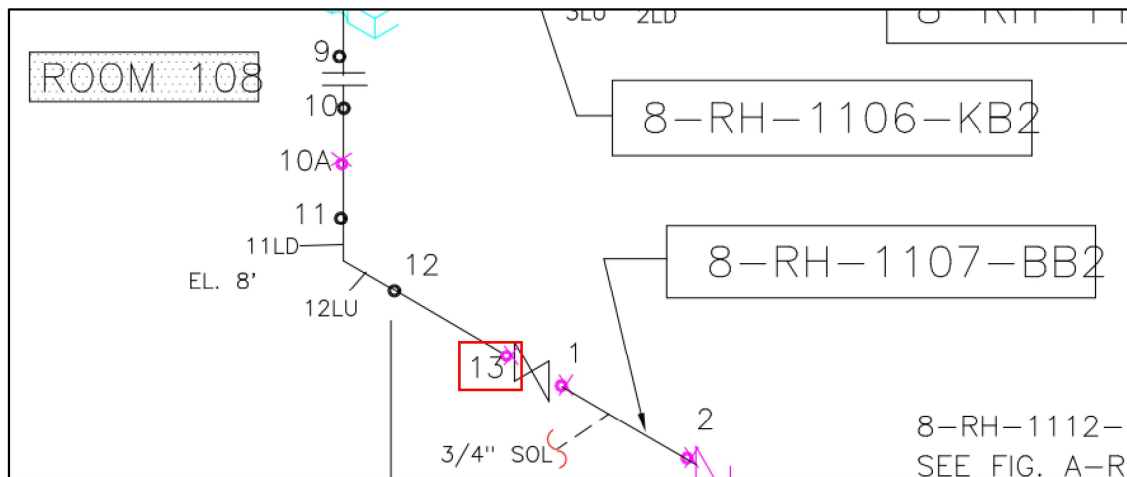


Figure 1.3-1 8-RH-1006-KB2, Weld 13 (Extracted from Reference DWG B-RH-7)

This weld was UT examined in Inspection Period 3, during the 1RE22 refueling outage in 2020. The NDE data came from UT Report No.: UT-2020-026. The UT Code Required Volume (CRV) was determined based on EPRI TR-112657, Figure 4-2 “Examination Volume for Thermal Fatigue Cracking in Piping Welds NPS 4 or Larger.” The corresponding CRV as shown on that Figure is A-B-C-D. This volume was examined with 45°S and 70°RL wave transducers. The UT examination was limited by the valve configuration resulting in total UT coverage of **37.5%** as described in Figures 1.3-2, 1.3-3, 1.3-4, 1.3-5 and 1.3-6. No recordable indications were detected during this scan.

Section XI Appendices and Supplements used for this UT examination were Appendix VIII, Supplement 2.

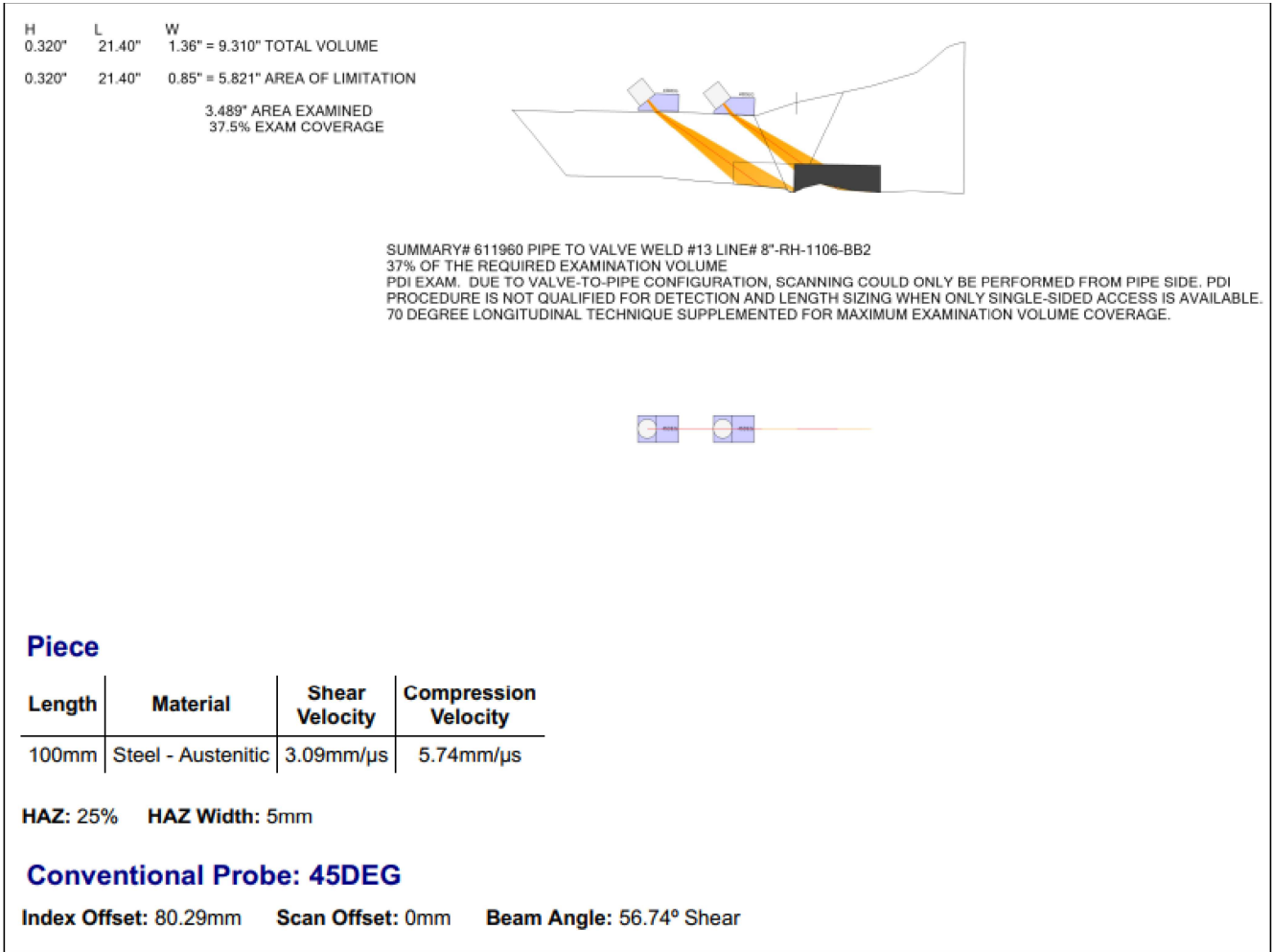


Figure 1.3-2 8-RH-1006-KB2, Weld 13 Scan Coverage and Scan Summary

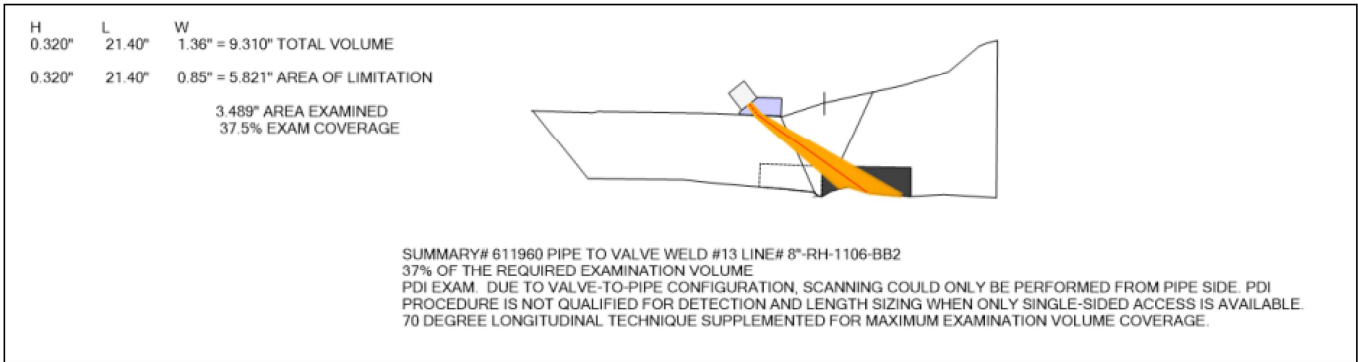


Figure 1.3-3 8-RH-1006-KB2, Weld 13 Examination Location and Coverage Map

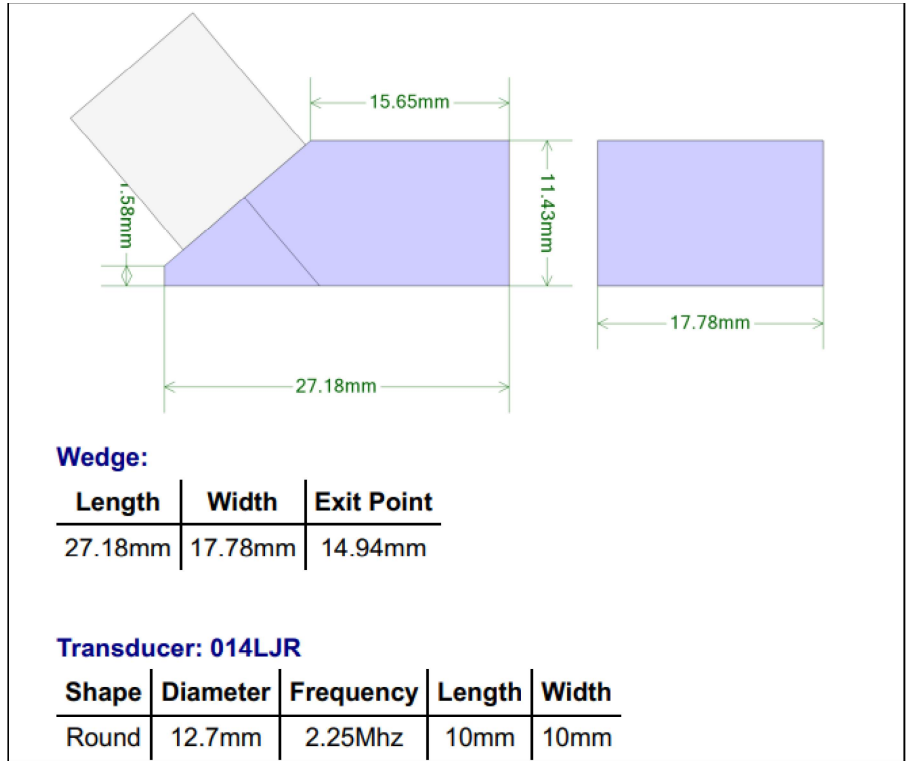


Figure 1.3-4 8-RH-1006-KB2, Weld 13 Examination Location and Coverage Map

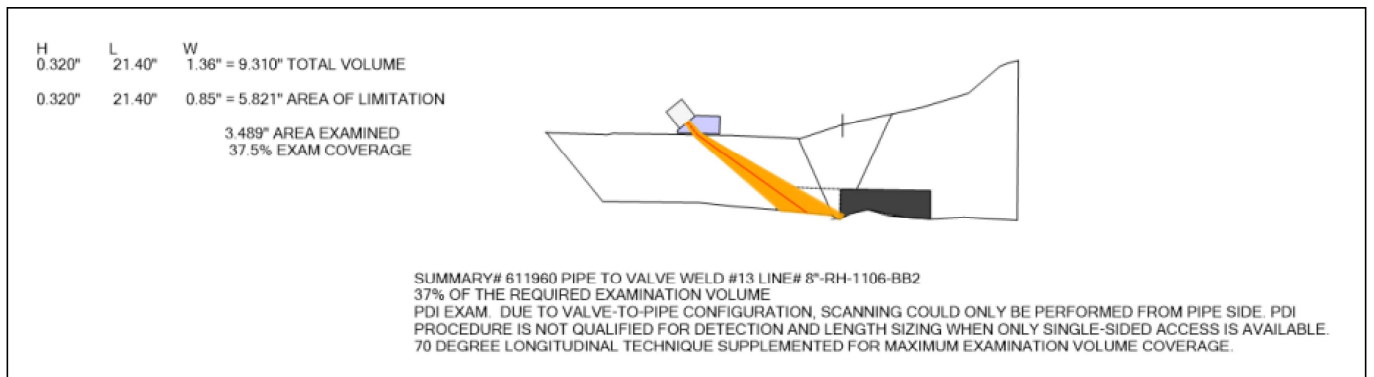


Figure 1.3-5 8-RH-1006-KB2, Weld 13 Examination Location and Coverage Map

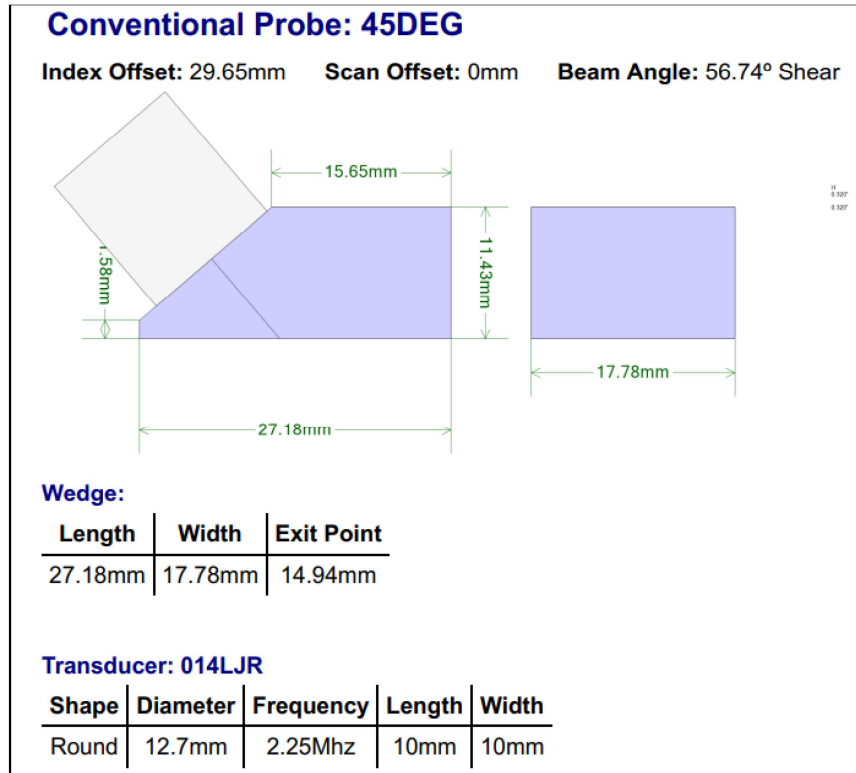


Figure 1.3-6 8-RH-1006-KB2, Weld 13 Examination Location and Coverage Map

1.4 **Weld 8-RH-1107-BB2, Weld 1 “Residual Heat Removal Valve to Pipe Weld”**

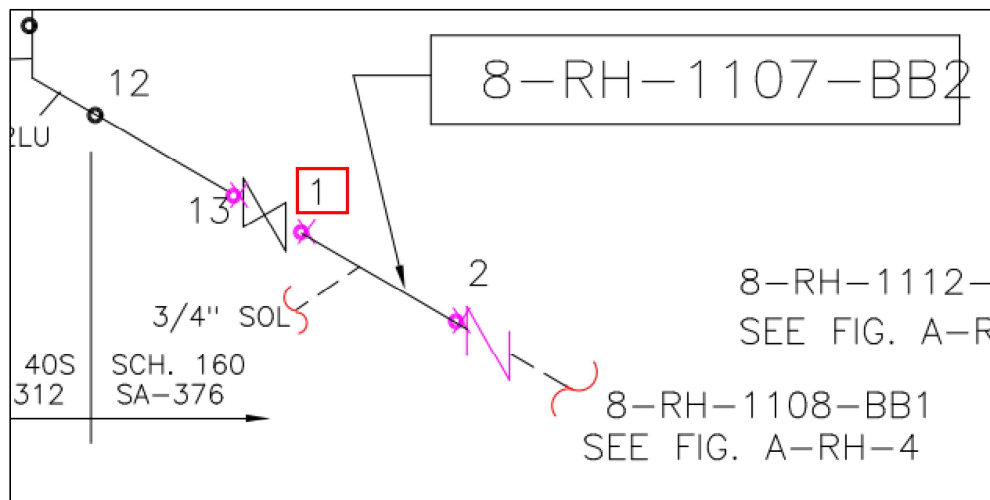


Figure 1.4-1 8-RH-1007-BB2, Weld 1 (Extracted from Reference DWG B-RH-7)

This weld was UT examined in Inspection Period 3, during the 1RE22 refueling outage in 2020. The NDE data came from UT Report No.: UT-2020-027. The UT Code Required Volume (CRV) was determined based on EPRI TR-112657, Figure 4-2 “Examination Volume for Thermal Fatigue Cracking in Piping Welds NPS 4 or Larger.” The corresponding CRV as shown on that Figure is A-B-C-D. This volume was examined with 45°S and 70°RL wave transducers. The UT examination was limited by the valve configuration resulting in total UT coverage of **37.5%** as described in Figures 1.4-2, 1.4-3, 1.4-4, 1.4-5, and 1.4-6. No recordable indications were detected during this scan.

Section XI Appendices and Supplements used for this UT examination were Appendix VIII, Supplement 2.

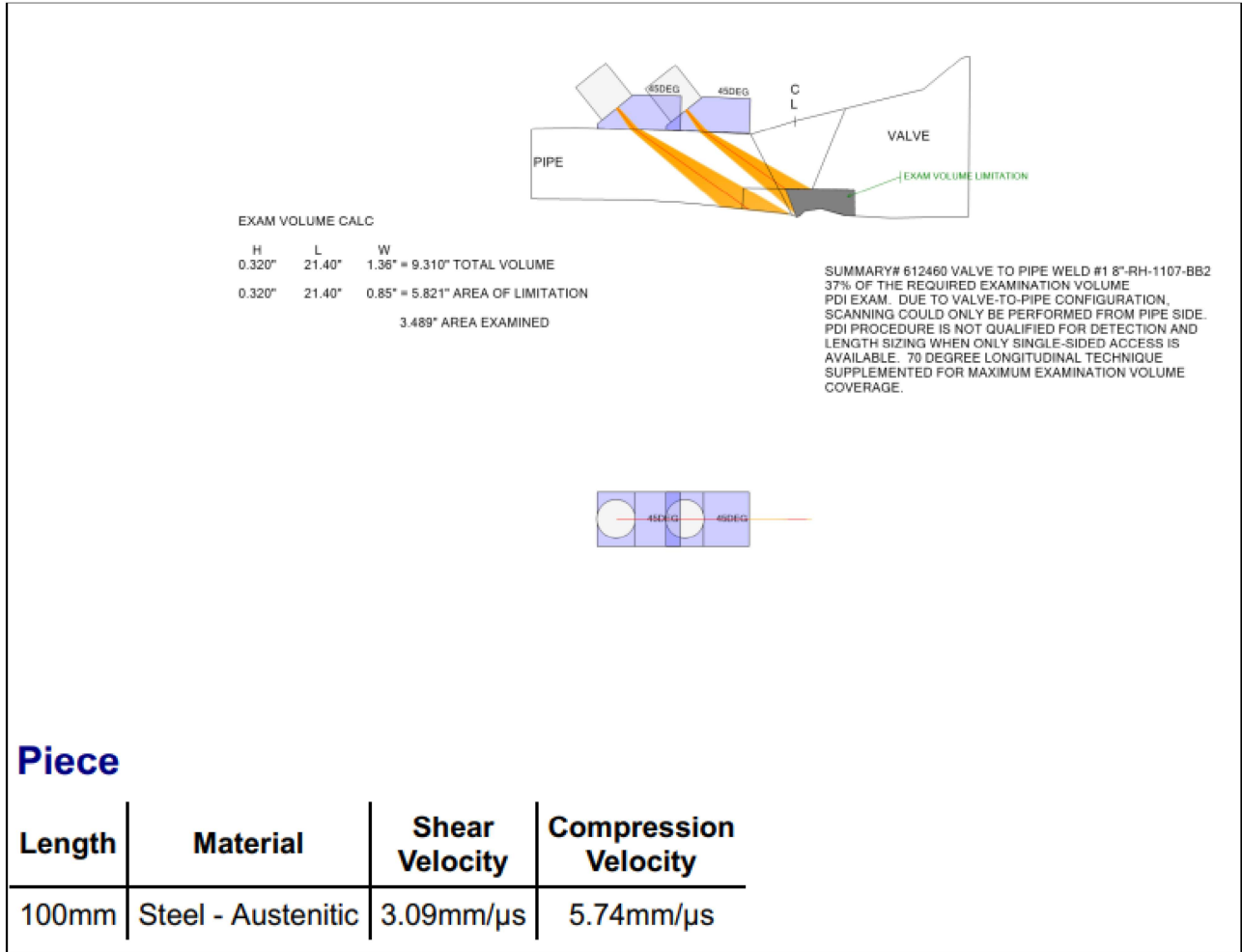


Figure 1.4-2 8-RH-1007-BB2, Weld 1 Scan Coverage and Scan Summary

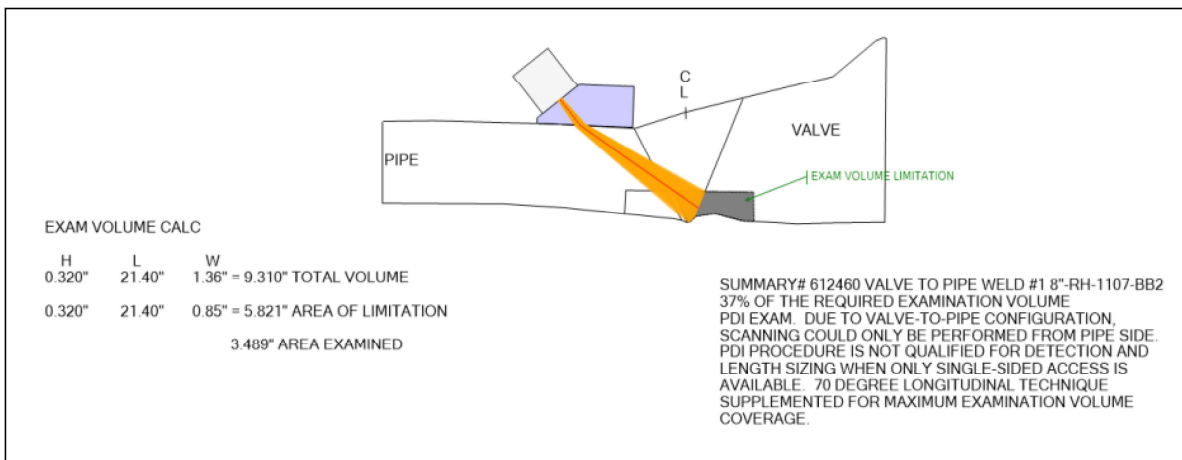


Figure 1.4-3 8-RH-1007-BB2, Weld 1 Examination Location and Coverage Map

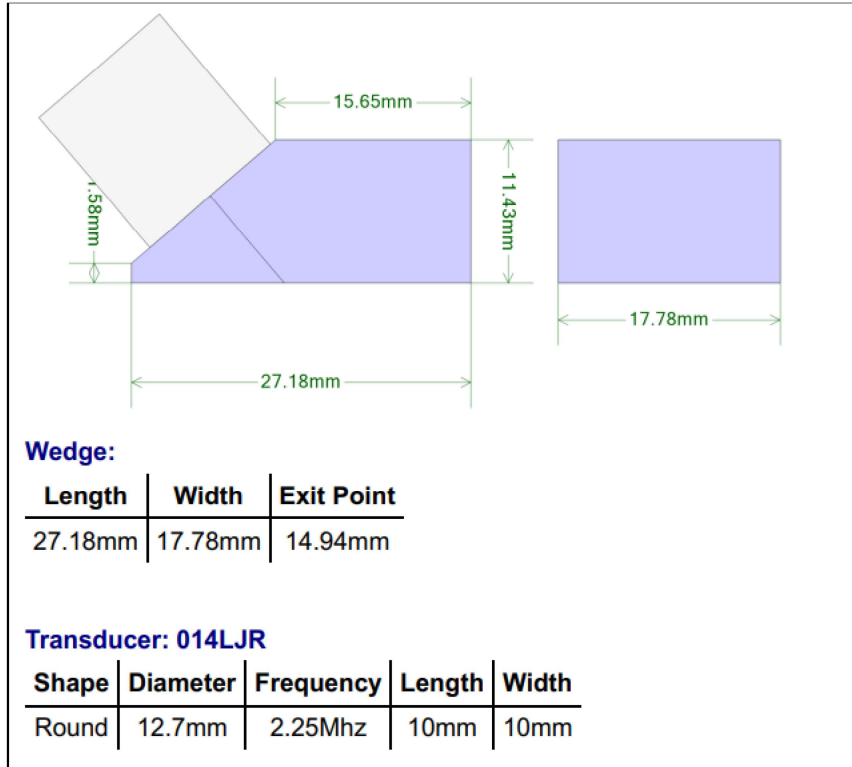


Figure 1.4-4 8-RH-1007-BB2, Weld 1 Examination Location and Coverage Map

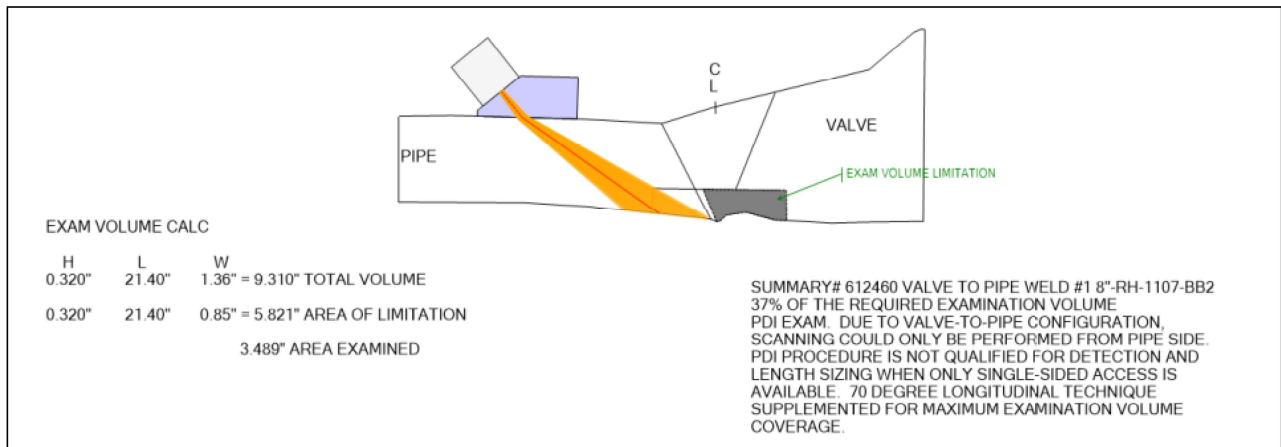


Figure 1.4-5 8-RH-1007-BB2, Weld 1 Examination Location and Coverage Map

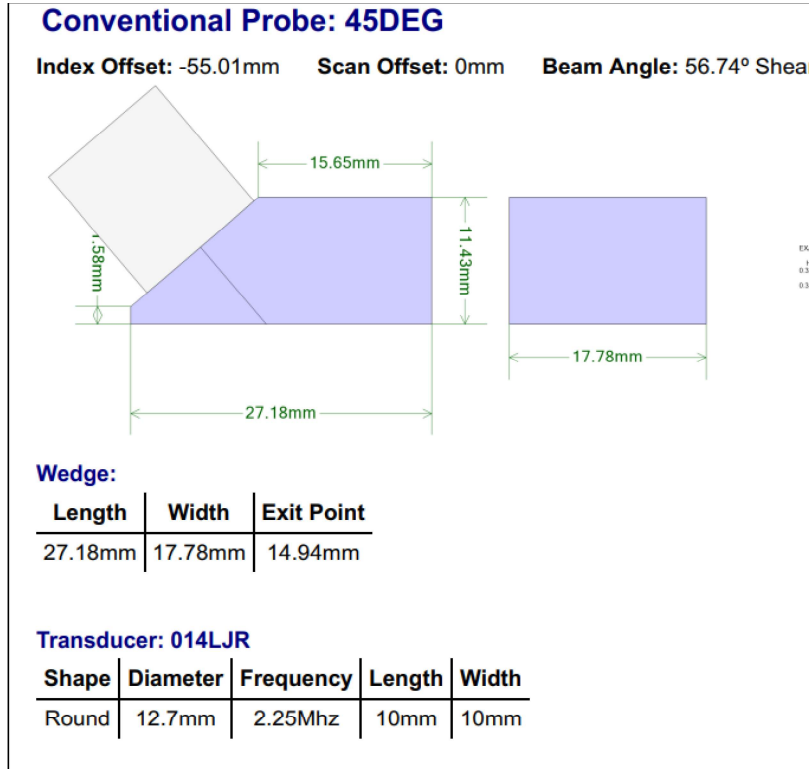


Figure 1.4-6 8-RH-1007-BB2, Weld 1 Examination Location and Coverage Map

2.1 **Weld PRZ-2-N3 “Pressurizer Relief Nozzle to Shell Weld”**

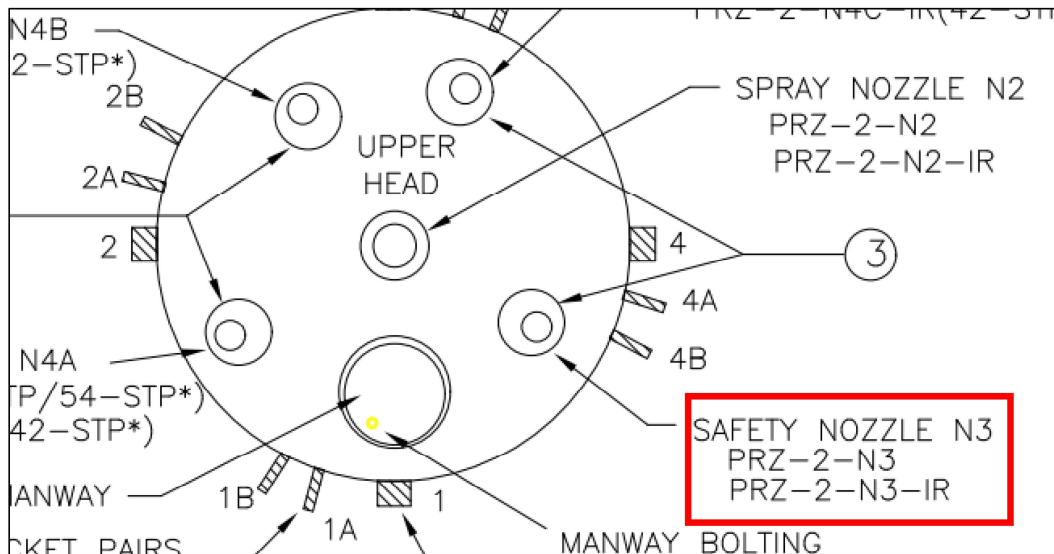


Figure 2.1-1 Weld PRZ-2-N3 (Extracted from Reference DWG A-PRZ-1)

This weld was UT examined in Inspection Period 1, during the 2RE16 refueling outage in 2013. The NDE data came from UT Report No.: UT-2013-014. The UT Code Required Volume (CRV) was determined based on ASME Section XI, Figure IWB-2500-2. The corresponding CRV as shown on that Figure is A-B-C-D. This volume was examined with 0°, 45°S and 60°S wave transducers. The UT examination was limited on the nozzle side due to the nozzle configuration resulting in total UT coverage of **70.63%** as described in Table 2.1-1 combined with Figure 2.1-2. No recordable indications were detected during this scan.

Section V, Article 4 was used for the examination.

PRZ -2-N3 Nozzle Exam Coverage					Achieved	Required
Scanning from Head to Nozzle						
	Volume total	Area missed	Area Achieved			
0°	1136.4	155.4	981		86.33	100
45°	1136.4	59	1077.4		94.81	100
60°	1136.4	33.5	1102.9		97.05	100
Scanning from Nozzle to Head						
	Volume total		Area missed	Area Achieved		
45°	1136.4	359.4	136	155.4	485.6	42.73
60°	1136.4	563.3	136	155.4	281.7	24.79
Scanning 45° and 60° CW / CCW						
	Volume total		Area missed	Area Achieved		
45°	1136.4	136	155.4	845		74.36
60°	1136.4	136	155.4	845		74.36
					494.42	700
					Percentage of Exam Coverage	
					70.63	

Table 2.1-1 Weld PRZ-2-N3 Scan Coverage and Scan Summary

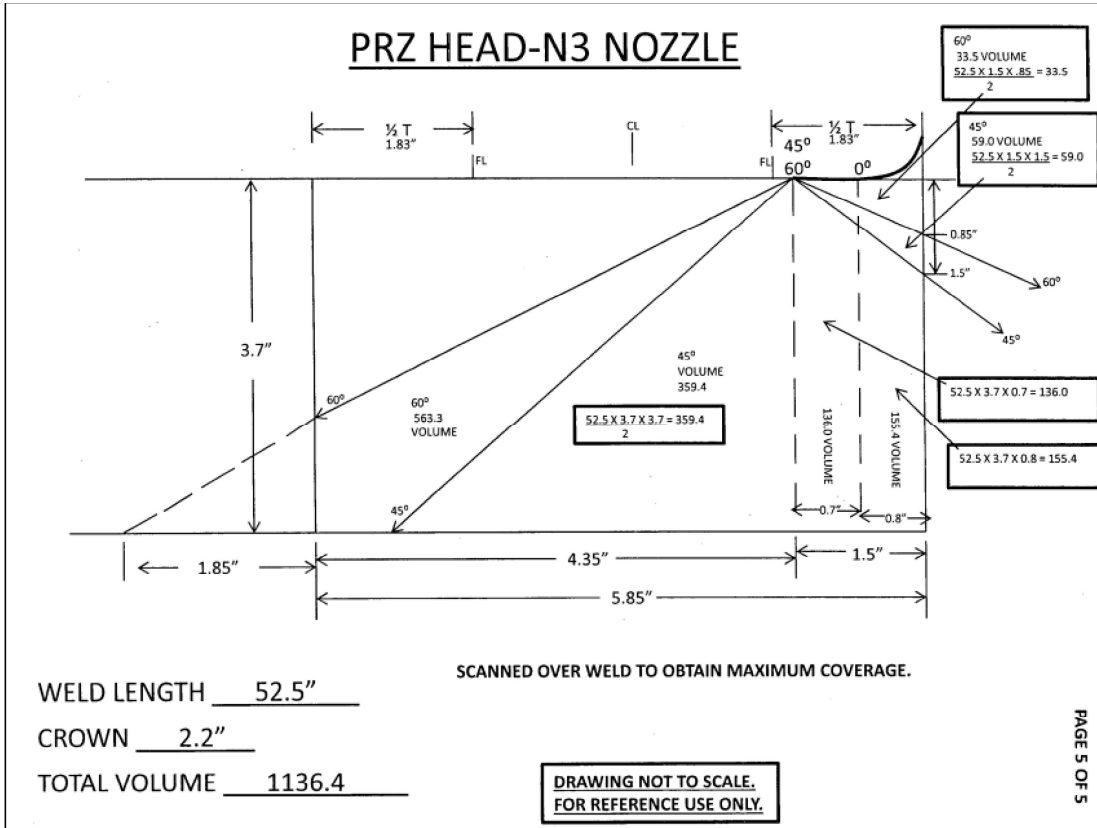


Figure 2.1-2 Weld PRZ-2-N3 Examination Location and Coverage Map

2.2 Weld PRZ-2-L6 “Pressurizer Relief Nozzle to Shell Weld”

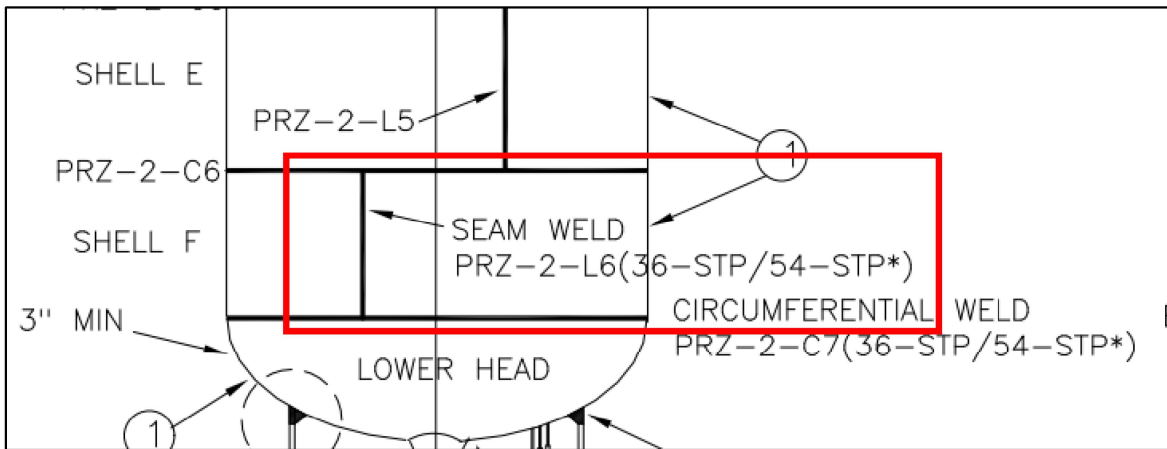


Figure 2.2-1 Weld PRZ-2-L6 (Extracted from Reference DWG A-PRZ-1)

This weld was UT examined in Inspection Period 1, during the 2RE16 refueling outage in 2013. The NDE data came from UT Report No.: UT-2013-017. The UT Code Required Volume (CRV) was determined based on ASME Section XI, Figure IWB-2500-2. The corresponding CRV as shown on that Figure is A-B-C-D. This volume was examined with 0°, 45°S and 60°S wave transducers. The UT examination was limited due to the permanent insulation support ring resulting in total UT coverage of **85%** as described in Table 2.1-1 combined with Figures 2.1-2, 2.1.3, and 2.1-4. No recordable indications were detected during this scan.

Section V, Article 4 was used for the examination.

NOMENCLATURE	SHELL F LONGITUDINAL WELD/PRZ-2 010400	
	COVERAGE OBTAINED	COVERAGE REQUIRED
0° ON WELD AND BASE MATERIAL	90	100
45° PERPENDICULAR/CW/CCW	90	100
45° PARALLEL/UP	73	100
45° PARALLEL/DOWN	90	100
60° PERPENDICULAR/CW/CCW	90	100
60° PARALLEL/UP	98	100
60° PARALLEL/DOWN	66	100
TOTAL	597	700
COVERAGE OBTAINED	85%	

Table 2.2-1 Weld PRZ-2-L6 Scan Coverage and Scan Summary

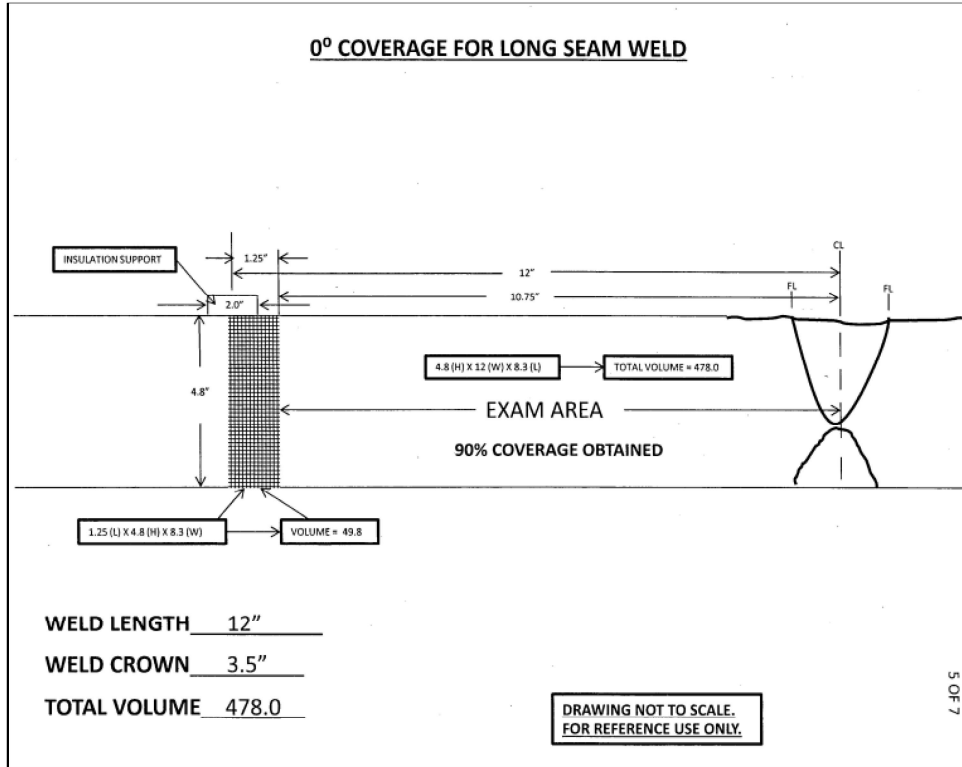


Figure 2.2-2 Weld PRZ-2-L6 Examination Location and 0° Coverage Map

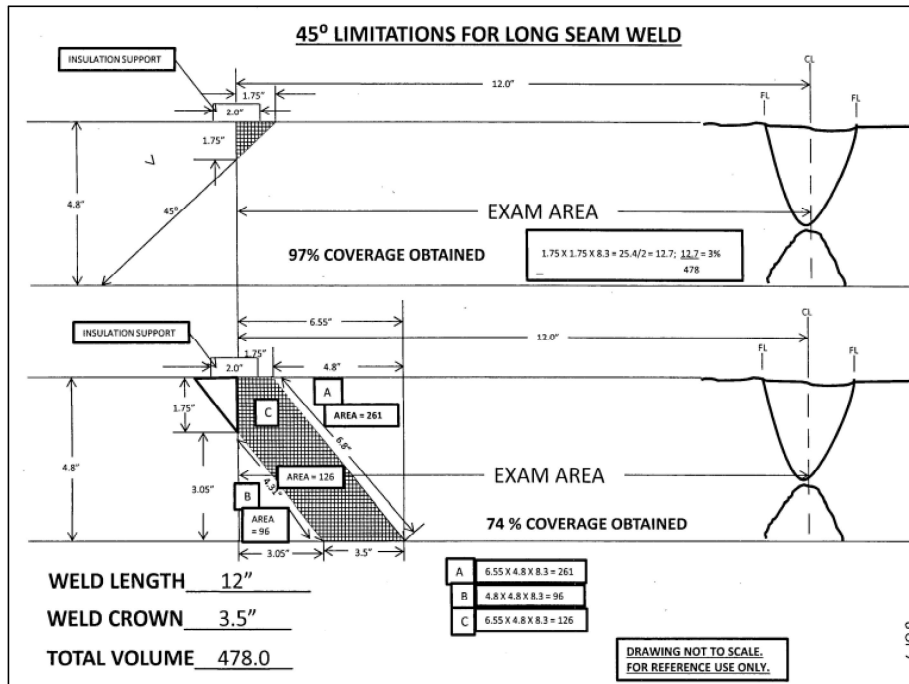


Figure 2.2-3 Weld PRZ-2-L6 Examination Location and 45° Coverage Map

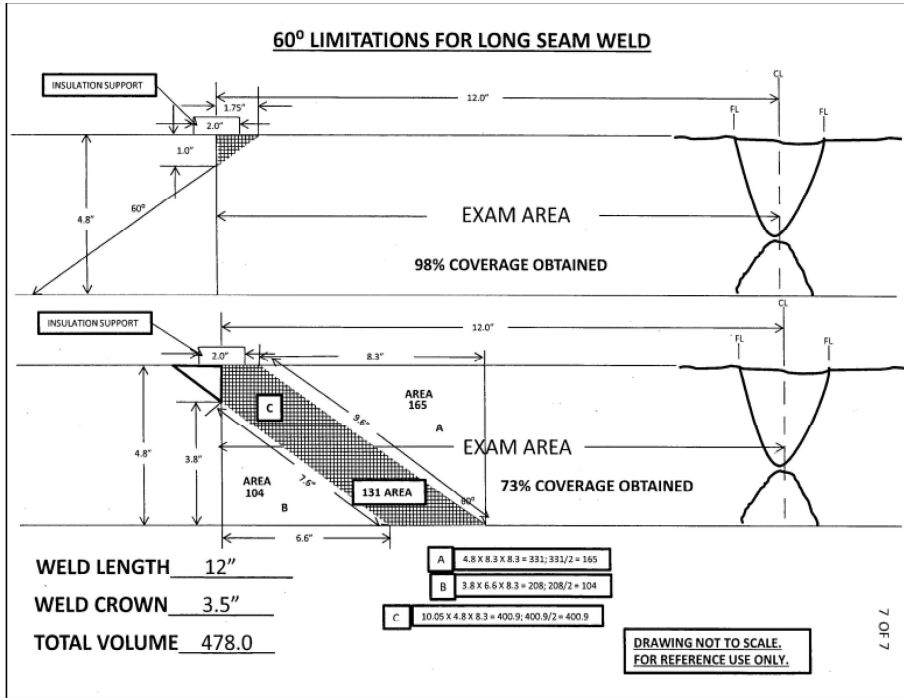


Figure 2.2-4 Weld PRZ-2-L6 Examination Location and 60° Coverage Map

2.3 Weld RSG-2A-T1, “Steam Generator Channel Head-to-Tubeplate”

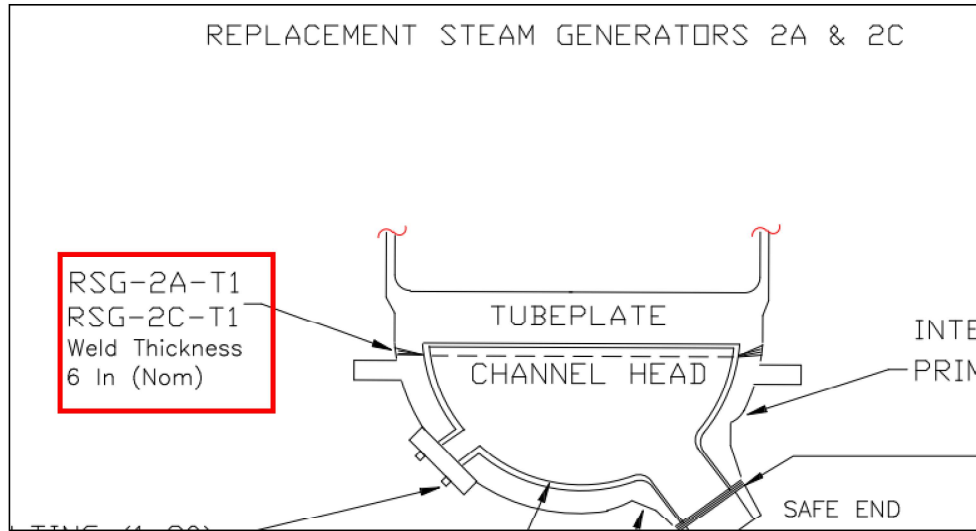
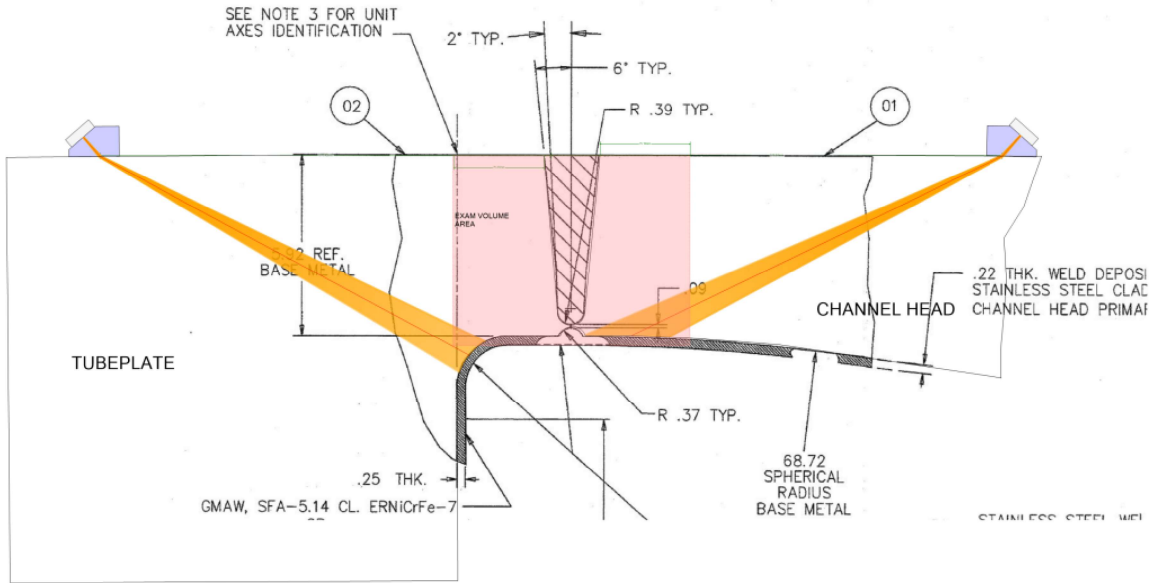


Figure 2.3-1 RSG-2A-T1 (Extracted from Reference DWG A-RSG-1R0)

This weld was UT examined in Inspection Period 3, during the 2RE20 refueling outage in 2019. The NDE data came from UT Report No.: UT-2019-049. The UT Code Required Volume (CRV) was determined based on ASME Section XI, Figure IWB-2500-6. The corresponding CRV as shown on that Figure is E-F-G-H. This volume was examined with 45°S and 60°S wave transducers. The UT examination was limited by the permanent insulation support ring resulting in total UT coverage of **88%** as described in Figures 2.3-2, 2.3-4, 2.3-5, and 2.3-6. No recordable indications were detected during this scan.

Section V. Article 4 was used for this examination.



Note: Unit 2 CHANNEL HEAD TO TUBEPLATE weld RSG-2A-T1 Summary # 015920 Exam limitation. Total length weld inspected was 470.20" where 56.42" of examination area not inspected due to interference of insulation support. Support obstructed travel path on 45DEG and 60DEG transducers
 $413.776" / 470" \times 100\% = 88.0374468085\%$ EXAM COVERAGE

Piece

Length	Material	Shear Velocity	Compression Velocity
11938mm	Steel 1020	3.24mm/μs	5.89mm/μs

HAZ: 25% HAZ Width: 5mm

Conventional Probe: UT Probe

Index Offset: 376.84mm Scan Offset: 0mm Beam Angle: 61.25° Shear

Figure 2.3-2 RSG-2A-T1 Scan Coverage and Scan Summary

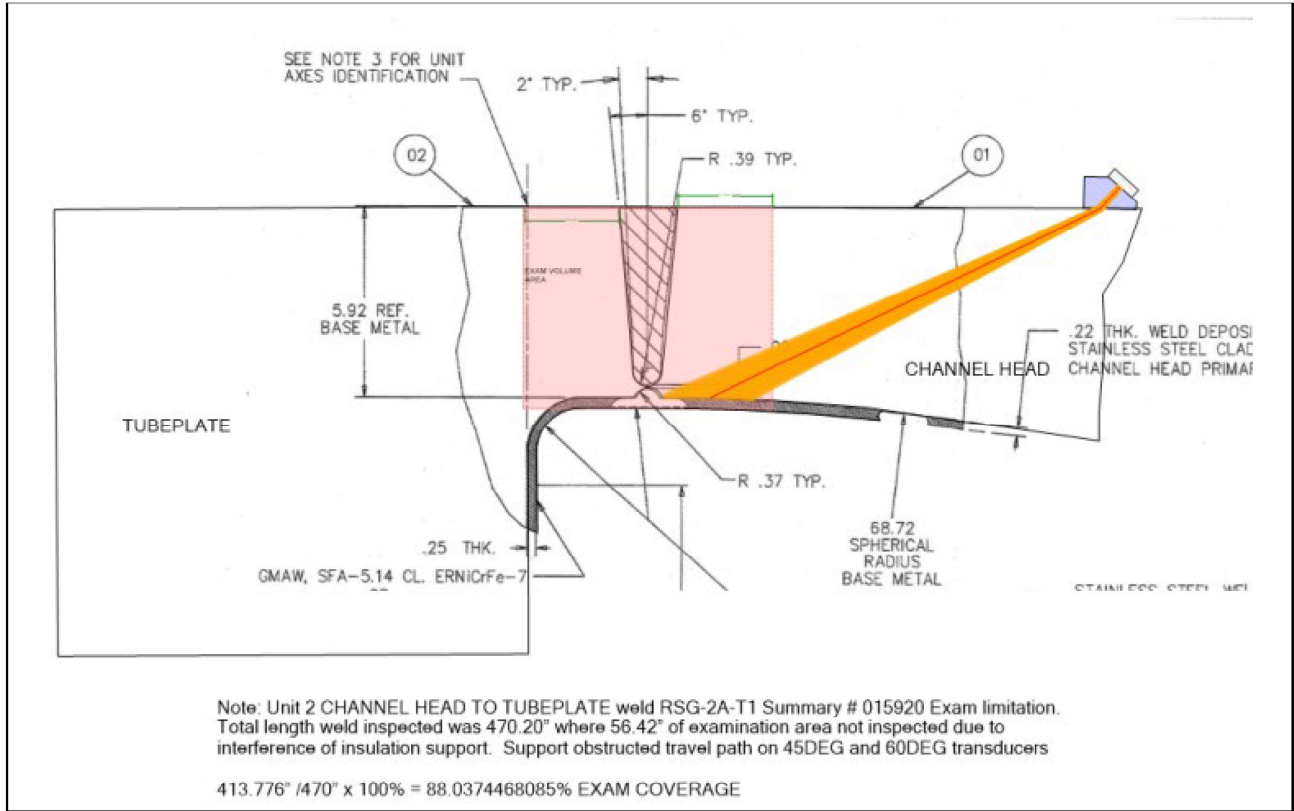


Figure 2.3-3 RSG-2A-T1 Examination Location and Coverage Map

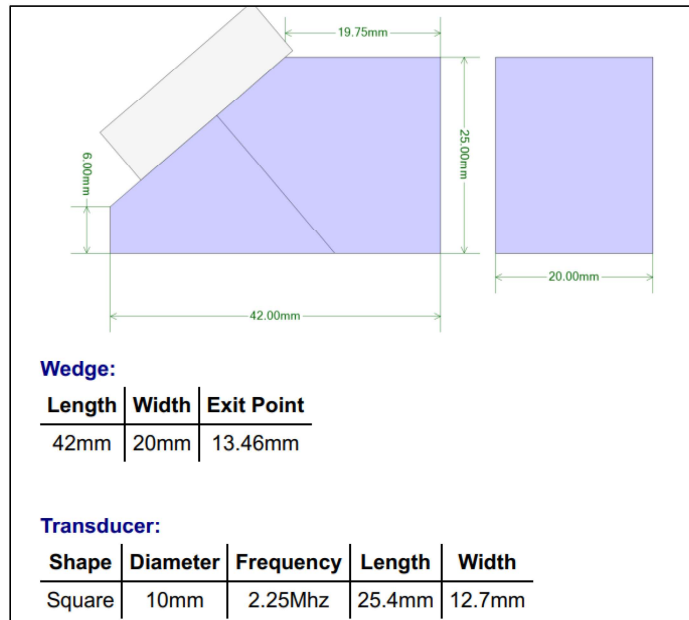


Figure 2.3-4 RSG-2A-T1 Examination Location and Coverage Map

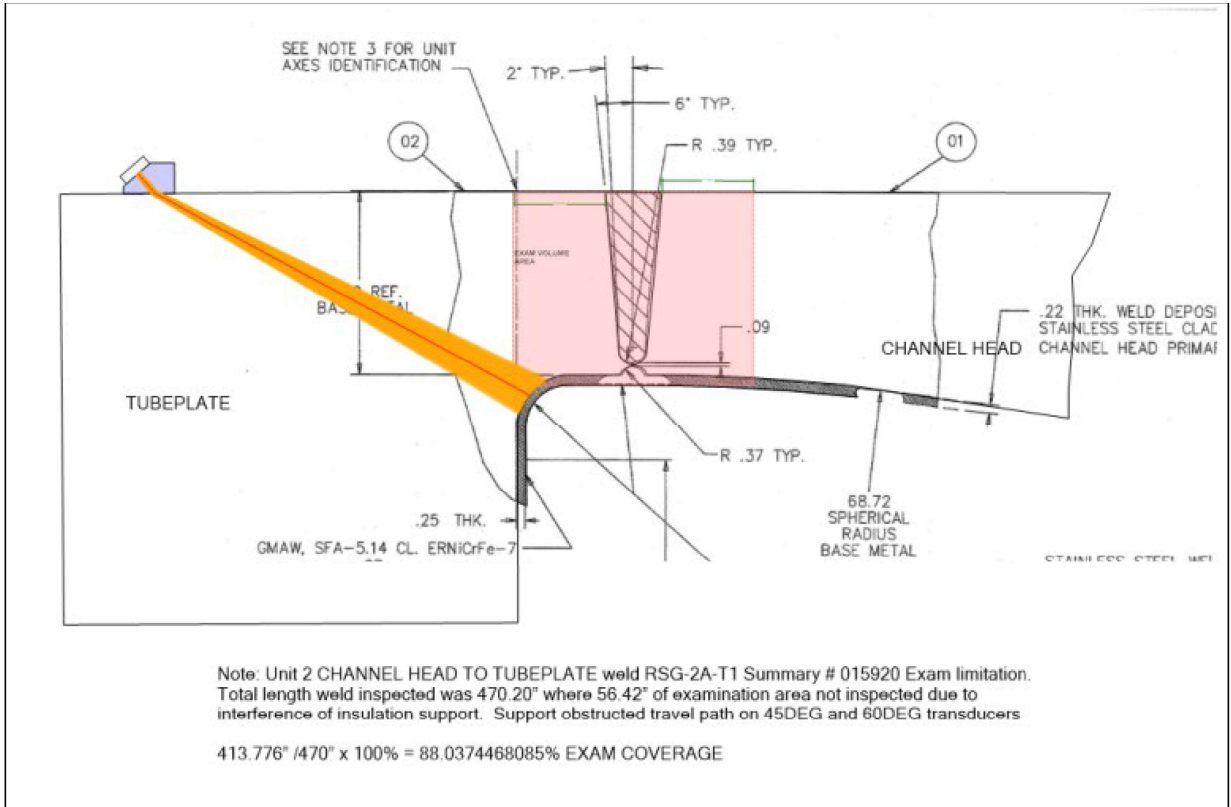


Figure 2.3-5 RSG-2A-T1 Examination Location and Coverage Map

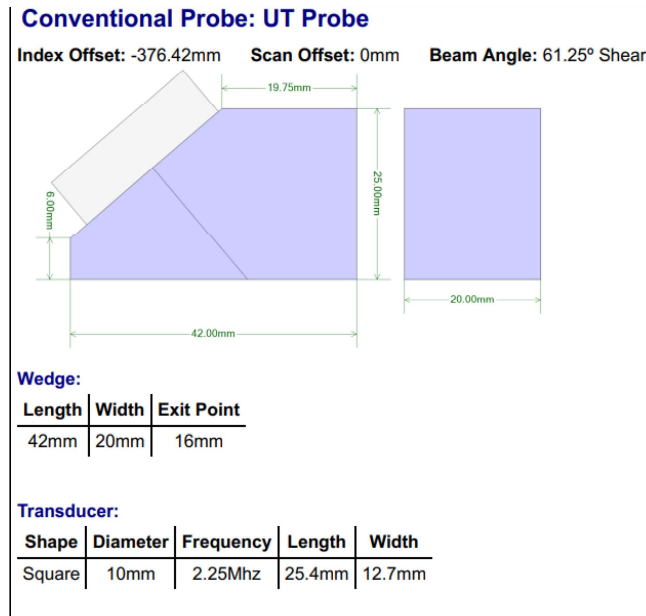


Figure 2.3-5 RSG-2A-T1 Examination Location and Coverage Map

2.4 **Weld 4-CV-2120-BB1, Weld 2 “Chemical Volume and Control Pipe to Valve Weld”**

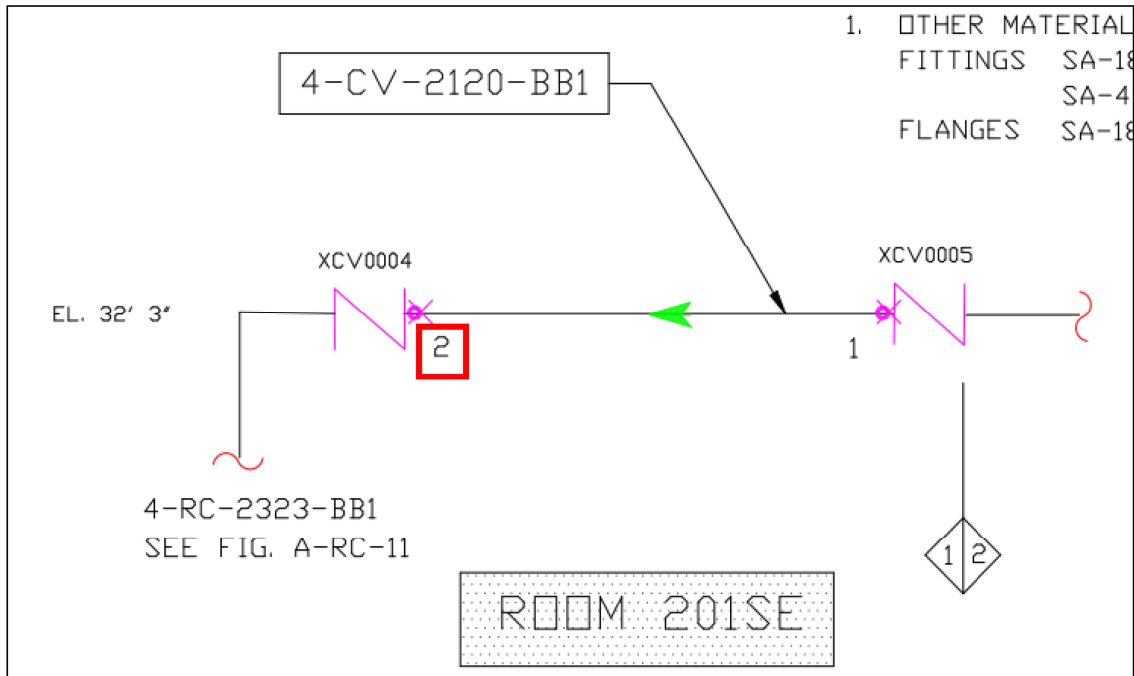


Figure 2.4-1 4-CV-2120-BB1, Weld 2 (Extracted from Reference DWG A-CV-2)

This weld was UT examined in Inspection Period 1, during the 2RE16 refueling outage in 2013. The NDE data came from UT Report No.: UT-2013-038. The UT Code Required Volume (CRV) was determined based on EPRI TR-112657, Figure 4-2 “Examination Volume for Thermal Fatigue Cracking in Piping Welds NPS 4 or Larger.” The corresponding CRV as shown on that Figure is A-B-C-D. This volume was examined with 45°S and 60°RL wave transducers. The UT examination was limited by the valve configuration resulting in total UT coverage of **50%** as described in Table 2.4-1 combined with Figure 2.4-2. No recordable indications were detected during this scan.

Section XI Appendices and Supplements used for this UT examination were Appendix VIII, Supplement 2.

ISI EXAMINATION COVERAGE		
NDE Record # UT-2013-038		Summary # 150460
Examination Method/Type: UT		
Description Of Limitation: VALVE		
Exam (Weld) Thickness (T): .60	Exam (Weld) With (W): 3/4"	Exam (Weld) Length (L): 1434"
Examination Volume (EV): TOTAL .20 X 1.52 X 14.75 = 4.484 LIMITATION VOLUME .20 X .76 X 14.75 = 2.242		
Examination Coverage (EC): TOTAL COVERAGE = 50% 60° RL USED AS BEST EFFORT TO ACHIEVE MAXIMUM COVERAGE		
% Examination Coverage (% EC): .50%		

Table 2.4-1 4-CV-2120-BB1, Weld 2 Scan Coverage and Scan Summary

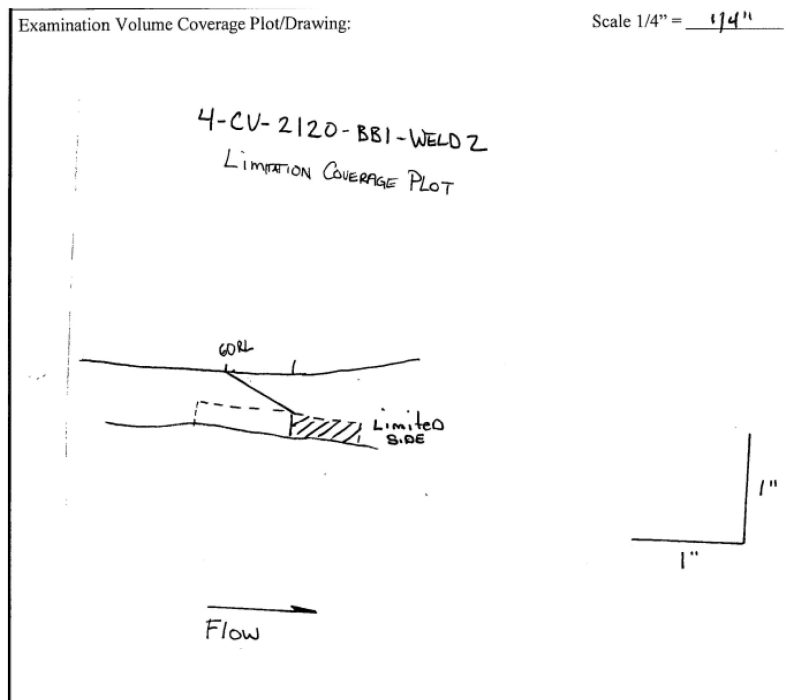


Figure 2.4-2 4-CV-2120-BB1, Weld 2 Examination Location and Coverage Map

2.5 Weld 8-RH-2106-BB2, Weld 13 “Residual Heat Removal Pipe to Valve Weld”

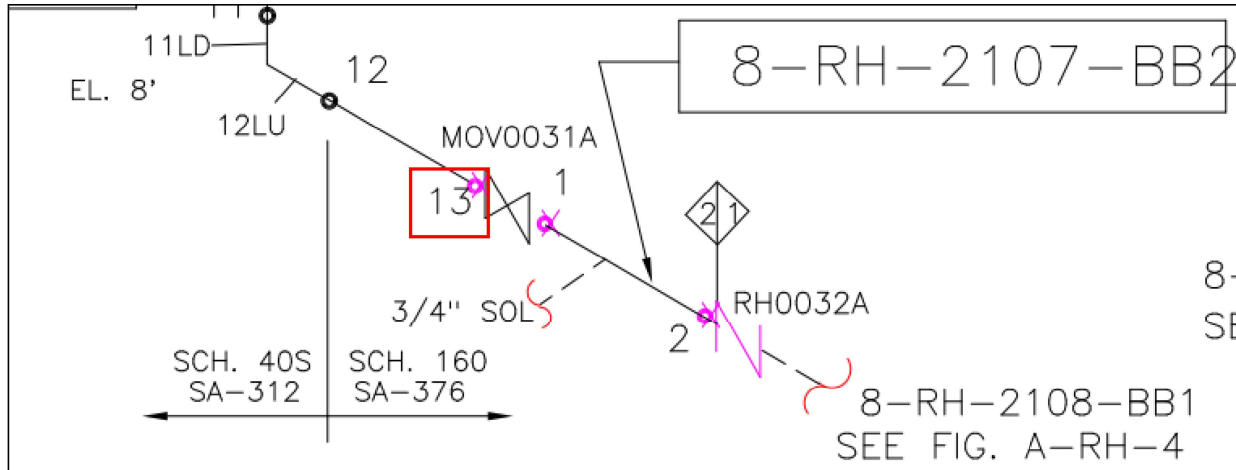


Figure 2.5-1 8-RH-2106-BB2, Weld 13 (Extracted from Reference DWG B-RH-7)

This weld was UT examined in Inspection Period 1, during the 2RE16 refueling outage in 2013. The NDE data came from UT Report No.: UT-2013-039. The UT Code Required Volume (CRV) was determined based on EPRI TR-112657, Figure 4-2 “Examination Volume for Thermal Fatigue Cracking in Piping Welds NPS 4 or Larger.” The corresponding CRV as shown on that Figure is A-B-C-D. This volume was examined with 45°S and 60°RL wave transducers. The UT examination was limited by the valve configuration resulting in total UT coverage of **69.3%** as described in Table 2.5-1 combined with Figure 2.5-2. No recordable indications were detected during this scan.

Section XI Appendices and Supplements used for this UT examination were Appendix VIII, Supplement 2.

ISI EXAMINATION COVERAGE		
NDE Record #	UT-2013-039	Summary # 960 61169091
Examination Method/Type:	UT	
Description Of Limitation:	VALVE	
Exam (Weld) Thickness (T):	.95"	Exam (Weld) With (W): 1.5" Exam (Weld) Length (L): 31.4"
Examination Volume (EV):	TOTAL $.31 \times 3.25 \times 31.4 = 31.64$ LIMITATION VOLUME $.31 \times 1 \times 31.4 = 9.734$	
Examination Coverage (EC):	TOTAL COVERAGE = 69.3% 60 RL USED AS BEST EFFORT TO ACHIEVE MAXIMUM COVERAGE	
% Examination Coverage (% EC):	69.3	

Table 2.5-1 8-RH-2106-BB2, Weld 13 Scan Coverage and Scan Summary

ISI EXAMINATION COVERAGE

NDE Record # UT-2013039

Summary # 960
611690A

Examination Volume Coverage Plot/Drawing: Scale 1/4" = 1/4"

8-RH-2106-KB2-WELD 13
LIMITATION COVERAGE PLOT

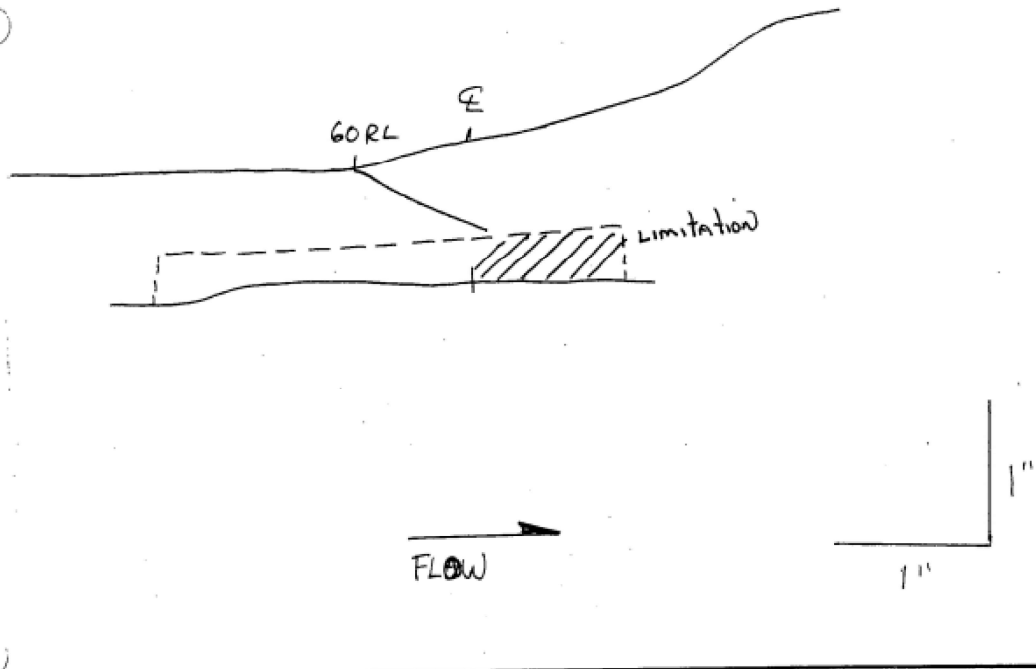


Figure 2.5-2 8-RH-2106-BB2, Weld 13 Examination Location and Coverage Map

2.6 Weld 8-RH-2107-BB2, Weld 1 “Residual Heat Removal Valve to Pipe Weld”

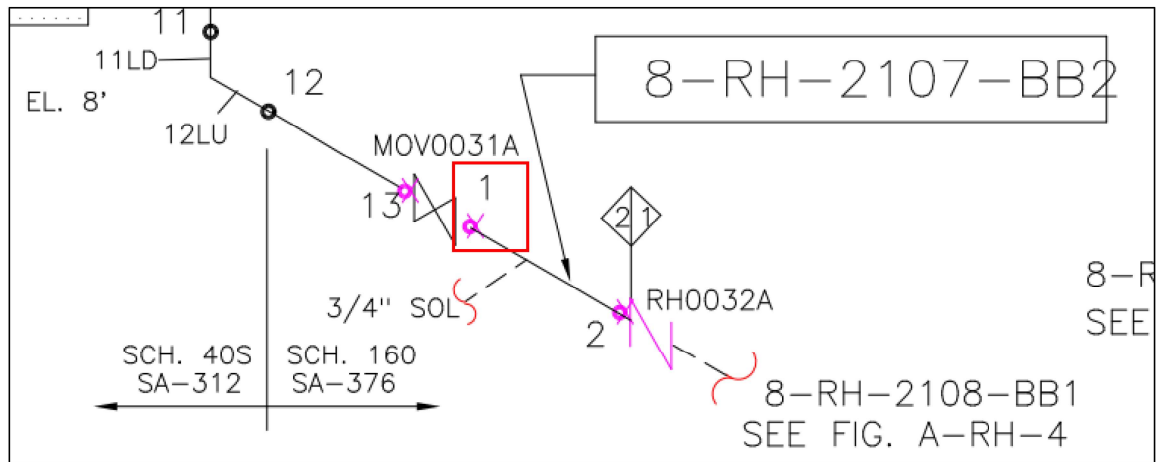


Figure 2.6-1 8-RH-2107-BB2, Weld 1 (Extracted from Reference DWG B-RH-7)

This weld was UT examined in Inspection Period 1, during the 2RE16 refueling outage in 2013. The NDE data came from UT Report No.: UT-2013-040. The UT Code Required Volume (CRV) was determined based on EPRI TR-112657, Figure 4-2 “Examination Volume for Thermal Fatigue Cracking in Piping Welds NPS 4 or Larger.” The corresponding CRV as shown on that Figure is A-B-C-D. This volume was examined with 45°S and 60°RL wave transducers. The UT examination was limited by the valve configuration resulting in total UT coverage of **69.3%** as described in Table 2.6-1 combined with Figure 2.6-2. No recordable indications were detected during this scan.

Section XI Appendices and Supplements used for this UT examination were Appendix VIII, Supplement 2.

ISI EXAMINATION COVERAGE			PAGE <u>2</u> OF <u>3</u>
NDE Record #	UT-2013-040	Summary #	612460
Examination Method/Type:	UT		
Description Of Limitation:	VALVE		
Exam (Weld) Thickness (T):	.25"	Exam (Weld) With (W):	1.5"
		Exam (Weld) Length (L):	31.4"
Examination Volume (EV):	<p>TOTAL $.31 \times 3.25 \times 31.4 = 31.64 \text{ in}^3$</p> <p>LIMITATION VOLUME $.31 \times 1 \times 31.4 = 9.734$</p>		
Examination Coverage (EC):	<p>TOTAL COVERAGE = 69.3%</p> <p>60° RL USED AS BEST EFFORT TO ACHIEVE MAXIMUM COVERAGE</p>		
% Examination Coverage (% EC):	69.3		

Table 2.6-1 8-RH-2107-BB2, Weld 1 Scan Coverage and Scan Summary

ISI EXAMINATION COVERAGE

NDE Record #

UT-2013-040

Summary #

612460

Examination Volume Coverage Plot/Drawing:

Scale 1/4" = 14"

8-RH-2107-BB2-1
LIMITATION COVERAGE PLOT

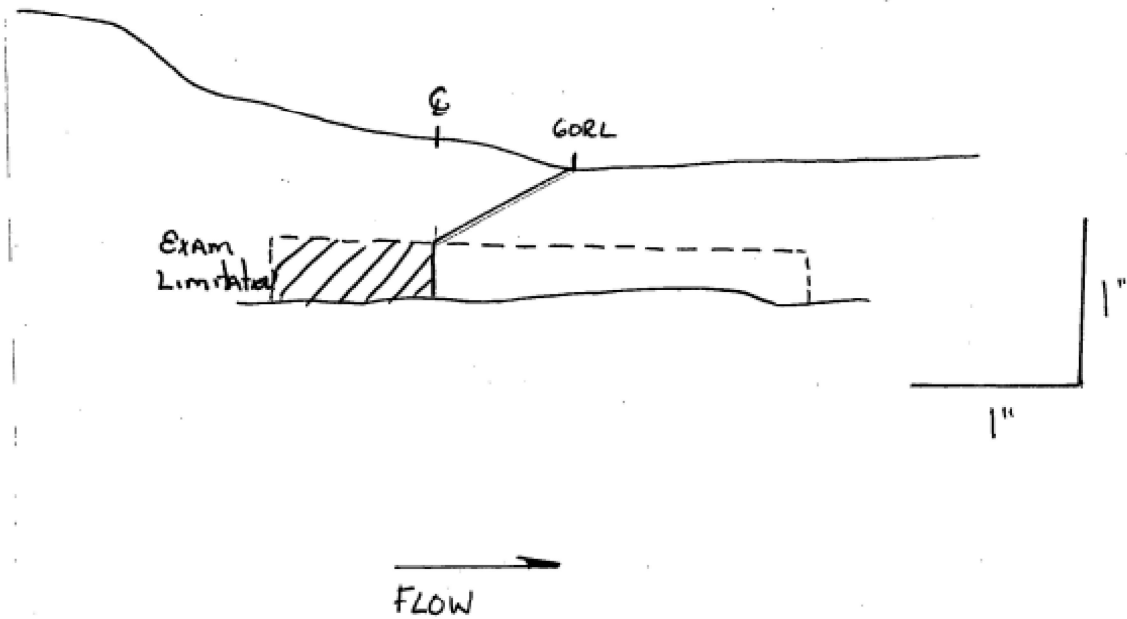


Figure 2.6-2 8-RH-2107-BB2, Weld 1 Examination Location and Coverage Map

2.7 Weld 4-RC-2422-BB1, Weld 24 “Reactor Coolant Pipe to Valve Weld”

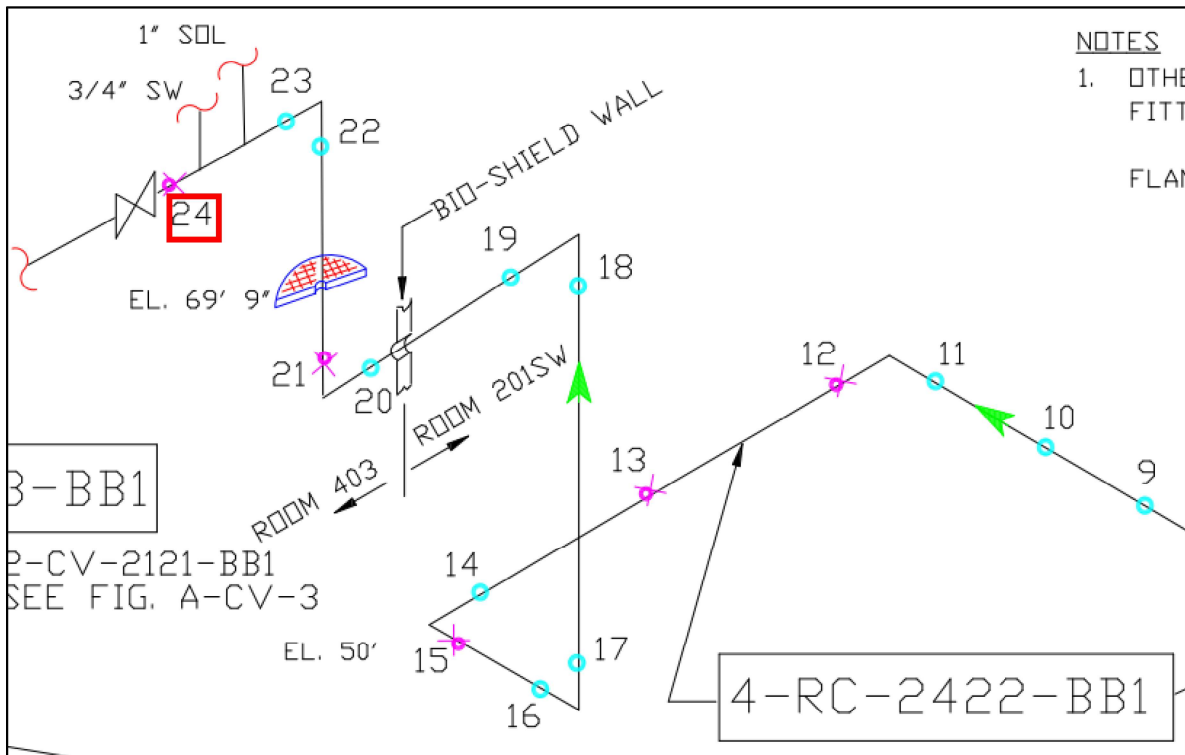


Figure 2.7-1 4-RC-2422-BB1, Weld 24 (Extracted from Reference DWG A-RC-13)

This weld was UT examined in Inspection Period 1, during the 2RE16 refueling outage in 2013. The NDE data came from UT Report No.: UT-2013-004. The UT Code Required Volume (CRV) was determined based on ASME Section XI, Figure IWB-2500-8c as this weld does not have any potential degradation mechanism. The corresponding CRV as shown on that Figure is C-D-E-F. This volume was examined with 0°, 45°S and 70°S wave transducers. The UT examination was limited by the valve configuration resulting in total UT coverage of **50%** as described in Table 2.7-1 combined with Figure 2.7-2. No recordable indications were detected during this scan.

Section XI Appendices and Supplements used for this UT examination were Appendix VIII, Supplement 2.

ISI EXAMINATION COVERAGE

NDE Record #	UT-EXAM-2013-004	Summary #	106160
Examination Method/Type: ULTRASONICS UTI-PDI-UT-2			
Description Of Limitation: PROXIMITY OF VALVE TO WELD Single-Sided Exam			
Exam (Weld) Thickness (T): 0.530"	Exam (Weld) With (W): 1.48"	Exam (Weld) Length (L): 14.3"	
Examination Volume (EV):			
AXIAL(TOWARDS VALVE)	0.53 x 1.48 x 14.3" = 11.217 = 100%		
AXIAL (TOWARD PIPE)	0.53 x 0 x 14.3" = 0 = 0%		
CIRC PIPE SIDE (COUNTER CLOCK WISE)	0.53 x 1.48 x 14.3" = 11.217 = 100%		
CIRC PIPE SIDE (CLOCK WISE)	0.53 x 1.48 x 14.3" = 11.217 = 100%		
CIRC VALVE SIDE (COUNTER CLOCK WISE)	0.53 x 0 x 14.3" = 0 = 0%		
CIRC VALVE SIDE (CLOCK WISE)	0.53 x 0 x 14.3" = 0 = 0%		
Examination Coverage (EC):			
AXIAL(TOWARDS VALVE)	0.53 x 1.48 x 14.3" = 11.217 = 100%		
AXIAL (TOWARD PIPE)	0.53 x 0 x 14.3" = 0 = 0%		
CIRC PIPE SIDE (COUNTER CLOCK WISE)	0.53 x 1.48 x 14.3" = 11.217 = 100%		
CIRC PIPE SIDE (CLOCK WISE)	0.53 x 1.48 x 14.3" = 11.217 = 100%		
CIRC VALVE SIDE (COUNTER CLOCK WISE)	0.53 x 0 x 14.3" = 11.217 = 0%		
CIRC VALVE SIDE (CLOCK WISE)	0.53 x 0 x 14.3" = 11.217 = 0%		
% Examination Coverage (% EC): 50%			

Table 2.7-1 4-RC-2422-BB1, Weld 24 Scan Coverage and Scan Summary

ISI EXAMINATION COVERAGE

NDE Record # UT-EXAM-2013-004

Summary # 106160

Examination Volume Coverage Plot/Drawing:

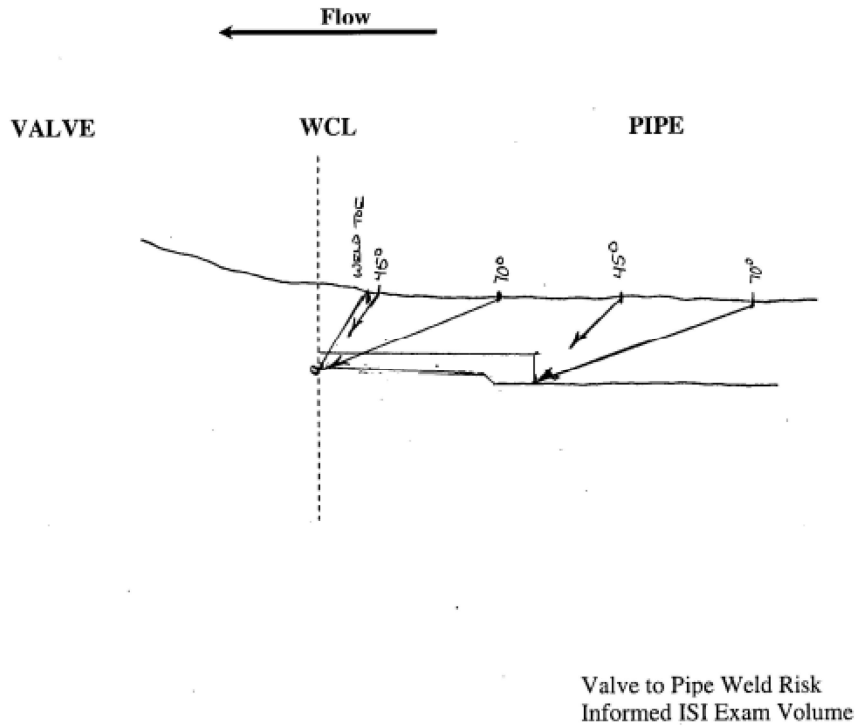


Figure 2.7-2 4-RC-2422-BB1, Weld 24 Examination Location and Coverage Map

2.8 Weld CIAPCS-2A-PCW1 “Containment Spray Pump – Flange to Upper Case”

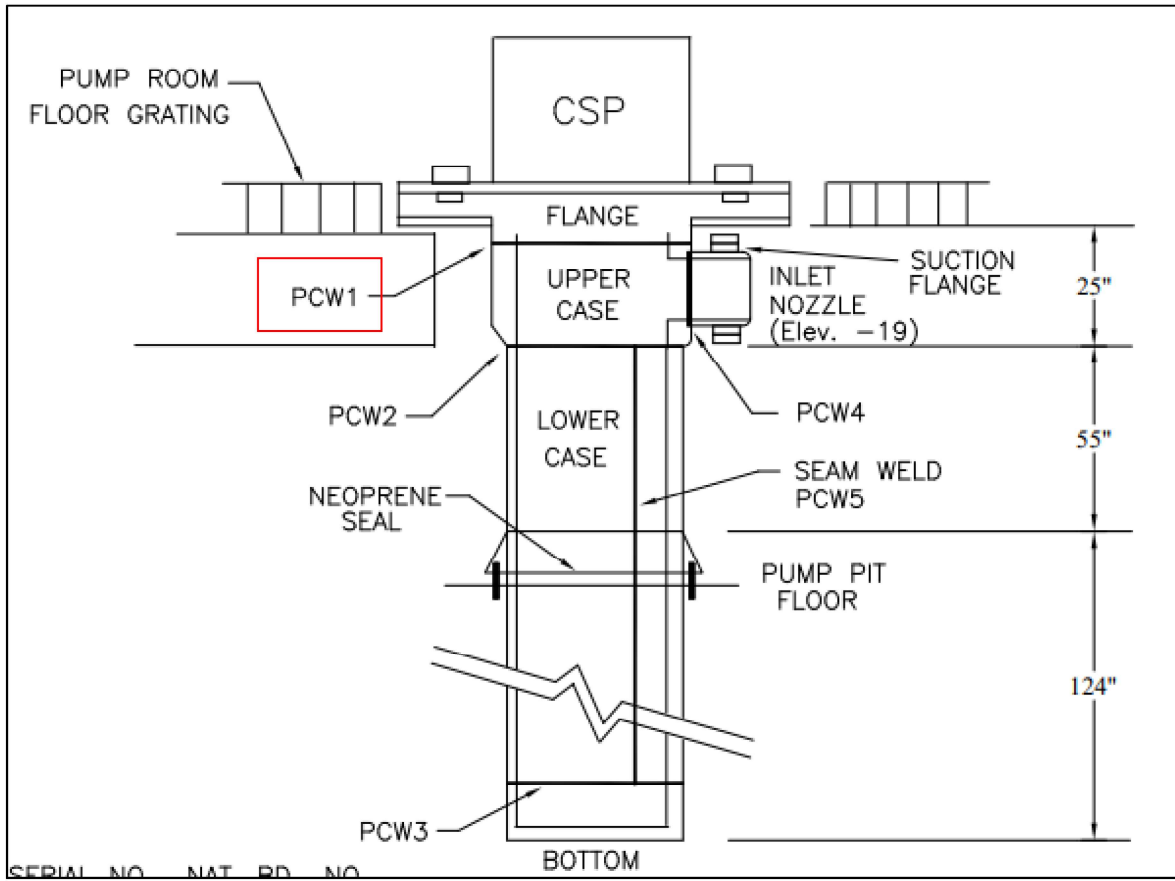


Figure 2.8-1 CIAPCS-2A-PCW1 (Extracted from Reference DWG B-CSP-1)

This weld was Liquid Penetrant examined in Inspection Period 1, during the 2RE16 refueling outage in 2013. The NDE data came from PT Report No.: UT-2013-105. The Code Required Surface Area (CSA) was determined based on ASME Section XI, Figure IWC-2500-8. The corresponding CSA as shown on that Figure is A-B. This surface area was examined with Liquid Penetrant method. The surface examination was limited due to the concrete opening resulting in total CSA coverage of **51.2%** as described in Table 2.8-1 combined with Figures 2.8-2 and 2.8-3. No recordable indications were detected during this scan.

Section XI, IWA-2222 which references Section V, Article 6.

ISI EXAMINATION COVERAGE LIMITATION

NDE Record # (same as Form 1 Record #) PT-2013-105		Summary # 750120 CIAPCS-2A-PCW1				
Examination Method/Type: Liquid Penetrant (Color Contrast Solvent Removable)						
Description Of Limitation: See attached photos and drawings for limitation area's due to building structure.						
Total Examination Length (L): 78.375"		Total Examination Width (W): 1.500"				
Total Limitation Length (LL): 38.350"		Examination Area (EA): 117.563"				
Examination Coverage (EC): 60.188"		% Examination Coverage (% EC): 51.20%				
Calculations:						
	A	B	C	D	E	F
	Total Length (L)	Exam Width (W)	Total Limitation Length (LL)	Examination Area =(A*B) (EA)	Examination Coverage= (A-C) (EC)	% Examination Coverage= (E/D)
Weld ID	78.375	1.500	38.250	117.563	60.188	51.20%
PCW1						

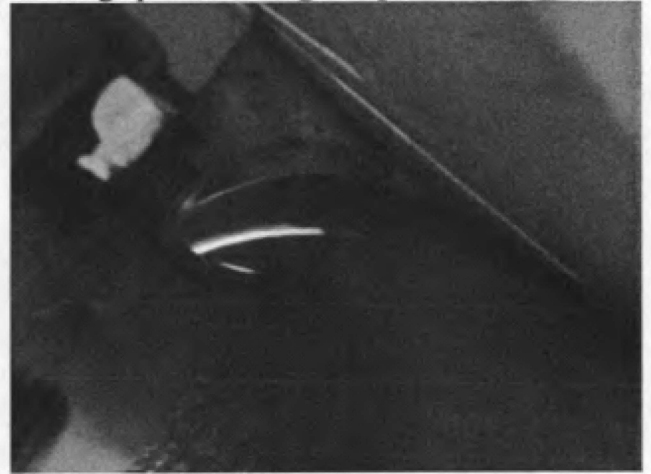
Table 2.8-1 CIAPCS-2A-PCW1, Weld 24 Area Coverage and Area Summary

Record No. PT-2013-105

General View of pump 2A area looking east.



Looking up SE corner @ flange -21' elev.



Looking up NE corner



Looking up NW corner.

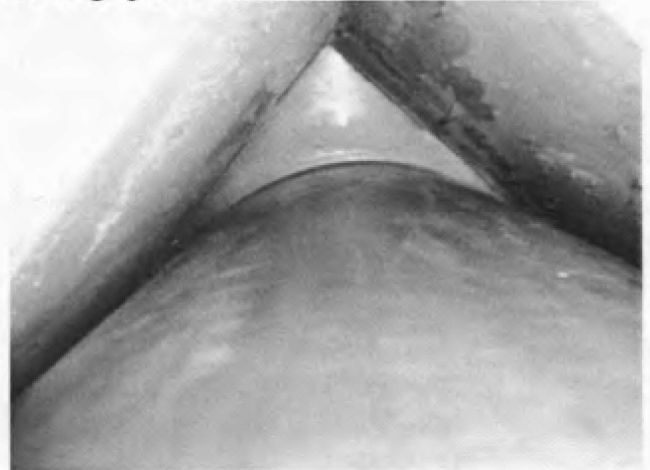


Figure 2.8-2 CIAPCS-2A-PCW1, Weld 24 Examination Location and Coverage Map

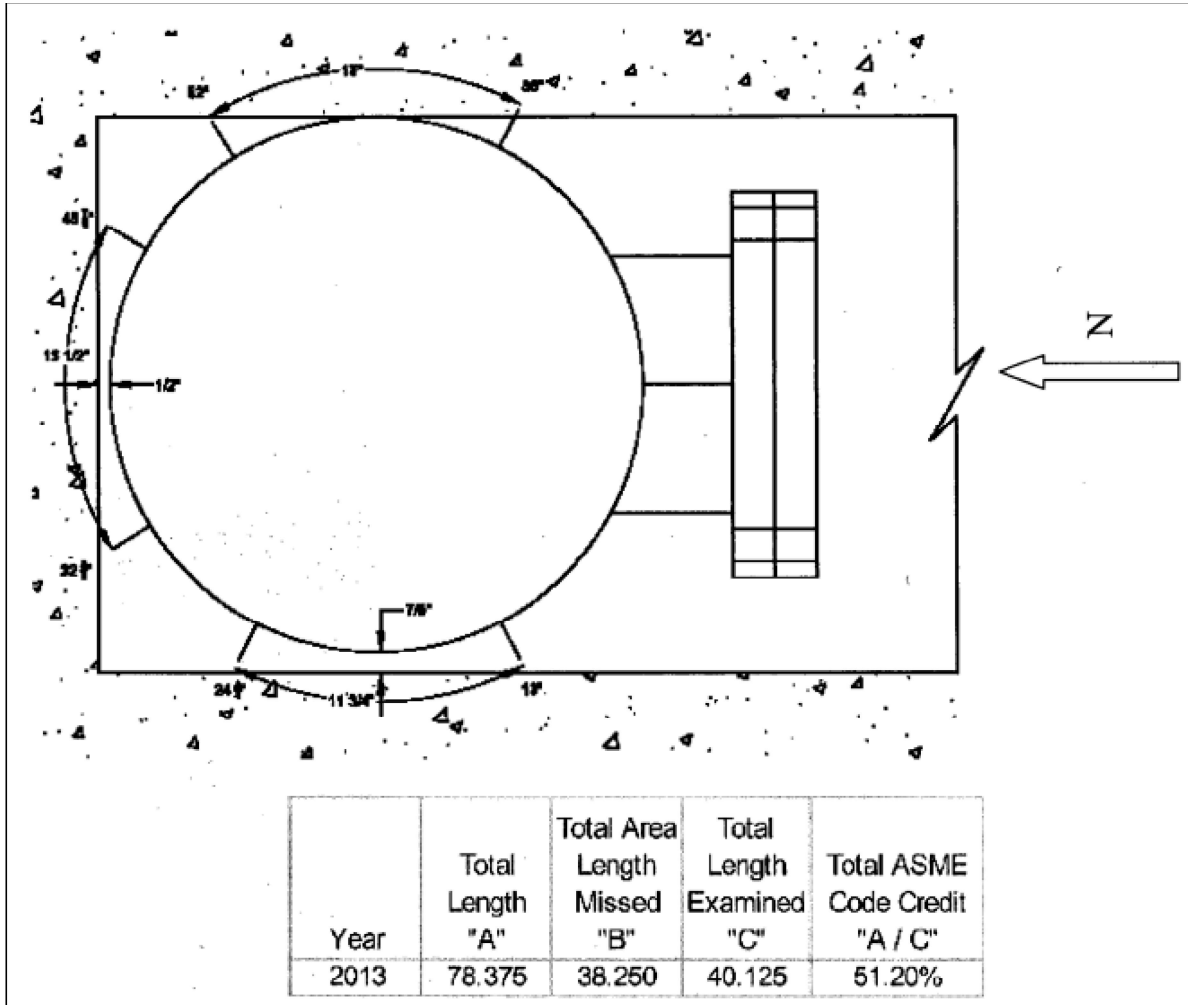


Figure 2.8-3 CIAPCS-2A-PCW1, Weld 24 Examination Location and Coverage Map

Note: NDE report has typographical error. Exam coverage calculation is actually "C/A"