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10 CFR 50.55a

GNRO-2018/00054

November 30, 2018

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

SUBJECT: Relief Request Number GG-ISI-023, Inservice Inspection Impracticality –
Limited Coverage Examinations During the Third 10-Year Inservice Inspection
Interval

Grand Gulf Nuclear Station, Unit 1
NRC Docket No. 50-416
Renewed Facility Operating License No. NPF-29

Dear Sir or Madam:

Pursuant to Title 10 of the Code of Federal Regulations (CFR) 50.55a(g)(6)(i), Entergy Operations Inc. hereby requests U.S. Nuclear Regulatory Commission (NRC) approval of the following request for the third 10-year inservice inspection (ISI) interval: Limited Examination Coverage of the Subject Welds. The details of the 10 CFR 50.55a request are provided as an Enclosure and associated Attachment.

Pursuant to 10 CFR 50.55a(g)(5)(iii), the basis for the determination of impracticality is being submitted to the NRC within 12 months after the expiration of the 120-month ISI interval. The third 10-year ISI interval ended on November 30, 2017, and complied with the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (BPVC), Section XI, 2001 Edition through the 2003 Addenda.

The attached relief request identifies weld locations for which less than the required examination coverage was obtained due to interference or geometry. The information provided in the attachment demonstrates the limitations experienced at each weld location when attempting to comply with the code required examination coverage.

No new regulatory commitments are made in this submittal.

Should you have any questions concerning the content of this letter, please contact Douglas A. Neve, Manager Regulatory Assurance, at 601-437-2103.

Sincerely,

A handwritten signature in cursive script that reads "Mandy K. Halter".

Mandy K. Halter

MKH/rws

Enclosure: Relief Request Number GG-ISI-023, Relief Request in Accordance with 10 CFR 50.55a(g)(5)(iii), Inservice Inspection Impracticality

Attachment: Examination Limitation Details

cc: NRC Region IV - Regional Administrator
NRC Senior Resident Inspector, Grand Gulf Nuclear Station
NRR Project Manager

GNRO 2018/00054

ENCLOSURE

Relief Request Number GG-ISI-023
Relief Request in Accordance with 10 CFR 50.55a(g)(5)(iii), Inservice Inspection Impracticality

ATTACHMENT: Examination Limitation Details

1. American Society of Mechanical Engineers (ASME) Code Component(s) Affected

The welds and items with limited examinations included in this relief request, GG-ISI-023, are identified in Table 1 below.

Table 1			
Examination Category	Item Number (No.)	Component Identification (ID)	Code Class
B-A	B1.30	Reactor Vessel Shell-to-Flange Weld – AE	1
B-A	B1.40	Reactor Vessel Head-to-Flange Weld – AG	1
B-G-1	B6.40	Reactor Vessel Threads in Flange – FLG LIG 1-25	1
B-G-1	B6.40	Reactor Vessel Threads in Flange – FLG LIG 26-50	1
B-G-1	B6.40	Reactor Vessel Threads in Flange – FLG LIG 51-76	1
B-O	B14.10	Reactor Vessel Welds in CRD Housings Lower Welds– 02-35, 02-31, 02-27 and 02-23	1
R-A ¹	R1.16	Reactor Recirculation System Weld – 1B33G001W11	1
R-A ¹	R1.16	Reactor Recirculation System Weld – 1B33G10-A1-A	1
R-A ¹	R1.16	Reactor Recirculation System Weld – 1B33G10-A1-B	1
R-A ¹	R1.16	Reactor Recirculation System Weld – 1B33G10-A1-E	1
R-A ¹	R1.16	Reactor Recirculation System Weld – 1B33G001W34	1
R-A ¹	R1.16	Reactor Recirculation System Weld – 1B33G10-B1-A	1
R-A ¹	R1.16	Reactor Recirculation System Weld – 1B33G10-B1-B	1
R-A ¹	R1.16	Jet Pump Instrument Nozzle N9-A Safe End-to-Extension Circumferential Weld – N09A-KC	1
R-A ¹	R1.20	Standby Liquid Control System Weld – 1C41G119-03-11-11	1

¹Entergy Operations, Inc. (EOI) implemented at Grand Gulf Nuclear Station (GGNS), Unit 1 a Risk Informed Inservice Inspection (RI-ISI) Program at the beginning of the Third 10-Year Inservice Inspection (ISI) Interval in accordance with an authorized request to use Code Case N-716 (Reference 1).

Unit/Inspection Interval: GGNS / Third 10-Year ISI Interval
 May 31, 2008 – November 30, 2017

2. **Applicable Code Edition and Addenda**

The "Code of Record" for the Third 10-Year ISI Interval at the GGNS was the 2001 Edition through the 2003 Addenda of the ASME Boiler and Pressure Vessel Code (BPV), Section XI, *Rules for Inservice Inspection of Nuclear Power Plant Components*, as conditioned by 10 CFR 50.55a. The Appendix VIII, Supplement 11, *Qualification Requirements for Full Structural Overlaid Wrought Austenitic Piping Welds*, requirements and use of the performance demonstration initiative (PDI) requirements at GGNS are in accordance with the 2001 Edition of Section XI as conditioned by 10 CFR 50.55a(b)(2).

3. **Applicable Code Requirement**

Throughout this request, as clarified by Code Case N-460, *Alternative Examination Coverage for Class 1 and Class 2 Welds Section XI, Division 1*, (Reference 2), when "essentially 100%" is stated it is understood to mean greater than 90% coverage of the required examination volume, or surface area, as applicable and is presented using guidance that was provided in the NRC presentation, *Coverage Relief Requests NDEIC* (Reference 4).

Examination Category: B-A, *Pressure Retaining Welds in Reactor Vessel*

Table IWB-2500-1, Examination Category B-A, Item No. B1.30 Shell-to-flange weld requires a volumetric examination depicted in Figure IWB-2500-4 for essentially 100% of the weld volume.

Table IWB-2500-1, Examination Category B-A, Item No. B1.40 Head-to-flange weld requires a volumetric and surface examination depicted in Figure IWB-2500-5 for essentially 100% of the weld volume and surface area.

Examination Category: B-G-1, *Pressure Retaining Bolting, Greater Than 2 in. In Diameter*

Table IWB-2500-1, Examination Category B-G-1, Item No. B6.40 Threads in Flange requires a volumetric examination depicted in Figure IWB-2500-12 for essentially 100% of the flange thread volume.

Examination Category: B-O, *Pressure Retaining Welds in Control Rod Housings*

Table IWB-2500-1, Examination Category B-O, Item No. B14.10 Reactor Vessel Welds in CRD housings requires a volumetric or surface examination depicted in Figures IWB-2500-18 for essentially 100% of the weld volume or surface area.

Examination Category: R-A, Table 1 of Code Case N-716 (Reference 3).

Code Case N-716, Table 1, Examination Category R-A, Item Nos. R1.16 and R1.20 require a volumetric examination of the volumes depicted in Figures IWB-2500-8(c) and IWB-2500-9, 10, and 11 and does not require a surface examination. The additional requirements apply from the table's applicable notes as described below:

Item No. R1.16

- These piping welds are to comply with the examination requirements under Item No. R1.16, which are those that have been identified in the GGNS RI-ISI Program as High Safety Significant (HSS) welds potentially subject to a degradation mechanism of Intergranular Stress Corrosion Cracking (IGSCC). Examination is limited due to the design configuration of each weld listed under this item number.

Note 1: The area of the examination volume shown in Figure IWB-2500-8(c) shall be increased by enough distance [approximately ~ ½ inch] to include each side of the base metal thickness transition or counter bore transition.

Note 2: Includes examination locations and Class 1 weld examination requirement figures that typically apply to Class 1, 2, 3, or Non-Class welds identified in accordance with [Note (4)] Inservice Inspection Requirements.

Note 3: In part, requires essentially 100% of the examination location to be examined.

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

Note 7: In accordance with the Owner's existing programs, such as primary water stress corrosion cracking (PWSCC), intergranular stress corrosion cracking (IGSCC), microbiological induced corrosion (MIC), or flow-accelerated corrosion (FAC) inspection programs, for degradation mechanisms as described in Table 2 of the Code Case.

Item No. R1.20

- These piping welds are to comply with the examination requirements under Item No. R1.20, which are those that have been identified in the GGNS RI-ISI Program as HSS welds not subject to a degradation mechanism. Examination is limited due to the design configuration of each weld listed under this item number. Only [Notes (1) and (3)] under R1.16 above apply to the piping welds with this item number.

4. Impracticality of Compliance

10 CFR 50.55a(g)(5)(iii) states, in part, that licensees may determine that conformance with certain code requirements is impractical and that the licensee shall notify the U.S. Nuclear Regulatory Commission (NRC or Commission) and submit information in support of the determination. Determination 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 120-month inspection interval or subsequent 120-month inspection interval for which relief is sought.

Pursuant to 10 CFR 50.55a(g)(5)(iii) described above, relief is requested because EOI has determined that compliance with the code requirements of achieving essentially 100% coverage of the welds and items listed in this request is impractical. This determination is based on actual demonstrated limitations experienced when attempting to comply with the code requirements in the performance of the examinations listed in this relief request.

The construction permit for GGNS was issued on September 4, 1974 and per 10 CFR 50.55a(g)(3) GGNS is required to meet the accessibility for preservice and inservice examination of Class 1, 2 and 3 components and their supports. However, these accessibility requirements only apply to standard designs such as those for fittings, valves, pumps, components and their supports where based on these standard designs limitations are inherently associated with the designs, such valves to fittings, valves to pipe and fittings to pipe where only a one sided ultrasonic examination is possible or the materials used for the fabrication of these components do not allow complete examination coverage. Details for all examination restrictions and reductions in required examination coverage are provided in Attachment.

When examined, the welds and items listed in this relief request did not receive the required code coverage due to their materials and/or design configurations. These conditions resulted in limitations that prohibited obtaining essentially 100% examination coverage of the required examination volume or area.

Examination Category: B-A, Pressure Retaining Welds in Reactor Vessel

Item No. B1.30

- Reactor Vessel Shell-to-Flange Weld – AE is a Class 1, pressure retaining weld. Examination is limited to a single sided examination from the shell side due to the proximity of the Reactor Vessel (RV) flange.

Item No. B1.40

- Reactor Vessel Head-to-Flange Weld – AG is a Class 1, pressure retaining weld. Examination is limited to a single sided examination from the top head side due to the proximity of the RV top head flange.

Examination Category: B-G-1, Pressure Retaining Bolting, Greater Than 2 in. In Diameter

Item No. B6.40

- Reactor Vessel Threads in Flange – Total Ligament Flange Thread Areas = 1 thru 76. This examination is part of the RV Class 1 bolting required examinations. Examination is limited due to the RV flange seating surface.

Examination Category: B-O, Pressure Retaining Welds in Control Rod Housings

Item No. B14.10

- Reactor Vessel Welds in CRD Housings Lower Welds – 02-35, 02-31, 02-27 and 02-23 are all Class 1 welds that requires a volumetric or surface examination in 10% of the peripheral CRD housings as depicted in Figures IWB-2500-18 for essentially 100% of the weld volume or surface area. Examination is limited on these lower CRD welds due to the proximity of adjacent components.

Examination Category: R-A

Item No. R1.16

- 1B33G001W11, 1B33G10-A1-A, 1B33G10-A1-B, 1B33G10-A1-E, 1B33G001W34, 1B33G10-B1-A and 1B33G10-B1-B are all Class 1, Reactor Recirculation System welds that are either NPS 16 or NPS 24 connecting a pipe to fitting or a fitting to pipe cap. Additionally, N09A-KC is a Class 1, Jet Pump Instrument nozzle N9-A safe end-to-extension circumferential weld NPS 4 that has a limitation where the downstream penetration side pipe extension piece design limits the examination to be performed. All of these welds were identified by the N-716 (Reference 1) RI-ISI Program as HSS with a potential degradation mechanism of IGSCC. Examination is limited due to the fittings of the Recirculation System welds and the pipe extension design configuration of N09A-KC.

Item No. R1.20

- 1C41G119-03-11-11 is a Class 1, Standby Liquid Control System weld NPS 1.5 elbow to pipe weld. This weld was identified by the N-716 (Reference 1) RI-ISI Program as HSS and not subject to a degradation mechanism. Examination is limited on the intrados of the elbow side of the weld due to the size and design of the elbow.

5. Burden Caused by Compliance

To obtain the code required examination volume or coverage of the subject welds would require significant modifications to GGNS welded components and fittings. The components and fittings associated with the subject welds are standard design items meeting typical national standards that specify required configurations and dimensions. To replace these items with items of alternate configurations to enhance examination coverage would require unique design and fabrication. Because these items are in the Class 1 boundaries and form part of the Reactor Coolant Pressure Boundary (RCPB), their redesign and fabrication would be an extensive effort. In addition to obtaining the non-standard items, their installation into the Class 1 boundaries is also a significant effort requiring disassembly of portions of the RCPB.

Radiographic Testing (RT) is not a desired option because RT is limited in the ability to detect service induced flaws. Additionally, the water must be drained from the systems where radiography is performed. This increases operational risk through prolonged system restoration times and increased station exposure due to increased general radiation dose rates over a much broader area than in the area of the weld being examined.

Overall, it is not possible to obtain examination coverage of greater than 90% of the required code examination volume or area for the welds and items in this request without extensive design modifications. Examinations have been performed to the maximum extent possible.

The examination techniques used for each weld or item in this relief request were reviewed to determine if additional coverage could be achieved by improving those techniques, and none could be identified, thus reconfirming that the examinations have been performed to the maximum extent possible. Therefore, EOI has determined that obtaining essentially 100% coverage is not feasible and is impractical without causing significant redesign, increased radiation exposure, and/or an increased potential to damage the plant or the component itself.

6. Proposed Alternative and Basis for Use

Proposed Alternative

In lieu of the ASME BPV Section XI essentially 100 percent volumetric examination, EOI proposes limited examination coverage for the subject welds achieved by ultrasonic testing (UT) and surface liquid penetrant testing (PT) as listed in Attachment.

Basis for Use

EOI performed inservice examinations of selected welds and items in accordance with the requirements of 10 CFR 50.55a, plant technical specifications, and the ASME BPV Section XI, 2001 edition through the 2003 Addenda, including Appendix VIII requirements in accordance with the 2001 edition of Section XI and applicable Performance Demonstration Initiative (PDI) requirements. When a component was found to have condition(s), which limit the examination volume, EOI is required to submit this information to the enforcement and regulatory authorities having jurisdiction at the plant site. This relief request has been written to address areas where these conditions exist and where the required amount of coverage is reduced below that required by ASME BPV Section XI and the NRC.

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.

EOI has performed all of the examinations for the welds and items listed in this request to the maximum extent possible. The welds and items subject to this request are all located inside the drywell and monitored for operational leakage per the GGNS leakage limits described below for the Reactor Coolant System (RCS).

RCS leakage is limited by GGNS Technical Specifications Section 3.4.5, *RCS Operational Leakage*, to:

- a. no pressure boundary leakage;
- b. ≤ 5 gpm of unidentified leakage;
- c. ≤ 30 gpm total leakage averaged over the previous 24 hour period; and
- d. ≤ 2 gpm increase in unidentified leakage within the previous 24 hour period in Mode 1.

Additionally, during outages, system engineers perform walk-downs of systems inside the drywell. This walk-down is performed to look for evidence of leakage accumulation as well as system abnormalities that could affect plant performance. Also, an ASME BPV Section XI system pressure test and VT-2 (visual testing), is performed each refueling outage.

All inservice examinations were performed by personnel certified in accordance with IWA-2300, *Qualifications of Nondestructive Examination Personnel*, of the 2001 Edition with the 2003 Addenda of the ASME BPV Section XI Code. Additionally, personnel performing ultrasonic examination are qualified in accordance with ASME BPV Section XI, Appendix VIII, of the 2001 Edition as conditioned by 10 CFR 50.55a(b)(2).

The UT techniques for each weld were reviewed to determine if additional coverage could be achieved. GGNS's procedures require the examiner to make an attempt to achieve complete coverage by using alternative techniques such as using a smaller transducer wedge thus reducing the distance from the exit point to the front of the wedge, changing angles or reducing the search unit element size. Any alternative equipment is required to be in compliance with the limits specified in the qualified procedure. Alternate techniques were investigated at the time when it was discovered that essentially 100% coverage could not be obtained.

For welds in austenitic materials examined in accordance with Appendix VIII, Supplement 2, *Qualification Requirements for Wrought Austenitic Piping Welds*, the ASME code required examination coverage is limited when the weld can only be scanned in the axial direction from one side. Therefore, Attachment, Table 1 only reports code coverage.

The Performance Demonstration Qualification Summary (PDQS) for the qualified Electric Power Research Institute (EPRI) procedure, PDI-UT-2, *PDI Generic Procedure for the Ultrasonic Examination of Austenitic Pipe Welds PDI-UT-2*, in part states, the austenitic single side qualification documented on this summary demonstrates application of best available technology, but do not meet the requirements of 10 CFR 50.55a(b)(2)(xvi)(B). It should be noted that UT was performed through the weld to obtain the maximum possible code examination volume and, as shown in Attachment, the theoretical beam path extends into the far side for the examinations performed. While the coverage is not included in the code coverage of Attachment, Table 1, the techniques employed for the single side examination are noted as a best effort examination in the examination coverage summary for each individual weld. The coverage obtained was the maximum practical. Therefore, the UT examinations conducted using the Appendix VIII, Supplement 2, qualified procedure, provide reasonable assurance for the detection of flaws on the far side of welds where the ultrasonic beam has been transmitted even though not presently qualified.

7. Duration of Proposed Alternative

This relief request is applicable to the GGNS Third 10-year ISI Interval which began on May 31, 2008 and ended on November 30, 2017.

8. Precedents

Industry requests for relief due to impracticality associated with limited examinations are common and are typically filed by licensees. Examples of recent NRC relief request authorizations that are in accordance with the guidance in (Reference 4) are:

1. NRC Safety Evaluation Report (SER) letter to Entergy Nuclear Operations, Inc., for the Palisades Nuclear Plant, Relief Request Number RR 4-25 Impracticality – Limited Coverage Examinations during the Fourth 10-Year Inservice Inspection Interval, (CAC No. MF8886), dated August 14, 2017 (ADAMS Accession Number ML17194A807).
2. NRC SER letter to Duke Energy Carolinas, LLC, *Oconee Nuclear Station, Units 1, 2, and 3 – Relief from the Requirements of the ASME Code (Relief Request Nos. 15-ON-002 and 15-ON-003, Fourth 10-Year Inservice Inspection Interval) (CAC Nos. MF6506, MF6507, and MF6511)*, dated July 22, 2016 (ADAMS Accession Number ML 16197 A011).
3. NRC SER letter to Exelon Generation Company, LLC, *Dresden Nuclear Power Station, Units 2 and 3 – Request 14R-17 Relief from the Requirements of the ASME Code (CAC Nos. MF3352 AND MF3353)*, dated October 30, 2015 (ADAMS Accession Number ML 15265A164).

9. References

1. NRC SER Letter that Authorized GG-ISI-002 Rev 0, Request to Utilize the Alternative Requirements of Code Case N-716; Alternative Piping Classification and Examination Requirements Authorized as GGNS RIS_B program. – See NRC SER, [ADAMS Accession No. ML072430005], Dated: 9-21-2007, TAC No. MD3044.
2. American Society of Mechanical Engineers, Boiler and Pressure Vessel Code, Section XI, Code Case N-460, *Alternative Examination Coverage for Class 1 and Class 2 Welds, Section XI, Division 1*.
3. American Society of Mechanical Engineers, Boiler and Pressure Vessel Code, Section XI, Code Case N-716, *Alternative Piping Classification and Examination Requirements, Section XI, Division 1*.
4. NRC presentation, *Coverage Relief Requests NDEIC-January 13-15, 2015*, dated January 13, 2015, (Adams Accession Number ML 15013A266).

10. Attachment

Attachment: Examination Limitation Details

GNRO 2018/00054

ENCLOSURE, ATTACHMENT

Examination Limitation Details

1. Introduction

This attachment contains a table (Table 1), and figures (Figures A through V) that are used to depict the limitations and calculations for obtained coverage, materials and product forms, with ultrasonic examination angles and wave forms used, and the examination results for the welds and items associated with this relief request.

Table 1							
Component Information							
Exam Cat	Item No.	Component ID	Item Description	Material 1 and Product Form	Material 2 and Product Form	Examination Code Coverage Obtained	Examination Limitations and Results
B-A	B1.30	AE	Reactor Vessel Shell-to-Flange Weld (Figs. A-C)	SA 533 Gr. B Class1, Plate with Stainless Steel Cladding	SA 508 Cl. 2, Forging	UT = 69.2%	RV Shell-to-Flange Weld AE is a Class 1 weld. Exam is limited due to the proximity of the RV flange. No recordable Indications.
B-A	B1.40	AG	Reactor Vessel Head-to-Flange Weld (Figs. A & D-E)	SA 533 Gr. B Class1, Plate	SA 508 Cl. 2, Forging	UT = 85.0%	RV Head-to-Flange AG is a Class 1 weld. Exam is limited due to the proximity of the top head flange. No recordable indications.
B-G-1	B6.40	FLG LIG 1-25	Reactor Vessel Threads in Flange (Figs. F-G)	SA 508 Cl. 2, Forging	N/A	UT = 81.5%	RV Threads in Flange Ligament Areas 1-25 is a Class 1 Item. No scan was performed for 3.5" on each ligament due to the configuration of the flange sealing surface. No recordable indications.

Table 1

Component Information							
Exam Cat	Item No.	Component ID	Item Description	Material 1 and Product Form	Material 2 and Product Form	Examination Code Coverage Obtained	Examination Limitations and Results
B-G-1	B6.40	FLG LIG 26-50	Reactor Vessel Threads in Flange (Figs. F-G)	SA 508 Cl. 2, Forging	N/A	UT = 81.5%	RV Threads in Flange Ligament Areas 26-50 is a Class 1 Item. No scan was performed for 3.5" on each ligament due to the configuration of the flange sealing surface. No recordable indications.
B-G-1	B6.40	FLG LIG 51-76	Reactor Vessel Threads in Flange (Figs. F-G)	SA 508 Cl. 2, Forging	N/A	UT = 81.5%	RV Threads in Flange Ligament Areas 51-76 is a Class 1 Item. No scan was performed for 3.5" on each ligament due to the configuration of the flange sealing surface. No recordable indications.
B-O	B14.10	02-35, 02-31, 02-27 and 02-23	Reactor Vessel Welds in CRD Housings Lower Welds Tube-to-Flange (Figs. H-I)	Inconel 600 SB-167, Tube	SA-182, F304, Forging	PT = 50.6%	RV Welds in CRD Housings Lower Welds are Tube-to-Flange Class 1 NPS 6 welds. Exam is limited due to the proximity of other components. No recordable indications.

Table 1

Component Information							
Exam Cat	Item No.	Component ID	Item Description	Material 1 and Product Form	Material 2 and Product Form	Examination Code Coverage Obtained	Examination Limitations and Results
R-A	R1.16	1B33G001W11	Pipe-to-Tee (Figs. J&K)	SA-358 Gr. 304 Cl. 1	SA-403 Gr. WPW 304	UT = 75%	Reactor Recirculation System Weld 1B33G001W11 is a Class 1 NPS 24 weld connecting a stainless steel Pipe to a stainless steel Tee. Exam is limited due to the Cross/Tee configuration. No recordable indications.
R-A	R1.16	1B33G10-A1-A	Tee-to-Pipe (Figs. J&L)	SA-403 Gr. WPW 304	SA-358 Gr. 304 Cl. 1	UT = 75%	Reactor Recirculation System Weld 1B33G10-A1-A is a Class 1 NPS 16 weld connecting a stainless steel Tee to a Stainless steel Pipe. Exam is limited due to the Cross/Tee configuration. No recordable indications.
R-A	R1.16	1B33G10-A1-B	Tee-to-Pipe (Figs. J&M)	SA-403 Gr. WPW 304	SA-358 Gr. 304 Cl. 1	UT = 75%	Reactor Recirculation System Weld 1B33G10-A1-B is a Class 1 NPS 16 weld connecting a stainless steel Tee to a Stainless steel Pipe. Exam is limited due to the Cross/Tee configuration. No recordable indications.

Table 1

Component Information							
Exam Cat	Item No.	Component ID	Item Description	Material 1 and Product Form	Material 2 and Product Form	Examination Code Coverage Obtained	Examination Limitations and Results
R-A	R1.16	1B33G10-A1-E	Tee-to-Pipe Cap (Figs. J&N)	SA-403 Gr. WPW 304	SA-358 Gr. 304 Cl. 1	UT = 50%	Reactor Recirculation System Weld 1B33G10-A1-E is a Class 1 NPS 24 weld connecting a stainless steel Tee to a Stainless steel Pipe. Exam is limited due to the Cross/Tee configuration. No recordable indications.
R-A	R1.16	1B33G001W34	Pipe-to-Tee (Figs. O&P)	SA-358 Gr. 304 Cl. 1	SA-403 Gr. WPW 304	UT = 50%	Reactor Recirculation System Weld 1B33G001W34 is a Class 1 NPS 24 weld connecting a stainless steel Pipe to a stainless steel Tee. Exam is limited due to the Cross/Tee configuration. No recordable indications.
R-A	R1.16	1B33G10-B1-A	Tee-to-Pipe (Figs.O&Q)	SA-403 Gr. WPW 304	SA-358 Gr. 304 Cl. 1	UT = 50%	Reactor Recirculation System Weld 1B33G10-B1-A is a Class 1 NPS 16 weld connecting a stainless steel Tee to a Stainless steel Pipe. Exam is limited due to the Cross/Tee configuration. No recordable indications.
R-A	R1.16	1B33G10-B1-B	Tee-to-Pipe (Figs.O&R)	SA-403 Gr. WPW 304	SA-358 Gr. 304 Cl. 1	UT = 50%	Reactor Recirculation System Weld 1B33G10-B1-B is a Class 1 NPS 16 weld connecting a stainless steel Tee to a Stainless steel Pipe. Exam is limited due to the Cross/Tee configuration. No

Table 1							
Component Information							
Exam Cat	Item No.	Component ID	Item Description	Material 1 and Product Form	Material 2 and Product Form	Examination Code Coverage Obtained	Examination Limitations and Results
							recordable indications.
R-A	R1.16	N09A-KC	Nozzle Safe End-to-Extension Circ. Weld (Figs. S-T)	SA 182, F304, or F316	SA-376, Gr. 304	UT = 64.5%	Jet Pump Instrument Nozzle N9-A Safe End-to-Extension Circ. Weld N09A-KC is a Class 1 NPS 4 weld connecting a stainless steel Safe End to a stainless steel Pipe extension piece. No axial exam was performed on the downstream side of this weld do to the design configuration. No recordable indications.
R-A	R1.20	1C41G119-03-11-11	Elbow-to-Pipe (Figs.U-V)	SA-403 or SA-182 Gr. 304	SA-376 or SA-358	UT = 87.7%	Standby Liquid Control System weld 1C41G119-03-11-11 is a Class 1 NPS 1.5 weld connecting a stainless steel Elbow to a stainless steel Pipe. Exam is limited due to the Elbow Intrados. No recordable indications.

NOTES:

Ref GE Drawing 767E977 was used for Reactor Recirculation System materials along with UFSAR Table 5.2-4.
 Ref LC-II-II from SEP-ISI-GGN-001, P Drawing P-1082, and UFSAR Table 5.2-4 for Standby Liquid Control System.
 Ref Drawing RPV-II-I from SEP-ISI-GGN-001, DRW 3519-328, and UFSAR Table 5.2-4 for Jet Pump Instrument Nozzle.

Figure A
 Examination Category: B-A
 Item No. B1.30 and B1.40

Component ID: RV Shell-to-Flange Weld AE and RV Head-to-Flange Weld AG

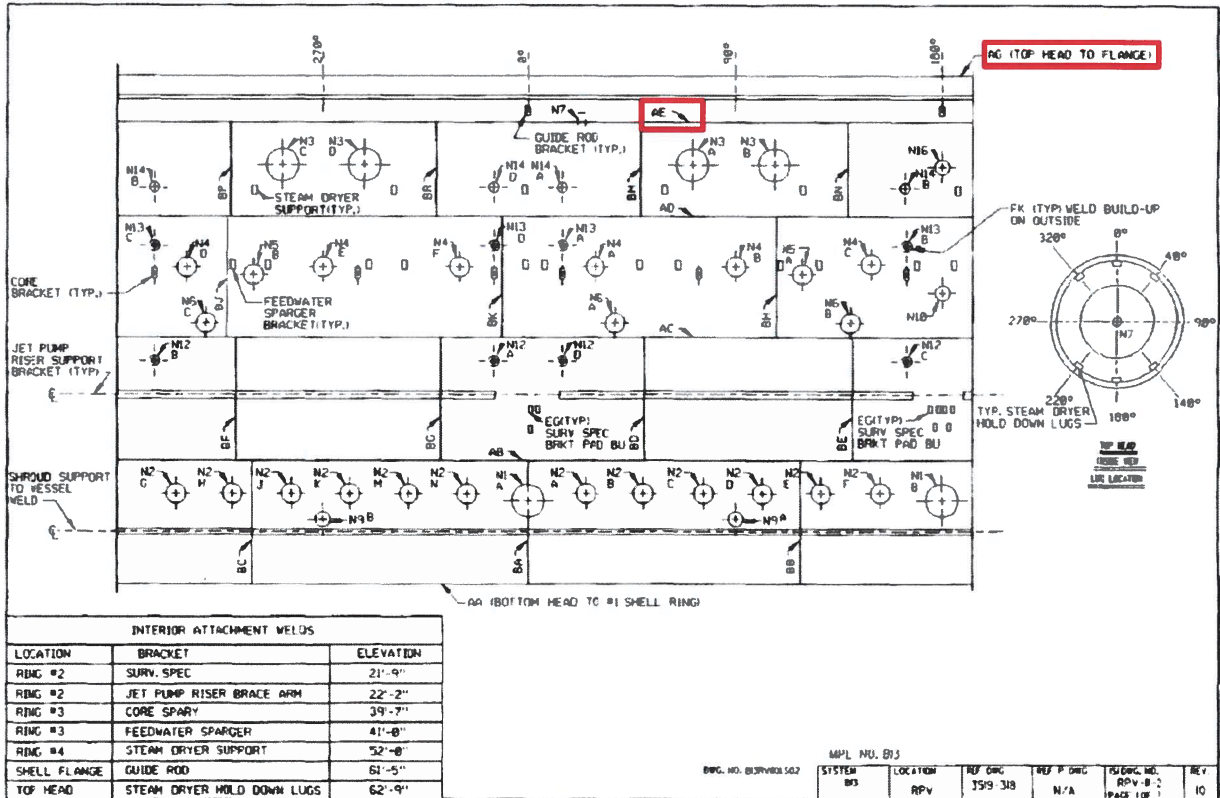


Figure B
Examination Category: B-A
Item No. B1.30

Component ID: RV Shell-to-Flange Weld AE

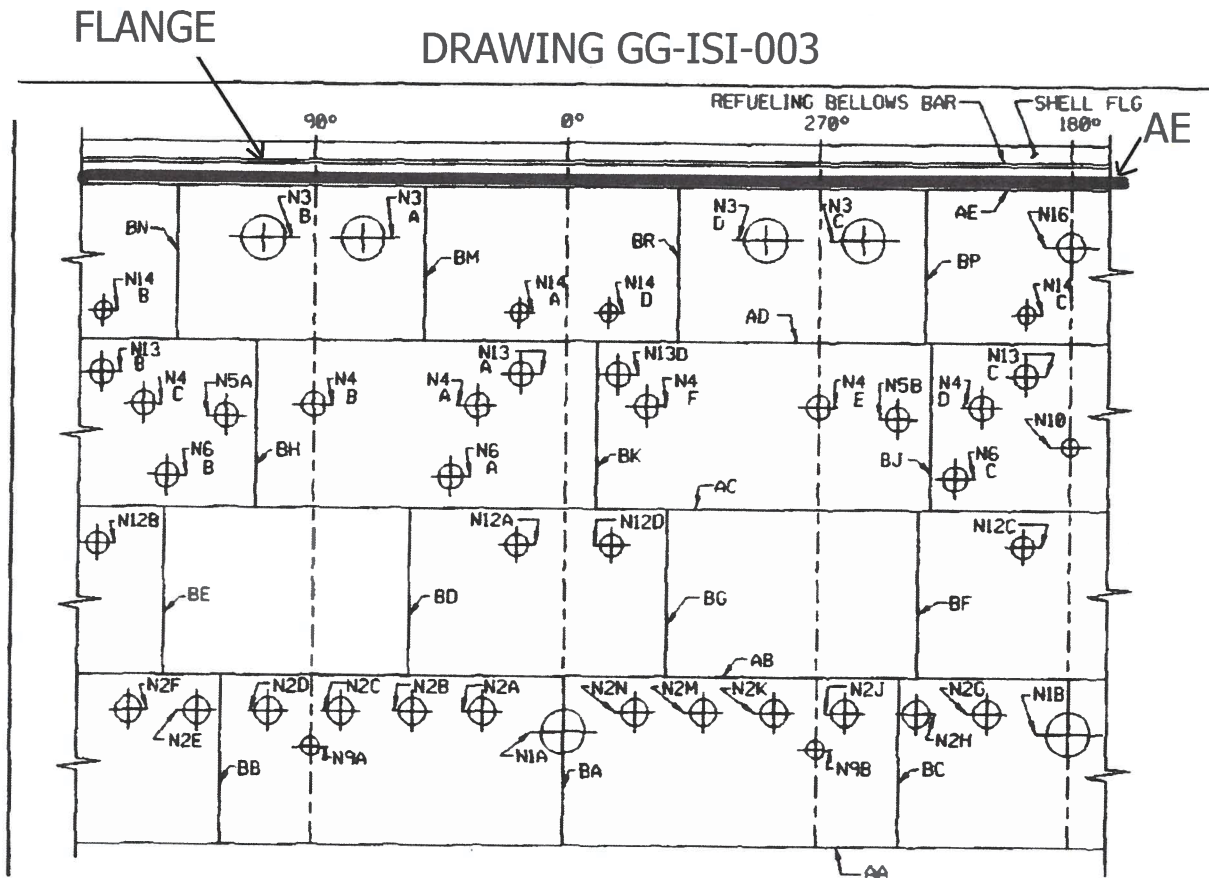


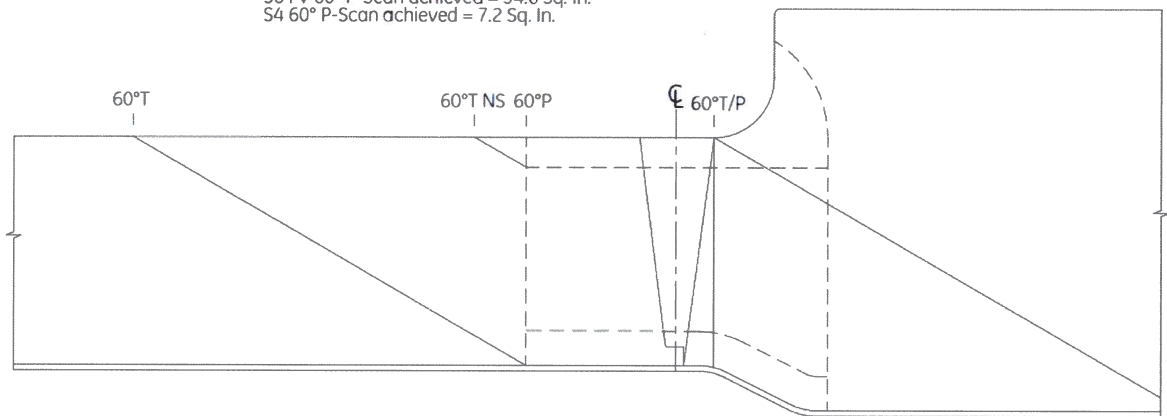
Figure C
Examination Category: B-A
Item No. B1.30

Component ID: RV Shell-to-Flange Weld AE

S6 NS 60° Exam Volume = 15.1 Sq. In.
S6 FV 60° Exam Volume = 58.6 Sq. In.
S4 60° Exam Volume = 11.9 Sq. In.

S6 NS 60° T-Scan achieved = 7.2 Sq. In.
S6 FV 60° T-Scan achieved = 57.3 Sq. In.
S4 60° T-Scan achieved = 11.9 Sq. In.

S6 NS 60° P-Scan achieved = 6.3 Sq. In.
S6 FV 60° P-Scan achieved = 34.6 Sq. In.
S4 60° P-Scan achieved = 7.2 Sq. In.



% Total Composite Coverage = 69.2%

During the manual examination of the Component ID AE Weld, no recordable indications were detected utilizing a 60°RL wave search unit. Examination was single-side due to proximity of the vessel flange.

Figure D
Examination Category: B-A
Item No. B1.40

Component ID: RV Head-to-Flange Weld AG

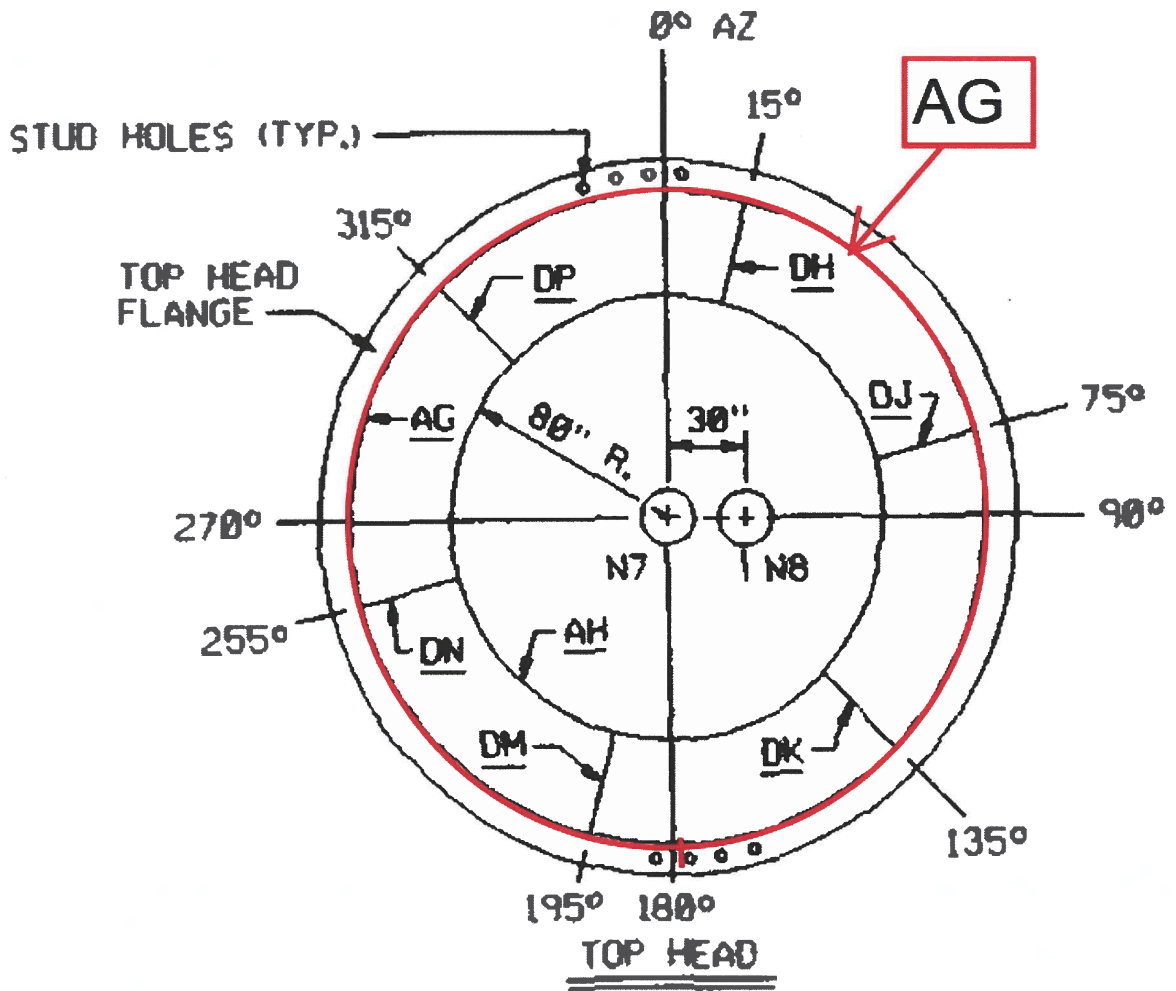
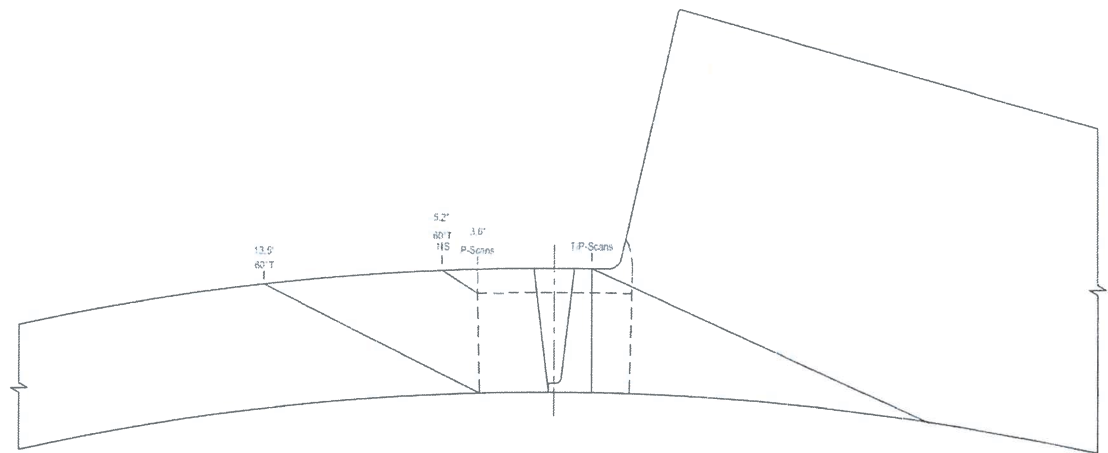


Figure E
Examination Category: B-A
Item No. B1.40

Component ID: RV Head-to-Flange Weld AG

Grand Gulf Unit 1
Top Head to Flange Weld AG



%Total Composite Coverage = 85.0%

During the manual examination of Component ID AE Weld, no recordable indications were detected utilizing a 60°RL wave search unit. Exam was a single side due to proximity of the vessel flange.

Note: An MT Exam was also performed on Component ID AE as a part of satisfying code requirements.

Figure F
 Examination Category: B-G-1
 Item No. B6.40

Component IDs: RV Reactor Vessel Threads in Flange, FLG LIG 1-25, FLG LIG 26-50,
 and FLG LIG 51-76

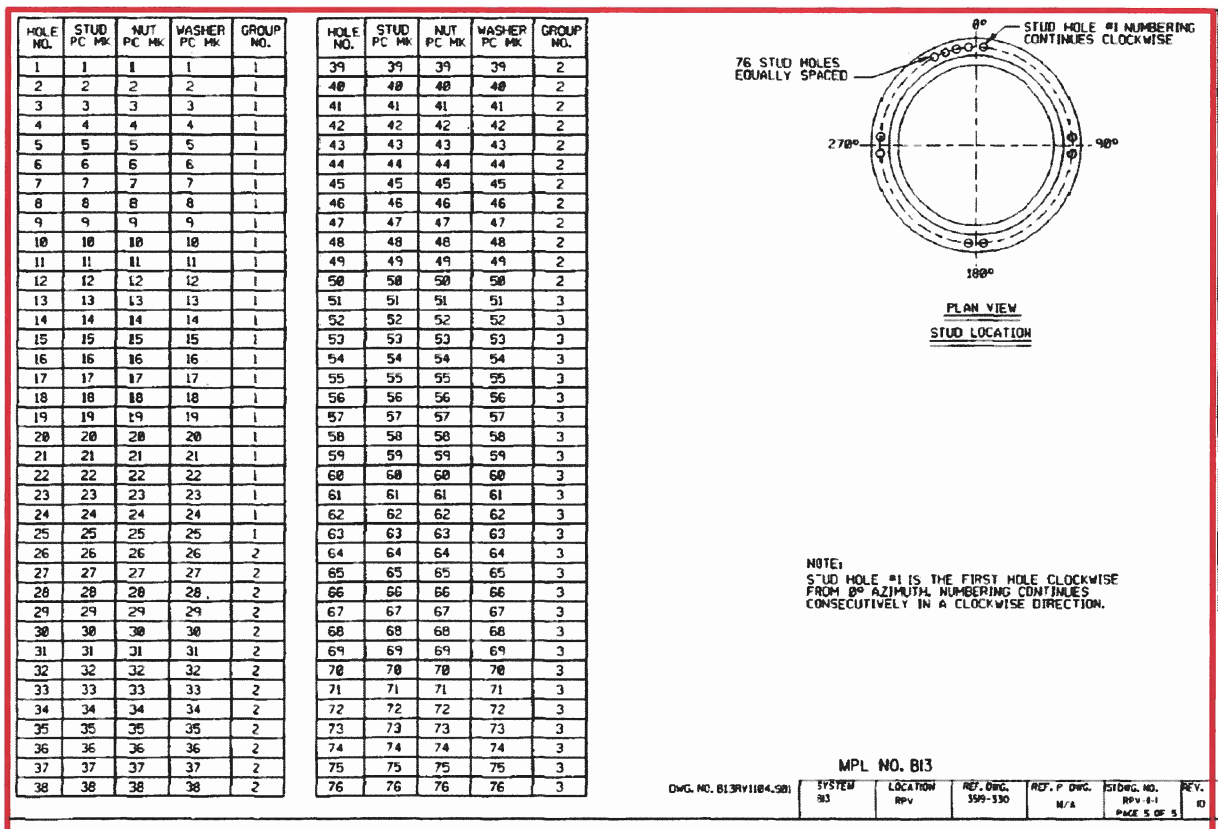
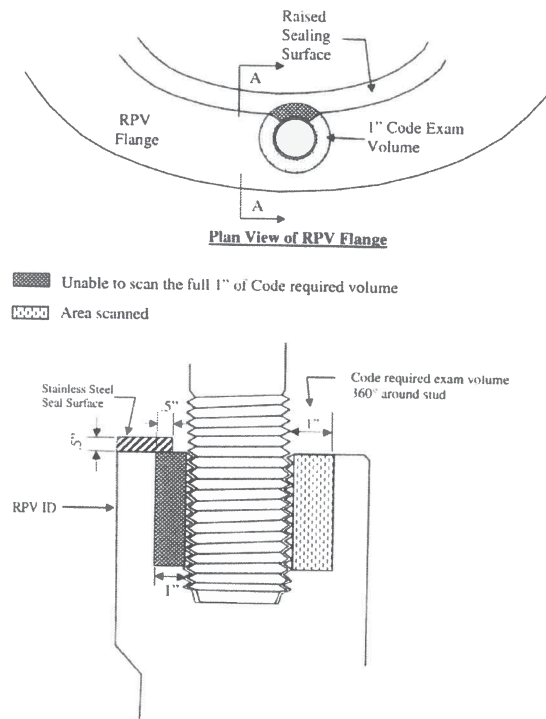


Figure G
Examination Category: B-G-1
Item No. B6.40

**Component ID: RV Reactor Vessel Threads in Flange, FLG LIG 1-25 FLG LIG 26-50 and
FLG LIG 51-76**



Manual Exam performed utilizing a 0° longitudinal wave search unit. No scan was performed for 3.5" on each ligament due to the configuration of the flange sealing surface. 81.5% of the Code required volume was achieved.

Figure H
 Examination Category: B-O
 Item No. B14.10

Component IDs: RV Welds in CRD Housings Lower Welds, 02-35, 02-31, 02-27 and 02-23

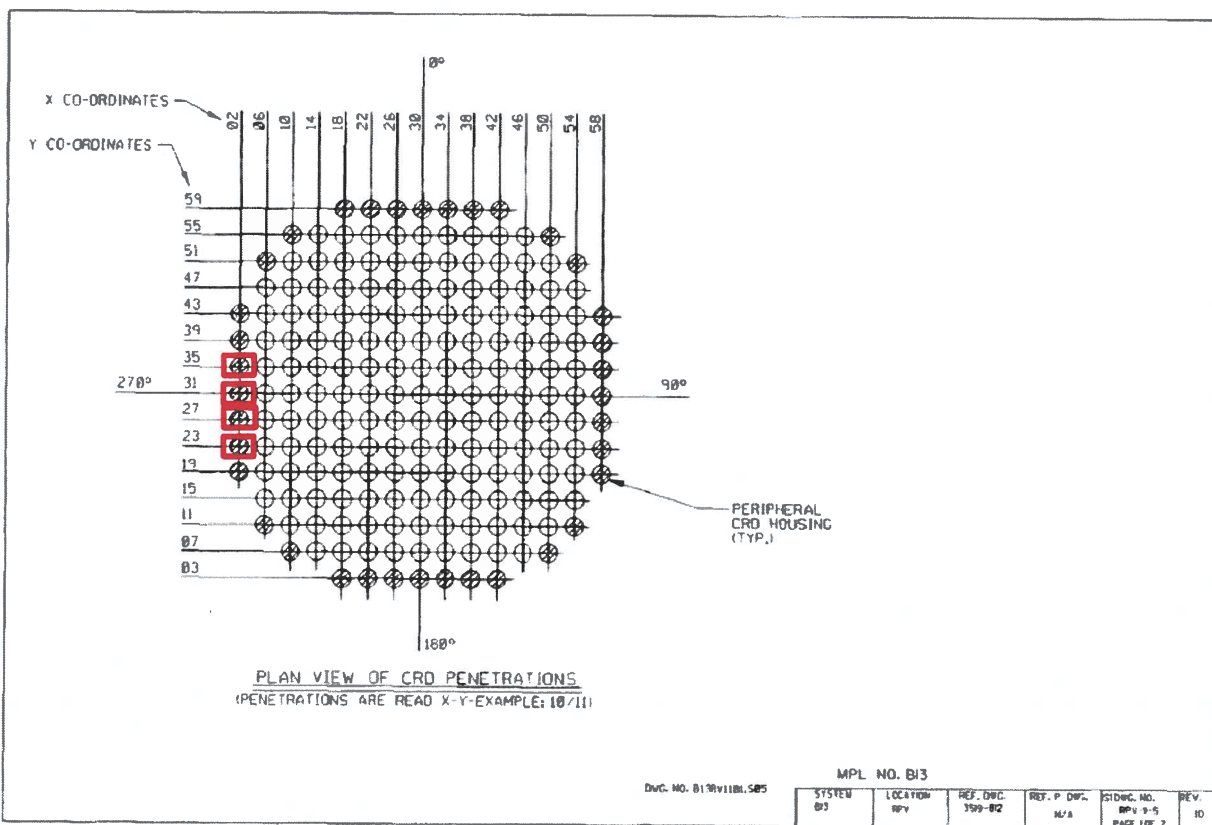
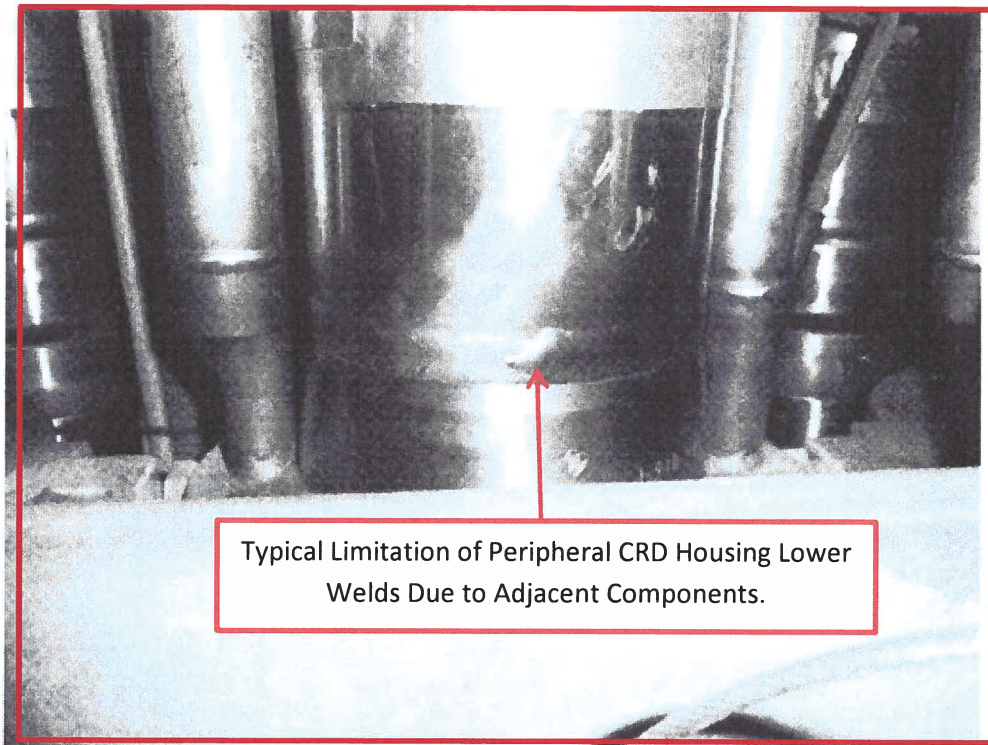


Figure I
Examination Category: B-O
Item No. B14.10

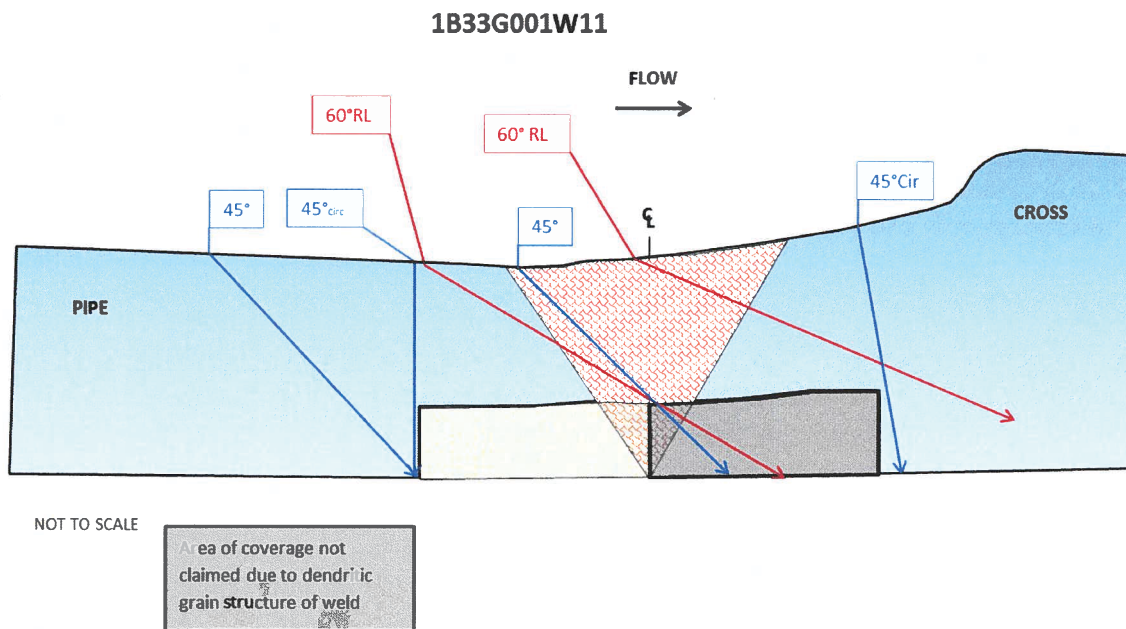
Component IDs: RV Welds in CRD Housings Lower Welds, 02-35, 02-31, 02-27 and 02-23



%Total Composite Coverage = 50.6%

Figure K
Examination Category: R-A
Item No. R1.16

Component ID: Reactor Recirculation System Weld, 1B33G001W11



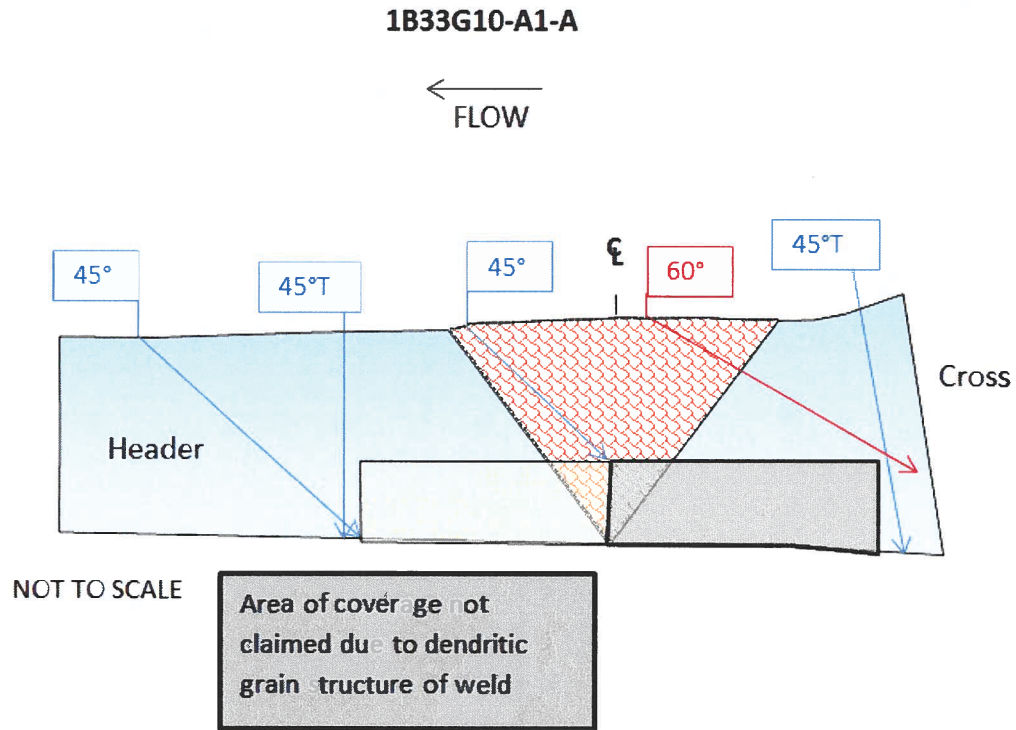
Crown Width = 1.60" Crown Height = Flush

Comments: Single side exam due to configuration (Pipe to Cross). A 45°S wave search unit was utilized for coverage per procedure. A 60°RL was used for best effort through the weld per procedure.

Circ. exam was performed on both sides of the weld
Axial exam performed only on the pipe side of weld due to component configuration.
Code Coverage claimed = 75%
No Recordable Indications were detected.

Figure L
Examination Category: R-A
Item No. R1.16

Component ID: Reactor Recirculation System Weld, 1B33G10-A1-A



Crown Width = 1.75" Crown Height = Flush

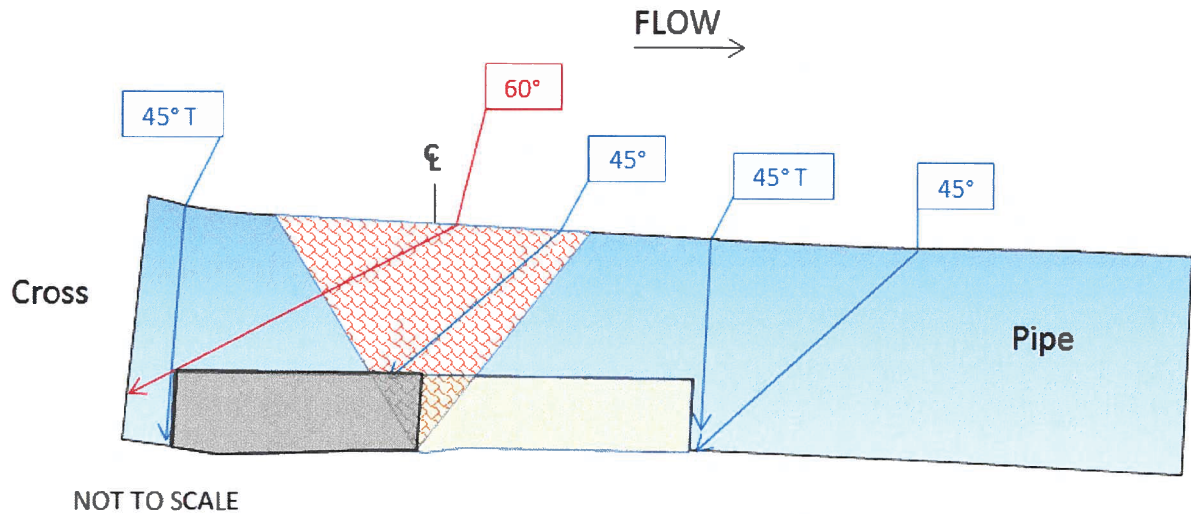
Comments: Single side exam due to configuration (Cross to Pipe Header). A 45°S wave search unit was utilized for coverage per procedure. A 60°RL was used for best effort through the weld per procedure. Code Coverage claimed

Circ. exam was performed on both sides of the weld
Axial exam performed only on the pipe side of weld due to component configuration.
Code Coverage claimed = 75%
No Recordable Indications were detected.

Figure M
Examination Category: R-A
Item No. R1.16

Component ID: Reactor Recirculation System Weld, 1B33G10-A1-B

1B33G10-A1-B



**Area of coverage not
claimed due to dendritic
grain structure of weld**

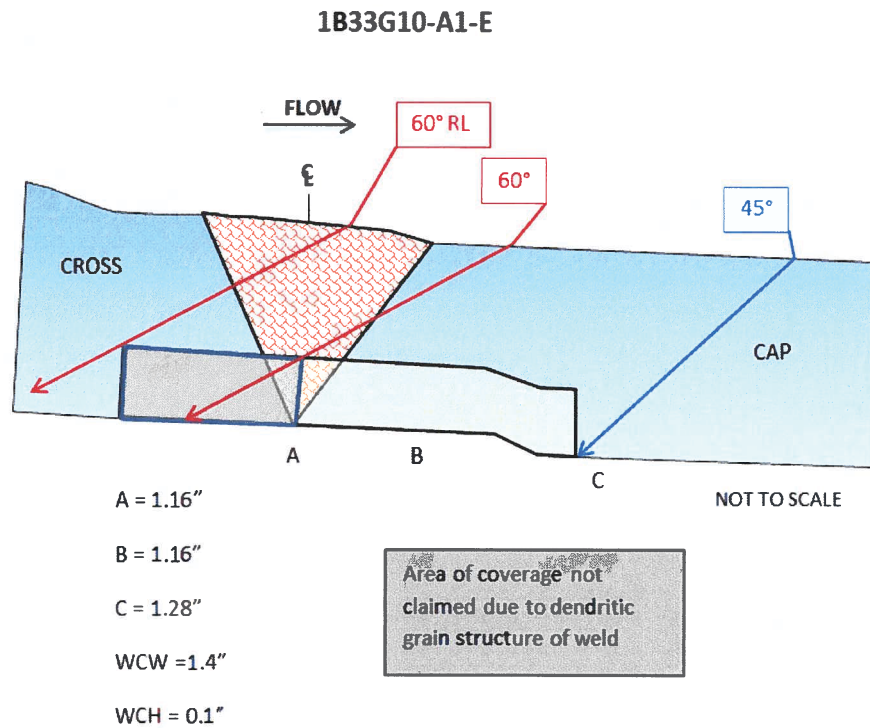
Crown Width = 1.60" Crown Height = Flush

Comments: Single side exam due to configuration (Cross to Pipe). A 45°S wave search unit was utilized for coverage per procedure. A 60°RL was used for best effort through the weld per procedure. Code Coverage claimed

Circ. exam was performed on both sides of the weld
Axial exam performed only on the pipe side of weld due to component configuration.
Code Coverage claimed = 75%
No Recordable Indications were detected.

Figure N
Examination Category: R-A
Item No. R1.16

Component ID: Reactor Recirculation System Weld, 1B33G10-A1-E



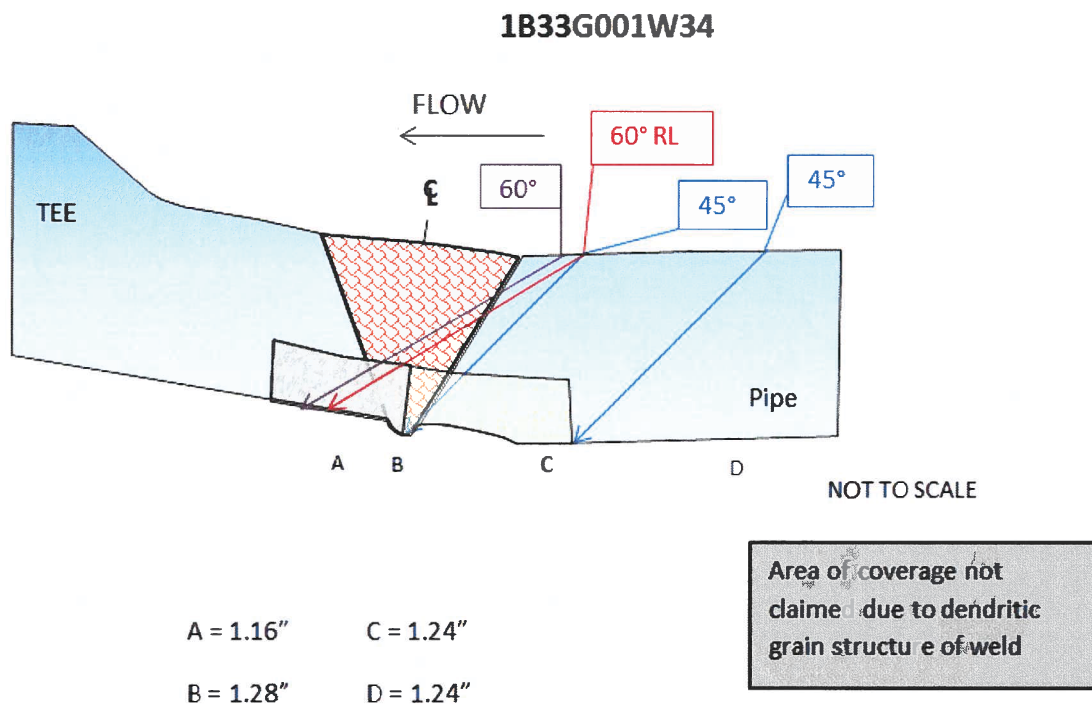
Comments: Single side exam due to configuration (Cross to Cap). A 45°S and a 60°S wave search unit was utilized for coverage per procedure. A 60°RL was used for best effort through the weld per procedure. Code Coverage claimed

Note: Procedure is not qualified for detection or length sizing while performing axial direction scans on the far side of the weld when only single side access is obtainable. Therefore the maximum obtainable CRV for single side UT exams of austenitic weld material is 50% while performing scan in the axial direction.

No Recordable Indications were detected.

Figure P
Examination Category: R-A
Item No. R1.16

Component ID: Reactor Recirculation System Weld, 1B33G001W34

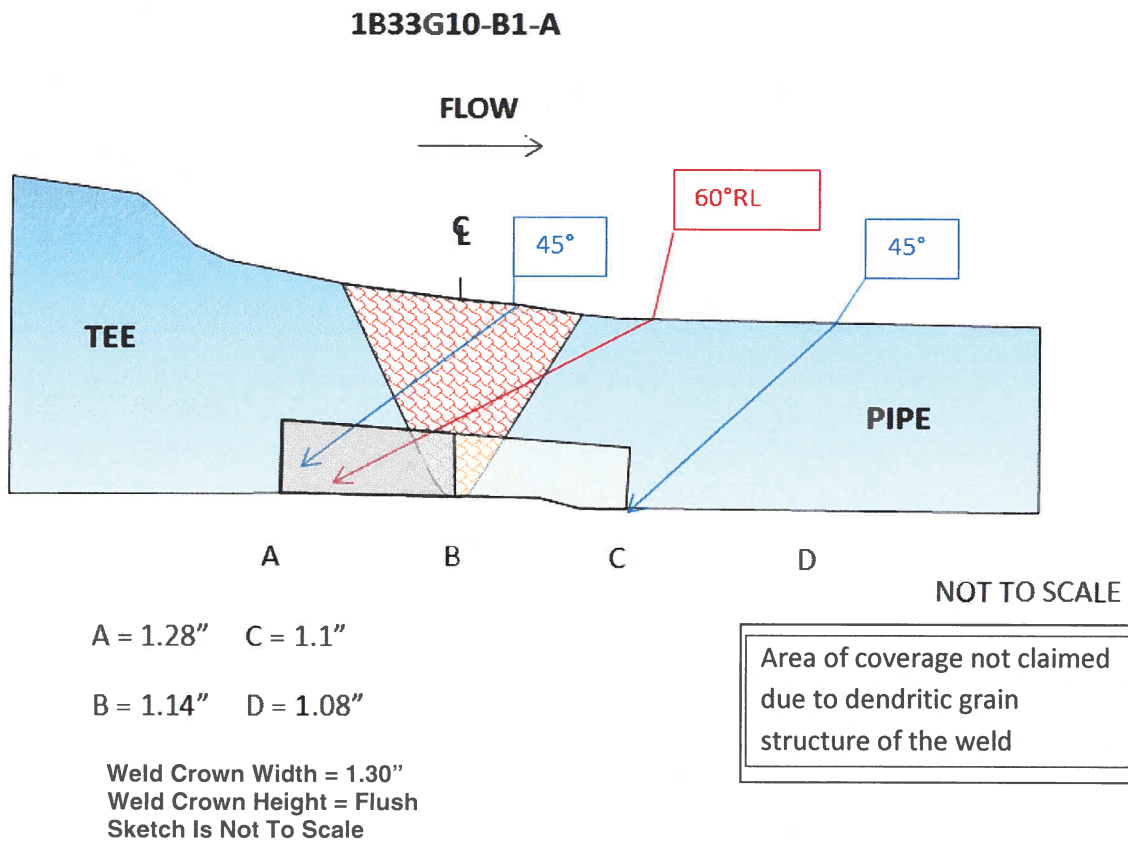


Comments: Single side exam due to configuration (Pipe to Tee). A 45°S and a 60°S wave search unit was utilized for coverage per procedure. A 60°RL was used for best effort through the weld per procedure. Code Coverage claimed

Note: Procedure is not qualified for detection or length sizing while performing axial direction scans on the far side of the weld when only single side access is obtainable. Therefore the maximum obtainable CRV for single side UT exams of austenitic weld material is 50% performing scan in the axial direction. No Recordable Indications were detected.

Figure Q
Examination Category: R-A
Item No. R1.16

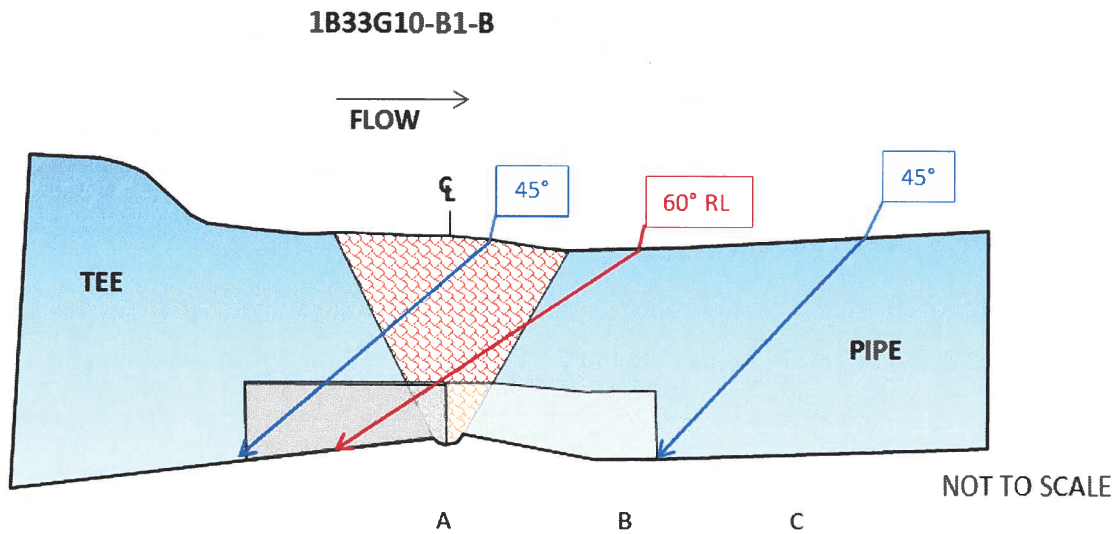
Component ID: Reactor Recirculation System Weld, 1B33G10-B1-A



Comments: Single side exam due to configuration (Tee to Pipe). A 45°S and a 60°S wave search unit was utilized for coverage per procedure. A 60RL was used for best effort through the weld per procedure. Code Coverage claimed.

Note: Procedure is not qualified for detection or length sizing while performing axial direction scans on the far side of the weld when only single side access is obtainable. Therefore the maximum obtainable CRV for single side UT exams of austenitic weld material is 50% while performing scan in the axial direction. No Recordable Indications were detected.

Figure R
Examination Category: R-A
Item No. R1.16
Component ID: Reactor Recirculation System Weld, 1B33G10-B1-B



A = 1.04"

B = 1.1"

C = 1.1"

Area of coverage not
claimed due to dendritic
grain structure of weld

Weld Crown Width = 1.30"
Weld Crown Height = 0.050"
Sketch Is Not To Scale

Comments: Single side exam due to configuration (Tee to Pipe). A 45°S wave search unit was utilized for coverage per procedure. A 60RL was used for best effort through the weld per procedure. Code Coverage claimed

Note: Procedure is not qualified for detection or length sizing while performing axial direction scans on the far side of the weld when only single side access is obtainable. Therefore the maximum obtainable CRV for single side UT exams of austenitic weld material is 50% while performing scan in the axial direction. No Recordable Indications were detected.

Figure S
Examination Category: R-A
Item No. R1.16

Component ID: Jet Pump Instrument Nozzle N9-A Safe End-to-Extension Circ. Weld, N09A-KC

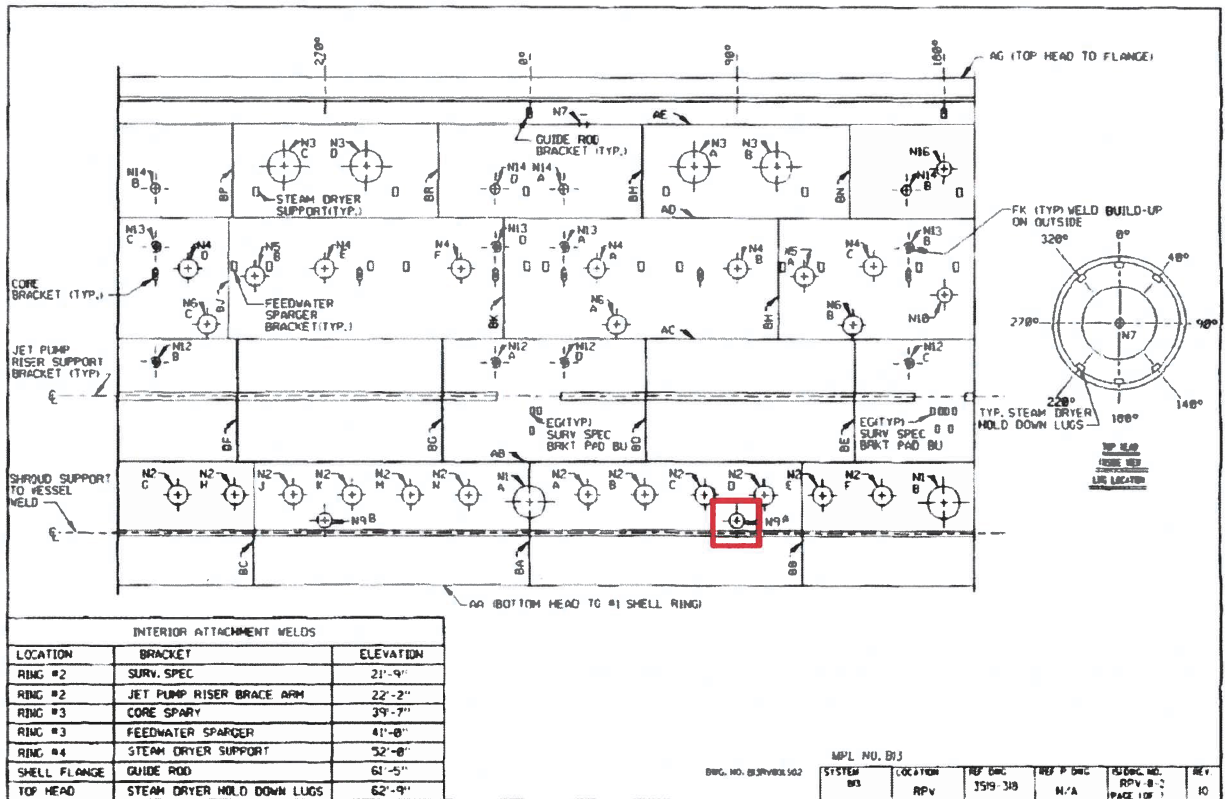
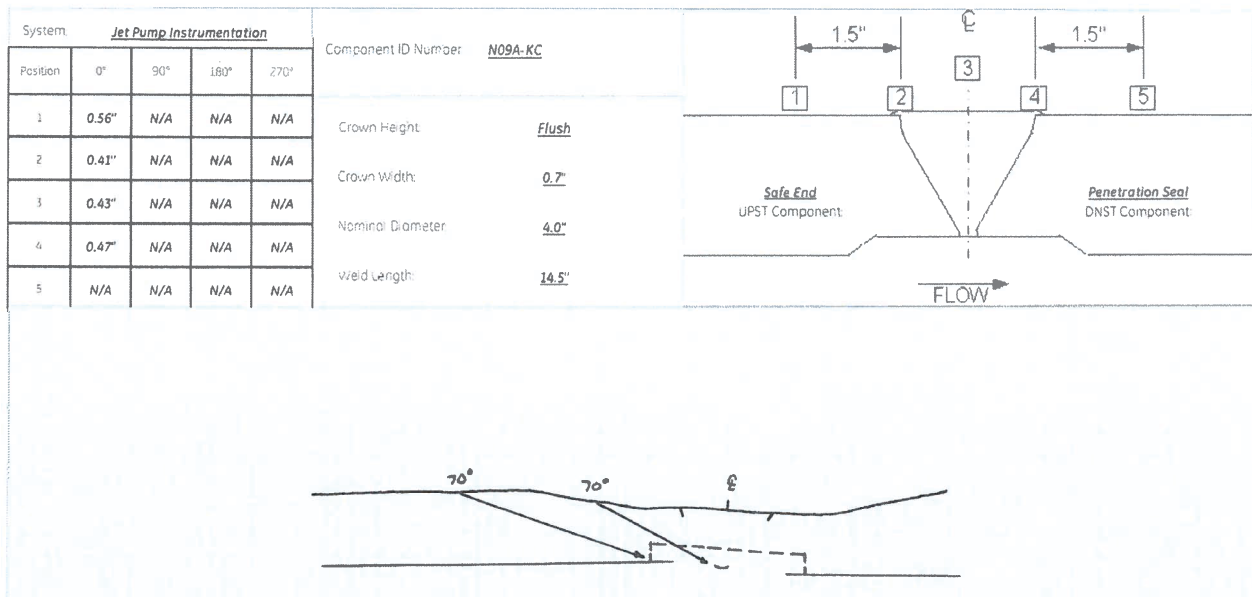


Figure T
Examination Category: R-A
Item No. R1.16

Component ID: Jet Pump Instrument Nozzle N9-A Safe End-to-Extension Circ. Weld, N09A-KC



Exam was performed utilizing 45° and 70° shear wave search units.
 Circ. exams were performed U/S and D/S with the 45° Shear wave search unit.
 Axial exam utilizing the 70° Shear wave search unit was performed D/S on the penetration side only due to component configuration.
 64.5% Code Coverage was achieved.
 No Recordable Indications were detected.

Figure U
Examination Category: R-A
Item No. R1.20

Component ID: Standby Liquid Control System Weld, 1C41G119-03-11-11

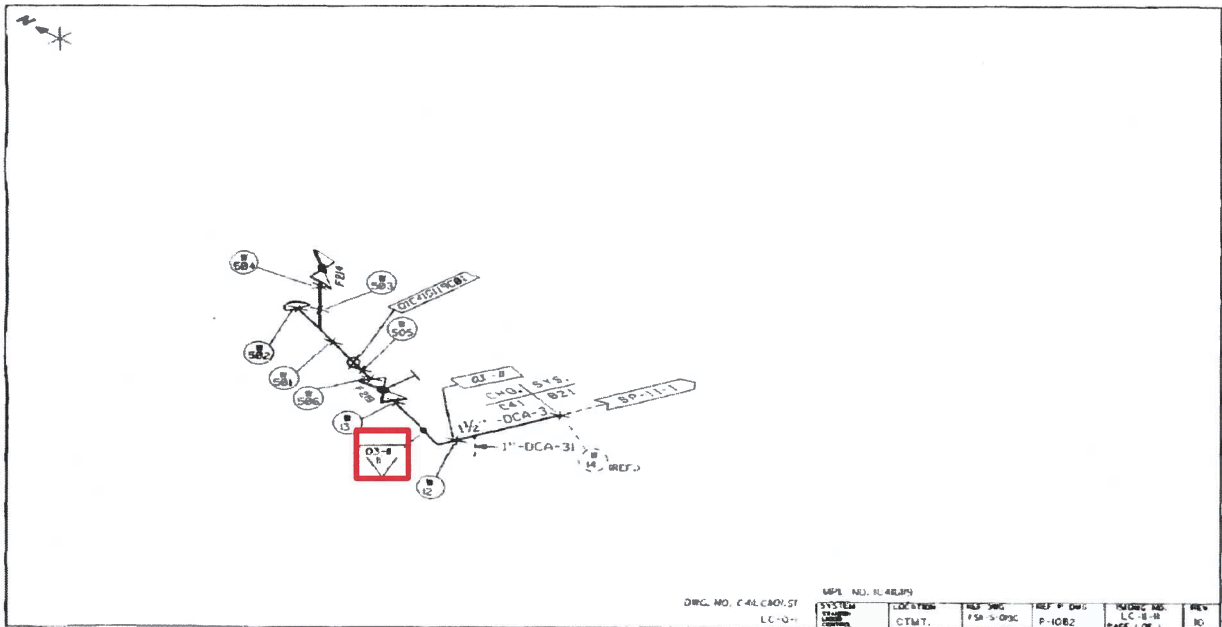
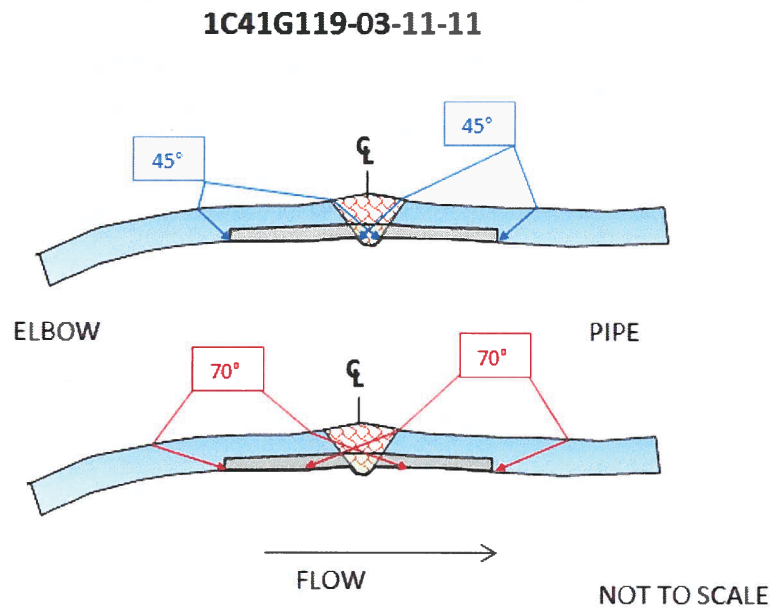


Figure V
Examination Category: R-A
Item No. R1.20

Component ID: Standby Liquid Control System Weld, 1C41G119-03-11-11



Comments: Exam limitation due to component configuration (tight radius bend on intrados of elbow). A 45°S and 70° wave search unit was utilized for coverage per procedure.
Code Coverage Achieved 87.7%
No Recordable Indications were detected.