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TALEN ENERGY

AUG 0 6 2015

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

SUSQUEHANNA STEAM ELECTRIC STATION
RESPONSE TO REQUEST FOR SUPPLEMENTAL INFORMATION FOR THE THIRD INTERVAL
RELIEF REQUESTS 3RR-19, 3RR-20 AND 3RR-21
PLA-7371

Docket Nos. 50-387
and 50-388

References: 1. *Letter PLA-7338, "End of Interval Relief Requests [3RR-19, 3RR-20 and 3RR-21] for Third Inservice Inspection Interval," dated May 28, 2015 (ML15148A774)*

2. *NRC letter "Supplemental Information Needed for Acceptance of Requested Licensing Action re: Proposed Relief Requests for the Third 10-Year Inservice Inspection Interval, (TAC Nos. MF6302 through MF6307)," dated July 10, 2015 (ML091810088)*

Susquehanna Nuclear, LLC is providing the requested supplemental information for Relief Requests 3RR-19, 3RR-20 and 3RR-21 in Attachments to this letter. This replaces the requests included with Reference 1 for Susquehanna Steam Electric Station (SSES), Units 1 and 2. These requests are in accordance with 10 CFR 50.55(a)(g)(5)(iii), and they involve determinations of impracticality that apply to certain required examinations for the third 10-year Inservice Inspection (ISI) Interval. The examinations demonstrated limitations that were experienced when attempting to comply with the required Code requirements for components described by these requests.

Reference 2 contains five questions for Relief Requests 3RR-19 and 3RR-20, and eight questions for Relief Request 3RR-21. Attachment 1 provides a response to these questions and the requested supplemental information required a revision to each of the relief requests. The revised relief requests are in Attachments 2 through 4.

There are no new regulatory commitments associated with this submittal.

If you have any questions or require additional information, please contact Mr. Jeffery N. Grisewood (570) 542-1330.

Sincerely,

J. A. Franke

A047
NRR

Attachments:
1. Response to Requested Additional Information
2. Relief Request: 3RR-19, Revision 1
3. Relief Request: 3RR-20, Revision 1
4. Relief Request: 3RR-21, Revision 1

Copy: NRC Region I
Mr. J. E. Greives, NRC Sr. Resident Inspector
Mr. J. A. Whited, NRC Project Manager
Mr. B. Fuller, PA DEP/BRP

Attachment 1 to PLA-7371

Response to Requested Additional Information

Response to Requested Additional Information

The NRC questions are re-stated in the balance of this Attachment 1. The responses to each question are also included. The supplemental information provided in response to the requested additional information (RAI) required a revision to the relief requests, (e.g., 3RR-19, 3RR-20, and 3RR-21, Revision 1), which are in Attachments 2 through 4.

Relief Requests 3RR-19 and 3RR-20, Revision 0

RAI-1:

1. Provide details of impracticality claim:
   a. Explanation of obstructions (supported by pictures/diagrams, see #2 below).
   b. Provide an explanation of the burden if ASME Code-required exam coverage is imposed.
   c. Provide a discussion, if any, of other means to achieve ASME Code-required volume.
   d. Given the limited exam coverage, provide a discussion of:
      i. Compensatory measures, such as VT-2
      ii. How the examined areas will give reasonable identification of degradation (had there been any)

Response to RAI 1:

a. An explanation of obstructions (e.g., Limiting Condition) for each component has been added to Tables 3RR-19.1, 3RR-19.2, 3RR-20.1, and 3RR20-2. Supporting diagrams to further describe the obstructions are added to the revised relief requests, in the attached figures.

b. An explanation of the burden imposed by the ASME Code required volume is added to the description in the "Basis for Relief" section of each relief request.

c. The requested discussion of other means to achieve the ASME Code required volume was added to the "Basis for Relief" section. Where other means were considered, their use was concluded to be ineffective at improving examination coverage.

d. (i). A discussion of alternative examinations can be found within the "Proposed Alternative Examinations" section of each respective relief request.

d. (ii). The examinations were performed to the maximum extent practicable in accordance with Appendix VIII of ASME Section XI.

Response to Requested Additional Information

(Continued)

RAI-2:

2. The sketches provided do not provide clear information for the NRC staff to evaluate the exam coverage obtained or determine the cause of the impracticality of the examination. For examples of required information refer to the Industry/NRC Information Exchange Public Meeting held on January 13 -15, 2015,(1) for a discussion of the NRC staff's expectations for the content of an inspection sketch/diagram (see slide 6 for the information expected and slide 12 for a sample sketch/diagram). This presentation clarifies what a satisfactory inspection sketch should clearly show, e.g., the required examination volume and achieved examination volume, such that the NRC staff can determine the percent examination coverage obtained by a licensee. The sketch/diagram should show relevant dimensions, such as wall thickness and weld dimensions.

Response to RAI 2:

Additional sketches have been provided that provide the wall thicknesses and weld dimensions of the welds. Code coverage sketches can be found within the attached figures for each weld and show the limitations imposed by the component configurations.

RAI-3:

3. Provide the examination methodology used (i.e., ASME Section XI, Appendix VIII or other methodology used). Refer to slide 6 of industry/NRC Information Exchange Public Meeting held on January 13 -15, 2015.

Response to RAI 3:

The examination methodology (e.g., ASME Section XI Appendix VIII) is provided within Tables 3RR-19.1, 3RR-19.2, 3RR-20.1, and 3RR-20.2.

(1) NRC Industry/NRC NDE Technical Information Exchange Public Meeting, "(NDEIC Meeting) Briefing Package/Handouts Slides and Viewgraphs," January 13, 2015, (Accession ML15013A266)

Response to Requested Additional Information

(Continued)

RAI-4:

4. Provide results of the examination: i.e., whether indications were detected or not. If indications were detected provide descriptions of how they have been dispositioned. Refer to slide 9 of industry/NRC Information Exchange Public Meeting held on January 13 -15, 2015.

Response to RAI 4:

No indications were detected within the covered volumes of any of the subject welds. This is now stated within the revised Tables 3RR-19.1, 3RR-19.2, 3RR-20.1, and 3RR-20.2.

RAI-5:

5. Discuss any industry or plant-specific operating experience regarding potential degradation and potential severe loading for the subject weld and associated components.

Response to RAI 5:

A discussion of operating experience has been added within the "Basis for Relief" section for each of the revised relief requests that are attached. Plant-specific experience is discussed that includes evidence of some prior susceptibility to Intergranular Stress Corrosion Cracking (IGSCC) at the Unit 1 nozzle-to-safe end welds N1B and N2J, that have since been corrected with an Inconel 52 weld overlay. Cases of stress corrosion cracking that have occurred in stainless steel materials throughout the industry are concerns that have been addressed by application of methods like Mechanical Stress Improvement (MSIP) and Hydrogen Water Chemistry, which are proven to limit the effects of IGSCC on stainless steel. Additionally, the performance of VT-2 visual examinations as well as online leakage monitoring provides assurance that no IGSCC flaws have gone through wall. There is no applicable industry or plant-specific operating experience to indicate that significant service-induced degradation had occurred for the subject welds and associated components since, and evidence of such degradation would have been detected by the examinations that were performed.

Response to Requested Additional Information

(Continued)

Relief Requests 3RR-21, Revision 0:

RAI-1, item a:

1. The NRC staff requests that the licensee:

    a. Provide schematic diagram of each weld and the associated components as well as provide sketches or scan plots detailing the insonification angles, ultrasonic wave modes (e.g., refracted shear and longitudinal waves), and volumetric coverage achieved by each angle on each weld.

Response to RAI 1, item a:

A schematic diagram depicting the isonification angles, ultrasonic weld modes, and volumetric coverage has been added to the attached figures for each weld. Additionally, the ultrasonic datasheets have been included within the figures. These datasheets identify details of the ultrasonic testing (UT) scanning apparatus including transducer size, frequency, wave modality, and isonification angles.

RAI-1, item b:

b. Mark clearly on the sketches the volume (i.e., the weld materials and the heat affected zone (HAZ) of base materials) examined and missed (i.e., not examined due to access and geometrical constraints). Please refer to the Industry/NRC Technical Information Exchange Public Meeting held on January 13-15, 2015, for a discussion of the NRC staff's expectations for the content of an inspection sketch/diagram (see slide 6 for the information expected and slide 12 for a sample sketch/diagram).

Response to RAI-1, item b:

The required inspection volumes can be found within the attached figures for each weld as well as volumes examined and missed, which have also been added to the attached figures for each weld.

Response to Requested Additional Information

(Continued)

RAI-1, item c:

c. Discuss why the refracted longitudinal waves (L-waves) were not used as part of "Best Effort" examination. The NRC staff notes that the L-waves have been shown capable of detecting planar flaws on the far-side volume (weld root and HAZ) of cast austenitic stainless steel (CASS) and stainless steel weld and base materials.

Response to RAI 1, item c:

Refracted longitudinal waves were employed as part of a "Best Effort" examination of the far-side weld volume. These waves are depicted within the attached figures for each weld. Additionally, a "Best Effort" coverage, while not code creditable, is provided within Tables 3RR-21.1 and 3RR-21.2.

RAI-1, item d:

d. Provide coverage summary table detailing percentage of axial scan coverage (upstream and downstream) and percentage of circumferential scan coverage (upstream and downstream), and the "Best Effort" scan coverage. As an example refer to relief requests by Turkey Point and North Anna.(2)

Response to RAI 1, item d:

A coverage summary table detailing the percentage of axial scan coverage, circumferential scan coverage, total coverage, and code creditable coverage is provided for each weld within Tables 3RR-21.1 and 3RR-21.2.

RAI-1, item e:

e. Provide discussions on whether use of alternative ultrasonic testing (UT) methods would have increased the examination coverage.

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(2) Turkey Point, Units 3 and 4, "Closeout of the Fourth Ten-Year Inservice Inspection (ISI) Interval, Relief Request Nos. 15, 16, 17," dated February 13, 2015, (ADAMS ML15062A279); and, North Anna Power Station, Unit 2, "ASME Section XI Inservice Inspection Program Relief Request N2-14-LMT-002 – Fourth Interval, Period 1 Limited Examinations," dated April 21, 2014, (ADAMS ML14115A066)

Response to Requested Additional Information

(Continued)

Response to RAI 1, item e:

There are no qualified alternative UT methods that could have increased examination coverage for these components. The use of alternative UT methods that were not demonstrated to Performance Demonstration Initiative (PDI)/Appendix VIII were not used as they are considered unproven and unacceptable, and additional Code credit cannot be obtained. SSES utilizes the PDI procedure PDI-UT-2 for the inspection guidance with the associated tables 1 and 2 to perform the qualified inspection techniques. Although there are no specific plans currently in place to pursue qualified alternative UT methods for these components, SSES continues to partner with Electric Power Research Institute (EPRI), the PDI, ISI vendors and other industry sources to encourage the development and provide an awareness of improved examination techniques. The goal of these initiatives is to enhance coverage and flaw detection commensurate with radiation dose reduction. Examination procedures are revised on a continuing basis to incorporate proven techniques for a higher level of safety and quality as they become available. The examinations and techniques used today exceed the examinations conducted in the past on each component. These examinations were performed to the maximum extent practical.

RAI-2:

2. a. Provide materials of construction for each weld and the associated components (e.g., pipes, nozzles, pumps, valves, branch connections) in this relief request.

   b. Provide wall thickness for each weld.

Response to RAI 2, items a and b:

All welds within the subject of this relief request are stainless steel. This information is now provided in Tables 3RR-21.1 and 3RR-21.2.

Wall thickness profiles for each weld within the subject of this relief are provided in the attached figures.

Response to Requested Additional Information

(Continued)

RAI-3:

3. For each weld in this relief request, provide inspection history.

   a. Discuss whether the licensee identified any indication(s) during construction and preservice inspections (i.e., volumetric or surface examination(s), or both) on the volume not covered by the UT of the affected welds.

   b. Discuss whether the licensee identified any indication(s) in these welds in the previous 10-year inservice inspection (ISI) intervals.

   c. Discuss whether the licensee identified any indication(s) in these welds in the third 10- year ISI interval.

   d. Discuss disposition of identified indications in parts a, b, and c, above.

Response to RAI 3, items a through d:

No relevant indications were identified in any of the subject welds. A table providing a summary of inspections (including any identified acceptable geometric indications) is provided within Tables 3RR-21.1 and 3RR-21.2.

Response to Requested Additional Information

(Continued)

RAI-4:

4. The NRC staff notes that this relief request did not provide any discussions on whether a qualified UT was used to examine these welds.

   a. Did the licensee use a qualified UT (e.g., according to Appendix VIII of Section XI that was administered by the Performance Demonstration Initiative program) to volumetrically examine these welds?

   b. If Appendix VIII was used for the UT qualification, provide supplement(s) number that is applicable to this relief request.

   c. Otherwise, provided subarticles and/or appendices (e.g., Appendix I of Section XI) of the ASME Code, the licensee used for the UT qualifications.

Response to RAI 4, items a through c:

The examination methodology (ASME Section XI Appendix VIII) as well as Performance Demonstration Initiative Supplement number is provided within the revised Tables 3RR-21.1 and 3RR-21.2.

RAI-5:

5. According to RI-ISI program, the welds that are classified as Item Number R1.11 are prone to potential degradation by thermal fatigue. Discuss whether any supplemental inspection (e.g., surface examination) was performed on the volume not examined by UT to ensure structural integrity of the system.

Response to RAI 5:

No supplemental inspection beyond the refracted longitudinal wave inspection of the far-side volume was performed on the subject welds. This is currently not a procedural or a Code requirement. Performance of VT-2 visual examinations in accordance with examination category B-P as well as online leakage monitoring provides additional assurance that significant service-induced degradation would have been detected by the examinations that were performed.

Response to Requested Additional Information

(Continued)

RAI-6, item a:

6. The NRC staff notes that when the RI-ISI program is established, the welds shall be selected such that the ASME Code required examination coverage is achievable.

   a. Discuss whether there were other welds with the same risk significance subject to the same degradation mechanism that could be examined and achieved the required examination coverage.

   b. If the answer to part a. is yes, then will the licensee substitute that weld for the subject weld in its RI-ISI program update?

Response to RAI 6, item a and b:

Yes, additional welds with the same risk significance subject to the same degradation mechanisms could be examined that may have a higher likelihood of achieving 100% coverage.

Currently, two of the welds presented in this relief request are selected for inspection during the 4th 10-Year Inservice Inspection Interval (e.g., DCA2071-FW-4 and DCA2071-FW-5) with other welds substituted for by welds within the same system for welds that may achieve greater coverage.

RAI-6, item c:

c. Discuss whether there exist additional weld with the same risk significance subject to the same degradation mechanism that could be chosen for examination provided that the coverage of chosen additional weld is greater than the coverage of the subject weld to supplement the reduced volumetric coverage of the subject weld.

Response to RAI 6, item c:

Welds were selected, in part, because previous Section XI examination history exists in some cases. Comparison of examination results over time is critical to detect service induced degradation. Although Susquehanna could select only weld locations where greater than 90% examination coverage is possible (when available based on selection criteria), meeting the purpose of the Code requires selecting a mix of not only piping-to-piping welds that have a higher likelihood of achieving 100% coverage, but also single sided exams such as piping-to-valve welds. The ASME Code allows only 50% Code

Response to Requested Additional Information

(Continued)

coverage for single-sided examinations. No unacceptable indications were found in any of the covered volumes for any Risk Informed ISI inspections during the 3rd 10-Year Inservice Inspection Interval.

RAI-7:

7. Given the reduced inspection coverage of the welds under consideration, discuss the need for compensatory measures such as frequent plant walk downs, VT-2 examination, or leak detection systems and whether such compensatory measures have been implemented.

Response to RAI 7:

A discussion of alternative examinations can be found within the "Proposed Alternative Examinations" section of this relief request. This includes VT-2 examinations and leakage detection systems.

RAI-8:

8. Discuss any industry or plant-specific operating experience regarding potential degradation (e.g., stress corrosion cracking and corrosion) and potential severe loading (e.g., vibration, water hammer, and overloading) for the subject weld and associated components.

Response to RAI 8:

A discussion of operating experience has been added within the "Basis for Relief" section for each of the revised relief requests that are attached. Plant-specific experience is discussed that includes evidence of some prior susceptibility to Intergranular Stress Corrosion Cracking (IGSCC) at the Unit 1 nozzle-to-safe end welds N1B and N2J, that have since been corrected with an Inconel 52 weld overlay. Cases of stress corrosion cracking that have occurred in stainless steel materials throughout the industry are concerns that have been addressed by application of methods like Mechanical Stress Improvement (MSIP) and Hydrogen Water Chemistry, which are proven to limit the effects of IGSCC on stainless steel. Additionally, the performance of VT-2 visual examinations as well as online leakage monitoring provides assurance that no IGSCC flaws have gone through wall. There is no applicable industry or plant-specific operating experience to indicate that significant service-induced degradation had occurred for the

Response to Requested Additional Information

(Continued)

subject welds and associated components since, and evidence of this would have been detected by the examinations that were performed.

Relief Request 3RR-21, Revision 1 discusses SSES experience of a fatigue failure of a 4-inch Reactor Recirculation weld in 2012, however, this vibrational fatigue was evaluated separate from the RI-ISI program requirements, which is consistent with requirements in EPRI TR-1126557, Revision B-A. This experienced fatigue failure is treated outside the RI-ISI program requirements and is not related to any acceptable basis for performance of these examinations. The condition has also been evaluated for the station, and this provides some assurance of no other unevaluated severe loading concerns remaining for any of the subject welds in this relief request.

Attachment 2 to PLA-7371

Relief Request: 3RR-19
Revision 1

RELIEF REQUEST: 3RR-19, REVISION 1

COMPONENT IDENTIFICATION

Code Class:	1
Reference:	Table IWB-2500-1
Examination Category:	B-D
Item Number:	B3.90
Description:	Alternative Requirements to the Examination of Full Penetration Welds of Nozzles in Vessels
Component Number:	Ref. Tables 3RR-19.1 and 3RR-19.2

CODE REQUIREMENT

Susquehanna Station Electric Station (SSES), Units 1 and 2 each have 30 Reactor Pressure Vessel (RPV) nozzles fabricated with full penetration nozzle-to-vessel shell (or head) welds. These nozzles are as follows:

Nozzle ID	System
N1A, B	Reactor Recirculation
N2A - H, J, K	Reactor Recirculation
N3A - D	Main Steam
N4A - F	Feedwater
N5A, B	Core Spray
N6A, B	Residual Heat Removal - Head Spray
N7	Reactor Pressure Vessel - Head Vent
N8A, B	Reactor Recirculation Instrumentation
N9	Control Rod Drive (capped)

Table IWB-2500-1, Examination Category B-D, Item Number B3.90, requires volumetric examination of all RPV nozzle-to-vessel welds in accordance with the examination requirements illustrated in Figure IWB-2500-7.

BASIS FOR RELIEF

Pursuant to 10CFR50.55a(g)(5)(iii), relief is requested on the basis that conformance with the specified Code requirement has been determined to be impractical.

The burden caused by compliance with the examination requirements of ASME Section XI includes required modification of plant components to remove obstructions, redesigning of plant systems, and replacement of components where geometry is inherent to component design.

Complete examination of all of the aforementioned SSES Units 1 and 2 Examination Category B-D nozzle-to-vessel welds is not practical due to the nozzle forging configuration. In each case, the radius of curvature of the nozzle forging (the nozzle side of the weld) causes the ultrasonic search unit to lift and lose contact, thereby limiting complete volumetric examination of the ASME Section XI required examination volume. This examination limitation affects both the transverse and parallel scans of those components listed in Table 3RR-19.1 and Table 3RR-19.2. Alternate means, such as small search units and full vee path examinations, were considered, but were found to be ineffective in improving examination coverage.

Due to the limitations created by the configuration of the vessel nozzles, there are no means of Appendix VIII qualified demonstrated ultrasonic inspection that may result in additional coverage.

Examinations of two Feedwater nozzle-to-vessel welds - N4A and N4D - are further limited due to plant design obstructions. A spacing of approximately 4.5 inches between the N4 and the N11 nozzles restricts examination of an arc of approximately 45 degrees (12.5%) of the affected nozzle-to-vessel welds.

Automatic examination of the Reactor Recirculation discharge nozzle-to-vessel weld N2J is limited due to plant design obstructions on Unit 2. The proximity of the N2J and N8D nozzles restricts examination of an arc of approximately 45 degrees (12.5%) of the affected nozzle-to-vessel welds. Note that these obstructions for the N2J nozzle exist on Unit1, however, the exams performed on the Unit 1 N2J nozzles during this interval utilized the reduced coverage volume under Code Case N-613-1.[3]

Unit 1 nozzle-to-safe end welds N1B and N2J received a weld overlay due to relevant indications found to be caused by Intergranular Stress Corrosion Cracking (IGSCC) in the Second Ten-Year Interval. These indications initiated and grew prior to Mechanical Stress improvement Process (MSIP) and Hydrogen Water Chemistry (HWC) adoption, which are proven methods of IGSCC mitigation. These welds have subsequently had an Inconel 52 weld overlay installed to correct the issue. There is no applicable internal operating experience regarding the subject welds.

No other internal or external operating experience reviewed is relevant regarding potential degradation or severe loading for the subject welds.

PROPOSED ALTERNATE EXAMINATIONS

The examinations were performed to the maximum extent practicable in accordance with Appendix VIII of ASME Section XI which is a proven means of identifying any degradation in the covered volumes. The proposed alternative is the maximum coverage achievable shown in Tables 3RR-19.1 and 3RR-19.2.

([3]) Code Case Number N-613-1, "Ultrasonic Examination of Penetration Nozzles in Vessels, Examination Category B-D, Item Nos. B3.10 and B3.90, Reactor Nozzle-to-Vessel Welds, Figs, IWB-2500-7(a), (b), and (c), Section XI, Division 1

The RPV pressure retaining welds are also subject to VT-2 visual examination during system pressure testing in accordance with the requirements of Examination Category B-P.

Online leakage monitoring for the subject welds is provided by the drywell floor drain sump monitoring system. This system has Technical Specification required monitoring (TS 3.4.4.1) every 12 hours. If leakage were to be detected beyond the limits identified in TS 3.4.4, the unit would be shutdown and any leakage would be identified and repaired.

APPLICABLE TIME PERIOD

Relief is requested for the third ten-year inspection interval of the Inservice Inspection Program for SSES Units 1 and 2.

Table 3RR-19.1: Unit 1

Nozzle Identification	Component Description	Material	Limiting Condition	Examination Coverage[1]	Examination Results	Figure 3RR-19._
N1A, B	Recirculation Suction Nozzle-to-Vessel Weld	SA-508 Cl. 2/ SA-533 Gr. B Cl. 1	Nozzle Forging Configuration	T Scans - 44.9% P Scans - 39.7% Total 84.5%	NRI[2]	1, 9-11
N2A, F	Recirculation Discharge Nozzle-to-Vessel Weld	SA-508 Cl. 2/ SA-533 Gr. B Cl. 1	Nozzle Forging Configuration	T Scans - 44.6% P Scans - 41.6% Total 86.3%	NRI[2]	2, 12-14
N3A - D	Main Steam Nozzle-to-Vessel Weld	SA-508 Cl. 2/ SA-533 Gr. B Cl. 1	Nozzle Forging Configuration	T Scans - 42.5% P Scans - 31.5% Total 74.1%	NRI[2]	3, 15-17
N4B, C, E, F	Feedwater Nozzle-to-Vessel Weld	SA-508 Cl. 2/ SA-533 Gr. B Cl. 1	Nozzle Forging Configuration	T Scans - 44.2% P Scans - 36.4% Total 80.5%	NRI[2]	4, 18-20
N4A	Feedwater Nozzle-to-Vessel Weld	SA-508 Cl. 2/ SA-533 Gr. B Cl. 1	Nozzle Forging Configuration and Limited scan path due to N11A instrumentation nozzle	T Scans - 40.6% P Scans - 38.6% Total - 79.3%	NRI[2]	4, 21-29
N4D	Feedwater Nozzle-to-Vessel Weld	SA-508 Cl. 2/ SA-533 Gr. B Cl. 1	Nozzle Forging Configuration and Limited scan path due to N11B instrumentation nozzle	T Scans - 40.5% P Scans - 34.5% Total 75%	NRI[2]	4, 30-35
N6A, B	Head Spray and Spare Nozzle-to-Vessel Weld	SA-508 Cl. 2/ SA-533 Gr. B Cl. 1	Nozzle Forging Configuration	T Scans - 40.2% P Scans - 37.0% Total - 77.1%	NRI[2]	5, 36-38
N7	Vent Nozzle-to-Vessel Weld	SA-508 Cl. 2/ SA-533 Gr. B Cl. 1	Nozzle Forging Configuration	T Scans - 43.8% P Scans - 37.9% Total - 81.8%	NRI[2]	6, 39-41

Table 3RR-19.1: Unit 1

Nozzle Identification	Component Description	Material	Limiting Condition	Examination Coverage[1]	Examination Results	Figure 3RR-19._
N8A, B	Jet Pump Instrumentation Nozzle-to-Vessel Weld	SA-508 Cl. 2/ SA-533 Gr. B Cl. 1	Nozzle Forging Configuration	T Scans - 36.5% P Scans - 42.4% Total - 78.8%	NRI[2]	7, 42-44
N9	CRD Hydraulic System Return Nozzle-to-Vessel Weld	SA-508 Cl. 2/ SA-533 Gr. B Cl. 1	Nozzle Forging Configuration	T Scans - 42.3% P Scans - 36.9% Total - 79.2%	NRI[2]	8, 45-47

1. Exams were performed in accordance with PDI Supplement 4 and Supplement 6 per Appendix VIII.
2. Previous examination results were reviewed with no significant changes noted.

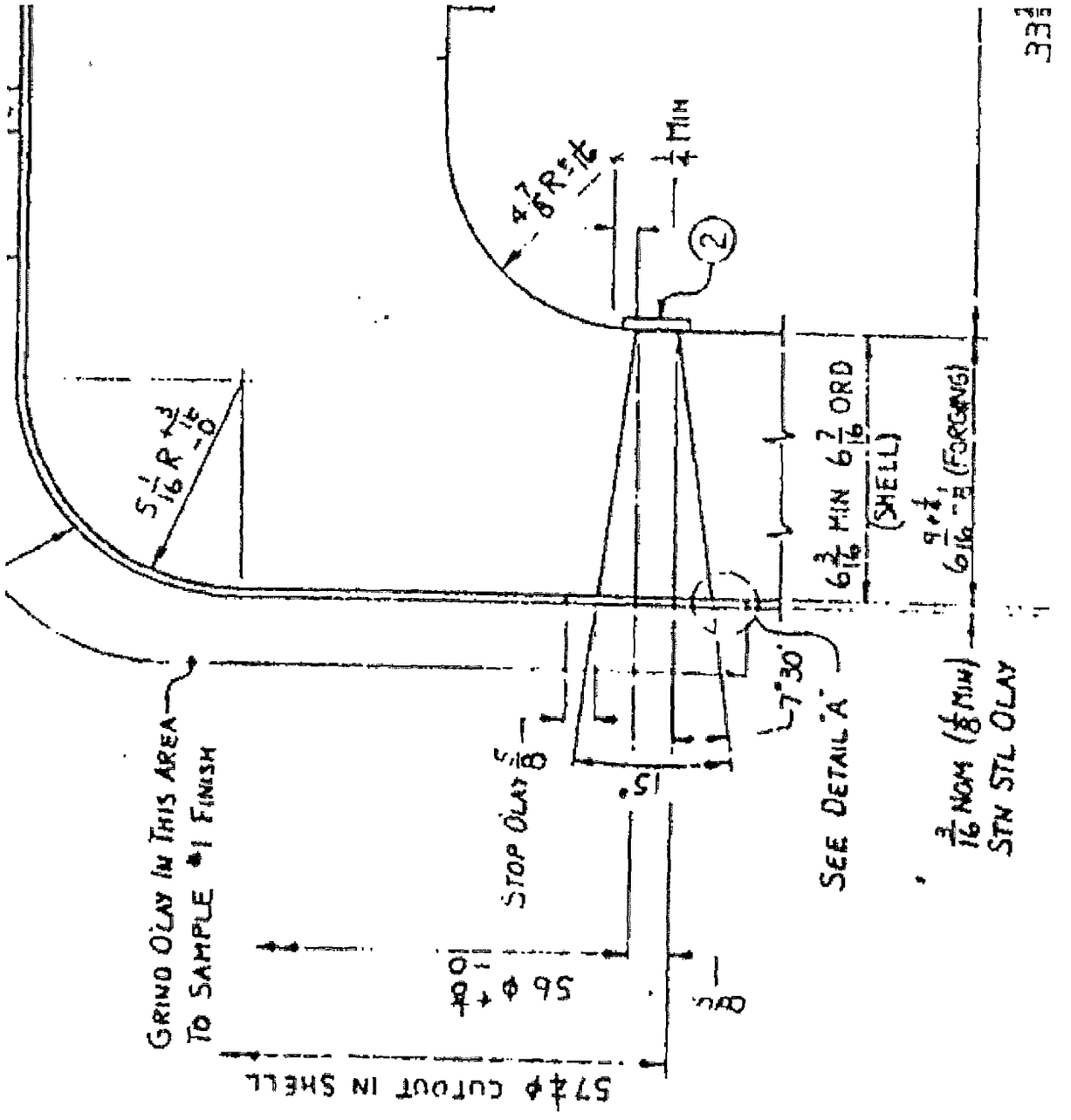
Table 3RR-19.2: Unit 2

Nozzle Identification	Component Description	Material	Limiting Condition	Examination Coverage[1]	Examination Results	Figure 3RR-19._
N1A	Recirculation Suction Nozzle-to-Vessel Weld	SA-508 Cl. 2/ SA-533 Gr. B Cl. 1	Nozzle Forging Configuration	T Scans - 42.1% P Scans – 38.2% Total 80.2%	NRI[2]	1, 48-50
N1B	Recirculation Suction Nozzle-to-Vessel Weld	SA-508 Cl. 2/ SA-533 Gr. B Cl. 1	Nozzle Forging Configuration	T Scans - 49.1% P Scans - 38.1% Total - 87.1%	NRI[2]	1, 51-53
N2A, F, K	Recirculation Discharge Nozzle-to-Vessel Weld	SA-508 Cl. 2/ SA-533 Gr. B Cl. 1	Nozzle Forging Configuration	T Scans - 40.3% P Scans - 36.2% Total - 76.6%	NRI[2]	2, 54-56
N2J	Recirculation Discharge Nozzle-to-Vessel Weld	SA-508 Cl. 2/ SA-533 Gr. B Cl. 1	Nozzle Forging Configuration and Limited Scan Path Due to N8B Nozzle	T Scans - 40.3% P Scans - 36.3% Total - 76.4%	NRI[2]	2, 57-62
N4A, D	Feedwater Nozzle-to-Vessel Weld	SA-508 Cl. 2/ SA-533 Gr. B Cl. 1	Nozzle Forging Configuration and Limited Scan Path Due to N11A/B Instrumentation Nozzle	T Scans - 40.1% P Scans - 36.1% Total - 76.3%	NRI[2]	4, 63-67
N4B, C, E, F	Feedwater Nozzle-to-Vessel Weld	SA-508 Cl. 2/ SA-533 Gr. B Cl. 1	Nozzle Forging Configuration	T Scans - 45.6% P Scans - 41.1% Total - 86.6%	NRI[2]	4, 68-70
N7	Vent Nozzle-to-Vessel Weld	SA-508 Cl. 2/ SA-533 Gr. B Cl. 1	Nozzle Forging Configuration	T Scans - 44.2% P Scans - 37.8% Total - 82.1%	NRI[2]	6, 71-73

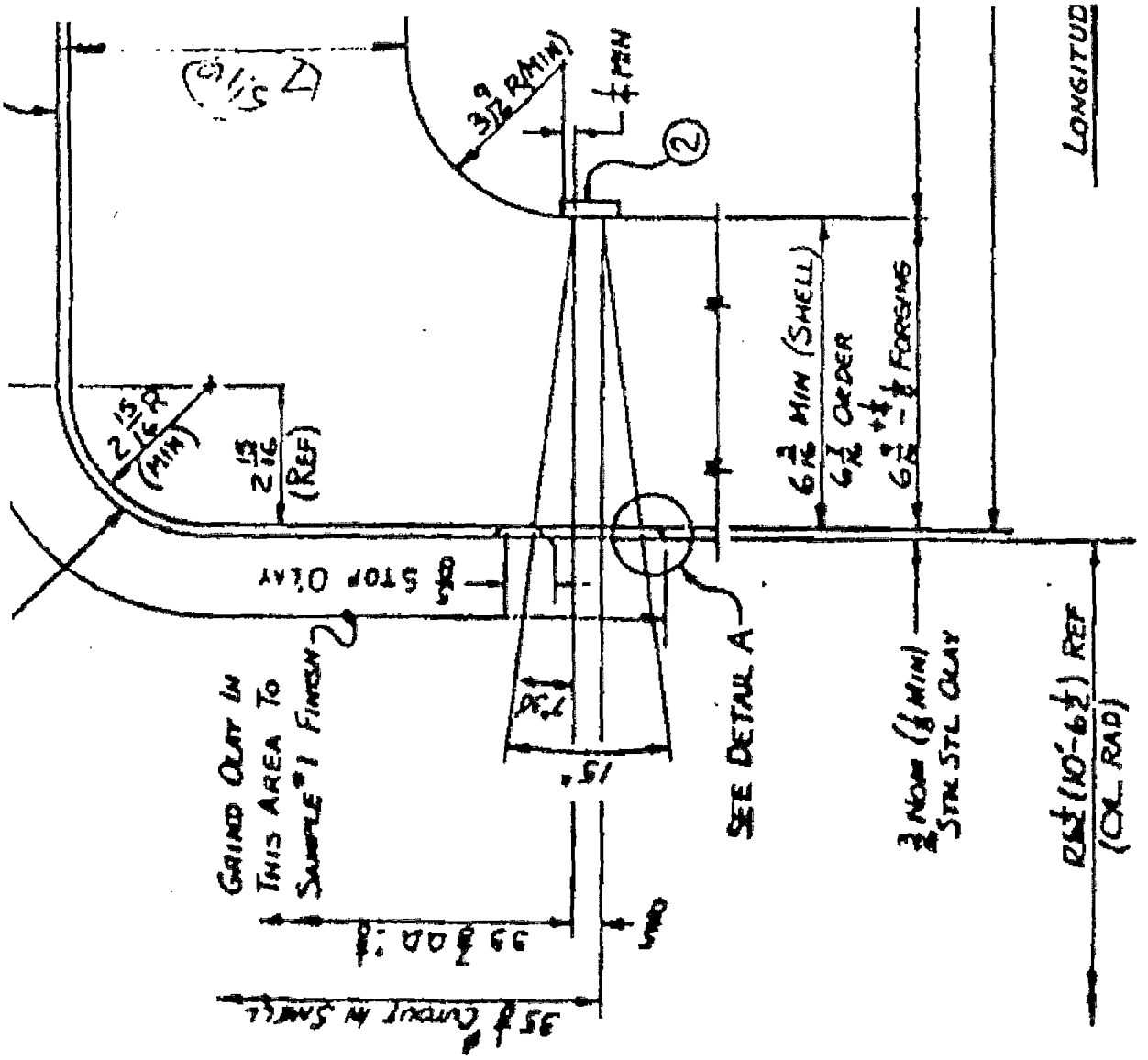
Table 3RR-19.2: Unit 2

Nozzle Identification	Component Description	Material	Limiting Condition	Examination Coverage[1]	Examination Results	Figure 3RR-19._
N8A, B	Jet Pump Instrumentation Nozzle-to-Vessel Weld	SA-508 Cl. 2/ SA-533 Gr. B Cl. 1	Nozzle Forging Configuration	T Scans - 43.9% P Scans - 40.8% Total - 84.6%	NRI[2]	7, 74-76
N9	Control Rod Drive (CRD) Hydraulic Nozzle-to-Vessel Weld	SA-508 Cl. 2/ SA-533 Gr. B Cl. 1	Nozzle Forging Configuration	T Scans - 43.9% P Scans - 40.8% Total - 84.6%	NRI[2]	8, 77-79

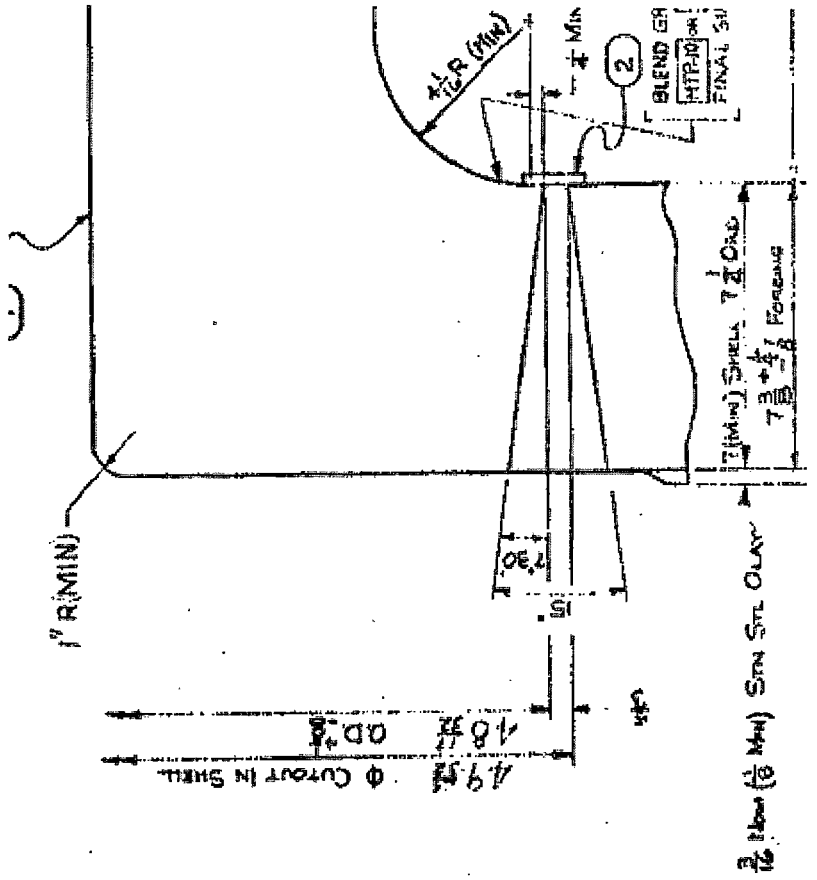
1. Exams were performed in accordance with PDI Supplement 4 and Supplement 6 per Appendix VIII.
2. Previous examination results were reviewed with no significant changes noted.



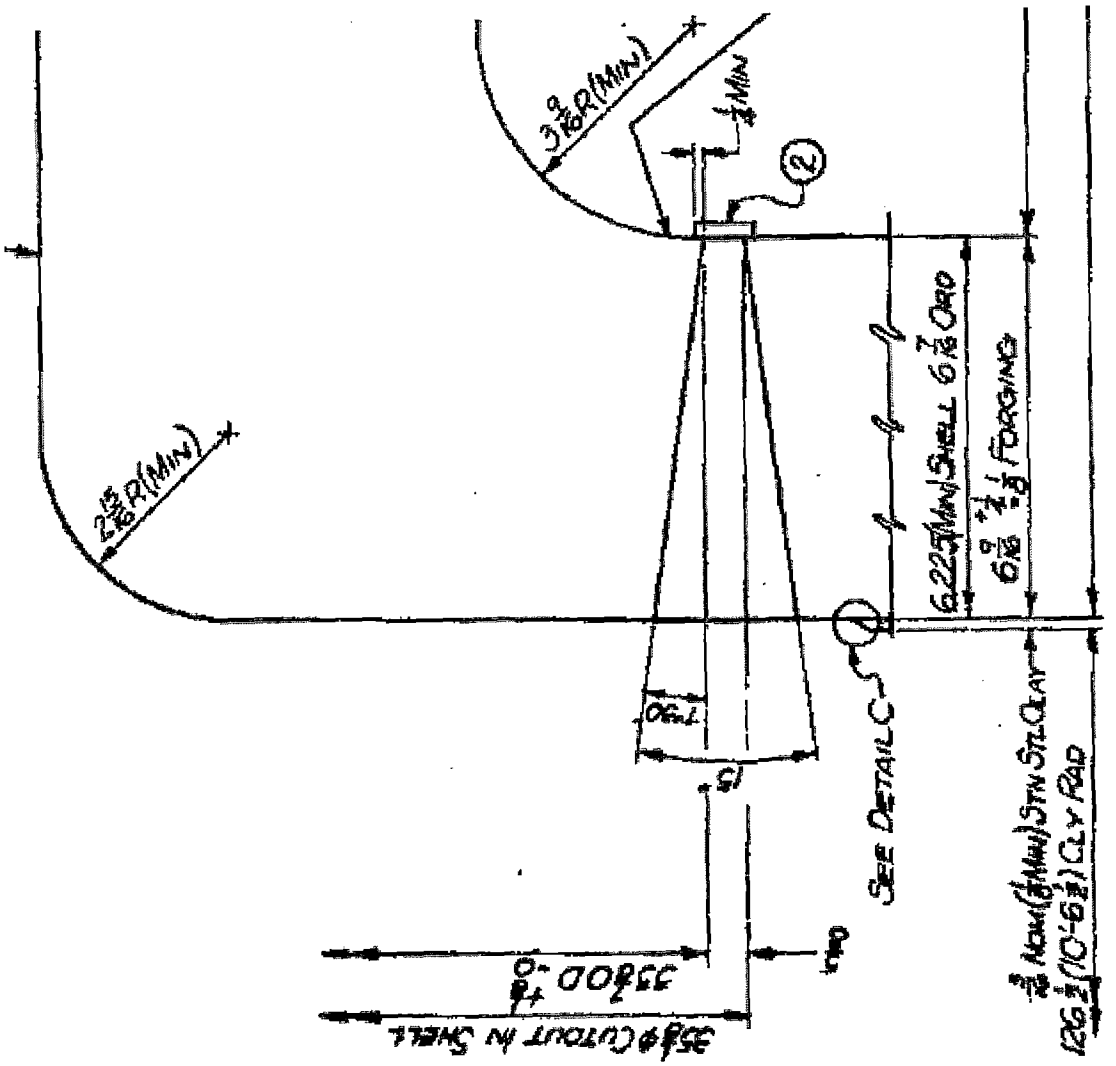
N1 Nozzle Welds
Figure 3RR-19.1



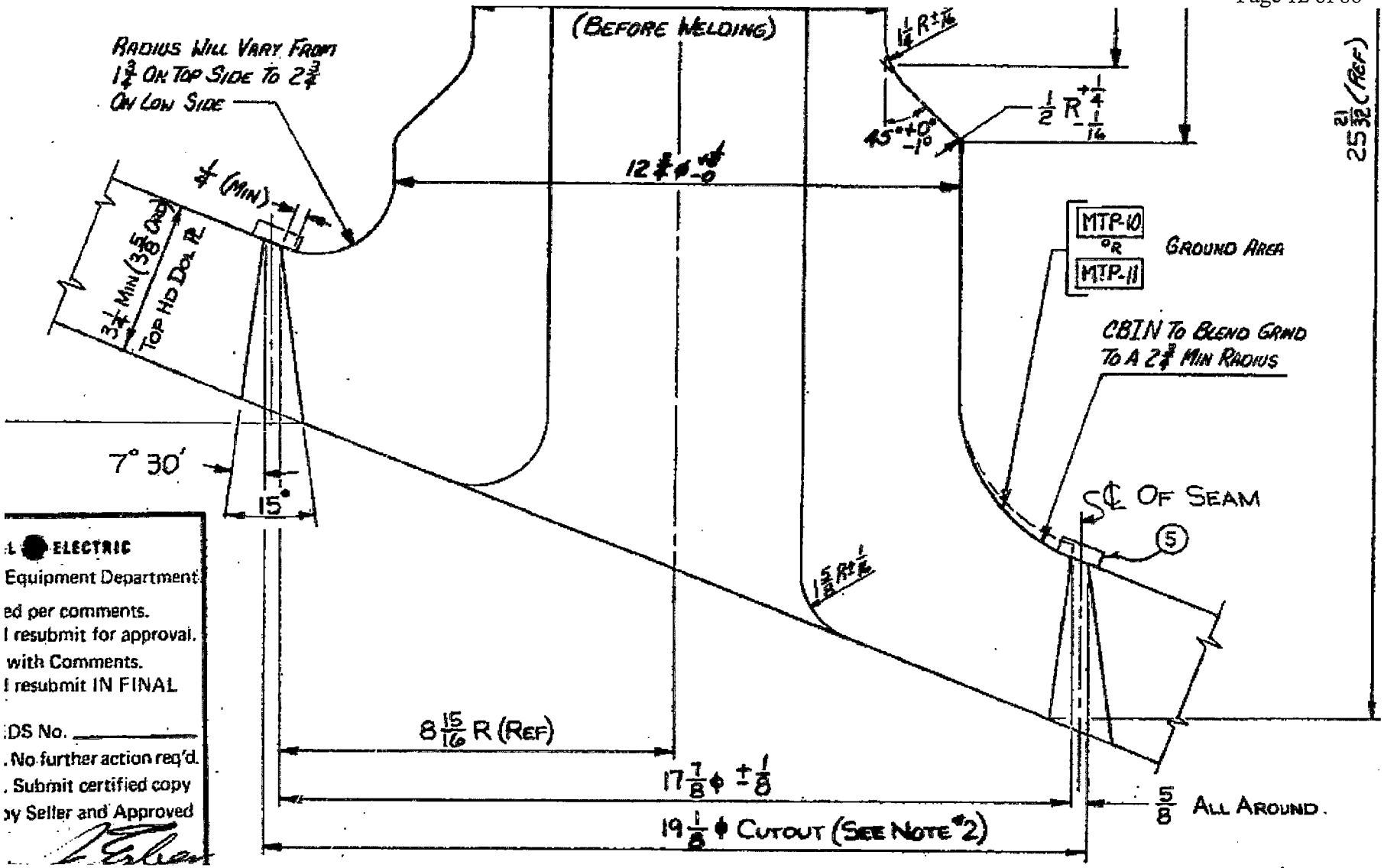
N2 Nozzle Welds
Figure 3RR-19.2



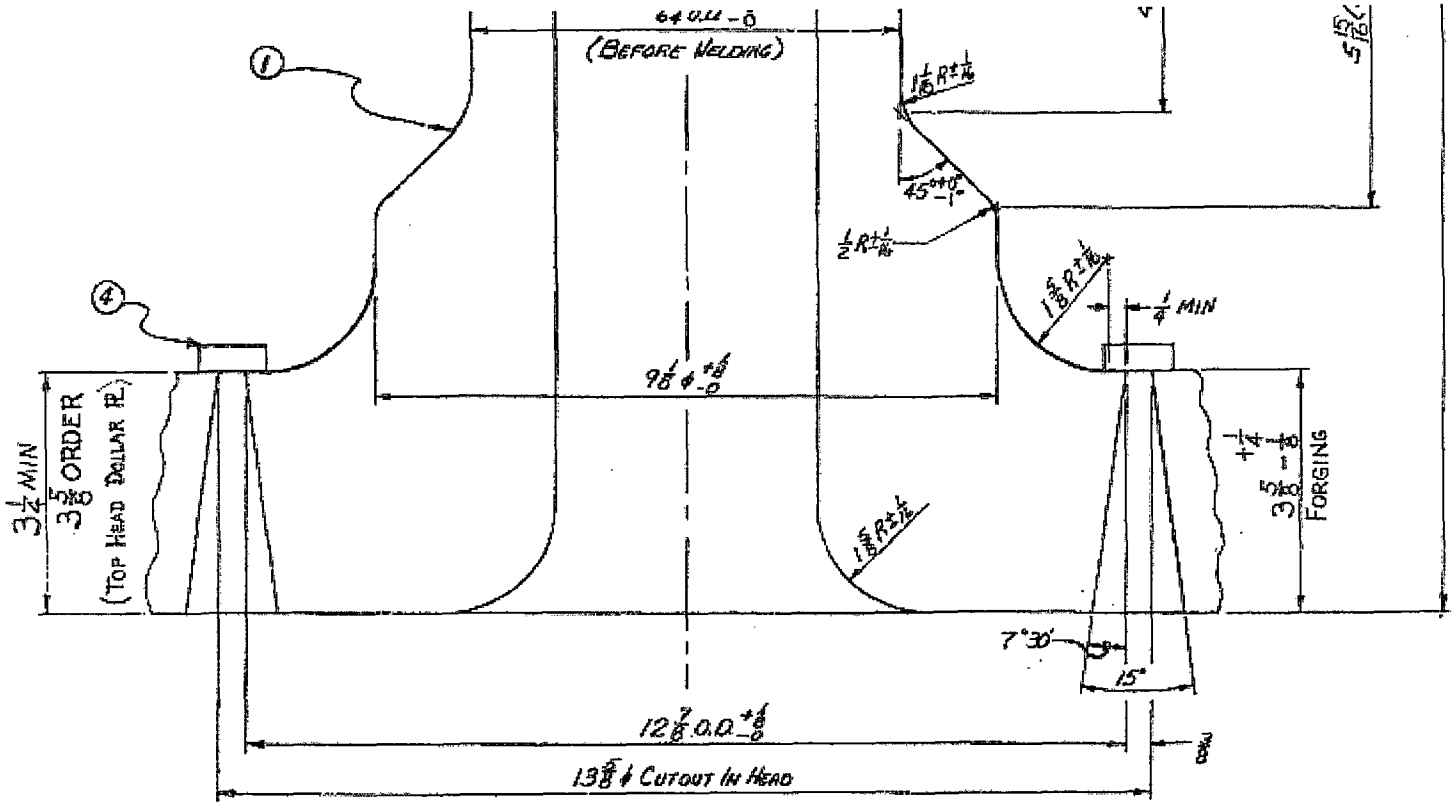
N3 Nozzle Welds
Figure 3RR-19.3



N4 Nozzle Welds
Figure 3RR-19.4

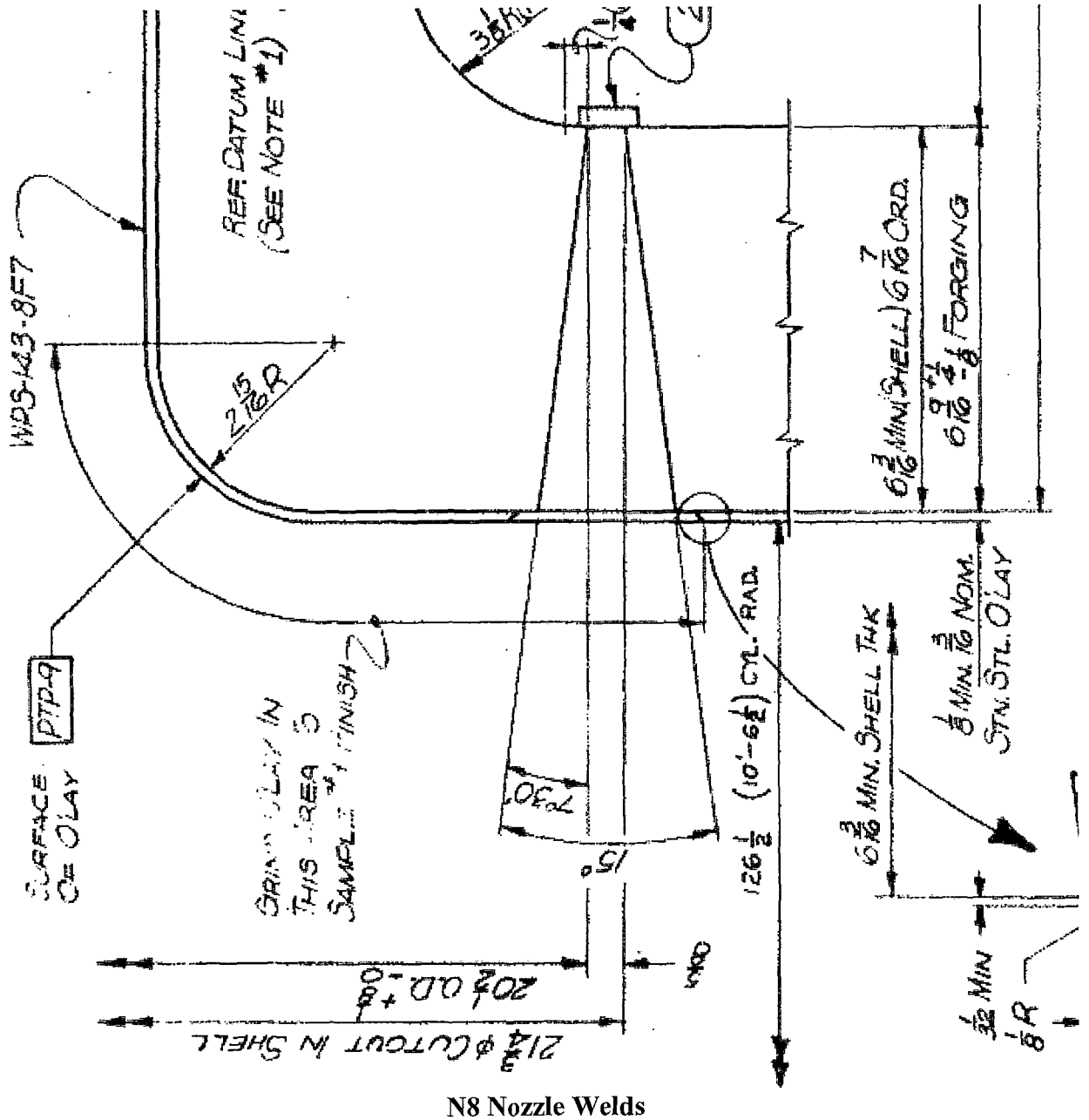


N6 Nozzle Welds
Figure 3RR-19.5

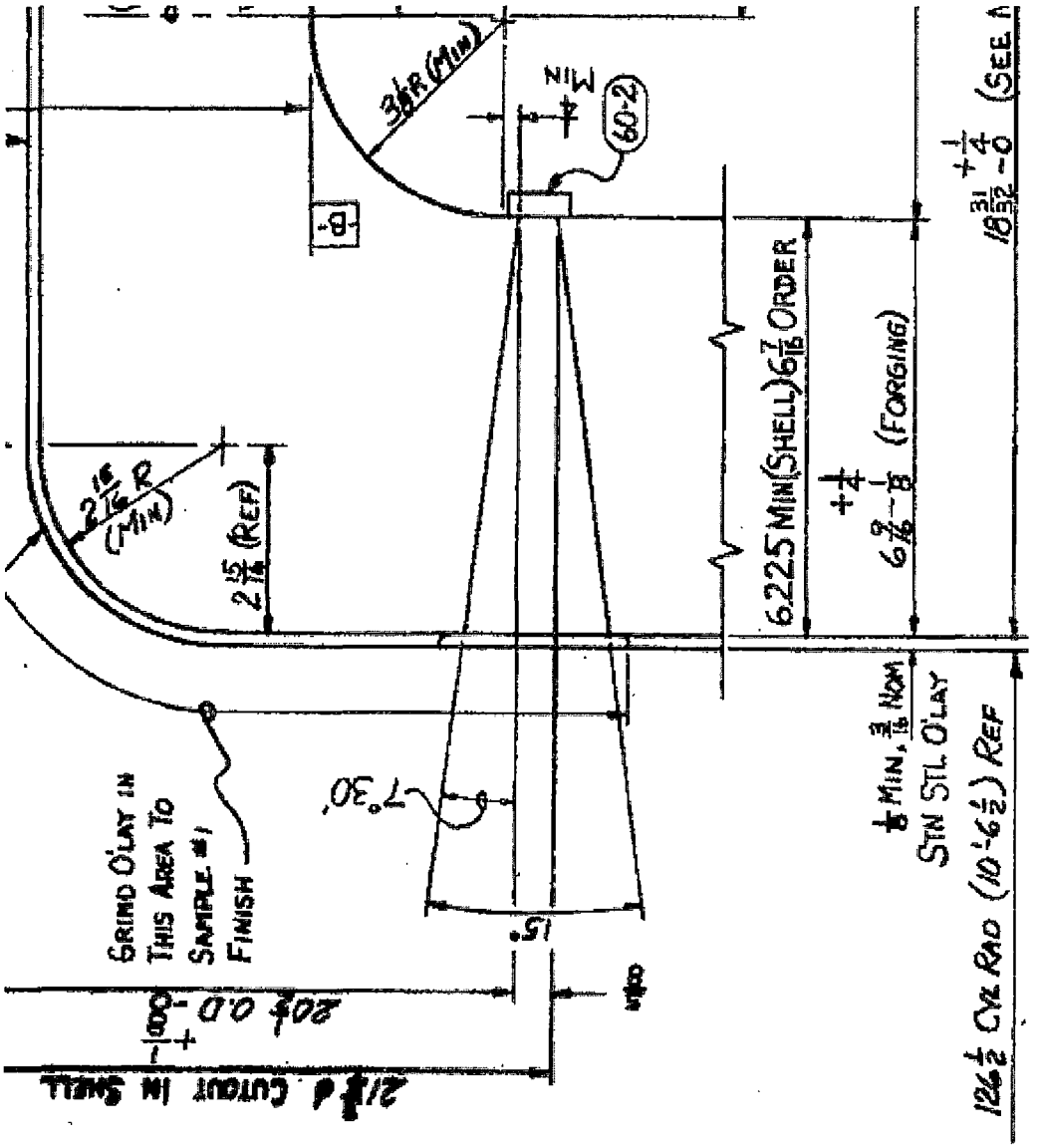


SECTION THRU NOZZLE

N7 Nozzle Welds
Figure 3RR-19.6



N8 Nozzle Welds
Figure 3RR-19.7



N9 Nozzle Welds
Figure 3RR-19.8

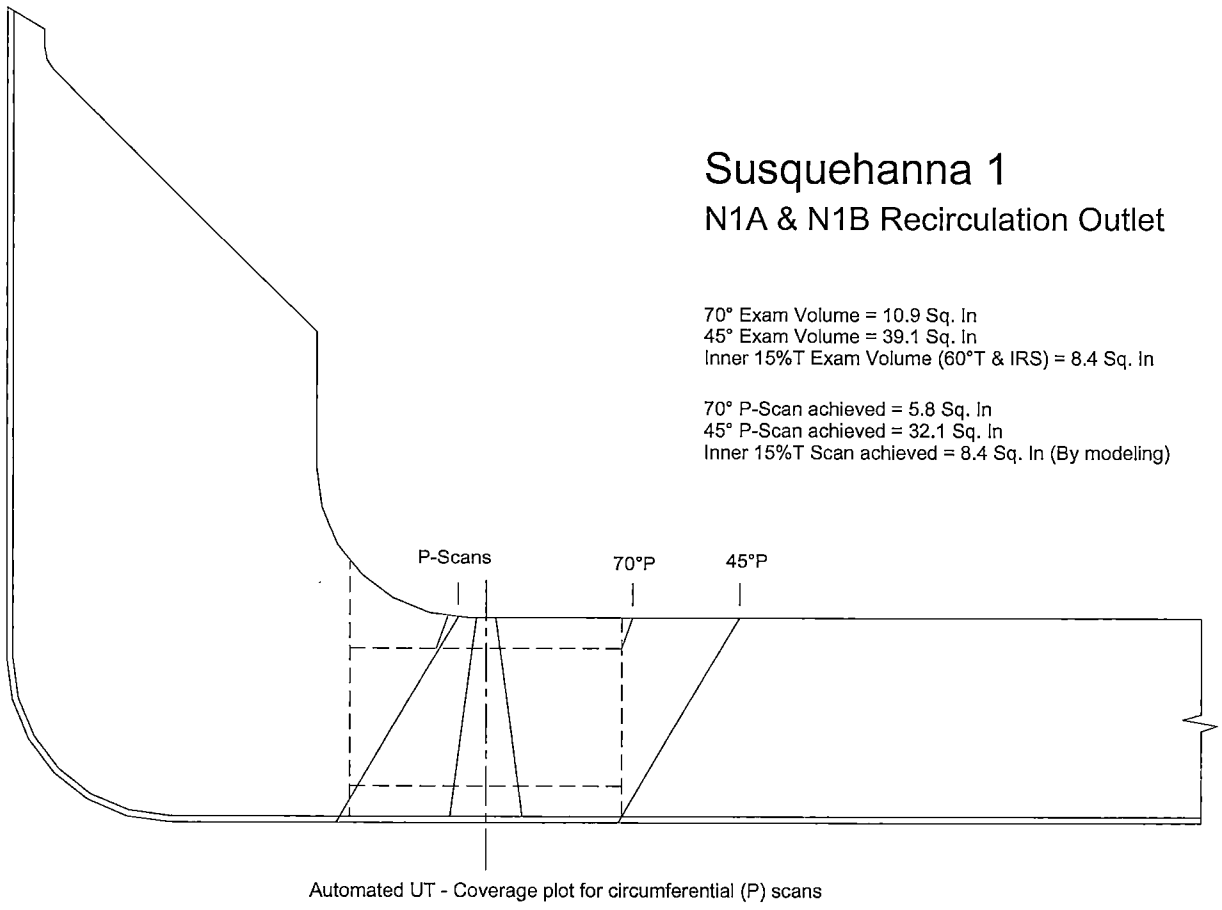


Figure 3RR-19.9

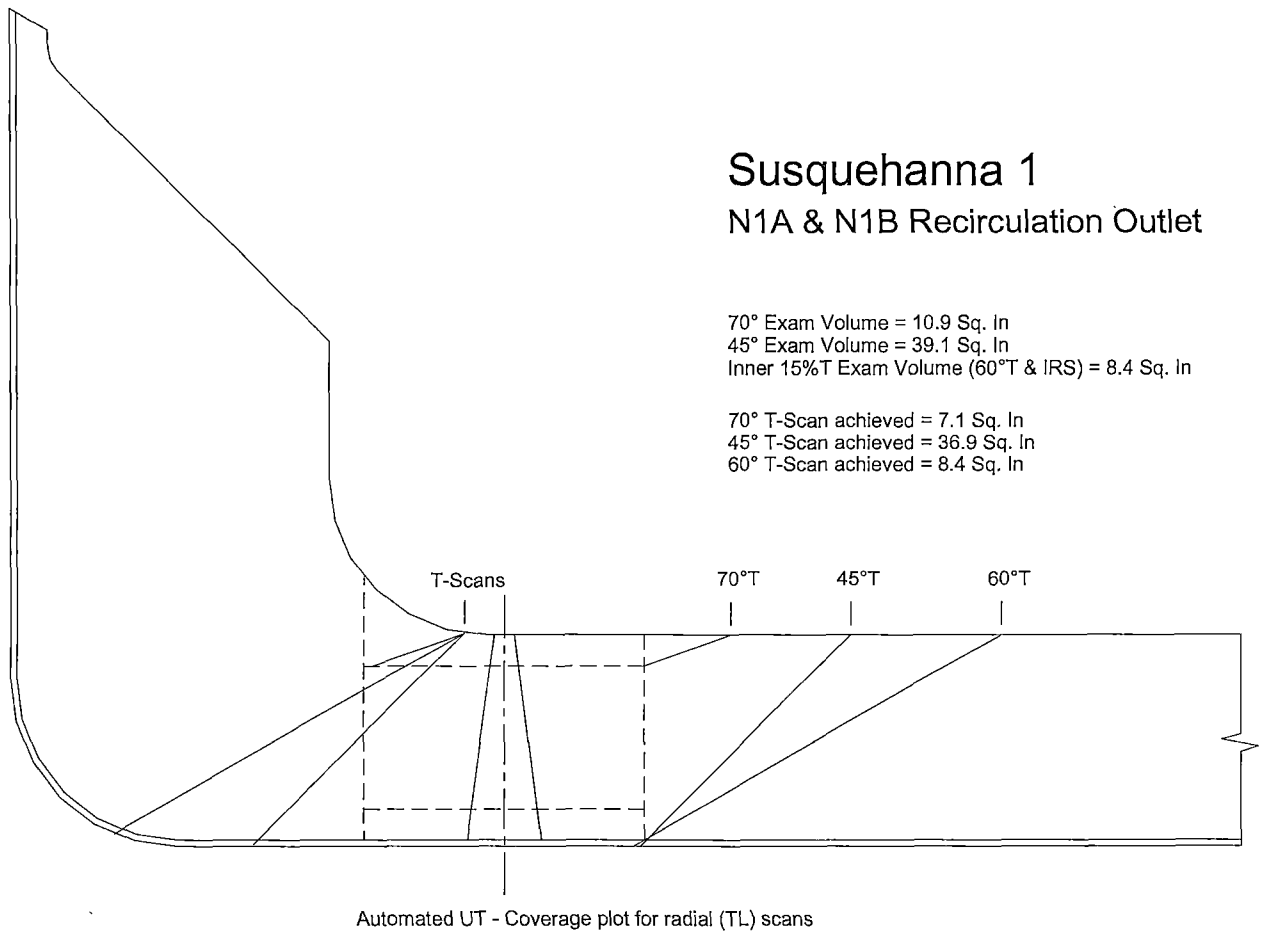


Figure 3RR-19.10

Susquehanna 1 / 2006

GE Energy - Nuclear

Reactor Pressure Vessel Coverage Calculation Sheet

Note: Calculation sheets for U1 N1A/B result in identical volumes scanned and coverage

Susquehanna 1 / 2006
N1A (N-SH)
Spring / R&IO14

		CODE CROSS-SECTIONAL AREA		TOTAL CODE COVERAGE		
Weld Length = 360. Exam Volume = 58.4		Required Exam Area Sq. In.	Area Scanned Automated	Percent of Area Automated	Weld Length Automated	Percent Automated
60° T-Scan (S4 UC)	A	8.4	8.4	14.4%	360	7.2%
45° T-Scan (S6 FV)	A	39.1	36.9	63.2%	360	31.6%
70° T-Scan (S6 NS)	A	10.9	7.1	12.2%	360	6.1%
IRS P-Scan (S4 UC)	A	8.4	8.4	14.4%	360	7.2%
45° P-Scan (S6 FV)	A	39.1	32.1	55.0%	360	27.5%
70° P-Scan (S6 NS)	A	10.9	5.8	9.9%	360	5.0%
60° T-Scan (S4 UC)			0		0	
45° T-Scan (S6 FV)			0		0	
70° T-Scan (S6 NS)			0		0	
IRS P-Scan (S4 UC)			0		0	
45° P-Scan (S6 FV)			0		0	
70° P-Scan (S6 NS)			0		0	
60° T-Scan (S4 UC)			0		0	
45° T-Scan (S6 FV)			0		0	
70° T-Scan (S6 NS)			0		0	
IRS P-Scan (S4 UC)			0		0	
45° P-Scan (S6 FV)			0		0	
70° P-Scan (S6 NS)			0		0	
				% Total Composite Coverage =		84.5%

Rev. 0 9/23/05

Comments: A - Automated scanning was not restricted.

A* - Single side access, 50% credit of the achieved Supplement 4 T-scan volume claimed.
Note - Rounding methods may affect calculated values. UC-Underclad, FV-Full volume, NS-Near Surface. Weld length in degrees.

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Figure 3RR-19.11

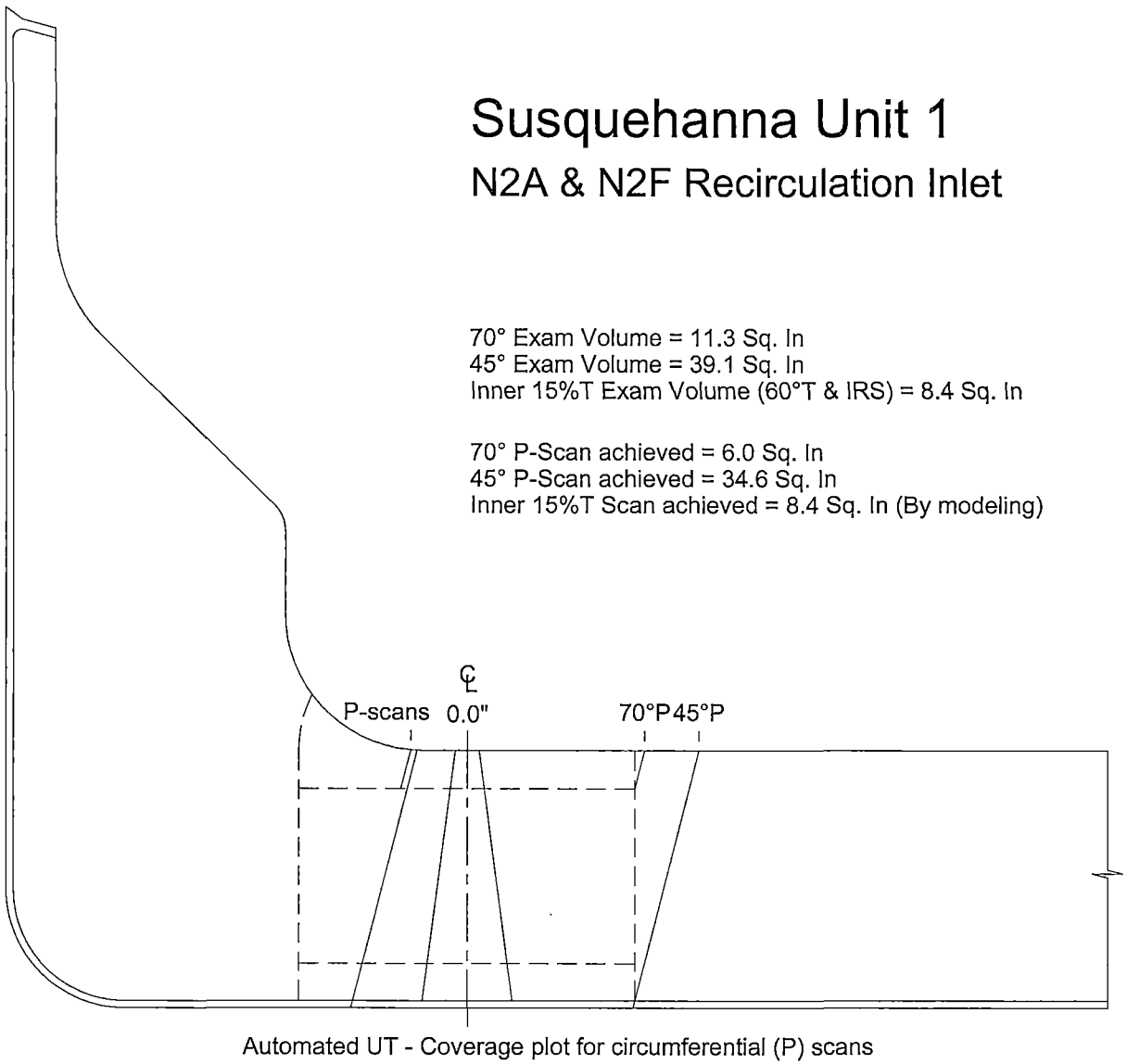

Figure 3RR-19.12

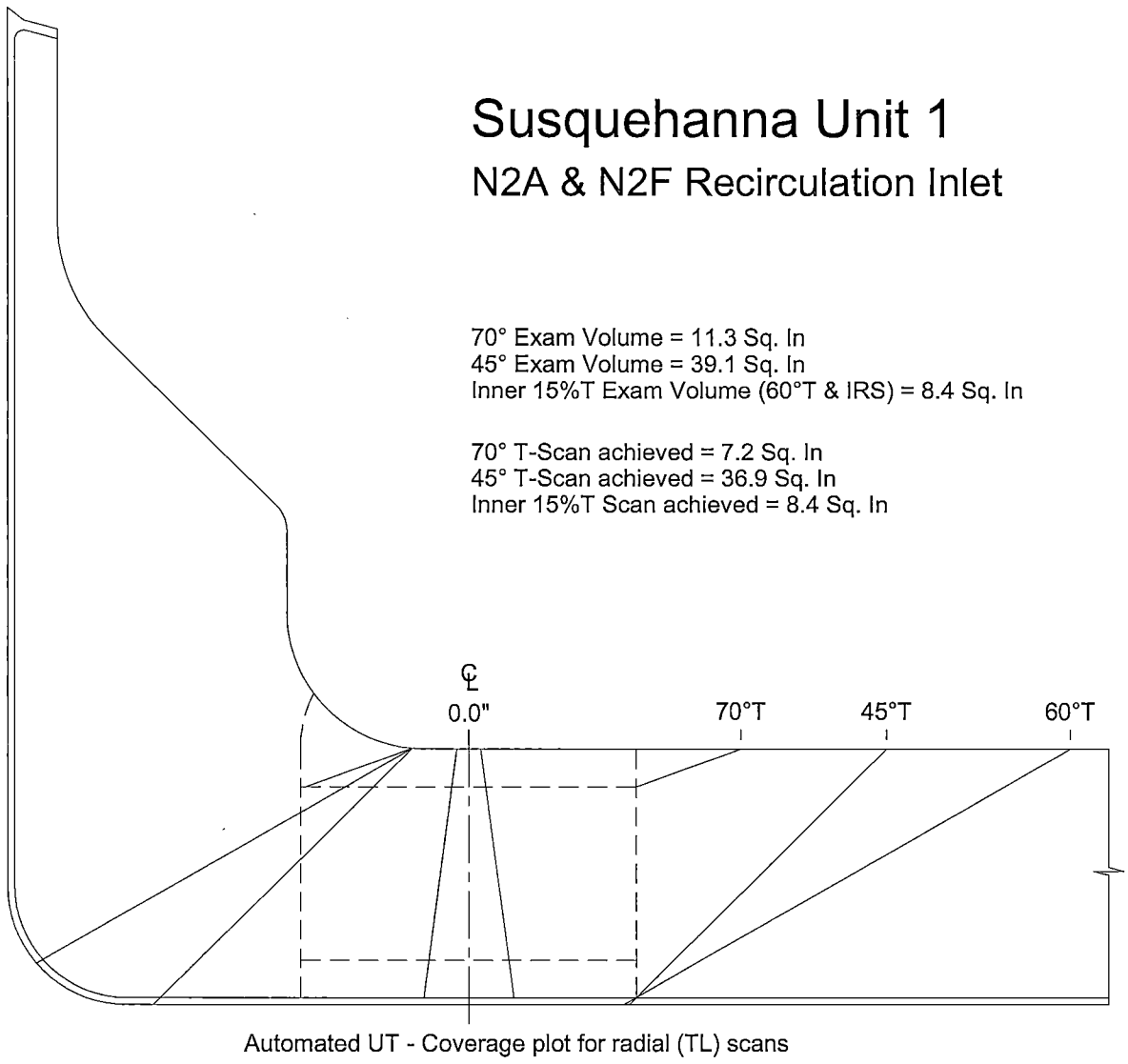

Figure 3RR-19.13

Susquehanna 1 / 2006

GE Energy - Nuclear

Reactor Pressure Vessel Coverage Calculation Sheet

Note: Calculation sheets for U1 N2A/F result in identical volumes scanned and coverage

Susquehanna 1 / 2006
N2A (N-SH)
Spring / R&IO14

		CODE CROSS-SECTIONAL AREA		TOTAL CODE COVERAGE		
Weld Length = 360. Exam Volume = 58.8		Required Exam Area Sq. In.	Area Scanned Automated	Percent of Area Automated	Weld Length Automated	Percent Automated
60° T-Scan (S4 UC)	A	8.4	8.4	14.3%	360	7.1%
45° T-Scan (S6 FV)	A	39.1	36.9	62.8%	360	31.4%
70° T-Scan (S6 NS)	A	11.3	7.2	12.2%	360	6.1%
IRS P-Scan (S4 UC)	A	8.4	8.4	14.3%	360	7.1%
45° P-Scan (S6 FV)	A	39.1	34.6	58.8%	360	29.4%
70° P-Scan (S6 NS)	A	11.3	6	10.2%	360	5.1%
60° T-Scan (S4 UC)			0		0	
45° T-Scan (S6 FV)			0		0	
70° T-Scan (S6 NS)			0		0	
IRS P-Scan (S4 UC)			0		0	
45° P-Scan (S6 FV)			0		0	
70° P-Scan (S6 NS)			0		0	
60° T-Scan (S4 UC)			0		0	
45° T-Scan (S6 FV)			0		0	
70° T-Scan (S6 NS)			0		0	
IRS P-Scan (S4 UC)			0		0	
45° P-Scan (S6 FV)			0		0	
70° P-Scan (S6 NS)			0		0	
				% Total Composite Coverage =		86.3%

Rev. 0 9/23/05

Comments: A - Automated scanning was not restricted.

A* - Single side access, 50% credit of the achieved Supplement 4 T-scan volume claimed.
Note - Rounding methods may affect calculated values. UC-Underclad, FV-Full volume, NS-Near Surface. Weld length in degrees.

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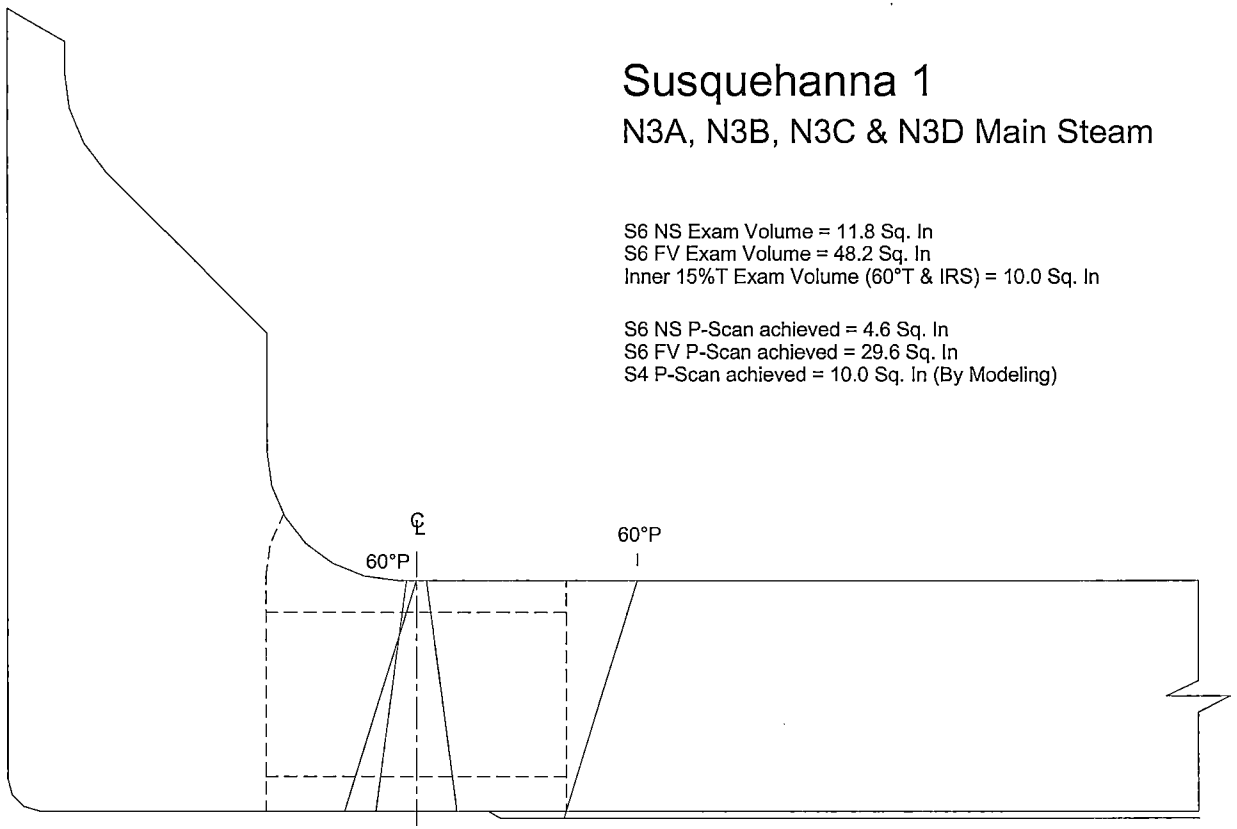
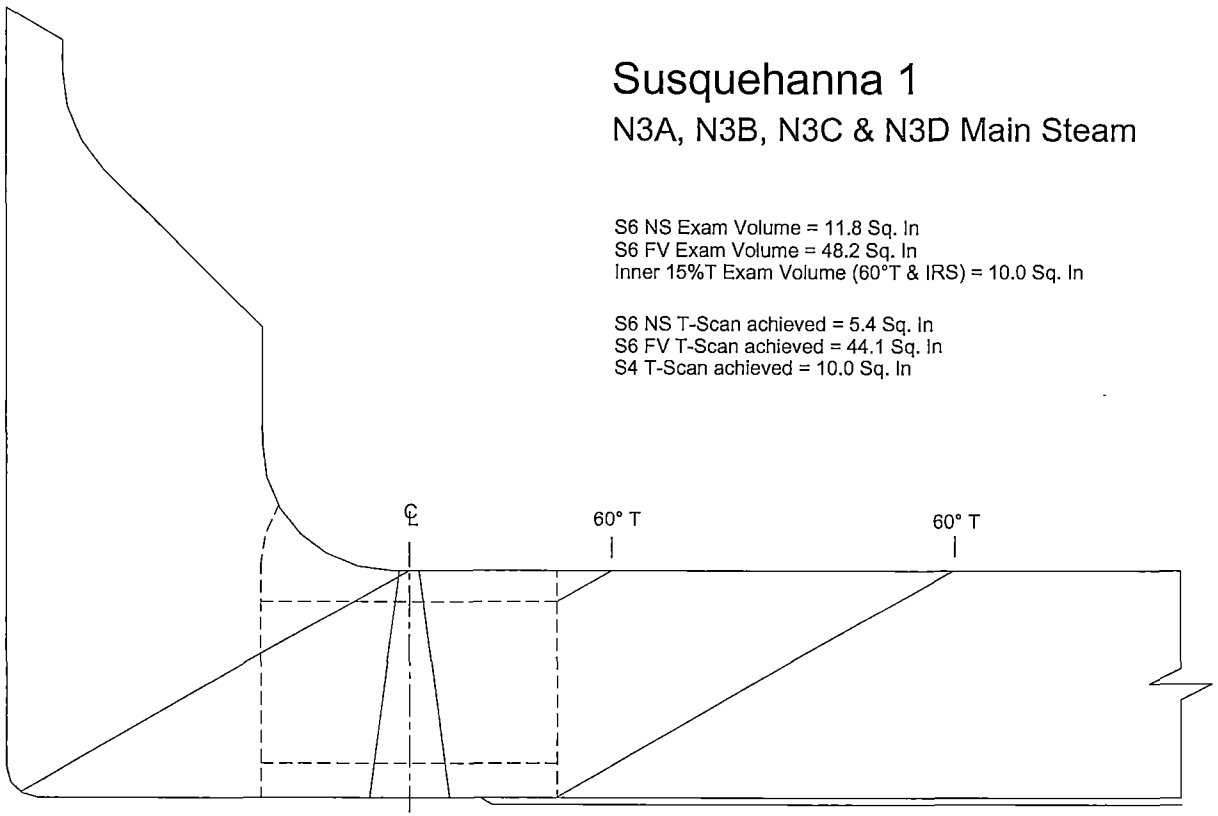
Figure 3RR-19.14



Manual UT - Coverage plot for circumferential (P) scans

Figure 3RR-19.15



Manual UT - Coverage plot for radial (TL) scans

Figure 3RR-19.16

Susquehanna Unit-1, 2008

HITACHI

Reactor Pressure Vessel Coverage Calculation Sheet

Note: Calculation sheets for U1 N3A-N3D result in identical volumes scanned and coverage

Susquehanna Unit-1, 2008
N3A - Main Steam
U1 R&IO 15

		CODE CROSS-SECTIONAL AREA		TOTAL CODE COVERAGE		
Weld Length = 360 Exam Volume = 70.		Required Exam Area Sq. In.	Area Scanned	Percent of Area	Weld Length	Percent
60° T-Scan (S4) *	A	10.0	10.0	14.3%	360	7.1%
60° T-Scan (S6)	A	60.0	49.5	70.7%	360	35.4%
IRS P-Scan (S4)	A	10.0	10.0	14.3%	360	7.1%
60° P-Scan (S6)	A	60.0	34.2	48.9%	360	24.4%

% Total Composite Coverage = 74.1%

Rev.0 9/23/05

Comments: A - Examination limited due to the nozzle configuration.

OneC15
3-26-08
OS

* - Single side access, 100% credit of the achieved Supplement 4 T-scan volume claimed l.a.w., 10CFR50.55a.
Note - Rounding methods may affect calculated values. Weld length in degrees

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Figure 3RR-19.17

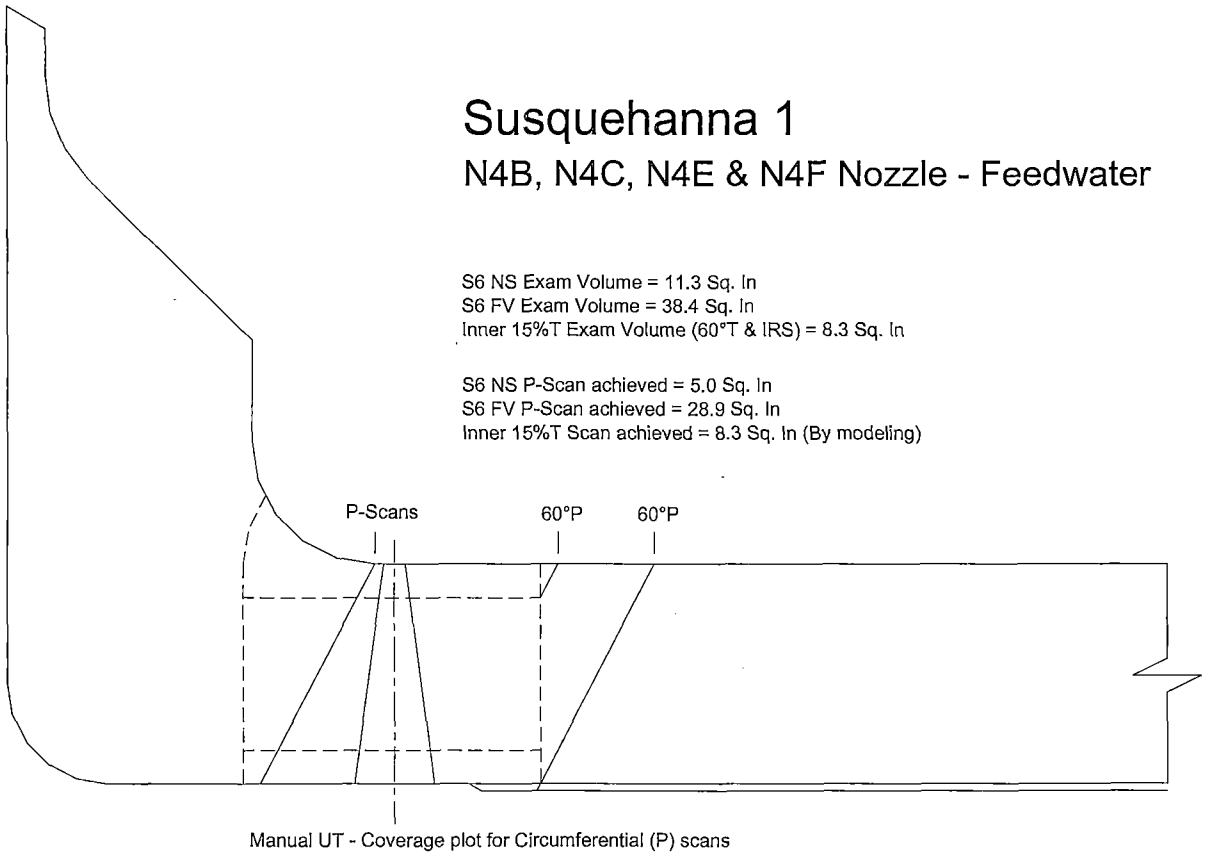

Figure 3RR-19.18

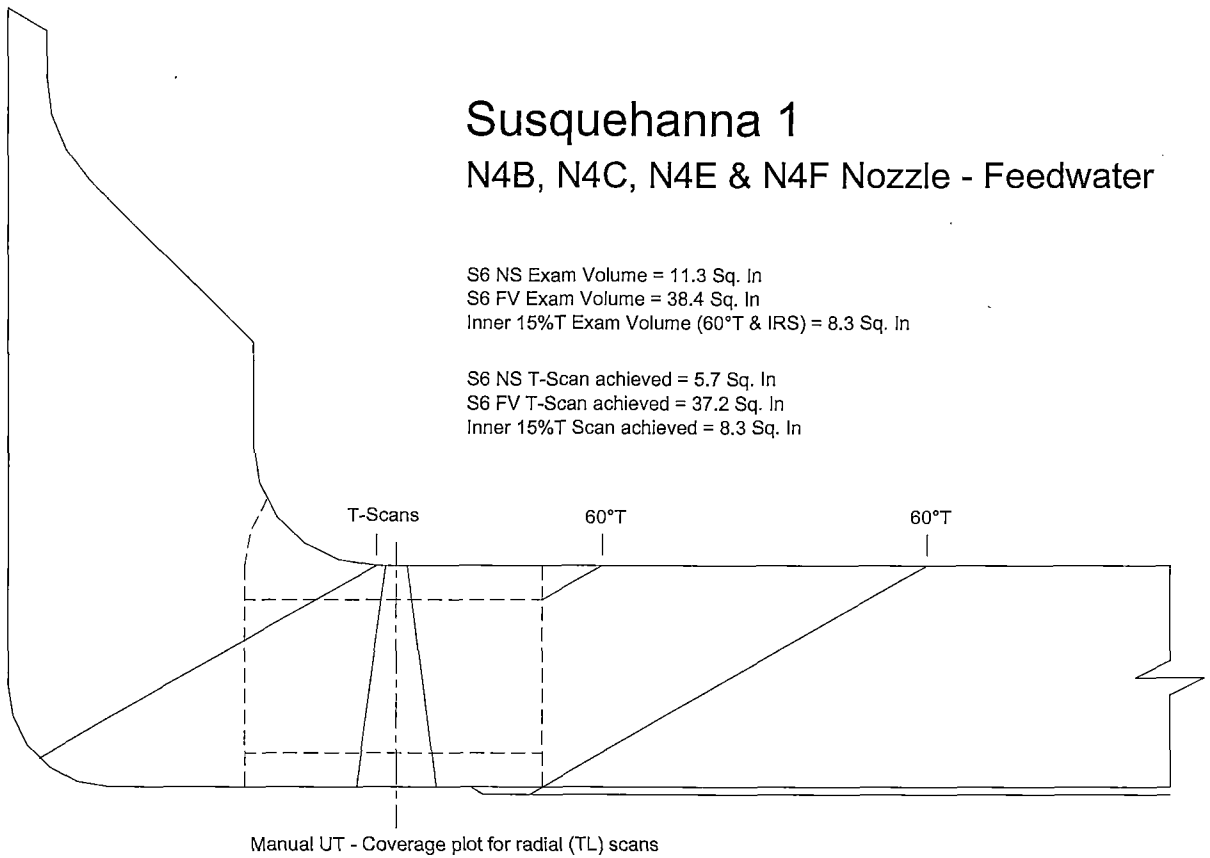

Figure 3RR-19.19

Susquehanna Unit-1 2006

GE Energy - Nuclear

Reactor Pressure Vessel Coverage Calculation Sheet

Note: Calculation sheets for U1 N4B/C/E/F result in identical volumes scanned and coverage

Susquehanna Unit-1 2006
N4B
2006 R&IO14

Weld Length = 360. / Exam Volume = 58.		CODE CROSS-SECTIONAL AREA		TOTAL CODE COVERAGE		
		Required Exam Area Sq. In.	Area Scanned Manual	Percent of Area Manual	Weld Length Manual	Percent Manual
60° T-Scan (S4)	A	8.3	8.3	14.3%	360.0	7.2%
60° T-Scan (S6)	A	49.7	42.9	74.0%	360.0	37.0%
IRS-Scan (S4)	A	8.3	8.3	14.3%	360.0	7.2%
60° P-Scan (S6)	A	49.7	33.9	58.4%	360.0	29.2%
60° T-Scan (S4)						
60° T-Scan (S6)						
IRS-Scan (S4)						
60° P-Scan (S6)						
60° T-Scan (S4)						
60° T-Scan (S6)						
IRS-Scan (S4)						
60° P-Scan (S6)						
60° T-Scan (S4)						
60° T-Scan (S6)						
IRS-Scan (S4)						
60° P-Scan (S6)						

% Total Composite Coverage = 80.5%

Rev. 0 9/23/05

Comments: Examined 360°. IRS Scan achieved determined by modeling.
A - Examination limited due to nozzle configuration.

Note - Rounding methods may affect calculated values. Weld length in degrees.

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Figure 3RR-19.20

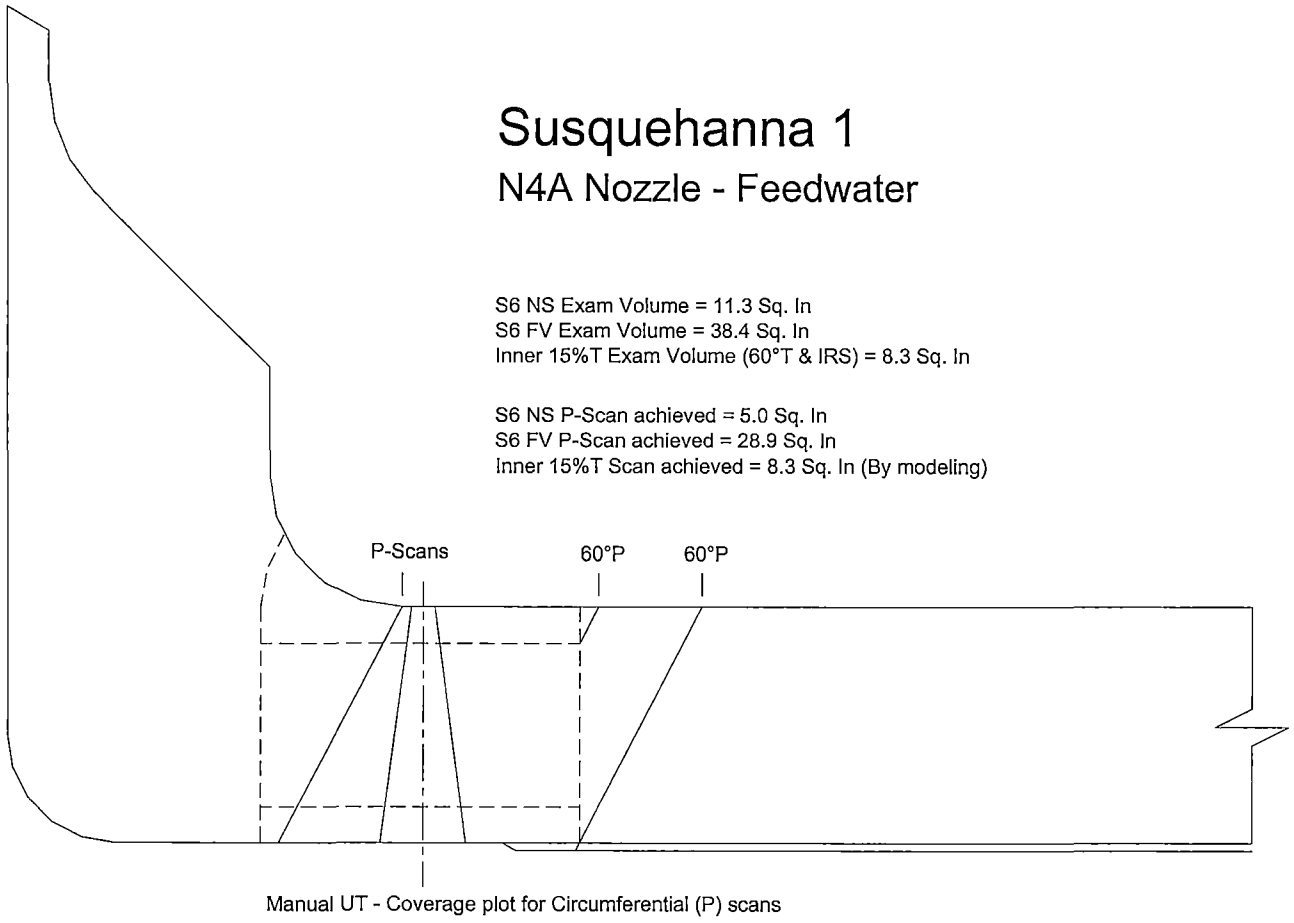


Figure 3RR-19.21

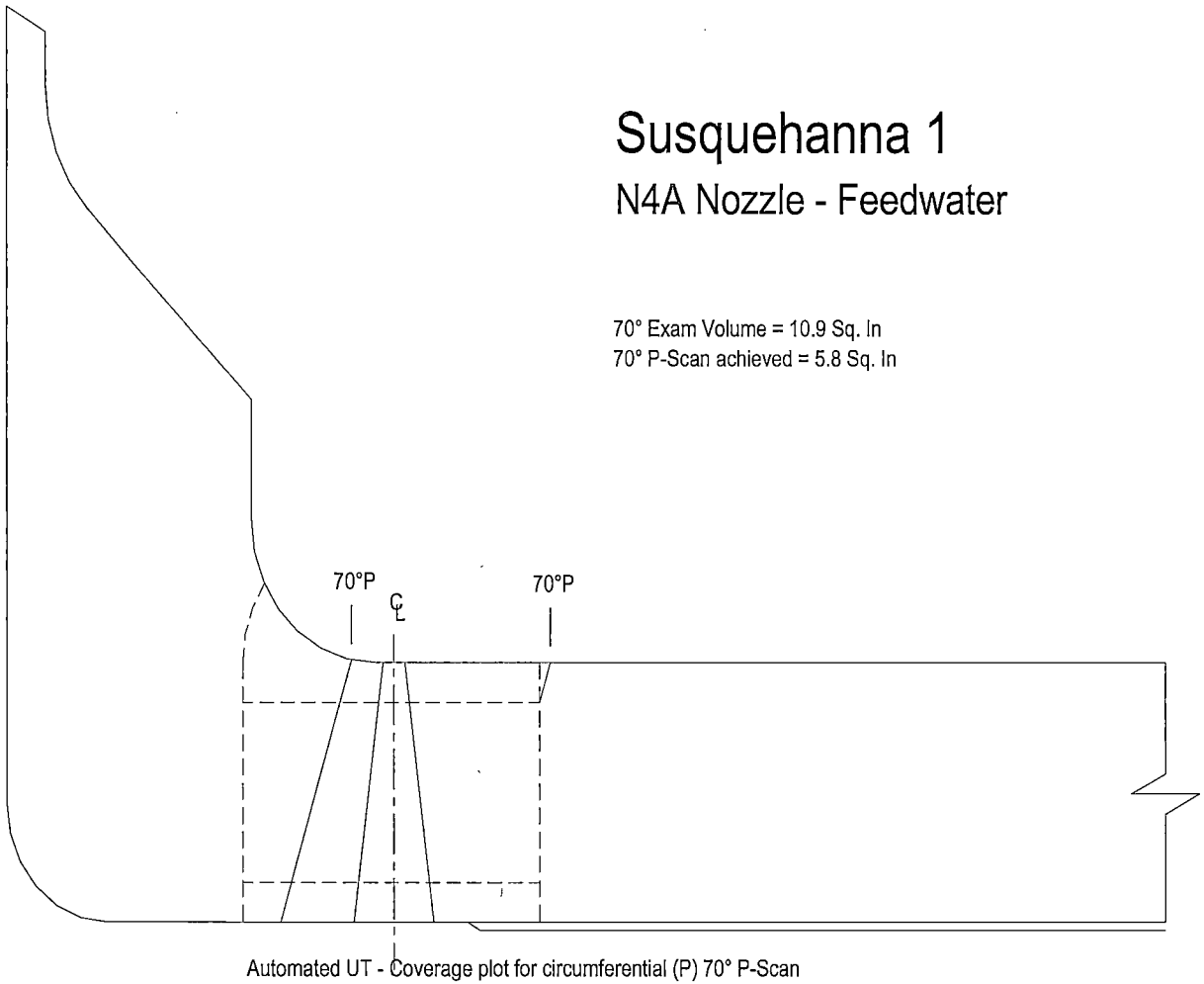


Figure 3RR-19. 22

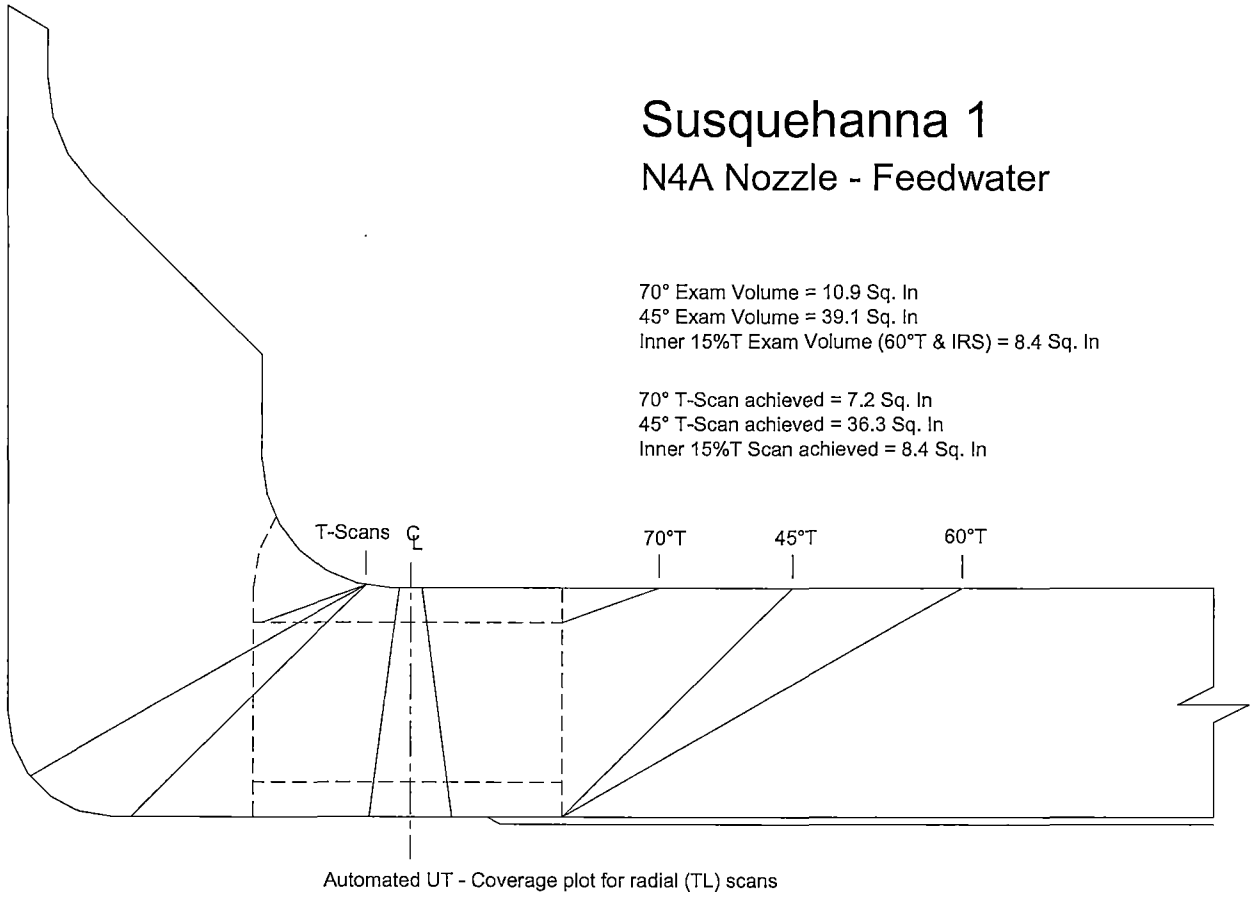


Figure 3RR-19.23

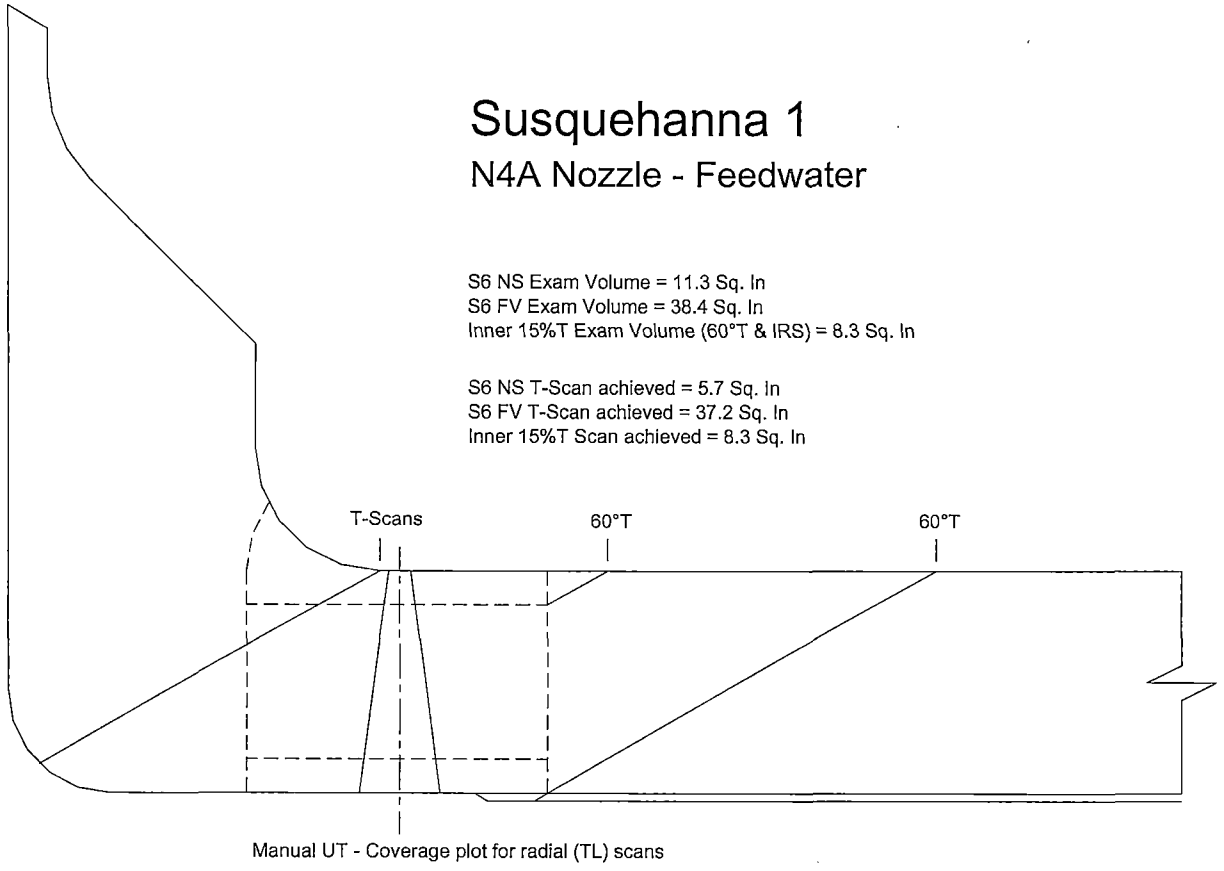


Figure 3RR-19.24

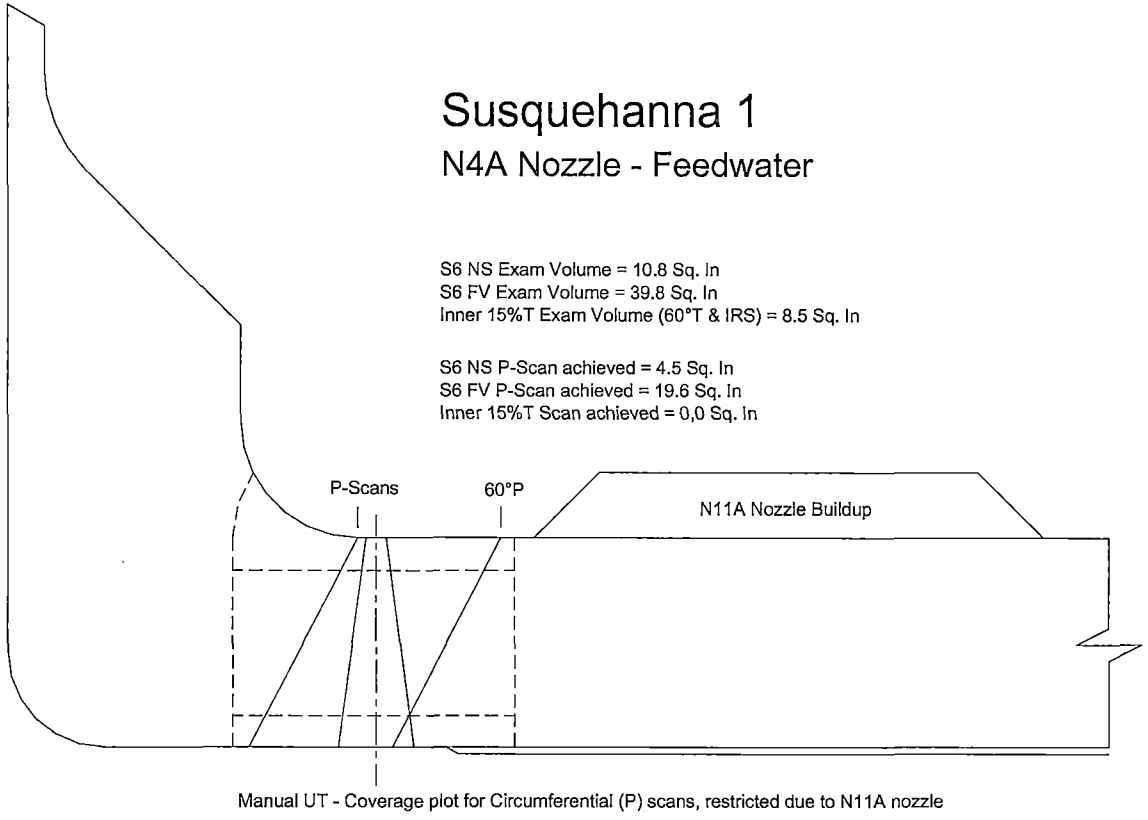


Figure 3RR-19.25

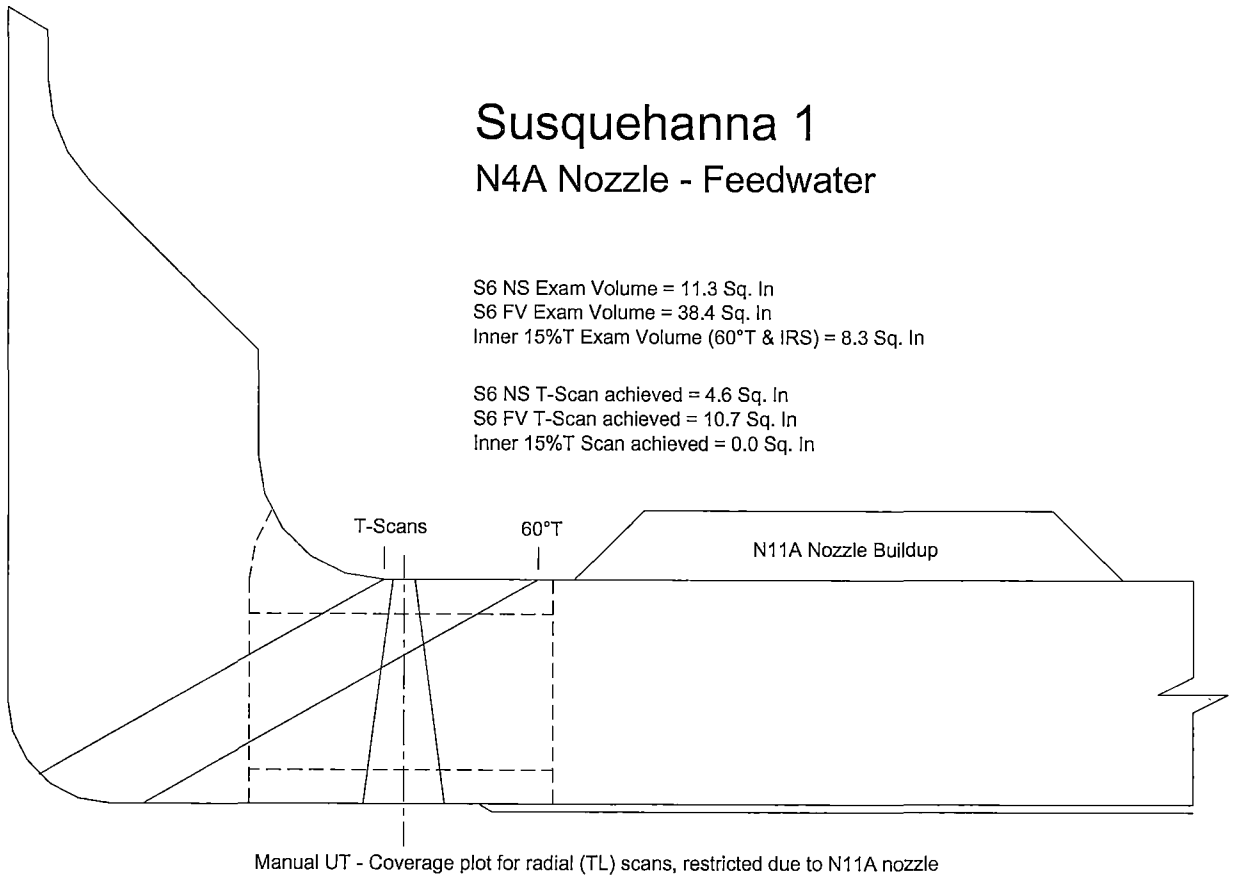
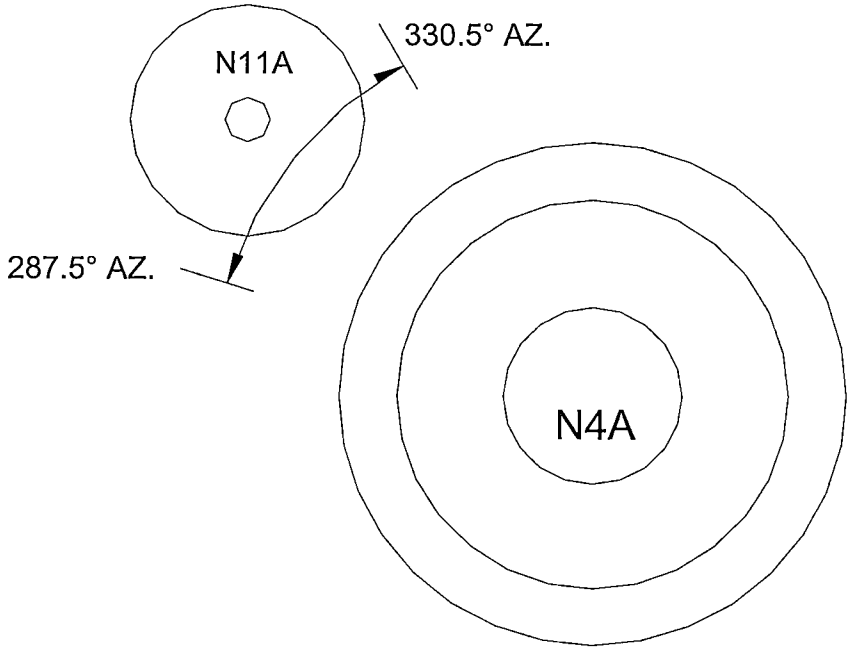


Figure 3RR-19. 26



Manual UT scanning restricted, due to N11A Nozzle.

Figure 3RR-19.27

Susquehanna 1 / 2006

GE Energy - Nuclear

Reactor Pressure Vessel Coverage Calculation Sheet

Susquehanna 1 / 2006
N4A (N-SH)
Spring / R&IO14

		CODE CROSS-SECTIONAL AREA		TOTAL CODE COVERAGE		
Weld Length = 360. Exam Volume = 58.4		Required Exam Area Sq. In.	Area Scanned Automated	Percent of Area Automated	Weld Length Automated	Percent Automated
60° T-Scan (S4 UC)	A	8.4	8.4	14.4%	304.8	6.1%
45° T-Scan (S6 FV)	A	39.1	36.3	62.2%	304.8	26.3%
70° T-Scan (S6 NS)	A	10.9	7.2	12.3%	300.6	5.1%
IRS P-Scan (S4 UC)	A	8.4	0	0.0%	0	0.0%
45° P-Scan (S6 FV)	A	39.1	0	0.0%	0	0.0%
70° P-Scan (S6 NS)	A	10.9	5.8	9.9%	300.6	4.1%
60° T-Scan (S4 UC)			0		0	
45° T-Scan (S6 FV)			0		0	
70° T-Scan (S6 NS)			0		0	
IRS P-Scan (S4 UC)			0		0	
45° P-Scan (S6 FV)			0		0	
70° P-Scan (S6 NS)			0		0	
60° T-Scan (S4 UC)			0		0	
45° T-Scan (S6 FV)			0		0	
70° T-Scan (S6 NS)			0		0	
IRS P-Scan (S4 UC)			0		0	
45° P-Scan (S6 FV)			0		0	
70° P-Scan (S6 NS)			0		0	

% Total Composite Coverage = 41.7%

Rev. 0 9/23/05

Comments: A - Automated scanning was restricted due to the proximity of the N11A nozzle.

A* - Single side access, 50% credit of the achieved Supplement 4 T-scan volume claimed.
Note - Rounding methods may affect calculated values. UC-Underclad, FV-Full volume, NS-Near Surface. Weld length in degrees.

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Figure 3RR-19.28

Susquehanna Unit-1 2006

GE Energy - Nuclear

Reactor Pressure Vessel Coverage Calculation Sheet

Susquehanna Unit-1 2006
N4A
2006 R&IO14

		CODE CROSS-SECTIONAL AREA		TOTAL CODE COVERAGE		
Weld Length = 360. Exam Volume = 58.		Required Exam Area Sq. In.	Area Scanned Manual	Percent of Area Manual	Weld Length Manual	Percent Manual
60° T-Scan (S4)	A	8.3	0.0	0.0%	0.0	0.0%
60° T-Scan (S6)	A	49.7	0.0	0.0%	0.0	0.0%
IRS-Scan (S4)	A	8.3	8.3	14.3%	317.0	6.3%
60° P-Scan (S6)	A	49.7	33.9	58.4%	317.0	25.7%
60° T-Scan (S4)	B	8.3	0.0	0.0%	43.0	0.0%
60° T-Scan (S6)	B	49.7	15.3	26.4%	43.0	1.6%
IRS-Scan (S4)	B	8.3	0.0	0.0%	43.0	0.0%
60° P-Scan (S6)	B	49.7	24.1	41.6%	43.0	2.5%
60° T-Scan (S4)	C	8.3	8.3	14.3%	12.2	0.2%
60° T-Scan (S6)	C	49.7	42.9	74.0%	12.2	1.3%
IRS-Scan (S4)						
60° P-Scan (S6)						
60° T-Scan (S4)						
60° T-Scan (S6)						
IRS-Scan (S4)						
60° P-Scan (S6)						
				% Total Composite Coverage =		37.6%

Rev. 0 9/23/05

Comments: Examined 360°. IRS Scan achieved determined by modeling.
A - Examination limited due to nozzle configuration. No T-scan this section was examined by GERIS.
B - Examination limited due to nozzle configuration and the proximity of N11 nozzle buildup.
C - Examination limited due to nozzle configuration. This section is located both sides of the N11 limited to the GERIS.
Note - Rounding methods may affect calculated values. Weld length in degrees.

Figure 3RR-19.29

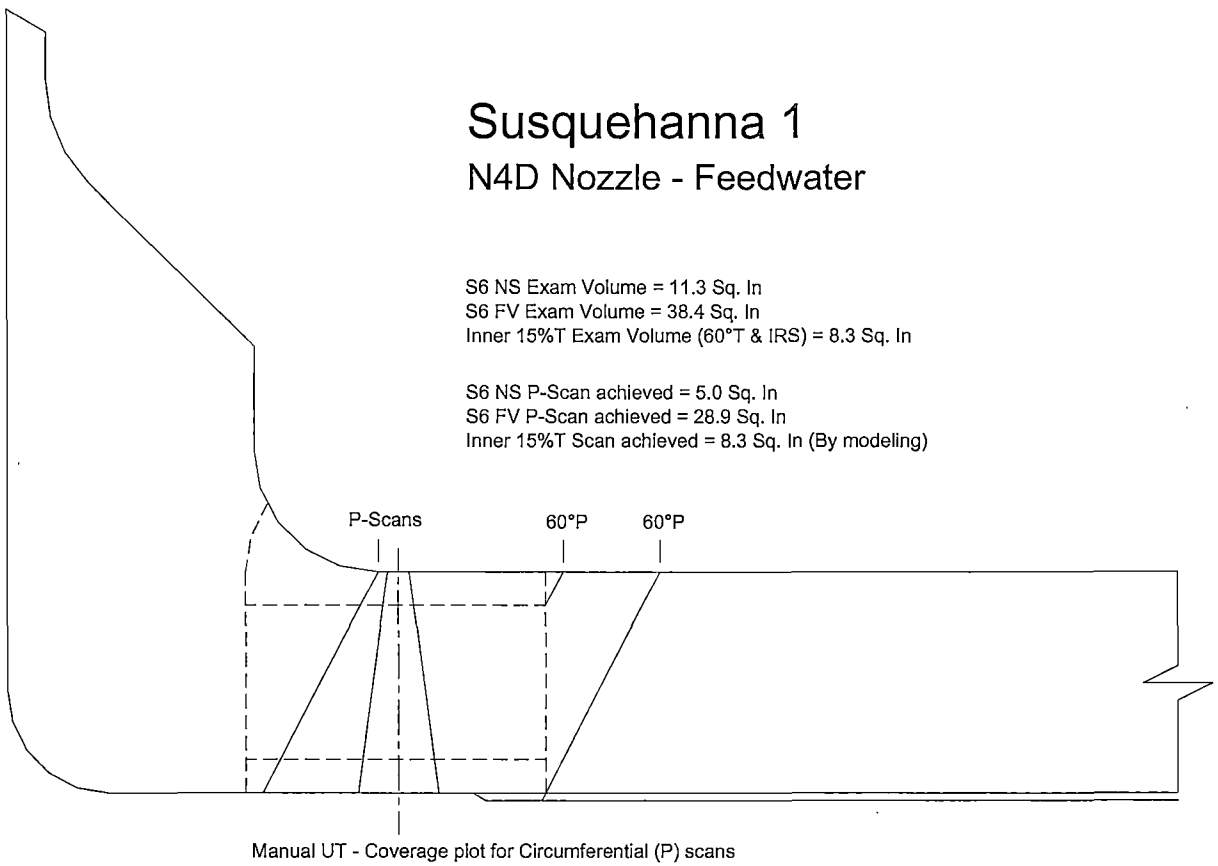


Figure 3RR-19.30

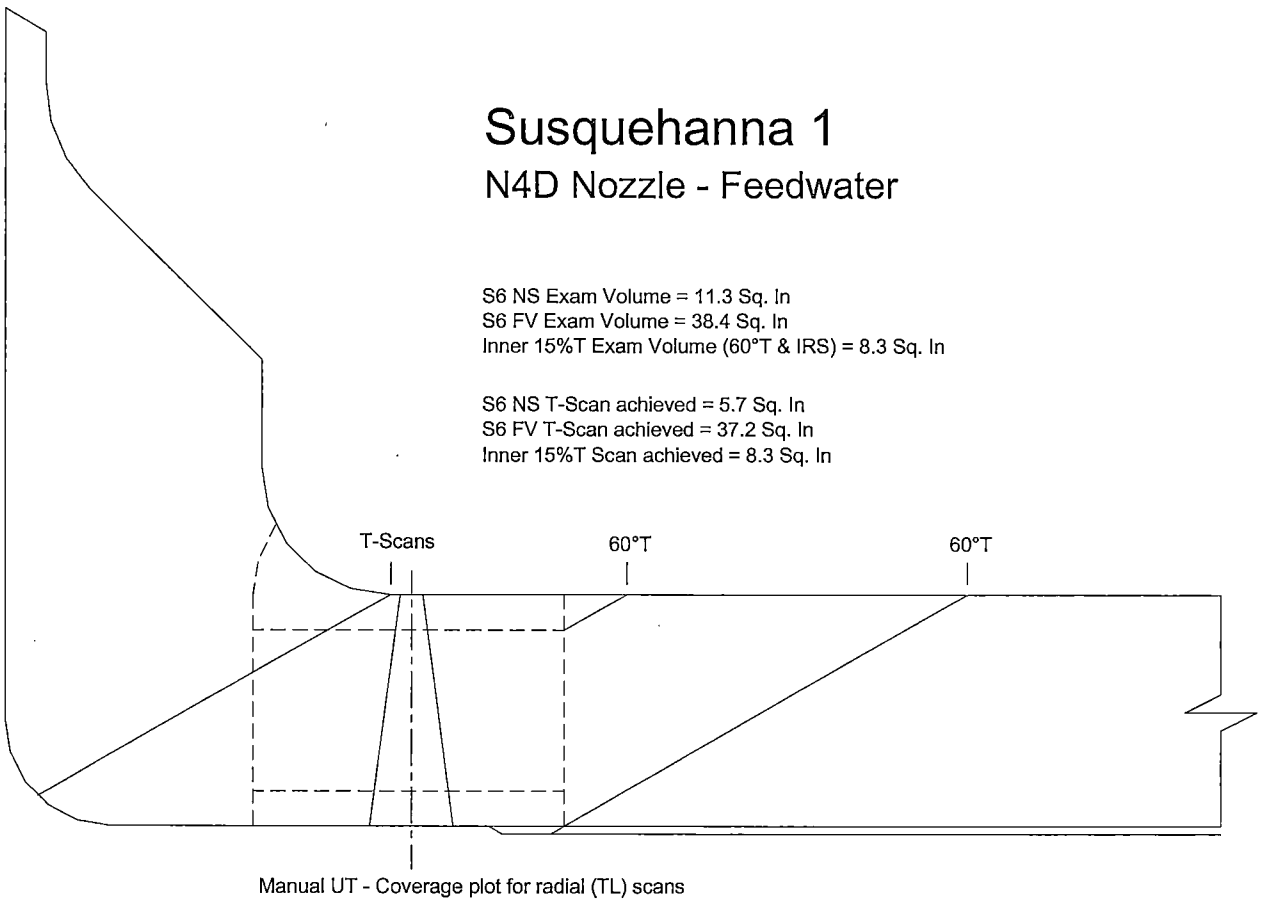


Figure 3RR-19.31

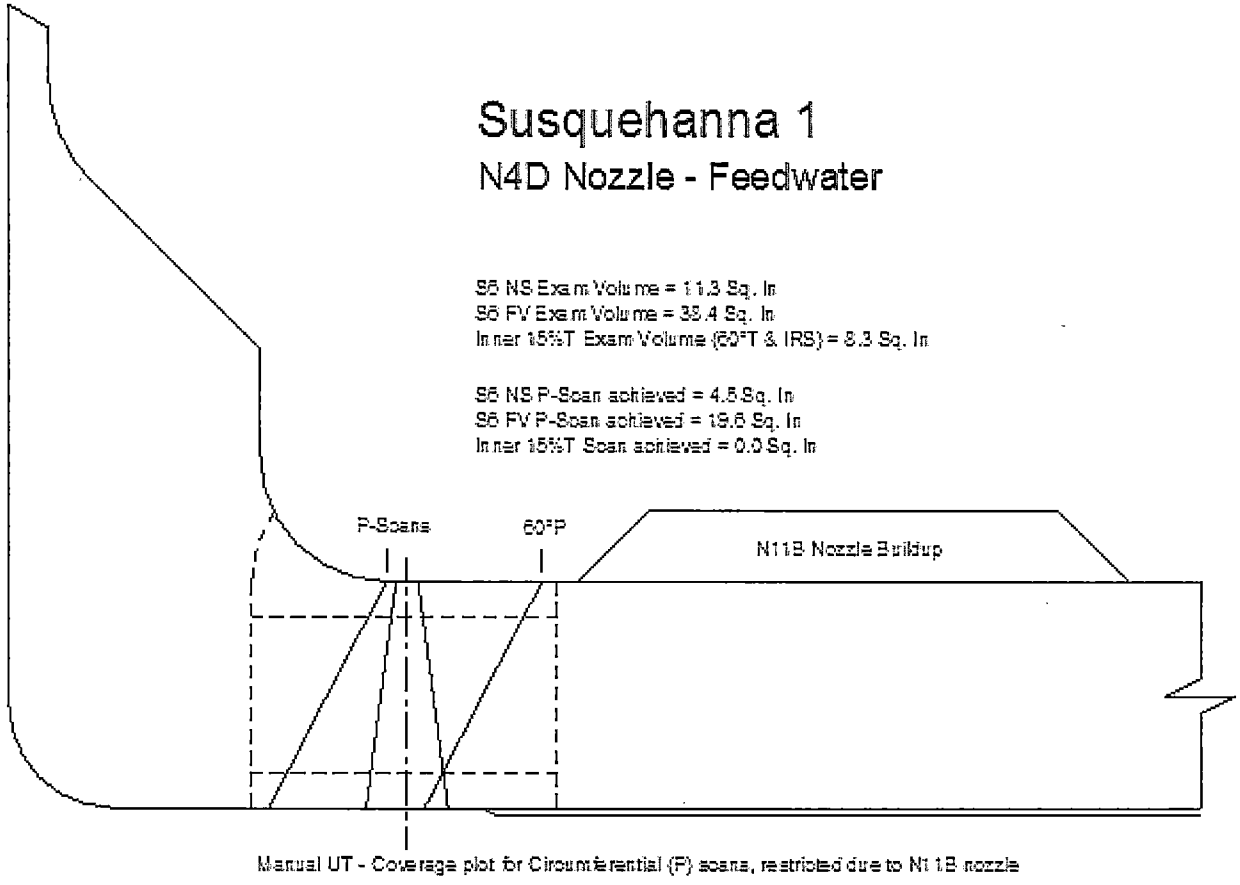


Figure 3RR-19.32

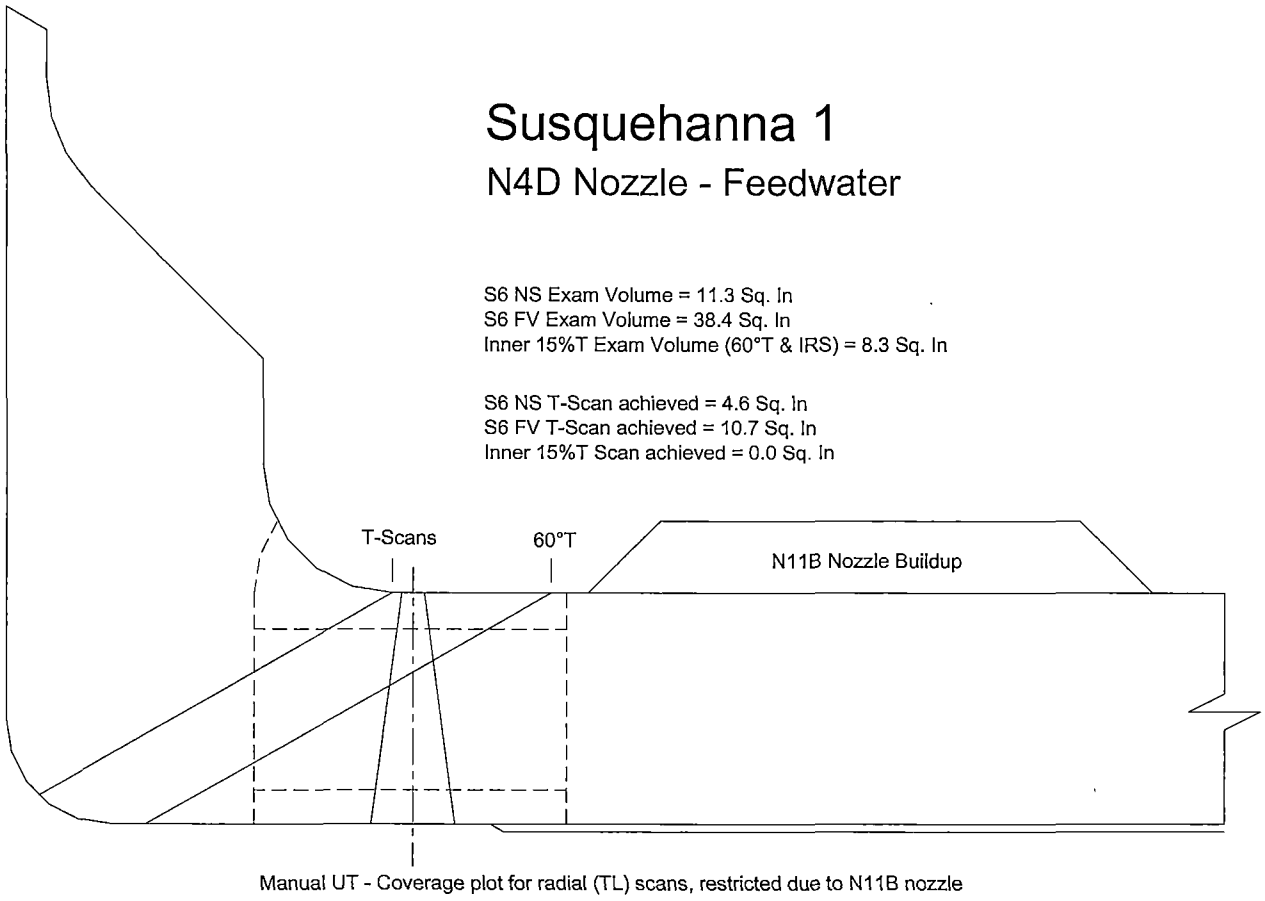
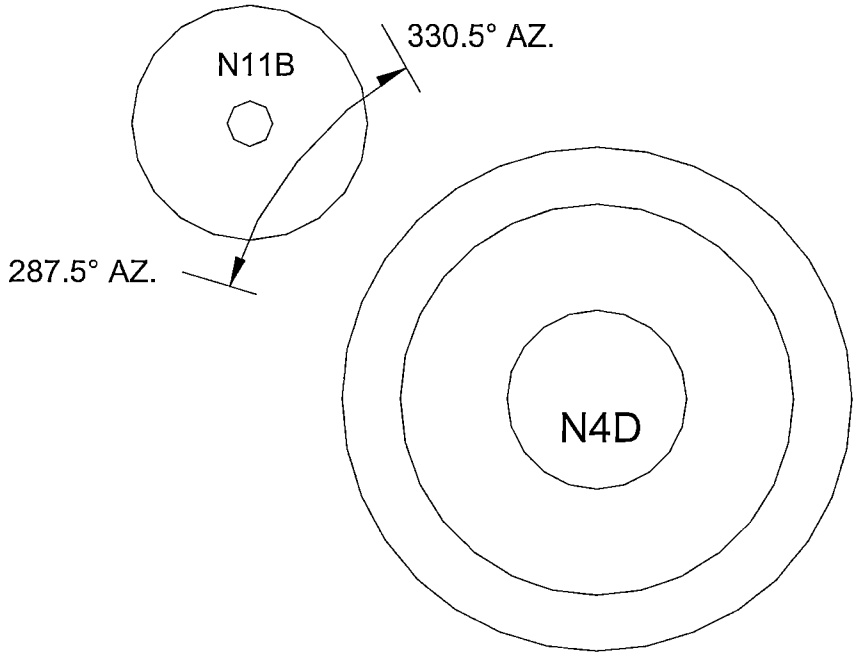


Figure 3RR-19.33



Manual UT scanning restricted, due to N11B Nozzle.

Figure 3RR-19.34

Susquehanna Unit-1 2006

GE Energy - Nuclear

Reactor Pressure Vessel Coverage Calculation Sheet

Susquehanna Unit-1 2006
N4D
2006 R&IO14

Weld Length = 360. Exam Volume = 58.		CODE CROSS-SECTIONAL AREA		TOTAL CODE COVERAGE		
		Required Exam Area Sq. In.	Area Scanned Manual	Percent of Area Manual	Weld Length Manual	Percent Manual
60° T-Scan (S4)	A	8.3	8.3	14.3%	317.0	6.3%
60° T-Scan (S6)	A	49.7	42.9	74.0%	317.0	32.6%
IRS-Scan (S4)	A	8.3	8.3	14.3%	317.0	6.3%
60° P-Scan (S6)	A	49.7	33.9	58.4%	317.0	25.7%
60° T-Scan (S4)	B	8.3	0.0	0.0%	43.0	0.0%
60° T-Scan (S6)	B	49.7	15.3	26.4%	43.0	1.6%
IRS-Scan (S4)	B	8.3	0.0	0.0%	43.0	0.0%
60° P-Scan (S6)	B	49.7	24.1	41.6%	43.0	2.5%
60° T-Scan (S4)						
60° T-Scan (S6)						
IRS-Scan (S4)						
60° P-Scan (S6)						
60° T-Scan (S4)						
60° T-Scan (S6)						
IRS-Scan (S4)						
60° P-Scan (S6)						
				% Total Composite Coverage =		75.0%

Rev. 0 9/23/05

Comments: Examined 360°. IRS Scan achieved determined by modeling.
A - Examination limited due to nozzle configuration.
B - Examination limited due to nozzle configuration and the proximity of N11 nozzle buildup.

Note - Rounding methods may affect calculated values. Weld length in degrees.

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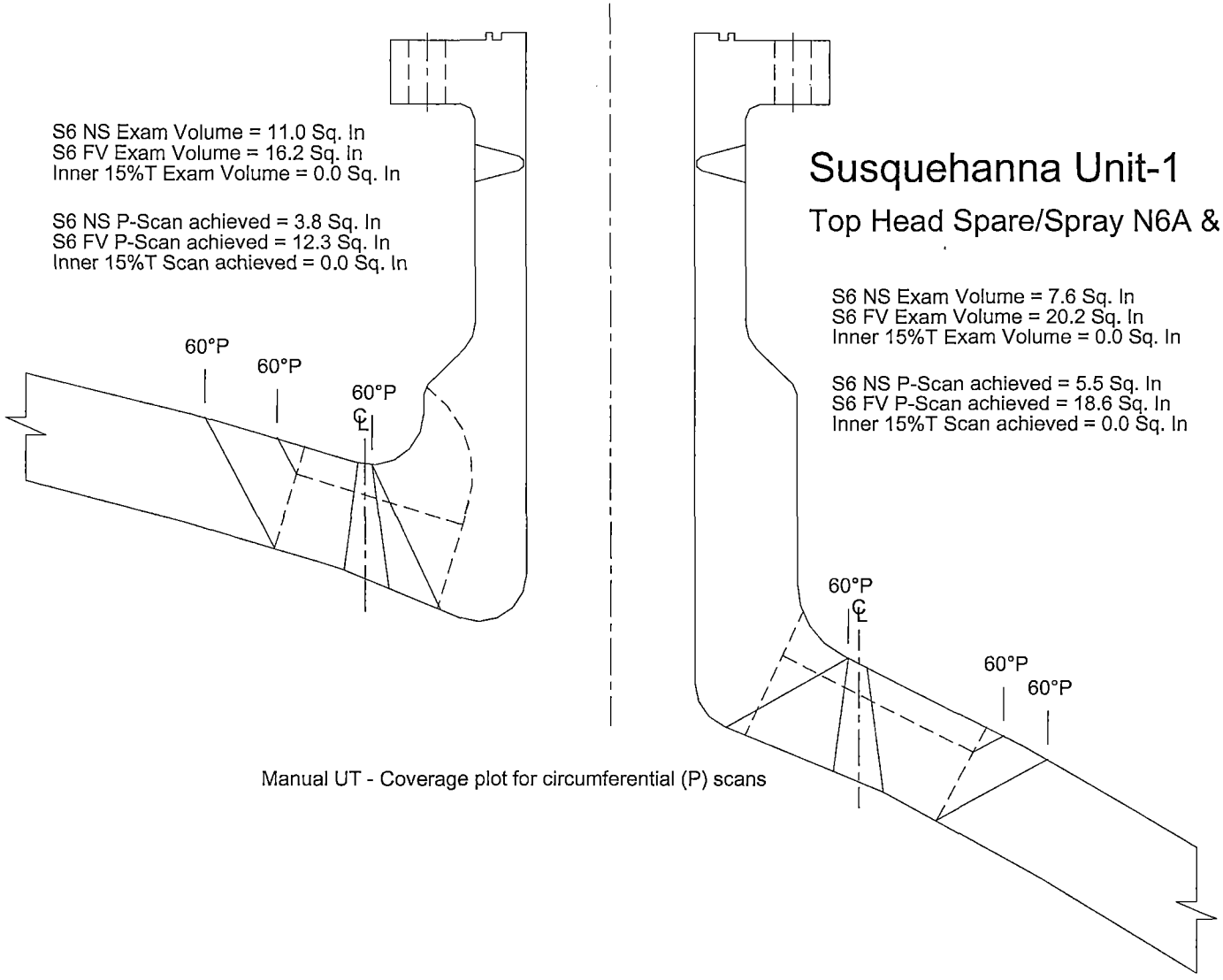
Figure 3RR-19.35



Manual UT - Coverage plot for circumferential (P) scans

Figure 3RR-19.36

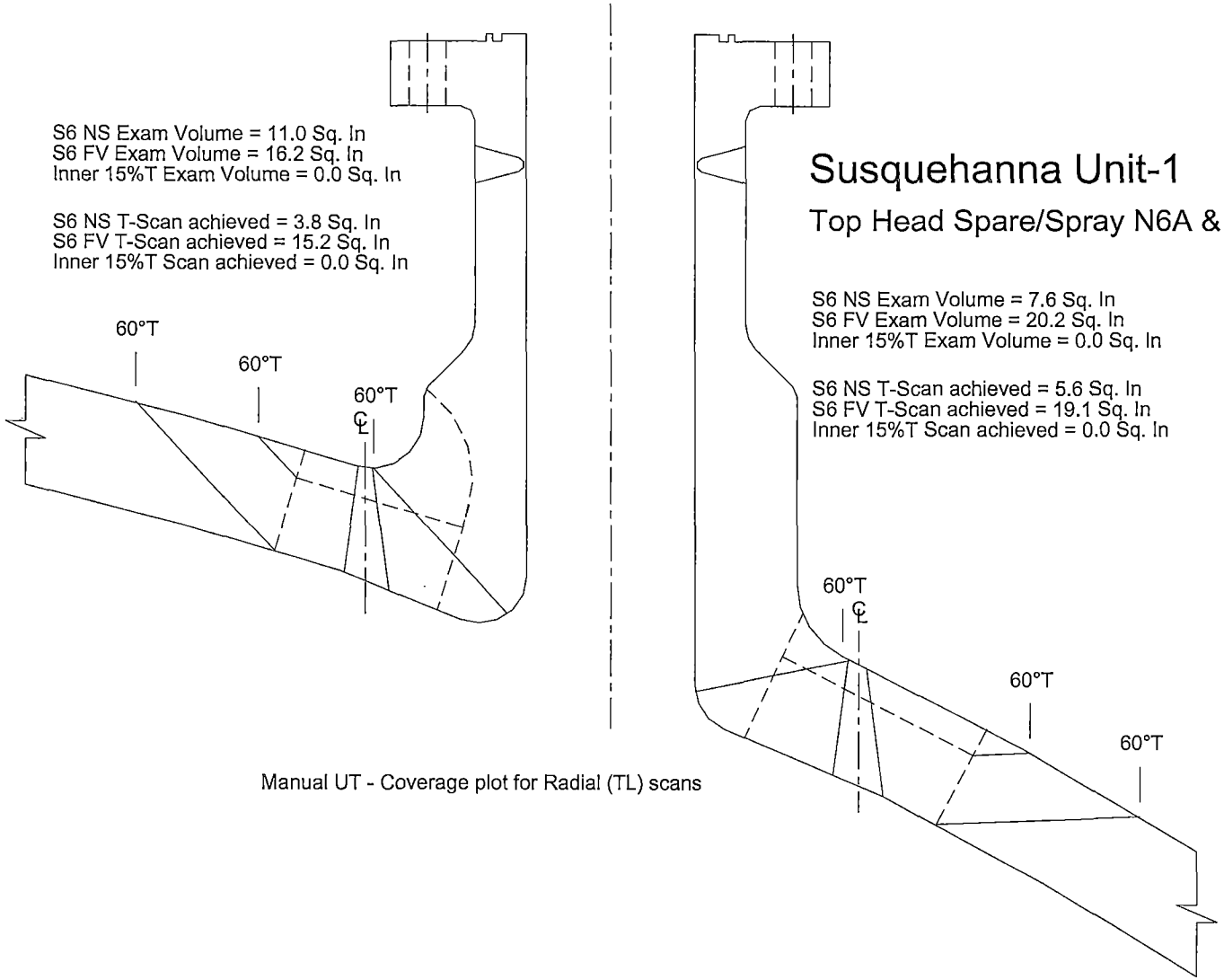


Figure 3RR-19.37

HITACHI

Reactor Pressure Vessel Coverage Calculation Sheet

Note: Calculation sheets for U1 N6A/B result in identical volumes scanned and coverage

Susquehanna Unit-1, 2008
N6A - Top Head Spare
U1 R&IO 15

		CODE CROSS-SECTIONAL AREA		TOTAL CODE COVERAGE		
Weld Length = 360 Exam Volume = 27.2		Required Exam Area Sq. In.	Area Scanned	Percent of Area	Weld Length	Percent
60° T-Scan (S4) *	A	0.0	0.0	0.0%	180	0.0%
60° T-Scan (S6)	A	27.2	19.0	69.9%	180	17.5%
IRS P-Scan (S4)	A	0.0	0.0	0.0%	180	0.0%
60° P-Scan (S6)	A	27.2	16.1	59.2%	180	14.8%
60° T-Scan (S4) *	B	0.0	0.0	0.0%	180	0.0%
60° T-Scan (S6)	B	27.8	24.7	90.8%	180	22.7%
IRS P-Scan (S4)	B	0.0	0.0	0.0%	180	0.0%
60° P-Scan (S6)	B	27.8	24.1	88.6%	180	22.2%
				% Total Composite Coverage =		77.1%

Rev. 0 9/23/05

Comments: Examination limited due to the nozzle configuration.
A - Top side of nozzle.
B - Bottom side of nozzle.
* - Single side access, 100% credit of the achieved Supplement 4 T-scan volume claimed l.a.w., 10CFR50.55a.
Note - Rounding methods may affect calculated values. Weld length in degrees

OneCIS
3-28-08
DCT

Figure 3RR-19.38

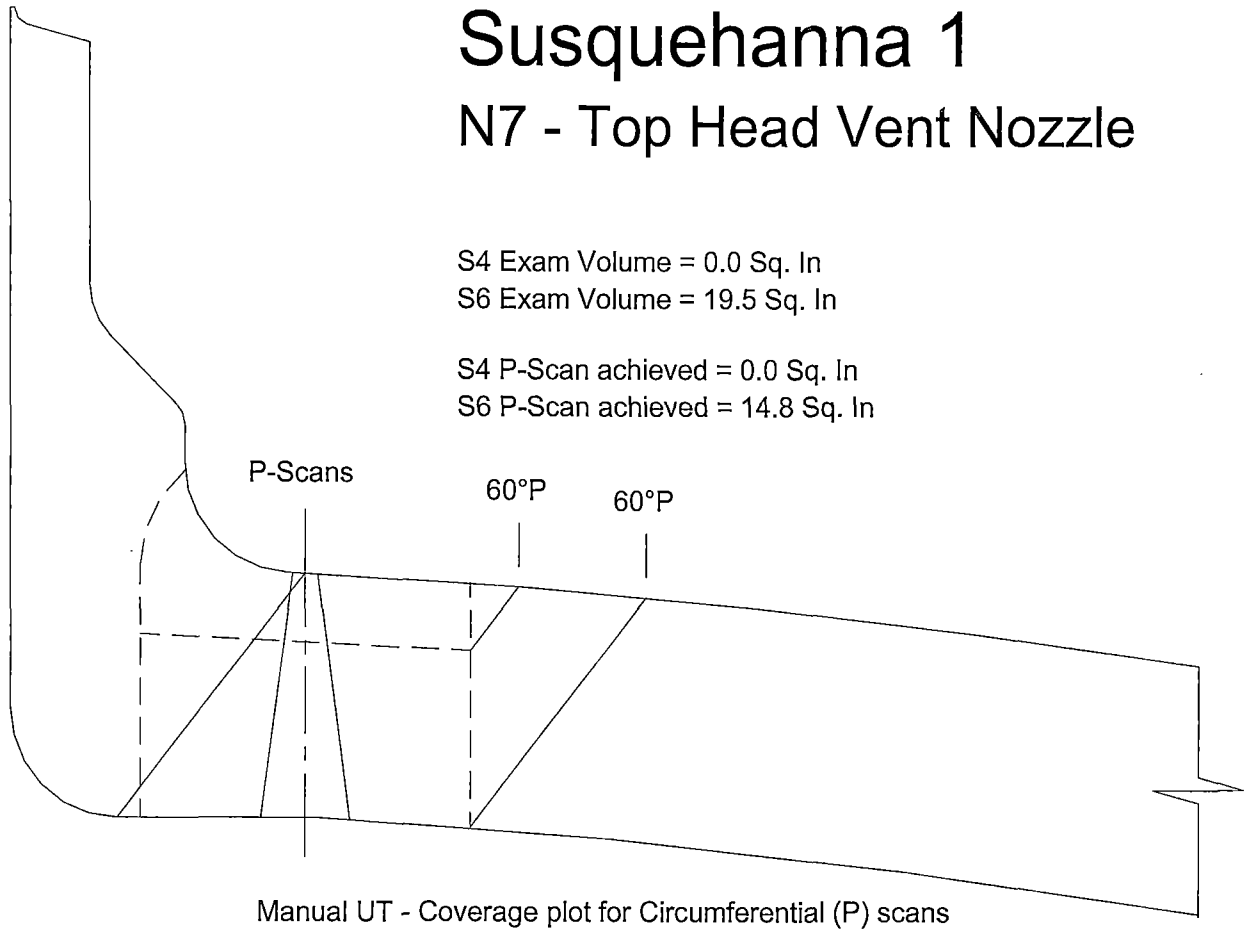


Figure 3RR-19.39

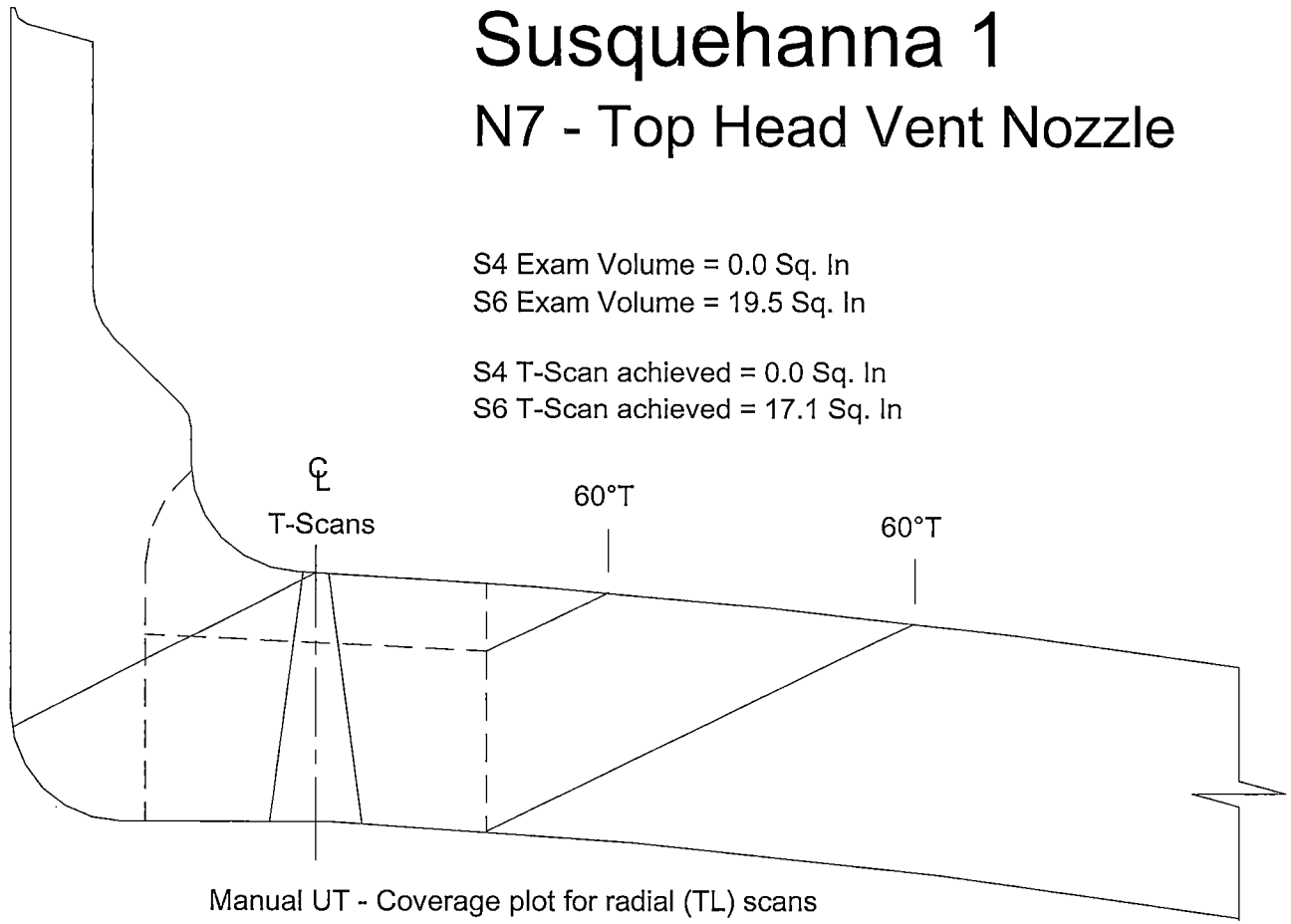


Figure 3RR-19.40

HITACHI

Reactor Pressure Vessel
Coverage Calculation Sheet

Susquehanna Unit-1, 2008
N7 - Top Head Vent
U1 R&IO 15

		CODE CROSS-SECTIONAL AREA		TOTAL CODE COVERAGE		
Weld Length = 360 Exam Volume = 19.5		Required Exam Area Sq. In.	Area Scanned	Percent of Area	Weld Length	Percent
60° T-Scan (S4) *	A	0.0	0.0	0.0%	360	0.0%
60° T-Scan (S6)	A	19.5	17.1	87.7%	360	43.8%
IRS P-Scan (S4)	A	0.0	0.0	0.0%	360	0.0%
60° P-Scan (S6)	A	19.5	14.8	75.9%	360	37.9%
				% Total Composite Coverage =		81.8%

Rev.0 9/23/05

Comments: A - Examination limited due to the nozzle configuration.

One C15
3-28-08
OCT

* - Single side access, 100% credit of the achieved Supplement 4 T-scan volume claimed i.a.w., 10CFR50.55a.
Note - Rounding methods may affect calculated values. Weld length in degrees

Figure 3RR-19.41

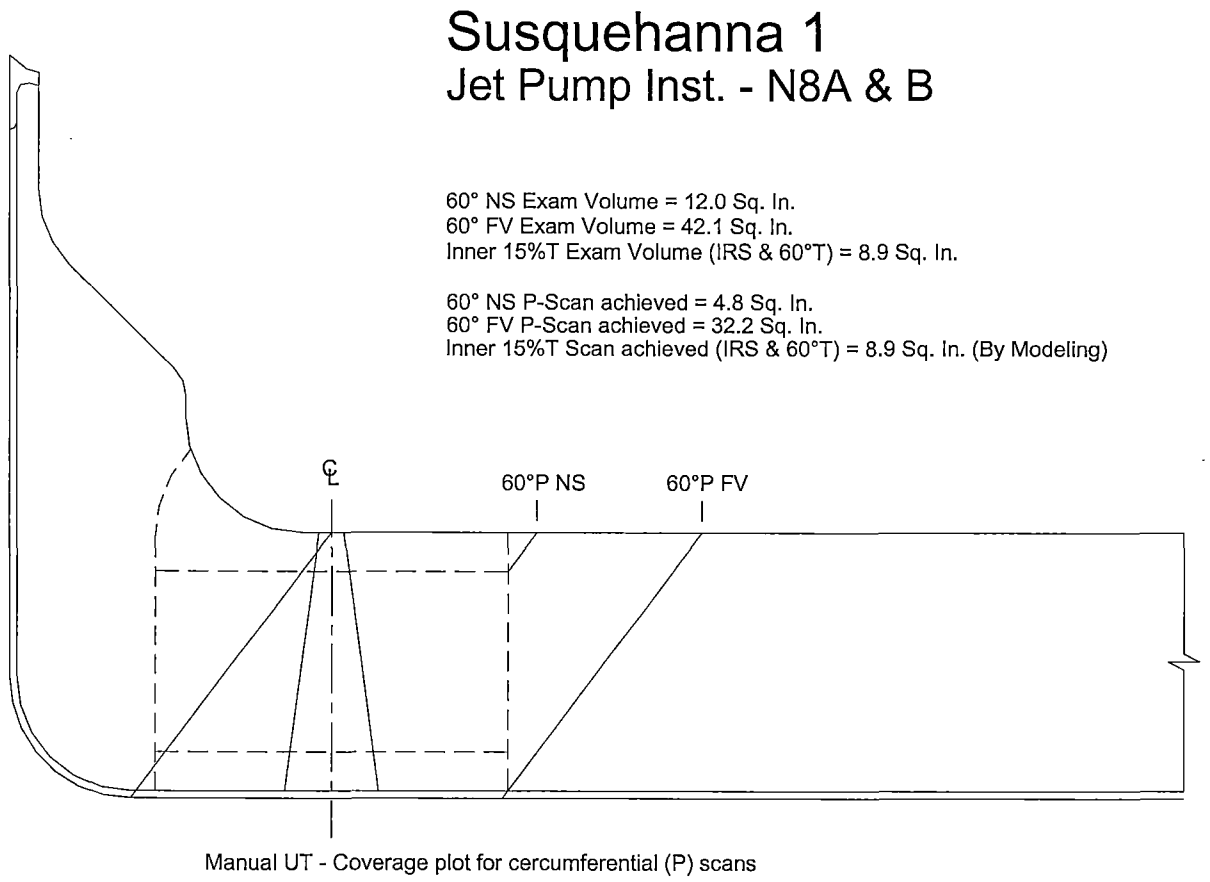
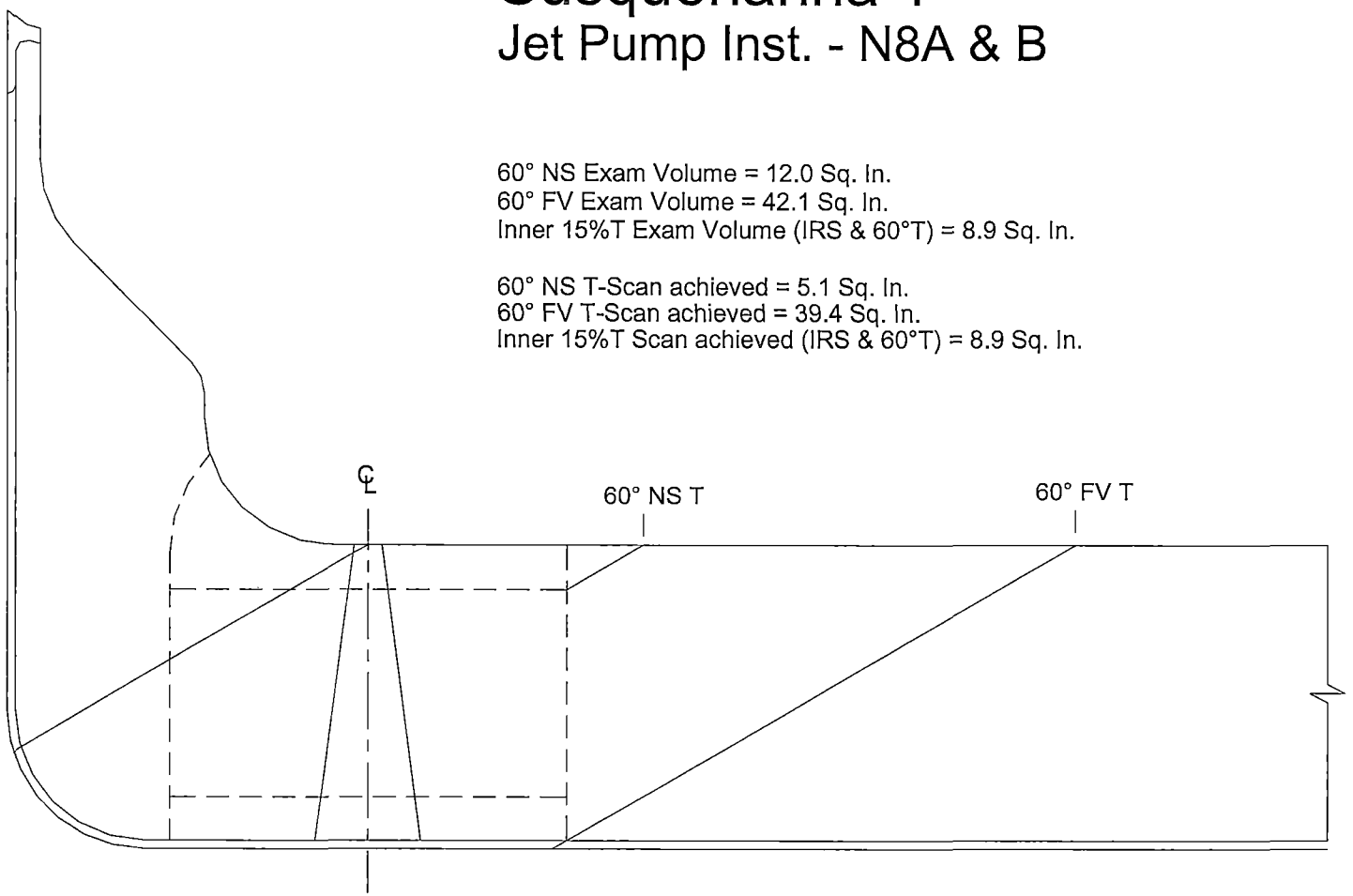


Figure 3RR-19.42

Susquehanna 1
Jet Pump Inst. - N8A & B

60° NS Exam Volume = 12.0 Sq. In.
60° FV Exam Volume = 42.1 Sq. In.
Inner 15%T Exam Volume (IRS & 60°T) = 8.9 Sq. In.

60° NS T-Scan achieved = 5.1 Sq. In.
60° FV T-Scan achieved = 39.4 Sq. In.
Inner 15%T Scan achieved (IRS & 60°T) = 8.9 Sq. In.



Manual UT - Coverage plot for radial (TL) scans

Figure 3RR-19.43

Susquehanna Unit-1, 2008

HITACHI

Reactor Pressure Vessel
Coverage Calculation Sheet

Note: Calculation sheets for U1 N8A/B result in identical volumes scanned and coverage

Susquehanna Unit-1, 2008
N8A - Jet Pump Instrumentation
U1 R&IO 15

		CODE CROSS-SECTIONAL AREA			TOTAL CODE COVERAGE	
Weld Length = 360 Exam Volume = 63.		Required Exam Area Sq. In.	Area Scanned	Percent of Area	Weld Length	Percent
60° T-Scan (S4) *	A	8.9	8.9	14.1%	360	7.1%
60° T-Scan (S6)	A	54.1	37.0	58.7%	360	29.4%
IRS P-Scan (S4)	A	8.9	8.9	14.1%	360	7.1%
60° P-Scan (S6)	A	54.1	44.5	70.6%	360	35.3%

% Total Composite Coverage = 78.8%

Rev.0 9/23/05

Comments: A - Examination limited due to the nozzle configuration.

Dnc C15
3-26-08
DG

* - Single side access, 100% credit of the achieved Supplement 4 T-scan volume claimed I.a.w., 10CFR50.55a.
Note - Rounding methods may affect calculated values. Weld length in degrees

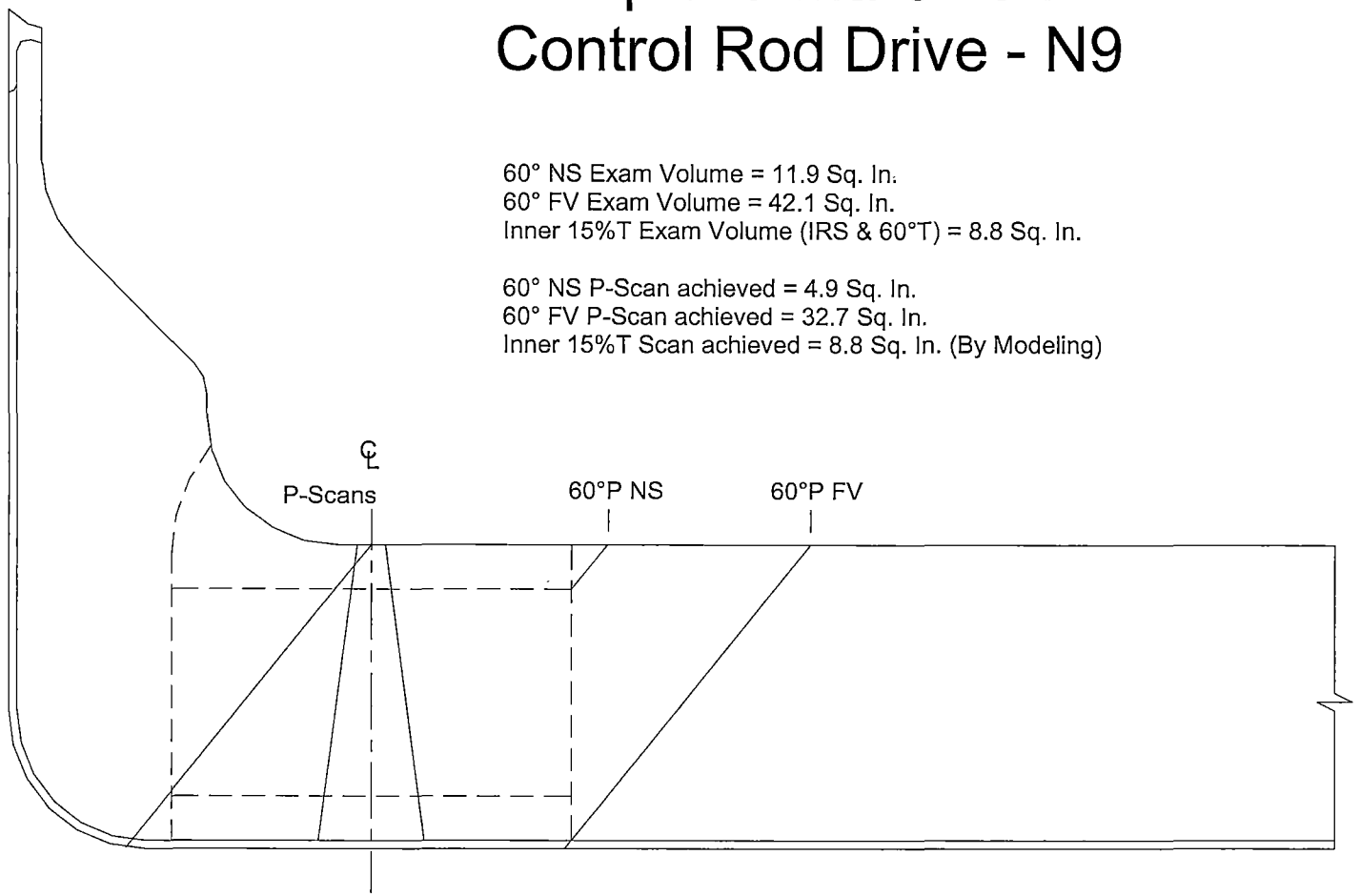
Page 5 of 7

Figure 3RR-19.44

Susquehanna Unit-1
Control Rod Drive - N9

60° NS Exam Volume = 11.9 Sq. In.
60° FV Exam Volume = 42.1 Sq. In.
Inner 15%T Exam Volume (IRS & 60°T) = 8.8 Sq. In.

60° NS P-Scan achieved = 4.9 Sq. In.
60° FV P-Scan achieved = 32.7 Sq. In.
Inner 15%T Scan achieved = 8.8 Sq. In. (By Modeling)



Manual UT - Coverage plot for circumferential (P) scans

Figure 3RR-19.45

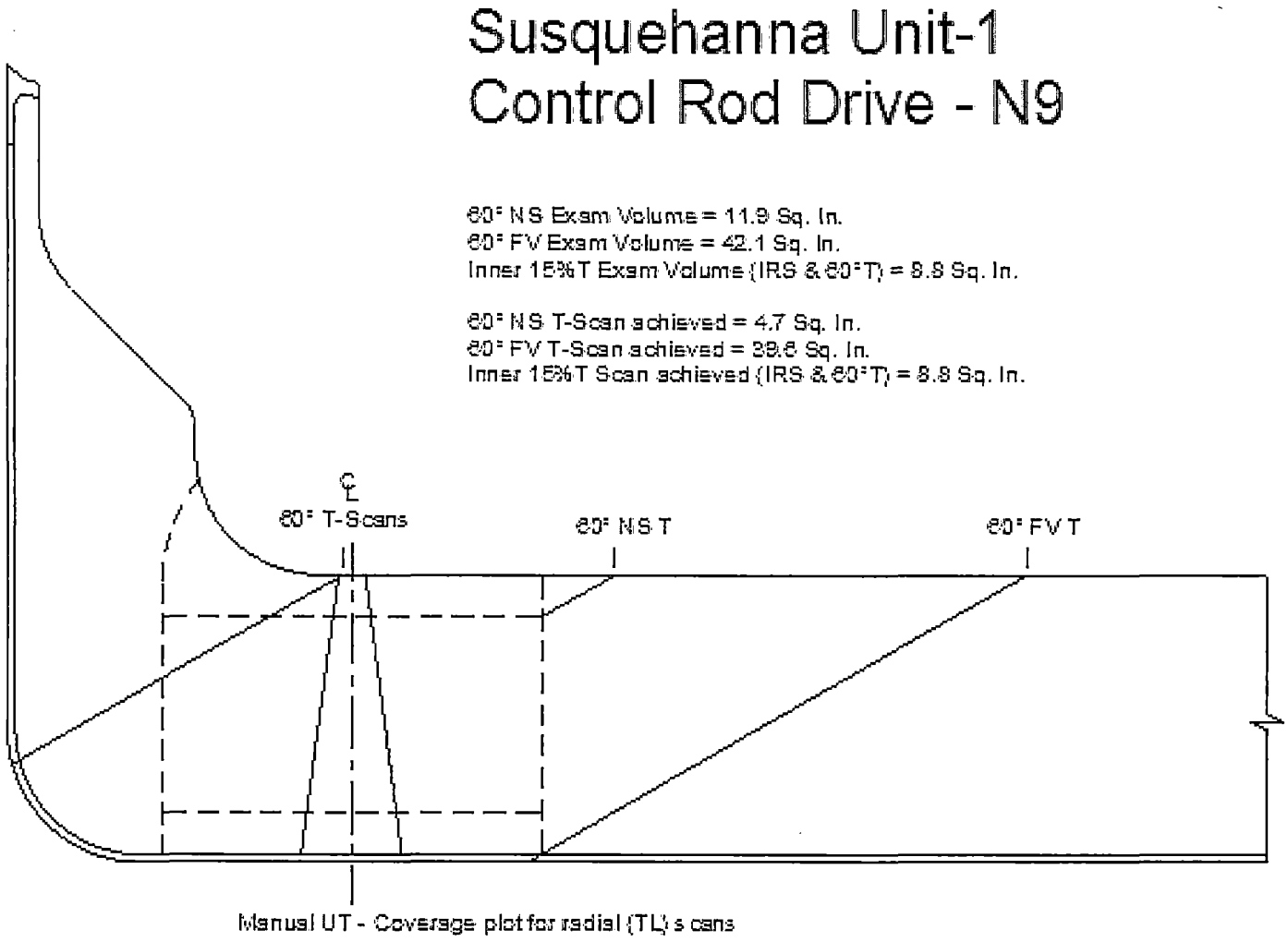


Figure 3RR-19.46

HITACHI

Reactor Pressure Vessel Coverage Calculation Sheet

Susquehanna Unit-1, 2008
N9 - CRD Return
U1 R&IO 15

Weld Length = 360 Exam Volume = 62.8		CODE CROSS-SECTIONAL AREA		TOTAL CODE COVERAGE		
		Required Exam Area Sq. In.	Area Scanned	Percent of Area	Weld Length	Percent
60° T-Scan (S4) *	A	8.8	8.8	14.0%	360	7.0%
60° T-Scan (S6)	A	54.0	44.3	70.5%	360	35.3%
IRS P-Scan (S4)	A	8.8	8.8	14.0%	360	7.0%
60° P-Scan (S6)	A	54.0	37.6	59.9%	360	29.9%

% Total Composite Coverage = 79.2%

Rev.0 9/23/05

Comments: A - Examination limited due to the nozzle configuration.

OneCIS
3-28-08
OET

* - Single side access, 100% credit of the achieved Supplement 4 T-scan volume claimed i.a.w., 10CFR50.55a.
Note - Rounding methods may affect calculated values. Weld length in degrees

Figure 3RR-19.47

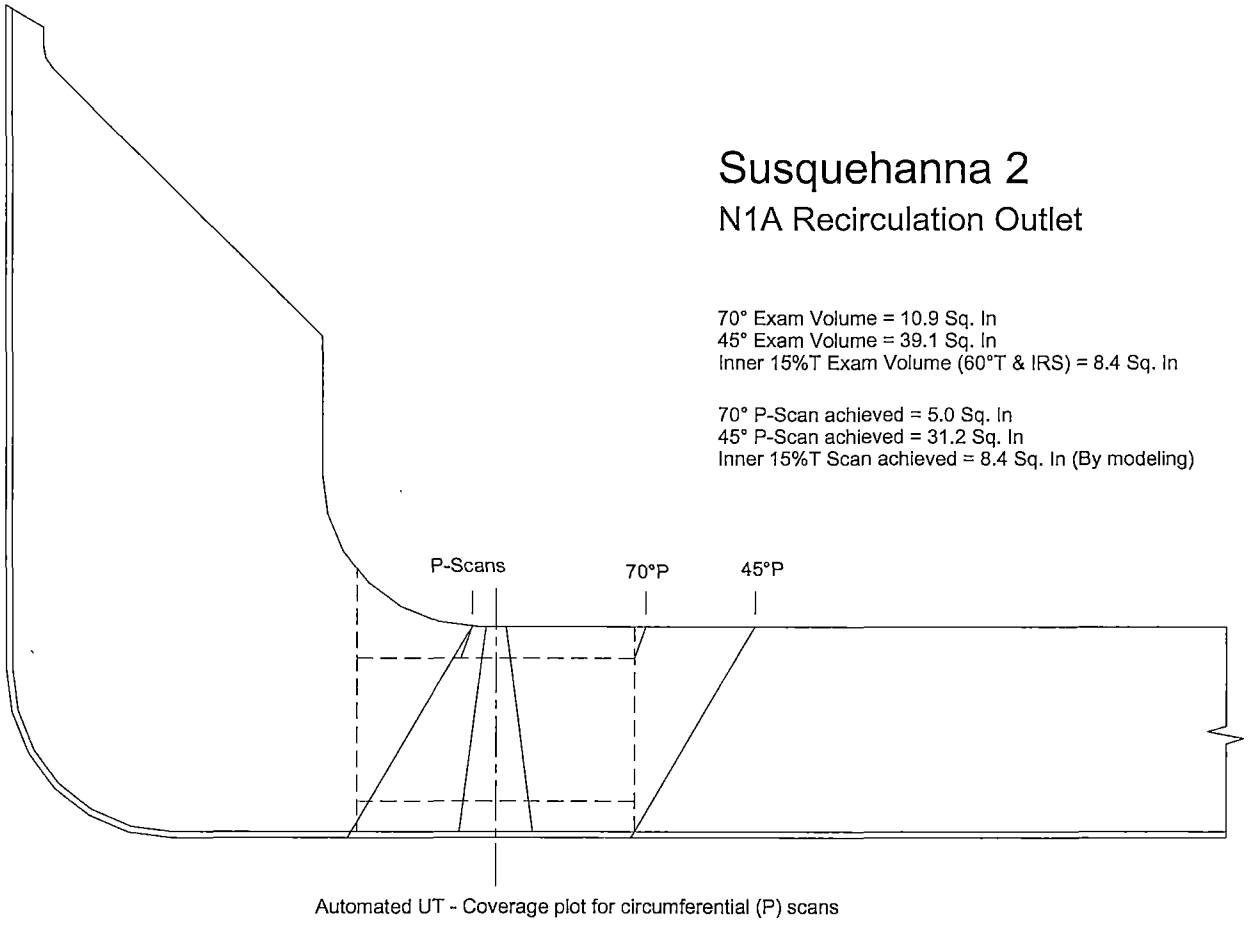


Figure 3RR-19.48

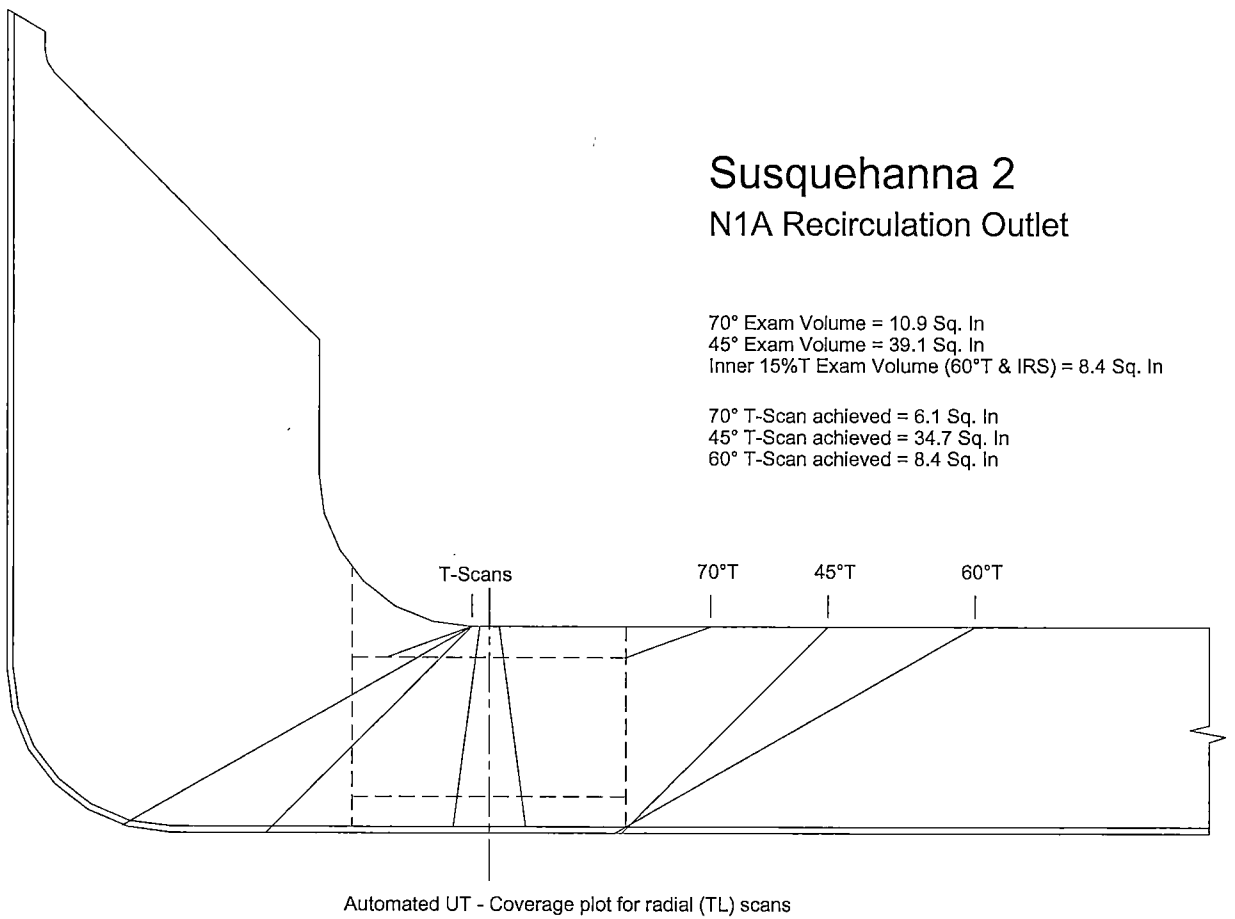


Figure 3RR-19.49

Susquehanna 2 / 2007

GE Energy - Nuclear

Reactor Pressure Vessel Coverage Calculation Sheet

Susquehanna 2 / 2007
N1A NOZ-SC1
Spring / 2RIO-13

		CODE CROSS-SECTIONAL AREA		TOTAL CODE COVERAGE		
Weld Length = 360. Exam Volume = 58.4		Required Exam Area Sq. In.	Area Scanned Automated	Percent of Area Automated	Weld Length Automated	Percent Automated
60° T-Scan (S4 UC)	A	8.4	8.4	14.4%	360	7.2%
45° T-Scan (S6 FV)	A	39.1	34.7	59.4%	360	29.7%
70° T-Scan (S6 NS)	A	10.9	6.1	10.4%	360	5.2%
IRS P-Scan (S4 UC)	A	8.4	8.4	14.4%	360	7.2%
45° P-Scan (S6 FV)	A	39.1	31.2	53.4%	360	26.7%
70° P-Scan (S6 NS)	A	10.9	5	8.6%	360	4.3%
60° T-Scan (S4 UC)			0		0	
45° T-Scan (S6 FV)			0		0	
70° T-Scan (S6 NS)			0		0	
IRS P-Scan (S4 UC)			0		0	
45° P-Scan (S6 FV)			0		0	
70° P-Scan (S6 NS)			0		0	
60° T-Scan (S4 UC)			0		0	
45° T-Scan (S6 FV)			0		0	
70° T-Scan (S6 NS)			0		0	
IRS P-Scan (S4 UC)			0		0	
45° P-Scan (S6 FV)			0		0	
70° P-Scan (S6 NS)			0		0	
				% Total Composite Coverage =		80.3%

Rev. 0 9/23/05

Comments: A - Automated scanning was not restricted.

Note - Rounding methods may affect calculated values. UC-Underclad, FV-Full volume, NS-Near Surface. Weld length in degrees.

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Figure 3RR-19.50

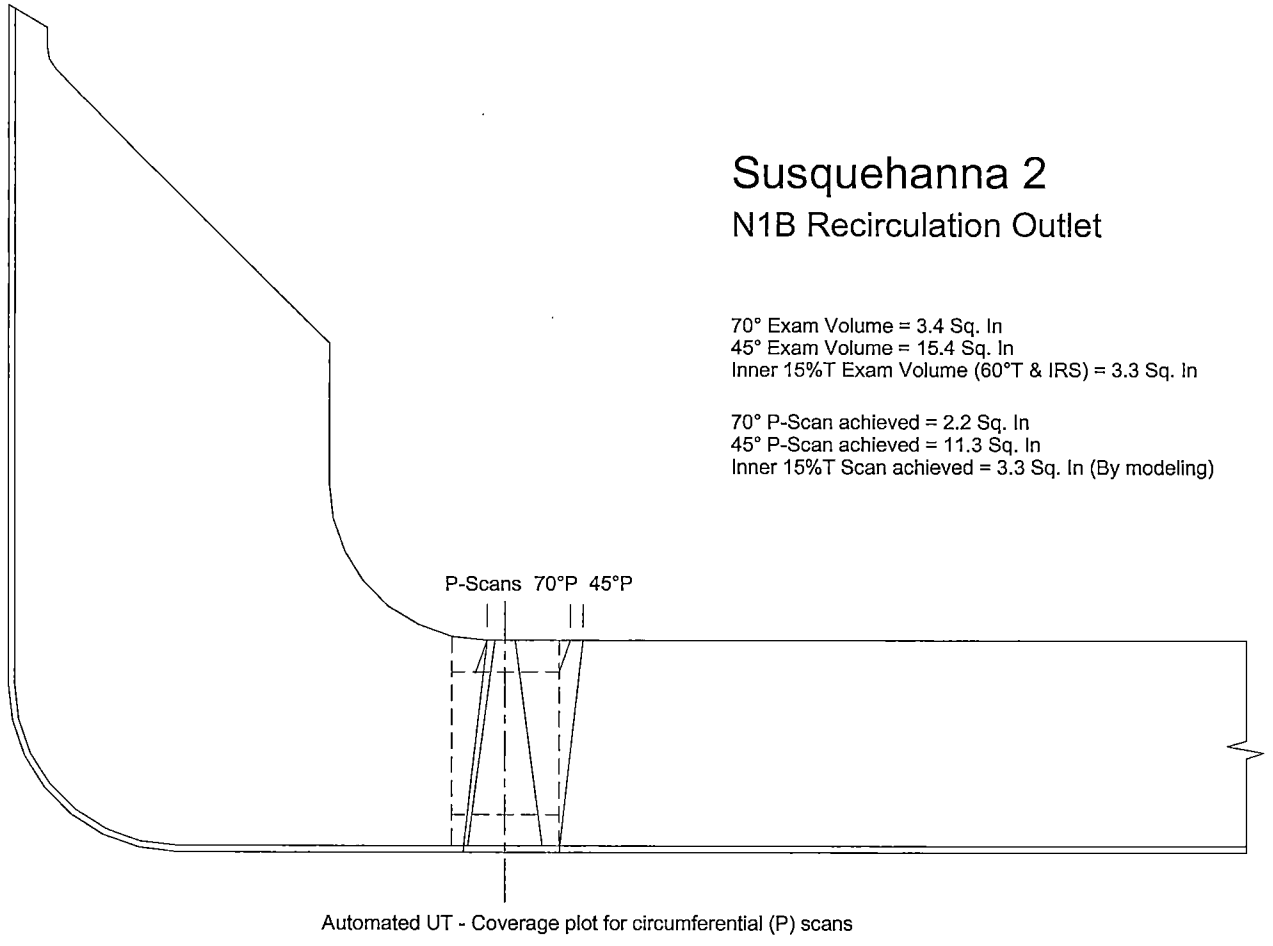

Figure 3RR-19.51

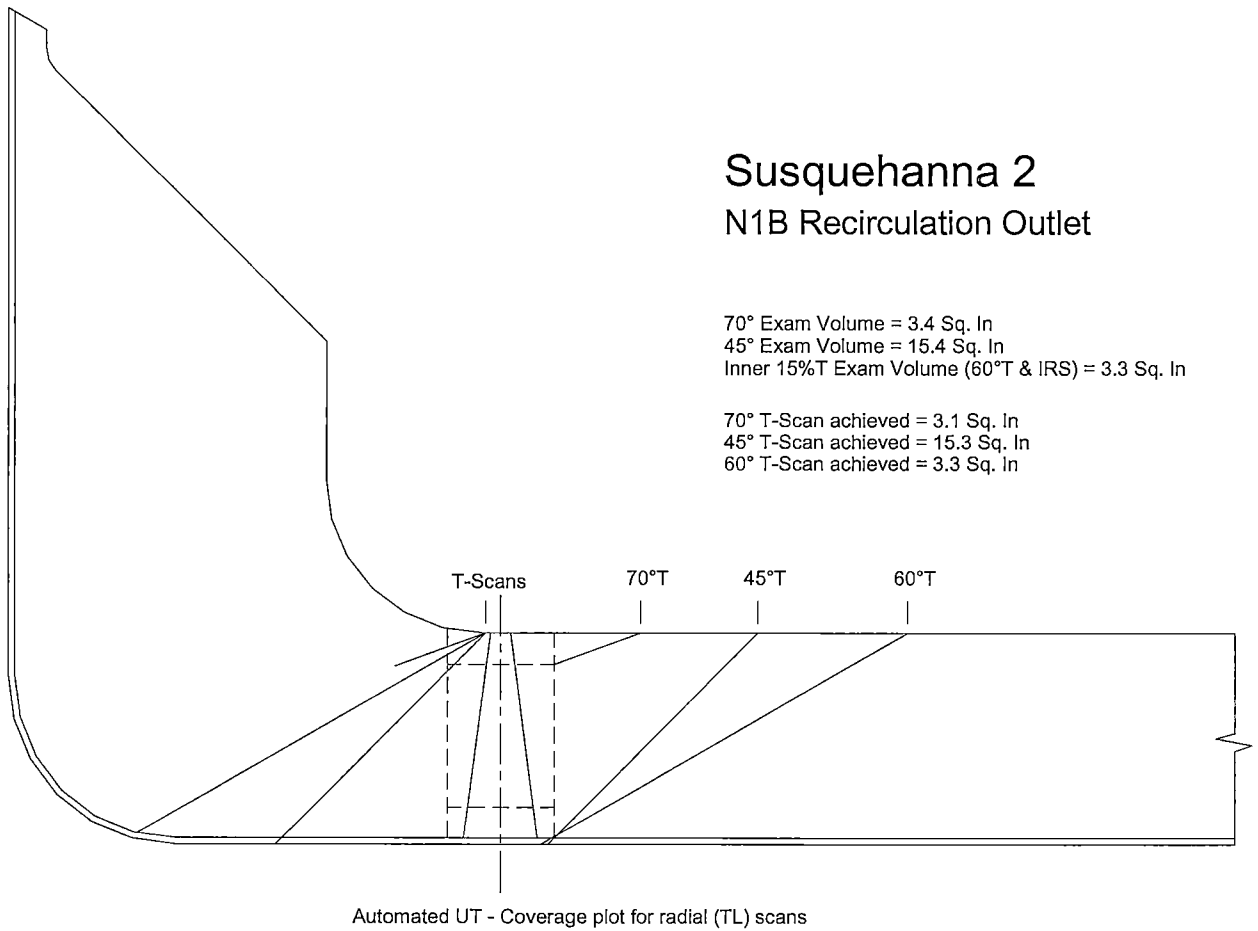

Figure 3RR-19.52

HITACHI

SP2000 RPV Examination Coverage Calculation Sheet

Susquehanna Unit 2 / 2RIO16
N1B (Noz-RPV)

Weld Length = 360 Exam Volume = 22.1		CODE CROSS-SECTIONAL AREA		TOTAL CODE COVERAGE		
		Required Exam Area Sq. In.	Area Scanned Automated	Percent of Area Automated	Weld Length Automated	Percent Automated
70° T-Scan (S6 NS)	A	3.4	3.1	14.0%	360.0	7.0%
45° T-Scan (S6 FV)	A	15.4	15.3	69.2%	360.0	34.6%
60° T-Scan (S4)	A	3.3	3.3	14.9%	360.0	7.5%
70° P-Scan (S6 NS)	A	3.4	2.2	10.0%	360.0	5.0%
45° P-Scan (S6 FV)	A	15.4	11.3	51.1%	360.0	25.6%
IRS P-Scan (S4)	A	3.3	3.3	14.9%	360.0	7.5%
70° T-Scan (S6 NS)						
45° T-Scan (S6 FV)						
60° T-Scan (S4)						
70° P-Scan (S6 NS)						
45° P-Scan (S6 FV)						
IRS P-Scan (S4)						
70° T-Scan (S6 NS)						
45° T-Scan (S6 FV)						
60° T-Scan (S4)						
70° P-Scan (S6 NS)						
45° P-Scan (S6 FV)						
IRS P-Scan (S4)						

% Total Composite Coverage = 87.1%

Rev. 0 8/23/05

Comments: A - Automated scanning was limited due to the nozzle configuration.

Note - Rounding methods may affect calculated values. UC-Underclad, FV-Full volume, NS-Near Surface. Weld length in degrees.

Figure 3RR-19.53

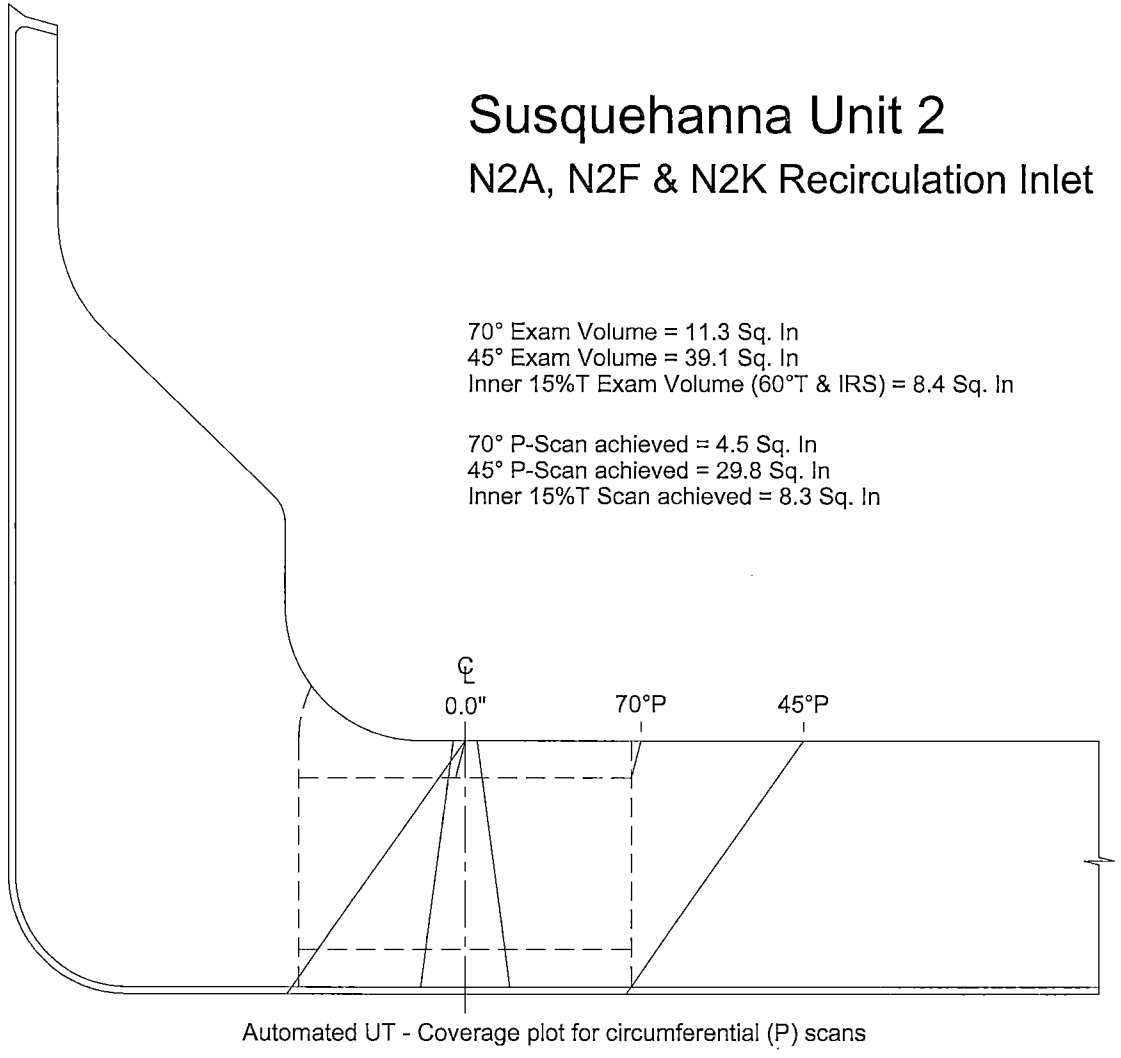

Figure 3RR-19.54

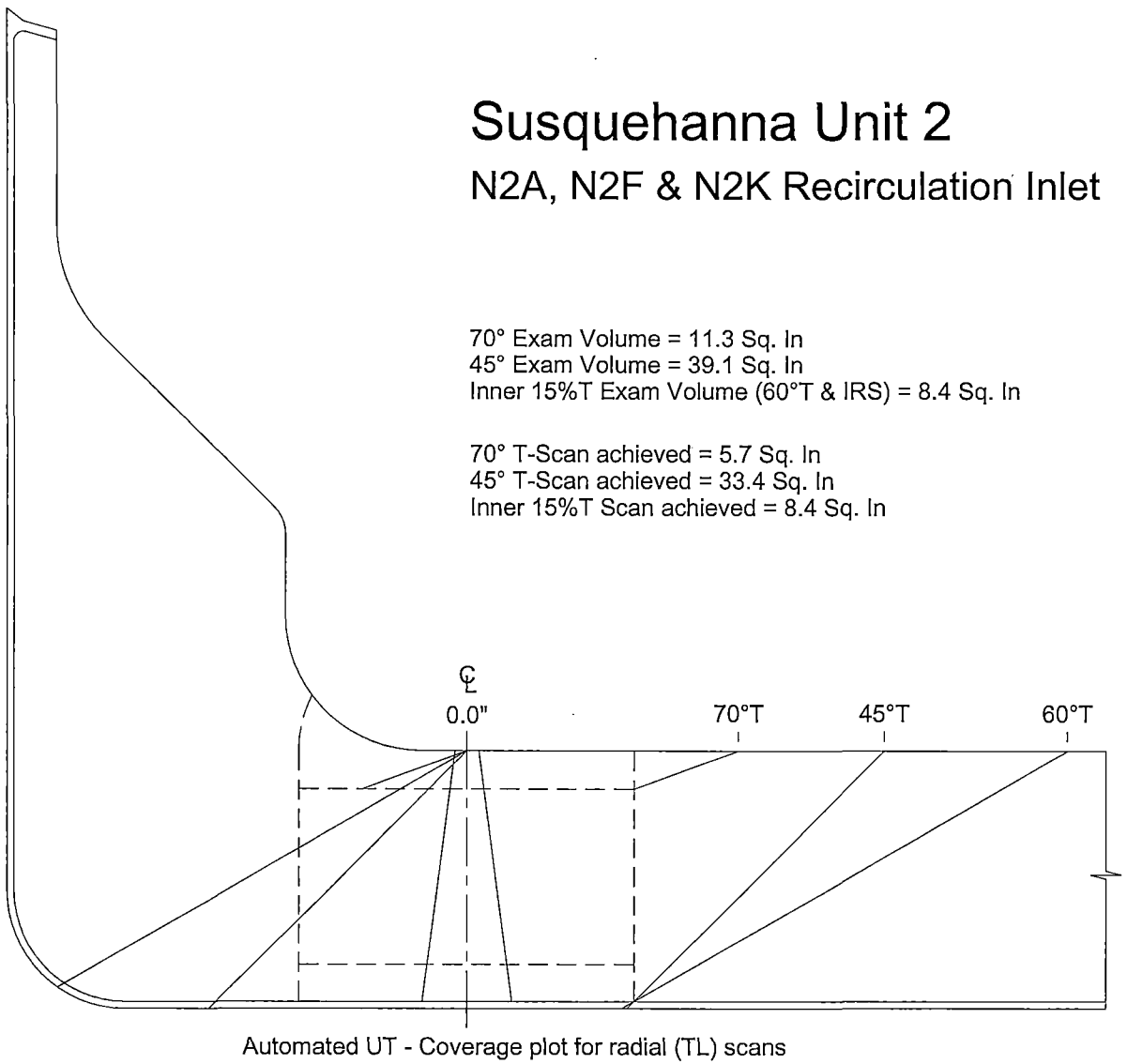

Figure 3RR-19.55

Susquehanna 2 / 2007

GE Energy - Nuclear

Reactor Pressure Vessel Coverage Calculation Sheet

Note: Calculation sheets for U2 N2A/F/K result in identical volumes scanned and coverage

Susquehanna 2 / 2007
N2A (SC1)
Spring / 2RIO-13

		CODE CROSS-SECTIONAL AREA		TOTAL CODE COVERAGE		
Weld Length = 360. Exam Volume = 58.8		Required Exam Area Sq. In.	Area Scanned Automated	Percent of Area Automated	Weld Length Automated	Percent Automated
60° T-Scan (S4 UC)	A	8.4	8.4	14.3%	360	7.1%
45° T-Scan (S6 FV)	A	39.1	33.4	56.8%	360	28.4%
70° T-Scan (S6 NS)	A	11.3	5.7	9.7%	360	4.8%
IRS P-Scan (S4 UC)	A	8.4	8.3	14.1%	360	7.1%
45° P-Scan (S6 FV)	A	39.1	29.8	50.7%	360	25.3%
70° P-Scan (S6 NS)	A	11.3	4.5	7.7%	360	3.8%
60° T-Scan (S4 UC)						
45° T-Scan (S6 FV)						
70° T-Scan (S6 NS)						
IRS P-Scan (S4 UC)						
45° P-Scan (S6 FV)						
70° P-Scan (S6 NS)						
60° T-Scan (S4 UC)						
45° T-Scan (S6 FV)						
70° T-Scan (S6 NS)						
IRS P-Scan (S4 UC)						
45° P-Scan (S6 FV)						
70° P-Scan (S6 NS)						
				% Total Composite Coverage =		76.6%

Rev. 0 9/23/05

Comments: A - Automated scanning was not restricted.

Note - Rounding methods may affect calculated values. UC-Underclad, FV-Full volume, NS-Near Surface. Weld length in degrees.

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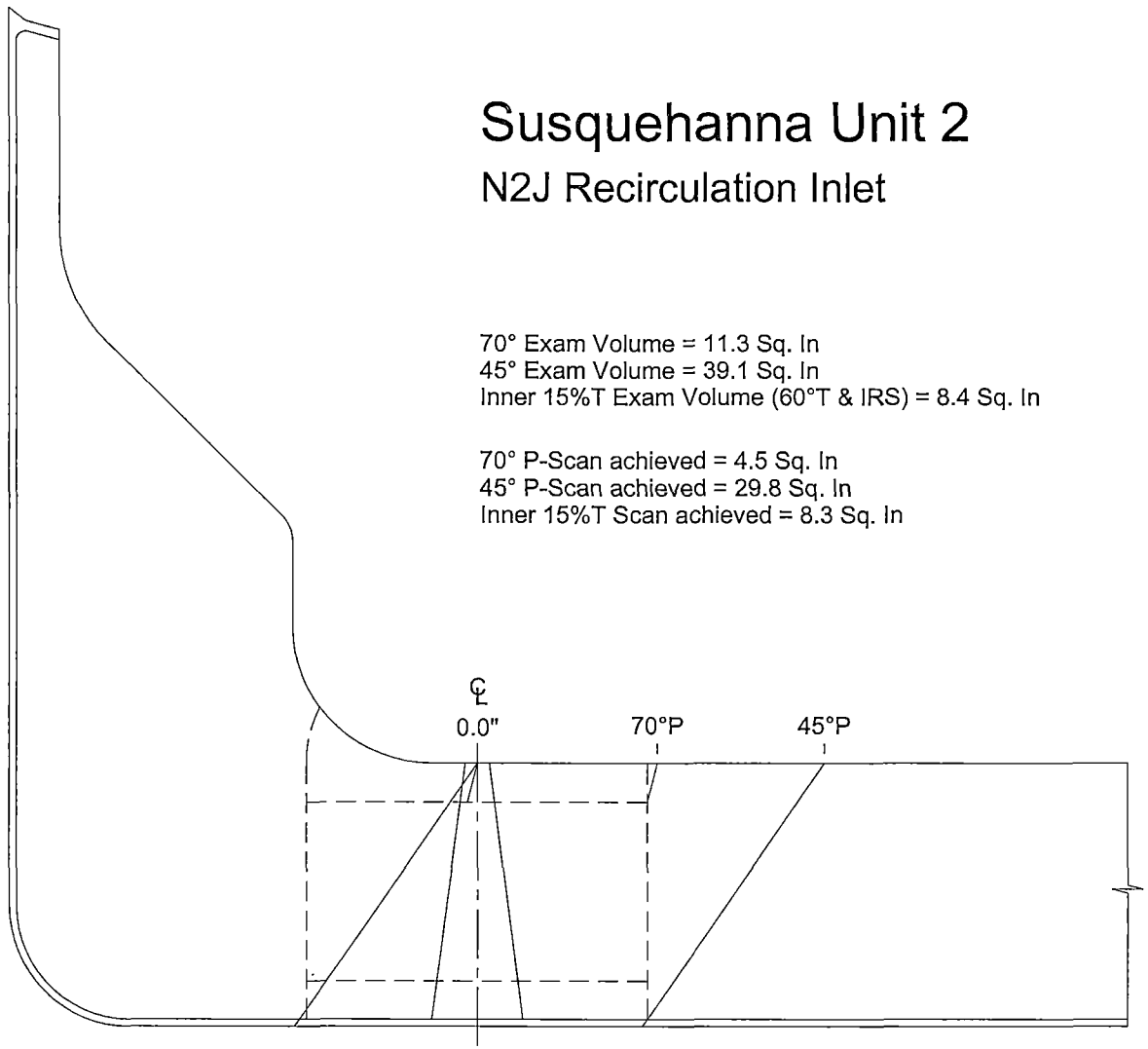
Figure 3RR-19.56



Automated UT - Coverage plot for circumferential (P) scans

Figure 3RR-19. 57

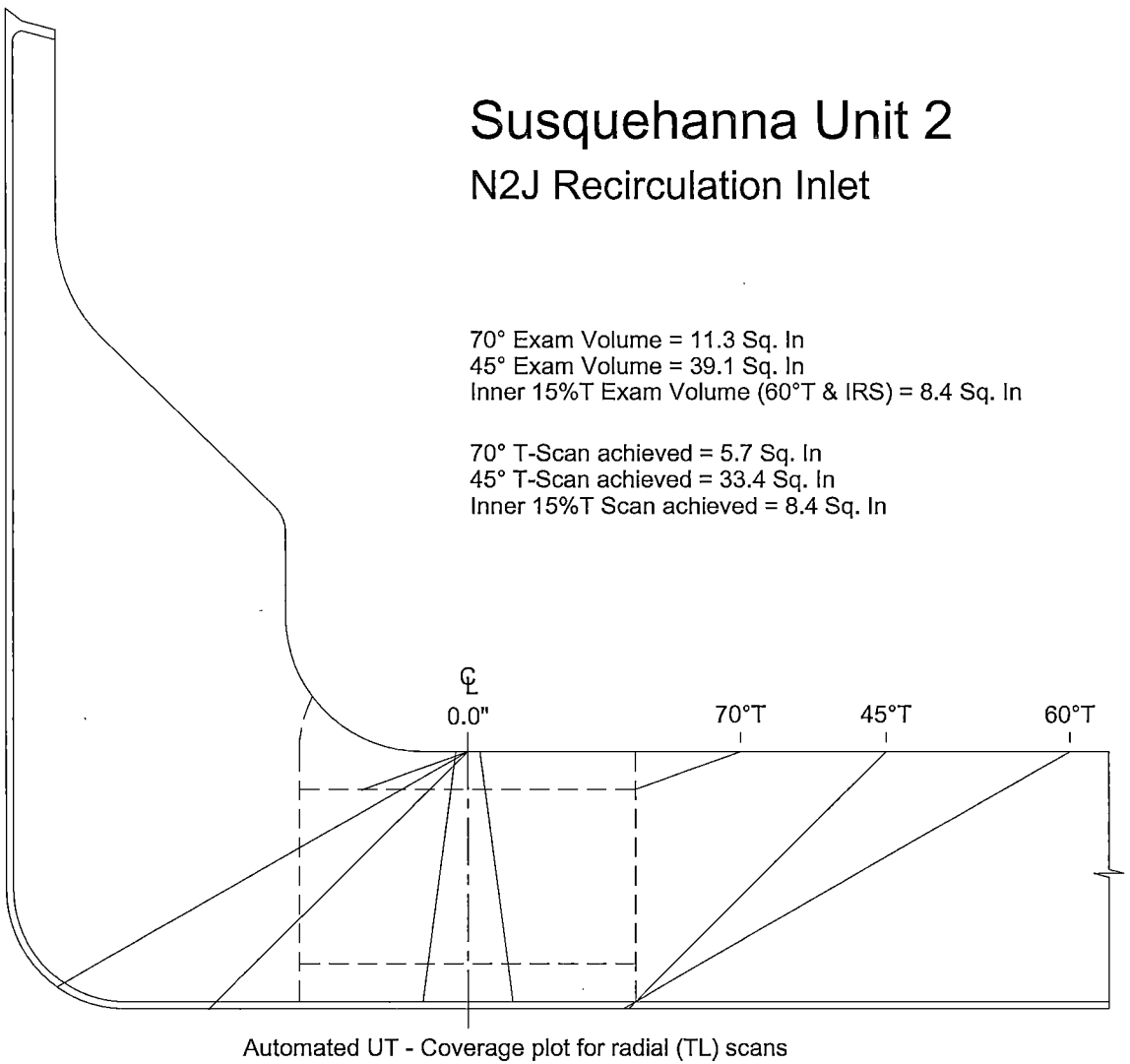


Figure 3RR-19.58

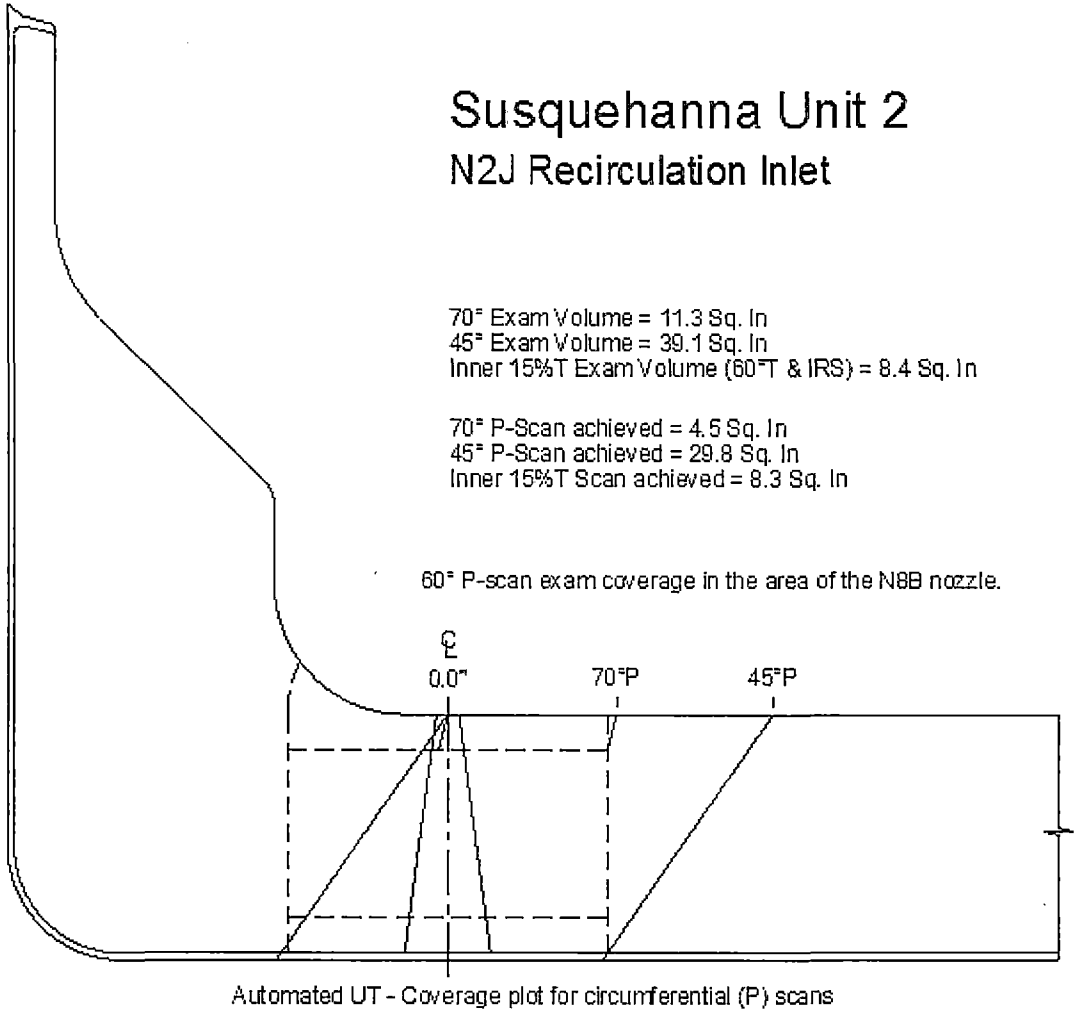


Figure 3RR-19.59

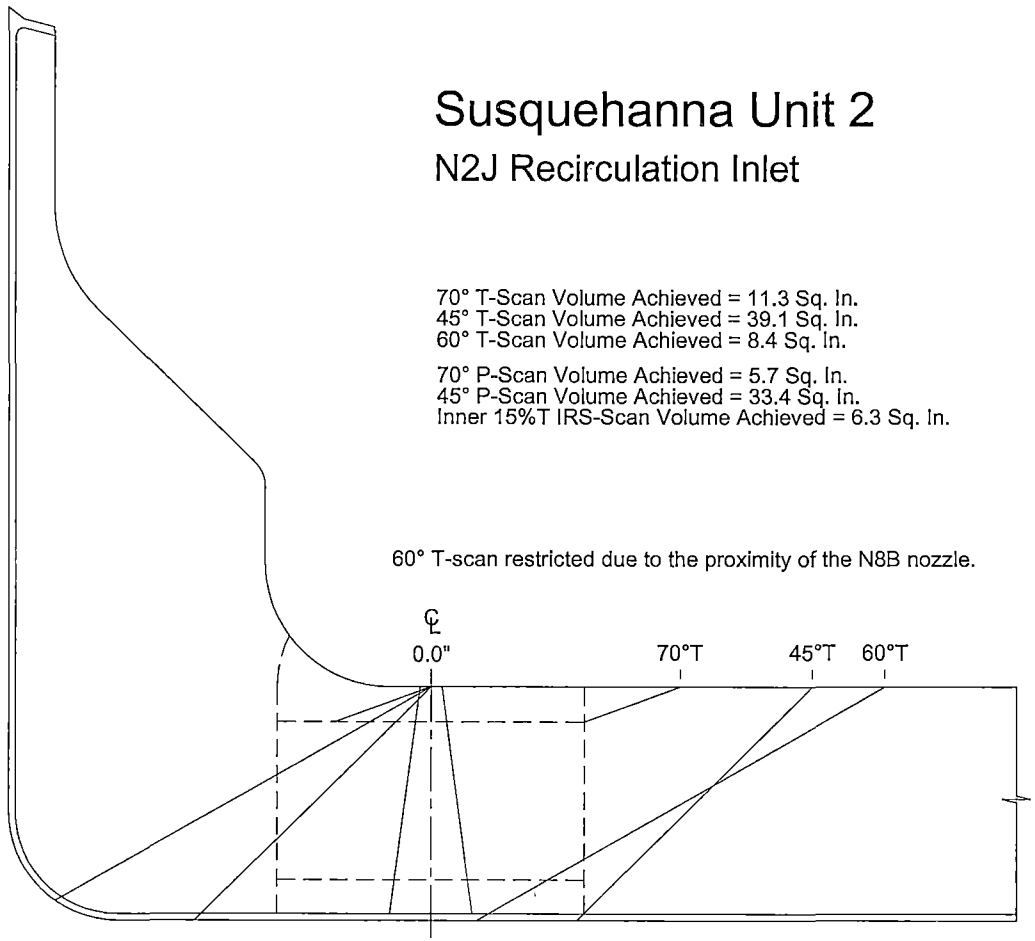


Figure 3RR-19. 60

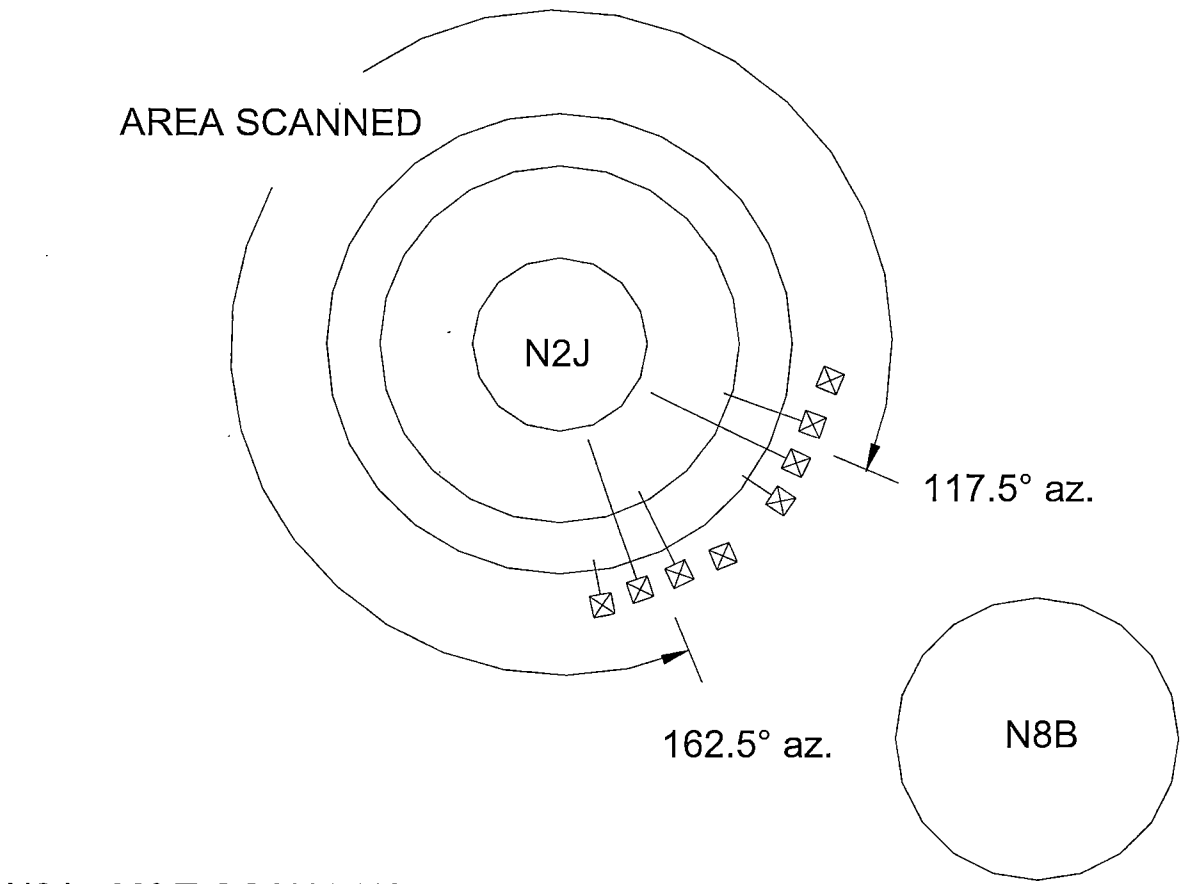


Figure 3RR-19.61

Susquehanna 2 / 2007

GE Energy - Nuclear

Reactor Pressure Vessel Coverage Calculation Sheet

Susquehanna 2 / 2007
N2J (SC1)
Spring / 2RIO-13

		CODE CROSS-SECTIONAL AREA		TOTAL CODE COVERAGE		
Weld Length = 360. Exam Volume = 58.8		Required Exam Area Sq. In.	Area Scanned Automated	Percent of Area Automated	Weld Length Automated	Percent Automated
60° T-Scan (S4 UC)	A	8.4	8.4	14.3%	315	6.3%
45° T-Scan (S6 FV)	A	39.1	33.4	56.8%	315	24.9%
70° T-Scan (S6 NS)	A	11.3	5.7	9.7%	315	4.2%
IRS P-Scan (S4 UC)	A	8.4	8.3	14.1%	315	6.2%
45° P-Scan (S6 FV)	A	39.1	29.8	50.7%	315	22.2%
70° P-Scan (S6 NS)	A	11.3	4.5	7.7%	315	3.3%
60° T-Scan (S4 UC)	B	8.4	6.3	10.7%	45	0.7%
45° T-Scan (S6 FV)	B	39.1	33.4	56.8%	45	3.6%
70° T-Scan (S6 NS)	B	11.3	5.7	9.7%	45	0.6%
IRS P-Scan (S4 UC)	B	8.4	8.3	14.1%	45	0.9%
45° P-Scan (S6 FV)	B	39.1	29.8	50.7%	45	3.2%
70° P-Scan (S6 NS)	B	11.3	4.5	7.7%	45	0.5%
60° T-Scan (S4 UC)						
45° T-Scan (S6 FV)						
70° T-Scan (S6 NS)						
IRS P-Scan (S4 UC)						
45° P-Scan (S6 FV)						
70° P-Scan (S6 NS)						
				% Total Composite Coverage =		76.4%

Rev. 0 9/23/05

Comments: A - Automated scanning was not restricted.
B - Automated scanning restricted due to the proximity of the N8B nozzle.

Note - Rounding methods may affect calculated values. UC-Underclad, FV-Full volume, NS-Near Surface. Weld length in degrees.

Page 9

Figure 3RR-19.62

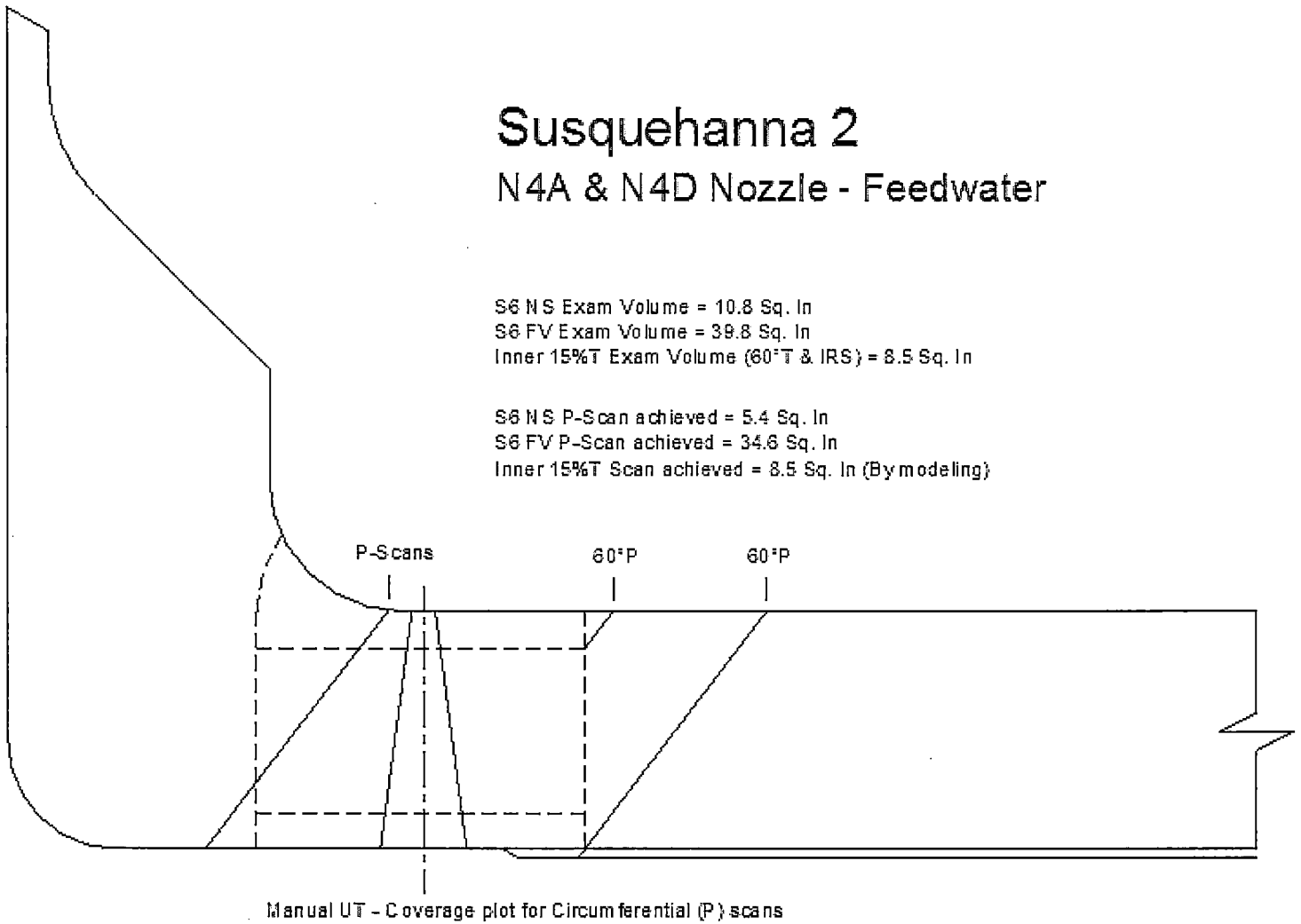


Figure 3RR-19.63

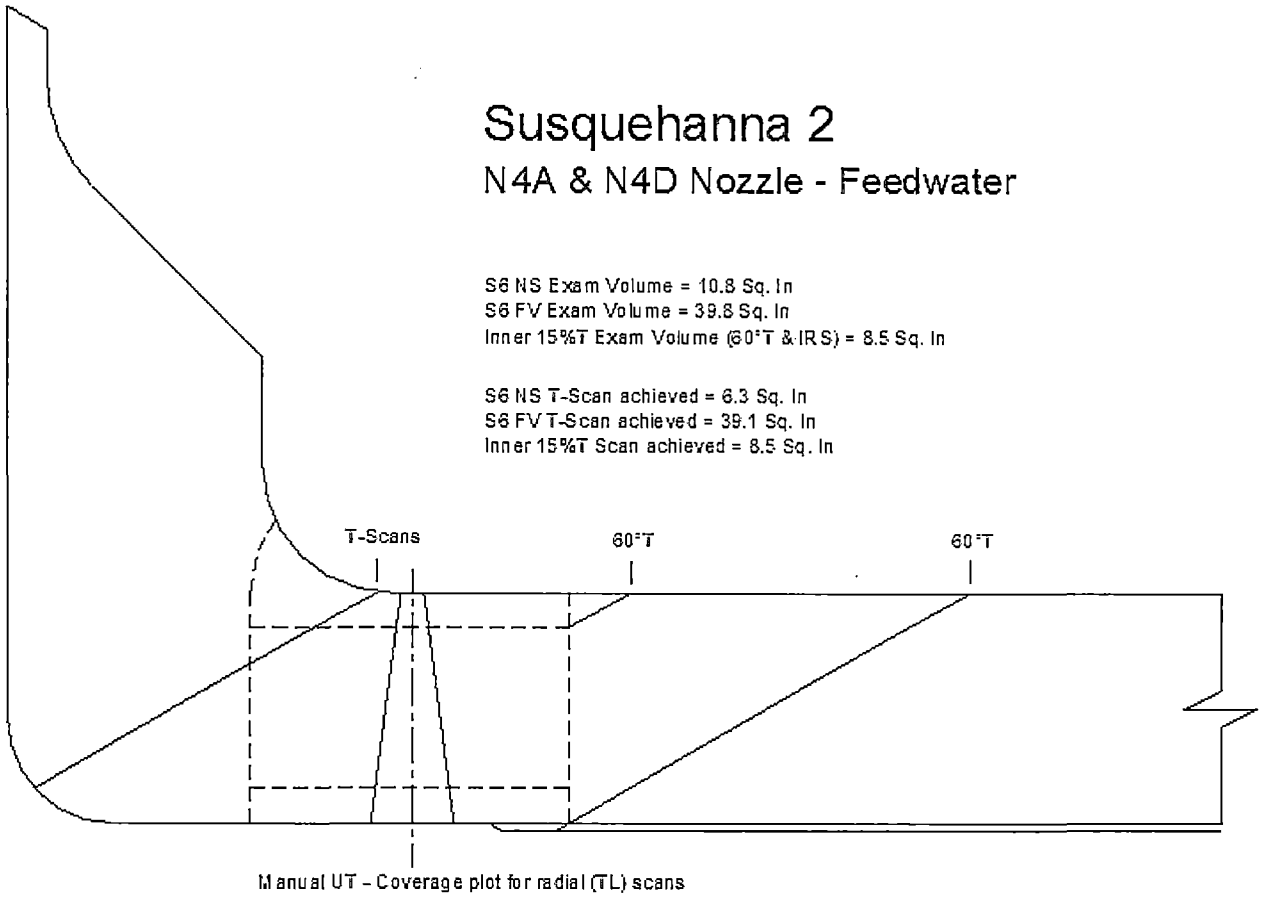
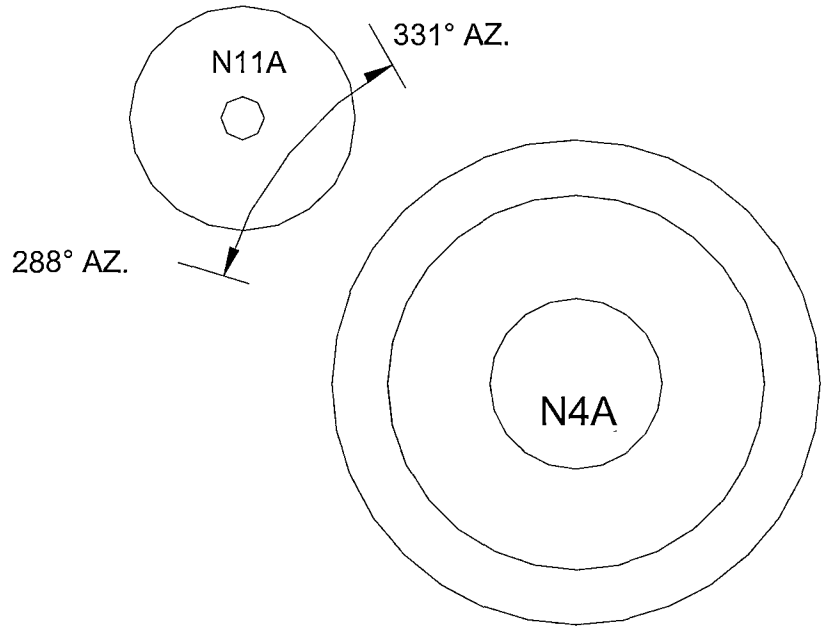
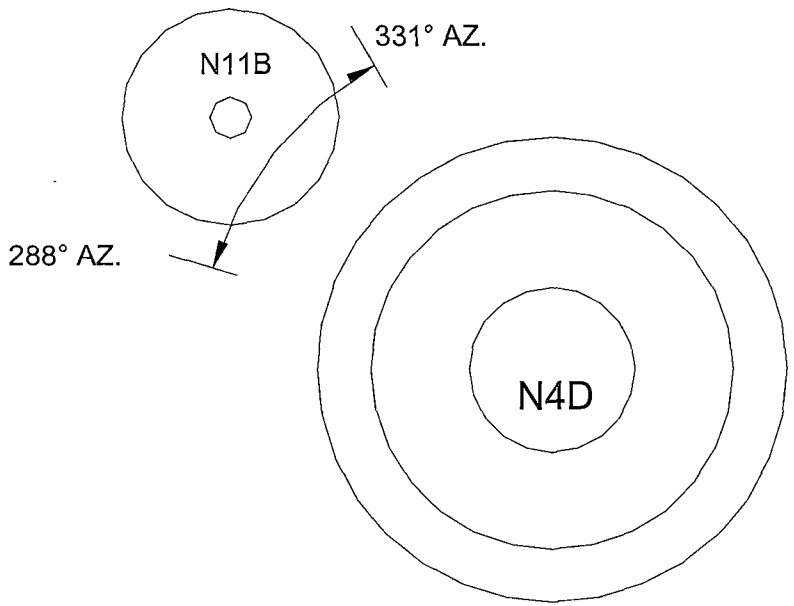


Figure 3RR-19.64



Manual UT scanning restricted, due to N11A Nozzle.

Figure 3RR-19.65



Manual UT scanning restricted, due to N11B Nozzle.

Figure 3RR-19.66

Susquehanna 2 / 2007

GE Energy - Nuclear

Reactor Pressure Vessel Coverage Calculation Sheet

Note: Calculation sheets for U2 N4A/D nozzles result in identical volumes scanned and coverage

Susquehanna 2 / 2007
N4A NOZ-SC3
Spring / 2RIO-13

		CODE CROSS-SECTIONAL AREA		TOTAL CODE COVERAGE		
Weld Length = 360. Exam Volume = 59.1		Required Exam Area Sq. In.	Area Scanned Manual	Percent of Area Manual	Weld Length Manual	Percent Manual
60° T-Scan (S4 UC)	A	8.5	8.5	14.4%	317	6.3%
60° T-Scan (S6 FV)	A	39.8	39.1	66.2%	317	29.1%
60° T-Scan (S6 NS)	A	10.8	6.3	10.7%	317	4.7%
IRS P-Scan (S4 UC)	A	8.5	8.5	14.4%	317	6.3%
60° P-Scan (S6 FV)	A	39.8	34.6	58.5%	317	25.8%
60° P-Scan (S6 NS)	A	10.8	5.4	9.1%	317	4.0%
60° T-Scan (S4 UC)						
60° T-Scan (S6 FV)						
60° T-Scan (S6 NS)						
IRS P-Scan (S4 UC)						
60° P-Scan (S6 FV)						
60° P-Scan (S6 NS)						
60° T-Scan (S4 UC)						
60° T-Scan (S6 FV)						
60° T-Scan (S6 NS)						
IRS P-Scan (S4 UC)						
60° P-Scan (S6 FV)						
60° P-Scan (S6 NS)						
				% Total Composite Coverage =		76.3%

Rev. 0 9/23/05

Comments: Scanning was limited due to the proximity of the N11A nozzle and the nozzle configuration.

Note - Rounding methods may affect calculated values. UC-Underclad, FV-Full volume, NS-Near Surface. Weld length in inches or degrees.

Page 7 of 8

Figure 3RR-19.67

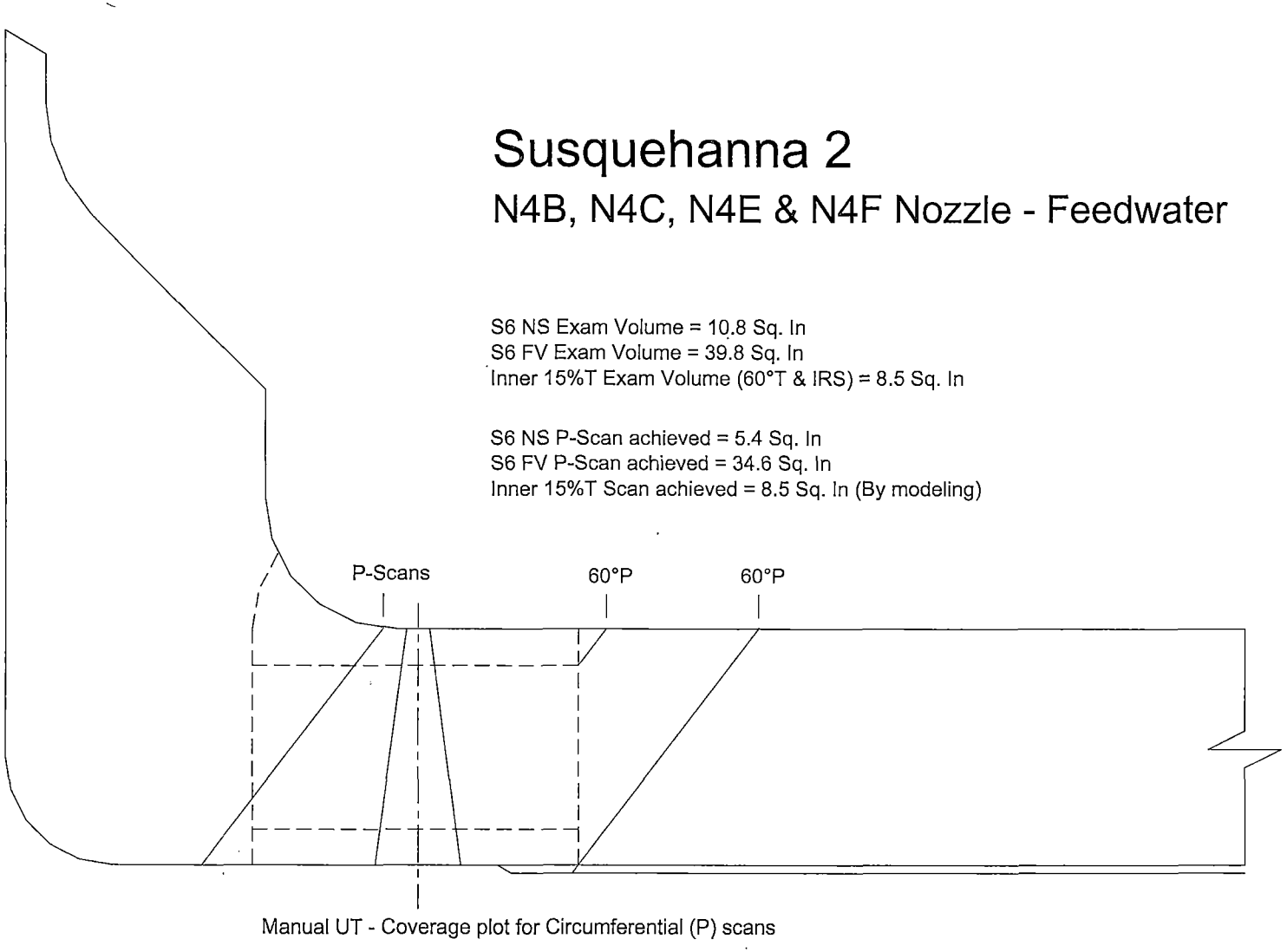


Figure 3RR-19 68

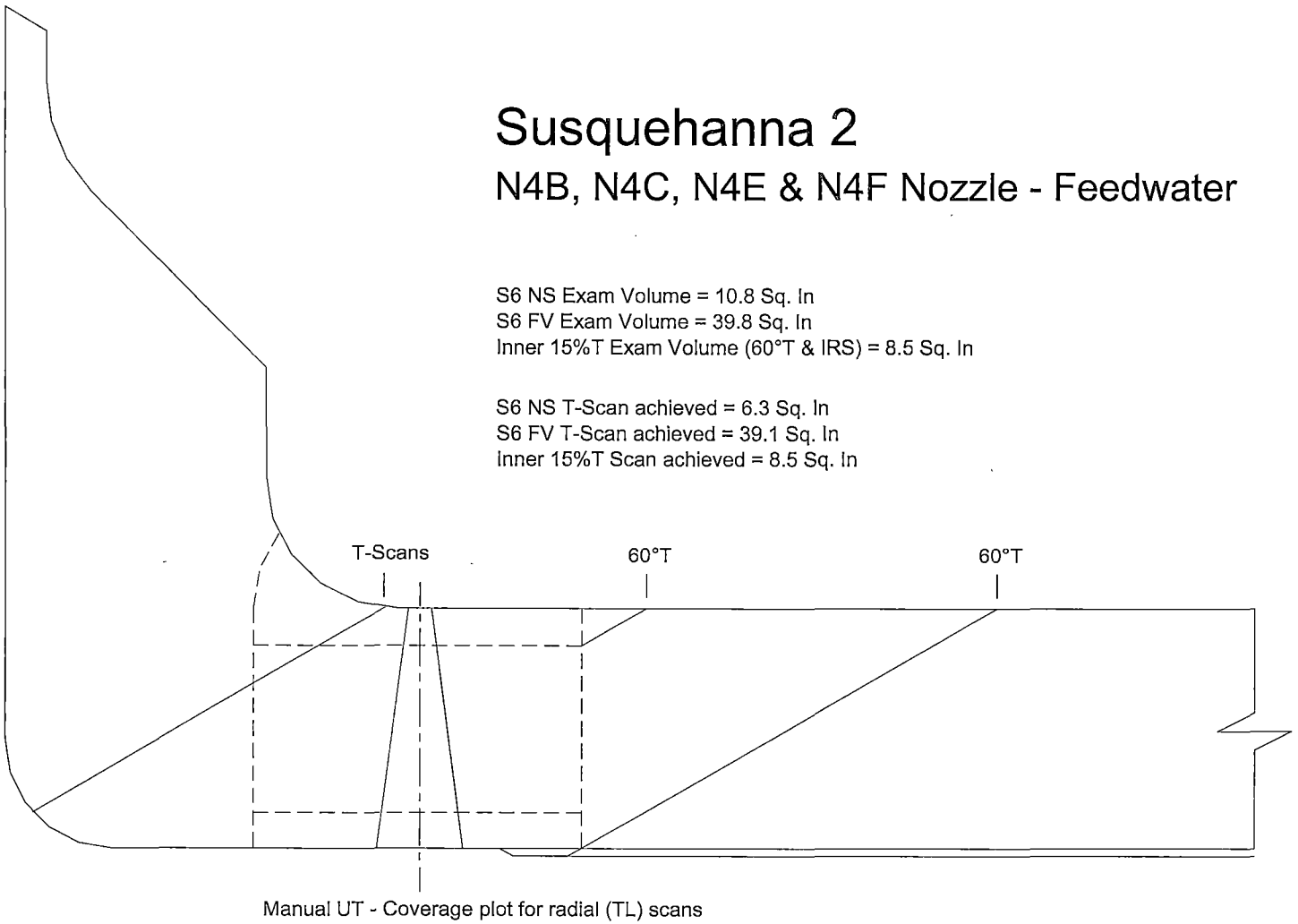


Figure 3RR-19.69

Susquehanna 2 / 2007

GE Energy - Nuclear

Reactor Pressure Vessel Coverage Calculation Sheet

Note: Calculation sheets for U2 N4B/C/E/F result in identical volumes scanned and coverage

Susquehanna 2 / 2007
N4B NOZ-SC3
Spring / 2RIO-13

		CODE CROSS-SECTIONAL AREA		TOTAL CODE COVERAGE		
Weld Length = 360. Exam Volume = 59.1		Required Exam Area Sq. In.	Area Scanned Manual	Percent of Area Manual	Weld Length Manual	Percent Manual
60° T-Scan (S4 UC)	A	8.5	8.5	14.4%	360	7.2%
60° T-Scan (S6 FV)	A	39.8	39.1	66.2%	360	33.1%
60° T-Scan (S6 NS)	A	10.8	6.3	10.7%	360	5.3%
IRS P-Scan (S4 UC)	A	8.5	8.5	14.4%	360	7.2%
60° P-Scan (S6 FV)	A	39.8	34.6	58.5%	360	29.3%
60° P-Scan (S6 NS)	A	10.8	5.4	9.1%	360	4.6%
60° T-Scan (S4 UC)						
60° T-Scan (S6 FV)						
60° T-Scan (S6 NS)						
IRS P-Scan (S4 UC)						
60° P-Scan (S6 FV)						
60° P-Scan (S6 NS)						
60° T-Scan (S4 UC)						
60° T-Scan (S6 FV)						
60° T-Scan (S6 NS)						
IRS P-Scan (S4 UC)						
60° P-Scan (S6 FV)						
60° P-Scan (S6 NS)						

% Total Composite Coverage = 86.6%

Rev. 0 9/23/05

Comments: Scan was limited due to the nozzle configuration.

Note - Rounding methods may affect calculated values. UC-Underclad, FV-Full volume, NS-Near Surface. Weld length in inches or degrees.

Page 7 of 8

Figure 3RR-19.70

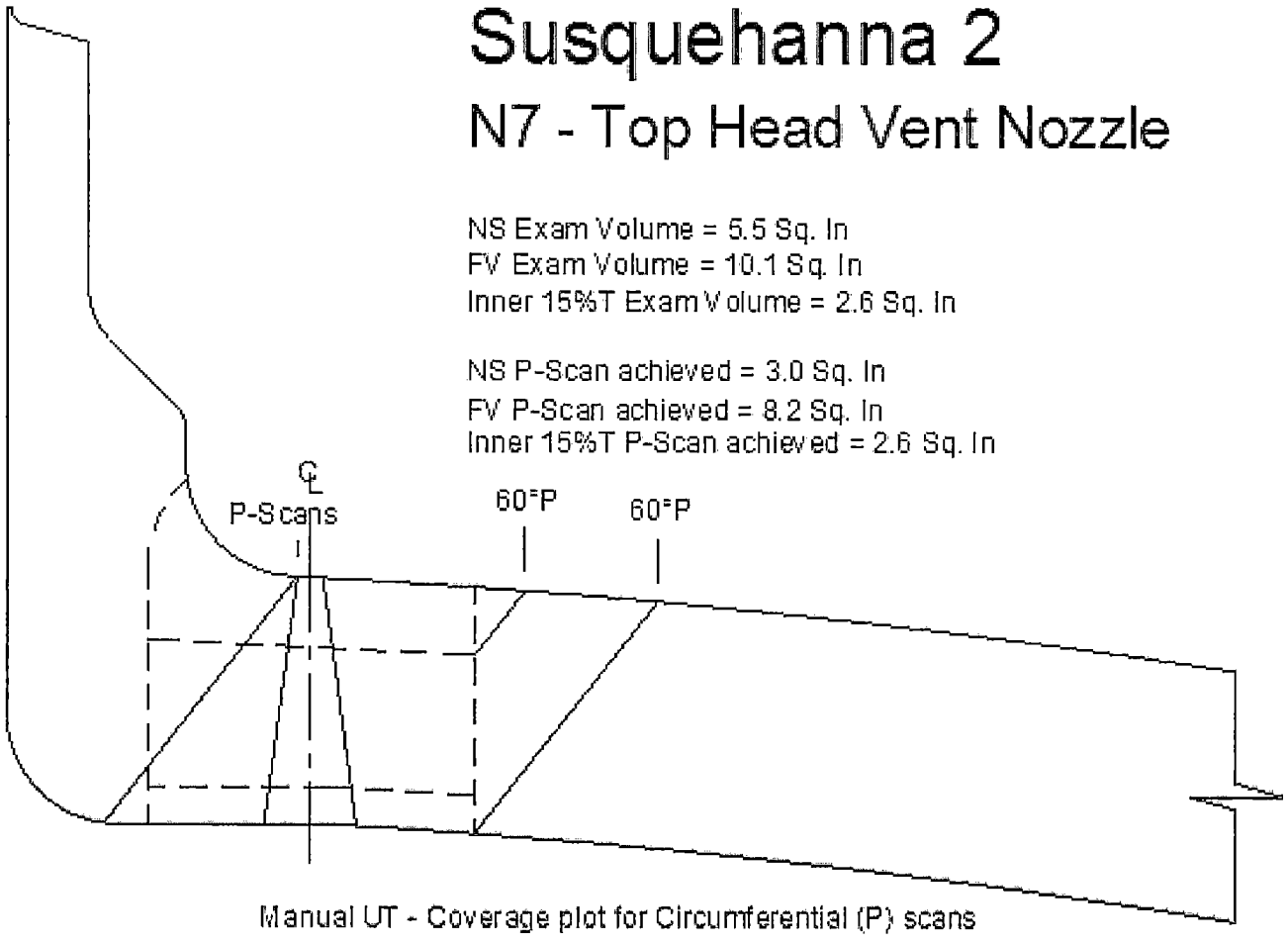


Figure 3RR-19.71

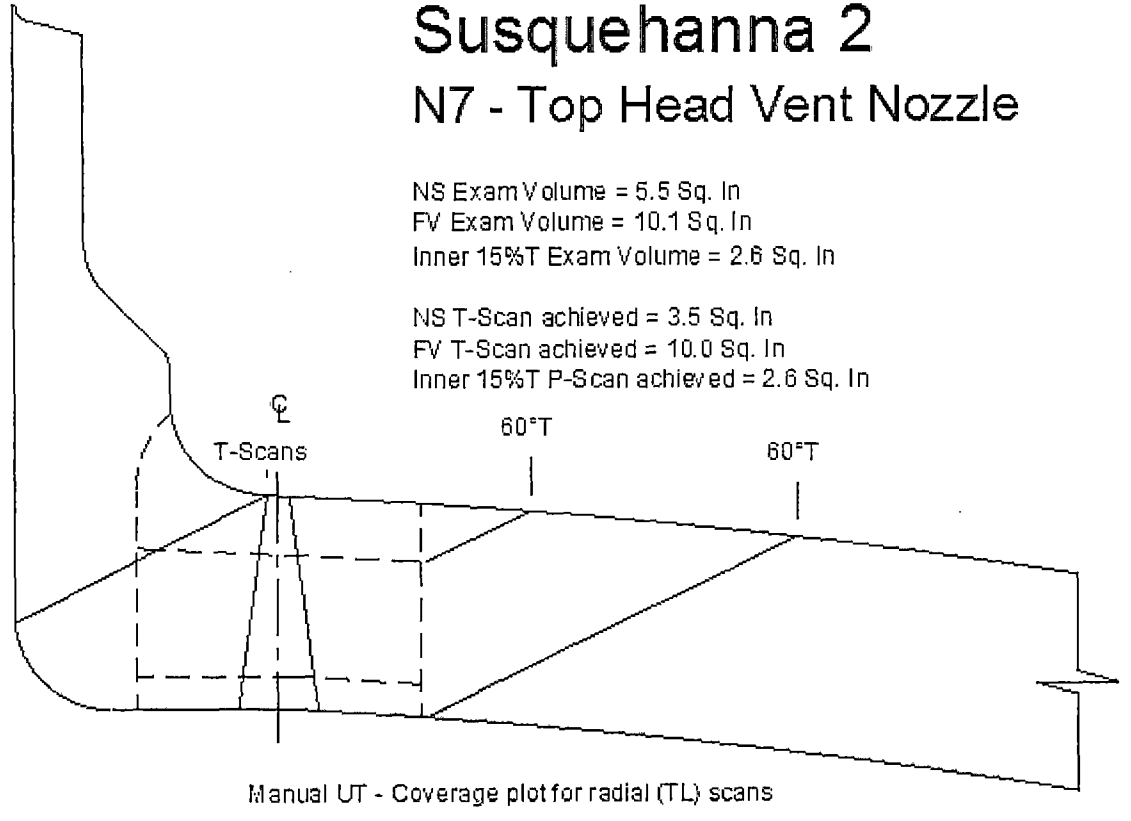


Figure 3RR-19.72

HITACHI

Reactor Pressure Vessel Coverage Calculation Sheet

Susquehanna Unit 2 - 2RI0-14
N7 (Top Head Nozzle)
Spring / 2009

Weld Length = 360. / Exam Volume = 18.2		CODE CROSS-SECTIONAL AREA		TOTAL CODE COVERAGE		
		Required Exam Area Sq. In.	Area Scanned Manual	Percent of Area Manual	Weld Length Manual	Percent Manul
60° T-Scan (S4 UC)	A	2.6	2.6	14.3%	360	7.1%
60° T-Scan (S6 FV)	A	10.1	10	54.9%	360	27.5%
60° T-Scan (S6 NS)	A	5.5	3.5	19.2%	360	9.6%
IRS P-Scan (S4 UC)	A*	2.6	2.6	14.3%	360	7.1%
60° P-Scan (S6 FV)	A	10.1	8.2	45.1%	360	22.5%
60° P-Scan (S6 NS)	A	5.5	3	16.5%	360	8.2%
60° T-Scan (S4 UC)						
60° T-Scan (S6 FV)						
60° T-Scan (S6 NS)						
IRS P-Scan (S4 UC)						
60° P-Scan (S6 FV)						
60° P-Scan (S6 NS)						
60° T-Scan (S4 UC)						
60° T-Scan (S6 FV)						
60° T-Scan (S6 NS)						
IRS P-Scan (S4 UC)						
60° P-Scan (S6 FV)						
60° P-Scan (S6 NS)						
				% Total Composite Coverage =		82.1%

Rev. 0 8/23/05

Comments: A - Manual UT scanning was restricted due to nozzle configuration.
A* - Coverage calculated by modeling.

Note - Rounding methods may affect calculated values. UC-Underclad, FV-Full volume, NS-Near Surface. Weld length in degrees.

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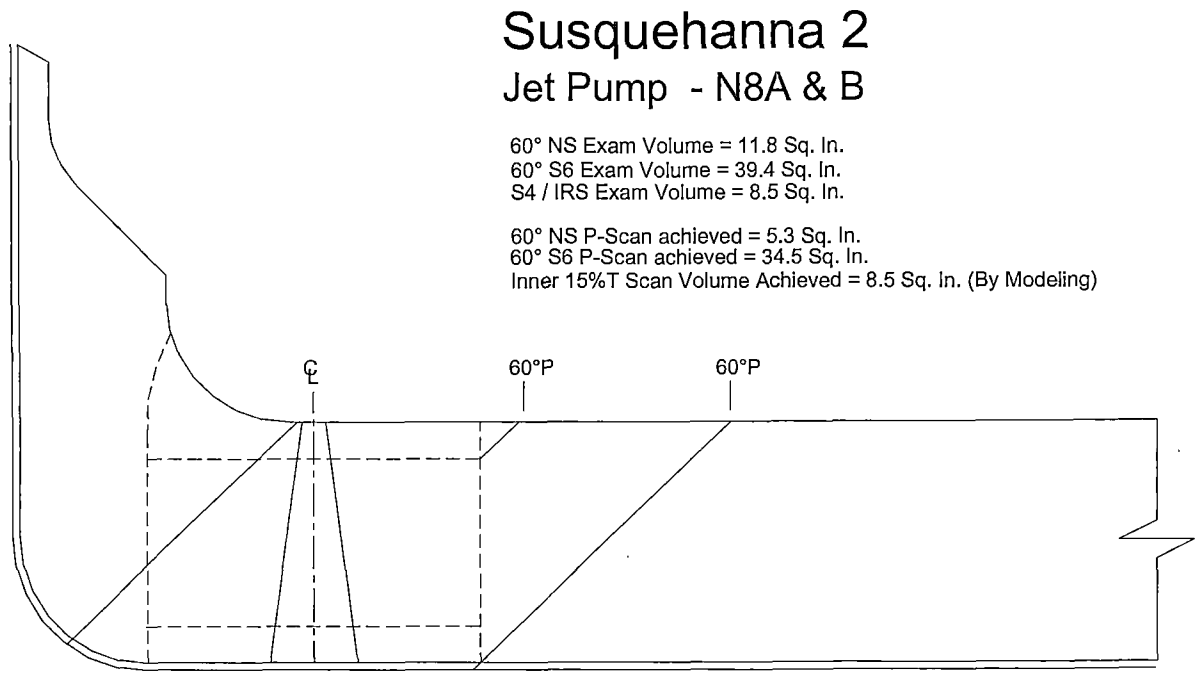
Figure 3RR-19.73



Manual UT - Coverage plot for circumferential (P) scans

Figure 3RR-19.74

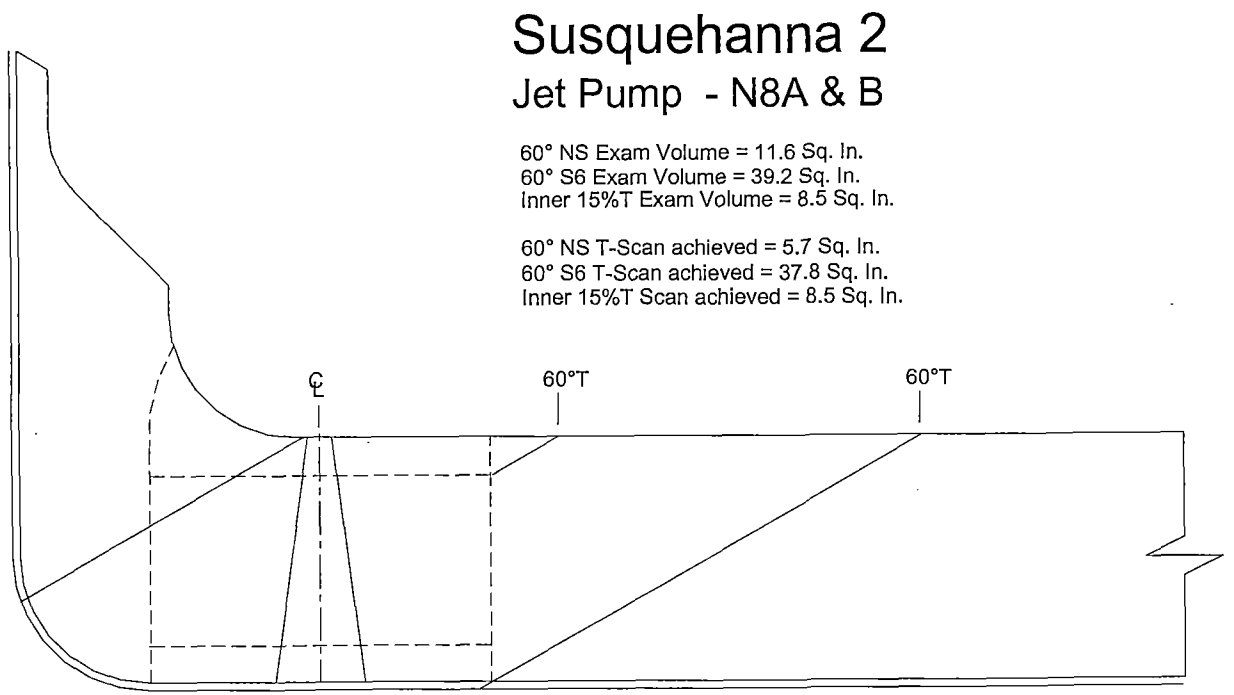


Figure 3RR-19.75

Note: Calculation sheets for U2 N8A/B result in identical volumes scanned and

Susquehanna Unit 2 - 2RI0-14
Weld N8A JPI Nozzle to Vessel Weld
Spring 2009

		CODE CROSS-SECTIONAL AREA		TOTAL CODE COVERAGE		
Weld Length = 360. Exam Volume = 59.3		Required Exam Area Sq. In.	Area Scanned Manual	Percent of Area Manual	Weld Length Manual	Percent Manual
60° NS T-Scan	A	11.6	5.7	9.6%	360	4.8%
60° S6 T-Scan	A	39.2	37.8	63.7%	360	31.9%
60° S4 / IRS Scan	A	8.5	8.5	14.3%	360	7.2%
60° NS P-Scan	A	11.6	5.3	8.9%	360	4.5%
60° S6 P-Scan	A	39.2	34.5	58.2%	360	29.1%
45° IRS P-Scan	A	8.5	8.5	14.3%	360	7.2%
				% Total Composite Coverage =		84.6%

Comments: A - Examined 360° Scanning limited due to nozzle configuration.

Note - Rounding methods may affect calculated values.

PAGE 5 OF 8

Figure 3RR-19.76

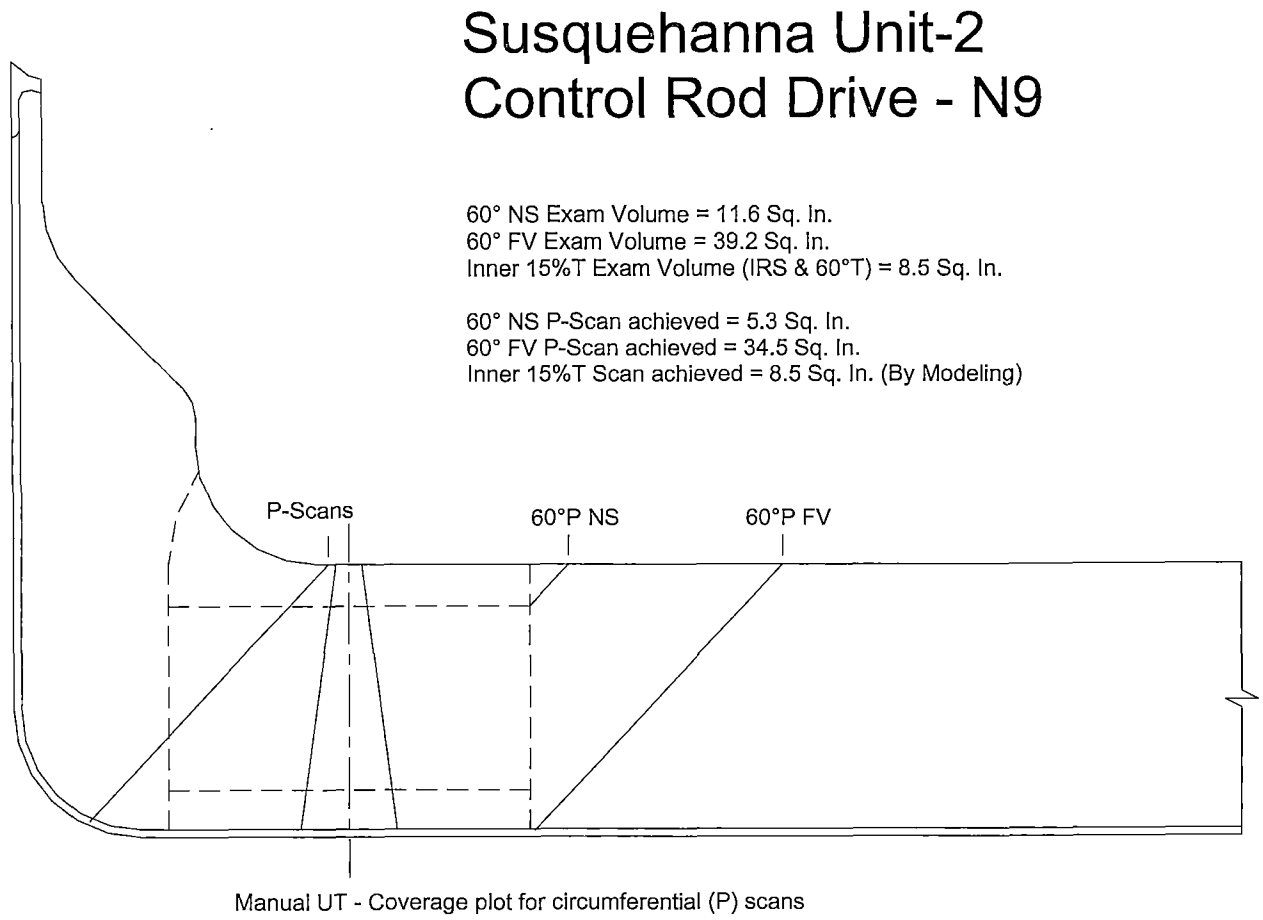


Figure 3RR-19.77

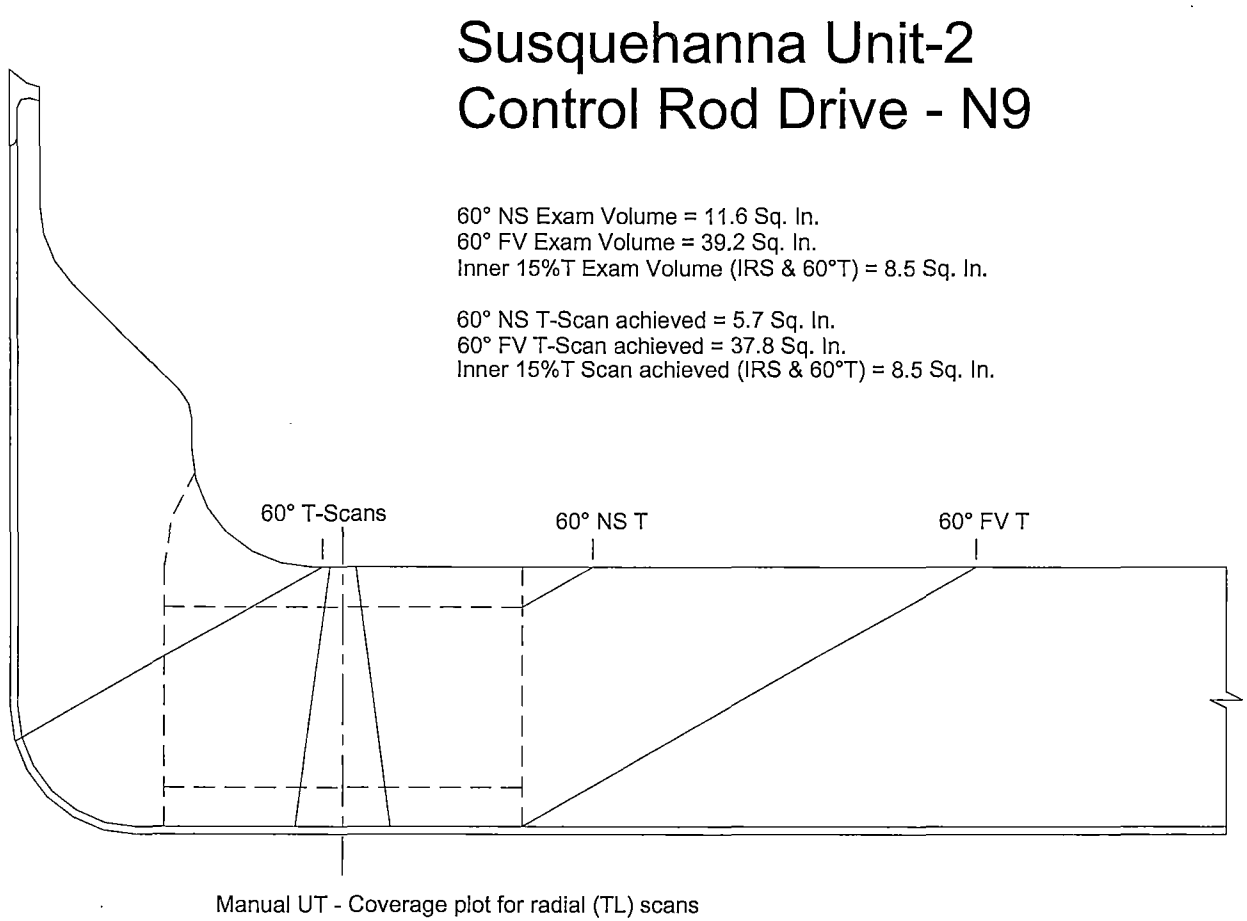


Figure 3RR-19.78

Susquehanna Unit 2 - 2RI0-14
Weld N9 CRD Nozzle to Vessel Weld
Spring 2009

		CODE CROSS-SECTIONAL AREA		TOTAL CODE COVERAGE		
Weld Length = 360. Exam Volume = 59.3		Required Exam Area Sq. In.	Area Scanned Manual	Percent of Area Manual	Weld Length Manual	Percent Manual
60° NS T-Scan	A	11.6	5.7	9.6%	360	4.8%
60° S6 T-Scan	A	39.2	37.8	63.7%	360	31.9%
60° S4 / IRS Scan	A	8.5	8.5	14.3%	360	7.2%
60° NS P-Scan	A	11.6	5.3	8.9%	360	4.5%
60° S6 P-Scan	A	39.2	34.5	58.2%	360	29.1%
45° IRS P-Scan	A	8.5	8.5	14.3%	360	7.2%
				% Total Composite Coverage =		84.6%

Comments: A - Examined 360° Scanning limited due to nozzle configuration.

Note - Rounding methods may affect calculated values.

Page 5 of 8

Figure 3RR-19.79

Attachment 3 to PLA-7371

Relief Request: 3RR-20
Revision 1

RELIEF REQUEST: 3RR-20, REVISION 1

COMPONENT IDENTIFICATION

Code Class:	1
Reference:	Table IWB-2500-1
Examination Category:	B-A
Item Number:	B1.12, B1.22
Description:	Alternative Requirements to the Examination of Pressure Retaining Welds in the Reactor Pressure Vessel
Component Number:	Ref. Tables 3RR-20.1 and 3RR-20.2

CODE REQUIREMENT

Table IWB-2500-1, Examination Category B-A, Item Number B1.12, requires volumetric examination of essentially 100% of the weld length of all longitudinal shell welds in accordance with the examination requirements illustrated in Figure IWB-2500-2.

Table IWB-2500-1, Examination Category B-A, Item Number B1.22, requires volumetric examination of essentially 100% of the weld length of the bottom head meridional welds in accordance with the examination requirements illustrated in Figure IWB-2500-3.

BASIS FOR RELIEF

Pursuant to 10CFR50.55a(g)(5)(iii), relief is requested on the basis that conformance with the specified Code requirement has been determined to be impractical.

Examinations of the affected welds were performed to the maximum extent practical. For item Number B1.12, longitudinal welds, the total examination coverage obtained is the maximum practical due to interference with permanent RPV mirror insulation support steel.

The burden that is caused by compliance with the examination requirements of ASME Section XI includes modification of plant components to remove obstructions, redesigning of plant systems, and replacement of components where geometry is inherent to component design.

For Item Number B1.22, meridional welds, the total examination coverage obtained is the maximum practical due to interference with the vessel support skirt and Control Rod Drive (CRD) obstructions.

Modification or temporary removal of the RPV mirror insulation support steel, vessel support skirt, and CRD obstructions is a significant burden to achieve any additional examination coverage.

No internal or external operating experience reviewed is relevant regarding potential degradation or severe loading for the subject welds.

PROPOSED ALTERNATE EXAMINATIONS

The examinations were performed to the maximum extent practicable in accordance with Appendix VIII of ASME Section XI which is a proven means of identifying any degradation in the covered volumes. The proposed alternative is the maximum coverage achievable shown in Table 3RR-20.1 and Table 3RR-20.2.

The RPV pressure retaining welds are also subject to VT-2 visual examination during system pressure testing in accordance with the requirements of Examination Category B-P.

Online leakage monitoring for the subject welds is provided by the drywell floor drain sump monitoring system. This system has Technical Specification required monitoring (TS 3.4.4.1) every 12 hours. If leakage were to be detected beyond the limits identified in TS 3.4.4, the unit would be shutdown and any leakage would be identified and repaired.

APPLICABLE TIME PERIOD

Relief is requested for the third ten-year inspection interval of the Inservice Inspection Program for SSES Units 1 and 2.

Table 3RR-20.1: Unit 1

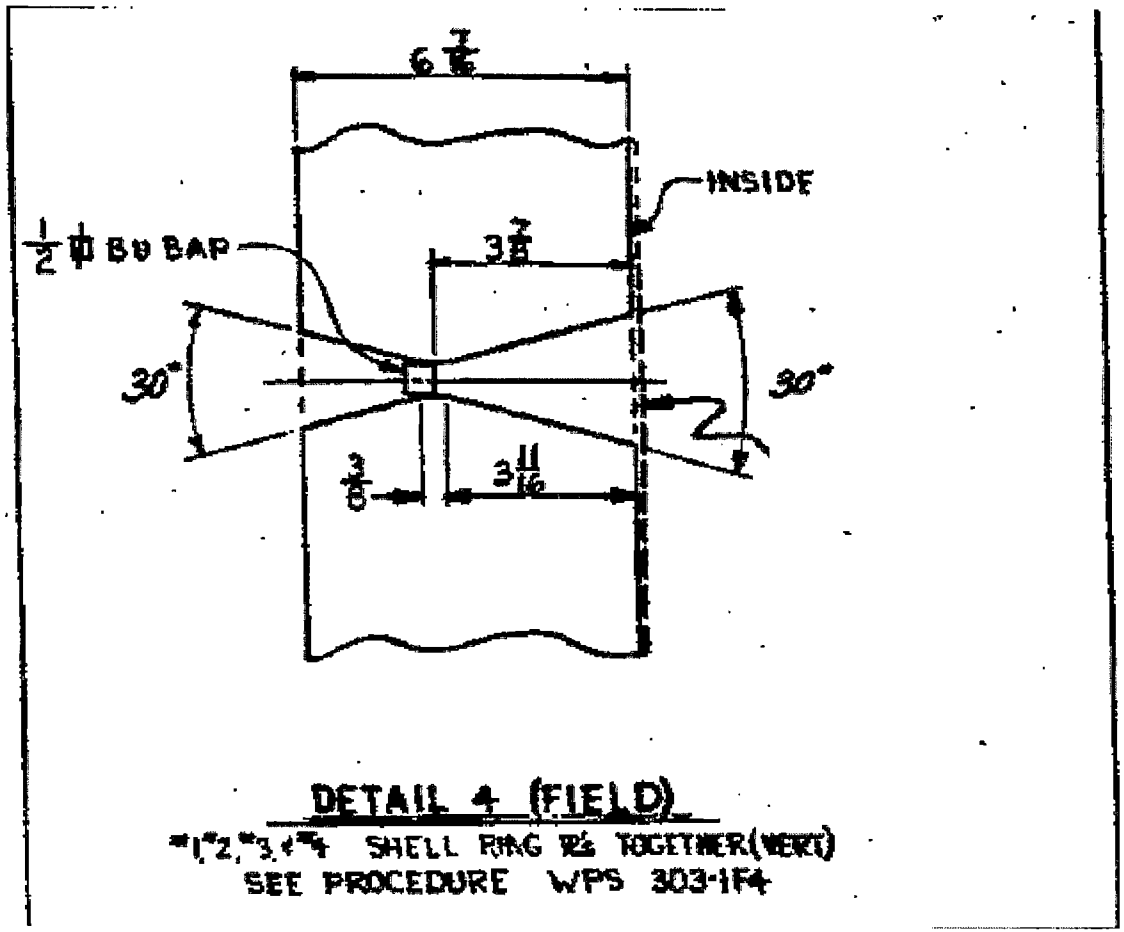
Component Identification	Item Number	Material	Component Description	Limiting Condition	Examination Coverage[1]	Examination Results	Figure 3RR-20._
BK	B1.12	SA-533 Gr. B Cl. 1	Vessel Longitudinal Weld	Limited by RPV mirror insulation support steel	T Scans - 38.4% P Scans - 38.4% Total - 76.7%	NRI[2]	1, 4-7
BM	B1.12	SA-533 Gr. B Cl. 1	Vessel Longitudinal Weld	Limited by RPV mirror insulation support steel	T Scans - 38.1% P Scans - 38.1% Total - 76.3%	NRI[2]	1, 8-11
DA-DF	B1.22	SA-533 Gr. B Cl. 1	Bottom Head Meridional Weld	Limited by vessel support	T Scans - 42.8% P Scans - 42.8% Total - 85.3%	NRI[2]	2, 12-14
DG-DH	B1.22	SA-533 Gr. B Cl. 1	Bottom Head Meridional Weld	Limited by bottom head penetrations	T Scans - 3.6% P Scans - 3.6% Total - 7.7%	NRI[2]	3, 15-17

1. Exams were performed in accordance with PDI Supplement 4 and Supplement 6 per Appendix VIII.
2. Previous examination data was reviewed with no significant changes noted.

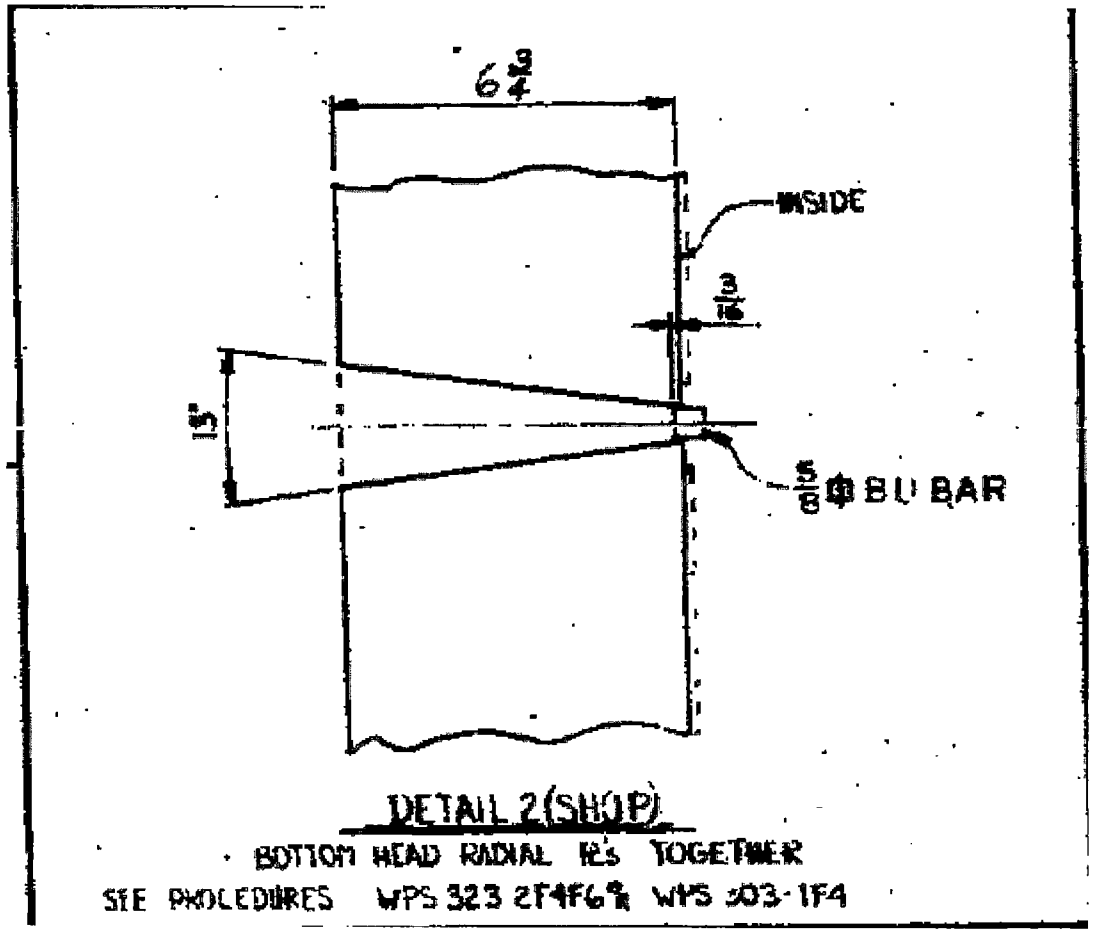
Table 3RR-20.2: Unit 2

Component Identification	Item Number	Material	Component Description	Limiting Condition	Examination Coverage[1]	Examination Results	Figure 3RR-20._
BK	B1.12	SA-533 Gr. B Cl. 1	Vessel Longitudinal Weld	Limited by RPV mirror insulation support steel	T Scans - 36.1% P Scans - 36.1% Total - 72.1%	NRI[2]	1, 18-21
BM	B1.12	SA-533 Gr. B Cl. 1	Vessel Longitudinal Weld	Limited by RPV mirror insulation support steel	T Scans - 35.3% P Scans - 35.3% Total - 70.6%	NRI[2]	1, 22-25
DA-DF	B1.22	SA-533 Gr. B Cl. 1	Bottom Head Meridional Weld	Limited by vessel support	T Scans - 42.5% P Scans - 42.5% Total - 85.2%	NRI[2]	2, 26-28
DG-DH	B1.22	SA-533 Gr. B Cl. 1	Bottom Head Meridional Weld	Limited by bottom head penetrations	T Scans - 11.9% P Scans - 11.9% Total – 23.7%	NRI[2]	3, 29-32

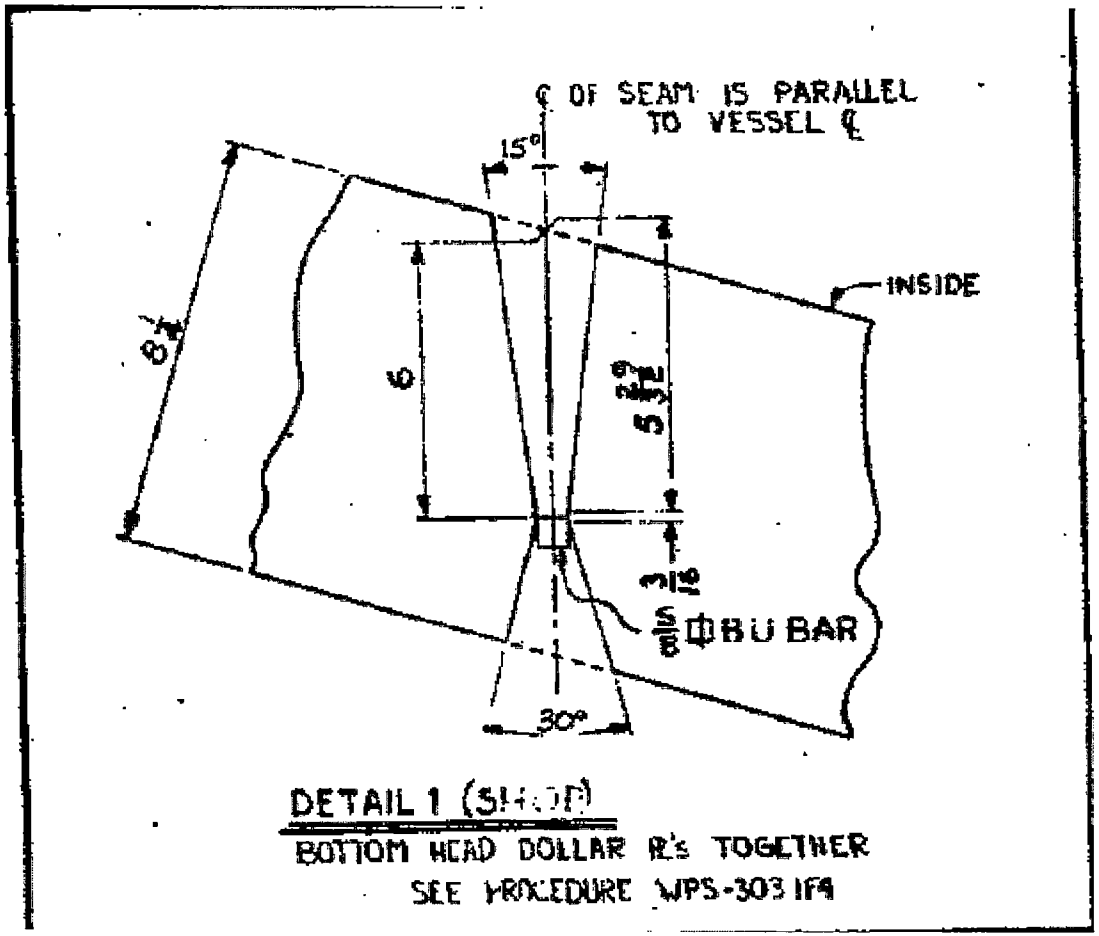
1. Exams were performed in accordance with PDI Supplement 4 and Supplement 6 per Appendix VIII.
2. Previous examination data was reviewed with no significant changes noted.



BK, BM Weld Detail
Figure 3RR-20.1



DA-DF Weld Detail
Figure 3RR-20.2



DG, DH Weld Detail
Figure 3RR-20.3

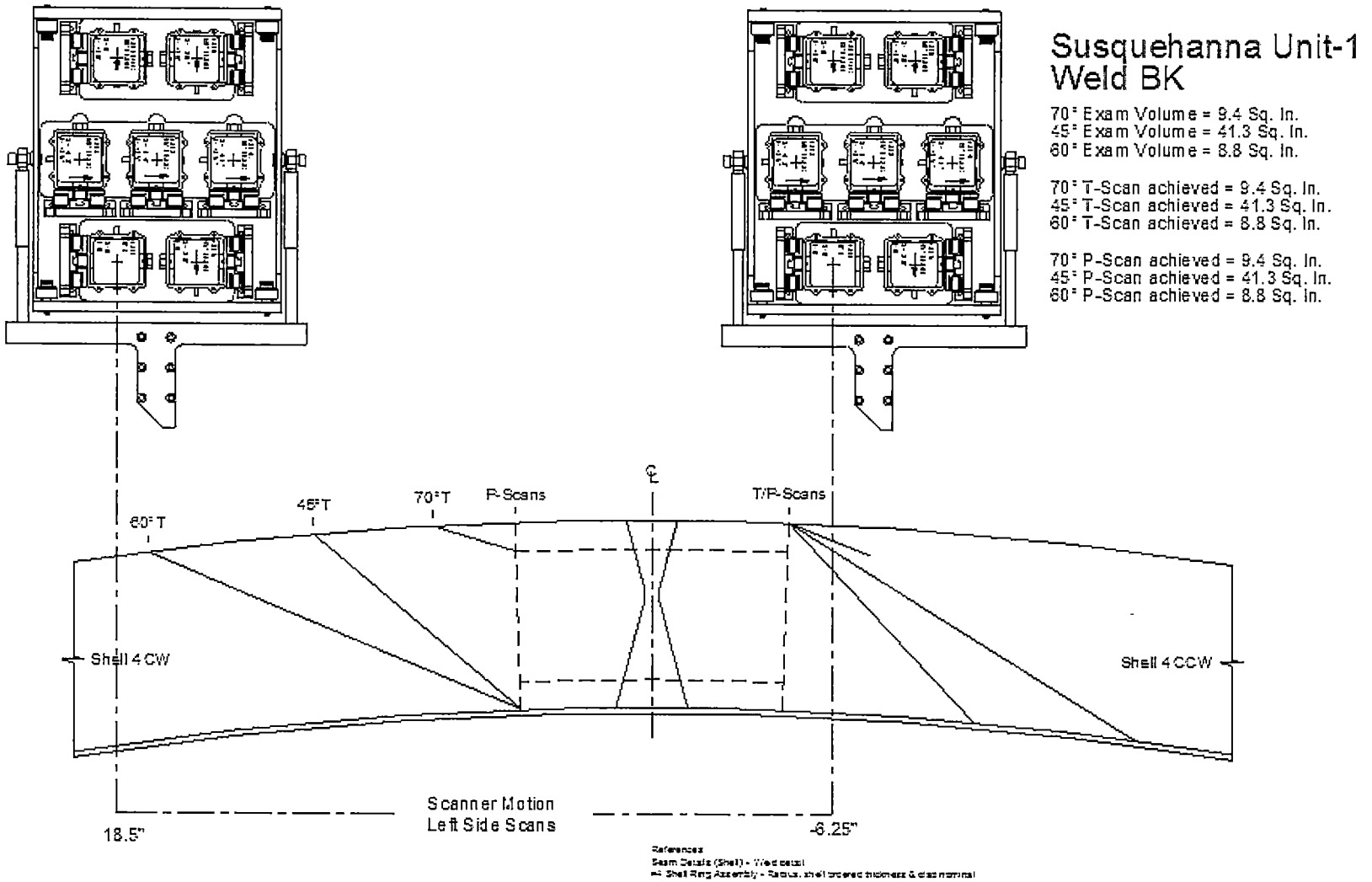


Figure 3RR-20.4

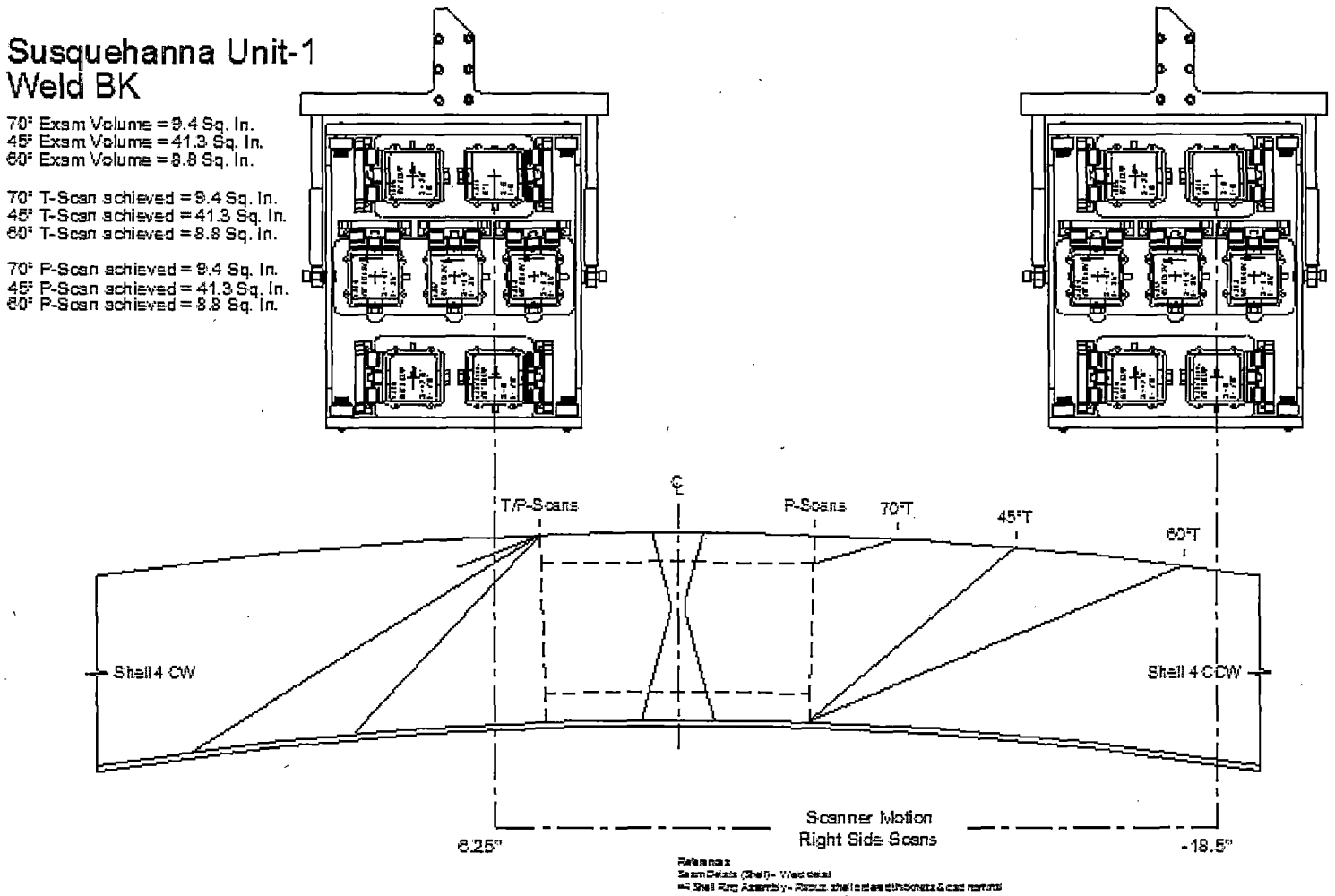


Figure 3RR-20.5

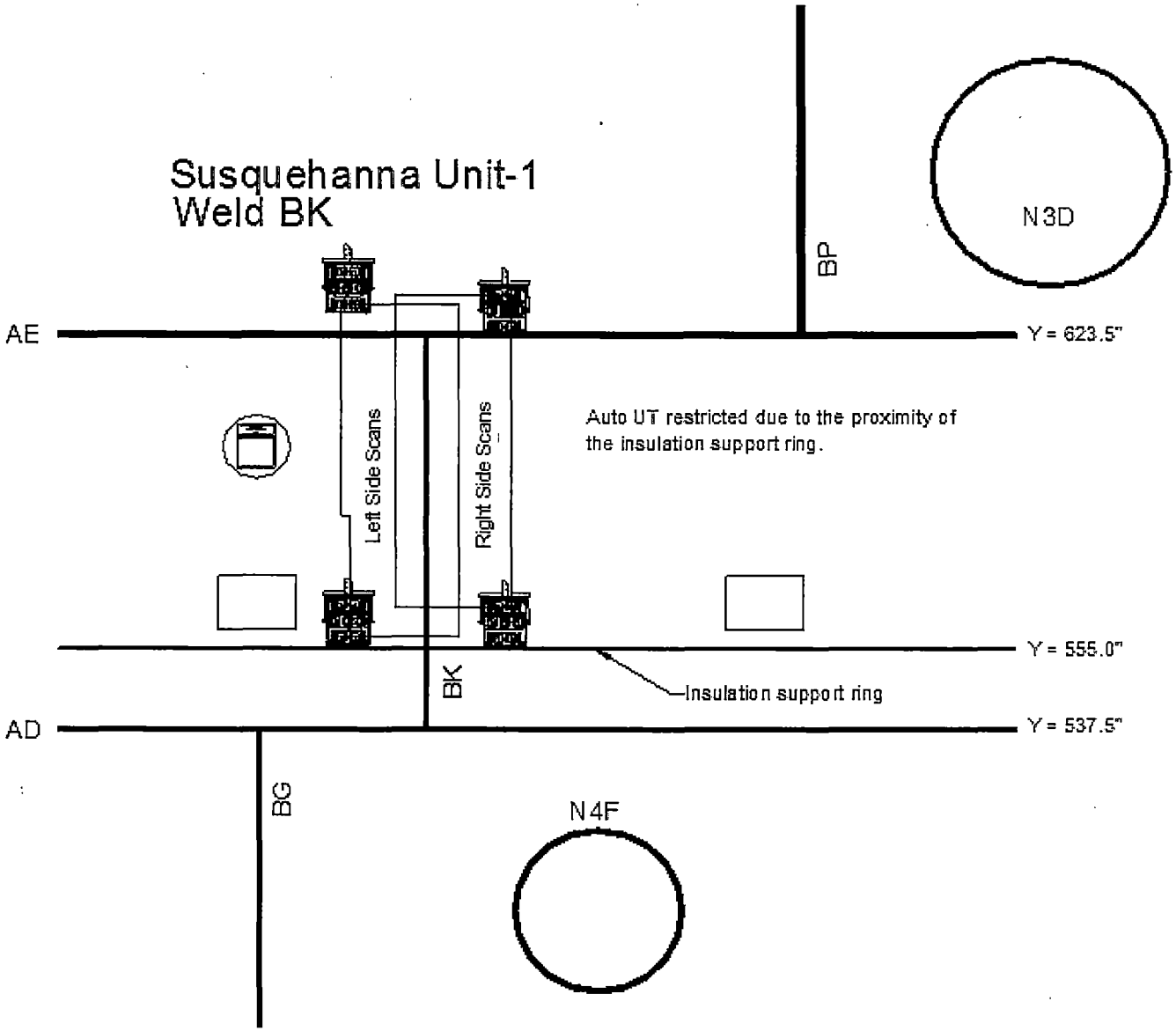


Figure 3RR-20.6

HITACHI

SP2000 RPV Examination Coverage Calculation Sheet

Susquehanna Unit 1, 1RIO18
BK-SC4

		CODE CROSS-SECTIONAL AREA		TOTAL CODE COVERAGE		
Weld Length = 86.00 Exam Volume = 59.5		Required Exam Area Sq. In.	Area Scanned Automated	Percent of Area Automated	Weld Length Automated	Percent Automated
70° T-Scan (S6 NS)	A	9.4	9.4	0.2	66.0	6.1%
45° T-Scan (S6 FV)	A	41.3	41.3	0.7	66.0	26.6%
60° T-Scan (S4 UC)	A	8.8	8.8	0.1	66.0	5.7%
70° P-Scan (S6 NS)	A	9.4	9.4	0.2	66.0	6.1%
45° P-Scan (S6 FV)	A	41.3	41.3	0.7	66.0	26.6%
60° P-Scan (S4 UC)	A	8.8	8.8	0.1	66.0	5.7%
70° T-Scan (S6 NS)						
45° T-Scan (S6 FV)						
60° T-Scan (S4 UC)						
70° P-Scan (S6 NS)						
45° P-Scan (S6 FV)						
60° P-Scan (S4 UC)						
70° T-Scan (S6 NS)						
45° T-Scan (S6 FV)						
60° T-Scan (S4 UC)						
70° P-Scan (S6 NS)						
45° P-Scan (S6 FV)						
60° P-Scan (S4 UC)						
				% Total Composite Coverage =		76.7%

Rev. 0 9/23/05

Comments: A - Automated scanning was limited due to the proximity of a non-removable insulation support ring.

Note - Rounding methods may affect calculated values. UC-Underclad, FV-Full volume, NS-Near Surface. Weld length in inches.

Figure 3RR-20.7

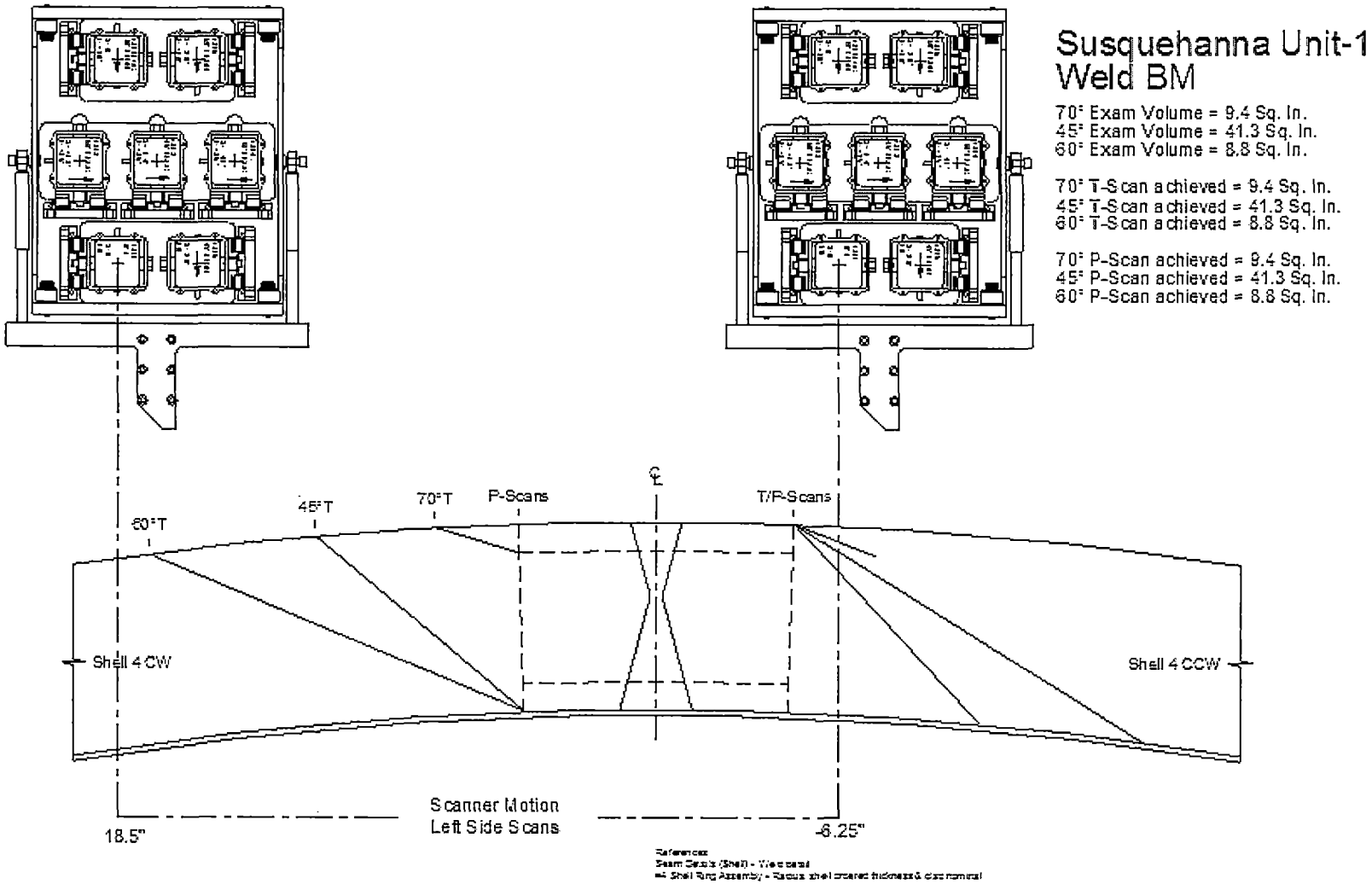


Figure 3RR-20.8

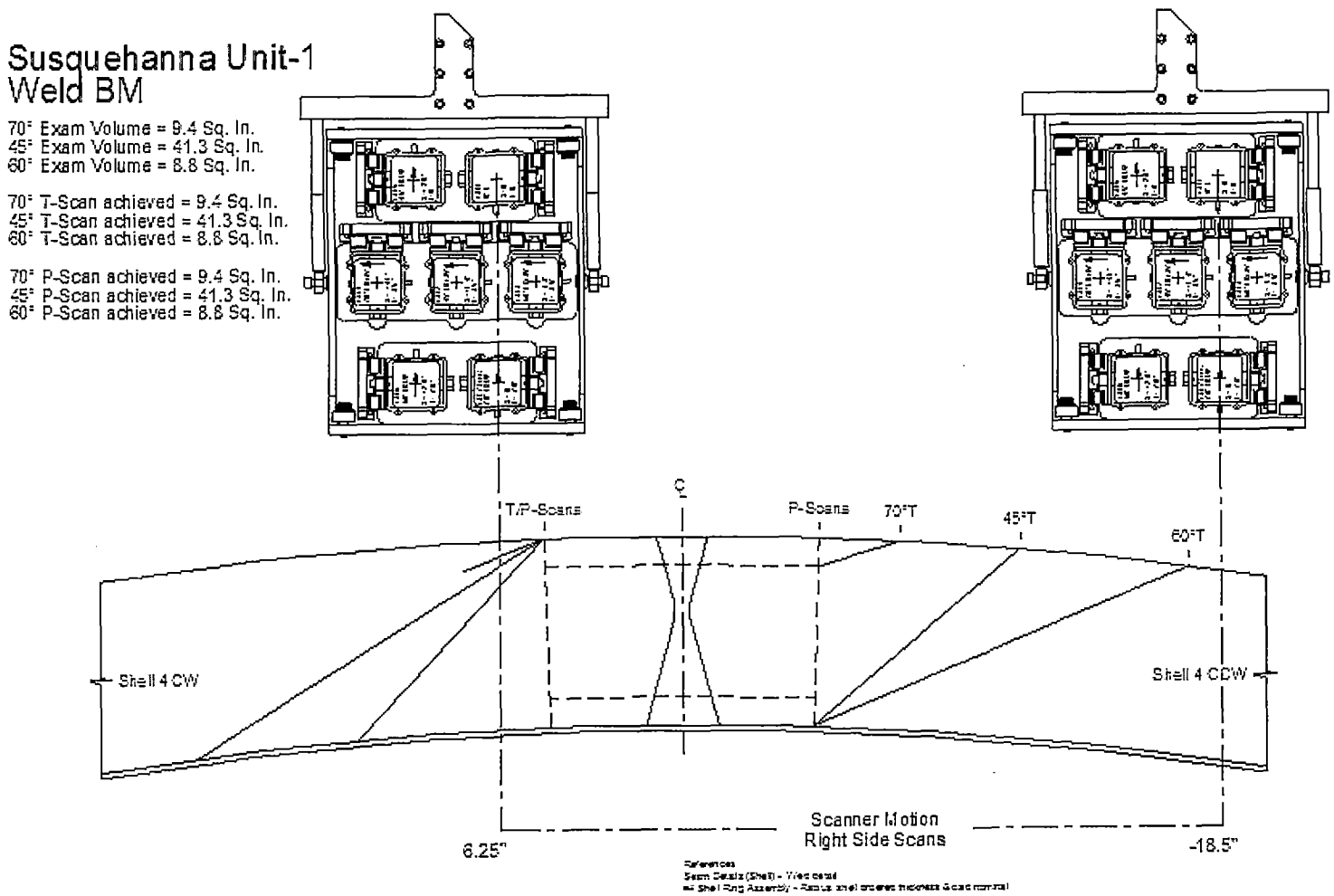


Figure 3RR-20.9

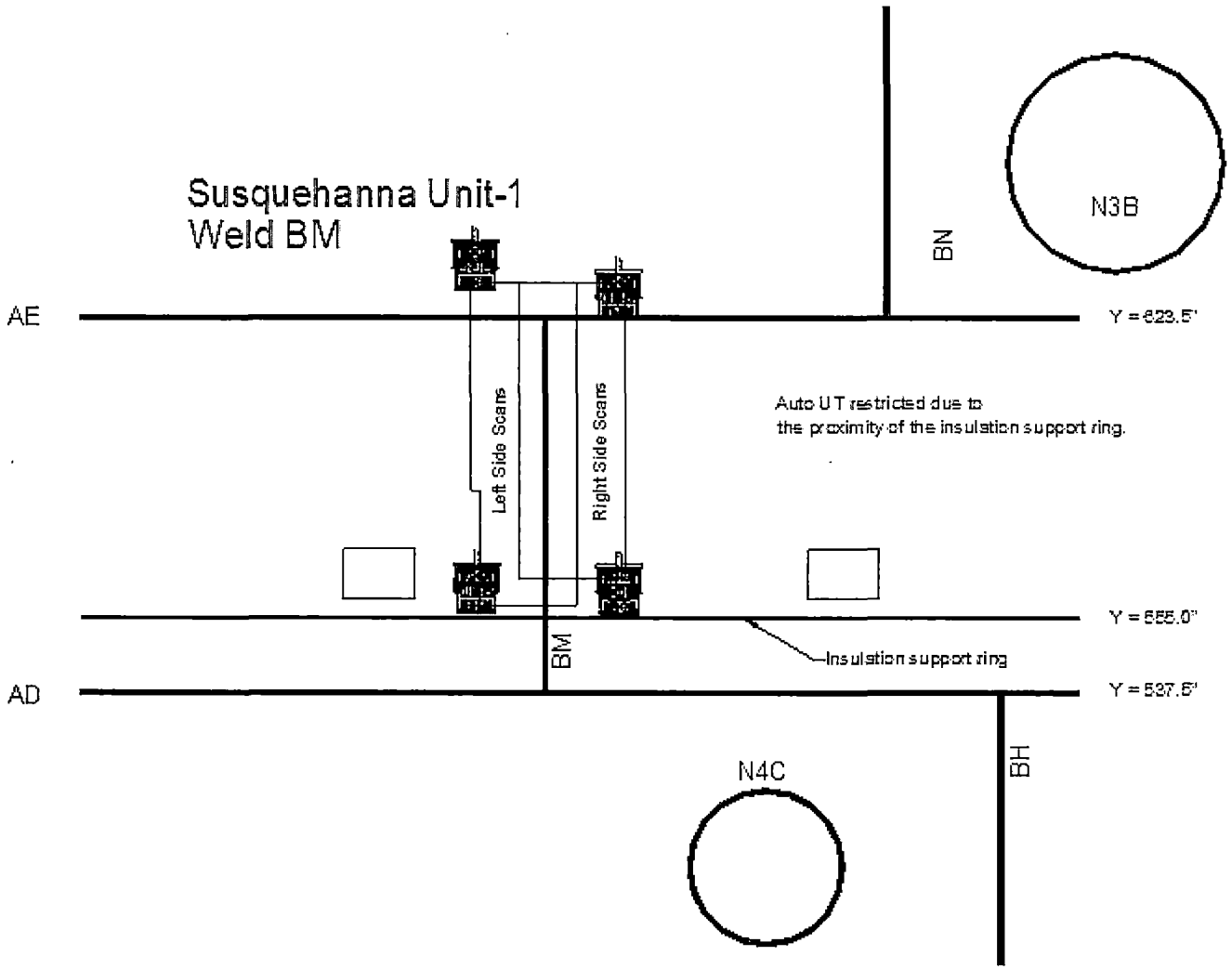


Figure 3RR-20.10

HITACHI

SP2000 RPV Examination Coverage Calculation Sheet

Susquehanna Unit 1, 1RIO18
BM-SC4

		CODE CROSS-SECTIONAL AREA		TOTAL CODE COVERAGE		
Weld Length = 86.00 Exam Volume = 59.5		Required Exam Area Sq. In.	Area Scanned Automated	Percent of Area Automated	Weld Length Automated	Percent Automated
70° T-Scan (S6 NS)	A	9.4	9.4	0.2	65.6	6.0%
45° T-Scan (S6 FV)	A	41.3	41.3	0.7	65.6	26.5%
60° T-Scan (S4 UC)	A	8.8	8.8	0.1	65.6	5.6%
70° P-Scan (S6 NS)	A	9.4	9.4	0.2	65.6	6.0%
45° P-Scan (S6 FV)	A	41.3	41.3	0.7	65.6	26.5%
60° P-Scan (S4 UC)	A	8.8	8.8	0.1	65.6	5.6%
70° T-Scan (S6 NS)						
45° T-Scan (S6 FV)						
60° T-Scan (S4 UC)						
70° P-Scan (S6 NS)						
45° P-Scan (S6 FV)						
60° P-Scan (S4 UC)						
70° T-Scan (S6 NS)						
45° T-Scan (S6 FV)						
60° T-Scan (S4 UC)						
70° P-Scan (S6 NS)						
45° P-Scan (S6 FV)						
60° P-Scan (S4 UC)						
				% Total Composite Coverage =		76.3%

Rev. 0 9/23/05

Comments: A - Automated scanning was limited due to the proximity of a non-removable insulation support ring.

Note - Rounding methods may affect calculated values. UC-Underclad, FV-Full volume, NS-Near Surface. Weld length in inches.

Susquehanna Unit 1 - 1RIO18 Report No. 621406 - BM-SC4 Page 5 of 10

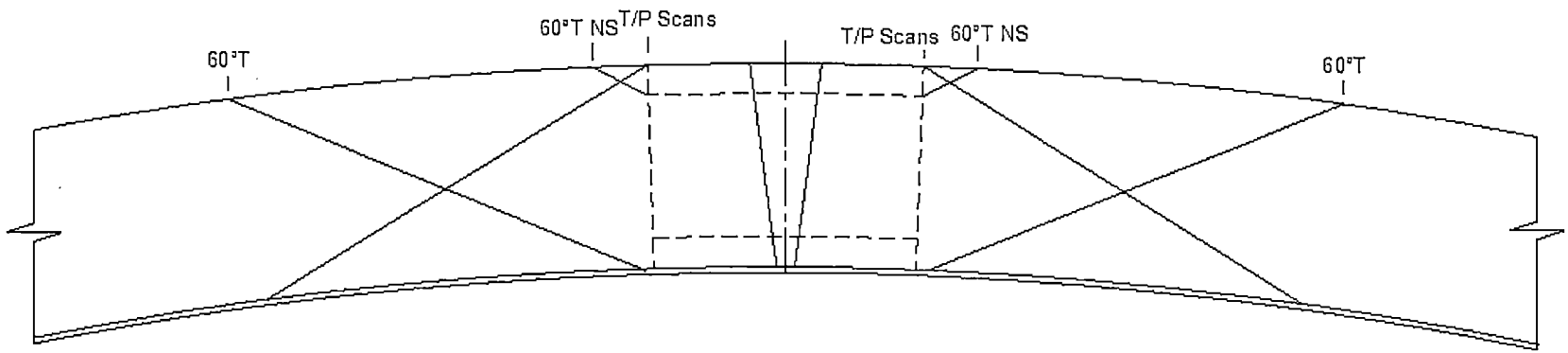
Figure 3RR-20.11

60° NS Exam Volume = 8.1 Sq. In.
60° S6 Exam Volume = 43.3 Sq. In.
60° S4 Exam Volume = 8.8 Sq. In.

60° NS T-Scan Achieved = 8.1 Sq. In.
60° S6 T-Scan Achieved = 43.3 Sq. In.
60° S4 T-Scan Achieved = 8.8 Sq. In.

60° NS P-Scan Achieved = 8.1 Sq. In.
60° S6 P-Scan Achieved = 43.3 Sq. In.
60° S4 P-Scan Achieved = 8.8 Sq. In.

Susquehanna 1
Bottom Hd. Radial (Meridional) Pl's
Welds DA thru DF



Manual Scan Area Right and Left Sides

Figure 3RR-20.12

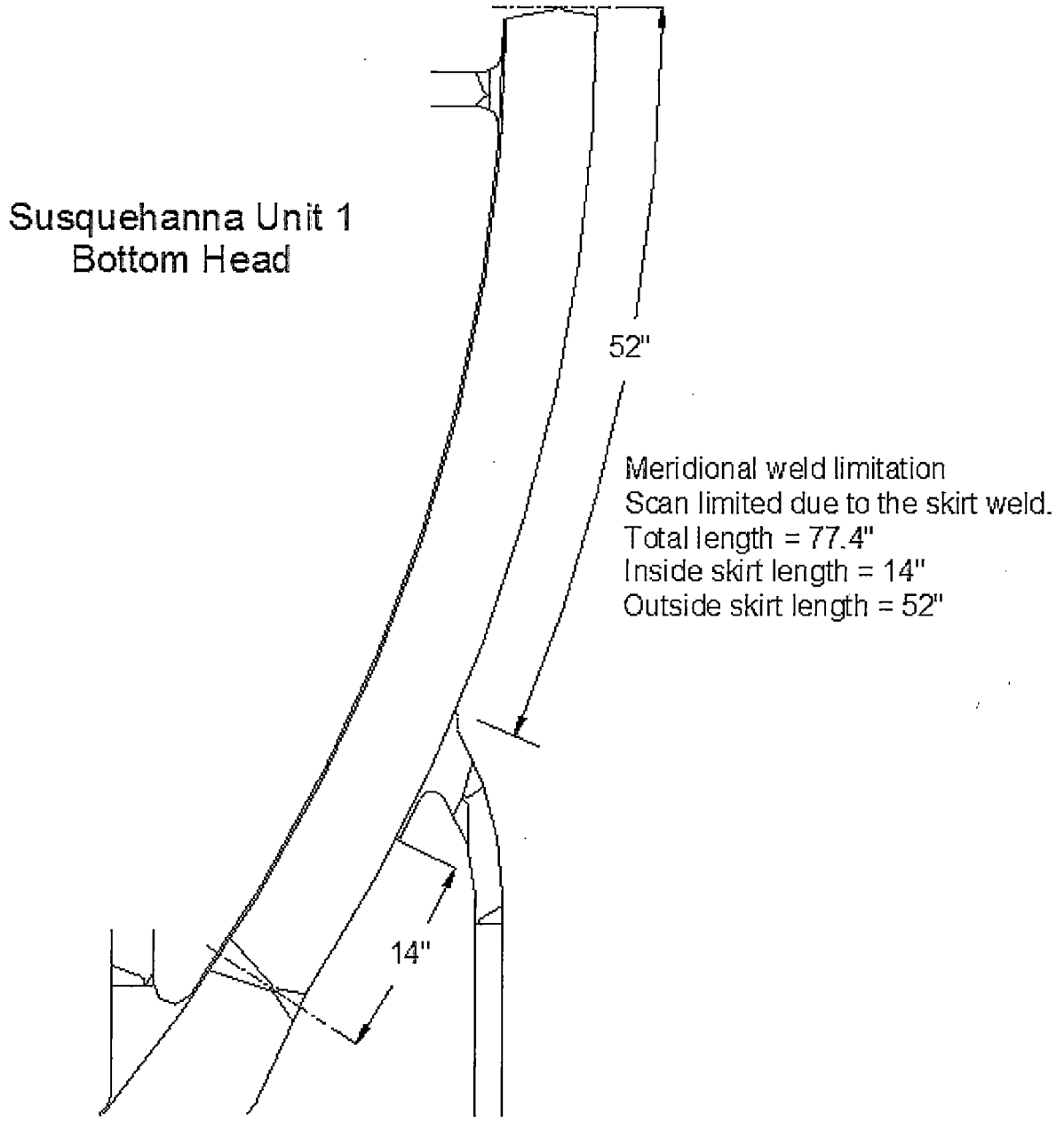


Figure 3RR-20.13

Susquehanna Unit-1, 2008

HITACHI

Reactor Pressure Vessel Coverage Calculation Sheet

Note: Calculation sheets for U1 DA-DF result in identical volumes scanned and coverage percentages

Susquehanna Unit-1, 2008
DA - Bottom Head Meridional
U1 R&IO 15

Weld Length = 77.4 Exam Volume = 60.2		CODE CROSS-SECTIONAL AREA		TOTAL CODE COVERAGE		
		Required Exam Area Sq. In.	Area Scanned Manual	Percent of Area Manual	Weld Length Manual	Percent Manual
60° T-Scan (S4 CW)	A	8.8	8.8	14.6%	14	0.7%
60° T-Scan (S4 CCW)	A	8.8	8.8	14.6%	14	0.7%
60° T-Scan (S6)	A	51.4	51.4	85.4%	14	7.7%
60° P-Scan (S4 UP)	A	8.8	8.8	14.6%	14	0.7%
60° P-Scan (S4 DN)	A	8.8	8.8	14.6%	14	0.7%
60° P-Scan (S6)	A	51.4	51.4	85.4%	14	7.7%
60° T-Scan (S4 CW)	B	8.8	8.8	14.6%	52	2.5%
60° T-Scan (S4 CCW)	B	8.8	8.8	14.6%	52	2.5%
60° T-Scan (S6)	B	51.4	51.4	85.4%	52	28.7%
60° P-Scan (S4 UP)	B	8.8	8.8	14.6%	52	2.5%
60° P-Scan (S4 DN)	B	8.8	8.8	14.6%	52	2.5%
60° P-Scan (S6)	B	51.4	51.4	85.4%	52	28.7%
				% Total Composite Coverage =		85.3%

Rev. 1 3/4/07

Comments: Weld length in inches.
A - Scanning is limited due to the vessel support skirt. Inside skirt access.
B - Scanning is limited due to the vessel support skirt. Outside skirt access.

Note - Rounding methods may affect calculated values.

One C15
3-22-08
OET

Page 6 of 8

Figure 3RR-20.14

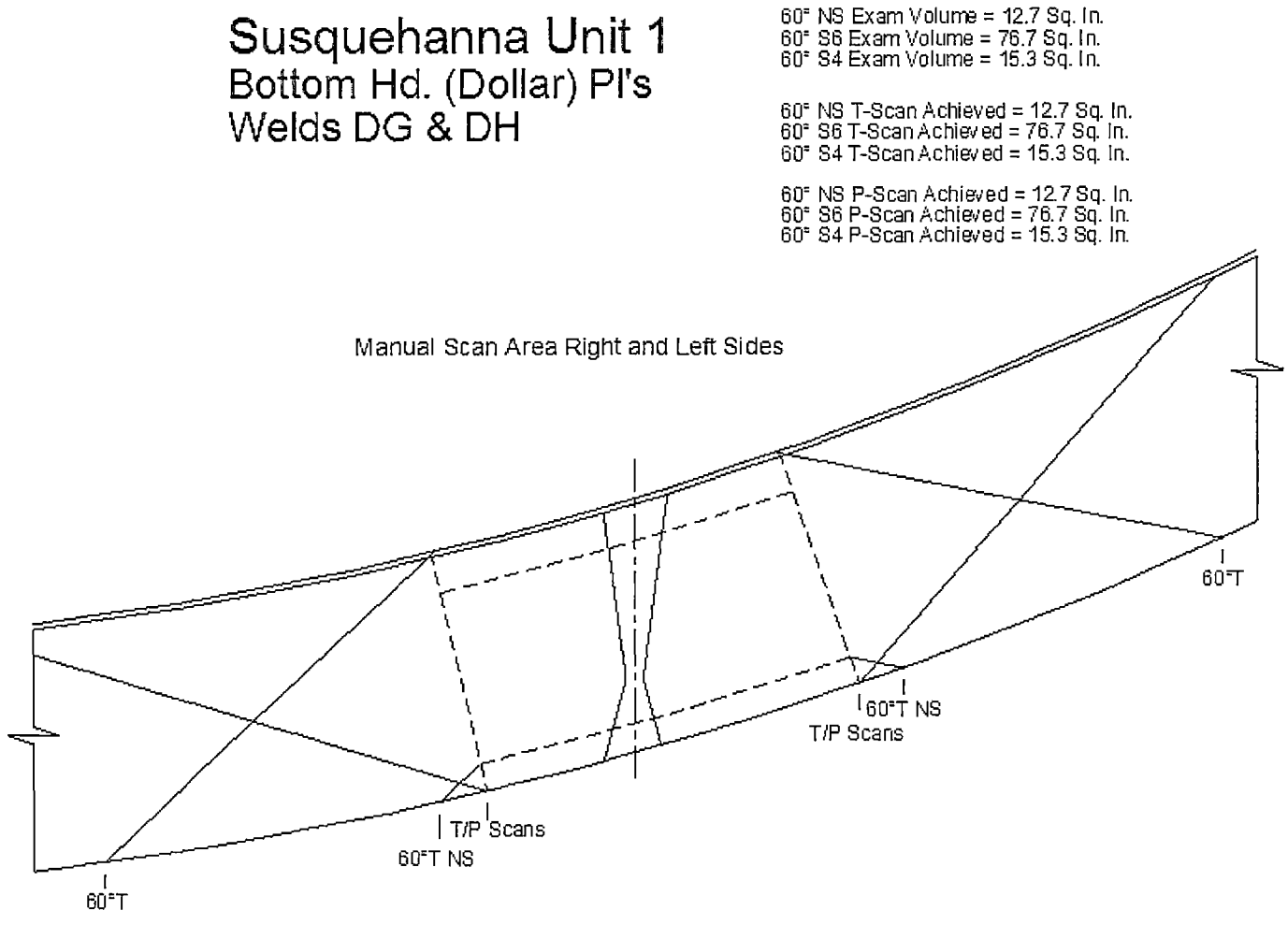


Figure 3RR-20.15

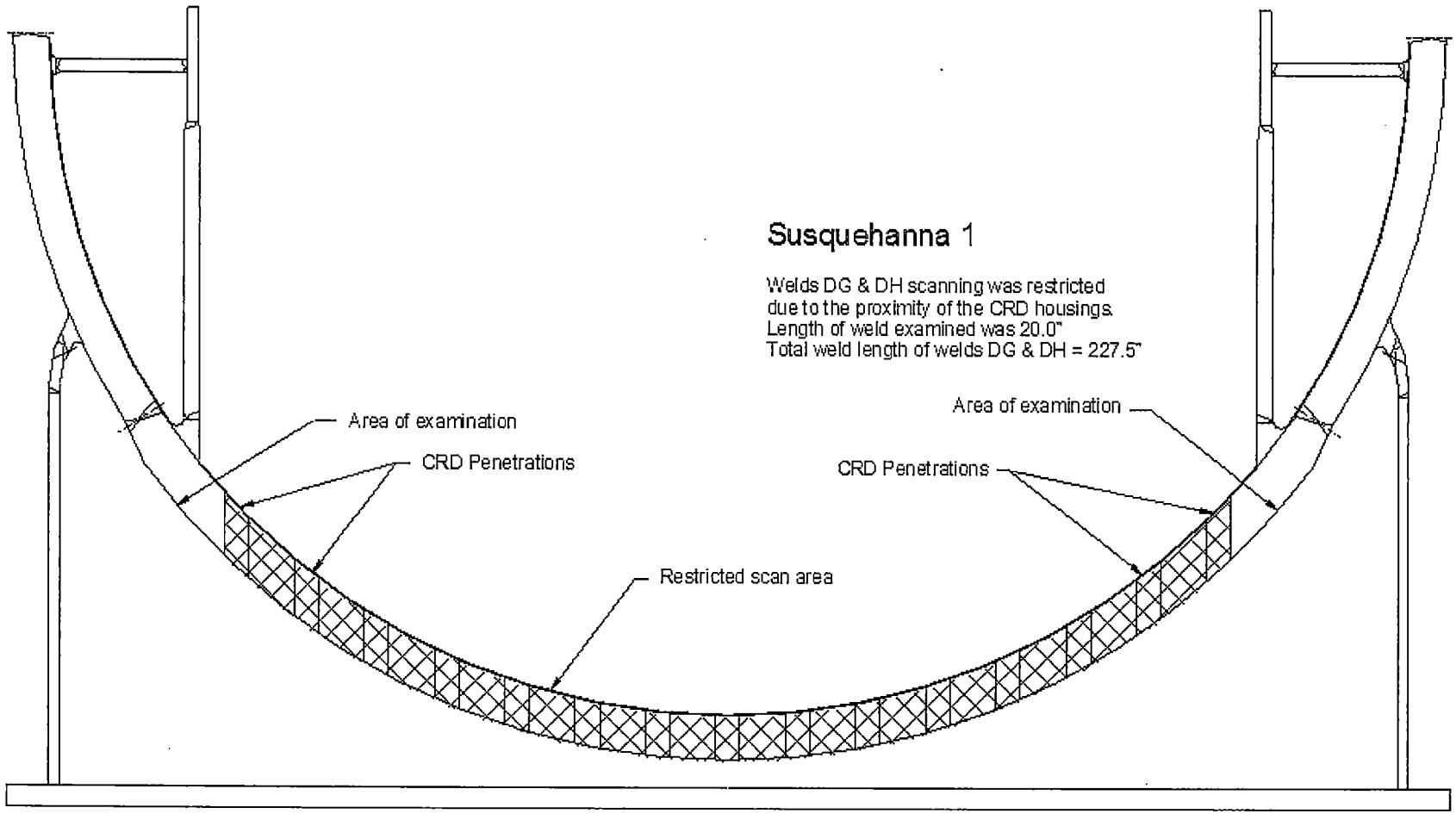


Figure 3RR-20.16

HITACHI

Reactor Pressure Vessel
Coverage Calculation Sheet

Note: Calculation sheets for U1 DG-DH result in identical volumes scanned and coverage percentages

Susquehanna Unit-1, 2008
DG - Bottom Head Dollar Side Plate
U1 R&IO 15

		CODE CROSS-SECTIONAL AREA		TOTAL CODE COVERAGE		
Weld Length = 260.0 Exam Volume = 104.7		Required Exam Area Sq. In.	Area Scanned Manual	Percent of Area Manual	Weld Length Manual	Percent Manual
60° T-Scan (S4 CW)	A	15.3	15.3	14.6%	10	0.1%
60° T-Scan (S4 CCW)	A	15.3	15.3	14.6%	10	0.1%
60° T-Scan (S6)	A	89.4	89.4	85.4%	10	1.6%
60° P-Scan (S4 UP)	A	15.3	15.3	14.6%	10	0.1%
60° P-Scan (S4 DN)	A	15.3	15.3	14.6%	10	0.1%
60° P-Scan (S6)	A	89.4	89.4	85.4%	10	1.6%
60° T-Scan (S4 CW)	B	15.3	15.3	14.6%	10	0.1%
60° T-Scan (S4 CCW)	B	15.3	15.3	14.6%	10	0.1%
60° T-Scan (S6)	B	89.4	89.4	85.4%	10	1.6%
60° P-Scan (S4 UP)	B	15.3	15.3	14.6%	10	0.1%
60° P-Scan (S4 DN)	B	15.3	15.3	14.6%	10	0.1%
60° P-Scan (S6)	B	89.4	89.4	85.4%	10	1.6%

% Total Composite Coverage = 7.7%

Rev. 1 3/4/07

Comments: Weld length in inches.
A - Scanning is limited due to the bottom head penetrations. Examined 10 inches on the 0° side of the dollar plate.
B - Scanning is limited due to the bottom head penetrations. Examined 10 inches on the 180° side of the dollar plate.

Note - Rounding methods may affect calculated values.

One C15
3-24-08
DET

Figure 3RR-20.17

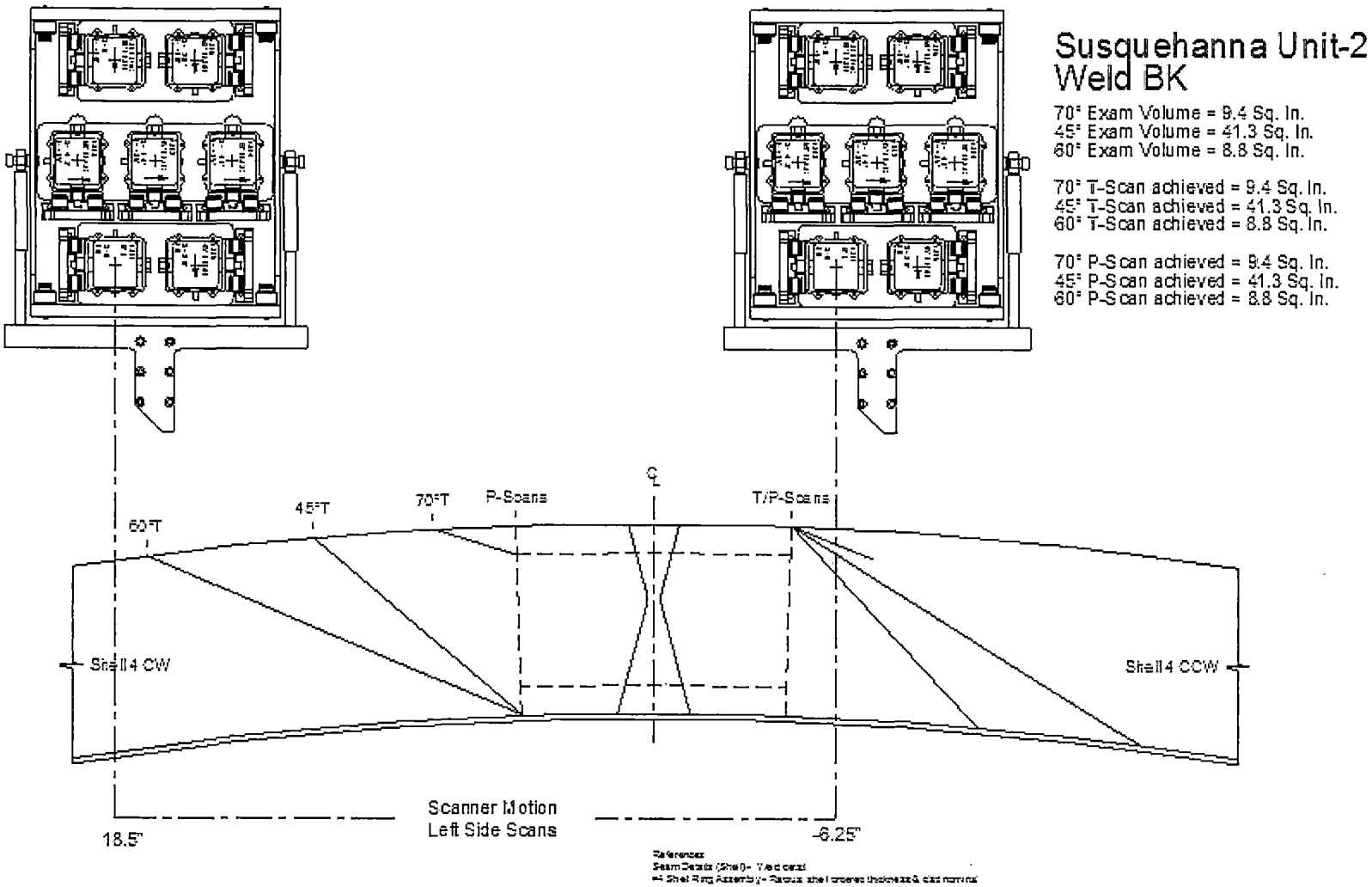


Figure 3RR-20.18

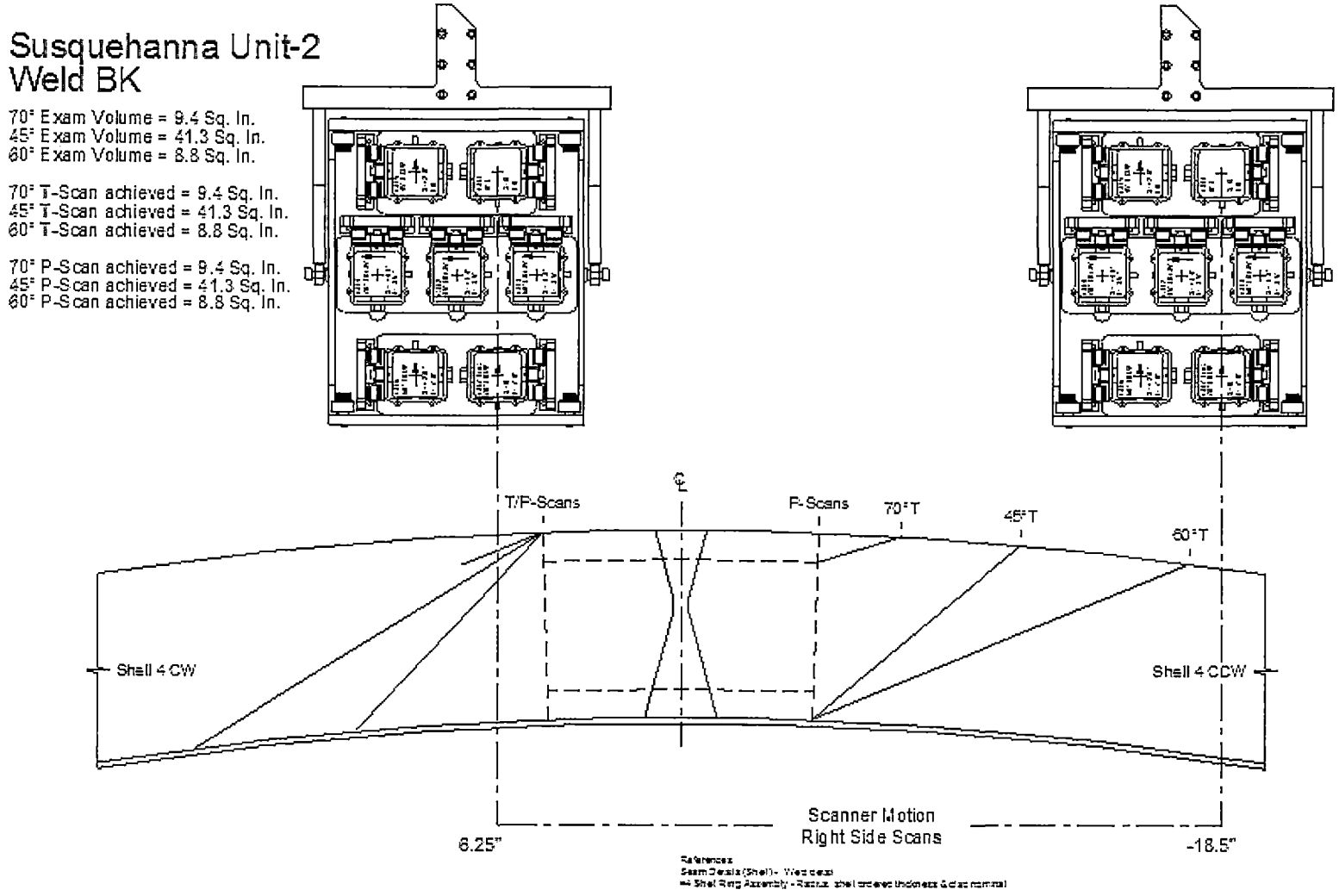


Figure 3RR-20.19

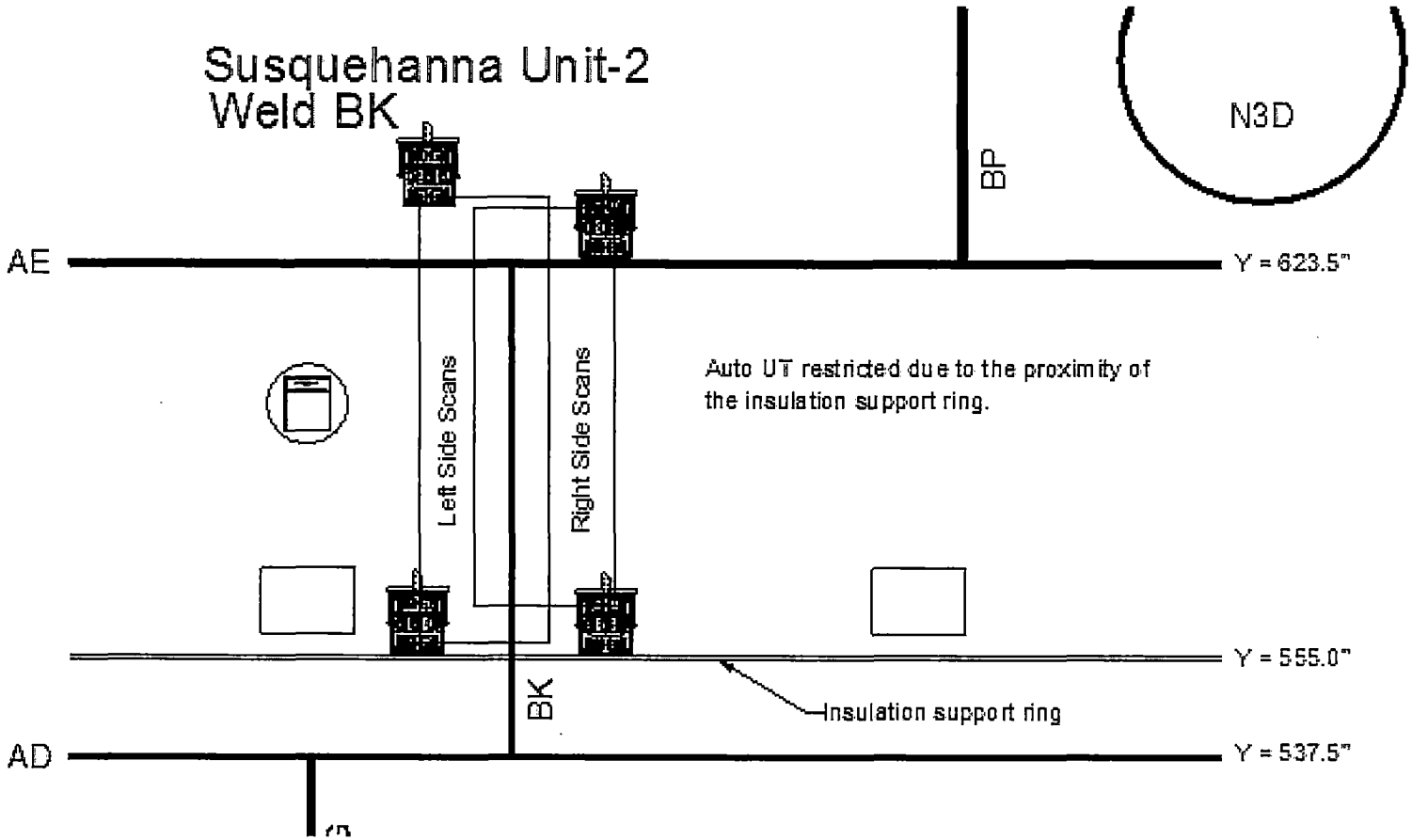


Figure 3RR-20.20

HITACHI

SP2000 RPV Examination Coverage Calculation Sheet

Susquehanna Unit 2 / 2RIO16
BK-SC4

Weld Length = 86.00 Exam Volume = 59.4		CODE CROSS-SECTIONAL AREA		TOTAL CODE COVERAGE		
		Required Exam Area Sq. In.	Area Scanned Automated	Percent of Area Automated	Weld Length Automated	Percent Automated
60° T-Scan (S4 UC)	A	8.7	8.7	14.6%	62.0	5.3%
45° T-Scan (S6 FV)	A	41.3	41.3	69.5%	62.0	25.1%
70° T-Scan (S6 NS)	A	9.4	9.4	15.8%	62.0	5.7%
60° P-Scan (S4 UC)	A	8.7	8.7	14.6%	62.0	5.3%
45° P-Scan (S6 FV)	A	41.3	41.3	69.5%	62.0	25.1%
70° P-Scan (S6 NS)	A	9.4	9.4	15.8%	62.0	5.7%
60° T-Scan (S4 UC)						
45° T-Scan (S6 FV)						
70° T-Scan (S6 NS)						
60° P-Scan (S4 UC)						
45° P-Scan (S6 FV)						
70° P-Scan (S6 NS)						
60° T-Scan (S4 UC)						
45° T-Scan (S6 FV)						
70° T-Scan (S6 NS)						
60° P-Scan (S4 UC)						
45° P-Scan (S6 FV)						
70° P-Scan (S6 NS)						

% Total Composite Coverage = 72.1%

Rev. 0 9/23/05

Comments: A - Automated scanning was limited due to the proximity of a non-removable insulation support ring.

Note - Rounding methods may affect calculated values. UC-Underclad, FV-Full volume, NS-Near Surface, Weld length in inches.

Figure 3RR-20.21

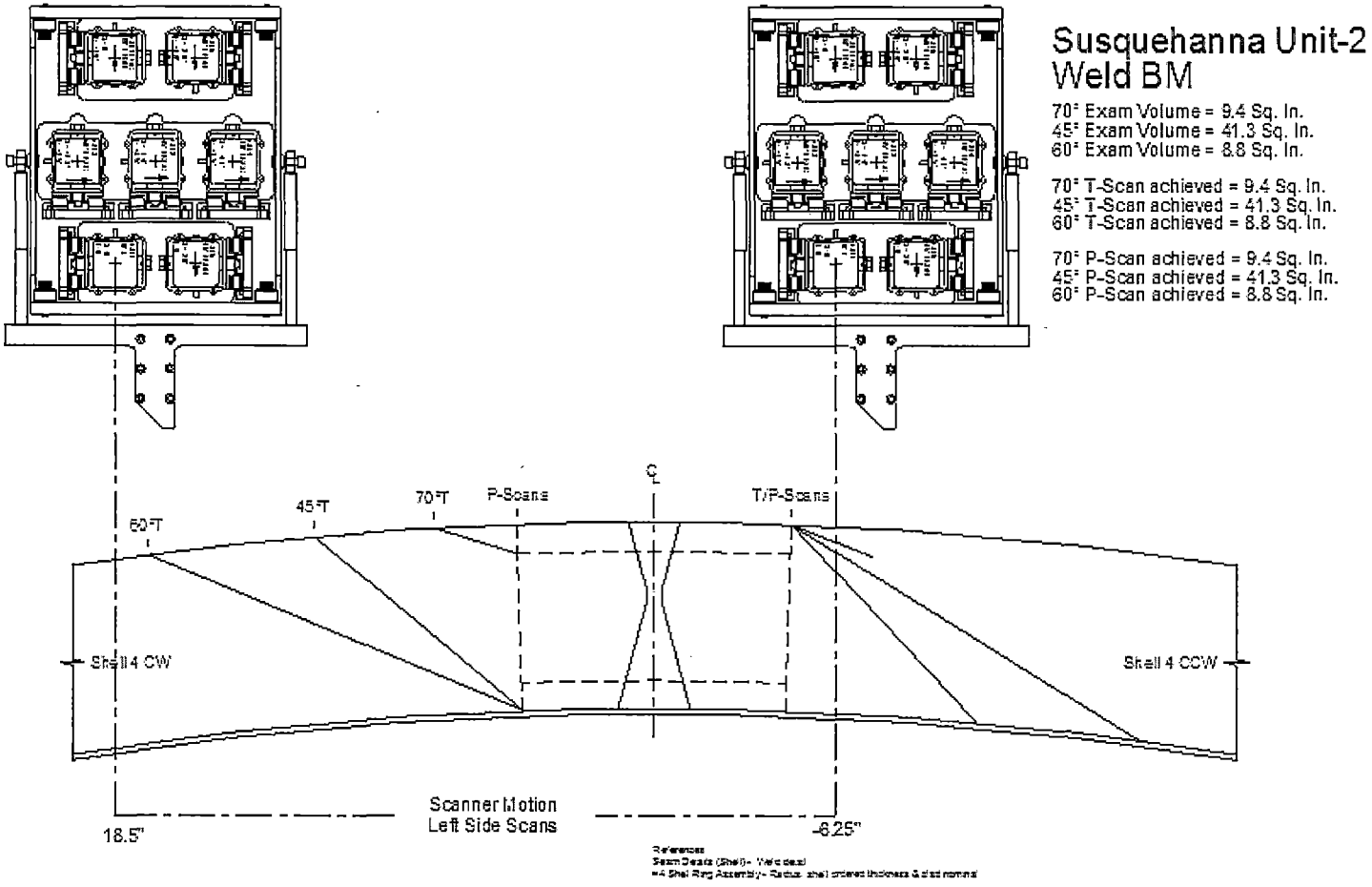


Figure 3RR-20.22

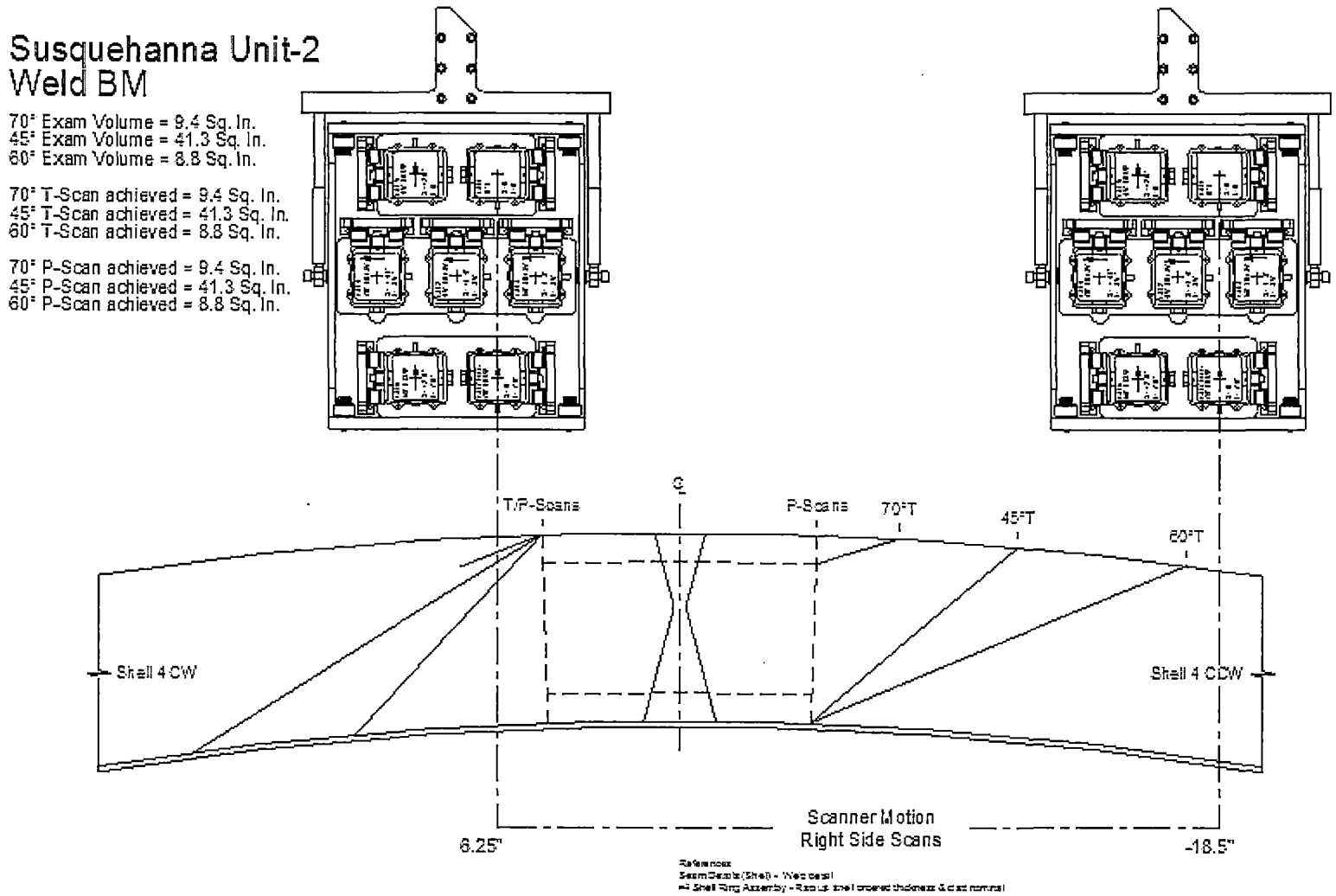


Figure 3RR-20.23

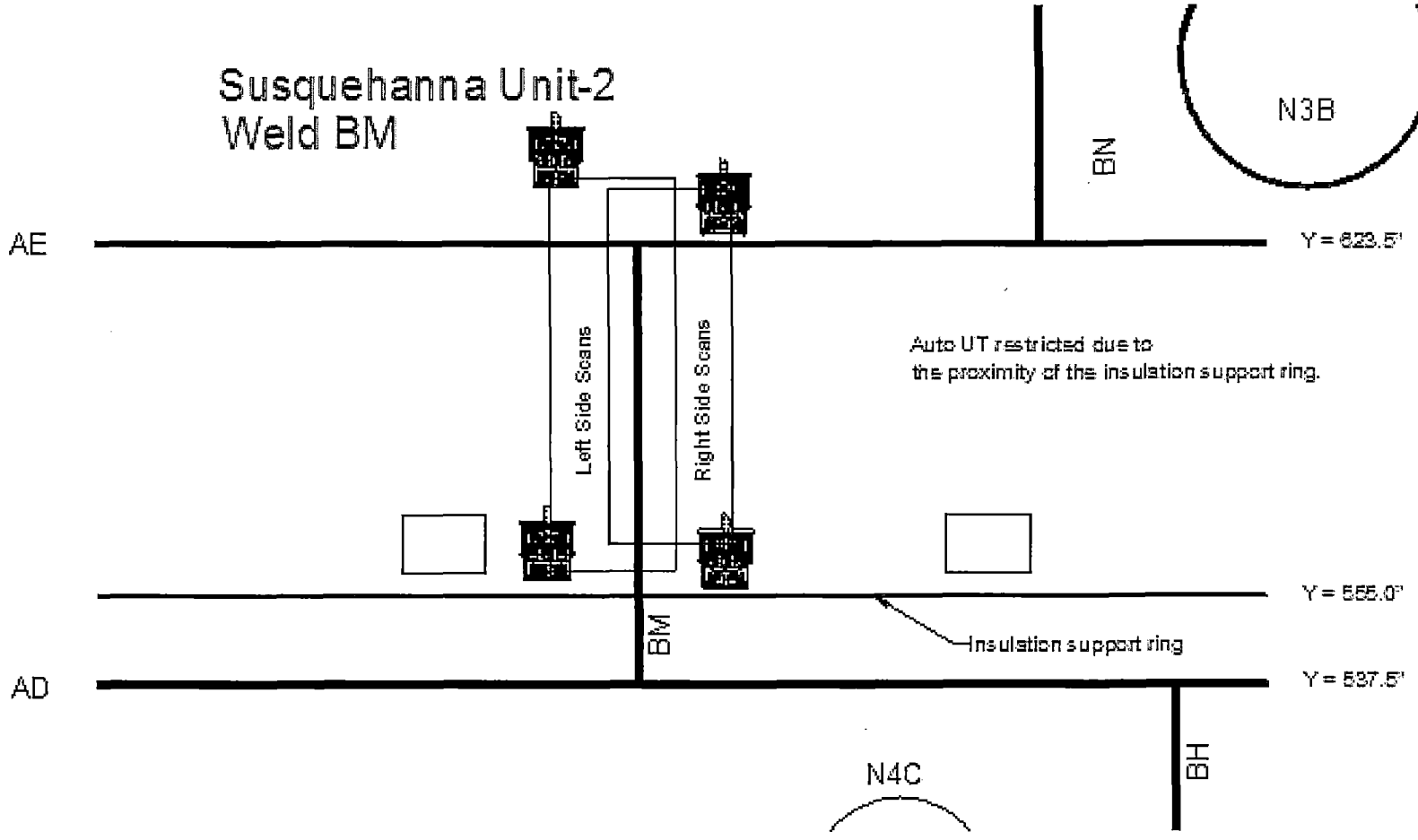


Figure 3RR-20.24

HITACHI

SP2000 RPV Examination Coverage Calculation Sheet

Susquehanna Unit 2 / U2 RIO16
BM-SC4

		CODE CROSS-SECTIONAL AREA		TOTAL CODE COVERAGE		
Weld Length = 85.75 Exam Volume = 59.6		Required Exam Area Sq. In.	Area Scanned Automated	Percent of Area Automated	Weld Length Automated	Percent Automated
70° T-Scan (S6 NS)	A	9.4	9.4	0.2	60.5	5.6%
45° T-Scan (S6 FV)	A	41.4	41.4	0.7	60.5	24.5%
60° T-Scan (S4 UC)	A	8.8	8.8	0.1	60.5	5.2%
70° P-Scan (S6 NS)	A	9.4	9.4	0.2	60.5	5.6%
45° P-Scan (S6 FV)	A	41.4	41.4	0.7	60.5	24.5%
60° P-Scan (S4 UC)	A	8.8	8.8	0.1	60.5	5.2%
70° T-Scan (S6 NS)						
45° T-Scan (S6 FV)						
60° T-Scan (S4 UC)						
70° P-Scan (S6 NS)						
45° P-Scan (S6 FV)						
60° P-Scan (S4 UC)						
70° T-Scan (S6 NS)						
45° T-Scan (S6 FV)						
60° T-Scan (S4 UC)						
70° P-Scan (S6 NS)						
45° P-Scan (S6 FV)						
60° P-Scan (S4 UC)						

% Total Composite Coverage = 70.6%

Rev. 0 9/23/05

Comments: A - Automated scanning was limited due to the proximity of a non-removable insulation support.

Note - Rounding methods may affect calculated values. UC-Underclad, FV-Full volume, NS-Near Surface. Weld length in inches.

Susquehanna Unit 2 - U2 16RIO Report No. 621017 - BM-SC4 Page 4 of 9

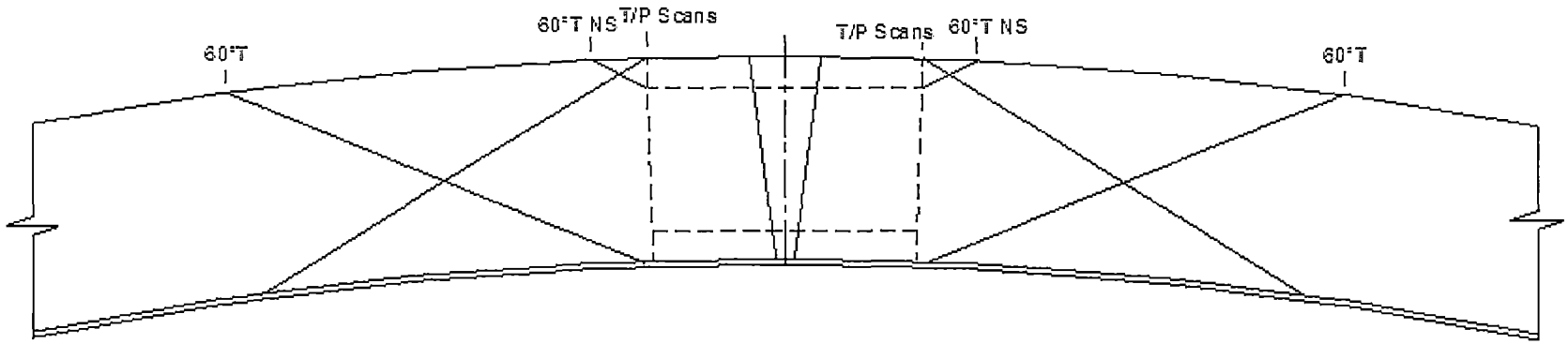
Figure 3RR-20.25

60° NS Exam Volume = 9.1 Sq. In.
60° S6 Exam Volume = 43.3 Sq. In.
60° S4 Exam Volume = 8.8 Sq. In.

60° NS T-Scan Achieved = 9.1 Sq. In.
60° S6 T-Scan Achieved = 43.3 Sq. In.
60° S4 T-Scan Achieved = 8.8 Sq. In.

60° NS P-Scan Achieved = 9.1 Sq. In.
60° S6 P-Scan Achieved = 43.3 Sq. In.
60° S4 P-Scan Achieved = 8.8 Sq. In.

Susquehanna
Bottom Hd. Radial (Meridional) Pl's



Manual Scan Area Right and Left Sides

Figure 3RR-20.26

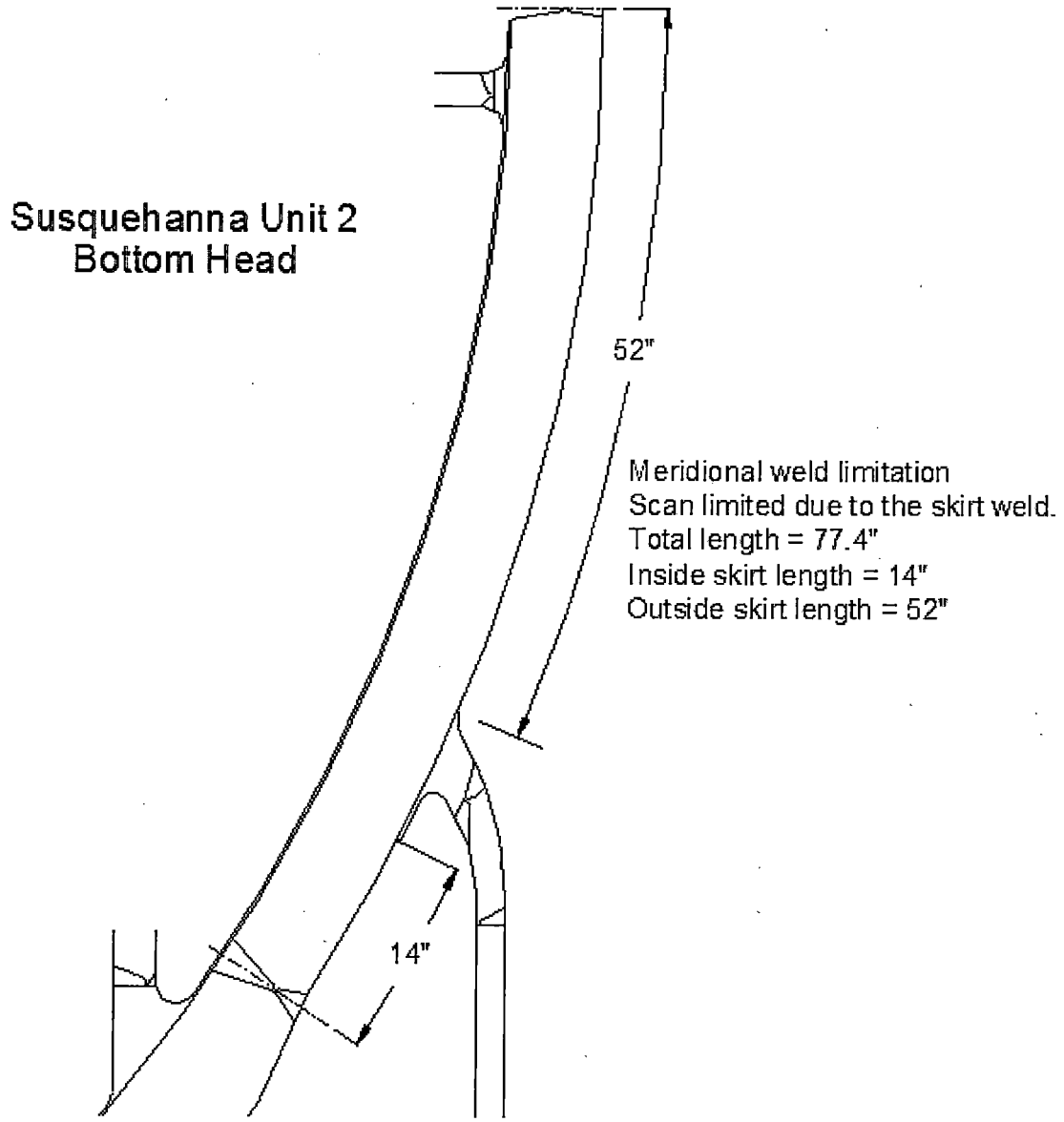


Figure 3RR-20.27

Note: Calculation sheets for U2 DA-DF result in identical volumes scanned and

Susquehanna Unit-2 - 2RIO-14
eld DA Bottom Head Meridional @ 33° 15' Az.
Spring 2009

		CODE CROSS-SECTIONAL AREA		TOTAL CODE COVERAGE		
Weld Length = 77.5 Exam Volume = 61.2		Required Exam Area Sq. In.	Area Scanned Manual	Percent of Area Manual	Weld Length Manual	Percent Manual
60° NS T-Scan	A	9.1	9.1	14.9%	66	6.3%
60° S6 T-Scan	A	43.3	43.3	70.8%	66	30.1%
60° S4 T-Scan	A	8.8	8.8	14.4%	66	6.1%
60° NS P-Scan	A	9.1	9.1	14.9%	66.0	6.3%
60° S6 P-Scan	A	43.3	43.3	70.8%	66.0	30.1%
60° S4 P-Scan	A	8.8	8.8	14.4%	66.0	6.1%
60° NS T-Scan						
60° S6 T-Scan						
60° S4 T-Scan						
60° NS P-Scan						
60° S6 P-Scan						
60° S4 P-Scan						
				% Total Composite Coverage =		85.2%

Comments: A - Examined accessible weld length. Examination restricted due to the proximity of the RPV skirt.
Weld length is in inches.

Note - Rounding methods may affect calculated values.

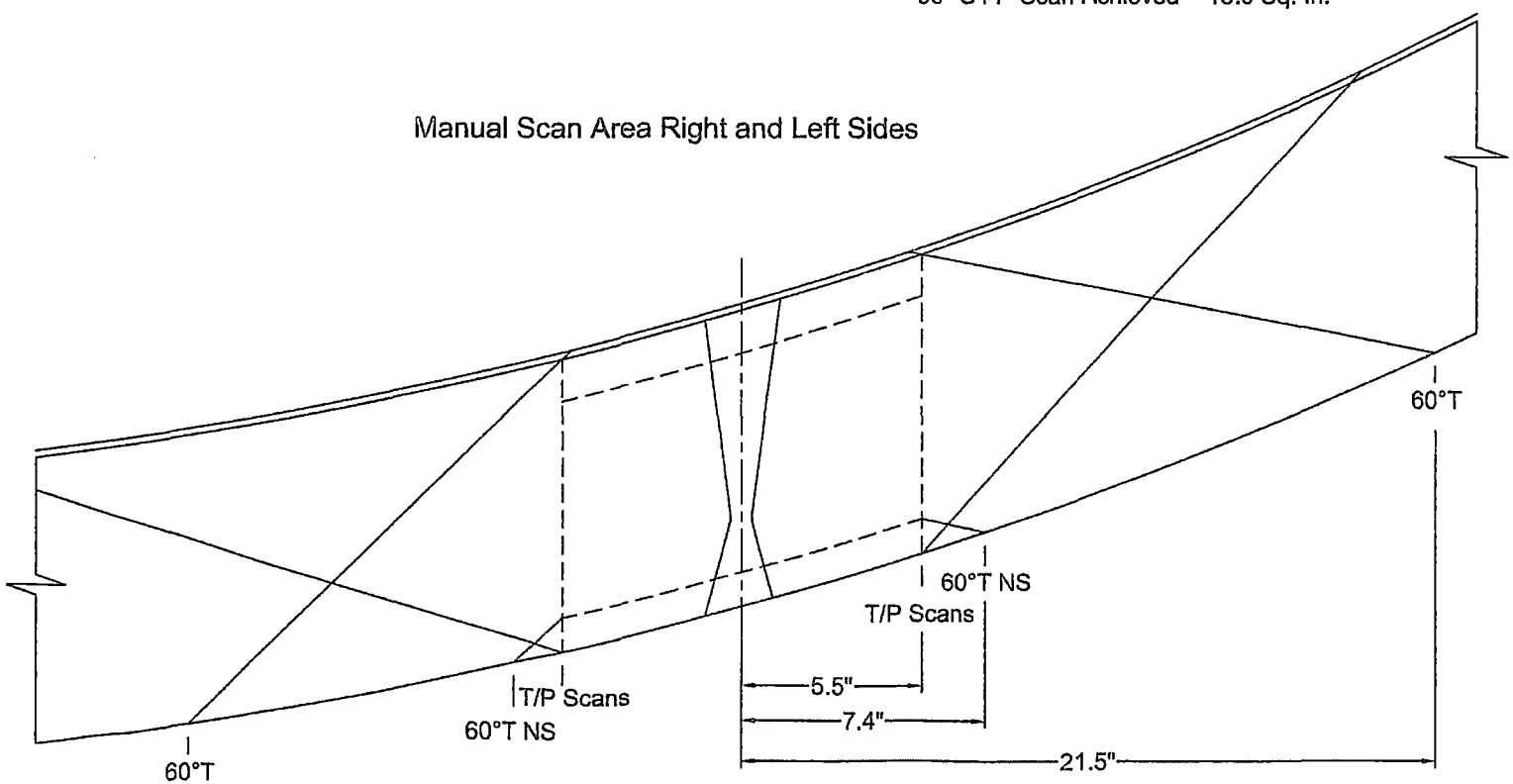
Figure 3RR-20.28

Susquehanna
Bottom Hd. (Dollar) PI's

60° NS Exam Volume = 10.4 Sq. In.
60° S6 Exam Volume = 66.3 Sq. In.
60° S4 Exam Volume = 13.0 Sq. In.

60° NS T-Scan Achieved = 10.4 Sq. In.
60° S6 T-Scan Achieved = 66.3 Sq. In.
60° S4 T-Scan Achieved = 13.0 Sq. In.

60° NS P-Scan Achieved = 10.4 Sq. In.
60° S6 P-Scan Achieved = 66.3 Sq. In.
60° S4 P-Scan Achieved = 13.0 Sq. In.



60° S4 P-Scan Achieved = 13.0 Sq. In.

Figure 3RR-20.29

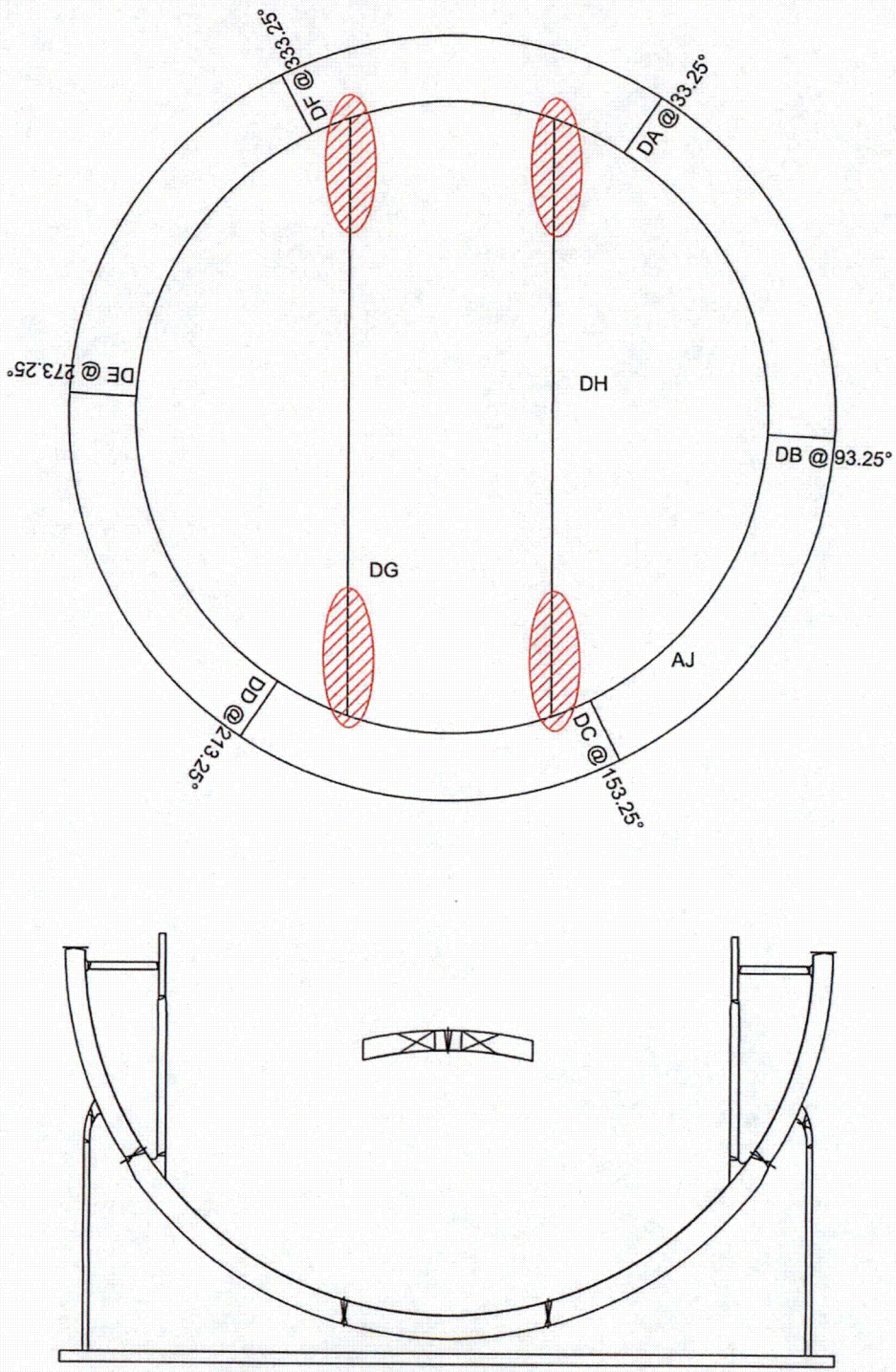


Figure 3RR-20.30

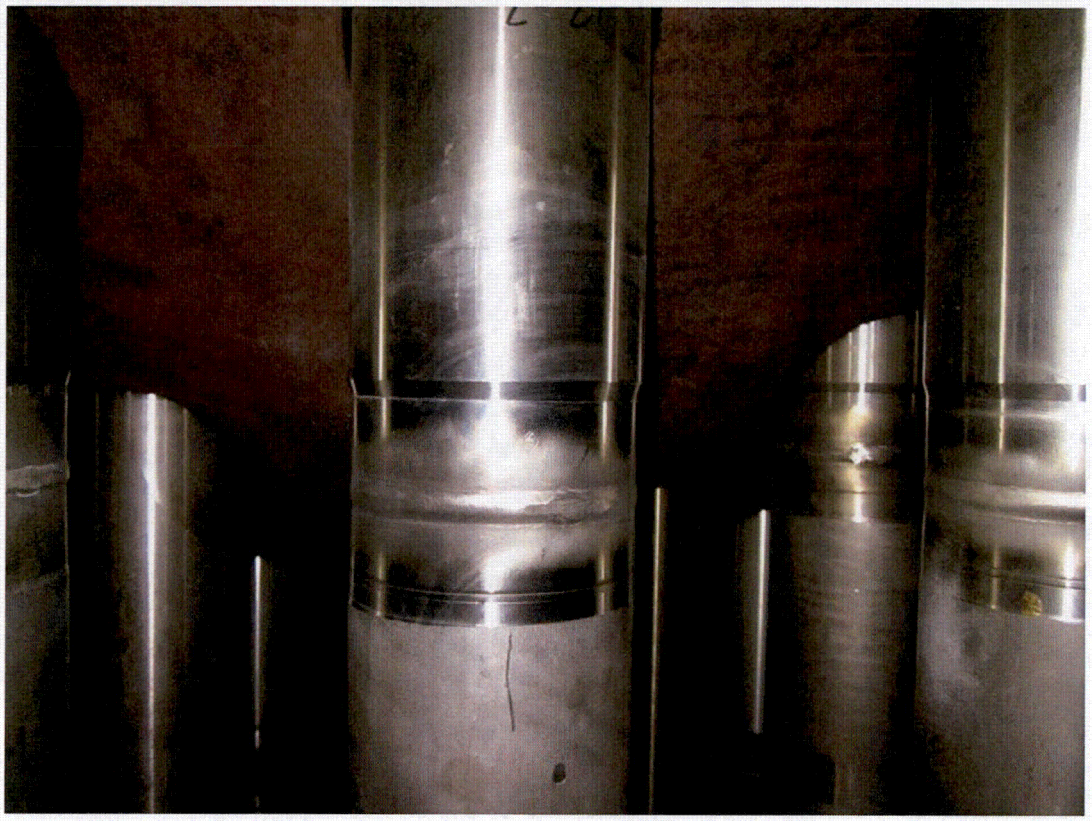


Figure 3RR-20.31

Note: Calculation sheets for U2 DG-DH result in identical volumes scanned and coverage percentages.

UT Calibration/Examination

Site/Unit:	SSES / 2	Procedure:	NDE-UT-042	Outage No.:	U2-16RIO
Summary No.:	2-B1.22.0007	Procedure Rev.:	4	Report No.:	UT-13-056
Workscope:	ISI	Work Order No.:	1504180	Page:	1 of 5

Code:	ASME 1998 Ed/2000 Add	Cat./Item:	B-A/B1.22	Location:	Rx Building
Drawing No.:	FF113010 SH 9201	Description:	BHEAD MERID		
System ID:	RPV-E				
Component ID:	DG			Size/Length: SEE COMMENTS	Thickness/Diameter: 8.313"
Limitations:	CRD PENETRATIONS OBSTRUCTING WELD			Start Time: 1431	Finish Time: 1513

Instrument Settings

Serial No.:	031526704		
Manufacturer:	Panametrics		
Model:	Epoch 4	Linearity:	L-13-015
Delay:	9.203	Range:	4.0"
M'tl Cal/Vel	0.2323	Pulser:	SQUARE
Damping:	400 Ohms	Reject:	0%
Rep. Rate:	AUTO	Freq.:	3.03 MHz
Filter:	0.8-3.0	Mode:	DUAL
Voltage:	N/A	Other:	N/A
Rectify:	Fullwave	Energy:	MEDIUM
Ax. Gain (dB):	58.3 dB	Circ. Gain (dB):	N/A
10 Screen Div. =	2	in. of	Depth

Calibration Block

Cal. Block No.:	CAL-IIW2-036		
Thickness:	4"	Dia.:	0
Cal. Blk. Temp.:	72°F	Temp. Tool:	279290
Comp. Temp.:	92°F	Temp. Tool:	279290

Search Unit

Serial No.:	22BC-09005		
Manufacturer:	Sigma		
Size:	2(1.1"x0.62")	Model:	SDC3
Freq.:	3.0 MHz	Center Freq.:	3.147 MHz
Exam Angle:	60°	Squint Angle:	N/A
Measured Angle:	60°	Mode:	RL
Exit Point:	0.6"	# of Elements:	2
Config.:	SBS	Focus:	10.0"
Shape:	Rect.	Contour:	N/A
Wedge Style:	Integral		

Search Unit Cable

Type:	RG-174	Length:	12'	No. Conn.:	0

Scan Coverage

Upstream ☐ Downstream ☐ Scan dB:
CW ☑ CCW ☑ Scan dB: 73.0
Exam Surface: OD
Surface Condition: Flush

Cal. Checks	Time	Date
Initial Cal.	1130	4/25/2013
Inter. Cal.	N/A	
Inter. Cal.	N/A	
Inter. Cal.	N/A	
Final Cal.	1634	4/25/2013

Couplant

Cal. Batch:	07225
Type:	Ultragel II
Mfg.:	Sonotech
Exam Batch:	07225
Type:	Ultragel II
Mfg.:	Sonotech

Reference Block

Serial No.:	N/A
Type:	N/A

Axial Orientated Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Depth
SDH	80%	3.0	.606
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Circumferential Orientated Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Depth
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Reference/Simulator Block

Gain dB	Reflector	Signal Amplitude %	Sweep Division	Depth
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A

Recordable Indication(s): Yes ☐ No ☑ (If Yes, Ref. Attached Ultrasonic Indication Report.)
Results: Accept ☑ Reject ☐ Info ☐
Percent Of Coverage Obtained > 90%: No - 23.7% Reviewed Previous Data: Yes

Comments: Exams performed a minimum of 14 dB above reference. Examined parallel and transverse to the weld. Examined 64.0" of 277.5" weld length.

Examiner	Level II	Signature	Date	Reviewer	Signature	Date
Johnson, Jimmy		Jimmy Johnson	4/25/2013	Setzer, James / Level III		4.30.13
Examiner	Level N/A	Signature	Date	Site Review	Signature	Date
N/A				Linden, Randy T. / Level III		5-2-13
Other	Level N/A	Signature	Date	ANII Review	Signature	Date
N/A				Young, Charles		5-3-13

Form NDE-UT-001-5, Rev. 1, Page 1 of 1

Figure 3RR-20.32

Attachment 4 to PLA-7371

Relief Request: 3RR-21
Revision 1

RELIEF REQUEST: 3RR-21, REVISION 1

COMPONENT IDENTIFICATION

Code Class:	1
Reference:	3RR-01
Examination Category:	N/A
Item Number:	R1.11, R1.20
Description:	Alternative Requirements to the Examinations in the Risk-Informed and Augmented Programs
Component Number:	Ref. Tables 3RR-21.1 and 3RR-21.2

CODE REQUIREMENT

The components listed in Table 3RR-21.1 and 3RR-21.2, subject to the examination requirements of the Risk Informed Inspection Program and various Augmented Inspection Programs, are discussed in this relief request. Detail of the Risk Informed Inspection Program can be found within approved relief request 3RR-01.[4]

Essentially 100% of the circumferential welds selected are required to be examined. As defined by ASME Code Case N-460,[5] essentially 100% means more than 90% of the examination volume of each weld, where reduction in coverage is due to interference by another component or component geometry.

BASIS FOR RELIEF

Pursuant to 10CFR50.55a(g)(5)(iii), relief is requested on the required 100% volumetric examination on the basis the Code requirement is impractical as described by the balance of this request. This relief request addresses welds for the third 10-year interval where $\leq 90\%$ of the examination volume was obtained.

Complete examination in accordance with the governing inspection requirements is not practical due to the limitations noted in Table 3RR-21.1 and Table 3RR21.2. All examinations were completed to the maximum extent practical with qualified, demonstrated Appendix VIII / PDI techniques.

Relief is requested for those components listed in Table 3RR-21.1 and Table 3RR21.2 where the governing inspection requirements are impractical to implement due to access restrictions and/or metallurgical constraints.

---

(4) NRC Safety Evaluation Report [related to Relief Request No. 3RR-01], dated July 28, 2006, "Third 10-Year Inservice Inspection (ISI) Interval Program Plan (TAC Nos. MC1181 and 1182)," (ADAMS ML051990330)

(5) ASME Code Case N-460, "Alternative Examination Coverage for Class 1 and Class 2 Welds, Section XI, Division 1

The burden that is caused by compliance with the examination requirements of ASME Section XI includes required modification of plant components to remove obstructions, redesigning of plant systems, and replacement of components where geometry is inherent to component design.

For the welds listed in the table, it has been determined that the obstruction or interference could not be removed without significant work, increased radiological dose, and/or damage to plant equipment.

A 60° refracted longitudinal "Best Effort" exam was performed on the far side volume for all single side access components. The percentage of coverage for these best effort exams can be viewed in Tables 3RR-21.1 and 3RR-21.2. No other supplemental inspections (e.g. surface examinations) were performed on the subject welds.

Of the welds presented in 3RR-21, two of the welds are currently selected for inspection during the 4th 10-Year Inservice Inspection Interval (DCA2071-FW-4 and DCA2071-FW-5) with the other welds substituted for by welds within the same system for welds that may achieve greater coverage. Welds were selected, in part, because previous Section XI examination history exists in some cases. Comparison of examination results over time is critical to detect service induced degradation. Although Susquehanna could select only weld locations where greater than 90% examination coverage is possible (when available based on selection criteria), meeting the purpose of the Code requires selecting a mix of not only piping-to-piping welds that have a higher likelihood of achieving 100% coverage, but also single-sided exams such as piping-to valve-welds, piping-to-reducer welds, etc. The ASME Code allows only 50% Code coverage for single-sided examinations. No unacceptable indications were found in any of the covered volumes for any Risk Informed ISI inspections during the 3rd 10-Year Inservice Inspection Interval.

There are no alternative methods of qualified, demonstrated ultrasonic testing that result in an increased code coverage. Examination of the weld using radiography was determined to be impractical due to the impact on surrounding area work and the increased exposures that would result. Additionally, draining affected piping for radiography was considered to also result in an increased dose in the surrounding areas.

Susquehanna experienced a fatigue failure of a 4" Reactor Recirculation weld in 2012, however, per Section 2.5.2 of EPRI TR-112657, Revision B-A,(6) vibrational fatigue should be treated outside the RI-ISI program and is thus irrelevant to the context of this relief. In the course of investigation of the 4" fatigue failure, an IGSCC flaw was discovered. The IGSCC flaw was found to be independent of the fatigue failure. The IGSCC indication was found to be arrested in the IGSCC resistant weld material, and would not have propogated through wall. These cases of stress corrosion cracking have occurred in stainless steel materials throughout the industry. These concerns are addressed by application of methods such as Mechanical Stress Improvement (MSIP) and Hydrogen Water Chemistry (HWC) which are proven to limit the effects of IGSCC on stainless steel. Additionally, the performance of VT-2 visual examinations in accordance with examination category B-P as well as online leakage monitoring provides assurance that no

(6) Electric Power Research Institute (EPRI) Topical Report (TR) 112657 Rev. B-A, "Revised Risk-Informed Inservice Inspection Evaluation Procedure"

IGSCC flaws have gone through wall. No other internal or external operating experience reviewed is relevant regarding potential degradation or severe loading for the subject welds.

PROPOSED ALTERNATE EXAMINATIONS

The examinations were performed to the maximum extent practicable with personnel and procedures qualified in accordance with Appendix VIII of ASME Section XI which is a proven means of identifying any degradation in the covered volumes. A 60° refracted longitudinal "Best Effort" exam was performed on the far side volume for all single side access components. The percentage of coverage for these best effort exams can be viewed in Tables 3RR-21.1 and 3RR-21.2.

All welds listed in Tables 3RR-21.1 and 3RR-21.2 are Class 1 welds subject to VT-2 visual examination during system pressure testing in accordance with the requirements of Examination Category B-P.

All subject welds are located within the primary containment structure. Online leakage monitoring located inside primary containment is provided by the drywell floor drain sump monitoring system. This system has Technical Specification required monitoring (TS 3.4.4.1) every 12 hours. If leakage were to be detected beyond the limits identified in TS 3.4.4, the unit would be shutdown and any leakage would be identified and repaired.

APPLICABLE TIME PERIOD

Relief is requested for the third ten-year inspection interval of the Inservice Inspection Program.

Table 3RR-21.1

Component Identification	Item Number	Material	Exam Requirement	Configuration/ System	Angles Used[1]	Limiting Condition	Examination Coverage	Examination Results	Figure 3RR-21._
DCA1081-1-A	R1.11	Stainless Steel	Risk Informed ISI/IGSCC Category B	Pipe to Elbow/Residual Heat Removal	45° Shear 60° RL	Hanger on downstream side of weld	Axial Scan 50% Circ Scan 50% Best Effort 25% Total Coverage 75% Code Coverage 50%	PSI – NRI 1986 - Root and OD Geometry 2006 - NRI	1-3
DCA1081-FW-3	R1.11	Stainless Steel	Risk Informed ISI/IGSCC Category B	Elbow to Valve/Residual Heat Removal	45° Shear 60° RL	Single side access due to valve configuration	Axial Scan 50% Circ Scan 50% Best Effort 25% Total Coverage 75% Code Coverage 50%	PSI – NRI 1986 - Root Geometry 1998 – NRI 2006 - NRI	4-6
DCA1101-FW-8	R1.11	Stainless Steel	Risk Informed ISI/IGSCC Category B	Elbow to Valve/Residual Heat Removal	45° Shear 60° RL	Single side access due to valve configuration	Axial Scan 50% Circ Scan 50% Best Effort 25% Total Coverage 75% Code Coverage 50%	PSI – NRI 1986 - Root Geometry 1995 – NRI 2008 - NRI	7-9
DCA1101-FW-9	R1.11	Stainless Steel	Risk Informed ISI/IGSCC Category B	Pipe to Valve/Residual Heat Removal	45° Shear 60° RL	Single side access due to valve configuration	Axial Scan 50% Circ Scan 50% Best Effort 6.8% Total Coverage 56.8% Code Coverage 50%	PSI – NRI 1985 - Root Geometry 1998 - Root Geometry 2012 - NRI	10-12
DCA1101-FW-10	R1.11	Stainless Steel	Risk Informed ISI/IGSCC Category B	Pipe to Valve/Residual Heat Removal	45° Shear 60° RL	Single side access due to valve configuration	Axial Scan 50% Circ Scan 50% Best Effort 25% Total Coverage 75% Code Coverage 50%	PSI – NRI 1986 - Root Geometry 1987 - Root Geometry 1998 – NRI 2008 - NRI	13-16

Table 3RR-21.1

Component Identification	Item Number	Material	Exam Requirement	Configuration/ System	Angles Used[1]	Limiting Condition	Examination Coverage	Examination Results	Figure 3RR-21._
DCA1102-FW-8	R1.11	Stainless Steel	Risk Informed ISI/IGSCC Category B	Elbow to Valve/Residual Heat Removal	45° Shear 60° RL	Single side access due to valve configuration	Axial Scan 50% Circ Scan 50% Best Effort 25% Total Coverage 75% Code Coverage 50%	PSI – NRI 1986 - Root and ID (Counterbore) Geometry 1998 – NRI 2008 - Root Geometry	17-21
DCA1102-FW-9	R1.11	Stainless Steel	Risk Informed ISI/IGSCC Category B	Valve to Pipe/Residual Heat Removal	45° Shear 60° RL	Single side access due to valve configuration	Axial Scan 50% Circ Scan 50% Best Effort 10.7% Total Coverage 60.7% Code Coverage 50%	PSI – NRI 1986 - Root Geometry 1998 –NRI 2012 - NRI	22-24
DCA1102-FW-10	R1.11	Stainless Steel	Risk Informed ISI/IGSCC Category B	Pipe to Valve/Residual Heat Removal	45° Shear 60° RL	Single side access due to valve configuration	Axial Scan 50% Circ Scan 50% Best Effort 9.7% Total Coverage 59.7% Code Coverage 50%	PSI – NRI 1985 - Inside Surface Geometry 1998 – NRI 2012 - NRI	25-27
VRRB311-FW-A14M	R1.20	Stainless Steel	Risk Informed ISI	Pipe to Pipe/Reactor Recirculation	45° Shear 60° RL	Single side access due to sweep-o-let	Axial Scan 50% Circ Scan 50% Best Effort 25% Total Coverage 75% Code Coverage 50%	PSI - OD Geometry 1992 - ID, Interface Geometry 2008 - Root Geometry (Automated Inspection)	28-32

1. Exams were performed in accordance with PDI Supplement 2.

Table 3RR-21.2

Component Identification	Item Number	Material	Exam Requirement	Configuration/ System	Angles Used[1]	Limiting Condition	Examination Coverage	Examination Results	Figure 3RR-21._
DCA2071-FW-4	R1.11	Stainless Steel	Risk Informed ISI	Valve to Elbow/Core Spray	45° Shear 60° RL	Single side access due to valve configuration	Axial Scan 50% Circ Scan 50% Best Effort 25% Total Coverage 75% Code Coverage 50%	PSI – NRI 1995 – NRI 2007 - NRI	31-33
DCA2071-FW-5	R1.11	Stainless Steel	Risk Informed ISI	Reducer to Safe End/Core Spray	45° Shear 60° RL	Configuration of upstream eccentric reducer	Axial Scan 57.95% Circ Scan 100% Best Effort 25% Total Coverage 100% Code Coverage 78.9%	PSI – NRI 1986 – NRI 1995 – NRI 2007 - NRI	34-36
DCA2081-1-A	R1.11	Stainless Steel	Risk Informed ISI/ IGSCC Category B	Elbow to Pipe/Residual Heat Removal	45° Shear 60° RL	Support collar restricts downstream exam	Axial Scan 71.2% Circ Scan 100% Best Effort 25% Total Coverage 100% Code Coverage 85.5%	PSI – NRI 1986 - OD Geometry 2007 - NRI	37-39
DCA2101-FW-8	R1.11	Stainless Steel	Risk Informed ISI/ IGSCC Category B	Elbow to Valve/Residual Heat Removal	45° Shear 60° RL	Single side access due to valve configuration	Axial Scan 50% Circ Scan 50% Best Effort 22.5% Total Coverage 72.5% Code Coverage 50%	PSI – NRI 1997 – NRI 2007 - NRI	40-42
DCA2101-FW-10	R1.11	Stainless Steel	Risk Informed ISI/ IGSCC Category B	Pipe to Valve/Residual Heat Removal	45° Shear 60° RL	Single side access due to valve configuration	Axial Scan 50% Circ Scan 50% Best Effort 25% Total Coverage 75% Code Coverage 50%	PSI – NRI 1988 – NRI 1997 – NRI 2013 - Root Geometry Seen with 60RL	43-47
DCA2102-FW-7	R1.11	Stainless Steel	Risk Informed ISI/ IGSCC Category B	Elbow to Valve/Residual Heat Removal	45° Shear 60° RL	Single side access due to valve configuration	Axial Scan 50% Circ Scan 50% Best Effort 23.9% Total Coverage 73.9% Code Coverage 50%	PSI – NRI 2001 – NRI 2007 - NRI	48-51

Table 3RR-21.2

Component Identification	Item Number	Material	Exam Requirement	Configuration/ System	Angles Used[1]	Limiting Condition	Examination Coverage	Examination Results	Figure 3RR-21._
DCA2102-FW-8	R1.11	Stainless Steel	Risk Informed ISI/ IGSCC Category B	Valve to Pipe/Residual Heat Removal	45° Shear 60° RL	Single side access due to valve configuration	Axial Scan 50% Circ Scan 50% Best Effort 20.8% Total Coverage 70.8% Code Coverage 50%	PSI – NRI 1992 – NRI 2001 – NRI 2007 - NRI	52-54
DCA2102-FW-9	R1.20	Stainless Steel	Risk Informed ISI/IGSCC Category B	Pipe to Valve/Residual Heat Removal	45° Shear 60° RL	Single side access due to valve configuration	Axial Scan 50% Circ Scan 50% Best Effort 25% Total Coverage 75% Code Coverage 50%	PSI - Root Geometry 1986 – Root 2001 - Root Seen with 60RL 2013 - Root Seen with 60RL	55-59

1. Exams were performed in accordance with PDI Supplement 2.

UT Calibration/Examination

Site/Unit:	PPL / 1	Procedure:	NDE-UT-001	Outage No.:	U1-14RIO
Summary No.:	1-R1.11.0037	Procedure Rev.:	6	Report No.:	UT-06-086
Workscope:	ISI	Work Order No.:	617464	Page:	1 of 1

Code:	ASME 1998/2000 Add	Cat./Item:	R-A/R1.11	Location:	CNTMT / R-400 / 719
Drawing No.:	ISI-DCA-105-1	Description:	E-F		
System ID:	RHR				
Component ID:	DCA1081-1-A			Size/Length:	20" / 63"
Limitations:	Hanger on D/S side of weld			Thickness/Diameter:	1.542" / 20"
				Start Time:	1508
				Finish Time:	1535

Instrument Settings

Serial No.:	031036006		
Manufacturer:	Panametrics		
Model:	Epoch 4		
Delay:	10.05" μs	Range:	6"
M'll Cal/Vel:	.2353	Pulser:	Square / Max
Damping:	400 Ω	Reject:	0%
Rep. Rate:	Auto	Freq.:	2.0 MHz
Filter:	0.8 - 3.0	Mode:	Rect. Full Wave
Voltage:	Fixed		
Ax. Gain (dB):	30.9	Circ. Gain (dB):	N/A
10 Screen Div. =	6	In. of	Sound Path
Linearity Report No.:	L-06-013		

Calibration Block

Cal. Block No.:	P-109		
Thickness:	0.50 - 2.0	Dia.:	Flat
Cal. Blk. Temp.:	73°	Temp. Tool:	246764
Comp. Temp.:	72°	Temp. Tool:	246764

Search Unit

Serial No.:	04-368		
Manufacturer:	RTD		
Size:	2(10x18) mm	Shape:	Rect.
Freq.:	2	Style:	TRL2-Aust
Exam Angle:	60°	# of Elements:	2
Mode:	RL		
Measured Angle:	60°		
Wedge Style:	Integral		

Search Unit Cable

Type:	RG-174		
Length:	6'	No. Conn.:	0

Scan Coverage

Upstream ☑	Downstream ☐	Scan dB:	32.9
CW ☐	CCW ☐	Scan dB:	N/A
Exam Surface:	OD		
Surface Condition:	As Found		

Recordable Indication(s): Yes ☐ No ☑ (If Yes, Ref. Attached Ultrasonic Indication Report.)

Results: Accept ☑ Reject ☐ Info ☐

Cal. Checks	Time	Date
Initial Cal.	1459	3/11/2006
Inter. Cal.	1507	3/11/2006
Inter. Cal.		
Inter. Cal.		
Final Cal.	1735	3/11/2006

Couplant

Cal. Batch:	00325
Type:	Ultragel II
Mfg.:	Sonotech
Exam Batch:	00325
Type:	Ultragel II
Mfg.:	Sonotech

Reference Block

Serial No.:	CAL-RHOM-090
Type:	SS Rhompus

Axial Orientated Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
2.0" Notch	80%	6.2	3.70"

Circumferential Orientated Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
N/A	N/A	N/A	N/A

Reference/Simulator Block

Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
29.2	SDH	80%	2.5	1.476"

Comments: Maintained a 5% to 20% ID noise level.

Percent Of Coverage Obtained ≥ 90%: 50% Reviewed Previous Data: Yes

Examiner	Level II	Signature	Date	Reviewer	Signature	Date
GINDER, TODD M.		Todd M. Ginder	3/11/2006	MINOR, CHRIS A.		3/18/06
Examiner	Level N/A	Signature	Date	Site Review	Signature	Date
N/A				LINDEN, RANDY T. / LEVEL III		3/18/06
Other	Level N/A	Signature	Date	ANII Review	Signature	Date
N/A				TILLERY, ERNIE	Deltoh E. Tillery	3-20-06

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Figure 3RR-21. 1

UT Calibration/Examination

Site/Unit:	PPL / 1	Procedure:	NDE-UT-001	Outage No.:	U1-14RIO
Summary No.:	1-R1.11.0037	Procedure Rev.:	6	Report No.:	UT-06-095
Workscope:	ISI	Work Order No.:	617464	Page:	1 of 2

Code:	ASME 1998/2000 Add	Cat./Item:	R-A/R1.11	Location:	CNTMT / R-400 / 719
Drawing No.:	ISI-DCA-108-1	Description:	E-P		
System ID:	RHR				
Component ID:	DCA1081-1-A			Size/Length:	20" / 63"
Limitations:	Hanger on D/S side of weld			Thickness/Diameter:	1.642" / 20"
				Start Time:	1445
				Finish Time:	1505

Instrument Settings

Serial No.:	031536006		
Manufacturer:	Panametrics		
Model:	Epoch 4		
Delay:	6.475 µs	Range:	5.0"
M'l Cal/Vel:	.1256	Pulser:	Square / Max
Damping:	400 Ω	Reject:	0%
Rep. Rate:	Auto	Freq.:	2.0 MHz
Filter:	0.5 - 3.0	Mode:	Rect. Full Wave
Voltage:	Fixed		
Ax. Gain (dB):	5.2	Circ. Gain (dB):	N/A
10 Screen Div. =	5	in. of	Sound Path
Linearity Report No.:	L-06-018		

Calibration Block

Cal. Block No.:	P-109		
Thickness:	0.50 - 2.0	Dia.:	Flat
Cal. Blk. Temp.:	73°	Temp. Tool:	246764
Comp. Temp.:	72°	Temp. Tool:	246764

Search Unit

Serial No.:	00HR0R		
Manufacturer:	KBA		
Size:	.375"	Shape:	Round
Freq.:	1.5 MHz	Style:	Comp-G
Exam Angle:	45°	# of Elements:	1
Mode:	Shear		
Measured Angle:	45°		
Wedge Style:	Non-Integral		

Search Unit Cable

Type:	RG-174		
Length:	6'	No. Conn.:	0

Scan Coverage

Upstream ☑	Downstream ☐	Scan dB:	19.9
CW ☑	CCW ☑	Scan dB:	23.2
Exam Surface:	OD		
Surface Condition:	As Found		

Cal. Checks	Time	Date
Initial Cal.	1424	3/11/2006
Inter. Cal.	1444	3/11/2006
Inter. Cal.		
Inter. Cal.		
Final Cal.	1730	3/11/2006

Couplant

Cal. Batch:	00325
Type:	Ultragel II
Mfg.:	Sonotech
Exam Batch:	00325
Type:	Ultragel II
Mfg.:	Sonotech

Reference Block

Serial No.:	CAL-RHOM-090
Type:	SS Rhompus

Axial Orientated Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
2.0" Notch	80%	5.5	2.75"

Circumferential Orientated Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
N/A	N/A	N/A	N/A

Reference/Simulator Block

Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
5.2	SDH	22%	2.0	.969"

Recordable Indication(s): Yes ☐ No ☑ (If Yes, Ref. Attached Ultrasonic Indication Report.)

Results: Accept ☑ Reject ☐ Info ☐

Comments: Counterbore located 2.0" from WCL on the U/S side of weld. Maintained a 5% to 20% ID Roll.

Percent Of Coverage Obtained > 90%: 50% Reviewed Previous Data: Yes

Examiner	Level II	Signature	Date	Reviewer		Signature	Date
GINDER, TODD M.		Todd M. Ginder	3/11/2006	MINOR, CHRIS A.			3/18/06
Examiner	Level N/A	Signature	Date	Site Review		Signature	Date
N/A				LINDEN, RANDY T. / LEVEL III			3.18.06
Other	Level N/A	Signature	Date	ANII Review		Signature	Date
N/A				TILLERY, ERNIE		Deborah E. Tillery	3-20-06

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Figure 3RR-21.2

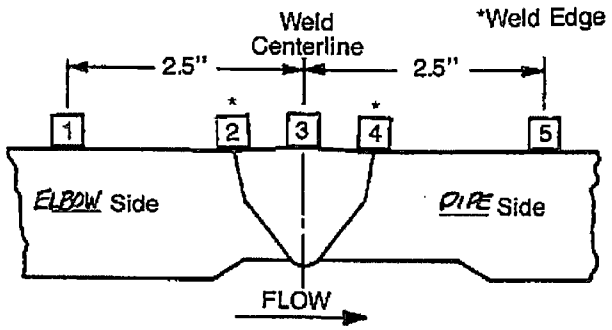
PP&L UNIT: 1

WALL THICKNESS PROFILE SHEET

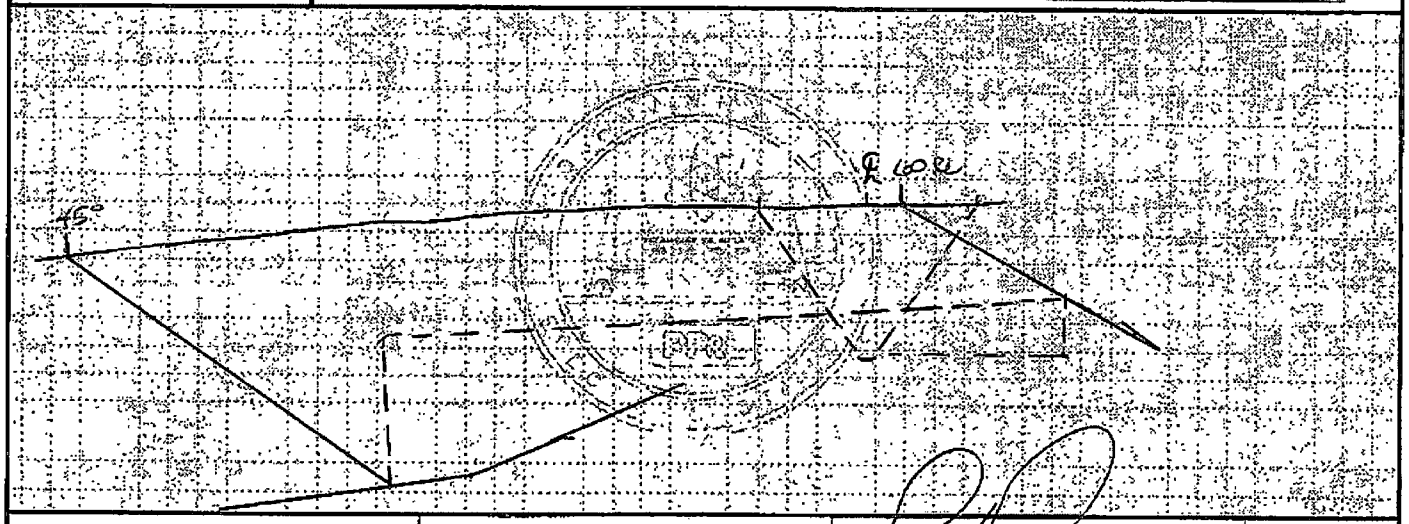
SYSTEM: RHR
WELD NO: DCA-108-1-1-A
DATA SHEET NO: UT-06-095
MINIMUM DETECTED THICKNESS: .963
Y LOCATION: OSR OF ELBOW
X LOCATION: WELD ℄
AREA: DW ELEV: 733'

Position	0°	90°	180°	270°
1	1.642			
2	1.134		N	
3	.963		A	
4	N/A			
5	N/A			

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



CROWN HEIGHT: FLUSH DIAMETER: 20"
CROWN WIDTH: 1.35" WELD LENGTH: 63"



Todd M. Linder II 3/11/06 — Examined By / Level / Date
Reviewed By III 3/13/06 — Reviewed By / Level / Date
Approved By III 3.18.06 — Approved By / Level / Date
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D. E. Tilley 3-20-06

Figure 3RR-21.3

UT Calibration/Examination

Site/Unit:	PPL / 1	Procedure:	NDE-UT-001	Outage No.:	U1-14RIO
Summary No.:	1-R1.11.0041 .	Procedure Rev.:	6	Report No.:	UT-06-098/120
Workscope:	ISI	Work Order No.:	617471	Page:	1 of 2

Code:	ASME 1998/2000 Add	Cat./Item:	R-A/R1.11/Aug 2	Location:	CNTMT / R-400 / 719
Drawing No.:	ISI-DCA-108-1	Description:	V-E		
System ID:	RHR				
Component ID:	DCA1081-FW-3			Size/Length:	20" / 63"
Limitations:	Exam performed from DNST side due to valve configuration.			Thickness/Diameter:	1.56" / 20"
				Start Time:	1540
				Finish Time:	1600

Instrument Settings

Serial No.:	031536006		
Manufacturer:	Panametrics		
Model:	Epoch 4		
Delay:	6.475" µs	Range:	5.0"
M'll Cal/Val:	.1256	Pulser:	Square / Max
Damping:	400 Ω	Reject:	0%
Rep. Rate:	Auto	Freq.:	2.0 MHz
Filter:	0.8 - 3.0	Mode:	Rect. Full Wave
Voltage:	Fixed		
Ax. Gain (dB):	5.2	Circ. Gain (dB):	N/A
10 Screen Div. =	5	in. of	Sound Path
Linearity Report No.:	L-06-018		

Calibration Block

Cal. Block No.:	P-109		
Thickness:	0.50 - 2.0	Dia.:	Flat
Cal. Blk. Temp.:	73°	Temp. Tool:	246764
Comp. Temp.:	72°	Temp. Tool:	246764

Search Unit

Serial No.:	00HR0R		
Manufacturer:	KBA		
Size:	.375"	Shape:	Round
Freq.:	1.5 MHz	Style:	Comp-G
Exam Angle:	45°	# of Elements:	1
Mode:	Shear		
Measured Angle:	45°		
Wedge Style:	Non-Integral		

Search Unit Cable

Type:	RG-174		
Length:	6'	No. Conn.:	0

Scan Coverage

Upstream ☐	Downstream ☑	Scan dB:	19.2
CW ☑	CCW ☑	Scan dB:	23.2
Exam Surface:	OD		
Surface Condition:	As Found		

Cal. Checks	Time	Date
Initial Cal.	1424	3/11/2006
Inter. Cal.	1539	3/11/2006
Inter. Cal.		
Inter. Cal.		
Final Cal.	1730	3/11/2006

Couplant

Cal. Batch:	00325
Type:	Ultragel II
Mfg.:	Sonotech
Exam Batch:	00325
Type:	Ultragel II
Mfg.:	Sonotech

Reference Block

Serial No.:	CAL-RHOM-090
Type:	SS Rhompus

Axial Orientated Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
2.0" Notch	80%	5.5	2.75"

Circumferential Orientated Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
N/A	N/A	N/A	N/A

Reference/Simulator Block

Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
5.2	SDH	22%	2.0	.969"

Recordable Indication(s): Yes ☐ No ☑ (If Yes, Ref. Attached Ultrasonic Indication Report.)

Results: Accept ☑ Reject ☐ Info ☐

Comments: No counterbore detected.
Maintained a 5% to 20% ID Roll.

Percent Of Coverage Obtained > 90%: 50% **Reviewed Previous Data:** Yes

Examiner	Level II	Signature	Date	Reviewer	Signature	Date
GINDER, TODD M.		Todd M. Ginder	3/11/2006	MINOR, CHRIS A.		3/17/06
Examiner	Level N/A	Signature	Date	Site Review	Signature	Date
N/A				LINDEN, RANDY T. / LEVEL III		3-BCC
Other	Level N/A	Signature	Date	ANII Review	Signature	Date
N/A				TILLERY, ERNIE	Dalton E. Tillery	3-20-06

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Figure 3RR-21.4

UT Calibration/Examination

Site/Unit:	PPL / 1	Procedure:	NDE-UT-001	Outage No.:	U1-14RIO
Summary No.:	1-R1.11.0041	Procedure Rev.:	6	Report No.:	UT-06-099
Workscope:	ISI	Work Order No.:	617471	Page:	1 of 1

Code:	ASME 1998/2000 Add	Cat./Item:	R-A/R1.11	Location:	CNTMT / R-400 / 719
Drawing No.:	ISI-DCA-108-1	Description:	V-E		
System ID:	RHR				
Component ID:	DCA1081-FW-3			Size/Length:	20" / 63"
Thickness/Diameter:	1.56" / 20"				
Limitations:	Exam performed from DNST side due to valve configuration.			Start Time:	1604
Finish Time:	1620				

Instrument Settings

Serial No.:	031536006		
Manufacturer:	Panametrics		
Model:	Epoch 4		
Delay:	10.05 µs	Range:	6"
Mtl Cal/Vel:	.2353	Pulser:	Square / Max
Damping:	400 Ω	Reject:	0%
Rep. Rate:	Auto	Freq.:	2.0 MHz
Filter:	0.5 - 3.0	Mode:	Rect. Full Wave
Voltage:	Fixed		
Ax. Gain (dB):	30.9	Circ. Gain (dB):	N/A
10 Screen Div. =	6	In. of	Sound Path
Linearity Report No.:	L-06-016		

Calibration Block

Cal. Block No.:	P-109		
Thickness:	0.50 - 2.0	Dia.:	Flat
Cal. Blk. Temp.:	73°	Temp. Tool:	246764
Comp. Temp.:	72°	Temp. Tool:	246764

Search Unit

Serial No.:	04-368		
Manufacturer:	RTD		
Size:	2(10x18) mm	Shape:	Rect.
Freq.:	2 MHz	Style:	TRL2-Aust
Exam Angle:	60°	# of Elements:	2
Mode:	RL		
Measured Angle:	60°		
Wedge Style:	Integral		

Search Unit Cable

Type:	RG-174		
Length:	6'	No. Conn.:	0

Scan Coverage

Upstream ☐	Downstream ☑	Scan dB:	32.9
CW ☐	CCW ☐	Scan dB:	N/A
Exam Surface:	OD		
Surface Condition:	As Found		

Recordable Indication(s): Yes ☐ No ☑ (If Yes, Ref. Attached Ultrasonic Indication Report.)

Results: Accept ☑ Reject ☐ Info ☐

Percent Of Coverage Obtained > 90%: 50% Reviewed Previous Data: Yes

Cal. Checks	Time	Date
Initial Cal.	1459	3/11/2006
Inter. Cal.	1603	3/11/2006
Inter. Cal.		
Inter. Cal.		
Final Cal.	1735	3/11/2005

Couplant

Cal. Batch:	00325
Type:	Ultragel II
Mfg.:	Sonotech
Exam Batch:	00325
Type:	Ultragel II
Mfg.:	Sonotech

Reference Block

Serial No.:	CAL-RHOM-090
Type:	SS Rhompus

Axial Orientated Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
2.0" Notch	80%	6.2	3.70"

Circumferential Orientated Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
N/A	N/A	N/A	N/A

Reference/Simulator Block

Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
29.2	SDH	80%	2.5	1.476"

Comments: Maintained a 5% to 20% ID noise level.

Examiner	Level II	Signature	Date	Reviewer	Signature	Date
GINDER, TODD M.		Todd M. Ginder	3/11/2006	MINOR, CHRIS A.		3/11/06
Examiner	Level N/A	Signature	Date	Site Review	Signature	Date
N/A				LINDEN, RANDY T. / LEVEL III		3-8-06
Other	Level N/A	Signature	Date	ANII Review	Signature	Date
N/A				TILLERY, ERNIE	Dellie E. Tillery	3-20-06

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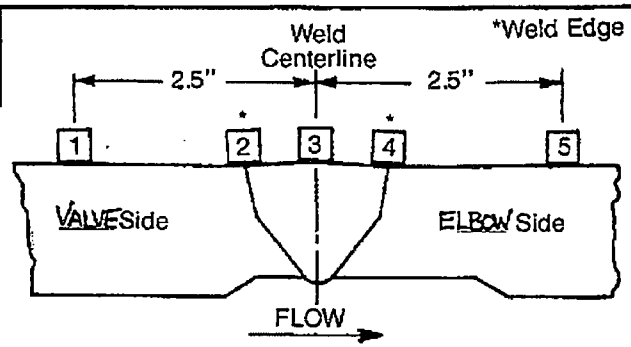
Figure 3RR-21.5

PP&L UNIT: 1

WALL THICKNESS PROFILE SHEET

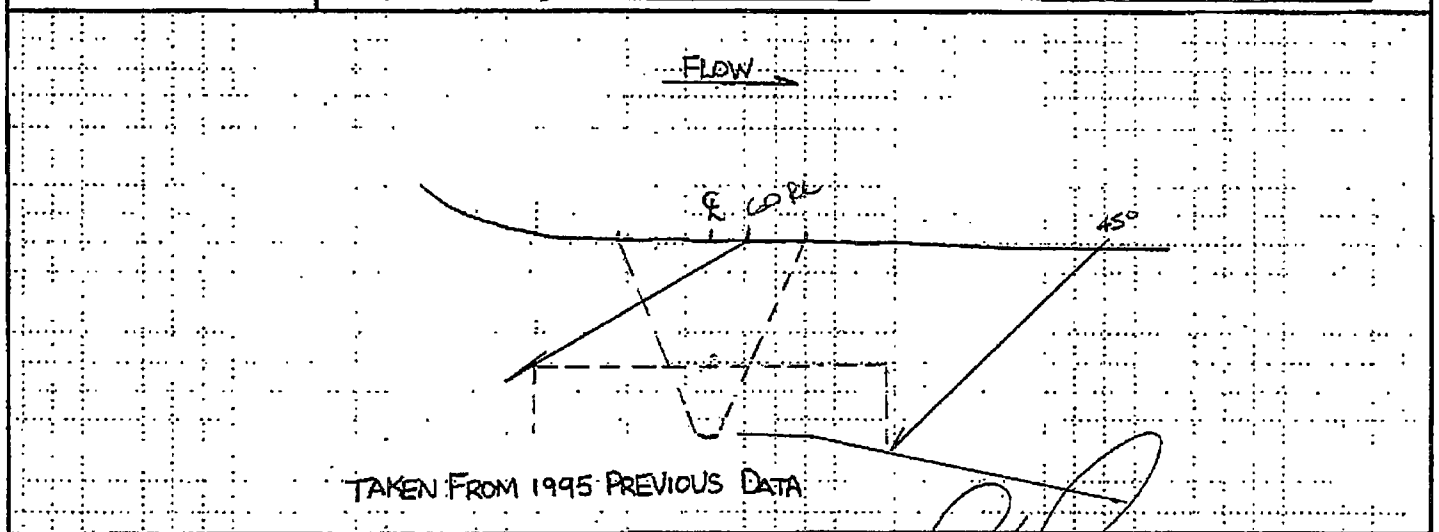
SYSTEM: RHR
WELD NO: DCA-1081-FW-3
DATA SHEET NO: UT-06-098
MINIMUM DETECTED THICKNESS: 1.16
Y LOCATION: TDC
X LOCATION: WELD ℄
AREA: 26 ELEV: 733'

Position	0°	90°	180°	270°
1	N/A			
2	N/A		N	
3	1.20		A	
4	1.16			
5	1.56			



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

CROWN HEIGHT: FLUSH DIAMETER: 20.0"
CROWN WIDTH: 1.15" WELD LENGTH: 63.0



Examined By	Level	Date	Reviewed By	Level	Date	Approved By	Level	Date
Todd M. Hinder	II	3/11/06		III	3/17/06	Delton E. Tilley	III	3-18-06

Page ___ Of ___

OPNDE-3.1 Rev. 0

3-20-06

Figure 3RR-21.6

UT Calibration/Examination

Site/Unit:	FPL / 1	Procedure:	NDE-UT-001	Outage No.:	U1-16RIO
Summary No.:	1-R1.11.0045	Procedure Rev.:	8	Report No.:	UT-08082
Workscope:	ISI	Work Order No.:	738802	Page:	1 of 1

Code:	ASME 1998/2000 Add	Cat./Item:	R-A/R1.11	Location:	R-400
Drawing No.:	ISI-DCA-110-1	Description:	E-V		
System ID:	RHR				
Component ID:	DCA1101-FW-8	Size/Length:	1.6" / 77"	Thickness/Diameter:	1.6" / 24"
Limitations:	SINGLE SIDE ACCESS DUE TO ELBOW TO VALVE CONFIGURATION	Start Time:	1515	Finish Time:	1530

Instrument Settings

Serial No.:	031573111		
Manufacturer:	Panametrics		
Model:	EPOCH 4		
Delay:	5.875	Range:	4"
Mtl Cal/Vel:	.1219	Pulser:	Square / Max
Damping:	400 Ω	Reject:	0%
Rep. Rate:	Auto	Freq.:	2 MHz
Filter:	0.8 - 3.0	Mode:	Pulse Echo
Voltage:	N/A	Other:	N/A
Ax. Gain (dB):	0	Circ. Gain (dB):	0

1 Screen Div. = .4" In. of Sound Path

Linearity Report No.: L-08-040

Calibration Block

Cal. Block No.:	P-109		
Thickness	0.5" - 2.0"	Dia.:	Flat
Cal. Blk. Temp.	72°	Temp. Tool:	257470
Comp. Temp.:	75°	Temp. Tool:	257470

Recordable Indication(s): Yes ☐ No ☑ (If Yes, Ref. Attached Ultrasonic Indication Report.)

Results: Accept ☑ Reject ☐ Info ☐

Search Unit

Serial No.:	01D648		
Manufacturer:	KBA		
Size:	0.50"	Shape:	Round
Freq.:	1.5 MHz	Style:	Comp-G
Exam Angle:	45°	# of Elements:	1
Mode:	Shear		
Measured Angle:	43.5°		
Wedge Style:	MSWQC		

Search Unit Cable

Type:	RG-174		
Length:	6'	No. Conn.:	0

Scan Coverage

Upstream ☑ Downstream ☐ Scan dB: 10

CW ☑ CCW ☑ Scan dB: 16

Exam Surface: ISI PREP

Surface Condition: Smooth

Cal. Checks	Time	Date
Initial Cal.	1330	3/19/2008
Inter. Cal.	N/A	
Inter. Cal.	N/A	
Inter. Cal.	N/A	
Final Cal.	1720	3/19/2008

Couplant

Cal. Batch:	03125
Type:	Ultragel II
Mfg.:	Sonotech
Exam Batch:	03125
Type:	Ultragel II
Mfg.:	Sonotech

Reference Block

Serial No.:	CAL-RHOM-110
Type:	SS RHOMPAS

Comments:

Axial Orientated Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
2.0" ID NOTCH	80%	7	2.8"
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Circumferential Orientated Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
2.0" ID NOTCH	80%	7	2.8"
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Reference/Simulator Block

Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
0	SDH	20%	2.7	1.06"
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A

Percent Of Coverage Obtained > 90%: 50% Reviewed Previous Data: Yes

Examiner	Level II	Signature	Date	Reviewer	Signature	Date
Clairday, Joey E.			3/19/2008	MINOR, CHRIS A./LEVEL III		3/22/08
Examiner	Level N/A	Signature	Date	Site Review	Signature	Date
N/A				LINDEN, RANDY T. / LEVEL III		3/25/08
Other	Level N/A	Signature	Date	ANII Review	Signature	Date
N/A				TILLERY, ERNIE		3-26-08

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Figure 3RR-21. 7

ppl

Site/Unit:	PPL / 1	Procedure:	NDE-UT-001	Outage No.:	U1-15RIO
Summary No.:	1-R1.11.0045	Procedure Rev.:	6	Report No.:	UT-08081
Workscope:	AUG	Work Order No.:	736802	Page:	1 of 1

Code:	ASME 1998/2000 Add	Cal./Item:	R-A/R1.11	Location:	R-400
Drawing No.:	ISI-DCA-110-1	Description:	E-V		
System ID:	RHR				
Component ID:	DCA1101-FW-8	Size/Length:	1.6" / 77"	Thickness/Diameter:	1.6" / 24"
Limitations:	SINGLE SIDE ACCESS DUE TO ELBOW TO VALVE CONFIGURATION	Start Time:	1532	Finish Time:	1550

Instrument Settings

Serial No.:	031573111		
Manufacturer:	Panametrics		
Model:	EPOCH 4		
Delay:	12.45	Range:	6"
Mtl Cal/Vel:	.2454	Pulser:	Square / Mox
Damping:	400 Ω	Reject:	0%
Rep. Rate:	Auto	Freq.:	2 MHz
Filter:	0.8 - 3.0	Mode:	Dual
Voltage:	N/A	Other:	N/A
Ax. Gain (dB):	33.8	Circ. Gain (dB):	N/A

1.0 Screen Div. = 0.6" in. of Sound Path

Linearity Report No.: L-08-040

Calibration Block

Cal. Block No.:	P-109		
Thickness:	0.5" - 2.0"	Dia.:	Flat
Cal. Blk. Temp.:	72°	Temp. Tool:	257470
Comp. Temp.:	75°	Temp. Tool:	257470

Recordable Indication(s): Yes ☐ No ☑ (If Yes, Ref. Attached Ultrasonic Indication Report.)

Search Unit

Serial No.:	04-323		
Manufacturer:	RTD		
Size:	2(15x25) mm	Shape:	Rectangle
Freq.:	2 MHz	Style:	TRL2-Aust
Exam Angle:	60°	# of Elements:	2
Mode:	Longitudinal		
Measured Angle:	60°		
Wedge Style:	Integral		

Search Unit Cable

Type:	RG-174		
Length:	6'	No. Conn.:	0

Scan Coverage

Upstream ☑	Downstream ☐	Scan dB:	40
CW ☐	CCW ☐	Scan dB:	N/A
Exam Surface:	ISI PREP		
Surface Condition:	Smooth		

Cal. Checks	Time	Date
Initial Cal.	1400	3/19/2008
Inter. Cal.	N/A	
Inter. Cal.	N/A	
Inter. Cal.	N/A	
Final Cal.	1732	3/19/2008

Couplant

Cal. Batch:	03125
Type:	Ultragel II
Mfg.:	Sonotech
Exam Batch:	03125
Type:	Ultragel II
Mfg.:	Sonotech

Reference Block

Serial No.:	CAL-RHOM-110
Type:	SS RHOMPAS

Axial Orientated Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
2.0" ID NOTCH	80%	6.6	3.9"
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Circumferential Orientated Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Reference/Simulator Block

Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
33.8	SDH	60%	2.6	1.5"
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A

Results: Accept ☑ Reject ☐ Info ☐

Comments:

Percent Of Coverage Obtained > 90%: 50% Reviewed Previous Data: Yes

Examiner	Level II	Signature	Date	Reviewer	Signature	Date
Clairday, Joey E.			3/19/2008	MINOR, CHRIS A./LEVEL III		3/20/08
Examiner	Level N/A	Signature	Date	Site Review	Signature	Date
N/A				LINDEN, RANDY T. / LEVEL II		3-25-08
Other	Level N/A	Signature	Date	ANII Review	Signature	Date
N/A				TILLERY, ERNIE		3-26-08

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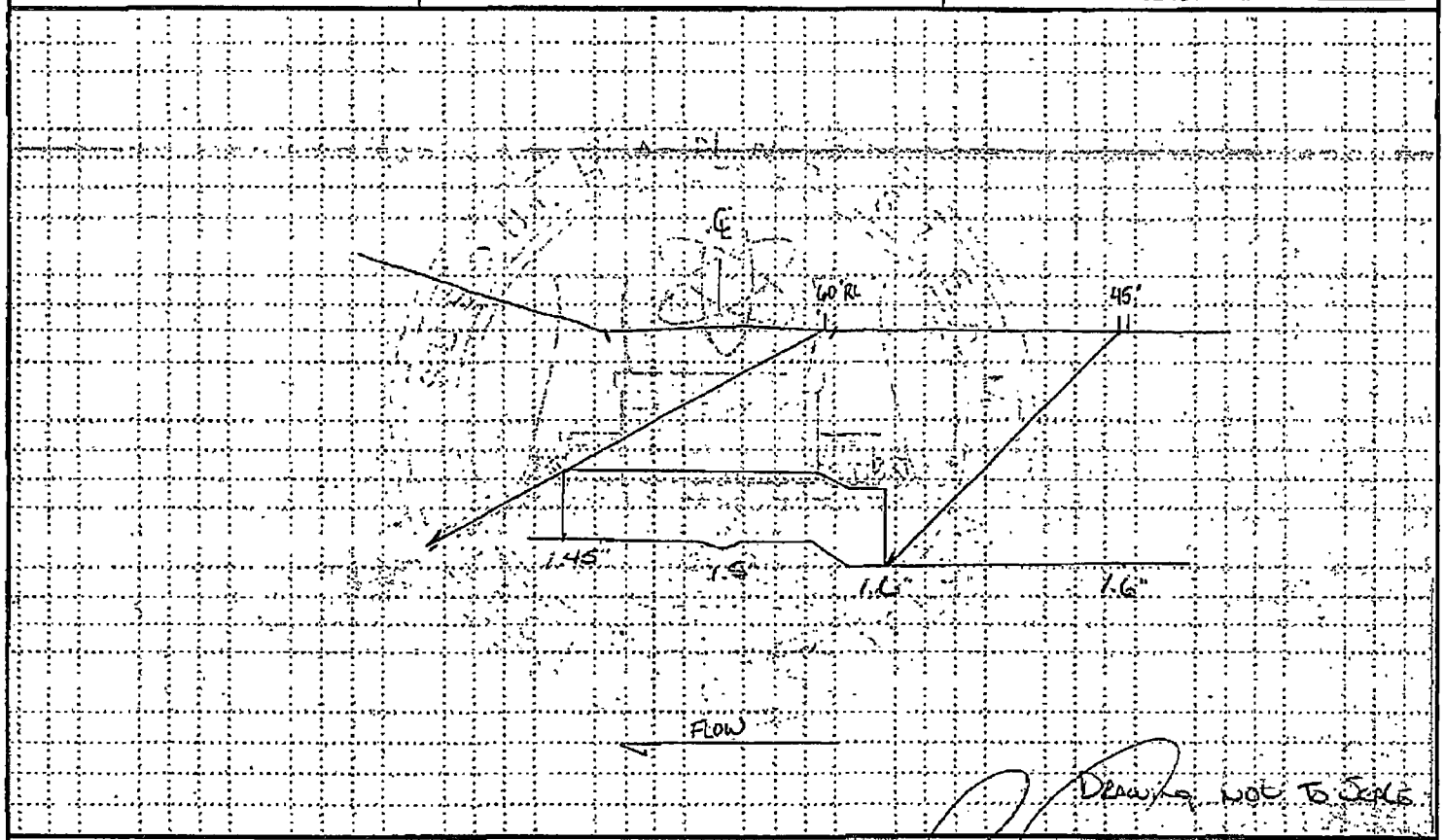
Figure 3RR-21.8

PP&L UNIT: 1

INDICATION PLOT SHEET

DATA SHEET NO.

SYSTEM: RHR | COMPONENT ID NO: DCA-H101 FW-8 | CONFIGURATION: ELBOW TO VALVE



Examined By	Level	Date	Reviewed By	Level	Date	Reviewed By	Level	Date	
	II	3-18-08	CO NT minor	III	3/21/08		III	32508	Page 1 Of 1

QPNDE-3.2 Rev. 0

O.E. Tilley 3-26-08

Figure 3RR-21.9

UT Calibration/Examination

ppl

Site/Unit:	SSES / 1	Procedure:	NDE-UT-001	Outage No.:	U1-17RIO
Summary No.:	1-R1.11.0046	Procedure Rev.:	10	Report No.:	UT-12-027
Workscope:	ISI	Work Order No.:	1426743	Page:	1 of 3

Code:	Section XI 1998 Ed /2000 Add	Cat./Item:	R-A/R1.11	Location:	R-400
Drawing No.:	ISI-DCA-110-1	Description:	V-P		
System ID:	RHR				
Component ID:	DCA1101-FW-9			Size/Length:	77"
Thickness/Diameter:	1.25" / 24"				
Limitations:	NONE			Start Time:	1455
Finish Time:	1515				

Instrument Settings

Serial No.:	0229P7		
Manufacturer:	GEIT		
Model:	USN 60SW	Linearity:	L-12-002
Delay:	7.596	Range:	3.0"
Mtl Cal/Vel:	1.295	Pulser Type:	Square
Damping:	500 Ohms	Reject:	0%
PRF:	Auto High	SU Freq.:	1.5 MHz
Frequency:	2.0 MHz	Rectify:	Fullwave
Voltage:	450	Pulse Width:	330

Ax. Gain (dB): 11.8 Circ. Gain (dB): 11.8

1 Screen Div. = .300 in. of Sound Path

Calibration Block

Cal. Block No.:	P-107		
Thickness:	0.50" - 2.0"	Dia.:	Flat
Cal. Blk. Temp.:	72°	Temp. Tool:	272799
Comp. Temp.:	94°	Temp. Tool:	272799

Search Unit

Serial No.:	01D63X		
Manufacturer:	KBA		
Size:	.60"	Model:	113-241-596
Freq.:	1.5 MHz	Center Freq.:	N/A
Exam Angle:	45°	Squint Angle:	N/A
Measured Angle:	48°	Mode:	Shear
Exit Point:	.36"	# of Elements:	1
Config.:	N/A	Focus:	N/A
Shape:	Round	Contour:	N/A
Wedge Style:	MSWQC		

Search Unit Cable

Type: RG-174 Length: 6.0' No. Conn.: 0

Scan Coverage

Upstream ☐ Downstream ☑ Scan dB: 27.0

CW ☑ CCW ☑ Scan dB: 27.0

Exam Surface: OD

Surface Condition: Ground

Cal. Checks	Time	Date
Initial Cal.	0720	4/4/2012
Inter. Cal.	1455	4/4/2012
Inter. Cal.		
Inter. Cal.		
Final Cal.	1818	4/4/2012

Couplant

Cal. Batch:	08125
Type:	Ultragel II
Mfg.:	Sonotech
Exam Batch:	08125
Type:	Ultragel II
Mfg.:	Sonotech

Reference Block

Serial No.:	CAL-RHOM-113
Type:	SS Rompas

Axial Orientated Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
1.5" NOTCH	80%	7.0	2.163"

Circumferential Orientated Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
N/A	N/A	N/A	N/A

Reference/Simulator Block

Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
11.8	FSDH	20%	3.4	1.022"

Recordable Indication(s): Yes ☐ No ☑ (If Yes, Ref. Attached Ultrasonic Indication Report.)

Results: Accept ☑ Reject ☐ Info ☐

Comments: SINGLE SIL...

Percent Of Coverage Obtained > 90%: NO-60% Reviewed Previous Data: Yes

Examiner	Level II	Signature	Date	Reviewer	Signature	Date
Reisowitz, Jack A.		Jack Reisowitz	4/4/2012	Setzer, James / Level III		04-09-2012
Examiner	Level N/A	Signature	Date	Site Review	Signature	Date
N/A				Linden, Randy T. / Level III		4/10/12
Other	Level N/A	Signature	Date	ANII Review	Signature	Date
N/A				Young, Charles		4-11-12

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Figure 3RR-21.10

UT Calibration/Examination

ppl

Site/Unit: SSES / 1 | Procedure: NDE-UT-001 | Outage No.: U1-17RIO
Summary No.: 1-R1.11.0046 | Procedure Rev.: 10 | Report No.: UT-12-027
Workscope: ISI | Work Order No.: 1426743 | Page: 2 of 3

Code: Section XI 1998 Ed /2000 Add | Cat./Item: R-A/R1.11 | Location: R-400
Drawing No.: ISI-DCA-110-1 | Description: V-P
System ID: RHR
Component ID: DCA1101-FW-9 | Size/Length: 77" | Thickness/Diameter: 1.25" / 24"
Limitations: NONE | Start Time: 1455 | Finish Time: 1615

Instrument Settings

Serial No.:	0229P7		
Manufacturer:	GEIT		
Model:	USN 906W	Linearity:	L-12-002
Delay:	9.2341	Range:	4.0"
Mtl Cal/Vel:	0.2338	Pulser Type:	Square
Damping:	500 Ohms	Reject:	0%
PRF:	Auto High	SU Freq.:	2.0 MHz
Frequency:	2.0 MHz	Rectify:	Fullwave
Voltage:	450	Pulse Width:	250
Ax Gain (dB):	55.5	Circ. Gain (dB):	55.5

1 Screen Div. = .400 in. of Sound Path

Calibration Block

Cal. Block No.:	P-107		
Thickness:	0.50" - 2.0"	Dia.:	Flat
Cal. Blk. Temp.:	72°	Temp. Tool:	272799
Comp. Temp.:	94°	Temp. Tool:	272799

Recordable Indication(s): Yes ☐ No ☑ (If Yes, Ref. Attached Ultrasonic Indication Report.)
Results: Accept ☑ Reject ☐ Info ☐

Search Unit

Serial No.:	04-386		
Manufacturer:	RTD		
Size:	2(10x16) mm	Model:	TRL2-Aust
Freq.:	2.0 MHz	Center Freq.:	N/A
Exam Angle:	60°	Squint Angle:	N/A
Measured Angle:	60°	Mode:	RL
Exit Point:	.50"	# of Elements:	2
Config.:	N/A	Focus:	N/A
Shape:	Rect.	Contour:	N/A
Wedge Style:	Integral		

Search Unit Cable

Type: RG-174 Length: 6.0' No. Conn.: 0

Scan Coverage

Upstream ☐ Downstream ☑ Scan dB: 50.0
CW ☐ CCW ☐ Scan dB: N/A
Exam Surface: OD
Surface Condition: Ground

Cal. Checks	Time	Date
Initial Cal.	0722	4/4/2012
Inter. Cal.	1608	4/4/2012
Inter. Cal.		
Inter. Cal.		
Final Cal.	1616	4/4/2012

Couplant

Cal. Batch:	08125
Type:	Ultragel II
Mfg.:	Sonotech
Exam Batch:	08125
Type:	Ultragel II
Mfg.:	Sonotech

Reference Block

Serial No.: CAL-RHOM-113
Type: SS Rompas

Axial Orientated Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
1.5" NOTCH	80%	7.0	2.872"

Circumferential Orientated Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
N/A	N/A	N/A	N/A

Reference/Simulator Block

Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
48.5	FSDH	80%	3.6	3.110"

Comments: SINGLE SIDE EXAM

Percent Of Coverage Obtained > 90%: NO-60% Reviewed Previous Data: Yes

Examiner: Reisewitz, Jack A.	Level: II	Signature: Jack A Reisewitz	Date: 4/4/2012	Reviewer: Selzer, James / Level III	Signature:	Date: 04-09-2012
Examiner: N/A	Level: N/A	Signature:	Date:	Site Review: Linden, Randy T. / Level III	Signature:	Date: 4.10.12
Other: N/A	Level: N/A	Signature:	Date:	ANII Review: Young, Charles	Signature:	Date: 4-11-12

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Figure 3RR-21.11

HITACHI

Wall Thickness Profile Sheet.

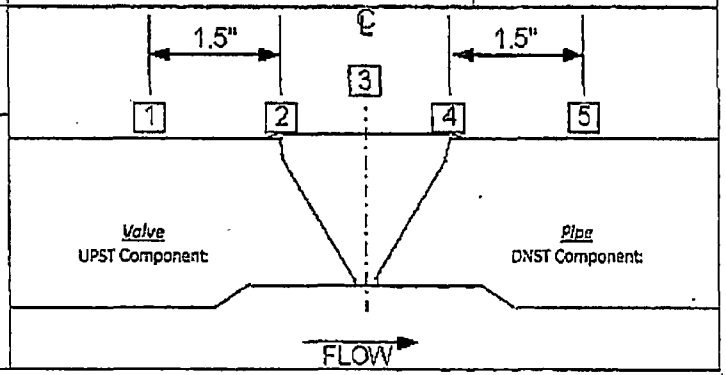
Site: Susquehanna Unit: 1 Report No.: UT-12-027
Project: 1RI017

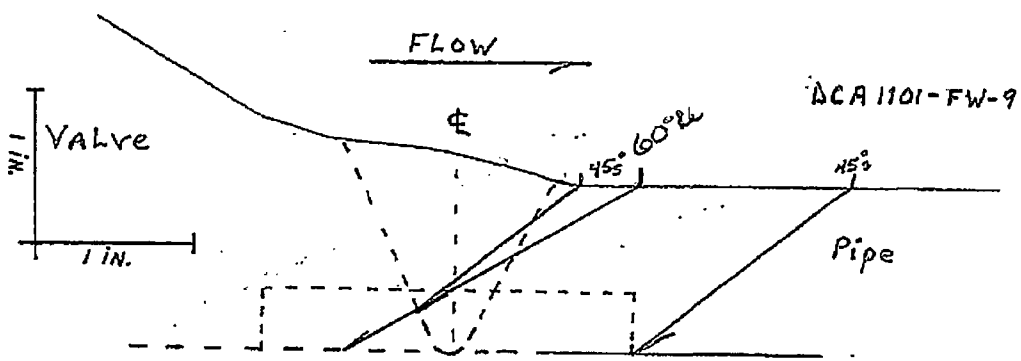
System: RHR

Component ID Number: DCA1101-FW-9

Position	0°	90°	180°	270°
1	N/A	N/A	N/A	N/A
2	N/A	N/A	N/A	N/A
3	1.30"	N/A	N/A	N/A
4	1.10"	N/A	N/A	N/A
5	1.10"	N/A	N/A	N/A

Crown Height: .200"
Crown Width: 1.6"
Nominal Diameter: 24.0"
Weld Length: 76.0"





Profile would Limit 60°RL From Scanning onto CWED.

JAB	Jack Reisewitz	II	4/9/2012		III	4.9.12	4.10.12
	Drawn by:	Level:	Date:	GE Reviewed By:	Level:	Date:	Utility Review: Date:

ANII Review: 4/11/12 Date:

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Figure 3RR-21.12

UT Calibration/Examination

Site/Unit:	PPL / 1	Procedure:	NDE-UT-001	Outage No.:	U1-16RIO
Summary No.:	1-R1.11.0043	Procedure Rev.:	6	Report No.:	UT-08078
Workscope:	ISI	Work Order No.:	736789	Page:	1 of 1

Code:	ASME 1998/2000 Add	Cat./Item:	R-A/R1.11	Location:	R-400
Drawing No.:	ISI-DCA-110-1	Description:	P-V		
System ID:	RHR				
Component ID:	DCA1101-FW-10	Size/Length:	1.5" / 76"	Thickness/Diameter:	1.35" / 24"
Limitations:	SINGLE SIDE ACCESS DUE TO PIPE TO VALVE CONFIGURATION	Start Time:	1400	Finish Time:	1420

Instrument Settings

Serial No.:	031673111		
Manufacturer:	Panametrics		
Model:	EPOCH 4		
Delay:	5.875	Range:	3.5"
M'tr Cal/Val:	.1219	Pulser:	Square / Max
Damping:	400 Ω	Reject:	0%
Rep. Rate:	Auto	Freq.:	2 MHz
Filter:	0.8 - 3.0	Mode:	Pulse Echo
Voltage:	N/A	Other:	N/A
Ax. Gain (dB):	0	Circ. Gain (dB):	0

1 Screen Div. = .35 in. of Sound Path

Linearity Report No.: L-08-038

Calibration Block

Cal. Block No.:	P-109		
Thickness	0.50" - 2.0"	Dia.:	Flat
Cal. Blk. Temp.	72°	Temp. Tool:	257470
Comp. Temp.:	75°	Temp. Tool:	257470

Recordable Indication(s): Yes ☐ No ☑ (If Yes, Ref. Attached Ultrasonic Indication Report.)

Results: Accept ☑ Reject ☐ Info ☐

Search Unit

Serial No.:	01D649		
Manufacturer:	KBA		
Size:	0.50"	Shape:	Round
Freq.:	1.9 MHz	Style:	Comp-G
Exam Angle:	45°	# of Elements:	1
Mode:	Shear		
Measured Angle:	43.5°		
Wedge Style:	MSWQC		

Search Unit Cable

Type:	RG-174		
Length:	6'	No. Conn.:	0

Scan Coverage

Upstream ☑ Downstream ☐ Scan dB: 10

CW ☑ CCW ☑ Scan dB: 15

Exam Surface: ISI PREP

Surface Condition: Smooth

Cal. Checks	Time	Date
Initial Cal.	1315	3/19/200
Inter. Cal.	N/A	
Inter. Cal.	N/A	
Inter. Cal.	N/A	
Final Cal.	1723	3/19/2008

Couplant

Cal. Batch:	03125
Type:	Ultragel II
Mfg.:	Sonotech
Exam Batch:	03125
Type:	Ultragel II
Mfg.:	Sonotech

Reference Block

Serial No.:	CAL-RHOM-110
Type:	SS RHOMPAS

Comments:

Axial Orientated Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
1.5" ID NOTCH	80%	6	2.06"
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Circumferential Orientated Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
1.5" ID NOTCH	80%	6	2.06"
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Reference/Simulator Block

Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
0	SDH	30%	1.3	.447"
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A

Percent Of Coverage Obtained > 90%: 60% Reviewed Previous Data: Yes

Examiner	Level II	Signature	Date	Reviewer	Signature	Date
Clalnday, Joey E.			3/19/2008	MINOR, CHRIS A/LEVEL III		3/26/08
Examiner	Level N/A	Signature	Date	Site Review	Signature	Date
N/A				LINDEN, RANDY T. / LEVEL III		3/26/08
Other	Level N/A	Signature	Date	ANII Review	Signature	Date
N/A				TILLERY, ERNIE		3-26-08

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Figure 3RR-21.13

UT Calibration/Examination

Site/Unit:	PPL / 1	Procedure:	NDE-UT-001	Outage No.:	U1-15RIO
Summary No.:	1-R1.11.0043	Procedure Rev.:	6	Report No.:	UT-08079
Workscope:	AUG	Work Order No.:	736789	Page:	1 of 1

Code:	ASME 1998/2000 Add	Cat./Item:	R-A/R1.11	Location:	R-400
Drawing No.:	ISI-DCA-110-1	Description:	P-V		
System ID:	RHR				
Component ID:	DCA1101-FW-10	Size/Length:	1.6" / 76"	Thickness/Diameter:	1.35" / 24"
Limitations:	SINGLE SIDE ACCESS DUE TO PIPE TO VALVE CONFIGURATION	Start Time:	1422	Finish Time:	1435

Instrument Settings

Serial No.:	031573111		
Manufacturer:	Panametrics		
Model:	EPOCH 4		
Delay:	12.45	Range:	5.3"
Mtl Cal/Vel:	.2454	Pulser:	Square / Max
Damping:	400 Ω	Reject:	0%
Rep. Rate:	Auto	Freq.:	2 MHz
Filter:	0.8 - 3.0	Mode:	Dual
Voltage:	N/A	Other:	N/A
Ax. Gain (dB):	33.8	Circ. Gain (dB):	N/A
1 Screen Div. =	.53	in. of	Sound Path
Linearity Report No.:	L-03-038		

Calibration Block

Cal. Block No.:	P-109		
Thickness:	0.50" - 2.0"	Dia.:	Flat
Cal. Blk. Temp.:	72°	Temp. Tool:	257470
Comp. Temp.:	75°	Temp. Tool:	257470

Search Unit

Serial No.:	04-323		
Manufacturer:	RTD		
Size:	2(15x25) mm	Shape:	Rect
Freq.:	2 MHz	Style:	TRL2-Axial
Exam Angle:	60°	# of Elements:	2
Mode:	LONGITUDINAL		
Measured Angle:	60°		
Wedge Style:	INTEGRAL		

Search Unit Cable

Type:	RG-174		
Length:	6'	No. Conn.:	0

Scan Coverage

Upstream ☑	Downstream ☐	Scan dB:	40
CW ☐	CCW ☐	Scan dB:	N/A
Exam Surface:	ISI PREP		
Surface Condition:	Smooth		

Recordable Indication(s): Yes ☐ No ☑ (If Yes, Ref. Attached Ultrasonic Indication Report.)

Results: Accept ☑ Reject ☐ Info ☐

Comments:

Cal. Checks	Time	Date
Initial Cal.	1415	3/19/2008
Inter. Cal.	N/A	
Inter. Cal.	N/A	
Inter. Cal.	N/A	
Final Cal.	1728	3/19/2008

Couplant

Cal. Batch:	03125
Type:	Ultragel II
Mfg.:	Sonotech
Exam Batch:	03125
Type:	Ultragel II
Mfg.:	Sonotech

Reference Block

Serial No.:	CAL-RHOM-110
Type:	SS RHOMPAS

Axial Orientated Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
1.5" ID NOTCH	80%	5.8	3.01"
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Circumferential Orientated Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Reference/Simulator Block

Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
33.8	SDH	90%	2.8	1.52"
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A

Percent Of Coverage Obtained > 90%: 50% Reviewed Previous Data: Yes

Examiner	Level II	Signature	Date	Reviewer		Signature	Date
Clairday, Joey E.			3/19/2008	MINOR, CHRIS A./LEVEL II			3/26/08
Examiner	Level N/A	Signature	Date	Site Review		Signature	Date
N/A				LINDEN, RANDY T. / LEVEL III			3.26.08
Other	Level N/A	Signature	Date	ANII Review		Signature	Date
N/A				TILLERY, ERNIE			3-26-08

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Figure 3RR-21.14

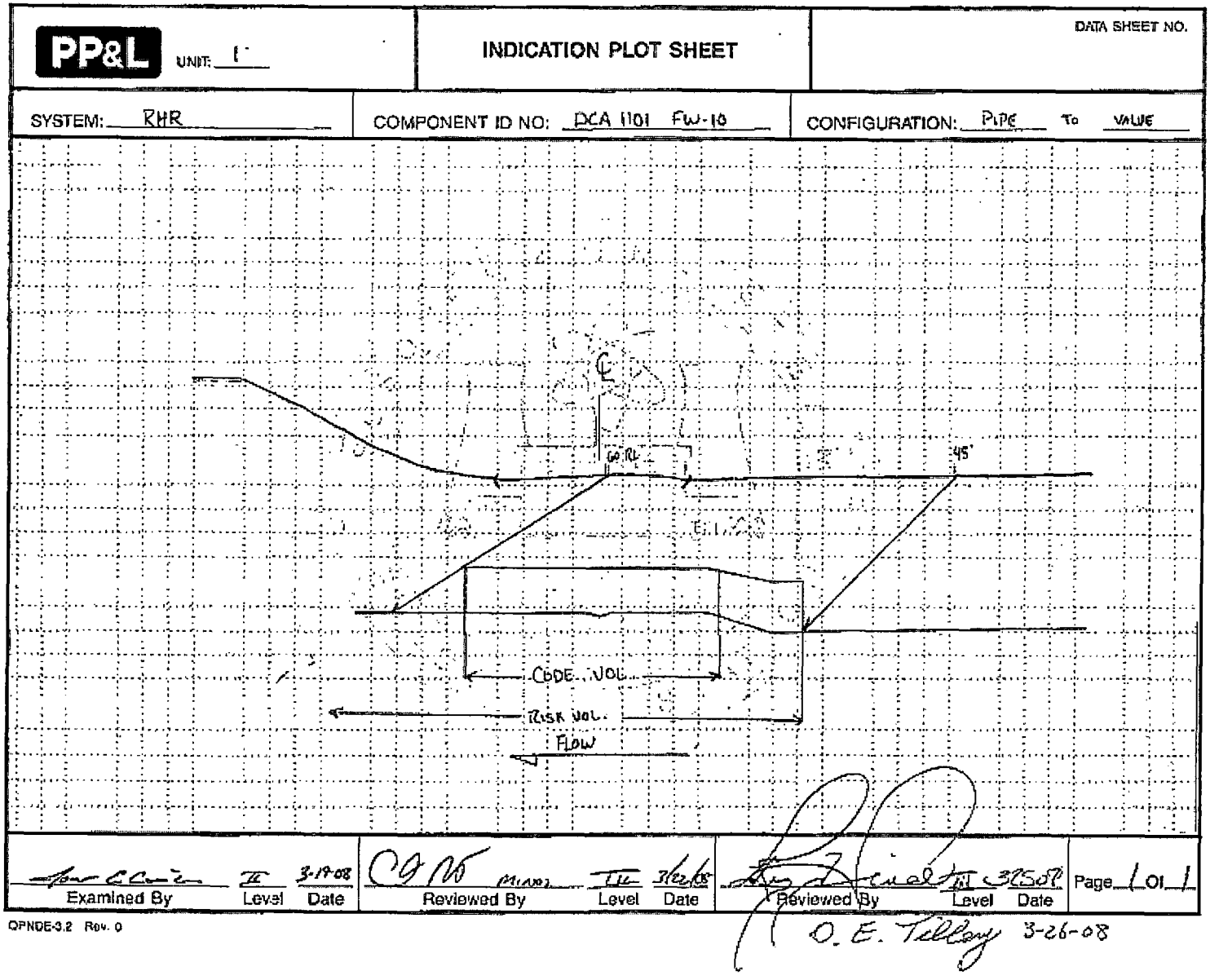


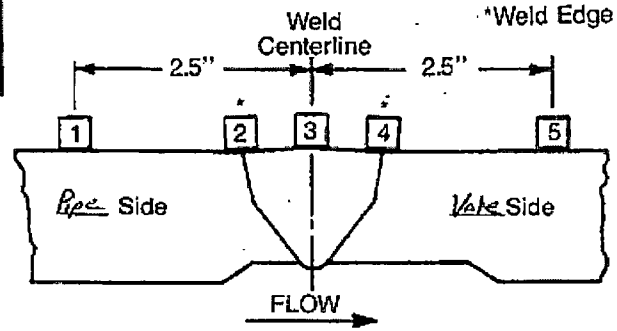
Figure 3RR-21.15

PP&L UNIT: 1

WALL THICKNESS PROFILE SHEET

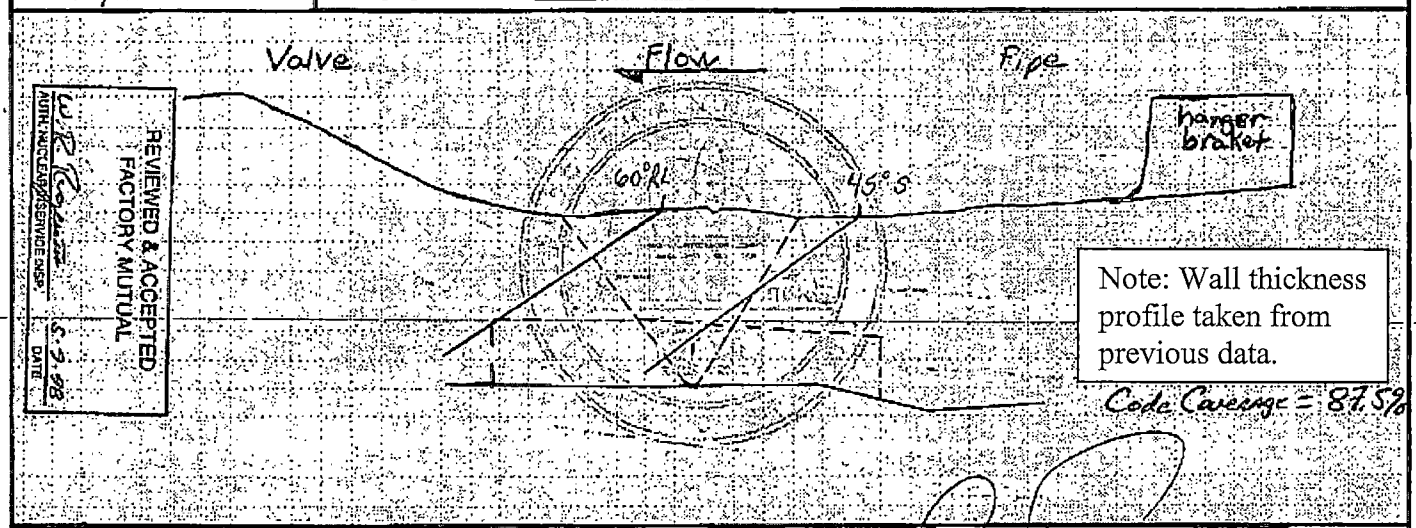
SYSTEM: RHR
WELD NO: DCA1101-FW-10
DATA SHEET NO: 498002
MINIMUM DETECTED THICKNESS: 1.20
Y LOCATION: Datum 0
X LOCATION: weld centerline
AREA: Drywell ELEV: 731'

Position	0°	90°	180°	270°
1	1.35			
2	1.13			
3	1.25			
4	1.2			
5	N/A			



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

CROWN HEIGHT: Flush DIAMETER: 24"
CROWN WIDTH: 1.6" WELD LENGTH: 76"



Examined By Level II Date 4-25-98
Reviewed By Level III Date 4/29/98
Approved By Level III Date 5-1-98
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Figure 3RR-21.16

UT Calibration/Examination

Site/Unit:	PPL / 1	Procedure:	NDE-UT-001	Outage No.:	U1-15RIO
Summary No.:	1-R1.11.0050	Procedure Rev.:	6	Report No.:	UT-08083
Workscope:	AUG	Work Order No.:	738807	Page:	1 of 1

Code:	ASME 1998/2000 Add	Cat./Item:	R-A/R1.11	Location:	R-400
Drawing No.:	ISI-DCA-110-2	Description:	E-V		
System ID:	RHR				
Component ID:	DCA1102-FW-8	Size/Length:	75.875"	Thickness/Diameter:	24"
Limitations:	SINGLE SIDE ACCESS EXAMINED FROM ELBOW SIDE DUE TO VALVE CONFIGURATION	Start Time:	1605	Finish Time:	1625

Instrument Settings

Serial No.:	031570311		
Manufacturer:	Panametrics		
Model:	Epoch 4		
Delay:	7.255	Range:	5.0
M'tl Cal/Vel:	.1254	Pulser:	Square
Damping:	400 Ω	Reject:	0%
Rep. Rate:	Auto	Freq.:	2.0 MHz
Filter:	0.8 - 3.0	Mode:	Pulse Echo
Voltage:	Max	Other:	Fullwave
Ax. Gain (dB):	0.0	Circ. Gain (dB):	0.0
1.0 Screen Dn. =	.5	in. of	Sound Path
Linearity Report No.:	L-08-041		

Calibration Block

Cal. Block No.:	P-109		
Thickness:	0.50" - 2.0"	Dia.:	Flat
Cal. Blk. Temp.:	74°	Temp. Tool:	257461
Comp. Temp.:	72°	Temp. Tool:	257461

Search Unit

Serial No.:	010647		
Manufacturer:	KBA		
Size:	0.50"	Shape:	Round
Freq.:	1.5 MHz	Style:	Comp-G
Exam Angle:	45°	# of Elements:	1
Mode:	Shear		
Measured Angle:	45°		
Wedge Style:	MSWQC		

Search Unit Cable

Type:	RG-174		
Length:	6'	No. Conn.:	0

Scan Coverage

Upstream ☑	Downstream ☐	Scan dB:	22
CW ☑	CCW ☑	Scan dB:	25
Exam Surface:	OD		
Surface Condition:	Smooth		

Cal. Checks	Time	Date
Initial Cal.	1335	3/19/2008
Inter. Cal.	1604	3/19/2008
Inter. Cal.	N/A	
Inter. Cal.	N/A	
Final Cal.	1745	3/19/2008

Couplant

Cal. Batch:	03125
Type:	Ultragel II
Mfg.:	Sonotech
Exam Batch:	03125
Type:	Ultragel II
Mfg.:	Sonotech

Reference Block

Serial No.:	CAL-RHOM-112
Type:	RHOMPAS

Axial Orientated Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
2.0" NOTCH	80%	5.7	2.86
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Circumferential Orientated Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Reference/Simulator Block

Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
0.0	FSDH	38%	3.5	1.74
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A

Recordable Indication(s): Yes ☐ No ☑ (If Yes, Ref. Attached Ultrasonic Indication Report.)

Results: Accept ☑ Reject ☐ Info ☐

Comments: NO COUNTERBORE DETECTED.
NO RECORDABLE INDICATIONS.

Percent Of Coverage Obtained > 90%: 50% Reviewed Previous Data: Yes

Examiner	Level II	Signature	Date	Reviewer	Signature	Date
GINDER, TODD M.		Todd M. Ginder	3/19/2008	MINOR, CHRIS A./LEVEL III		3/25/08
Examiner	Level N/A	Signature	Date	Site Review	Signature	Date
N/A				LINDEN, RANDY T. / LEVEL III		3/26/08
Other	Level N/A	Signature	Date	ANII Review	Signature	Date
N/A				TILLERY, ERNIE	Delton E. Tillery	5-28-08

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Figure 3RR-21.17

ppl

UT Calibration/Examination

Site/Unit: PPL / 1 | Procedure: NDE-UT-001 | Outage No.: U1-15RIO
Summary No.: 1-R1.11.0050 | Procedure Rev.: 6 | Report No.: UT-08084
Workscope: ISI | Work Order No.: 735807 | Page: 1 of 2

Code: ASME 1998/2000 Add | Cat./Item: R-A/R1.11 | Location: R-400
Drawing No.: ISI-DCA-110-2 | Description: E-V
System ID: RHR
Component ID: DCA1102-FW-8 | Size/Length: 75.875" | Thickness/Diameter: 24"
Limitations: SINGLE SIDE ACCESS EXAMINED FROM ELBOW SIDE DUE TO VALVE CONFIGURATION | Start Time: 1630 | Finish Time: 1700

Instrument Settings

Serial No.: 031570311
Manufacturer: Panametrics
Model: Epoch 4
Delay: 12.61 | Range: 6.0
M/I Cal/Vel: .2488 | Pulser: Square
Damping: 400 Ω | Reject: 0%
Rep. Rate: Auto | Freq.: 2.0 MHz
Filter: 0.8 - 3.0 | Mode: Dual
Voltage: Max | Other: Fullwave
Ax. Gain (dB): 43.8 | Circ. Gain (dB): N/A
1.0 Screen Div. = .6 in. of Sound Path
Linearity Report No.: L-08-041

Search Unit

Serial No.: 04-322
Manufacturer: RTD
Size: 2(15x25) mm | Shape: Rect
Freq.: 2 MHz | Style: TRL2-Aust
Exam Angle: 60° | # of Elements: 2
Mode: Longitudinal
Measured Angle: 60°
Wedge Style: Integral

Search Unit Cable

Type: RG-174
Length: 6' | No. Conn.: 0

Scan Coverage

Upstream ☑ Downstream ☐ Scan dB: 47.8
CW ☐ CCW ☐ Scan dB: N/A
Exam Surface: OD
Surface Condition: Smooth

Cal. Checks	Time	Date
Initial Cal.	1440	3/19/2008
Inter. Cal.	1627	3/19/2008
Inter. Cal.	N/A	
Inter. Cal.	N/A	
Final Cal.	1740	3/19/2008

Couplant

Cal. Batch: 03125
Type: Ultragel II
Mfg.: Sonotech
Exam Batch: 03125
Type: Ultragel II
Mfg.: Sonotech

Reference Block

Serial No.: CAL-RHOM-112
Type: RHOMPAS

Axial Orientated Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
2.0" NOTCH	80%	6.0	3.61
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Circumferential Orientated Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Reference/Simulator Block

Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
21.3	2" Radius	80%	3.4	2.03
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A

Calibration Block

Cal. Block No.: P-109
Thickness: 0.50" - 2.0" | Dia.: Flat
Cal. Blk. Temp.: 74° | Temp. Tool: 257461
Comp. Temp.: 72° | Temp. Tool: 257461

Recordable Indication(s): Yes ☐ No ☑ (If Yes, Ref. Attached Ultrasonic Indication Report.)

Results: Accept ☑ Reject ☐ Info ☐

Comments: ROOT GEOMETRY RECORDED SEEN INTERMITTENTLY 360°

Percent Of Coverage Obtained > 90%: 50% | Reviewed Previous Data: Yes

Examiner	Level	Signature	Date	Reviewer	Signature	Date
GINDER, TODD M.	II	Todd M. Ginder	3/19/2008	MINOR, CHRIS A./LEVEL III	C. Minor	3/25/08
Examiner: N/A	N/A			Site Review: LINDEN, RANDY T. / LEVEL III	[signature]	3/26/08
Other: N/A	N/A			ANII Review: TILLERY, ERNIE	Delton E. Tillery	3-28-08

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Figure 3RR-21.18

Ultrasonic Indication Report

Site/Unit:	PPL / 1	Procedure:	NDE-UT-001	Outage No.:	U1-15RIO
Summary No.:	1-R1.11.0050	Procedure Rev.:	6	Report No.:	UT-08084
Workscope:	ISI	Work Order No.:	736807	Page:	2 of 2

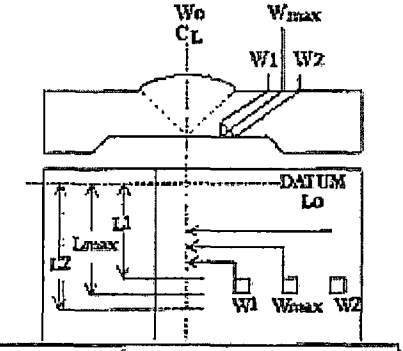
Search Unit Angle: 60° RL °

Wo Location: WELD CENTER LINE

Lo Location: TDC

(•) Piping Welds
( ) Ferritic Vessels ≥ 2"T
( ) Other

MP	Metal Path	Wmax	Distance From Wo To S.U. At Maximum Response
RBR	Remaining Back Reflection	W1	Distance From Wo At Of Max (Forward)
L	Distance From Datum	W2	Distance From Wo At Of Max (Forward)



Comments:

Angle	Indication No.	% Of DAC	W Max W	W Max MP	Forward Of Max W1	Forward Of Max MP	Backward Of Max W2	Backward Of Max MP	L1 Of Max	L Max	L2 Of Max	RBR Amp.	Remarks
60° RL	1	100%	1.55	2.16					19.5				ROOT GEOMETRY SEEN INTERMITTENT 360°

Examiner GINDER, TODD M.	Level II	Signature Todd M. Ginder	Date 3/19/2008	Reviewer MINOR, CHRIS A./LEVEL III	Signature [signature] Date 3/26/08
Examiner N/A	Level N/A	Signature	Date	Site Review LINDEN, RANDY T./ LEVEL III	Signature [signature] Date 3/26/08
Other N/A	Level N/A	Signature	Date	ANII Review TILLERY, ERNIE	Signature Dalton E. Tillery Date 3-28-08

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Figure 3RR-21.19

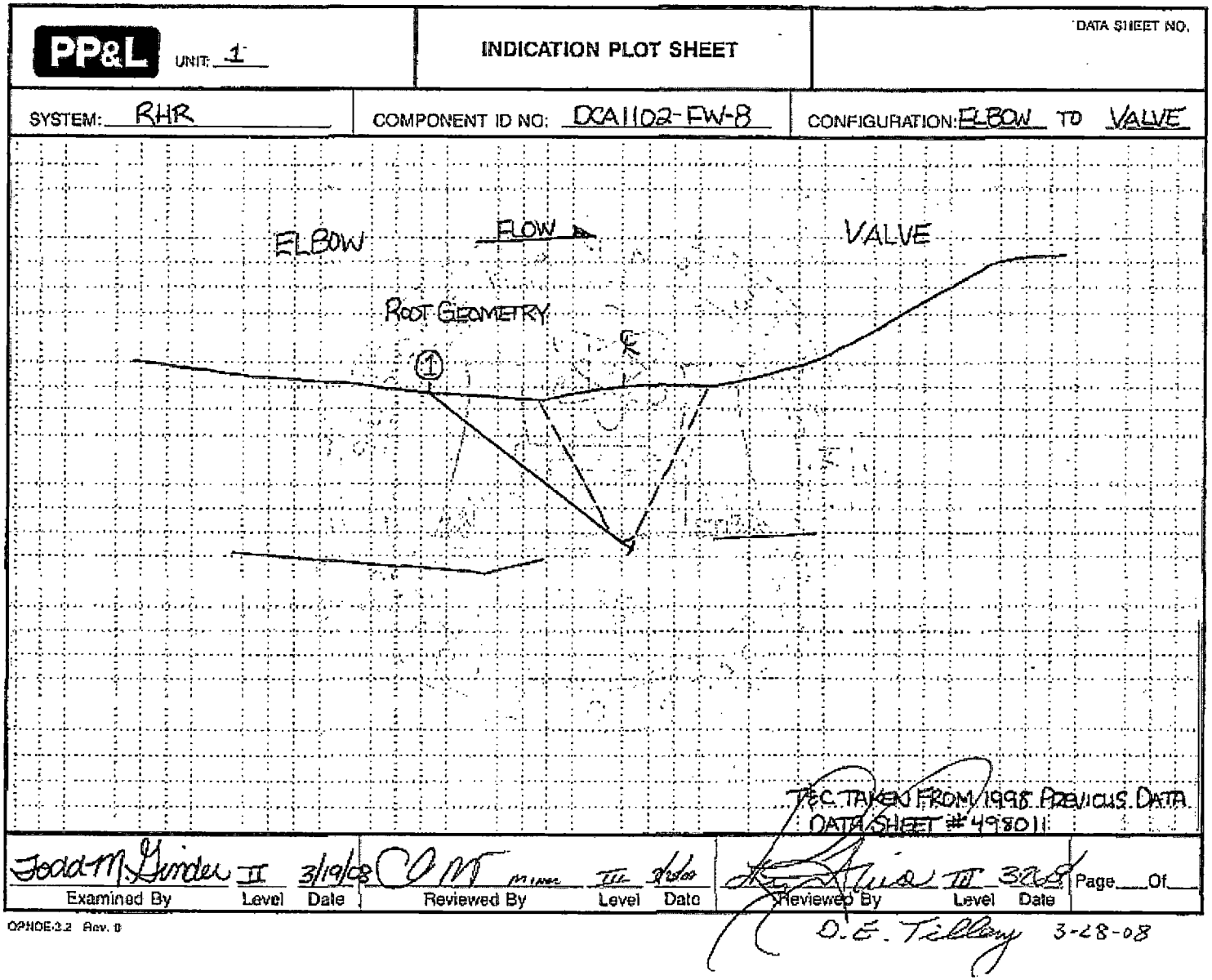


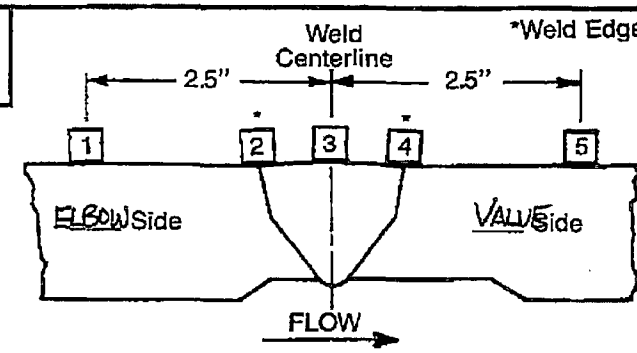
Figure 3RR-21.20

PP&L UNIT: 1

WALL THICKNESS PROFILE SHEET

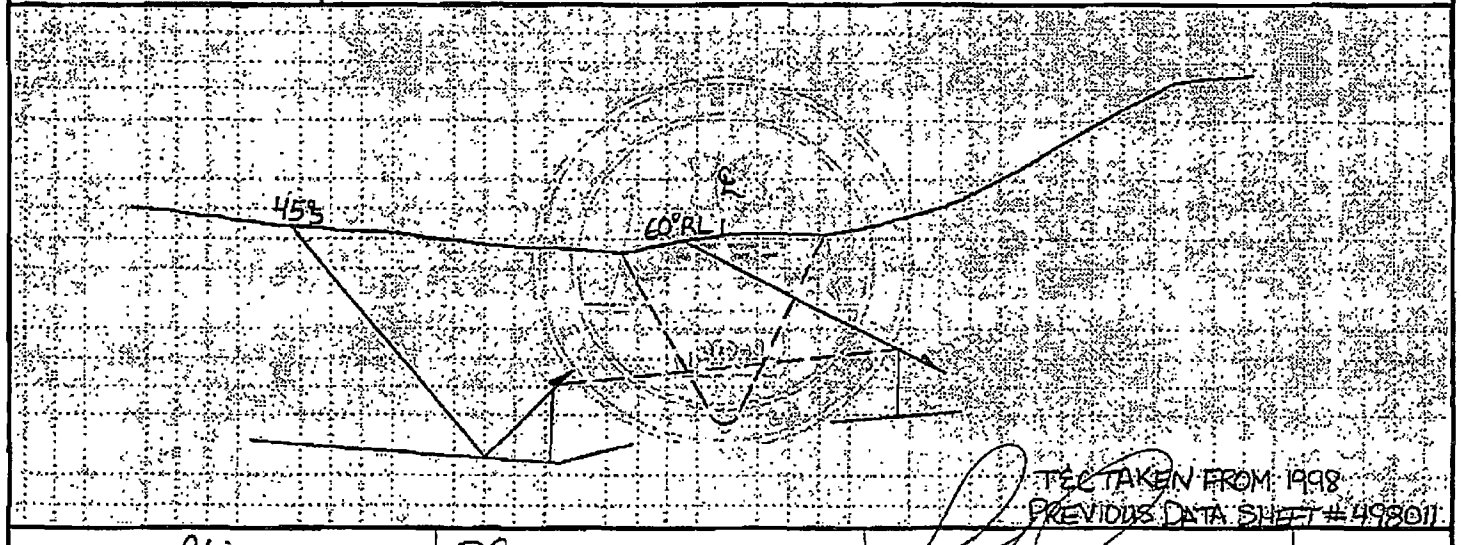
SYSTEM: RHR
WELD NO: DCA1102-FW-8
DATA SHEET NO:
MINIMUM DETECTED THICKNESS: 1.3
Y LOCATION: IDC
X LOCATION: WELD ℄
AREA: DRYWELL ELEV: 731'

Position	0°	90°	180°	270°
1			1.55	
2	N		1.35	N
3		A	1.35	A
4			1.3	
5			N/A	



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

CROWN HEIGHT: .07" DIAMETER: 24"
CROWN WIDTH: 1.45" WELD LENGTH: 75 7/8"



Examined By	Level	Date	Reviewed By	Level	Date	Approved By	Level	Date	Page Of
Todd M. Linder	II	3/19/08	[illegible]	III	3/20/08	O.E. Tilley	III	3-28-08	

QPNDE-3.1 Rev. 0

Figure 3RR-21.21

UT Calibration/Examination

Site/Unit:	SSES / 1	Procedure:	NDE-UT-001	Outage No.:	U1-17RIO
Summary No.:	1-R1.11.0051	Procedure Rev.:	10	Report No.:	UT-12-029
Workscope:	ISI	Work Order No.:	1426747	Page:	1 of 3

Code:	Section XI 1998 Ed /2000 Add	Cat./Item:	R-A/R1.11	Location:	R-400
Drawing No.:	ISI-DCA-110-2	Description:	V-P		
System ID:	RHR				
Component ID:	DCA1102-FW-9	Size/Length:	76"	Thickness/Diameter:	1.3" / 24"
Limitations:	NONE	Start Time:	1528	Finish Time:	1617

Instrument Settings

Serial No.:	0229P7		
Manufacturer:	GEIT		
Model:	USN 60SW	Linearity:	L-12-002
Delay:	7.595	Range:	3.0"
Mtl Cal/Vel:	1.285	Pulser Type:	Square
Damping:	500 Ohms	Reject:	0%
PRF:	Auto High	SU Freq.:	1.6 MHz
Frequency:	2.0 MHz	Rectify:	Fullwave
Voltage:	450	Pulse Width:	330
Ax. Gain (dB):	11.8	Circ. Gain (dB):	11.8
1 Screen Div. =	.300	in. of	Sound Path

Calibration Block

Cal. Block No.:	P-107		
Thickness:	0.50" - 2.0"	Dia.:	Flat
Cal. Blk. Temp.:	72°	Temp. Tool:	272789
Comp. Temp.:	84°	Temp. Tool:	272789

Search Unit

Serial No.:	01D63X		
Manufacturer:	KBA		
Size:	.60"	Model:	113-241-696
Freq.:	1.6 MHz	Center Freq.:	N/A
Exam Angle:	45°	Squint Angle:	N/A
Measured Angle:	46°	Mode:	Shear
Ext Point:	.35"	# of Elements:	1
Config.:	N/A	Focus:	N/A
Shape:	Round	Contour:	N/A
Wedge Style:	MSWQC		

Search Unit Cable

Type:	RG-174	Length:	6.0'	No. Conn.:	0

Scan Coverage

Upstream ☐	Downstream ☑	Scan dB:	27.0
CW ☑	CCW ☑	Scan dB:	27.0
Exam Surface:	OD		
Surface Condition:	Ground		

Cal. Checks	Time	Date
Initial Cal.	0720	4/4/2012
Inter. Cal.	1528	4/4/2012
Inter. Cal.		
Inter. Cal.		
Final Cal.	1818	4/4/2012

Couplant

Cal. Batch:	08125
Type:	Ultragel II
Mfg.:	Sonotech
Exam Batch:	08125
Type:	Ultragel II
Mfg.:	Sonotech

Reference Block

Serial No.:	CAL-RHDM-113
Type:	SS Rompas

Axial Orientated Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
1.5" NOTCH	80%	7.0	2.183"

Circumferential Orientated Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
N/A	N/A	N/A	N/A

Reference/Simulator Block

Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
11.8	FSDH	20%	3.4	1.022"

Recordable Indication(s): Yes ☐ No ☑ (If Yes, Ref. Attached Ultrasonic Indication Report.)

Results: Accept ☑ Reject ☐ Info ☐

Comments: SINGLE SIDE EXAM

Percent Of Coverage Obtained > 90%: NO - 50% Reviewed Previous Data: Yes

Examiner	Level II	Signature	Date	Reviewer	Signature	Date
Reisewitz, Jack A.		Jack A Reisewitz	4/4/2012	Setzer, James / Level III		04-09-2012
Examiner	Level N/A	Signature	Date	Site Review	Signature	Date
N/A				Linden, Randy T. / Level III		4-10-12
Other	Level N/A	Signature	Date	ANII Review	Signature	Date
N/A				Young, Charles	Charles Young	4-11-12

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Figure 3RR-21.22

UT Calibration/Examination

Site/Unit:	SSES / 1	Procedure:	NDE-UT-001	Outage No.:	U1-17RIO
Summary No.:	1-R1.11.0051	Procedure Rev.:	10	Report No.:	UT-12-029
Workscope:	ISI	Work Order No.:	1426747	Page:	2 of 3

Code:	Section XI 1998 Ed /2000 Add	Cat./Item:	R-A/R1.11	Location:	R-400
Drawing No.:	ISI-DCA-110-2	Description:	V-P		
System ID:	RHR				
Component ID:	DCA1102-FW-9			Size/Length: 76"	Thickness/Diameter: 1.3" / 24"
Limitations:	NONE			Start Time: 1528	Finish Time: 1617

Instrument Settings

Serial No.:	0228P7		
Manufacturer:	GEIT		
Model:	USN 60S/W	Linearity:	L-12-002
Delay:	9.2341	Range:	4.0"
M/I Cal/Vel:	0.2341	Pulser Type:	Square
Damping:	500 Ohms	Reject:	0%
PRF:	Auto High	SU Freq.:	2.0 MHz
Frequency:	2.0 MHz	Rectify:	Fullwave
Voltage:	450	Pulse Width:	250
Ax Gain (dB):	59.6	Circ. Gain (dB):	56.6
1 Screen Div. =	.400	In. of	Sound Path

Calibration Block

Cal. Block No.:	P-107		
Thickness:	0.50" - 2.0"	Dia.:	Flat
Cal. Blk. Temp.:	72°	Temp. Tool:	272799
Comp. Temp.:	94°	Temp. Tool:	272799

Recordable Indication(s): Yes ☐ No ☑ (If Yes, Ref. Attached Ultrasonic Indication Report.)

Results: Accept ☑ Reject ☐ Info ☐

Search Unit

Serial No.:	04-386		
Manufacturer:	RTD		
Size:	2(10x18) mm	Model:	TRL2-Aust
Freq.:	2.0 MHz	Center Freq.:	N/A
Exam Angle:	60°	Squint Angle:	N/A
Measured Angle:	60°	Mode:	RL
Exit Point:	.50"	# of Elements:	2
Config.:	N/A	Focus:	N/A
Shape:	Rect.	Contour:	N/A
Wedge Style:	Integral		

Search Unit Cable

Type:	RG-174	Length:	6.0'	No. Conn.:	0

Scan Coverage

Upstream ☐	Downstream ☑	Scan dB:	69.0
CW ☐	CCW ☐	Scan dB:	N/A
Exam Surface	OD		
Surface Condition:	Ground		

Cal. Checks	Time	Date
Initial Cal.	0722	4/4/2012
Inter. Cal.	1564	4/4/2012
Inter. Cal.		
Inter. Cal.		
Final Cal.	1815	4/4/2012

Couplant

Cal. Batch:	08125
Type:	Ultragel II
Mfg.:	Sonotech
Exam Batch:	08125
Type:	Ultragel II
Mfg.:	Sonotech

Reference Block

Serial No.:	CAL-RHOM-113
Type:	SS Rompas

Axial Orientated Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
ID NOTCH	80%	7.0	2.872"

Circumferential Orientated Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
N/A	N/A	N/A	N/A

Reference/Simulator Block

Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
48.6	FSDH	80%	3.6	3.110"

Comments: SINGLE SIDE EXAM

Percent Of Coverage Obtained > 90%: NO - 60% Reviewed Previous Data: Yes

Examiner	Level II	Signature	Date	Reviewer	Signature	Date
Reisewitz, Jack A.		Jack Reisewitz	4/4/2012	Setzer, James / Level III		04-09-2012
Examiner	Level N/A	Signature	Date	Site Review	Signature	Date
N/A				Linden, Randy T. / Level III		4-10-12
Other	Level N/A	Signature	Date	ANII Review	Signature	Date
N/A				Young, Charles		4-11-12

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Figure 3RR-21.23

HITACHI

Wall Thickness Profile Sheet

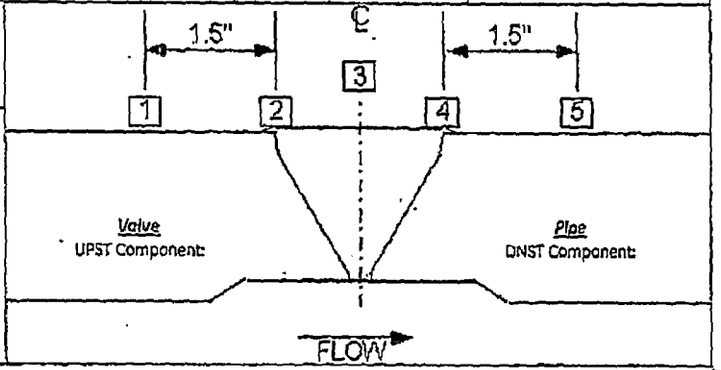
Site: Susquehanna Unit: 1 Project: 1RIO17 Report No.: UT-12-029

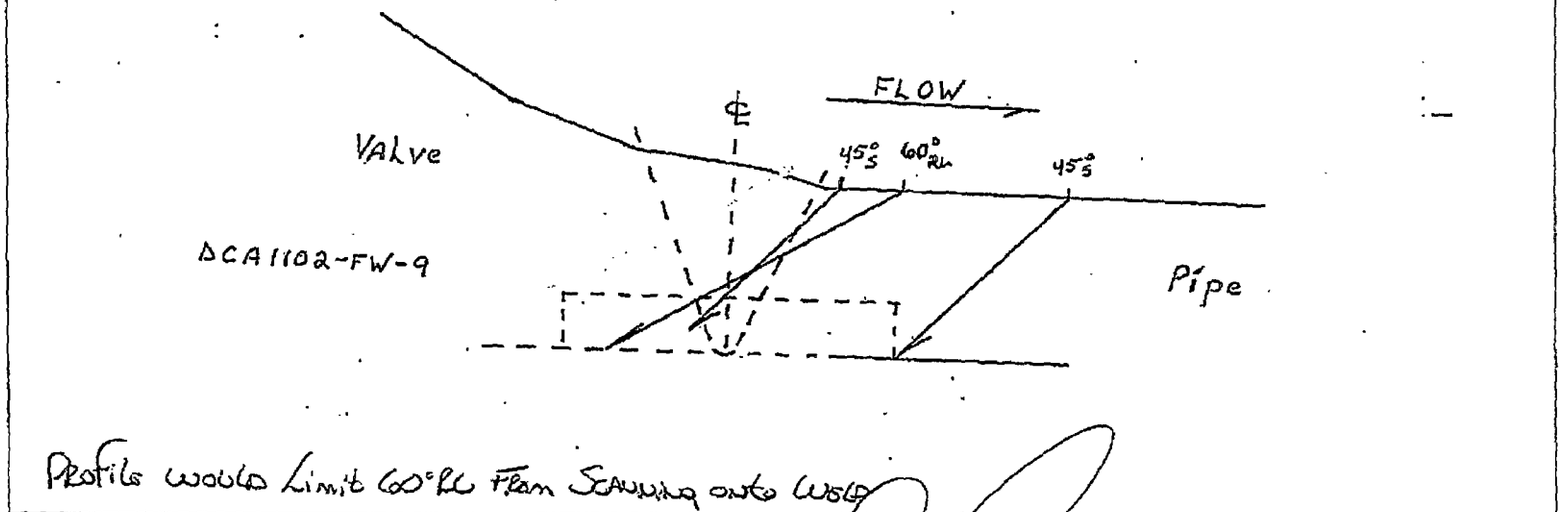
System: RHR

Component ID Number: DCA1102-FW-9

Position	0°	90°	180°	270°
1	N/A	N/A	N/A	N/A
2	N/A	N/A	N/A	N/A
3	1.3"	N/A	N/A	N/A
4	1.1"	N/A	N/A	N/A
5	1.1"	N/A	N/A	N/A

Crown Height: .150"
Crown Width: 1.2"
Nominal Diameter: 24.0"
Weld Length: 76.0"





Profile would Limit 60°RL from Scanning onto Weld

JAR	Jack Reisewitz	II	4/4/2012		4-9-12	4-10-12	4-11-12
	Drawn by:	Level:	Date:	GE Reviewed By:	Level: Date:	Utility Review: Date:	ANII Review: Date:

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Figure 3RR-21.24

UT Calibration/Examination

Site/Unit:	SSES / 1	Procedure:	NDE-UT-001	Outage No.:	U1-17RIO
Summary No.:	1-R1.11.0047	Procedure Rev.:	10	Report No.:	UT-12-028
Workscope:	ISI	Work Order No.:	1320969	Page:	1 of 3

Code:	ASME XI 1998 2000 Add	Cat./Item:	R-A/R1.11	Location:	400
Drawing No.:	ISI-DCA-110-2	Description:	P-V		
System ID:	RHR				
Component ID:	DCA1102-FW-10	Size/Length:	76"	Thickness/Diameter:	1.25" / 24"
Limitations:	NONE	Start Time:	1528	Finish Time:	1617

Instrument Settings

Serial No.:	0229P7		
Manufacturer:	GEIT		
Model:	USN 60SW	Linearity:	L-12-002
Delay:	7.696	Range:	3.0"
M'tl Cal/Vel:	1.295	Pulser Type:	Square
Damping:	500 Ohms	Reject:	0%
PRF:	Auto High	SU Freq.:	1.5 MHz
Frequency:	2.0 MHz	Rectify:	Fullwave
Voltage:	450	Pulse Width:	330

Ax. Gain (dB): 11.8 Circ. Gain (dB): 11.8

1 Screen Div. = .300 In. of Sound Path

Calibration Block

Cal. Block No.: P-107

Thickness: 0.50" - 2.0" Dia.: Flat

Cal. Blk. Temp.: 72° Temp. Tool: 272799

Comp. Temp.: 94° Temp. Tool: 272799

Search Unit

Serial No.:	01D63X		
Manufacturer:	KBA		
Size:	.50"	Model:	113-241-596
Freq.:	1.5 MHz	Center Freq.:	N/A
Exam Angle:	45°	Squint Angle:	N/A
Measured Angle:	46°	Mode:	Shear
Exit Point:	.35"	# of Elements:	1
Config.:	N/A	Focus:	N/A
Shape:	Round	Contour:	N/A
Wedge Style:	MSWQC		

Search Unit Cable

Type: RG-174 Length: 6.0' No. Conn.: 0

Scan Coverage

Upstream ☐ Downstream ☑ Scan dB: 27.0

CW ☑ CCW ☑ Scan dB: 27.0

Exam Surface: OD

Surface Condition: Ground

Cal. Checks	Time	Date
Initial Cal.	0720	4/4/2012
Inter. Cal.	1528	4/4/2012
Inter. Cal.		
Inter. Cal.		
Final Cal.	1818	4/4/2012

Couplant

Cal. Batch:	08125
Type:	Ultragel II
Mfg.:	Sonotech
Exam Batch:	08125
Type:	Ultragel II
Mfg.:	Sonotech

Reference Block

Serial No.: CAL-RHOM-113

Type: SS Rompas

Axial Orientated Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
1.5" NOTCH	80%	7.0	2.163"

Circumferential Orientated Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
N/A	N/A	N/A	N/A

Reference/Simulator Block

Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
11.8	FSDH	20%	3.4	1.022"

Recordable Indication(s): Yes ☐ No ☑ (If Yes, Ref. Attached Ultrasonic Indication Report.)

Results: Accept ☑ Reject ☐ Info ☐

Comments: SINGLE SIDE EXAM

Percent Of Coverage Obtained > 90%: NO - 50% Reviewed Previous Data: Yes

Examiner	Level II	Signature	Date	Reviewer	Signature	Date
Reisowitz, Jack A.		Jack A. Reisowitz	4/4/2012	Setzer, James / Level III		04-09-2012
Examiner	Level N/A	Signature	Date	Site Review	Signature	Date
N/A				Linden, Randy T. / Level III		4.10.12
Other	Level N/A	Signature	Date	ANII Review	Signature	Date
N/A				Young, Charles	Charles Young	4-11-12

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Figure 3RR-21.25

UT Calibration/Examination

Site/Unit:	SSES / 1	Procedure:	NDE-UT-001	Outage No.:	U1-17RIO
Summary No.:	1-R1.11.0047	Procedure Rev.:	10	Report No.:	UT-12-028
Workscope:	ISI	Work Order No.:	1320969	Page:	2 of 3

Code:	ASME XI 1998 2000 Add	Cat./Item:	R-A/R1.11	Location:	400
Drawing No.:	ISI-DCA-110-2	Description:	P-V		
System ID:	RHR				
Component ID:	DCA1102-FW-10	Size/Length:	76"	Thickness/Diameter:	1.25" / 24"
Limitations:	NONE	Start Time:	1528	Finish Time:	1617

Instrument Settings

Serial No.:	0229P7		
Manufacturer:	GEIT		
Model:	USN 60SW	Linearity:	L-12-002
Delay:	9.2341	Range:	4.0"
M'tl Cal/Vel:	0.2338	Pulser Type:	Square
Damping:	600 Ohms	Reject:	0%
PRF:	Auto High	SU Freq.:	2.0 MHz
Frequency:	2.0 MHz	Rectify:	Fullwave
Voltage:	450	Pulse Width:	260
Ax. Gain (dB):	66.5	Circ. Gain (dB):	66.5
1 Screen Div. =	.400	in. of	Sound Path

Calibration Block

Cal. Block No.:	P-107		
Thickness:	0.50" - 2.0"	Dia.:	Flat
Cal. Blk. Temp.:	72°	Temp. Tool:	272799
Comp. Temp.:	94°	Temp. Tool:	272799

Search Unit

Serial No.:	04-386		
Manufacturer:	RTD		
Size:	2(10x18) mm	Model:	TRL2-Aust
Freq.:	2.0 MHz	Center Freq.:	N/A
Exam Angle:	60°	Squint Angle:	N/A
Measured Angle:	60°	Mode:	RL
Exit Point:	.50"	# of Elements:	2
Config.:	N/A	Focus:	N/A
Shape:	Rect.	Contour:	N/A
Wedge Style:	Integral		

Search Unit Cable

Type: RG-174 Length: 6.0' No. Conn.: 0

Scan Coverage

Upstream ☐ Downstream ☑ Scan dB: 59.0
CW ☐ CCW ☐ Scan dB: N/A
Exam Surface: OD
Surface Condition: Ground

Cal. Checks	Time	Date
Initial Cal.	0722	4/4/2012
Inter. Cal.	1617	4/4/2012
Inter. Cal.		
Inter. Cal.		
Final Cal.	1816	4/4/2012

Couplant

Cal. Batch:	08125
Type:	Ultragel II
Mfg.:	Sonotech
Exam Batch:	08125
Type:	Ultragel II
Mfg.:	Sonotech

Reference Block

Serial No.:	CAL-RHOM-113
Type:	SS Rompas

Axial Orientated Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
ID NOTCH	80%	7.0	2.872"

Circumferential Orientated Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
N/A	N/A	N/A	N/A

Reference/Simulator Block

Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
48.6	FSDH	80%	3.5	3.110".

Recordable Indication(s): Yes ☐ No ☑ (If Yes, Ref. Attached Ultrasonic Indication Report.)

Results: Accept ☑ Reject ☐ Info ☐

Comments: SINGLE SIDE EXAM

Percent Of Coverage Obtained > 90%: NO - 60% Reviewed Previous Data: Yes

Examiner	Level II	Signature	Date	Reviewer	Signature	Date
Reisewitz, Jack A.		Jack A Reisewitz	4/4/2012	Setzer, James / Level III		04-09-2012
Examiner	Level N/A	Signature	Date	Site Review	Signature	Date
N/A				Linden, Randy T. / Level III		4-10-12
Other	Level N/A	Signature	Date	ANII Review	Signature	Date
N/A				Young, Charles		4-11-12

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Figure 3RR-21.26

HITACHI

Wall Thickness Profile Sheet

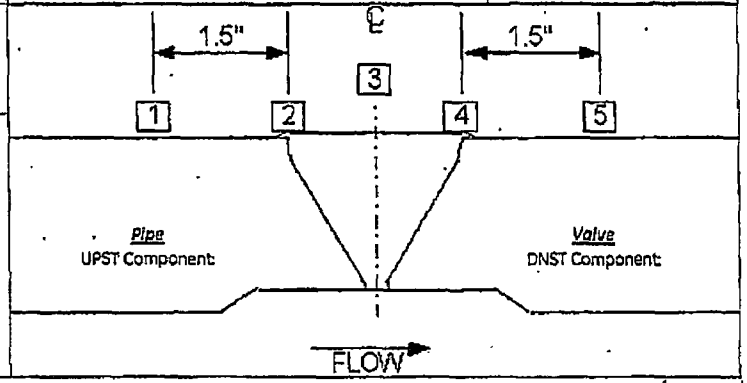
Site: Susquehanna Unit: 1 Report No.: UT-12-028
Project: 1RIO17

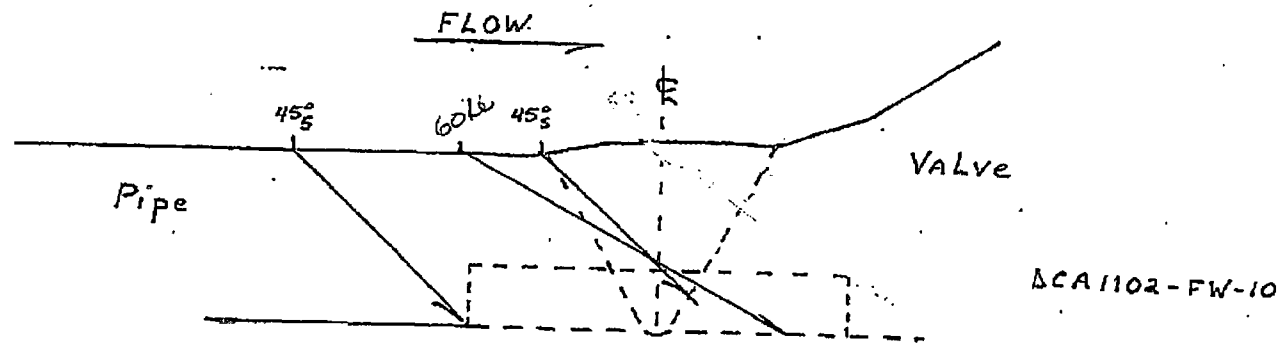
System: RHR

Component ID Number: DCA1102-FW-10

Position	0°	90°	180°	270°
1	1.12"	N/A	N/A	N/A
2	1.12"	N/A	N/A	N/A
3	1.25"	N/A	N/A	N/A
4	N/A	N/A	N/A	N/A
5	N/A	N/A	N/A	N/A

Crown Height: .80"
Crown Width: 1.50"
Nominal Diameter: 24.0"
Weld Length: 76.0"





Profile Weld Limit 60° Ref From Scanning on 60 Weld.

JAR	Jack Relsewitz	II	4/4/2012	JWS	II	4.9.12	4.10.12	4/11/12
	Drawn by:	Level:	Date:	GE Reviewed By:	Level:	Date:	Utility Review: Date:	ANII Review: Date:

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Figure 3RR-21.27

HITACHI

EXAMINATION SUMMARY SHEET

Report No: 1-AUG2.0072

Site: Susquehanna Component ID: VRRB311-FW-A14/M

Outage: U1 15 RIO Component Configuration: SWOL-P / P-P

System: RR ASME Cat.: NA ASME Item AUG2 Aug Req IGSCC

Exams Performed	Data Sheet	Cal Sheet	Procedure	Calibration Block	Exam / Oper. Personnel	Cert Level	Date
45°/RL	N/A	APC-031	NDE-UT-034	P-92	Josh Stellakis	II-L	3/18/2008
00°/RL	N/A	APC-032	NDE-UT-034	P-92	Josh Stellakis	II-L	3/18/2008
45°/RL	N/A	APC-033	NDE-UT-034	P-92	Tyler Raymond	I	3/19/2008
60°/RL	N/A	APC-034	NDE-UT-034	P-92	Tyler Raymond	I	3/19/2008
N/A	APD-009	N/A	NDE-UT-034	N/A	Earnest Catron	III	3/19/2008

Examination Results:

During the automated ultrasonic examination of the above referenced welds, no indications associated with IGSCC or any defined mechanism were recorded by the "SP 2000" system utilizing 45° and 60° refracted longitudinal wave search units.

This exam was performed on two welds simultaneously, VRRB311-FW-A14 and VRRB311-FW-A14M. Weld VRRB311-FW-A14 was performed as an AUG 2 exam and Weld VRRB311-FW-A14M was examined as a risk informed exam with no defined degradation mechanism

The 45° refracted longitudinal wave search unit recorded non-relevant indications and root geometry.

The 60° refracted longitudinal wave search unit recorded non-relevant indications and root geometry.

The exam was performed in all four directions downstream of weld VRRB311-FW-A14 Centerline.

No examination was performed upstream due to the sweep-o-let configuration

Previous data was reviewed prior to this summary.

50% coverage achieved.

This examination was performed under the requirements of ASME Section XI 1998 Edition, 2000 Addenda and BWR VIP 75.

Examination results were compared to Data Report 648001/648007 from: 1998 ☐ Change

These examinations were performed under Work Order: 736971 ☑ No Change

This Summary and the following data sheets have been reviewed and accepted by the following personnel

Earnest Catron III 3-21-08 — 3/24/08

Prepared By: Level Date: Utility Review: Date:

P.P. Tilley 3-25-08

ANII Review: Date:

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Figure 3RR-21.28

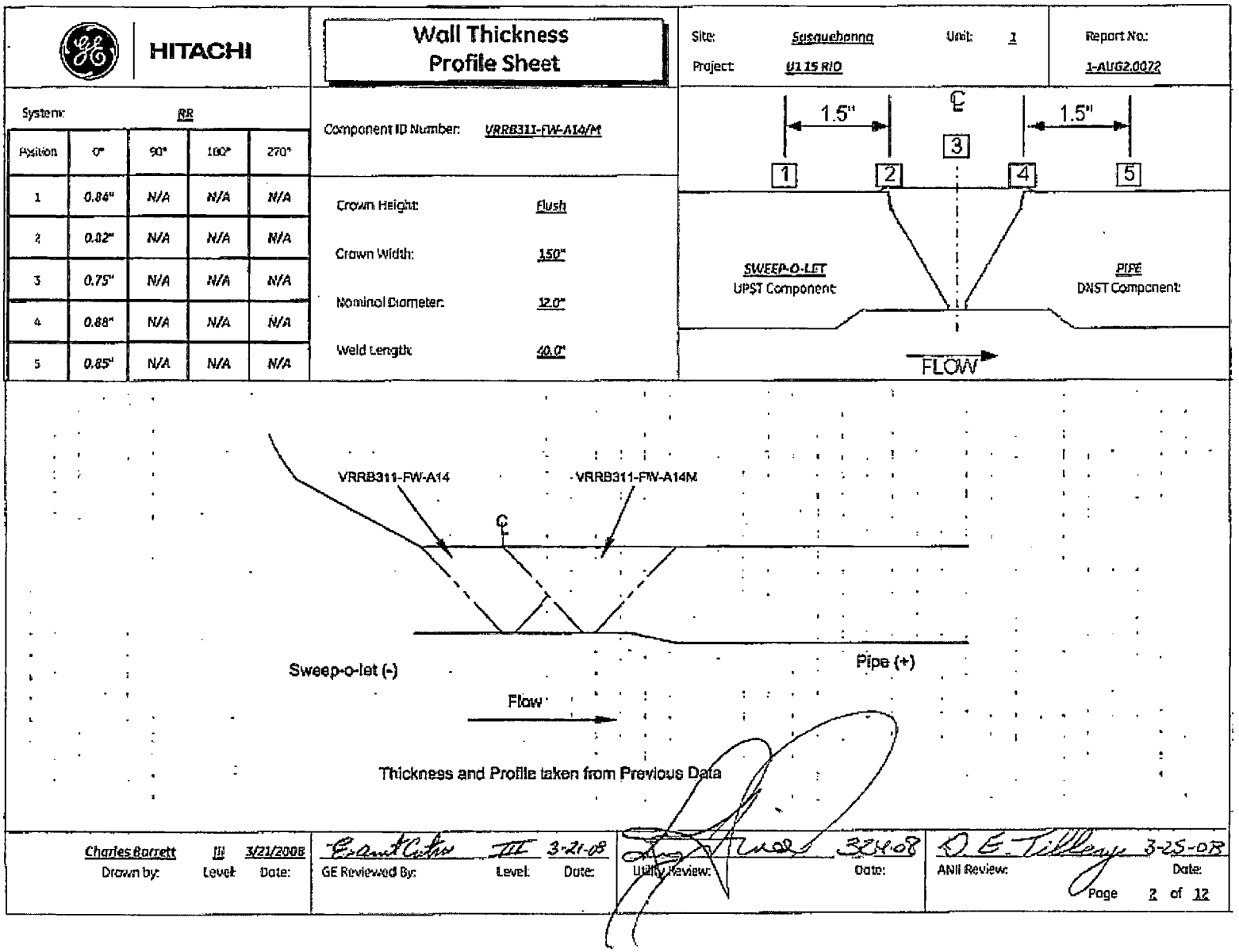


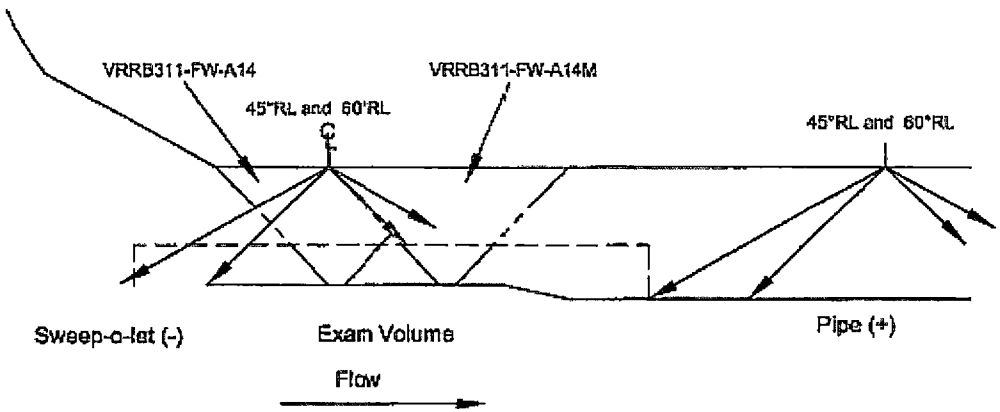
Figure 3RR-21.29

HITACHI

Indication / Coverage Plot Sheet

Site: Susquehanna Unit: 1 Report Number: 1-AUG2.0072
Project: U1 15 RIO

System: RR Component ID Number: VRRB311-FW-A14/M Configuration: SWEEP-O-LET to PIPE



Thickness and Profile taken from Previous Data

Charles Barrett	III	3/21/2008	[signature]	III	3-21-08	[signature]	3-24-8	DE Tilley 3-25-08
Drawn by:	Level:	Date:	GE Reviewed By:	Level:	Date:	Utility Reviewed By:	Date:	ANII Reviewed By: Date:

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Figure 3RR-21.30

UT Calibration/Examination

Site/Unit:	PPL / 2	Procedure:	NDE-UT-001	Outage No.:	U2-13RIO
Summary No.:	2-R1.20.0074	Procedure Rev.:	6	Report No.:	UT-07-027
Worksscope:	ISI	Work Order No.:	723515	Page:	1 of 1

Code:	ASME XI 1998/2000 Add	Cat/Item:	R-A/R1.20	Location:	R-516
Drawing No.:	ISI-DCA-207-1	Description:	V-E		
System ID:	CS				
Component ID:	DCA2071-FW-4	Size/Length:	1.4" / 41"	Thickness/Diameter:	.76" / 12.0"
Limitations:	No UPST Exam Due To Valve Configuration.	Start Time:	1205	Finish Time:	1210

Instrument Settings

Serial No.:	031572811		
Manufacturer:	Panametrics		
Model:	Epoch 4		
Delay:	Zero: 6.916	Range:	3.0"
M'tl Cal/Vel:	.123	Pulser:	Square / Max
Damping:	400 Ω	Reject:	0%
Rep. Rate:	Auto	Freq.:	2.0 MHz
Filter:	0.8 - 3.0	Mode:	Rectif. Full Wave
Voltage:	Fixed		
Ax. Gain (dB):	2.5	Circ. Gain (dB):	2.5

1 Screen Div. = .3 in. of Sound Path

Linearity Report No.: L-07-008

Calibration Block

Cal. Block No.:	P-107		
Thickness:	0.50 - 2.0	Dia.:	Flat
Cal. Blk. Temp.:	71°	Temp. Tool:	252108
Comp. Temp.:	68°	Temp. Tool:	252108

Search Unit

Serial No.:	00MPXD		
Manufacturer:	KBA		
Size:	.5"	Shape:	Round
Freq.:	1.5 MHz	Style:	Comp-G
Exam Angle:	45°	# of Elements:	1
Mode:	Shear		
Measured Angle:	44.1°		
Wedge Style:	Non-Integral		

Search Unit Cable

Type:	RG-174		
Length:	6'	No. Conn.:	0

Scan Coverage

Upstream ☐ Downstream ☑ Scan dB: 14.5
CW ☑ CCW ☑ Scan dB: 14.5
Exam Surface: OD
Surface Condition: Ground Flush

Cal. Checks	Time	Date
Initial Cal.	1000	3/15/2007
Inter. Cal.	1205	3/15/2007
Inter. Cal.		
Inter. Cal.		
Final Cal.	1350	3/15/2007

Couplant

Cal. Batch:	03125
Type:	Ultragel II
Mfg.:	Sonotech
Exam Batch:	03125
Type:	Ultragel II
Mfg.:	Sonotech

Reference Block

Serial No.:	CAL-RHOM-010
Type:	SS Rompas

Axial Orientated Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
1.0" Notch	80%	4.6	1.39"

Circumferential Orientated Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
N/A	N/A	N/A	N/A

Reference/Simulator Block

Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
2.5	FSDH	16%	3.6	1.08"

Recordable Indication(s): Yes ☐ No ☑ (If Yes, Ref. Attached Ultrasonic Indication Report.)

Results: Accept ☑ Reject ☐ Info ☐

Comments: No Counterbore Detected.

Percent Of Coverage Obtained > 90%: 50% Reviewed Previous Data: Yes

Examiner	Level II	Signature	Date	Reviewer	Signature	Date
STEINBAUER, TROY A.			3/15/2007	DuBOSE, GEORGE E. (III) / LVL III		3-16-07
Examiner	Level N/A	Signature	Date	Site Review	Signature	Date
N/A				LINDEN, RANDY T. / LEVEL III		3-17-07
Other	Level N/A	Signature	Date	ANII Review	Signature	Date
N/A				TILLERY, ERNIE		3-18-07

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Figure 3RR-21.31

UT Calibration/Examination

Site/Unit:	PPL / 2	Procedure:	NDE-UT-001	Outage No.:	U2-13RIO
Summary No.:	2-R1.20.0074	Procedure Rev.:	6	Report No.:	UT-07-028
Workscope:	ISI	Work Order No.:	723515	Page:	1 of 1

Code:	ASME XI 1998/2000 Add	Cat./Item:	R-A/R1.20	Location:	R-516
Drawing No.:	ISI-DCA-207-1	Description:	V-E		
System ID:	CS				
Component ID:	DCA2071-FW-4			Size/Length:	1.4" / 41.0"
Limitations:	No UPST Exam Due To Valve Configuration.			Thickness/Diameter:	.76" / 12.0"
				Start Time:	1211
				Finish Time:	1220

Instrument Settings

Serial No.:	031572811		
Manufacturer:	Panametrics		
Model:	Epoch 4		
Delay:	Zero: 8.732	Range:	3.0"
M'tl Cal/Vel:	.2222	Pulser:	Square / Max
Damping:	400 Ω	Reject:	0%
Rep. Rate:	Auto	Freq.:	2.0 MHz
Filter:	0.8 - 3.0	Mode:	Rectif. Full Wave
Voltage:	Fixed		
Ax. Gain (dB):	38.7	Circ. Gain (dB):	38.7

1 Screen Div. = .3 in. of Sound Path

Linearity Report No.: L-07-008

Calibration Block

Cal. Block No.:	P-107		
Thickness:	0.50 - 2.0	Dia.:	Flat
Cal. Blk. Temp.:	71°	Temp. Tool:	252108
Comp. Temp.:	68°	Temp. Tool:	252108

Search Unit

Serial No.:	00-403		
Manufacturer:	RTD		
Size:	2(8x14) mm	Shape:	Rect.
Freq.:	2.0 MHz	Style:	60 TRL2-Aust
Exam Angle:	60°	# of Elements:	2
Mode:	Longitudinal		
Measured Angle:	60.5°		
Wedge Style:	Integral		

Search Unit Cable

Type:	RG-174		
Length:	6'	No. Conn.:	0

Scan Coverage

Upstream ☐ Downstream ☑ Scan dB: 44.7

CW ☐ CCW ☐ Scan dB: N/A

Exam Surface: OD

Surface Condition: Ground Flush

Recordable Indication(s): Yes ☐ No ☑ (If Yes, Ref. Attached Ultrasonic Indication Report.)

Results: Accept ☑ Reject ☐ Info ☐

Percent Of Coverage Obtained > 90%: 50% Reviewed Previous Data: Yes

Cal. Checks	Time	Date
Initial Cal.	1012	3/15/2007
Inter. Cal.	1211	3/15/2007
Inter. Cal.		
Inter. Cal.		
Final Cal.	1351	3/15/2007

Couplant

Cal. Batch:	03125
Type:	Ultragel II
Mfg.:	Sonotech
Exam Batch:	03125
Type:	Ultragel II
Mfg.:	Sonotech

Reference Block

Serial No.:	CAL-RHOM-010
Type:	SS Rompas

Axial Orientated Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
1.0" Notch	80%	6.2	1.63"

Circumferential Orientated Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
N/A	N/A	N/A	N/A

Reference/Simulator Block

Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
32.1	FSDH	80%	5.1	1.08"

Comments: Supplemental Exam Due to Valve Configuration.

Examiner	Level II	Signature	Date	Reviewer	Signature	Date
STEINBAUER, TROY A.			3/15/2007	DuBOSE, GEORGE E. (III) / LVL III		3-16-07
Examiner	Level N/A	Signature	Date	Site Review	Signature	Date
N/A				LINDEN, RANDY T. / LEVEL III		3.17.07
Other	Level N/A	Signature	Date	ANII Review	Signature	Date
N/A				TILLERY, ERNIE		3-18-07

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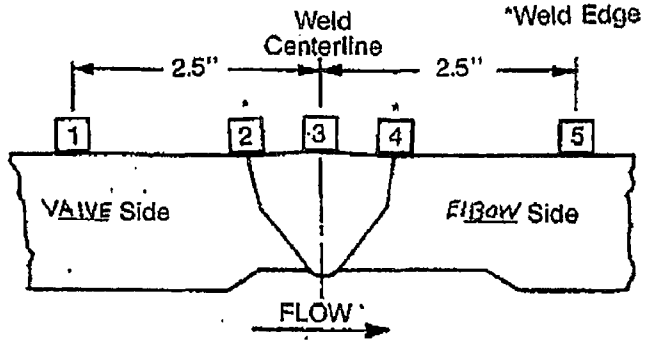
Figure 3RR-21.32

PP&L UNIT: 2

WALL THICKNESS PROFILE SHEET

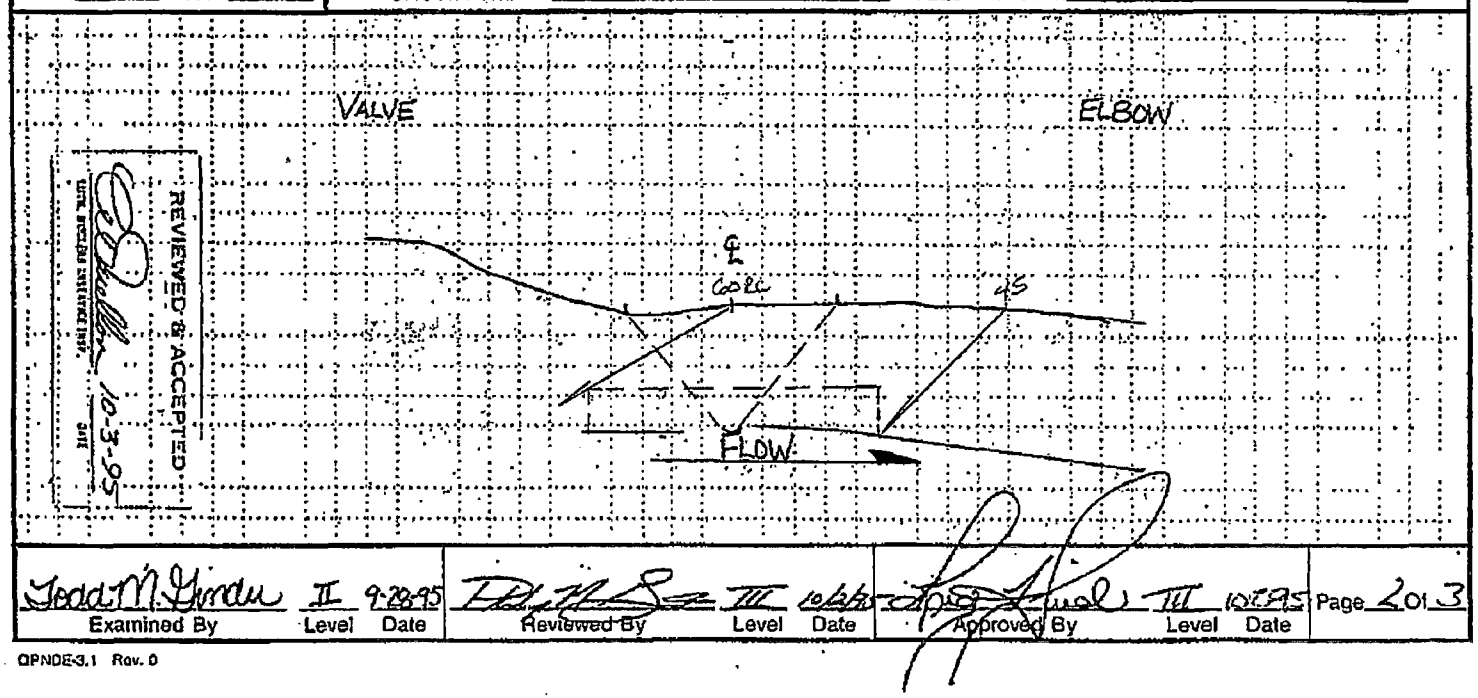
SYSTEM: CORE SPRAY
WELD NO: DCA2071-FW-4
DATA SHEET NO: 515202
MINIMUM DETECTED THICKNESS: .76"
Y LOCATION: OSR OF ELBOW
X LOCATION: WELD ℄
AREA: RB ELEV: 771

Position	0°	90°	180°	270°
1	N/A			
2	.76		N	
3	.80			
4	.84		A	
5	.92			



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

CROWN HEIGHT: FLUSH DIAMETER: 12"
CROWN WIDTH: 1.4" WELD LENGTH: 41"



Examined By	Level	Date	Reviewed By	Level	Date	Approved By	Level	Date	Page
Todd M Girdw	II	9-28-95	[illegible]	III	10/4/95	[illegible]	III	10/4/95	2 of 3

QPNDE-3.1 Rev. 0

Figure 3RR-21.33

UT Calibration/Examination

Site/Unit:	PPL / 2	Procedure:	NDE-UT-001	Outage No.	U2-13RIO
Summary No.:	2-R1.11.0032	Procedure Rev.:	6	Report No.:	UT-07-006
Workscope:	ISI	Work Order No.:	724190	Page	1 of 2

Code:	ASME XI 1998/2000 Add	Cat./Item:	R-A/R1.11	Location:	R-516
Drawing No.:	ISI-DCA-207-1	Description:	RED-SE EXT		
System ID:	CS				
Component ID:	DCA2071-FW-5	Size/Length:	1.2" / 34.5"	Thickness/Diameter:	.92" / 10.0"
Limitations:	Reference Page 2 for Wall Thickness Profile Sheet	Start Time:	1315	Finish Time:	1330

Instrument Settings

Serial No.:	031572811		
Manufacturer:	Panametrics		
Model:	Epoch 4		
Delay:	Zero: 6.916	Range:	3.0"
Mtl Cal/Vel:	.123	Pulser:	Square / Max
Damping:	400 Ω	Reject:	0%
Rep. Rate:	Auto	Freq.:	2.0 MHz
Filter:	0.8 - 3.0	Mode:	Rectif. Full Wave
Voltage:	Fixed		
Ax. Gain (dB):	2.5	Circ. Gain (dB):	2.5
1 Screen Div. =	.3	In. of	Sound Path
Linearity Report No.:	L-07-003		

Calibration Block

Cal. Block No.:	P-107		
Thickness:	0.50 - 2.0	Dia.:	Flat
Cal. Blk. Temp.:	71°	Temp. Tool:	252105
Comp. Temp.:	86°	Temp. Tool:	252106

Search Unit

Serial No.:	00MPXD		
Manufacturer:	KBA		
Size:	.5"	Shape:	Round
Freq.:	1.5	Style:	Comp-G
Exam Angle:	45°	# of Elements:	1
Mode:	Shear		
Measured Angle:	44.1°		
Wedge Style:	Non-Integral		

Search Unit Cable

Type:	RG-174		
Length:	6'	No. Conn.:	0

Scan Coverage

Upstream ☑	Downstream ☑	Scan dB:	14.5
CW ☑	CCW ☑	Scan dB:	14.5
Exam Surface:	OD		
Surface Condition:	Ground Flush		

Cal. Checks	Time	Date
Initial Cal.	0952	3/11/2007
Inter. Cal.	1315	3/11/2007
Inter. Cal.		
Inter. Cal.		
Final Cal.	1568	3/11/2007

Couplant

Cal. Batch:	03125		
Type:	Ultragel II		
Mfg.:	Sonotech		
Exam Batch:	03125		
Type:	Ultragel II		
Mfg.:	Sonotech		

Reference Block

Serial No.:	CAL-RHOM-010		
Type:	SS Rompas		

Axial Orientated Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
1.0" Notch	80%	4.6	1.39"

Circumferential Orientated Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
N/A	N/A	N/A	N/A

Reference/Simulator Block

Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
2.5	FSDH	16%	3.6	1.08"

Recordable Indication(s): Yes ☐ No ☑ (If Yes, Ref. Attached Ultrasonic Indication Report.)

Results: Accept ☑ Reject ☐ Info ☐

Comments: No counterbore detected.

Percent Of Coverage Obtained > 90%: 78.9% Reviewed Previous Data: Yes

Examiner	Level II	Signature	Date	Reviewer	Signature	Date
STEINBAUER, TROY A.			3/11/2007	DuBOSE, GEORGE E. (III) / LVL III		3-16-07
Examiner	Level N/A	Signature	Date	Site Review	Signature	Date
N/A				LINDEN, RANDY T. / LEVEL III		3.19.07
Other	Level N/A	Signature	Date	ANII Review	Signature	Date
N/A				TILLERY, ERNIE		3-20-07

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Figure 3RR-21.34

UT Calibration/Examination

Site/Unit:	PPL / 2	Procedure:	NDE-UT-001	Outage No.:	U2-13RIO
Summary No.:	2-R1.11.0032	Procedure Rev.:	6	Report No.:	UT-07-007
Workscope:	ISI	Work Order No.:	724190	Page:	1 of 1

Code:	ASME XI 1998/2000 Add	Cat./Item:	R-A/R1.11	Location:	R-516
Drawing No.:	ISI-DCA-207-1	Description:	RED-SE EXT		
System ID:	CS				
Component ID:	DCA2071-FW-5	Size/Length:	1.2" / 34.5"	Thickness/Diameter	.92" / 10.0"
Limitations:	Reference UT-07-006 Page 2 for Wall Thickness Profile Sheet	Start Time:	1330	Finish Time:	1340

Instrument Settings

Serial No.:	031572811		
Manufacturer:	Panametrics		
Model:	Epoch 4		
Delay:	Zero: 8.732	Range:	3.0"
M'll Cal/Vel:	.2222	Pulser:	Square / Max
Damping:	400 Ω	Reject:	0%
Rep. Rate:	Auto	Freq.:	2.0 MHz
Filter:	0.8 - 3.0	Mode:	Rectif. Full Wave
Voltage:	Fixed		
Ax. Gain (dB):	38.7	Circ. Gain (dB):	38.7

1 Screen Div. = .3 in. of Sound Path

Linearity Report No.: L-07-003

Calibration Block

Cal. Block No.:	P-107		
Thickness:	0.50 - 2.0	Dia.:	Flat
Cal. Blk. Temp.:	71°	Temp. Tool:	252108
Comp. Temp.:	66°	Temp. Tool:	252108

Search Unit

Serial No.:	00-403		
Manufacturer:	RTD		
Size:	2(8x14) mm	Shape:	Rect.
Freq.:	2.0 MHz	Style:	60 TRL2-Aust
Exam Angle:	60°	# of Elements:	2
Mode:	Longitudinal		
Measured Angle:	60.5°		
Wedge Style:	Integral		

Search Unit Cable

Type:	RG-174		
Length:	6'	No. Conn.:	0

Scan Coverage

Upstream ☐ Downstream ☑ Scan dB: 44.7

CW ☐ CCW ☐ Scan dB: N/A

Exam Surface:	OD
Surface Condition:	Ground Flush

Recordable Indication(s): Yes ☐ No ☑ (If Yes, Ref. Attached Ultrasonic Indication Report.)

Results: Accept ☑ Reject ☐ Info ☐

Percent Of Coverage Obtained > 90%: 78.9% Reviewed Previous Data: Yes

Cal. Checks	Time	Date
Initial Cal.	1015	3/11/2007
Inter. Cal.	1330	3/11/2007
Inter. Cal.		
Inter. Cal.		
Final Cal.	1600	3/11/2007

Couplant

Cal. Batch:	03125
Type:	Ultragel II
Mfg.:	Sonotech
Exam Batch:	03125
Type:	Ultragel II
Mfg.:	Sonotech

Reference Block

Serial No.:	CAL-RHOM-010
Type:	SS Rompas

Axial Orientated Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
1.0" Notch	80%	6.2	1.83"

Circumferential Orientated Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
N/A	N/A	N/A	N/A

Reference/Simulator Block

Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
32.1	FSDH	80%	5.1	1.08"

Comments: Supplemental exam due to eccentric reducer. Scanned weld and base metal.

Examiner	Level II	Signature	Date	Reviewer	Signature	Date
STEINBAUER, TROY A.			3/11/2007	DuBOSE, GEORGE E. (III) / LVL III		3-16-07
Examiner	Level N/A	Signature	Date	Site Review	Signature	Date
N/A				LINDEN, RANDY T. / LEVEL III		3.19.07
Other	Level N/A	Signature	Date	ANII Review	Signature	Date
N/A				TILLERY, ERNIE		3-20-07

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Figure 3RR-21.35

PP&L UNIT: ____

WALL THICKNESS PROFILE SHEET

SYSTEM: CS

WELD NO: DCA2071-FW-5

DATA SHEET NO: UT-07-006

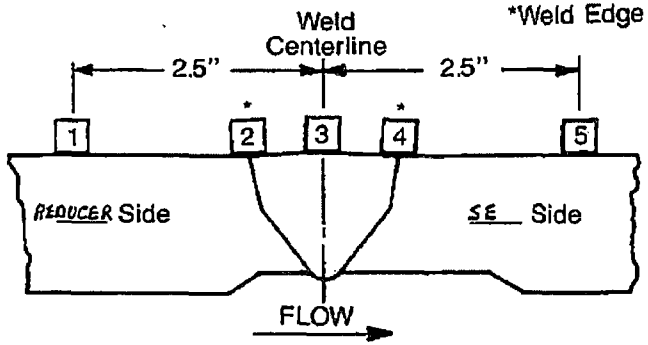
MINIMUM DETECTED THICKNESS: .76"

Y LOCATION: TDC

X LOCATION: WELD ℄

AREA: RA ELEV: 773'

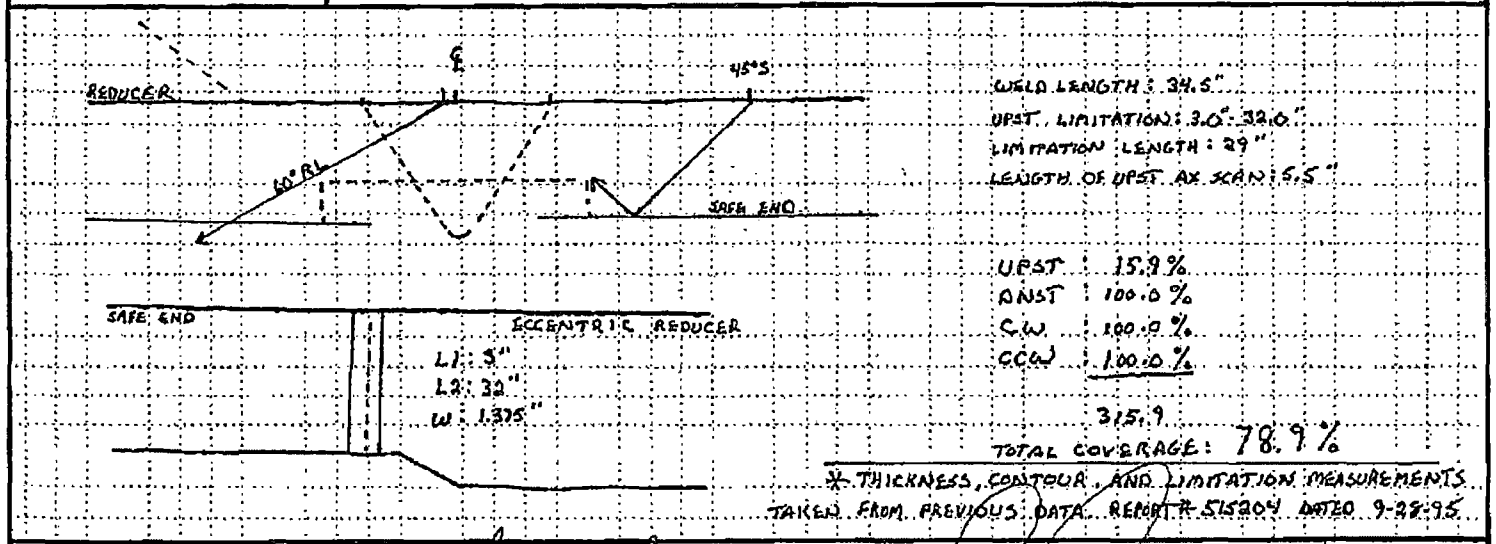
Position	0°	90°	180°	270°
1	.76"			
2	.8"	N		
3	.92"			
4	.76"			A
5	.76"			



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

CROWN HEIGHT: .1" DIAMETER: 10"

CROWN WIDTH: 1.2" WELD LENGTH: 34.5"



Examined By	Level	Date	Reviewed By	Level	Date	Approved By	Level	Date	
STEINBAUER, TROY	II	3-11-07		III	3-15-07		III	3-19-07	Page 2 Of 2

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One CIS 3-20-07 O. E. Tilley

Figure 3RR-21.36

UT Calibration/Examination

Site/Unit:	PPL / 2	Procedure:	NDE-UT-001	Outage No.:	U2-13RIO
Summary No.:	2-R1.11.0037	Procedure Rev.:	6	Report No.:	UT-07-050
Workscope:	ISI	Work Order No.:	724453	Page:	1 of 2

Code:	ASME XI 1998/2000 Add	Cat./Item:	R-A/R1.11	Location:	R-400
Drawing No.:	ISI-DCA-208-1	Description:	E-P		
System ID:	RHR				
Component ID:	DCA2081-1-A			Size/Length:	1.25" / 62.875"
Thickness/Diameter:	1.124" / 20"				
Limitations:	Support Collar - Pipe Side			Start Time:	1437
Finish Time:	1514				

Instrument Settings

Serial No.:	031626904		
Manufacturer:	Panametrics		
Model:	Epoch 4		
Delay:	Zero: 7.776	Range:	2.5"
M'll Cal/Val:	.1250	Pulser:	Square / Max
Damping:	400 Ω	Reject:	0%
Rep. Rate:	Auto	Freq.:	2.0 MHz
Filter:	0.8 - 3.0	Mode:	Rectif. Full Wave
Voltage:	Fixed		
Ax. Gain (dB):	1.6	Circ. Gain (dB):	1.6
1 Screen Div. =	.250	In. of	Sound Path
Linearity Report No.:	L-07-013		

Calibration Block

Cal. Block No.:	P-109		
Thickness	1.5"	Dia.:	N/A
Cal. Blk. Temp.	72°	Temp. Tool:	251970
Comp. Temp.:	72°	Temp. Tool:	251970

Search Unit

Serial No.:	01D3TD		
Manufacturer:	KBA		
Size:	.60"	Shape:	Round
Freq.:	1.5	Style:	Comp-G
Exam Angle:	45°	# of Elements:	1
Mode:	Shear		
Measured Angle:	45°		
Wedge Style:	MSWQC		

Search Unit Cable

Type:	RG-174		
Length:	6'	No. Conn.:	0

Scan Coverage

Upstream ☑	Downstream ☐	Scan dB:	13.5
CW ☑	CCW ☑	Scan dB:	13.5
Exam Surface:	OD		
Surface Condition:	Flush		

Cal. Checks	Time	Date
Initial Cal.	1213	3/17/2007
Inter. Cal.	1437	3/17/2007
Inter. Cal.		
Inter. Cal.		
Final Cal.	1737	3/17/2007

Couplant

Cal. Batch:	03125
Type:	Ultragel II
Mfg.:	Sonotech
Exam Batch:	03125
Type:	Ultragel II
Mfg.:	Sonotech

Reference Block

Serial No.:	CAL-RHOM-086
Type:	SS Rompas

Axial Orientated Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
1.6" Notch	80%	8.5	2.12"

Circumferential Orientated Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
N/A	N/A	N/A	N/A

Reference/Simulator Block

Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
1.6	NSDH	22%	1.8	.395"
1.5	FSDH	20%	4.2	1.034"

Recordable Indication(s): Yes ☐ No ☑ (If Yes, Ref. Attached Ultrasonic Indication Report.)

Results: Accept ☑ Reject ☐ Info ☐

Comments: Support collar restricts D. S. exam at 1.6" past centerline. 60° RL supplemental exam performed from UPST side of weld.

Percent Of Coverage Obtained > 90%: No (85.5%) *Reviewed Previous Data:* Yes

Examiner: REISEWITZ, JACK A.	Level: II	Signature: Jack Reisewitz	Date: 3/17/2007	Reviewer: DuBOSE, GEORGE E. (III) / LVL III	Signature: George E. DuBose III	Date: 3-20-07
Examiner: N/A	Level: N/A	Signature	Date	Site Review: LINDEN, RANDY T. / LEVEL III	Signature: Randy Linden	Date: 3-20-07
Other: N/A	Level: N/A	Signature	Date	ANII Review: TILLERY, ERNIE	Signature: Ernie E. Tillery	Date: 3-21-07

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Figure 3RR-21.37

UT Calibration/Examination

Site/Unit:	PPL / 2	Procedure:	NDE-UT-001	Outage No.:	U2-13RIO
Summary No.:	2-R1.11.0037	Procedure Rev.:	6	Report No.:	UT-07-051
Workscope:	ISI	Work Order No.:	724453	Page:	1 of 1

Code:	ASME XI 1998/2000 Add	Cat./Item:	R-A/R1.11	Location:	R-460
Drawing No.:	ISI-DCA-208-1	Description:	E-P		
System ID:	RHR				
Component ID:	DCA2081-1-A	Size/Length:	1.25" / 62.875"	Thickness/Diameter:	1.124" / 20"
Limitations:	Support Collar - Pipe Side	Start Time:	1514	Finish Time:	1535

Instrument Settings

Serial No.:	031526904		
Manufacturer:	Panametrics		
Model:	Epoch 4		
Delay:	Zero: 8.685	Range:	2.5"
Mtl Cal/Vel:	.2277	Pulser:	Square / Max
Damping:	400 Ω	Reject:	0%
Rep. Rate:	Auto	Freq.:	2.0 MHz
Filter:	0.8 - 3.0	Mode:	Rectif. Full Wave
Voltage:	Fixed		
Ax. Gain (dB):	49	Circ. Gain (dB):	N/A
1 Screen Div. =	.500	In. of	Sound Path
Linearity Report No.:	L-07-013		

Calibration Block

Cal. Block No.:	P-109		
Thickness	1.5"	Dia.:	N/A
Cal. Blk. Temp.	72°	Temp. Tool:	251970
Comp. Temp.:	72°	Temp. Tool:	251970

Recordable Indication(s): Yes ☐ No ☑ (If Yes, Ref. Attached Ultrasonic Indication Report.)

Results: Accept ☑ Reject ☐ Info ☐

Percent Of Coverage Obtained > 90%: No (50%) for RL only exam - Total 85.5% Reviewed Previous Data: Yes

Search Unit

Serial No.:	00-403		
Manufacturer:	RTD		
Size:	2(8x14) mm	Shape:	Rect.
Freq.:	2.0 MHz	Style:	60 TRL2-Aust
Exam Angle:	60°	# of Elements:	2
Mode:	Dual		
Measured Angle:	60°		
Wedge Style:	Integral		

Search Unit Cable

Type:	RG-174		
Length:	6'	No. Conn.:	0

Scan Coverage

Upstream ☑	Downstream ☐	Scan dB:	55
CW ☐	CCW ☐	Scan dB:	N/A
Exam Surface:	OD		
Surface Condition:	Flush		

Cal. Checks	Time	Date
Initial Cal.	1237	3/17/2007
Inter. Cal.	1514	3/17/2007
Inter. Cal.		
Inter. Cal.		
Final Cal.	1735	3/17/2007

Couplant

Cal. Batch:	03125
Type:	Ultragel II
Mfg.:	Sonotech
Exam Batch:	03125
Type:	Ultragel II
Mfg.:	Sonotech

Reference Block

Serial No.:	CAL-RHOM-095
Type:	SS Rompas

Axial Orientated Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
1.5" Notch	80%	5.3	2.65"

Circumferential Orientated Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
N/A	N/A	N/A	N/A

Reference/Simulator Block

Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
40	NSDH	80%	1.4	.68"
40	FSDH	80%	2.8	1.38"

Comments: Support collar restricts D. S. exam at 1.0" past TOE. 60° RL exam used to supplement 45° exam from UPST of weld.

Examiner	Level II	Signature	Date	Reviewer	Signature	Date
REISEWITZ, JACK A.		Jack Reisewitz	3/17/2007	DuBOSE, GEORGE E. (III) / LVL III	George E. DuBose III	3-20-07
Examiner	Level N/A	Signature	Date	Site Review	Signature	Date
N/A				LINDEN, RANDY T. / LEVEL III		3-20-07
Other	Level N/A	Signature	Date	ANII Review	Signature	Date
N/A				TILLERY, ERNIE	Ernie E. Tillery	3-21-07

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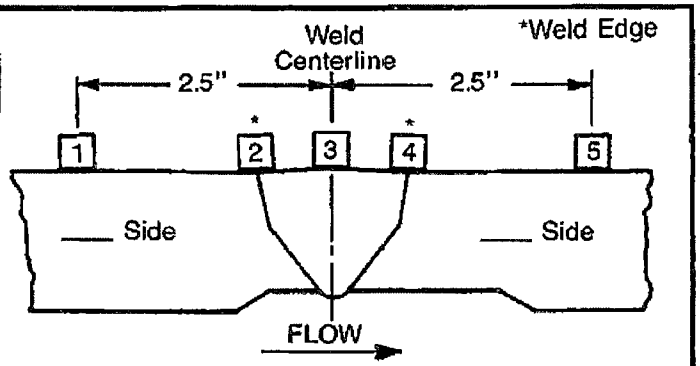
Figure 3RR-21.38

PP&L UNIT: ____

WALL THICKNESS PROFILE SHEET

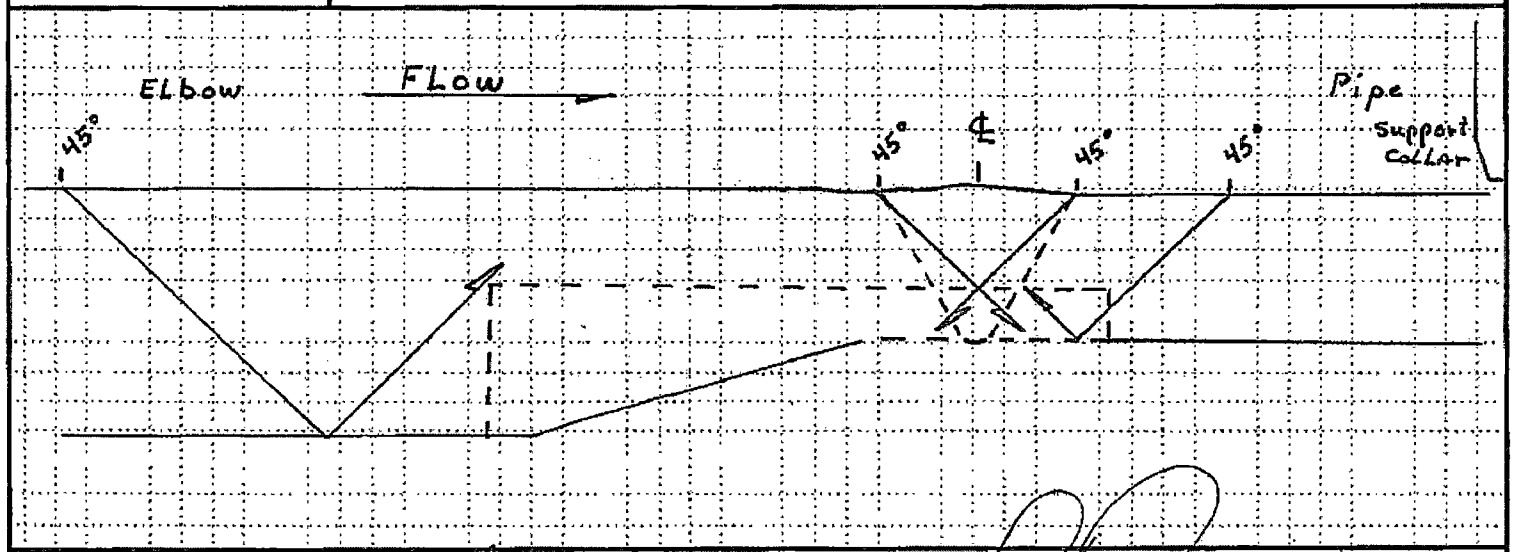
SYSTEM: RHR
WELD NO: DCA-2081-1A
DATA SHEET NO: UT-07-050
MINIMUM DETECTED THICKNESS: .924"
Y LOCATION: Weld ℄
X LOCATION: TDC
AREA: ____ ELEV: 733'4"

Position	0°	90°	180°	270°
1	1.500			
2	1.129			
3	.964			
4	.953			
5	.956			



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

CROWN HEIGHT: Flush DIAMETER: 20.0"
CROWN WIDTH: 1.20" WELD LENGTH: 62 7/8



Jack Reisewitz — Examined By — II — 3-17-07
Reviewed By — III — 3-20-07
Approved By — III — 3/20/07
Page 2 Of 2

QPNDE-3.1 Rev. 0

Ohe CIS 3-21-07 O. E. Tilley

Figure 3RR-21.39

UT Calibration/Examination

Site/Unit:	PPL / 2	Procedure:	NDE-UT-001	Outage No.:	U2-13RIO
Summary No.:	2-R1.11.0043	Procedure Rev.:	6	Report No.:	UT-07-048
Workscope:	AUG	Work Order No.:	724459	Page:	1 of 2

Code:	ASME XI 1998/2000 Add	Cat./Item:	R-A/R1.11	Location:	R-400
Drawing No.:	ISI-DCA-210-1	Description:	E-V		
System ID:	RHR				
Component ID:	DCA2101-FW-8	Size/Length:	1.55/76"	Thickness/Diameter:	1.56/24
Limitations:	Elbow Side Only	Start Time:	1405	Finish Time:	1417

Instrument Settings

Serial No.:	031572611		
Manufacturer:	Panametrics		
Model:	Epoch 4		
Delay:	Zero: 6.261	Range:	4.0"
M'tl Cal/Vel:	.121	Pulser:	Square / Max
Damping:	400 Ω	Reject:	0%
Rep. Rate:	Auto	Freq.:	2.0 MHz
Filter:	0.8 - 3.0	Mode:	Rectif. Full Wave
Voltage:	Fixed		
Ax. Gain (dB):	4.6	Circ. Gain (dB):	4.6
1 Screen Div. =	.4	in. of	Sound Path
Linearity Report No.:	L-07-012		

Calibration Block

Cal. Block No.:	P-107		
Thickness:	0.50 - 2.0"	Dia.:	Flat
Cal. Blk. Temp.:	70°	Temp. Tool:	252108
Comp. Temp.:	68°	Temp. Tool:	252108

Search Unit

Serial No.:	00MPXD		
Manufacturer:	KBA		
Size:	.5"	Shape:	Round
Freq.:	1.5	Style:	Comp-G
Exam Angle:	45°	# of Elements:	1
Mode:	Shear		
Measured Angle:	44.1°		
Wedge Style:	Non-Integral		

Search Unit Cable

Type:	RG-174		
Length:	6'	No. Conn.:	0

Scan Coverage

Upstream ☑	Downstream ☐	Scan dB:	16.6
CW ☑	CCW ☑	Scan dB:	16.6
Exam Surface:	OD		
Surface Condition:	Ground Flush		

Recordable Indication(s): Yes ☐ No ☑ (If Yes, Ref. Attached Ultrasonic Indication Report.)

Cal. Checks	Time	Date
Initial Cal.	1050	3/19/2007
Inter. Cal.	1405	3/19/2007
Inter. Cal.		
Inter. Cal.		
Final Cal.	1527	3/19/2007

Couplant

Cal. Batch:	03125
Type:	Ultragel II
Mfg.:	Sonotech
Exam Batch:	03125
Type:	Ultragel II
Mfg.:	Sonotech

Reference Block

Serial No.:	CAL-RHOM-010
Type:	SS Rompas

Axial Orientated Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
2" Notch	80%	6.9	2.782"

Circumferential Orientated Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
N/A	N/A	N/A	N/A

Reference/Simulator Block

Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
4.6	FSDH	16%	2.6	1.050"

Results: Accept ☑ Reject ☐ Info ☐

Comments: Counterbore detected from -1.9" to -2.3".

Percent Of Coverage Obtained > 90%: No (50%) Reviewed Previous Data: Yes

Examiner	Level II	Signature	Date	Reviewer	Signature	Date
STEINBAUER, TROY A.			3/19/2007	DuBOSE, GEORGE E. (III) / LVL III		3-20-07
Examiner	Level N/A	Signature	Date	Site Review	Signature	Date
N/A				LINDEN, RANDY T. / LEVEL III		3207
Other	Level N/A	Signature	Date	ANII Review	Signature	Date
N/A				TILLERY, ERNIE		3-21-07

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Figure 3RR-21.40

UT Calibration/Examination

Site/Unit:	PPL / 2	Procedure:	NDE-UT-001	Outage No.:	U2-13RIO
Summary No.:	2-R1.11.0043	Procedure Rev.:	6	Report No.:	UT-07-049
Workscope:	AUG	Work Order No.:	724459	Page:	1 of 1

Code:	ASME XI 1998/2000 Add	Cat./Item:	R-A/R1.11	Location:	R-400
Drawing No.:	ISI-DCA-210-1	Description:	E-V		
System ID:	RHR				
Component ID:	DCA2101-FW-8	Size/Length:	1.55/76.0"	Thickness/Diameter:	1.56/24.0"
Limitations:	Elbow Side Only	Start Time:	1417	Finish Time:	1430

Instrument Settings

Serial No.:	031572011		
Manufacturer:	Panametrics		
Model:	Epoch 4		
Delay:	Zero: 9.254	Range:	5.0"
M'll Cal/Vel:	.2313	Pulser:	Square / Max
Damping:	400 Ω	Reject:	0%
Rep. Rate:	Auto	Freq.:	2.0 MHz
Filter:	0.5 - 3.0	Mode:	Rectif. Full Wave
Voltage:	Fixed		
Ax. Gain (dB):	48.7	Circ. Gain (dB):	N/A
1 Screen Div. =	.5	in. of	Sound Path
Linearity Report No.:	L-07-012		

Calibration Block

Cal. Block No.:	P-107		
Thickness:	0.50 - 2.0"	Dia.:	Flat
Cal. Blk. Temp.:	70°	Temp. Tool:	252108
Comp. Temp.:	68°	Temp. Tool:	252108

Search Unit

Serial No.:	98-542		
Manufacturer:	RTD		
Size:	2(10x18) mm	Shape:	Rect.
Freq.:	2.0	Style:	TRL 2-Aust
Exam Angle:	60°	# of Elements:	2
Mode:	Long		
Measured Angle:	59.5°		
Wedge Style:	Integral		

Search Unit Cable

Type:	RG-174		
Length:	6'	No. Conn.:	0

Scan Coverage

Upstream ☑	Downstream ☐	Scan dB:	60.7
CW ☐	CCW ☐	Scan dB:	N/A
Exam Surface:	OD		
Surface Condition:	Ground Flush		

Recordable Indication(s): Yes ☐ No ☑ (If Yes, Ref. Attached Ultrasonic Indication Report.)

Results: Accept ☑ Reject ☐ Info ☐

Percent Of Coverage Obtained > 90%: No (50%) Reviewed Previous Data: Yes

Cal. Checks	Time	Date
Initial Cal.	1055	3/19/2007
Inter. Cal.	1417	3/19/2007
Inter. Cal.		
Inter. Cal.		
Final Cal.	1525	3/19/2007

Couplant

Cal. Batch:	03125
Type:	Ultragel II
Mfg.:	Sonotech
Exam Batch:	03125
Type:	Ultragel II
Mfg.:	Sonotech

Reference Block

Serial No.:	CAL-RHOM-010
Type:	SS Rompas

Axial Orientated Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
2" Notch	80%	7.2	3.62"

Circumferential Orientated Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
N/A	N/A	N/A	N/A

Reference/Simulator Block

Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
42.0	FSDH	80%	3.0	1.5"

Comments: Supplemental exam performed due to single side configuration. Shear component observed outside supplemental coverage area.

Examiner	Level II	Signature	Date	Reviewer		Signature	Date
STEINBAUER, TROY A.			3/19/2007	DuBOSE, GEORGE E. (III) / LVL III			3/20/2007
Examiner	Level N/A	Signature	Date	Site Review		Signature	Date
N/A				LINDEN, RANDY T. / LEVEL III			3/20/07
Other	Level N/A	Signature	Date	ANII Review		Signature	Date
N/A				TILLERY, ERNIE			3-21-07

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Figure 3RR-21.41

PP&L UNIT: 2

WALL THICKNESS PROFILE SHEET

SYSTEM: RHR

WELD NO: DCA2101-FW-8

DATA SHEET NO: UT-07-048

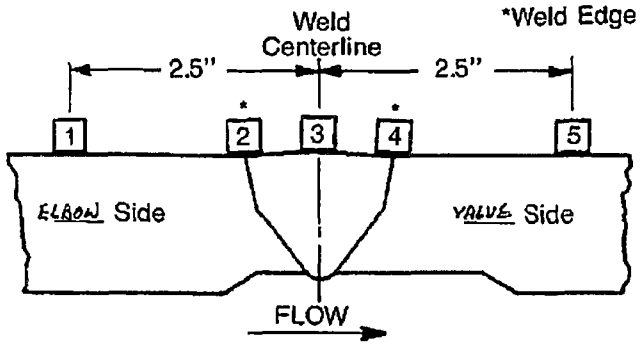
MINIMUM DETECTED THICKNESS: 1.56"

Y LOCATION: TDC

X LOCATION: WELD ℄

AREA: DW ELEV: 731'

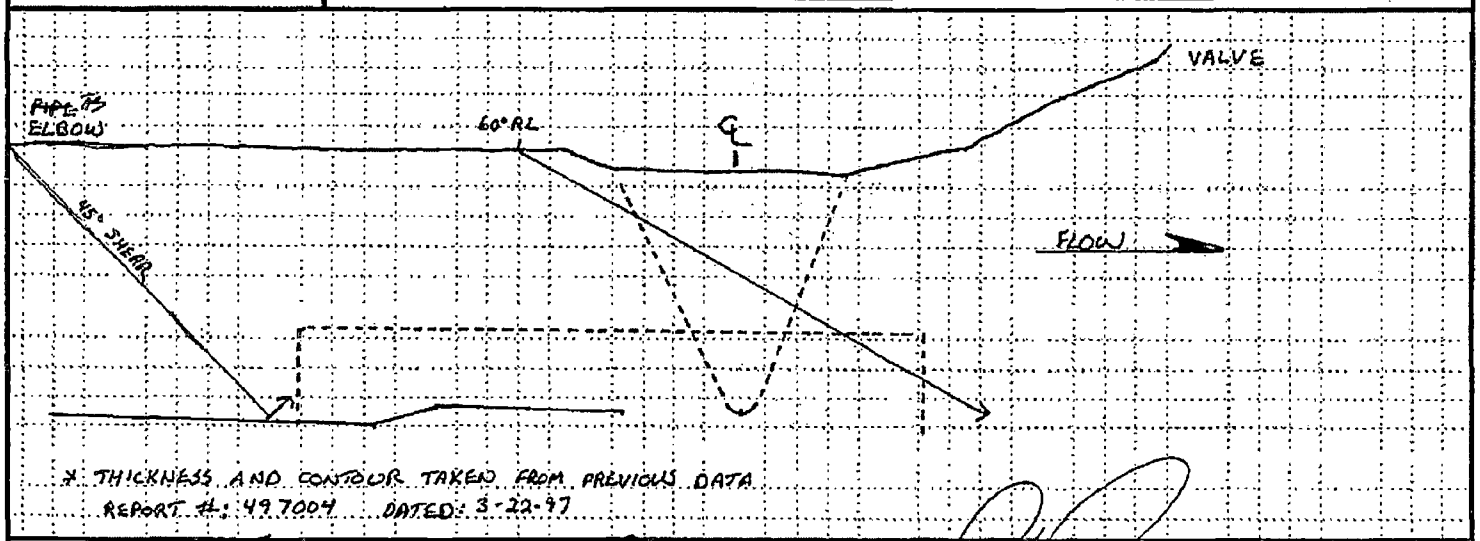
Position	0°	90°	180°	270°
1	1.8			
2	1.6	N		
3	1.56			
4	N/A			A
5				



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

CROWN HEIGHT: FLUSH DIAMETER: 24.0"

CROWN WIDTH: 1.55" WELD LENGTH: 76.0"



STEINBAUER, TROY	II	03-19-07		III	3-20-07		III	3-20-07	Page 2 of 2
Examined By	Level	Date	Reviewed By	Level	Date	Approved By	Level	Date	

QPNDE-3.1 Rev. 0

One CIS 3-21-07 O.E. Tilley

Figure 3RR-21.42

UT Calibration/Examination

ppl

Site/Unit:	SSES / 2	Procedure:	NDE-UT-001	Outage No.:	U2-16RIO
Summary No.:	2-RI.11.0042	Procedure Rev.:	10	Report No.:	UT-13-032
Workscope:	ISI	Work Order No.:	1502203	Page:	1 of 6

Code:	ASME XI 1998 2000 Add	Cat./Item:	R-A/R1.11	Location:	R-400
Drawing No.:	ISI-DCA-210-1	Description:	P-V		
System ID:	RHR				
Component ID:	DCA2101-FW-10	Size/Length:	24"	Thickness/Diameter:	1.28"
Limitations:	Single-side exam due to configuration; Pipe to Valve	Start Time:	1153	Finish Time:	1213

Instrument Settings

Serial No.:	0229NY		
Manufacturer:	GEIT		
Model:	USN 60 SW	Linearity:	L-13-007
Delay:	6.7138	Range:	3.2"
Mtl Cal/Vel:	0.1236	Pulser Type:	Square
Damping:	500 Ohms	Reject:	0%
PRF:	Auto High	SU Freq.:	1.5 MHz
Frequency:	2.0 MHz	Rectify:	Fullwave
Voltage:	450	Pulse Width:	330
Ax. Gain (dB):	9.6	Circ. Gain (dB):	N/A
10 Screen Div. =	3.2	in. of	Sound Path

Calibration Block

Cal. Block No.:	P-107		
Thickness:	0.50 - 2.0	Dia.:	Flat
Cal. Blk. Temp.:	74°F	Temp. Tool:	281427
Comp. Temp.:	76°F	Temp. Tool:	281427

Search Unit

Serial No.:	00X9FY		
Manufacturer:	KBA		
Size:	0.50"	Model:	Comp-G
Freq.:	1.5 MHz	Center Freq.:	N/A
Exam Angle:	45°	Squint Angle:	N/A
Measured Angle:	45°	Mode:	Shear
Exit Point:	0.3"	# of Elements:	1
Config.:	Single	Focus:	N/A
Shape:	Round	Contour:	Flat
Wedge Style:	Non-Integral		

Search Unit Cable

Type: RG-174 Length: 6' No. Conn.: 0

Scan Coverage

Upstream ☑ Downstream ☐ Scan dB: 27.6
CW ☑ CCW ☑ Scan dB: 27.6
Exam Surface: OD
Surface Condition: Ground

Cal. Checks	Time	Date
Initial Cal.	0910	4/19/2013
Inter. Cal.	1152	4/19/2013
Inter. Cal.	N/A	
Inter. Cal.	N/A	
Final Cal.	1337	4/19/2013

Couplant

Cal. Batch:	12M020
Type:	Ultragel II
Mfg.:	Sonotech
Exam Batch:	12M020
Type:	Ultragel II
Mfg.:	Sonotech

Reference Block

Serial No.: CAL-RHOM-081
Type: SS Rompas

Axial Orientated Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
1.5" Notch	80	6.7	2.12"
N/A			
N/A			
N/A			
N/A			

Circumferential Orientated Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
N/A			
N/A			
N/A			
N/A			

Reference/Simulator Block

Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
9.6	FSDH	20	3.4	1.06"
N/A				
N/A				

Recordable Indication(s): Yes ☐ No ☑ (If Yes, Ref. Attached Ultrasonic Indication Report.)

Results: Accept ☑ Reject ☐ Info ☐

Comments: None

Percent Of Coverage Obtained > 90%: No - 50% Reviewed Previous Data: Yes

Examiner	Level II	Signature	Date	Reviewer	Signature	Date
Olson, Chad M.		Chad Olson	4/19/2013	Setzer, James / Level III		4.23.13
Examiner	Level N/A	Signature	Date	Site Review	Signature	Date
N/A				Linden, Randy T. / Level III		4.24.13
Other	Level N/A	Signature	Date	ANII Review	Signature	Date
N/A				Young, Charles		5-1-13

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Figure 3RR-21.43

UT Calibration/Examination

Site/Unit:	SSES / 2	Procedure:	NDE-UT-001	Outage No.:	U2-16RIO
Summary No.:	2-R1.11.0042	Procedure Rev.:	10	Report No.:	UT-13-032
Workscope:	ISI	Work Order No.:	1502203	Page:	2 of 6

Code: ASME XI 1998 2000 Add | Cat./Item: R-A/R1.11 | Location: R-400

Drawing No: ISI-DCA-210-1 | Description: P-V

System ID: RHR

Component ID: DCA2101-FW-10 | Size/Length: 24" | Thickness/Diameter: 1.28"

Limitations: Single-side exam due to configuration; Pipe to Valve | Start Time: 1216 | Finish Time: 1230

Instrument Settings

Serial No.:	0229NY		
Manufacturer:	GEIT		
Model:	USN 60 SW	Linearity:	L-13-007
Delay:	9.2319	Range:	4.5"
M'll Cal/Vel:	0.2380	Pulser Type:	Square
Damping:	500 Ohms	Reject:	0%
PRF:	Auto High	SU Freq.:	2.0 MHz
Frequency:	2.0 MHz	Rectify:	Fullwave
Voltage:	450	Pulse Width:	250

Ax. Gain (dB): 54 | Circ. Gain (dB): N/A

10 Screen Div. = 4.5 in. of Sound Path

Calibration Block

Cal. Block No.: P-107

Thickness: 0.50" - 2.0" | Dia.: Flat

Cal. Blk. Temp.: 74°F | Temp. Tool: 281427

Comp. Temp.: 76°F | Temp. Tool: 281427

Search Unit

Serial No.:	02-242		
Manufacturer:	RTD		
Size:	2(10x18) mm	Model:	60° TRL2-Aust
Freq.:	2.0 MHz	Center Freq.:	N/A
Exam Angle:	60°	Squint Angle:	5°
Measured Angle:	60°	Mode:	RL
Exit Point:	0.4"	# of Elements:	2
Config.:	Dual-SBS	Focus:	FS-40mm
Shape:	Rect.	Contour:	Flat
Wedge Style:	Integral		

Search Unit Cable

Type: RG-174 | Length: 6' | No. Conn.: 0

Scan Coverage

Upstream ☑ | Downstream ☐ | Scan dB: 54.0

CW ☐ | CCW ☐ | Scan dB: N/A

Exam Surface: OD

Surface Condition: Ground

Recordable Indication(s): Yes ☑ No ☐ (If Yes, Ref. Attached Ultrasonic Indication Report.)

Results: Accept ☑ Reject ☐ Info ☐

Cal. Checks	Time	Date
Initial Cal.	0927	4/19/2013
Inter. Cal.	1215	4/19/2013
Inter. Cal.	N/A	
Inter. Cal.	N/A	
Final Cal.	1341	4/19/2013

Couplant

Cal. Batch:	12M020
Type:	Ultragel II
Mfg.:	Sonotech
Exam Batch:	12M020
Type:	Ultragel II
Mfg.:	Sonotech

Reference Block

Serial No.: CAL-RHOM-081

Type: SS Rompas

Axial Orientated Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
1.5" Notch	80	7.0	2.98"
N/A			
N/A			
N/A			
N/A			

Circumferential Orientated Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
N/A			
N/A			
N/A			
N/A			

Reference/Simulator Block

Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
50.0	NSDH	80	1.8	0.70"
N/A				
N/A				

Comments: Root geomorty noted.

Percent Of Coverage Obtained > 90%: No - 60% | Reviewed Previous Data: Yes

Examiner	Level II	Signature	Date	Reviewer	Signature		Date
Olson, Chad M.		Chad Ol	4/19/2013	Setzer, James / Level III			4-23-13
Examiner	Level N/A	Signature	Date	Site Review	Signature		Date
N/A				Linden, Randy T. / Level III			4-24-13
Other	Level N/A	Signature	Date	ANII Review	Signature		Date
N/A				Young, Charles			5-1-13

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Figure 3RR-21.44

ppl

Supplemental Report

Report No.: UT-13-032
Page: 3 of 6

Summary No.: 2-R1.11.0042
Examiner: Olson, Chad M. Level: II Reviewer: Date: 4-23-13
Examiner: N/A Level: N/A Site Review: Date: 4.24.13
Other: N/A Level: N/A ANII Review: Date: 5-1-13

Comments:

Sketch or Photo:

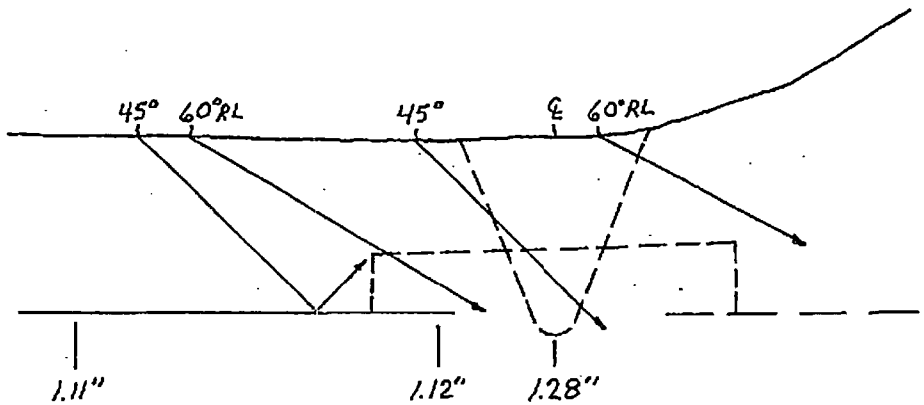

Figure 3RR-21.45

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Supplemental Report

Report No.: UT-13-032
Page: 4 of 6

Summary No.: 2-R1.11.0042

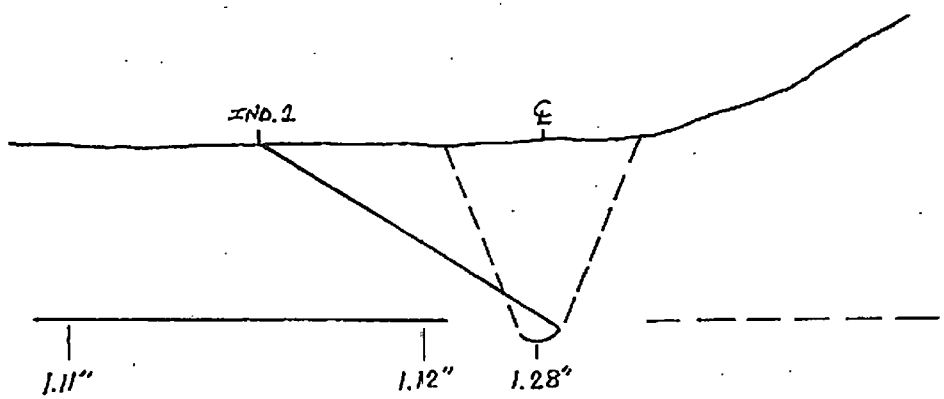
Examiner: Olson, Chad M. Level: II Reviewer: Date: 4-23-13

Examiner: N/A Level: N/A Site Review: Date: 4.24.13

Other: N/A Level: N/A ANII Review: Date: 5-1-13

Comments:

Sketch or Photo:



Root geometry was verified with Radiograph Review.
Contract Dgr. - ANII PPL 4/30/13

Figure 3RR-21.46

Ultrasonic Indication Report

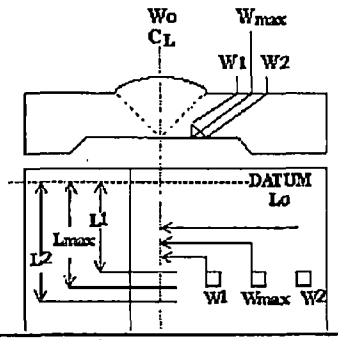
Site/Unit:	SSES / 2	Procedure:	NDE-UT-001	Outage No.:	U2-16RIO
Summary No.:	2-R1.11.0042	Procedure Rev.:	10	Report No.:	UT-13-032
Workscope:	ISI	Work Order No.:	1502203	Page:	6 of 6

Search Unit Angle: 60 °

Wo Location: Weld Centerline

Lo Location: Top Dead Center

(●) Piping Welds
( ) Ferritic Vessels ≥ 2"T
( ) Other _____



MP	Metal Path	Wmax	Distance From Wo To S.U. At Maximum Response
RBR	Remaining Back Reflection	W1	Distance From Wo At N/A Of Max (Forward)
L	Distance From Datum	W2	Distance From Wo At N/A Of Max (Backward)

Comments: None

Angle	Indication No.	% Of DAC	W Max W	W Max MP	Forward N/A Of Max W1	Forward N/A Of Max MP	Backward N/A Of Max W2	Backward N/A Of Max MP	L1 Of Max	L Max	L2 Of Max	RBR Amp.	Remarks
60°	1	140	1.8"	2.3"	N/A	N/A	N/A	N/A	*	71"	*	N/A	Root Geometry. *Intermittent 360° at varying amplitides

Examiner	Level II	Signature	Date	Reviewer	Signature	Date
Olson, Chad M.			4/19/2013	Setzer, James / Level III		4.23.13
Examiner	Level N/A	Signature	Date	Site Review	Signature	Date
N/A				Linden, Randy T. / Level III		4.30.13
Other	Level N/A	Signature	Date	ANII Review	Signature	Date
N/A				Young, Charles		5-1-13

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Figure 3RR-21.47

UT Calibration/Examination

Site/Unit:	SSES / 2	Procedure:	NDE-UT-001	Outage No.:	U2-14RIO
Summary No.:	2-R1.11-0046	Procedure Rev.:	7	Report No.:	UT-09050
Workscope:	ISI	Work Order No.:	918990	Page:	1 of 3

Code:	ASME XI 1998/2000 Add	Cat./Item:	R-A/R1.11	Location:	R-400
Drawing No.:	ISI-DCA-210-2	Description:	E-V		
System ID:	RHR				
Component ID:	DCA2102-FW-7	Size/Length:	24"	Thickness/Diameter:	1.36"
Limitations:	SINGLE SIDE EXAM	Start Time:	16:00	Finish Time:	16:16

Instrument Settings

Serial No.:	031674011		
Manufacturer:	Panametrics		
Model:	Epoch 4		
Delay:	6.840	Range:	4.0"
M'ti Cal/Vel:	.1224	Pulser:	SQUARE
Damping:	400 Ω	Reject:	0
Rep. Rate:	AUTO	Freq.:	2.0 MHz
Filter:	.9 - 3.0	Mode:	P/E
Voltage:	MAX	Other:	N/A
Ax. Gain (dB):	1.2	Circ. Gain (dB):	N/A
10 Screen Div. =	4	In. of	Sound Path
Linearity Report No.:	L-09-029		

Calibration Block

Cal. Block No.:	P-107		
Thickness:	0.50 - 2.0	Dia.:	FLAT
Cal. Blk. Temp.:	73°	Temp. Tool:	261692
Comp. Temp.:	66°	Temp. Tool:	261692

Search Unit

Serial No.:	00MPX7		
Manufacturer:	KBA		
Size:	.50	Shape:	ROUND
Freq.:	1.5 MHz	Style:	BENCHMARK
Exam Angle:	45°	# of Elements:	Single
Mode:	SHEAR		
Measured Angle:	45°		
Wedge Style:	NON-INTEGRAL		

Search Unit Cable

Type:	RG-174		
Length:	6'	No. Conn.:	0

Scan Coverage

Upstream ☑	Downstream ☐	Scan dB:	20
CW ☑	CCW ☑	Scan dB:	20
Exam Surface:	OD		
Surface Condition:	GROUND		

Cal. Checks	Time	Date
Initial Cal.	11:30	4/21/2009
Inter. Cal.		
Inter. Cal.		
Inter. Cal.		
Final Cal.	17:00	4/21/2009

Couplant

Cal. Batch:	03125
Type:	Ultragel II
Mfg.:	Sonotech
Exam Batch:	03125
Type:	Ultragel II
Mfg.:	Sonotech

Reference Block

Serial No.:	CAL-RHOM-072
Type:	SS Rompas

Axial Orientated Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
1.5" NOTCH	80%	5.2	2.07

Circumferential Orientated Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Reference/Simulator Block

Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
7.3	NSDH	80%	1.2	.424

Recordable Indication(s): Yes ☐ No ☑ (If Yes, Ref. Attached Ultrasonic Indication Report.)

Results: Accept ☑ Reject ☐ Info ☐

Comments: SINGLE SIDE EXAM SEE COVERAGE PLOT SHEET

Percent Of Coverage Obtained > 90%: No Reviewed Previous Data: Yes

Examiner	Level II	Signature	Date	Reviewer		Signature	Date
Hancock, David			4/21/2009	Healey, Robert / Level III			4-25-09
Examiner	Level N/A	Signature	Date	Site Review		Signature	Date
N/A				Linden, Randy / Level III			4-27-09
Other	Level N/A	Signature	Date	ANII Review		Signature	Date
N/A							4-30-09

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Figure 3RR-21.48

UT Calibration/Examination

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Site/Unit:	SSES / 2	Procedure:	NDE-UT-001	Outage No.:	U2-14RIO
Summary No.:	2-R1.11.0046	Procedure Rev.:	7	Report No.:	UT-08060
Workscope:	ISI	Work Order No.:	918880	Page:	2 of 3

Code:	ASME XI 1998/2000 Add	Cat./Item:	R-A/R1.11	Location:	R-400
Drawing No.:	ISI-DCA-210-2	Description:	E-V		
System ID:	RHR				
Component ID:	DCA2102-FW-7	Size/Length:	24"	Thickness/Diameter:	1.36"
Limitations:	SINGLE SIDE EXAM	Start Time:	16:16	Finish Time:	16:25

Instrument Settings

Serial No.:	031674011		
Manufacturer:	Panametrics		
Model:	Epoch 4		
Delay:	12.36	Range:	6.0"
M'tl Cal/Vel:	.2378	Pulser:	SQUARE
Damping:	400 Ω	Reject:	0
Rep. Rate:	AUTO	Freq.:	2.0 MHz
Filter:	.8 - 3.0	Mode:	LONG
Voltage:	MAX	Other:	N/A
Ax. Gain (dB):	33.1	Circ. Gain (dB):	N/A

10 Screen Div. = 6 In. of Sound Path

Linearity Report No.: L-08-029

Calibration Block

Cal. Block No.:	P-107		
Thickness:	0.50 - 2.0	Dia.:	FLAT
Cal. Blk. Temp.:	73°	Temp. Tool:	261692
Comp. Temp.:	65°	Temp. Tool:	261692

Search Unit

Serial No.:	01-1290		
Manufacturer:	RTD		
Size:	2(15x25) mm	Shape:	RECTANGLE
Freq.:	2	Style:	RL
Exam Angle:	60°	# of Elements:	2
Mode:	LONG		
Measured Angle:	60°		
Wedge Style:	INTEGRAL		

Search Unit Cable

Type:	RG-174		
Length:	6'	No. Conn.:	0

Scan Coverage

Upstream ☑	Downstream ☐	Scan dB:	45
CW ☑	CCW ☑	Scan dB:	45
Exam Surface:	OD		
Surface Condition:	GROUND		

Recordable Indication(s): Yes ☐ No ☑ (If Yes, Ref. Attached Ultrasonic Indication Report.)

Results: Accept ☑ Reject ☐ Info ☐

Cal. Checks	Time	Date
Initial Cal.	11:55	4/21/2009
Inter. Cal.		
Inter. Cal.		
Inter. Cal.		
Final Cal.	17:10	4/21/2009

Couplant

Cal. Batch:	03125		
Type:	Ultragel II		
Mfg.:	Sonotech		
Exam Batch:	03125		
Type:	Ultragel II		
Mfg.:	Sonotech		

Reference Block

Serial No.:	CAL-RHOM-072		
Type:	SS Rompas		

Axial Orientated Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
1.5" NOTCH	80%	4.7	2.81

Circumferential Orientated Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Reference/Simulator Block

Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
41.9	NSDH	80%	1.1	.655

Comments: SUPPLEMENT TO 45° SHEAR EXAM

Percent Of Coverage Obtained > 90%: No Reviewed Previous Data: Yes

Examiner	Level II	Signature	Date	Reviewer	Signature	Date
Hancock, David			4/21/2009	Healey, Robert / Level III		4-25-09
Examiner	Level N/A	Signature	Date	Site Review	Signature	Date
N/A				Linden, Randy / Level III		4.27.09
Other	Level N/A	Signature	Date	ANII Review	Signature	Date
N/A				Delton E. Tilley		4-30-09

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Figure 3RR-21.49

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Supplemental Report

Report No.: UT-09060
Page: 3 of 3

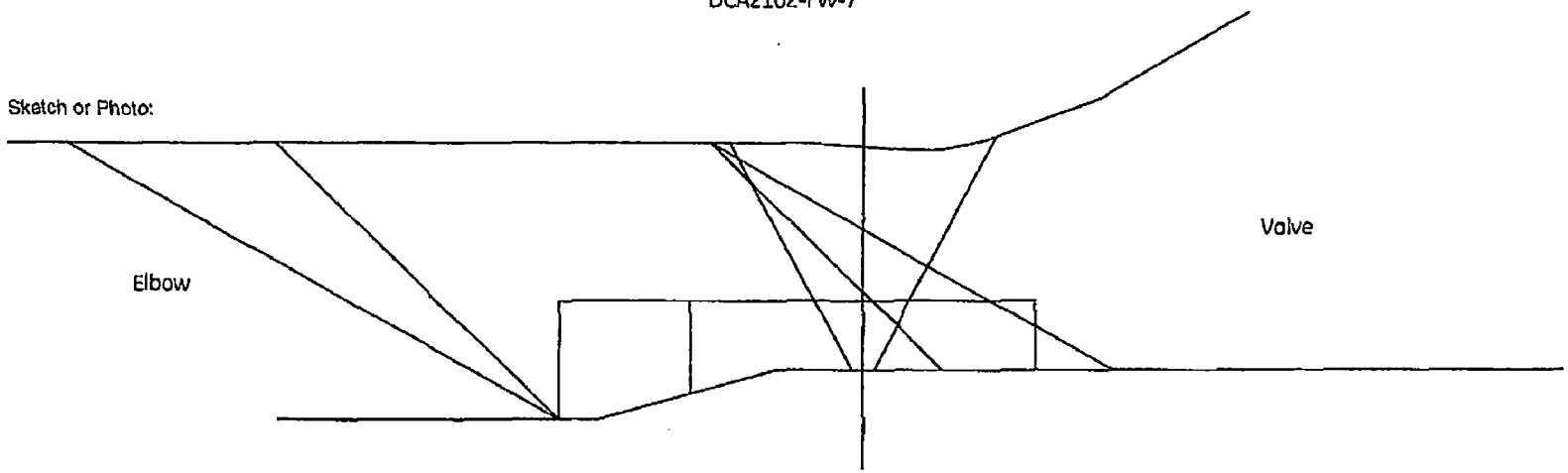
Summary No.: 2-R1.11.0046

Examiner:	Hancock, David	For	Level:	II	Reviewer:	Healey, Robert / Level III	Date: 4-25-09
Examiner:	N/A		Level:	N/A	Site Review:	Linden, Randy / Level III	Date: 4/27-09
Other:	N/A		Level:	N/A	ANII Review:	Dalton E. Tallery	Date: 4-30-09

Comments:

DCA2102-FW-7

Sketch or Photo:



Exam limited due to Valve configuration.
50% Code coverage obtained.

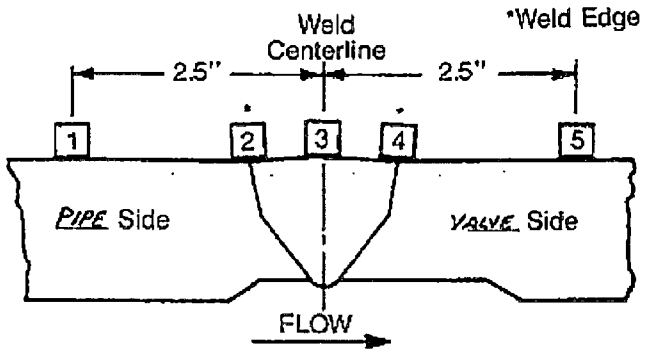
Figure 3RR-21.50

PP&L UNIT: 2

WALL THICKNESS PROFILE SHEET

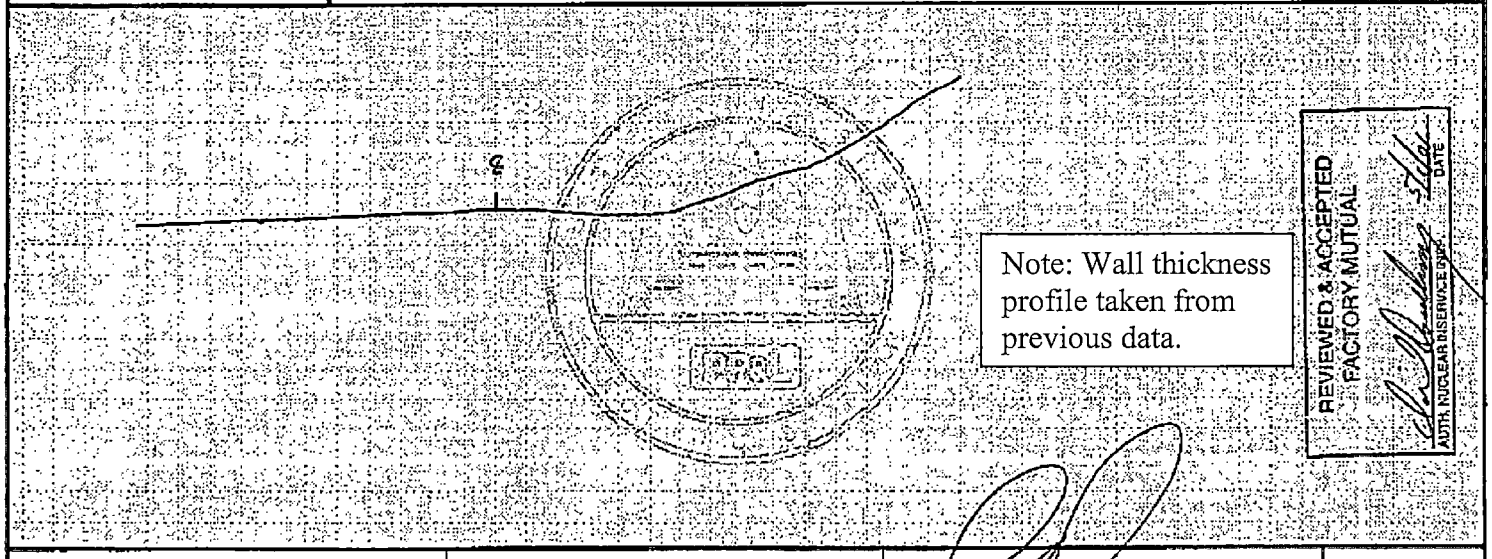
SYSTEM: RHR
WELD NO: DCA2102-FW-7
DATA SHEET NO: 491014
MINIMUM DETECTED THICKNESS: 1.36"
Y LOCATION: TDC
X LOCATION: WELD ℄
AREA: 31 ELEV: 737'

Position	0°	90°	180°	270°
1	1.73			
2	1.46			
3	1.36			
4	1.36			
5	N/A			



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

CROWN HEIGHT: FLUSH DIAMETER: 24.0"
CROWN WIDTH: 1.70" WELD LENGTH: 76.0"



Note: Wall thickness profile taken from previous data.

REVIEWED & ACCEPTED FACTORY MUTUAL AUTH. NUCLEAR INSURANCE DIV. DATE

Examined By	Level	Date	Reviewed By	Level	Date	Approved By	Level	Date	
	II	4/16/01		III	4/9/01		III	4/16/01	Page 5 Of 6

QPNDE-3.1 Rev. 0

Figure 3RR-21.51

UT Calibration/Examination

Site/Unit:	SSES / 2	Procedure:	NDE-UT-002	Outage No.:	U2-16RIO
Summary No.:	2-R1.11.0047	Procedure Rev.:	6	Report No.:	UT-13-068
Workscope:	ISI	Work Order No.:	1502204	Page:	1 of 4

Code: ASME 1998 Ed/2000 Add Cat./Item: R-A/R1.11 Location:

Drawing No.: ISI-DCA-210-2 Description: V-P

System ID: RHR

Component ID: DCA2102-FW-8 Size/Length: 1.2" / 76" Thickness/Diameter: 1.3" / 24"

Limitations: NO SCANS PERFORMED UPSTREAM DUE TO VALVE Start Time: 1127 Finish Time: 1147

Instrument Settings

Serial No.:	0229NY		
Manufacturer:	GEIT		
Model:	USN 60 SW	Linearity:	L-13-023
Delay:	6.7138	Range:	3.2
M'tl Cal/Vel:	0.1236	Pulser Type:	Square
Damping:	500 Ohms	Reject:	0%
PRF:	Auto High	SU Freq.:	1.5 MHz
Frequency:	2.0 MHz	Rectify:	Fullwave
Voltage:	450	Pulse Width:	330

Ax. Gain (dB): 11.4 Circ. Gain (dB): N/A

10 Screen Div. = 3.2 in. of Sound Path

Calibration Block

Cal. Block No.: P-107

Thickness: 0.50 - 2.0 Dia.: Flat

Cal. Blk. Temp.: 73°F Temp. Tool: 281427

Comp Temp.: 72°F Temp. Tool: 281427

Search Unit

Serial No.:	01JP21		
Manufacturer:	KBA		
Size:	0.50"	Model:	Comp-G
Freq.:	1.5 MHz	Center Freq.:	N/A
Exam Angle:	45°	Squint Angle:	N/A
Measured Angle:	45°	Mode:	Shear
Exit Point:	0.3	# of Elements:	1
Config.:	Single	Focus:	N/A
Shape:	Round	Contour:	Flat
Wedge Style:	Non-Integral		

Search Unit Cable

Type: RG-174 Length: 6' No. Conn.: 0

Scan Coverage

Upstream ☐ Downstream ☑ Scan dB: 23.4

CW ☑ CCW ☑ Scan dB: 29.4

Exam Surface: OD

Surface Condition: Ground

Cal. Checks	Time	Date
Initial Cal.	0855	4/27/2013
Inter. Cal.	1125	4/27/2013
Inter. Cal.	N/A	
Inter. Cal.	N/A	
Final Cal.	1324	4/27/2013

Couplant

Cal. Batch: 12M020

Type: Ultragel II

Mfg.: Sonotech

Exam Batch: 12M020

Type: Ultragel II

Mfg.: Sonotech

Reference Block

Serial No.: CAL-RHOM-081

Type: SS Rompas

Axial Orientated Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
1.5" NOTCH	80%	6.7	2.12"
N/A			
N/A			
N/A			
N/A			

Circumferential Orientated Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
N/A			
N/A			
N/A			
N/A			

Reference/Simulator Block

Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
11.4	FSDH	20%	3.4	1.06"
N/A				
N/A				

Recoidable Indication(s): Yes ☐ No ☑ (If Yes, Ref. Attached Ultrasonic Indication Report.)

Results: Accept ☑ Reject ☐ Info ☐

Comments: NONE

Percent Of Coverage Obtained > 90%: No - 50% Reviewed Previous Data: Yes

Examiner	Level II	Signature	Date	Reviewer	Signature	Date
Olson, Chad M.		Chad Olson	4/27/2013	Setzer, James / Level III		4.30.13
Examiner	Level N/A	Signature	Date	Site Review	Signature	Date
N/A				Linden, Randy T. / Level III		4-30-13
Other	Level N/A	Signature	Date	ANII Review	Signature	Date
N/A				Young, Charles	Charles Young	5-1-13

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Figure 3RR-21.52

UT Calibration/Examination

Site/Unit:	SSES / 2	Procedure:	NDE-UT-002	Outage No.:	U2-16RIO
Summary No.:	2-R1.11.0047	Procedure Rev.:	6	Report No.:	UT-13-068
Workscope:	ISI	Work Order No.:	1502204	Page:	2 of 4

Code: ASME 1998 Ed/2000 Add | Cat./Item: R-A/R1.11 | Location:

Drawing No.: ISI-DCA-210-2 | Description: V-P

System ID: RHR

Component ID: DCA2102-FW-8 | Size/Length: 1.2" / 76" | Thickness/Diameter: 1.3" / 24"

Limitations: NO SCANS PERFORMED UPSTREAM DUE TO VALVE | Start Time: 1150 | Finish Time: 1210

Instrument Settings

Serial No.:	0229NY		
Manufacturer:	GEIT		
Model:	USN 60 SW	Linearity:	L-13-023
Delay:	9.2319	Range:	4.5
M'tl Cal/Vel:	0.2360	Pulser Type:	Square
Damping:	500 Ohms	Reject:	0%
PRF:	Auto High	SU Freq.:	2.0 MHz
Frequency:	2.0 MHz	Rectify:	Fullwave
Voltage:	450	Pulse Width:	250
Ax. Gain (dB):	53	Circ. Gain (dB):	N/A

10 Screen Div. = 4.5 in. of Sound Path

Calibration Block

Cal. Block No.:	P-107		
Thickness:	0.50 - 2.0	Dia.:	Flat
Cal. Blk. Temp.:	73°F	Temp. Tool:	281427
Comp. Temp.:	72°F	Temp. Tool:	281427

Recordable Indication(s): Yes ☐ No ☑

Results: Accept ☑ Reject ☐ Info ☐

Search Unit

Serial No.:	02-242		
Manufacturer:	RTD		
Size:	2(10x18) mm	Model:	60° TRL2-Aust
Freq.:	2.0 MHz	Center Freq.:	N/A
Exam Angle:	60°	Squint Angle:	N/A
Measured Angle:	60°	Mode:	Long.
Exit Point:	.45	# of Elements:	2
Config.:	Dual SBS	Focus:	FS-40mm
Shape:	Rect.	Contour:	Flat
Wedge Style:	Integral		

Search Unit Cable

Type: RG-174 Length: 6' No. Conn.: 0

Scan Coverage

Upstream ☐ Downstream ☑ Scan dB: 53.0

CW ☐ CCW ☐ Scan dB: N/A

Exam Surface: OD

Surface Condition: Ground

(If Yes, Ref. Attached Ultrasonic Indication Report.)

Cal. Checks	Time	Date
Initial Cal.	0907	4/27/2013
Inter. Cal.	1149	4/27/2013
Inter. Cal.	N/A	
Inter. Cal.	N/A	
Final Cal.	1321	4/27/2013

Couplant

Cal. Batch:	12M020
Type:	Ultragel II
Mfg.:	Sonotech
Exam Batch:	12M020
Type:	Ultragel II
Mfg.:	Sonotech

Reference Block

Serial No.: CAL-RHOM-081

Type: SS Rompas

Axial Orientated Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
1.5" NOTCH	80%	6.9	2.93"
N/A			
N/A			
N/A			
N/A			

Circumferential Orientated Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
N/A			
N/A			
N/A			
N/A			

Reference/Simulator Block

Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
50	NSDH	80%	1.7	0.70"
N/A				
N/A				

Comments: NONE

Percent Of Coverage Obtained > 90%: No - 50% Reviewed Previous Data: Yes

Examiner	Level II	Signature	Date	Reviewer	Signature	Date
Olson, Chad M.			4/27/2013	Setzer, James / Level III		4-29-13
Examiner	Level N/A	Signature	Date	Site Review	Signature	Date
N/A				Linden, Randy T. / Level III		4-30-13
Other	Level N/A	Signature	Date	ANII Review	Signature	Date
N/A				Young, Charles		5-1-13

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Figure 3RR-21.53

ppl

Supplemental Report

Report No.: UT-13-068
Page: 3 of 4

Summary No.: 2-R1.11.0047

Examiner:	Olson, Chad M.	Level:	II	Reviewer:	Setzer, James / Level III	Date: 4-29-13
Examiner:	N/A	Level:	N/A	Site Review:	Linden, Randy T. / Level III	Date: 4-30-13
Other:	N/A	Level:	N/A	ANII Review:	Young, Charles	Date: 5-1-13

Comments: code Coverage Plot

Sketch or Photo:

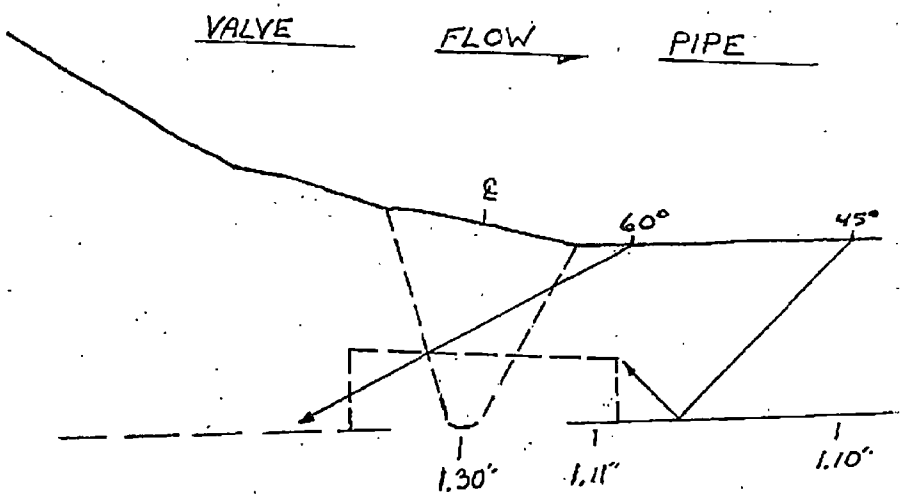

Figure 3RR-21.54

UT Calibration/Examination

Site/Unit:	SSES / 2	Procedure:	NDE-UT-002	Outage No.:	U2-16RIO
Summary No.:	2-R1.11.0048	Procedure Rev.:	6	Report No.:	UT-13-067
Workscope:	ISI	Work Order No.:	1502204	Page:	1 of 6

Code: ASME 1998 Ed/2000 Add | Cat./Item: R-A/R1.11 | Location: R-400

Drawing No.: ISI-DCA-210-2 | Description: P-V

System ID: RHR

Component ID: DCA2102-FW-9 | Size/Length: 1.25" / 75.5" | Thickness/Diameter: 1.28" / 24"

Limitations: NO SCANS PERFORMED FROM DOWNSTREAM SIDE DUE TO VALVE | Start Time: 1223 | Finish Time: 1243

Instrument Settings

Serial No.:	0229NY		
Manufacturer:	GEIT		
Model:	USN 60 SW	Linearity:	L-13-023
Delay:	6.7138	Range:	3.2
M'tl Cal/Vel:	0.1236	Pulser Type:	Square
Damping:	500 Ohms	Reject:	0%
PRF:	Auto High	SU Freq.:	1.5 MHz
Frequency:	2.0 MHz	Rectify:	Fullwave
Voltage:	450	Pulse Width:	330

Ax. Gain (dB): 11.4 | Circ. Gain (dB): N/A

10 Screen Div. = 3.2 in. of Sound Path

Calibration Block

Cal. Block No.: P-107

Thickness: 0.50 - 2.0 | Dia.: Flat

Cal. Blk. Temp.: 73° | Temp. Tool: 281427

Comp. Temp.: 72° | Temp. Tool: 281427

Search Unit

Serial No.:	01JP21		
Manufacturer:	KBA		
Size:	0.50"	Model:	Comp-G
Freq.:	1.5 MHz	Center Freq.:	N/A
Exam Angle:	45°	Squint Angle:	N/A
Measured Ang'e:	45°	Mode:	Shear
Exit Point:	0.3	# of Elements:	1
Config.:	Single	Focus:	N/A
Shape:	Round	Contour:	Flat

Wedge Style: Non-Integral

Search Unit Cable

Type: RG-174 | Length: 6' | No. Conn.: 0

Scan Coverage

Upstream ☑ Downstream ☐ Scan dB: 23.4

CW ☑ CCW ☑ Scan dB: 29.4

Exam Surface: OD

Surface Condition: Ground

Cal. Checks	Time	Date
Initial Cal.	0855	4/27/2013
Inter. Cal.	1221	4/27/2013
Inter. Cal.	N/A	
Inter. Cal.	N/A	
Final Cal.	1324	4/27/2013

Couplant

Cal. Batch:	12M020
Type:	Ultragel II
Mfg.:	Sonotech
Exam Batch:	12M020
Type:	Ultragel II
Mfg.:	Sonotech

Reference Block

Serial No.: CAL-RHOM-081

Type: SS Rompas

Axial Orientated Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
1.5" NOTCH	80%	6.7	2.12"
N/A			
N/A			
N/A			
N/A			

Circumferential Orientated Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
N/A			
N/A			
N/A			
N/A			

Reference/Simulator Block

Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
11.4	FSDH	20%	3.4	1.06"
N/A				
N/A				

Recordable Indication(s): Yes ☐ No ☑ (If Yes, Ref. Attached Ultrasonic Indication Report.)

Results: Accept ☑ Reject ☐ Info ☐

Comments: NONE

Percent Of Coverage Obtained > 90%: No - 50% | Reviewed Previous Data: Yes

Examiner	Level II	Signature	Date	Reviewer	Signature	Date
Olson, Chad M.		Chad Olson	4/27/2013	Setzer, James / Level III		4-29-13
Examiner	Level N/A	Signature	Date	Site Review	Signature	Date
N/A				Linden, Randy T. / Level III		4/30/13
Other	Level N/A	Signature	Date	ANII Review	Signature	Date
N/A				Young, Charles		5-1-13

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Figure 3RR-21.55

UT Calibration/Examination

Site/Unit:	SSES / 2	Procedure:	NDE-UT-002	Outage No.:	U2-16RIO
Summary No.:	2-R1.11.0048	Procedure Rev.:	6	Report No.:	UT-13-067
Workscope:	ISI	Work Order No.:	1502204	Page:	2 of 6

Code: ASME 1998 Ed/2000 Add | Cat./Item: R-A/R1.11 | Location: R-400

Drawing No.: ISI-DCA-210-2 | Description: P-V

System ID: RHR

Component ID: DCA2102-FW-9 | Size/Length: 1.25" / 75.5" | Thickness/Diameter: 1.28" / 24"

Limitations: NO SCANS PERFORMED FROM DOWNSTREAM SIDE DUE TO VALVE | Start Time: 1247 | Finish Time: 1305

Instrument Settings

Serial No.:	0229NY		
Manufacturer:	GEIT		
Model:	USN 60 SW	Linearity:	L-13-023
Delay:	9.2319	Range:	4.5
M'tl Cal/Vel:	0.2380	Pulser Type:	Square
Damping:	500 Ohms	Reject:	0%
PRF:	Auto High	SU Freq.:	2.0 MHz
Frequency:	2.0 MHz	Rectify:	Fullwave
Voltage:	450	Pulse Width:	250
Ax. Gain (dB):	53.0	Circ. Gain (dB):	N/A

10 Screen Div. = 4.5 in. of Sound Path

Calibration Block

Cal. Block No.:	P-107		
Thickness:	0.50 - 2.0	Dia.:	Flat
Cal. Blk. Temp.:	73°F	Temp. Tool:	281427
Comp. Temp.:	72°F	Temp. Tool:	281427

Recordable Indication(s): Yes ☑ No ☐

Results: Accept ☑ Reject ☐ Info ☐

Search Unit

Serial No.:	02-242		
Manufacturer:	RTD		
Size:	2(10x18) mm	Model:	60° TRL2-Aust
Freq.:	2.0 MHz	Center Freq.:	N/A
Exam Angle:	60°	Squint Angle:	N/A
Measured Angle:	60°	Mode:	LONG
Exit Point:	0.45	# of Elements:	2
Config.:	Dual SBS	Focus:	FS-40mm
Shape:	Rect.	Contour:	Flat
Wedge Style:	Integral		

Search Unit Cable

Type: RG-174 Length: 6' No. Conn.: 0

Scan Coverage

Upstream ☑ Downstream ☐ Scan dB: 53.0

CW ☐ CCW ☐ Scan dB: N/A

Exam Surface: OD

Surface Condition: Ground

(If Yes, Ref. Attached Ultrasonic Indication Report.)

Cal. Checks	Time	Date
Initial Cal.	0907	4/27/2013
Inter. Cal.	1245	4/27/2013
Inter. Cal.	N/A	
Inter. Cal.	N/A	
Final Cal.	1321	4/27/2013

Couplant

Cal. Batch:	12M020
Type:	Ultragel II
Mfg.:	Sonotech
Exam Batch:	12M020
Type:	Ultragel II
Mfg.:	Sonotech

Reference Block

Serial No.: CAL-RHOM-081

Type: SS Rompas

Axial Orientated Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
1.5" NOTCH	80%	6.9	2.93"
N/A			
N/A			
N/A			
N/A			

Circumferential Orientated Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
N/A			
N/A			
N/A			
N/A			

Reference/Simulator Block

Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
50	NSDH	80%	1.7	0.70"
N/A				
N/A				

Comments: None

Percent Of Coverage Obtained > 90%: No - 50% Reviewed Previous Data: Yes

Examiner	Level II	Signature	Date	Reviewer	Signature		Date
Olson, Chad M.			4/27/2013	Setzer, James / Level III			4.29-13
Examiner	Level N/A	Signature	Date	Site Review	Signature		Date
N/A				Linden, Randy T. / Level III			4.30.13
Other	Level N/A	Signature	Date	ANII Review	Signature		Date
N/A				Young, Charles			5-1-13

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Figure 3RR-21.56

ppl

Supplemental Report

Report No.: UT-13-067
Page: 3 of 6

Summary No.: 2-R1.11.0048

Examiner:	Olson, Chad M.	Level:	II	Reviewer:	Setzer, James / Level III	Date: 4-29-13
Examiner:	N/A	Level:	N/A	Site Review:	Linden, Randy T. / Level III	Date: 4.30.13
Other:	N/A	Level:	N/A	ANII Review:	Young, Charles	Date: 5-1-13

Comments: Code Coverage Plot

Sketch or Photo:

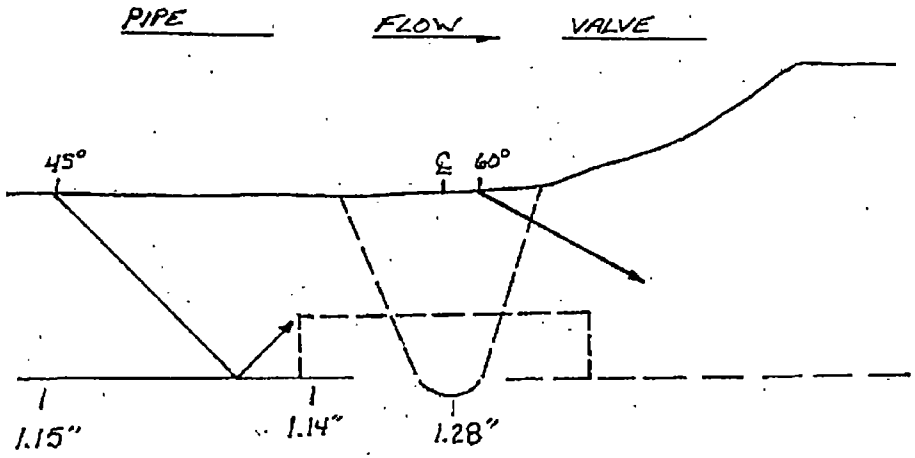


Figure 3RR-21.57

ppl

Supplemental Report

Report No.: UT-13-067
Page: 4 of 6

Summary No.: 2-R1.11.0048

Examiner: Olson, Chad M. Level: II Reviewer: Setzer, James / Level III Date: 4-29-13

Examiner: N/A Level: N/A Site Review: Linden, Randy T. / Level III Date: 4.30.13

Other: N/A Level: N/A ANII Review: Young, Charles Date: 5-1-13

Comments: Indication Plot

Sketch or Photo:

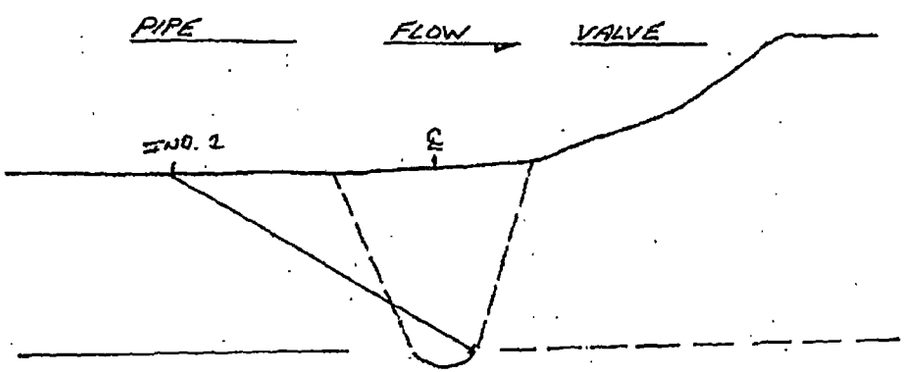


Figure 3RR-21.58

Ultrasonic Indication Report

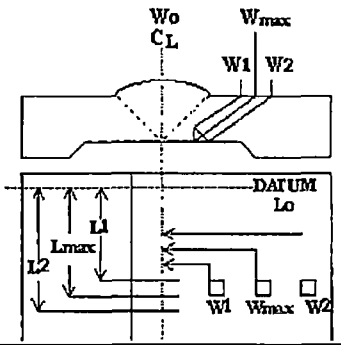
Site/Unit:	SSES / 2	Procedure:	NDE-UT-002	Outage No.:	U2-16RIO
Summary No.:	2-R1.11.0048	Procedure Rev.:	6	Report No.:	UT-13-067
Workscope:	ISI	Work Order No.:	1502204	Page:	6 of 6

Search Unit Angle: 60 °

Wo Location: WELD

Lo Location: TDC

(•) Piping Welds
( ) Ferritic Vessels ≥ 2"T
( ) Other _____



MP	Metal Path	Wmax	Distance From Wo To S.U. At Maximum Response
RBR	Remaining Back Reflection	W1	Distance From Wo At Of Max (Forward)
L	Distance From Datum	W2	Distance From Wo At Of Max (Backward)

Comments:

Angle	Indication No.	% Of DAC	W Max W	W Max MP	Forward Of Max W1	Forward Of Max MP	Backward Of Max W2	Backward Of Max MP	L1 Of Max	L Max	L2 Of Max	RBR Amp.	Remarks
60°	1	110%	1.7"	2.22"	N/A	N/A	N/A	N/A	N/A	72"	N/A	N/A	ROOT GEOMETRY INTERMITTENT 360°

Examiner	Level II	Signature	Date	Reviewer	Signature	Date
Olson, Chad M.			4/27/2013	Setzer, James / Level III		4-29-13
Examiner	Level N/A	Signature	Date	Site Review	Signature	Date
N/A				Linden, Randy T. / Level III		4-30-13
Other	Level N/A	Signature	Date	ANII Review	Signature	Date
N/A				Young, Charles		5-1-13

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Figure 3RR-21.59