

JAN 7 2004

L-PI-04-005
10 CFR 50.55a

U S Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555


PRAIRIE ISLAND NUCLEAR GENERATING PLANT
DOCKET NO. 50-306
LICENSE NO. DPR-60

SUBJECT: REQUEST FOR RELIEF NO. 16, REVISION 0, FOR THE UNIT 2 3RD
10-YEAR INTERVAL INSERVICE INSPECTION PROGRAM

On November 15, 1994 we submitted for review our third 10-year Inservice Inspection Examination Plan for Unit 2 and, on April 19, 1995, relief request revisions associated with that plan. The NRC issued its evaluation of the 3rd 10-year Interval Program Plan on February 22, 1996.

The purpose of this letter is to submit a relief request for "limited examinations" associated with that plan. Attached is Unit 2 Relief Request No. 16, Revision 0 which addresses those limited examinations. We are requesting relief pursuant to 10 CFR Part 50, Section 50.55a(g)(5)(iii) due to the impracticality of obtaining "100%" examination coverage for the affected items.

This letter contains no new commitments and no revisions to existing commitments. Please contact Jack Leveille (651-388-1121, Ext. 4142) if you have any questions related to this letter.


Joseph M. Solymosy
Site Vice President, Prairie Island Nuclear Generating Plant

cc: (see next page)

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NUCLEAR MANAGEMENT COMPANY, LLC

cc: Regional Administrator, USNRC, Region III
Project Manager, Prairie Island Nuclear Generating Plant, USNRC, NRR
NRC Resident Inspector – Prairie Island Nuclear Generating Plant
Chief Boiler Inspector, State of Minnesota
P. Fisher, Hartford Insurance

Enclosure: ISI Relief Request No. 16 (Rev. 0), Prairie Island Unit 2, 3rd Interval, with
attached examination reports and Prairie Island Procedure SWI NDE-LTS-1,
"Limitations to NDE"

ENCLOSURE

**NUCLEAR MANAGEMENT COMPANY, LLC
PRAIRIE ISLAND NUCLEAR GENERATING PLANT
DOCKET NO. 50-306**

January 2004

ISI Relief Request No. 16 (Rev. 0), Prairie Island Unit 2, 3rd Interval

This enclosure consists of a 10 page write-up, entitled, "ISI Relief Request No. 16 (Rev. 0), Prairie Island Unit 2, 3rd Interval" and the following attachments:

- Attachment 1, Drawing No. 2-ISI-41, 1 page
- Attachment 2, Inspection Report No. 2003U033, 4 pages
- Attachment 3, Inspection Report No. 2000U156, 26 pages
- Attachment 4, Drawing No. 2-ISI-33B, 1 page
- Attachment 5, Inspection Report No. 2003U005, 6 pages
- Attachment 6, Drawing No. 2-ISI-21, 1 page
- Attachment 7, Inspection Report No. 2003U002, 6 pages
- Attachment 8, Inspection Report No. 2003P012, 4 pages
- Attachment 9, Drawing No. 2-ISI-29, 1 page
- Attachment 10, Inspection Report No. 2003U040, 5 pages
- Attachment 11, Drawing No. 2-ISI-11, 1 page
- Attachment 12, Inspection Report No. 2003U015, 4 pages
- Attachment 13, Drawing No. 2-ISI-69B, 1 page
- Attachment 14, Inspection Report No. 2003U035, 5 pages
- Attachment 15, Drawing No. 2-ISI-90A, 1 page
- Attachment 16, Inspection Report No. 2003U010, 4 pages
- Attachment 17, Inspection Report No. 2003U011, 4 pages
- Attachment 18, Drawing No. 2-ISI-93A, 1 page
- Attachment 19, Inspection Report No. 2003U026, 4 pages
- Attachment 20, Drawing No. 2-ISI-46B, 1 page
- Attachment 21, Inspection Report No. 2003U029, 3 pages
- Attachment 22, Prairie Island Procedure SWI NDE-LTS-1, "Limitations to NDE"
13 pages

Limited Examination

SYSTEM: Various
CATEGORY: Various

CLASS: 1 and 2
ITEM NO: Various

Impractical Examination Requirements:

ASME Section XI (1989 Edition, no addenda) Code requires full examination coverage of inservice inspection (ISI) components per Table IWB-2500-1, and IWC-2500-1. NRC Regulatory Guide 1.147 endorses the use of Section XI Code Case N-460, "Alternative Examination Coverage for Class 1 and Class 2 Welds." This code case allows greater than 90% coverage of a weld to meet the "essentially 100%" requirement.

In addition, NRC Information Notice 98-42 "Implementation of 10 CFR 50.55a(g) Inservice Inspection requirements" dated Dec. 1, 1998, states, "The NRC has adopted and further refined the definition of 'essentially 100 percent' to mean 'greater than 90 percent' in 10 CFR 50.55a(g)(6)(ii)(A)(2) for required examination coverage of reactor pressure vessel welds. This standard has been applied to all examination of welds or other areas required by ASME Section XI.

The Prairie Island construction permit was issued in 1967. This facility was designed and constructed with limited accessibility due to component configurations and/or physical barriers for which 100% examination coverage is not achievable on some ISI components examined for the Third Ten Year Interval.

Basis for Relief:

This request is submitted pursuant to 10 CFR 50.55a(g)(5)(iv) which states, "Where an examination requirement by the code or addenda is determined to be impractical by the licensee and is not included in the revised inservice inspection program as permitted by paragraph (g)(4) of this section, the basis for this determination must be demonstrated to the satisfaction of the Commission."

The regulation further states in 10 CFR 50.55a(g)(1) that, "For a boiling or pressurized water-cooled nuclear power facility whose construction permit was issued before January 1, 1971, components (including supports) must meet the requirements of paragraphs (g) (4) and (g)(5) of this section to the extent practical." 10 CFR 50.55a(g)(4) states, "Throughout the service life of a boiling or pressurized water-cooled nuclear power facility, components (including supports) which are classified as ASME Code Class 1, Class 2, and Class 3 must meet the requirements, except design and access provisions and preservice examination requirements, set forth in Section XI of editions of the ASME Boiler and Pressure Vessel Code ... to the extent practical within the limitations of design, geometry and materials of construction of the components."

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Prairie Island was designed and constructed prior to development of ASME XI, therefore design for accessibility and inspection coverage is not in many cases, sufficient to permit satisfying the current Code requirements. Limitations to inspections are primarily due to design obstructions, component configurations and interference. In the case of circumferential welds a limitation from ultrasonic examination may exist simply because of weld joint configuration as with a pipe to valve or fitting weld.

A summary of the limited examinations are described below and also included in Table 1, "Limited Examinations – Prairie Island Unit 2 – 2003 Refueling Outage."

Part A: Category B-A, "Pressure Retaining Welds In Reactor Vessel"

Reactor Vessel (RV) Weld (W-6), Head to Flange:

The RV head-to-flange weld is subject to volumetric and surface examination. In addition to Section XI Code requirements the volumetric examination was performed pursuant to the requirements of Regulatory Guide 1.150. The material of the head is carbon steel. The weld was examined, to the maximum extent practical, using a 0-degree longitudinal wave and 45 and 60-degree shear waves. Supplemental ultrasonic techniques were considered to extend examination coverage of the weld required volume (WRV). It was determined that no significant additional coverage could be obtained. As an alternative to the ultrasonic examination, radiography was considered and determined to be an unacceptable substitute due to radiological constraints, weld configuration, and the undue hardship imposed without offering any commensurate increase in safety with cost benefit.

This weld was examined in three separate sections throughout the 3rd Interval. Limitations of one-third of the weld from 0' to 12' was approved by the staff on August 8, 2000 per Unit 2 Relief Request #8. This request for relief represents the remaining two-thirds of the weld, 12' to 24' and 24' to 36'.

The required volumetric examination of the WRV was limited from the flange side of the weld due to weld joint configuration and close proximity of the flange to the intersecting radius of the reactor head. In addition, there are two 5.5 inch wide lifting lugs located approximately 120 degrees apart and 3 inches from the toe of the weld on the head that prevent 100% scanning and axial coverage from the head side of the weld. The axial WRV was limited to approximately 43.4% using a 45-degree shear wave and 41.9% using a 60-degree shear wave. Circumferential scanning in the clockwise and counterclockwise direction of the WRV was limited to 66.7% again by the flange and could only be performed on the head side of the weld. The credited volumetric examination of the WRV was limited to 58.68%.

The Ultrasonic reflectors recorded with this examination are within the outer 75% of through-wall thickness, are not surface related and are not suspected to being cracks.

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The required surface examinations were performed using magnetic particle and were not limited. 100% of the required surface area was inspected (Inspection Report Nos. 2000M093 and 2003M004). No relevant indications were detected.

The weld is included in the boundary examined by VT-2 during pressure testing (SP 2070, "Reactor Coolant System Integrity Test," completed on 6/5/2000 and 10/8/2003).

The following supporting documentation is provided:

Attachment 1, ISI Drawing 2-ISI-41

Attachment 2, Examination Report Number 2003U033

Attachment 3, Examination Report Number 2000U156

Part B: Category B-J, "Pressure Retaining Welds in Piping"

Reactor Coolant (RC) Weld (W-6/2LSU) Elbow to Pump:

This piping weld is subject to be examined by both volumetric and surface examination methods. The volumetric examination was performed using personnel and procedures qualified in accordance with Appendix III. The examination was conducted using 45 refracted longitudinal transducers. The pump and piping elbow material are cast austenitic stainless steel. In addition, the attenuation of the cast stainless material of the pump and elbow impedes the examination and use of other angles. The examination is limited to 48% in the axial direction and 90% in the circumferential direction from the piping elbow side of the weld due to the weld joint configuration connection to the pump. The credited volumetric examination of the WRV was limited to 69% and only a single-sided examination could be performed. The techniques employed for the examination provide for a best effort examination. As an alternative to the ultrasonic examination, radiography was considered and determined to be an unacceptable substitute due to radiological constraints, weld configuration, and the undue hardship imposed without offering any commensurate increase in safety with cost benefit.

The required surface examination was performed using liquid penetrant and was not limited. 100% of the required surface area was inspected (Inspection Report No. 2003P019). No relevant indications were detected.

The weld is included in the boundary examined by VT-2 during pressure testing (SP 2070, "Reactor Coolant System Integrity Test," completed on 10/8/2003).

The following supporting documentation is provided:

Attachment 4, ISI Drawing 2-ISI-33B

Attachment 5, Examination Report Number 2003U005

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Safety Injection (SI) Weld (W-2), Elbow to Pipe:

This piping weld is subject to be examined by both volumetric and surface examination methods. The volumetric examination was performed using personnel and procedures qualified in accordance with Appendix VIII, Supplement 2. The examination was conducted using 45 and 60-degree transducers. The elbow and piping material are austenitic stainless steel. The examination is limited to 34.5% in the axial direction and 44% in the circumferential direction due to four welded support lugs covering the weld. The credited volumetric examination of the WRV was limited to 39.25%. The techniques employed for the examination provide for a best effort examination. As an alternative to the ultrasonic examination, radiography was considered and determined to be an unacceptable substitute due to radiological constraints, weld configuration, and the undue hardship imposed without offering any commensurate increase in safety with cost benefit.

The required surface examination was performed using liquid penetrant. This exam was limited due to four welded support lugs covering the weld. 52.9% of the required surface area was inspected. Alternative exams would be subject to the same limitations. No relevant indications were detected.

The weld is included in the boundary examined by VT-2 during pressure testing (SP 2070, "Reactor Coolant System Integrity Test," completed on 10/8/2003). The following supporting documentation is provided:

Attachment 6, ISI Drawing 2-ISI-21

Attachment 7, Examination Report Number 2003U002

Attachment 8, Examination Report Number 2003P012

Safety Injection (SI) Weld (W-3), Pipe to Elbow:

This piping weld is subject to be examined by both volumetric and surface examination methods. The volumetric examination was performed using personnel and procedures qualified in accordance with Appendix VIII, Supplement 2. The examination was conducted using 45 and 60-degree transducers. The elbow and piping material are austenitic stainless steel. The examination is limited to 50% in the axial direction due to a non-removable restraint on the upstream side of the weld. 100% of the circumferential direction was examined. The credited volumetric examination of the WRV was limited to 75% and only a single-sided examination could be performed for the axial direction. It should be noted that the volumetric examination was performed through 100% of the Code WRV; however, the Performance Demonstration Initiative (PDI) Appendix VIII procedure used is not qualified for the detection of flaws on the far side of single sided access examinations on austenitic stainless steel piping welds. The techniques employed for the examination provide for a best effort examination. As an alternative to the ultrasonic examination, radiography was considered and determined to be an unacceptable substitute due to radiological constraints, weld

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configuration, and the undue hardship imposed without offering any commensurate increase in safety with cost benefit.

The required surface examination was performed using liquid penetrant and was not limited. 100% of the required surface area was inspected (Inspection Report No. 2003P057). No relevant indications were detected.

The weld is included in the boundary examined by VT-2 during pressure testing (SP 2070, "Reactor Coolant System Integrity Test," completed on 10/8/2003).

The following supporting documentation is provided:

Attachment 9, ISI Drawing 2-ISI-29

Attachment 10, Examination Report Number 2003U040

Reactor Coolant (RC) Weld (W-12), Nozzle to Pipe:

This piping branch connection weld is subject to be examined by both volumetric and surface examination methods. The volumetric examination was performed using personnel and procedures qualified in accordance with Appendix VIII, Supplement 2. The examination was conducted using a 45-degree transducer. No 60-degree refracted longitudinal examination was performed due to technique limitations based on material thicknesses and component diameter considerations that are outside the qualified typical equipment parameters of Table 1 of the PDI document.

The branch nozzle connection to the reactor coolant piping material is austenitic stainless steel. The examination is limited to 50% in both the axial and circumferential directions from the nozzle side of the weld due to the weld joint configuration of the branch connection to the process pipe. The credited volumetric examination of the WRV was limited to 50% and only a single-sided examination could be performed. It should be noted that the volumetric examination was performed through 100% of the Code WRV; however, the PDI Appendix VIII procedure used is not qualified for the detection of flaws on the far side of single sided access examinations on austenitic stainless steel piping welds. The techniques employed for the examination provide for a best effort examination. As an alternative to the ultrasonic examination, radiography was considered and determined to be an unacceptable substitute due to radiological constraints, weld configuration, and the undue hardship imposed without offering any commensurate increase in safety with cost benefit.

The required surface examination was performed using liquid penetrant and was not limited. 100% of the required surface area was (Inspection Report No. 2003P020). No relevant indications were detected.

The weld is included in the boundary examined by VT-2 during pressure testing (SP 2070, "Reactor Coolant System Integrity Test," completed on 10/8/2003).

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The following supporting documentation is provided:

Attachment 11, ISI Drawing 2-ISI-11

Attachment 12, Examination Report Number 2003U015

Part C: Category C-A "Pressure Retaining Welds in Pressure Vessels"

Residual Heat Removal (RH) Weld (W-1), Head to Shell:

This head to shell weld is subject to be examined by volumetric examination method. The volumetric examination was performed using personnel and procedures qualified in accordance with Appendix III. The examination was conducted using a 45 and 60-degree transducers. The head and shell materials are austenitic stainless steel. The examination is limited in all scan directions due to outlet / inlet nozzle reinforcing rings and two welded supports. The credited volumetric examination of the WRV was limited to 74%. The techniques employed for the examination provide for a best effort examination. As an alternative to the ultrasonic examination, radiography and liquid penetrant was considered and determined to add no examination area due to limited accessibility.

The weld is included in the boundary examined by VT-2 during pressure testing (SP 2168.10, "RHR System Pressure Test," completed 10/7/2003).

The following supporting documentation is provided:

Attachment 13, ISI Drawing 2-ISI-69B

Attachment 14, Examination Report Number 2003U035

Part D: Category C-F-1 "Pressure Retaining Welds in Austenitic Stainless Steel or High Alloy Piping"

Safety Injection (SI) Weld (W-11), Valve to Elbow:

This piping weld is subject to be examined by both volumetric and surface examination methods. The volumetric examination was performed using personnel and procedures qualified in accordance with Appendix VIII, Supplement 2. The examination was conducted using 45 and 70-degree transducers. The elbow and piping material are austenitic stainless steel. The examination is limited to 50% in both the axial and circumferential directions from the piping side of the weld due to the weld joint configuration connection to the valve. The credited volumetric examination of the WRV was limited to 50% and only a single-sided examination could be performed. It should be noted that the volumetric examination was performed through 100% of the Code WRV; however, the PDI Appendix VIII procedure used is not qualified for the detection of flaws on the far side of single sided access examinations on austenitic stainless steel piping welds. The techniques employed for the examination provide for a best effort examination. As an alternative to the ultrasonic examination, radiography

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was considered and determined to be an unacceptable substitute due to radiological constraints, weld configuration, and the undue hardship imposed without offering any commensurate increase in safety with cost benefit.

The required surface examination was performed using liquid penetrant and was not limited. 100% of the required surface area was inspected (Inspection Report No. 2003P014). No relevant indications were detected.

The weld is included in the boundary examined by VT-2 during pressure testing (SP 2168.13, "Safety Injection System Pressure Test." This test has not been completed in its entirety; however the portion of piping that includes this weld has been completed per this SP).

The following supporting documentation is provided:

Attachment 15, ISI Drawing 2-ISI-90A

Attachment 16, Examination Report Number 2003U010

Safety Injection (SI) Weld (W-14), Elbow to Valve:

This piping weld is subject to be examined by both volumetric and surface examination methods. The volumetric examination was performed using personnel and procedures qualified in accordance with Appendix VIII, Supplement 2. The examination was conducted using 45 and 70-degree transducers. The valve and piping material are austenitic stainless steel. The examination is limited to 50% in both the axial and circumferential directions from the piping elbow side of the weld due to the weld joint configuration connection. The credited volumetric examination of the WRV was limited to 50% and only a single-sided examination could be performed. It should be noted that the volumetric examination was performed through 100% of the Code WRV; however, the PDI Appendix VIII procedure used is not qualified for the detection of flaws on the far side of single sided access examinations on austenitic stainless steel piping welds. The techniques employed for the examination provide for a best effort examination. As an alternative to the ultrasonic examination, radiography was considered and determined to be an unacceptable substitute due to radiological constraints, weld configuration, and the undue hardship imposed without offering any commensurate increase in safety with cost benefit.

The required surface examination was performed using liquid penetrant and was not limited. 100% of the required surface area was inspected (Inspection Report No. 2003P030). No relevant indications were detected.

The weld is included in the boundary examined by VT-2 during pressure testing (SP 2168.13, "Safety Injection System Pressure Test." This test has not been completed in its entirety; however the portion of piping that includes this weld has been completed per this SP).

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The following supporting documentation is provided:

Attachment 15, ISI Drawing 2-ISI-90A

Attachment 17, Examination Report Number 2003U011

Safety Injection (SI) Weld (W-17), Pipe to Flange:

This piping weld is subject to be examined by both volumetric and surface examination methods. The volumetric examination was performed using personnel and procedures qualified in accordance with Appendix VIII, Supplement 2. The examination was conducted using 45 and 70-degree transducers. The flange and piping material are austenitic stainless steel. The examination is limited to 50% in both the axial and circumferential directions from the piping side of the weld due to the weld joint configuration connection to the flange. The credited volumetric examination of the WRV was limited to 50% and only a single-sided examination could be performed. It should be noted that the volumetric examination was performed through 100% of the Code WRV; however, the PDI Appendix VIII procedure used is not qualified for the detection of flaws on the far side of single sided access examinations on austenitic stainless steel piping welds. The techniques employed for the examination provide for a best effort examination. As an alternative to the ultrasonic examination, radiography was considered and determined to be an unacceptable substitute due to radiological constraints, weld configuration, and the undue hardship imposed without offering any commensurate increase in safety with cost benefit.

The required surface examination was performed using liquid penetrant and was not limited. 100% of the required surface area was inspected (Inspection Report No. 2003P032). No relevant indications were detected.

The weld is included in the boundary examined by VT-2 during pressure testing (SP 2168.13, "Safety Injection System Pressure Test." This test has not been completed in its entirety; however the portion of piping that includes this weld has been completed per this SP).

The following supporting documentation is provided:

Attachment 18, ISI Drawing 2-ISI-93A

Attachment 19, Examination Report Number 2003U026

Part E: Category C-F-2 "Pressure Retaining Welds In Carbon or Low Alloy Steel Piping"

Main Steam (MS) Weld (W-36), Elbow to Pipe:

This sweepolet to Flanged Nozzle weld is subject to be examined by both volumetric and surface examination methods. The sweepolet and flange materials are carbon steel. No volumetric examination was performed due to joint configuration. At the time

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of the examination the adjacent relief valve RS-21-14 was removed for maintenance work. As an additional means of examination a VT-1 was performed on the ID (Inspection Report No. 2003V115). No relevant indications were detected. As an alternative to the ultrasonic examination, radiography was considered and determined to be an unacceptable substitute due to radiological constraints, weld configuration, and the undue hardship imposed without offering any commensurate increase in safety with cost benefit.

The required surface examination was performed using Magnetic Particle and was not limited. 100% of the required surface area was inspected (Inspection Report No. 2003M002). No relevant indications were detected.

The weld is included in the boundary examined by VT-2 during pressure testing (SP 2168.11, "Main Steam System Pressure Test," completed 9/13/2003).

The following supporting documentation is provided:

Attachment 20, ISI Drawing 2-ISI-46B
Attachment 21, Examination Report Number 2003U029

Additional Means of Establishing Component Integrity:

System integrity is monitored during normal operation by many direct and indirect methods, e.g., containment radiation monitoring, containment air monitoring, containment sump monitoring, containment temperature monitoring, system walk downs, surveillance testing, etc.

Alternate Examination:

The limitations have been noted on the ISI examination reports and are included in the 2003 ISI Outage Summary Report. NMC will continue to document limitations.

All in-service inspections at Prairie Island Unit 2 have been completed to the greatest extent practical. When limitations to required inspections are encountered, Prairie Island Procedure SWI NDE-LTS-1, "Limitations to NDE," was applied. SWI NDE-LTS-1 (Attachment 22) is used when an ASME Section XI Code required examination results in less than 90% coverage. It requires a review of the procedures to obtain maximum coverage and documentation of the limitation. The procedure also examines whether an alternative method could be used to obtain better coverage as allowed by the Code. This procedure was used for all the items identified above and the maximum inspection coverage was achieved.

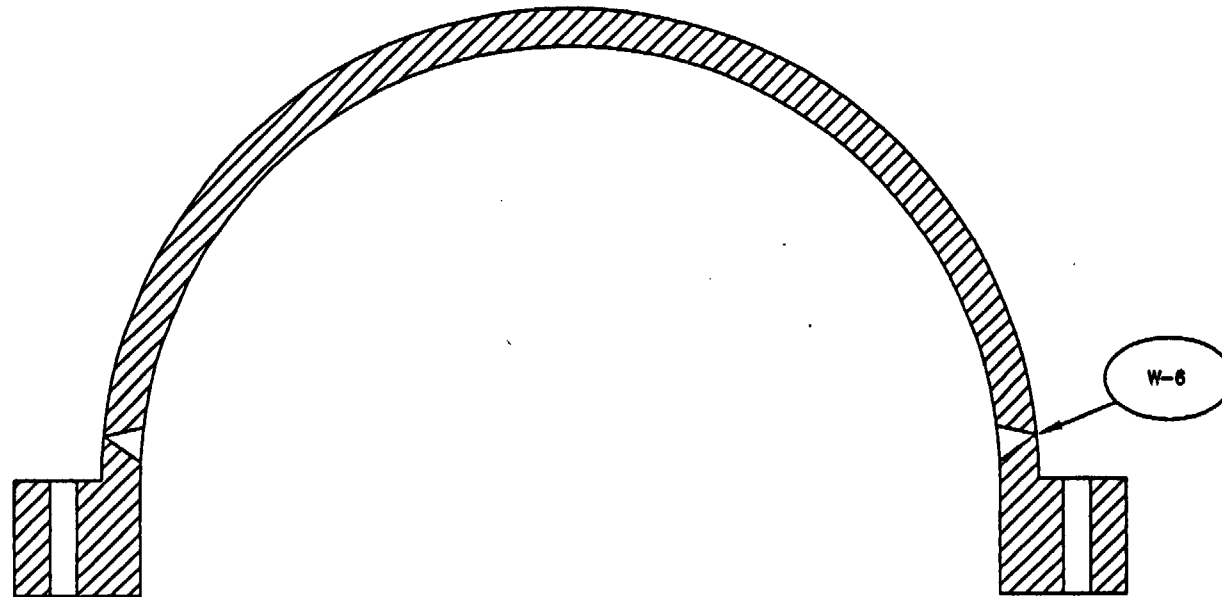
Limitations are due to design, geometry, and materials of construction of the components. NMC will continue to utilize the most current techniques available for future examinations.

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Table 1. Limited Examinations - Prairie Island Unit 2 – 2003 Refueling Outage

Category	Item No.	SYSTEM	ISO	Comp ID Summary #	Description	Method	% Coverage	REPORT	Limitation
B-A	B1.40	Reactor Vessel	2-ISI-41	W-6 501733	Head to Flange	Volumetric UT	58.68% & 58.68%	2003U033 & 2000U156	Limited to flange configuration (lifting lugs).
B-J	B9.10	Reactor Coolant	2-ISI-33B	W-6/2LSU 501145	Elbow to Pump	Volumetric UT	69%	2003U005	Limited due to configuration and material attenuation
B-J	B9.11	Safety Injection	2-ISI-21	W-2 501900	Elbow to Pipe	Volumetric UT	39.25% & 52.9%	2003U002 & 2003P012	Limited due to four welded support attachments.
B-J	B9.11	Safety Injection	2-ISI-29	W-3 501813	Pipe to Elbow	Volumetric UT	75%	2003U040	Limited due to restraint.
B-J	B9.31	Reactor Coolant	2-ISI-11	W-12 501939	Nozzle to Pipe	Volumetric UT	50%	20033U015	Limited due to Nozzle weld configuration.
C-A	C1.20	Residual Heat Removal	2-ISI69B	W-1 501477	Head to Shell	Volumetric UT	74%	2003U035	Limited due to inlet / outlet reinforcing rings and two welded supports.
C-F-1	C5.21	Safety Injection	2-ISI-90A	W-11 505055	Valve to Elbow	Volumetric UT	50%	2003U010	Limited on valve side due to configuration.
C-F-1	C5.21	Safety Injection	2-ISI-90A	W-14 505058	Elbow to Valve	Volumetric UT	50%	2003U011	Limited on valve side due to configuration.
C-F-1	C5.21	Safety Injection	2-ISI-93A	W-17 505370	Pipe to Flange	Volumetric UT	50%	2003U026	Limited on flange side due to configuration.
C-F-2	C5.51	Main Steam	2-ISI-46B	W-36 500861	Sweepolet to Flanged Nozzle	Volumetric UT	0%	2003U029	Limited due to joint configuration

REACTOR VESSEL HEAD WELD



W-6

ISI

= WELD NO.

REF:

FILE NO: 21041R05

NSP (M&SP)-PI-2

ISI

DWN: CADWorks CHKD: *Dr. K. G. APPD: Dr. K. G.*

SYSTEM: REACTOR VESSEL HEAD WELD

LINE: NA

DWG: 2-ISI-41

REV: 05



UT Vessel Examination

Site/Unit: PINGP / P12

Procedure: SWI NDE-UT-3A

Outage No.: P12RF2003

Summary No.: 501733

Procedure Rev.: 0

Report No.: 2003U033

Workscope: ISI

Work Order No.: 0305010

Page: 1 of 4

Code: 1989

Code Cat.: B-A

Location: Containment

Drawing No.: 2-ISI-41

Description: Head to Flange

System ID: RV

Component ID: W-6

Size/Length: 12'

Thickness/Diameter: 6.30"

Limitations: See attached limitation data sheet

Start Time: 1305

Finish Time: 1350

Examination Surface: Inside

Outside ☒

Surface Condition: Ground

Lo Location: Stud Hole #1

Wo Location: Centerline of Weld

Couplant: Sonotrace 40

Batch No.: #00143

Temp. Tool Mfg.: PTC Instruments

Serial No.: 3796

Surface Temp.: 84 °F

Cal. Report No.: 2003CA036, 2003CA037, 2003CA038

Angle Used

0	45	45T	60	60T	
33.3	52.3	52.3	63	63	

Scanning dB

Indication(s): Yes ☐ No ☒

Scan Coverage: Upstream ☒ Downstream ☒ CW ☒ CCW ☒

Comments:

Examined from 24' to 36'. Location: Containment

Results: NAD ☒ IND ☐ GEO ☐

Percent Of Coverage Obtained > 90%: No

Reviewed Previous Data: Yes

Examiner	Level II	Signature	Date	Reviewer	Signature	Date
Howard, Dean		<i>Dean Howard</i>	9/23/2003	Jones, Thomas	<i>Tom Jones</i>	9/24/03
Examiner	Level II	Signature	Date	Site Review	Signature	Date
Stevermer, Aaron		<i>Aaron Stevermer</i>	9/23/2003	Hanson, Shannon	<i>Shannon Hanson</i>	10/2/03
Other	Level N/A	Signature	Date	ANII Review	Signature	Date
N/A				Daly, Gerald	<i>Gerald Daly</i>	0300703

ATTACHMENT 2 PAGE 1 OF 4



Determination of Percent Coverage for UT Examinations - Vessels

Site/Unit: PIGP / PI2 Procedure: SWI NDE-UT-3A Outage No.: PI2RF2003
Summary No.: 501733 Procedure Rev.: 0 Report No.: 2003U033
Workscope: ISI Work Order No.: 0305010 Page: 2 of 4

0 deg Planar

Scan 100.000 % Length X 66.700 % volume of length / 100 = 66.700 % total for 0 deg

45 deg

Scan 1 0.000 % Length X 0.000 % volume of length / 100 = 0.000 % total for Scan 1

Scan 2 100.000 % Length X 86.800 % volume of length / 100 = 86.800 % total for Scan 2

Scan 3 100.000 % Length X 66.700 % volume of length / 100 = 66.700 % total for Scan 3

Scan 4 100.000 % Length X 66.700 % volume of length / 100 = 66.700 % total for Scan 4

Add totals and divide by # scans = 55.050 % total for 45 deg

Other deg 60

Scan 1 0.000 % Length X 0.000 % volume of length / 100 = 0.000 % total for Scan 1

Scan 2 100.000 % Length X 83.800 % volume of length / 100 = 83.800 % total for Scan 2

Scan 3 100.000 % Length X 66.700 % volume of length / 100 = 66.700 % total for Scan 3

Scan 4 100.000 % Length X 66.700 % volume of length / 100 = 66.700 % total for Scan 4

Add totals and divide by # scans = 54.300 % total for 60 deg

Percent complete coverage

Add totals for each angle and scan required and divide by # of angles to determine;

58.683 % Total for complete exam

Note:

Supplemental coverage may be achieved by use of other angles / methods. When used, the coverage for volume not obtained with angles as noted above shall be calculated and added to the total to provide the percent total for the complete examination.

Site Field Supervisor: Tom Jack L. III

Date: 9/24/03

Additional - Calculation Vessel <edit from Setup>

PAGE 2 OF 4
ATTACHMENT 2

Limitation Record

Site/Unit: PINGP / PI2
 Summary No.: 501733
 Workscope: ISI

Procedure: SWI NDE-UT-3A
 Procedure Rev.: 0
 Work Order No.: 0305010

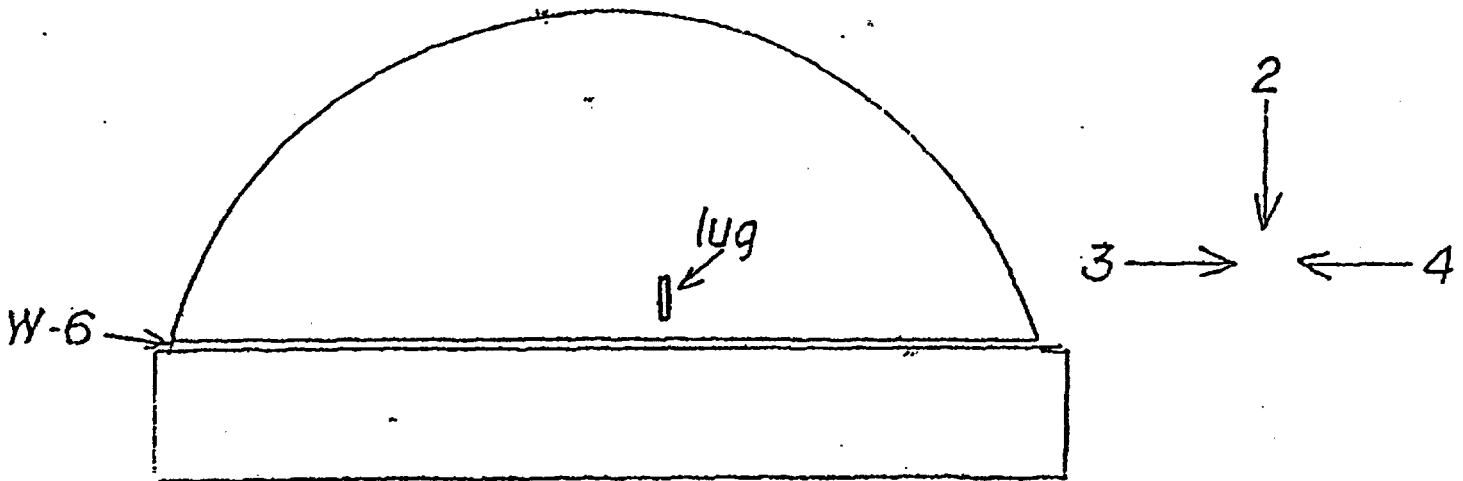
Outage No.: PI2RF2003
 Report No.: 2003U033
 Page: 3 of 4

Description of Limitation:

5.50" WIDE LIFTING LUG

Sketch of Limitation:

J:\Ideal_Photos\PI2RFO2003\UT Images\2003U033_1.bmp



Limitations removal requirements:

None

Radiation field:

Examiner	Level II	Signature	Date	Reviewer	Signature	Date
Howard, Dean		<i>Dean Howard</i>	9/23/2003	Jones, Thomas	<i>Thomas Jones</i>	9/24/03
Examiner	Level II	Signature	Date	Site Review	Signature	Date
Stevermer, Aaron		<i>Aaron Stevermer</i>	9/23/2003	Hanson, Shannon	<i>Shannon Hanson</i>	10/2/03
Other	Level N/A	Signature	Date	ANII Review	Signature	Date
N/A				Daly, Gerald	<i>Gerald Daly</i>	030CT03

Additional - Limitation <edit from Setup>

ATTACHMENT 2 PAGE 3 OF 4

Summary No.: 501733

Examiner: Howard, Dean

Level: II

Reviewer: Jones, Thomas

Date: 9/24/03

Examiner: Stevermer, Aaron

Level: II

Site Review: Hanson, Shannon

Date: 10/2/03

Other: N/A

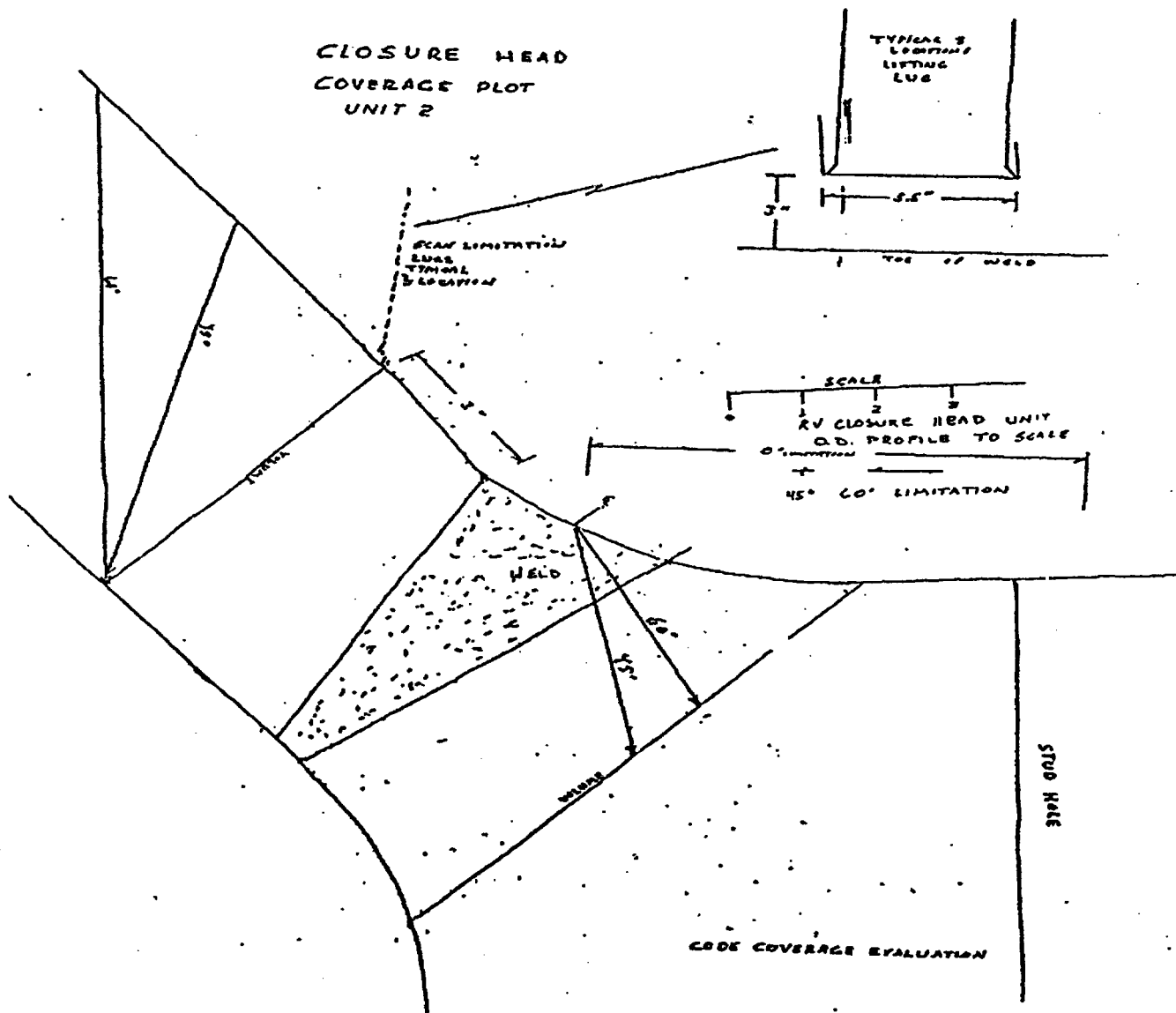
Level: N/A

ANII Review: Daly, Gerald

Date: 03 OCT 03

Comments: None

Sketch or Photo: J:\Ideal_Photos\PI2RFO2003\UT Images\2003U033_2.bmp



ATTACHMENT 2 PAGE 4 OF 4



UT Vessel Examination

Report No.: 2000U156Site/Unit: NSP / PI2Procedure: ISI-UT-3APage: 1 of 5Summary No.: 501733Procedure Revision/FC: 8 /Examination For: ISIWork Order No.: 0000232Applicable Code: 1989ISO Drawing No.: 2-Isi-41Location: ContainmentDescription: Head to FlangeSystem ID: RVComponent ID: W-6 Size/Length: N/A Thick/Dia: 6.00"Limitations: See attached limitation data sheets. Start Time: 08:00 Finish Time: 18:30Examination Surface: Inside ☐ Outside ☒ Surface Condition: BlendedTemp. Tool MFG: Telatemp Serial No.: NSP 118 Surface Temp.: 75 °F Couplant: Sonotrace 40 Batch No.: #98243Angle Used

0	45	45T	60	60T	
---	----	-----	----	-----	--

 Lo Location: Stud Hole #1 Wo Location: Centerline of WeldScanning dB

20/13	20/12	20/12	20/23	20/23	N/A
-------	-------	-------	-------	-------	-----

 Cal Sheet No.: 2000CA162, 2000CA163, 2000CA164Indication(s): Yes ☒ No ☐ Scan Coverage WRT Weld: Upstream ☐ Downstream ☒ CW ☒ CCW ☒

Comments:

Examined from 12' to 24' only.

Results: NAD ☐ IND ☒ GEO ☐Percent Of Coverage Obtained > 90%: NoReviewed Previous Data: Yes

Examiner	Level	III	Signature	Date	Reviewer	Signature	Date
Carlin, William D.			<i>W. Carlin</i>	5/20/2000	Halling, David A.	<i>D.A. Halling</i>	5/30/00
Examiner	Level	II	Signature	Date	Site Review	Signature	Date
Auer, Robert G.			<i>D.A. Halling for R.G. Auer</i>	5/20/2000	Kinney, Charles R.	<i>C. Kinney</i>	5-31-00
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A					Heater, Stephen B.	<i>S. Heater</i>	6-1-00

ATTACHMENT 3 PAGE 1 OF 26

PAGE 1 OF 26
REPORT # 2000U156



Ultrasonic Indentation Report

Report No.: 2000U156

Site/Unit: NSP / PI2

Procedure: ISI-UT-3A

Page: 2 of 5

Summary No.: 501733

Procedure Revision/FC: 8 /

Examination For: ISI

Work Order No.: 0000232

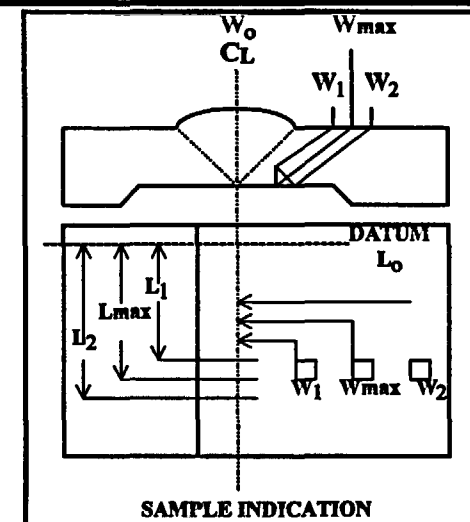
Search Unit Angle: 60 °

Wo Location: Weld Centerline

Lo Location: #1 Bolt Hole

☐ Piping Welds☒ Ferritic Vessels $\geq 2^{\circ}T$ ☐ Other

MP	Metal Path	Wmax	Distance From Wo To S.U. At Maximum Response
RBR	Remaining Back Reflection	W1	Distance From Wo At 50% Of Max (Forward)
L	Distance From Datum	W2	Distance From Wo At 50% Of Max (Forward)



Scan #	Indication No.	% Of DAC	W Max		Forward 50% Of Max		Backward 50% Of Max		L1 50% Of Max	L Max	L2 50% Of Max	RBR Amp.	Remarks
			W	MP	W1	MP	W2	MP					
2	1	27%	3.4	3.17	3.0	2.88	4.4	3.46	254.5	254.6	254.7		Adjust per Paragraph 8.3.2.a
2	2	25%	3.5	3.27	3.0	2.96	4.7	3.58	255.0	255.4	255.6		Adjust per Paragraph 8.3.2.a
2	3	26%	4.0	3.64	3.2	3.36	4.6	3.92	266.4	266.6	266.7		Adjust per Paragraph 8.3.2.a
2	4	39%	4.0	3.75	3.2	3.47	4.9	4.03	267.9	268.2	268.4		Adjust per Paragraph 8.3.2.a
2	5	40%	3.6	3.29	3.2	2.97	4.9	3.61	270.8	271.0	271.1		Adjust per Paragraph 8.3.2.a
2	6	52%	3.7	3.41	3.3	3.13	4.7	3.69	279.2	279.4	279.7		Adjust per Paragraph 8.3.2.a
2	7	51%	4.2	3.90	3.2	3.65	4.8	4.15	281.1	281.4	281.6		Adjust per Paragraph 8.3.2.a

Examiner	Level III	Signature	Date	Reviewer	Signature	Date
Carlin, William D.		<i>W. Carlin</i>	5/20/2000	Halling, David A.	<i>D. Halling</i>	5/30/00
Examiner	Level II	Signature	Date	Site Review	Signature	Date
Auer, Robert G.		<i>R. G. Auer</i>	5/20/2000	Kinney, Charles R.	<i>C. Kinney</i>	5-31-00
Other	Level N/A	Signature	Date	ANII Review	Signature	Date
N/A				Heater, Stephen B.	<i>S. Heater</i>	6-1-00

ATTACHMENT 3 PAGE 2 OF 26

PAGE 2 OF 26
REPORT # 2000U156



Limitation Record

Report No.: 2000U156

Page: 3 of 5

Site/Unit: NSP / PI2

Procedure: ISI-UT-3A

Summary No.: 501733

Procedure Revision/FC: 8 /

Examination For: ISI

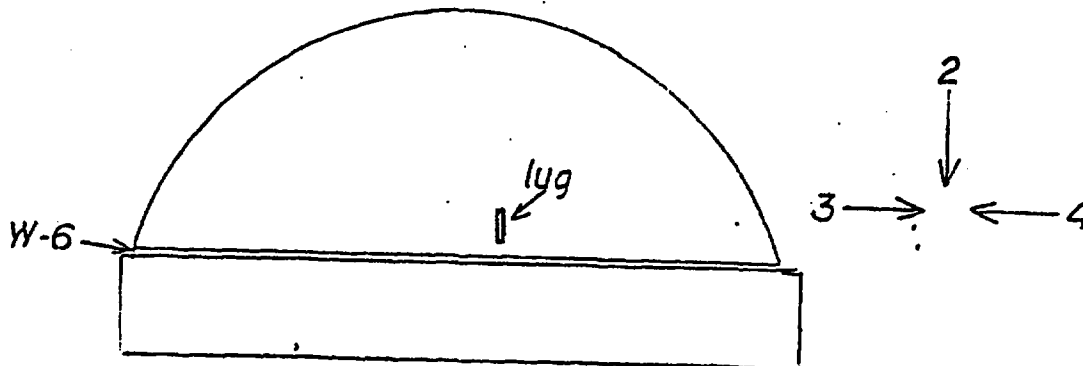
Work Order No.: 0000232

Description of Limitation:

Flange configuration prohibits exam from flange side. In area of lifting lug, exam limited from head side for 17.5". Lifting lug limits 12.3% of exam length. In this 12.3% area, 45 degree had 56% coverage and 60 degree had 31% coverage. See Determination of Percent Coverage Worksheet (UT - Vessel) for Scan 2 coverage.

Sketch of Limitation:

G:\WDDEAL50\PI2RFO2000\PI2 SUPPLEMENTAL\PI2 SUPPLEMENTAL UT\2000U1



Limitations removal requirements:

None

Radiation field: 8 - 12 mR / hr

Examiner	Level III	Signature	Date	Reviewer	Signature	Date
Carlin, William D.	1	<i>W. Carlin</i>	5/20/2000	Halling, David A.	1 <i>DA Halling</i>	5/30/00
Examiner	Level II	Signature	Date	Site Review	Signature	Date
Auer, Robert G.	1	<i>DA Halling for R.G. Auer</i>	5/20/2000	Kinney, Charles R.	1 <i>CKinney</i>	5-31-00
Other	Level N/A	Signature	Date	ANII Review	Signature	Date
N/A	1			Heater, Stephen B.	1 <i>Stephen Heater</i>	6-1-00

PAGE 3 OF 26

REPORT # 2000U156

ATTACHMENT 3 PAGE 3 OF 26



Supplemental Report

Report No.: 2000U156

Page: 4 of 5

Summary No.: 501733

Examiner: Carlin, William D.

Level: III

Reviewer: Halling, David A.

Date: 5/30/00

Examiner: Auer, Robert G.

Level: II

Site Review: Kinney, Charles R.

Date: 5-31-00

Other: N/A

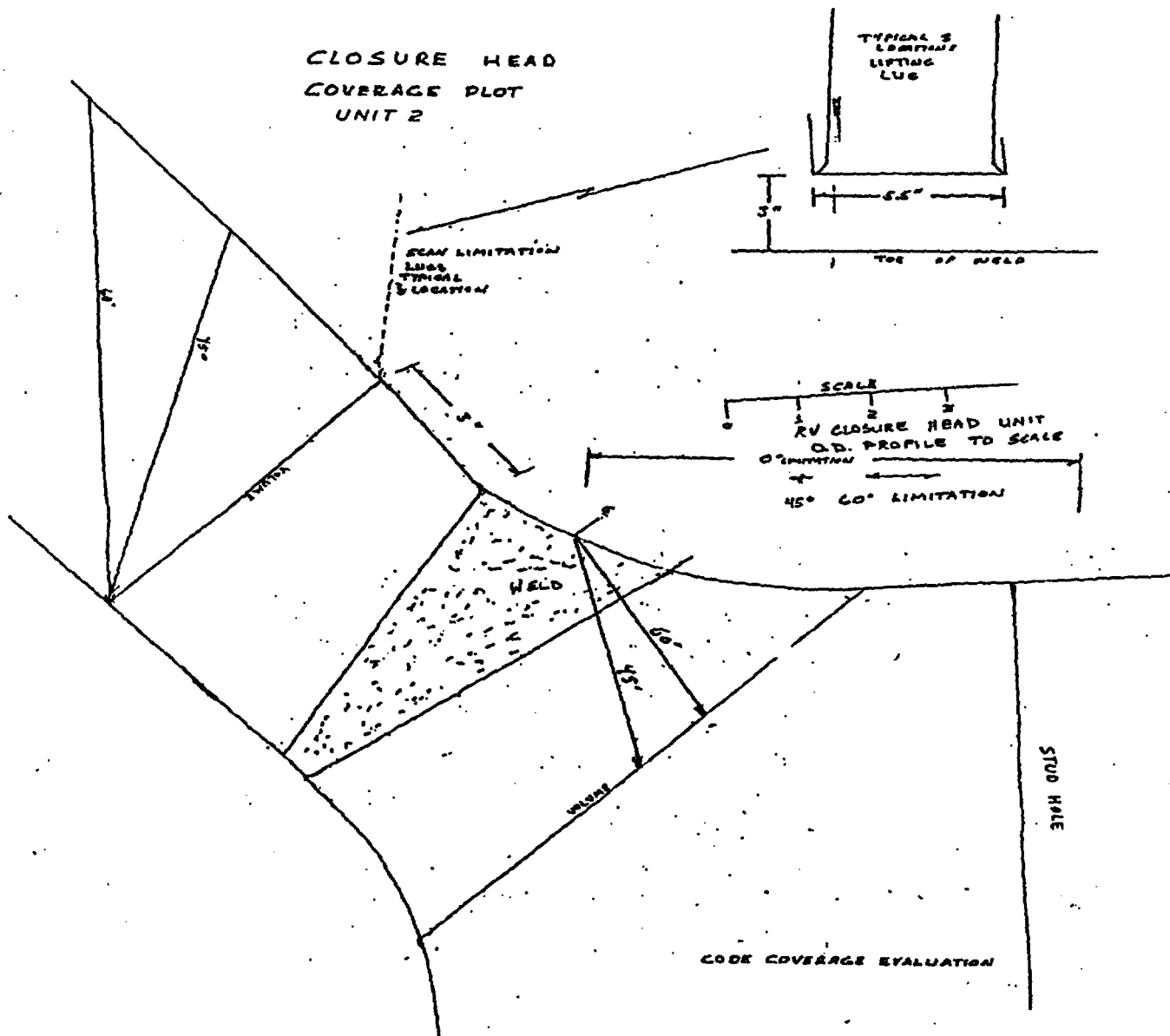
Level: N/A

ANII Review: Heater, Stephen B.

Date: 6-1-00

Comments: None

Sketch or Photo: G:\IDEAL50\PI2RFO2000\PI2 SUPPLEMENTAL\PI2 SUPPLEMENTAL UT2000U1





Determination of Percent Coverage for UT Examinations - Vessels

Report No.: 2000U156
Page: 5 of 5
Site/Unit: NSP / PI2 Procedure: ISI-UT-3A
Summary No.: 501733 Procedure Revision/FC: 8 /
Examination For: ISI Work Order No.: 0000232

0 deg Planar

Scan 100.000 % Length X 66.700 % volume of length / 100 = 66.700 % total for 0 deg

45 deg

Scan 1 0.000 % Length X 0.000 % volume of length / 100 = 0.000 % total for Scan 1

Scan 2 100.000 % Length X 86.800 % volume of length / 100 = 86.800 % total for Scan 2

Scan 3 100.000 % Length X 66.700 % volume of length / 100 = 66.700 % total for Scan 3

Scan 4 100.000 % Length X 66.700 % volume of length / 100 = 66.700 % total for Scan 4

Add totals and divide by # scans = 65.050 % total for 45 deg

Other deg 60

Scan 1 0.000 % Length X 0.000 % volume of length / 100 = 0.000 % total for Scan 1

Scan 2 100.000 % Length X 83.800 % volume of length / 100 = 83.800 % total for Scan 2

Scan 3 100.000 % Length X 66.700 % volume of length / 100 = 66.700 % total for Scan 3

Scan 4 100.000 % Length X 66.700 % volume of length / 100 = 66.700 % total for Scan 4

Add totals and divide by # scans = 64.300 % total for 60 deg

Percent complete coverage

Add totals for each angle and scan required and divide by # of angles to determine;

58.683 % Total for complete exam

Note:

Supplemental coverage may be achieved by use of other angles / methods. When used, the coverage for volume not obtained with angles as noted above shall be calculated and added to the total to provide the percent total for the complete examination.

Site Field Supervisor: 

Date: 5-31-00

PAGE 5 OF 26
REPORT # 2000U156

ATTACHMENT 3 PAGE 5 OF 26



ISI Flaw Disposition Worksheet

Report No.: 2000 0156Site/Unit: PI2 1Procedure: ISI-UT-3APage: of Summary No.: 501733Procedure Revision/FC: 8 1Examination For: ISIWork Order No.: 00002321) Flaw Number 13) ISI Interval 3rdOK Reviewer KSH2) Item Number B1.404) Code Edition & Addenda 1989 NO Addm.OK Reviewer KSH5) Acceptance Standard IWB-3510-1OK Reviewer KSH

6) Calculations (See Below)

OK Reviewer CAK/MSHFLAW TYPE: SUB SURFACE
PLANAR. $a = .15$ $L = .30$ $t = 6.0$ $S = 1.4$ ASPECT RATIO $= a/L = .15/.30 = .50$ $t_{\text{MINIMUM}} = 6.0$ $y = S/a = 1.4/.15 > 1.0$ $\therefore y = 1$ $a/t\%$ allowed $= 7.6(1) = 7.6\%$ $a/t\%$ actual $= .15/6.0 = .025 \approx 2.5\%$ $a/t\%$ allowed $> a/t\%$ actual $7.6\% > 2.5\%$ \therefore FLAW IS ACCEPTABLE
by Code TABLE
IWB-3510-17) Results OK Reviewer KSH $a/L = .50$ Code allowable $a/t\% = 7.6$ Calculated $a/t\% = 2.5$ Laminar flaw surface area: $(0.75 | w) = N/A$ 8) Table used for analysis OK Reviewer KSH IWB-3510-19) Was linear interpolation used? ☒ Yes ☐ No If no, why?CALCULATION FELL ON TABLE VALUE.10) Was IWA-3200 Significant Digits For Limiting Values followed? ☒ Yes ☐ No If no, why?11) The correct Code Edition and Addenda was available and used. ☒ Yes Preparer MSH OK Reviewer KSH12) Statement of acceptability or rejectability with basis. ☒ OK Reviewer KSH ☒ Accept ☐ Reject☒ (a/t) Code allowable $>$ (a/t) calculated MSH☐ OEM flaw evaluation handbook (see attached analysis)☐ (a/t) Code allowable $<$ (a/t) calculated

13) Prepared by and date

Daniel D. White 5-26-2000

The results are correct and the methodology used is in accordance with applicable codes, standards, specifications and procedures.

14) Engineering review by and date

Frank B. Hall 5-30-00

This review assures that the results are correct and the methodology used is in accordance with applicable codes, standards, specifications and procedures.

15) Approved by and date

J. Ricker 30 May 2000

This approval assures that all involved with this flaw sizing and flaw disposition were aware of the necessity that the results and the methodology are correct and in accordance with applicable codes, standards, specifications and procedures.

PAGE 6 OF 26
REPORT # 20000156

ATTACHMENT 3 PAGE 6 OF 26

Flaw Sizing Calculations Using Metal Path for Vessel Welds > 2" For surface and subsurface single planar flaws oriented in plane normal to pressure retaining surface

ASME SECT XI 1989 W/ NO ADDENDA gwr INITIAL TO VERIFY

ISI Report # 2000U156
Flaw # 1

Evaluation Performed By: Jay P. Wm Date: 5-25-00
Reviewed By: NUTCH Date: 5-25-00

Length

Length of the flaw "L" is determined by finding the difference between L1 and L2 for perpendicular scans, W1 and W2 for parallel scans.

L and W values are from page 2 of the UT report.

$L = 254.7$ (L2) - 254.5 (L1) = .2 inches.

Thickness

Thickness of the component at the location of the flaw, using UT or nom wall (circle one).

This value is from page 1 of the UT report.

"t" = 6.0 inches

Calibration

The measured angle in the calibration block was 60 degrees

Calculations using metal path

From page of the UT report, Scan # 2

The flaw exhibited (20%) DAC at 2.88 and 3.46 inches MP. Max amplitude is 3.17 inches MP with the transducer exit point at 3.4 inches (W) from the centerline of the weld and 254.6 inches (L) from the 0" reference. (Use of 20% DAC vs. 50% max amp for indications > 100% DAC is conservative.)

- 1) Determine the upper depth of the flaw from the exam surface.
2.88 (metal path at 20% upper) * COS of the measured angle .5 = 1.44 inches depth.
- 2) Determine the lower depth of the flaw from the exam surface.
3.46 (metal path at 20% lower) * COS of the measured angle .5 = 1.73 inches depth.
- 3) Determine the depth of the flaw from the exam surface at the maximum amplitude point.
3.17 (metal path at maximum amplitude point) * COS of the measured angle .5 = 1.585 inches depth.
- 4) Determine the distance from the center line of the weld to the maximum amplitude point of the flaw.
3.17 (metal path at maximum amplitude point) squared = 10.0489 (a²)
1.585 (depth at maximum amplitude point) squared = 2.5122 (b²)
 $\sqrt{a^2 - b^2} = 2.7453$ inches of surface distance to the flaw from the transducer exit point.
3.4 (Wmax) - 2.7453 (surf dist) = .6547 inches to the centerline of the weld.
- 5) Determine S by picking the smaller of the following;
S = 1.44 (result of 1) = distance between exam surface and the upper flaw tip
 >> OR <<
S = 6.0 (part "t") - 1.73 (result of 2) = 4.27 distance between the side opposite exam surface and the lower flaw tip
- 6) Determine 2d in though wall thickness.
1.73 (from step 2) - 1.44 (from step 1) = .29 inches.

Determination of surface or subsurface

$0.4d = (2d / 2) * 0.4 = .058$

Compare to S (from step 5) -

If S is less than 0.4d, the flaw is surface: $a = 2d + S =$ N/A inches.

If S is greater than or equal to 0.4a the flaw is sub-surface. $a = 2a / 2 =$.145 inches.

$L = .30$ (for $a/L > 0.5$, $L = 2a$)

$t = 6.0$ (part thickness)

$a = .15$ (surf or SUB SURF, circle one)

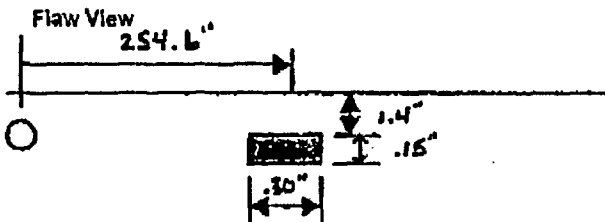
$S = 1.4$

PAGE 7 OF 26

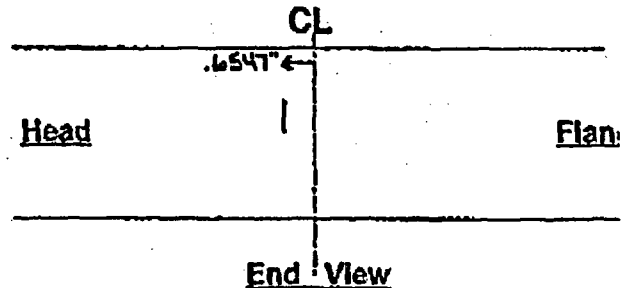
REPORT # 2000U156



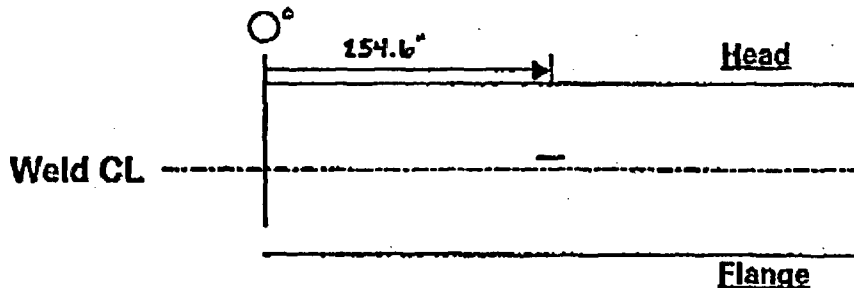
ISI Flaw Sizing Worksheet

Report No.: 20000156Site/Unit: PI 1 2
Summary No.: 501733
Examination For: W-6 12'-24'Procedure: ISI-UT-3A
Procedure Revision/FC: 8 1 NA
Work Order No.: 0000232Page: of 1) Flaw Number 1
2) Item Number B 1.403) ISI Interval 3"
4) Code Edition & Addenda 1989 NA 100
5) Method UT
6) Flaw Sketch OK Reviewer SPCOK Reviewer PC
OK Reviewer SPC

Side View



End View



Flange

7) Calculations OK Reviewer SPC

Top View

Show determination of Surface or subsurface

See Attached

Show determination of type of "a" to use

See Attached8) ISI-FE-1 Paragraph 7.0 - "Rounding-off Method" was used ☒ Yes Preparer SPW OK Reviewer SPC9) Code Flaw Dimensions OK Reviewer SPC
"r" .30 "a" .15 "t nominal" 6.0 "t measured" 6.0 "s" 1.4 "w" NA10) Flaw Type OK Reviewer Sub Surface Planar11) Flaw Characterization Figure 3 OK Reviewer IWA 3320-112) Flaw Characterization Figure Number #113) Was IWA-3300 Flaw Characterization followed? ☒ Yes ☐ No If no, why?

14) The correct Code Edition and Addenda was available and used

☒ Yes Preparer SPW OK Reviewer SPC

15) Prepared by and date

JERRY WREN 5/25/00

16) Review by and date

SEAN CLAY 5/25/00

The results are correct and the methodology used is in accordance with applicable codes, standards, specifications and procedures.

The review assures that the results are correct and the methodology used is in accordance with applicable codes, standards, specifications and procedures.

PAGE 8 OF 26REPORT # 20000156



ISI Flaw Disposition Worksheet

Report No.: 20000156

Site/Unit: PI2 1

Procedure: ISI-UT-3A

Page: of

Summary No.: 501733

Procedure Revision/FC: 8 1

Examination For: ISI

Work Order No.: 0000232

1) Flaw Number 2
2) Item Number B1.40

3) ISI Interval 3rd.
4) Code Edition & Addenda 1989 No Addenda

OK Reviewer RSH
OK Reviewer RSH
OK Reviewer RSH
OK Reviewer RSH

FLAW TYPE: SUB SURFACE
PLANNAR

5) Acceptance Standard IWB-3510-1
6) Calculations (See Below)

$$a = .15 \quad l = .6 \quad t_m = 6.0 \quad S = 1.5$$

$$\text{ASPECT RATIO} = a/l = .15/.6 = 0.25$$

$$Y = \frac{S}{a} = \frac{1.5}{.15} = 10 \therefore Y > 1 \quad Y = 1$$

$$a/t_{net} = .15/6.0 = .025 \approx 2.5\%$$

From TABLE IWB-3510-1 (4-12") wall t-

ASPECT RATIO SUB SURFACE FLAWS
0.25 $a/t\% = 3.84\%$

$$a/t\% \text{ allow} = 3.8\%$$

8. $a/t_{allow} > a/t_{act} \quad 3.8\% > 2.5\% \quad \text{Flaw is acceptable by Code.}$

7) Results OK Reviewer RSH

$a/l = 0.25$ Code allowable $a/t\% = 3.8$ Calculated $a/t\% = 2.5$ Laminar flaw surface area: $(0.75 \mid w) = NA$

8) Table used for analysis OK Reviewer RSH IWB-3510-1

9) Was linear interpolation used? ☒ Yes ☐ No If no, why? DSW

VALUE FALL ON TABLE.

10) Was IWA-3200 Significant Digits For Limiting Values followed? ☒ Yes ☐ No If no, why?

11) The correct Code Edition and Addenda was available and used. ☒ Yes Preparer DSW OK Reviewer RSH

12) Statement of acceptability or rejectability with basis. OK Reviewer RSH ☒ Accept ☐ Reject

- ☒ (a/t) Code allowable > (a/t) calculated DSW
- ☐ OEM flaw evaluation handbook (see attached analysis)
- ☐ (a/t) Code allowable < (a/t) calculated

13) Prepared by and date
Daniel W. Kistner 5-26-2000

The results are correct and the methodology used is in accordance with applicable codes, standards, specifications and procedures.

14) Engineering review by and date
Daniel W. Kistner 5-30-00

This review assures that the results are correct and the methodology used is in accordance with applicable codes, standards, specifications and procedures.

15) Approved by and date
J. Riker 30 May 2000

This approval assures that all involved with this flaw sizing and flaw disposition were aware of the necessity that the results and the methodology are correct and in accordance with applicable codes, standards, specifications and procedures.

Flaw Sizing Calculations Using Metal Path for Vessel Welds > 2" For surface and subsurface single planar flaws oriented in plane normal to pressure retaining surface

ASME SECT XI 1989 W/ NO ADDENDA *APV* INITIAL TO VERIFY

ISI Report # 2000U156
Flaw # 2

Evaluation Performed By: *Joseph W. ...* Date: 5-25-00
Reviewed By: *[Signature]* Date: 5-25-00

Length

Length of the flaw "L" is determined by finding the difference between L1 and L2 for perpendicular scans, W1 and W2 for parallel scans.

L and W values are from page of the UT report.

$l = 255.6 \text{ (L2)} - 255.0 \text{ (L1)} = .6 \text{ inches.}$

Thickness

Thickness of the component at the location of the flaw, using UT or nom wall (circle one).

This value is from page of the UT report.

$t = 6.0 \text{ inches}$

Calibration

The measured angle in the calibration block was 60 degrees

Calculations using metal path

From page of the UT report, Scan # 2

The flaw exhibited 20% DAC at 2.88 and 3.58 inches MP. Max amplitude is 3.27 inches MP with the transducer exit point at 3.5 inches (W) from the centerline of the weld and 255.4 inches (L) from the 0" reference. (Use of 20% DAC vs. 50% max amp for indications > 100% DAC is conservative.)

- Determine the upper depth of the flaw from the exam surface.
 $2.88 \text{ (metal path at 20% upper)} * \text{COS of the measured angle } .5 = 1.48 \text{ inches depth.}$
- Determine the lower depth of the flaw from the exam surface.
 $3.58 \text{ (metal path at 20% lower)} * \text{COS of the measured angle } .5 = 1.79 \text{ inches depth.}$
- Determine the depth of the flaw from the exam surface at the maximum amplitude point.
 $3.27 \text{ (metal path at maximum amplitude point)} * \text{COS of the measured angle } .5 = 1.635 \text{ inches depth.}$
- Determine the distance from the center line of the weld to the maximum amplitude point of the flaw.
 $3.27 \text{ (metal path at maximum amplitude point)} \text{ squared} = 10.6923 \text{ (a}^2\text{)}$
 $1.635 \text{ (depth at maximum amplitude point)} \text{ squared} = 2.6732 \text{ (b}^2\text{)}$
 $\sqrt{a^2 - b^2} = 2.8318 \text{ inches of surface distance to the flaw from the transducer exit point.}$
 $3.5 \text{ (Wmax)} - 2.8318 \text{ (surf dist)} = .6682 \text{ inches to the centerline of the weld.}$
- Determine S by picking the smaller of the following:
 $S = 1.48 \text{ (result of 1)} = \text{distance between exam surface and the upper flaw tip}$
 $\geq \text{OR} \leq$
 $S = 6.0 \text{ (part t)} - 1.79 \text{ (result of 2)} = 4.21 \text{ distance between the side opposite exam surface and the lower flaw tip}$
- Determine 2d in though wall thickness.
 $1.79 \text{ (from step 2)} - 1.48 \text{ (from step 1)} = .31 \text{ inches.}$

Determination of surface or subsurface

$0.4d = (2d / 2) * 0.4 = .062$

Compare to S (from step 5)

If S is less than 0.4d, the flaw is surface. $a = 2d + S = \text{N/A}$ inches.

If S is greater than or equal to 0.4d the flaw is sub-surface. $a = 2S / 2 = .155 \text{ inches.}$

$l = .60 \text{ (for } a/t > 0.5, l = 2a)$

$t = 6.0 \text{ (part thickness)}$

$a = .15 \text{ (surf or sub surf, circle one)}$

$S = 1.5$

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REPORT # 2000U156



ISI Flaw Sizing Worksheet

Report No. 20000156

Site/Unit: PI 1 2

Procedure: ISI-UT-3A

Page: of

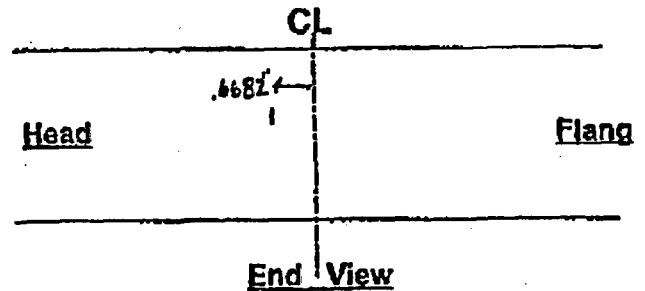
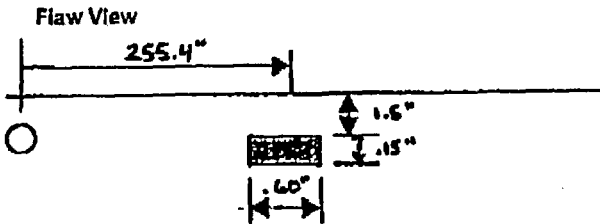
Summary No.: 501733

Procedure Revision/FC: 8 1 NA

Examination For: W-6 12'-24'

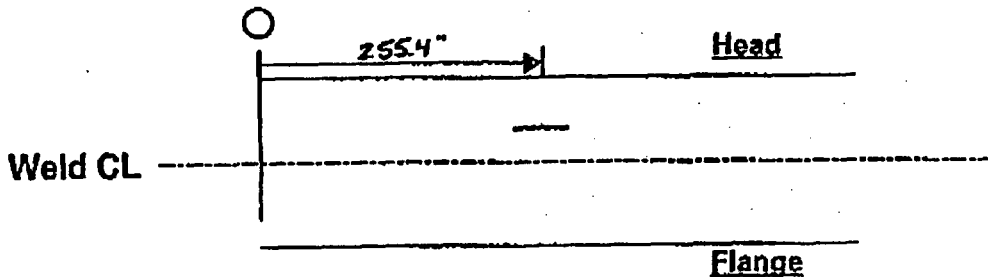
Work Order No 0000252

- | | | |
|------------------------------|--|------------------------|
| 1) Flaw Number <u>2</u> | 3) ISI Interval <u>3.2</u> | OK Reviewer <u>SPC</u> |
| 2) Item Number <u>B 1.40</u> | 4) Code Edition & Addenda <u>1989 NO 100</u> | OK Reviewer <u>SPC</u> |
| | 5) Method <u>UT</u> | |
| | 6) Flaw Sketch | OK Reviewer <u>SPC</u> |



Side View

End View



7) Calculations (OK Reviewer SPC) Top View

Show determination of Surface or subsurface

SEE ATTACHED

Show determination of type of "a" to use

SEE ATTACHED

8) ISI-FE-1 Paragraph 7.0 - "Rounding-off Method" was used ☒ Yes Preparer QW OK Reviewer SPC

9) Code Flaw Dimensions OK Reviewer SPC

"l" .6 "a" .15 "t nominal" NA "t measured" .6.0 "s" 1.5 "w" NA

10) Flaw Type OK Reviewer SUB SURFACE PLANAR

11) Flaw Characterization Figure 3 OK Reviewer IWA-8320-1

12) Flaw Characterization Figure Number 1

13) Was IWA-3300 Flaw Characterization followed? ☒ Yes No If no, why?

14) The correct Code Edition and Addenda was available and used. ☒ Yes Preparer QW OK Reviewer SPC

15) Prepared by and date Jerry Wren 5/25/00

16) Review by and date SEAN CLAY 5/25/00

The results are correct and the methodology used is in accordance with applicable codes, standards, specifications and procedures

The review assures that the results are correct and the methodology used is in accordance with applicable codes, standards, specifications and procedures.

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REPORT # 951m0002



ISI Flaw Disposition Worksheet

Report No.: 20000156Site/Unit: PT2 1Procedure: ISI-UT-3APage: of Summary No.: 501733Procedure Revision/FC: 8 1Examination For: Work Order No.: 00002321) Flaw Number 33) ISI Interval 3rd.OK Reviewer KH2) Item Number B1.404) Code Edition & Addenda 1989 No AddendaOK Reviewer KHFLAW TYPE: SUB SURFACE PLANAR5) Acceptance Standard TWB-3510-1OK Reviewer KH

6) Calculations (See Below)

OK Reviewer KH $a = .15$ $L = .30$ $t_n = 6.0$ $S = 1.7$ FROM TABLE TWB-3510-1 (4-12") wall
ASPECT RATIO SUB SURFACE FLAW
.50 7.64aspect ratio = $a/L = .15/.30 = .50$ $y = S/a = 1.7/.15 = 11$ $y > 1$ $\therefore y = 1$ $a/t\%_{allow} = 7.6\%$ $a/t\%_{act} = .15/6.0 = .025 \approx 2.5\%$ $a/t\%_{allow} > a/t\%_{act}$ $7.6\% > 2.5\%$ \therefore FLAW IS ACCEPTABLE BY CODE7) Results OK Reviewer KH $a/L = .50$ Code allowable $a/t\% = 7.6$ Calculated $a/t\% = 2.5$ Laminar flaw surface area: $(0.75 \times w) = NA$ 8) Table used for analysis OK Reviewer KH TWB-3510-19) Was linear interpolation used? ☒ Yes ☐ No If no, why? NAVALUES FALL ON TABLE.10) Was IWA-3200 Significant Digits For Limiting Values followed? ☒ Yes ☐ No If no, why? 11) The correct Code Edition and Addenda was available and used. ☒ Yes Preparer DEW OK Reviewer KH12) Statement of acceptability or rejectability with basis. OK Reviewer KH ☒ Accept ☐ Reject☒ (a/t) Code allowable > (a/t) calculated DEW☐ OEM flaw evaluation handbook (see attached analysis)☐ (a/t) Code allowable < (a/t) calculated

13) Prepared by and date

Daniel White 5-26-2000

The results are correct and the methodology used is in accordance with applicable codes, standards, specifications and procedures.

14) Engineering review by and date

Daniel White 5-30-00

This review assures that the results are correct and the methodology used is in accordance with applicable codes, standards, specifications and procedures.

15) Approved by and date

J. Ritten 2 May 2000

This approval assures that all involved with this flaw sizing and flaw disposition were aware of the necessity that the results and the methodology are correct and in accordance with applicable codes, standards, specifications and procedures.

PAGE 12 OF 26
REPORT # 20000156PAGE 12 OF 26
ATTACHMENT 3

Flaw Sizing Calculations Using Metal Path for Vessel Welds > 2"

For surface and subsurface single planar flaws oriented in plane normal to pressure retaining surface

ASME SECT XI 1989 W/ NO ADDENDA g INITIAL TO VERIFY

ISI Report # 2000U156
Flaw # 3

Evaluation Performed By: Joseph P. Wu Date: 5-25-00
Reviewed By: D. H. P. Date: 5-25-00

Length

Length of the flaw "L" is determined by finding the difference between L1 and L2 for perpendicular scans, W1 and W2 for parallel scans.

L and W values are from page of the UT report.

$L = 258.7$ (L2) - 266.4 (L1) = $.30$ inches.

Thickness

Thickness of the component at the location of the flaw, using UT or nom wall (circle one).

This value is from page of the UT report.

"t" = 6.0 inches

Calibration

The measured angle in the calibration block was 60 degrees

Calculations using metal path

From page of the UT report, Scan # 2

The flaw exhibited 20% DAC at 3.36 and 3.92 inches MP. Max amplitude is 3.64 inches MP with the transducer exit point at 4.0 inches (W) from the centerline of the weld and 266.6 inches (L) from the 0° reference. (Use of 20% DAC vs. 50% max amp for indications > 100% DAC is conservative.)

- Determine the upper depth of the flaw from the exam surface.
 3.36 (metal path at 20% upper) * COS of the measured angle $.5$ = 1.68 inches depth.
- Determine the lower depth of the flaw from the exam surface.
 3.92 (metal path at 20% lower) * COS of the measured angle $.5$ = 1.96 inches depth.
- Determine the depth of the flaw from the exam surface at the maximum amplitude point.
 3.64 (metal path at maximum amplitude point) * COS of the measured angle $.5$ = 1.82 inches depth.
- Determine the distance from the center line of the weld to the maximum amplitude point of the flaw.
 3.64 (metal path at maximum amplitude point) squared = 13.2496 (a²)
 1.82 (depth at maximum amplitude point) squared = 3.3124 (b²)
 $\sqrt{a^2 - b^2}$ = 3.1523 inches of surface distance to the flaw from the transducer exit point.
 4.0 (Wmax) - 3.1523 (surf dist) = $.8477$ inches to the centerline of the weld.
- Determine S by picking the smaller of the following:
 $S = 1.68$ (result of 1) = distance between exam surface and the upper flaw tip
 $\geq OR \leq$
 $S = 6.0$ (part "t") - 1.96 (result of 2) = 4.08 distance between the side opposite exam surface and the lower flaw tip
- Determine 2d in though wall thickness.
 1.96 (from step 2) - 1.68 (from step 1) = $.28$ inches.

Determination of surface or subsurface

$0.4d = (2d / 2) * 0.4 = .056$

Compare to S (from step 5)

If S is less than 0.4d, the flaw is surface. $a = 2d + S = \text{N/A}$ inches.

If S is greater than or equal to 0.4d the flaw is sub-surface. $a = 2a / 2 = .14$ inches.

$l = .30$ (for $a/t > 0.6$, $l = 2a$)

$t = 6.0$ (part thickness)

$a = .15$ (surf or sub surf, circle one)

$S = 1.7$



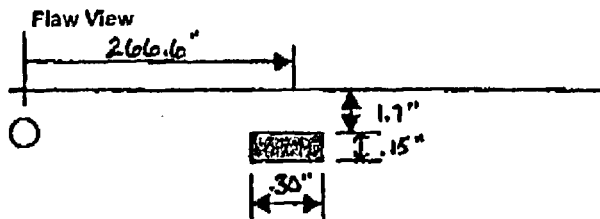
ISI Flaw Sizing Worksheet

Report No. 2000N156

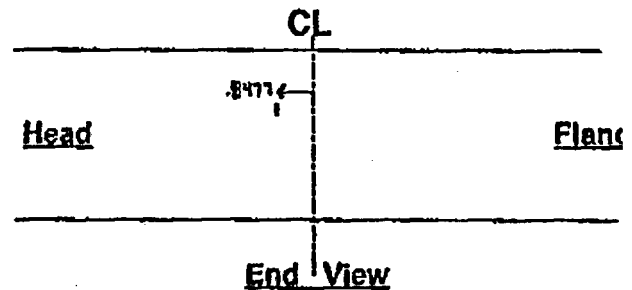
Site/Unit: PI 12 Procedure: ISI-UT-3A
Summary No.: 501733 Procedure Revision/FC: 81 NA
Examination For: W-6 12' ~ 24' Work Order No.: 0060732

Page: of

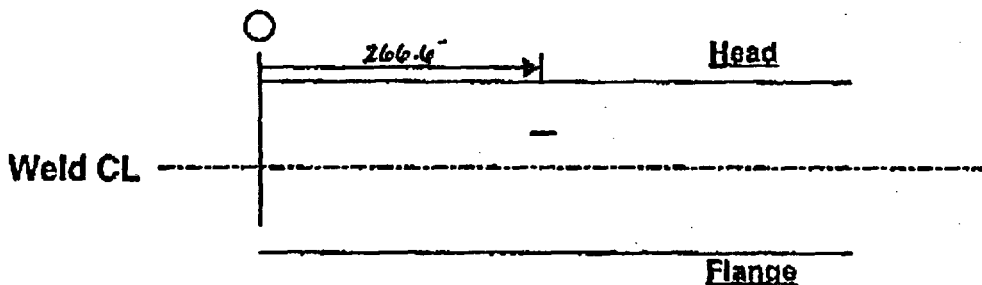
1) Flaw Number 3 3) ISI Interval 3"± OK Reviewer SPC
2) Item Number B1.40 4) Code Edition & Addenda 1989 NDA0 OK Reviewer SPC
5) Method UT
6) Flaw Sketch OK Reviewer SPC



Side View



End View



7) Calculations : OK Reviewer SPC Top View
Show determination of Surface or subsurface

See attached

Show determination of type of "a" to use

See attached

8) ISI-FE-1 Paragraph 7.0 - "Rounding-off Method" was used ☒ Yes Preparer SPW OK Reviewer SPC

9) Code Flaw Dimensions : OK Reviewer SPC

"t" .30 "a" .15 "t nominal" NA "t measured" 6.0 "s" 1.7 "w" = N/A

10) Flaw Type OK Reviewer SUBSURFACE Planar

11) Flaw Characterization Figure : OK Reviewer IWA-3320-1

12) Flaw Characterization Figure Number #1

13) Was IWA-3300 Flaw Characterization followed? ☐ Yes ☐ No If no, why?

14) The correct Code Edition and Addenda was available and used

☒ Yes Preparer SPW OK Reviewer SPC

15) Prepared by and date SPW 5/25/00

16) Review by and date SEAN CLAY 5/25/00

The results are correct and the methodology used is in accordance with applicable codes, standards, specifications and procedures.

The review assures that the results are correct and the methodology used is in accordance with applicable codes, standards, specifications and procedures.

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REPORT # 2000N156

MAY-25-00 THU 12:50



ISI Flaw Disposition Worksheet

Report No.: 20000156Site/Unit: PT2 1Procedure: ISI-UT-3APage: of Summary No.: 501733Procedure Revision/FC: 8 1Examination For: ISIWork Order No.: 00062321) Flaw Number 43) ISI Interval 3rd.OK Reviewer KJH2) Item Number 81.404) Code Edition & Addenda 1989 No Addm.OK Reviewer KJHFLAW TYPE: SUBSURFACE
PLANAR5) Acceptance Standard IWB-3510-1OK Reviewer KJH

6) Calculations (See Below)

OK Reviewer KJHFROM TABLE IWB-3510-1 (4-12) INT.ASPECT RATIO a/t SUBSURFACE FLAW0.304.44

$$l = .50 \quad a = .15 \quad t = 6.0 \quad S = 1.7$$

$$a \text{ aspect ratio} = a/l = \frac{.15}{.50} = 0.30$$

$$Y = \frac{S}{a} = 1.7/.15 = 11.3 \quad Y > 1 \therefore Y = 1$$

$$a/t \% = .15/6.0 = .025 = 2.5\%$$

$$a/t_{\text{allow}} = 4.4\%$$

$$a/t_{\text{allow}} > a/t \% \text{ calc} \quad 4.4\% > 2.5\%$$

So $a/t_{\text{allow}} > a/t \% \text{ calc}$ $4.4\% > 2.5\%$ FLAW IS ACCEPTABLE BY CODE.

7) Results OK Reviewer KJHa/l = 0.30 Code allowable a/t% = 4.4 Calculated a/t% = 2.5 Laminar flaw surface area: $(0.75 \mid w) = \underline{NA}$ 8) Table used for analysis OK Reviewer KJH IWB-3510-19) Was linear interpolation used? ☒ Yes ☐ No If no, why?VALUE FELL ON TABLE.10) Was IWA-3200 Significant Digits For Limiting Values followed? ☒ Yes ☐ No If no, why?11) The correct Code Edition and Addenda was available and used. ☒ Yes Preparer DEW OK Reviewer KJH12) Statement of acceptability or rejectability with basis. OK Reviewer KJH ☒ Accept ☐ Reject☒ (a/t) Code allowable > (a/t) calculated☐ OEM flaw evaluation handbook (see attached analysis)☐ (a/t) Code allowable < (a/t) calculated

13) Prepared by and date

David M. Miller 5-26-2000

The results are correct and the methodology used is in accordance with applicable codes, standards, specifications and procedures.

14) Engineering review by and date

David M. Miller 5-30-00

This review assures that the results are correct and the methodology used is in accordance with applicable codes, standards, specifications and procedures.

15) Approved by and date

J. R. Riker 30 May 2000

This approval assures that all involved with this flaw sizing and flaw disposition were aware of the necessity that the results and the methodology are correct and in accordance with applicable codes, standards, specifications and procedures.



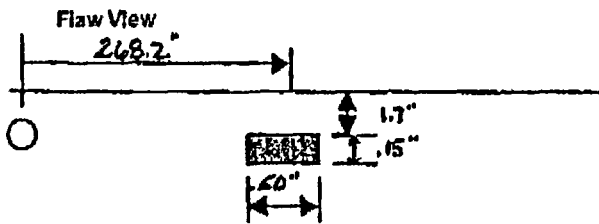
ISI Flaw Sizing Worksheet

Report No. 20000156

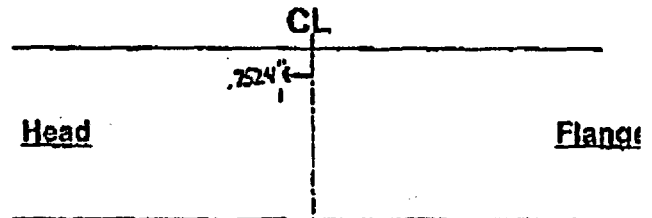
Site/Unit: PI 2 Procedure I-FE-1-3A
Summary No.: 501733 Procedure Revision/FC: 8 1 NA
Examination For: W-6 12' to 24' Work Order No.: 0000232

Page: of

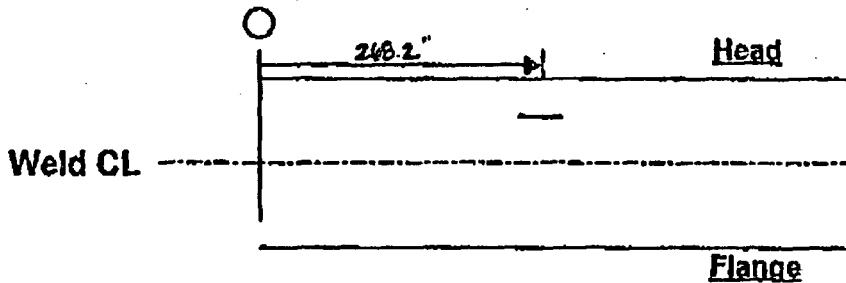
1) Flaw Number 4 3) ISI Interval 5" OK Reviewer SPC
2) Item Number B 1.40 4) Code Edition & Addenda 1989 N2 AD OK Reviewer SPC
5) Method UT
6) Flaw Sketch OK Reviewer SPC



Side View



End View



7) Calculations : OK Reviewer SPC Top View

Show determination of Surface or subsurface

See attach

Show determination of type of "a" to use

See Attach

8) ISI-FE-1 Paragraph 7.0 - "Rounding-off Method" was used ☒ Yes Preparer SPW OK Reviewer SPC

9) Code Flaw Dimensions OK Reviewer SPC

"T" .50 "a" .15 "t nominal" NA "t measured" 6.0 "s" 1.7 "w" = NA

10) Flaw Type OK Reviewer SUB SURFACE PLANAR

11) Flaw Characterization Figure OK Reviewer IWA-3320-1

12) Flaw Characterization Figure Number #1

13) Was IWA-3300 Flaw Characterization followed? • Yes No If no, why?

14) The correct Code Edition and Addenda was available and used

☒ Yes Preparer SPW OK Reviewer SPC

15) Prepared by and date

JERRY WREN 5/25/00

16) Review by and date

SEAN YAU 5/25/00

The results are correct and the methodology used is in accordance with applicable codes, standards, specifications and procedures

The review assures that the results are correct and the methodology used is in accordance with applicable codes, standards, specifications and procedures.

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REPORT # 20000156

MAY-25-00 THU 12:51

Flaw Sizing Calculations Using Metal Path for Vessel Welds > 2"
For surface and subsurface single planar flaws oriented in plane normal to pressure retaining surface

ASME SECT XI 1989 W/ NO ADDENDA SLW INITIAL TO VERIFY

ISI Report # 2000U156
Flaw # 4

Evaluation Performed By: SLW Date: 5-25-00
Reviewed By: DAK Date: 5-28-00

Length

Length of the flaw "l" is determined by finding the difference between L1 and L2 for perpendicular scans, W1 and W2 for parallel scans.

L and W values are from page of the UT report.

$l = 268.4 \text{ (L2)} - 267.9 \text{ (L1)} = .50 \text{ inches.}$

Thickness

Thickness of the component at the location of the flaw, using UT or nom wall (circle one).

This value is from page of the UT report.

"t" = 6.0 inches

Calibration

The measured angle in the calibration block was 60 degrees

Calculations using metal path

From page of the UT report, Scan # 2

The flaw exhibited 20% DAC at 3.47 and 4.03 inches MP. Max amplitude is 3.75 inches MP with the transducer exit point at 4.0 inches (W) from the centerline of the weld and 268.2 inches (L) from the 0" reference. (Use of 20% DAC vs. 60% max amp for indications > 100% DAC is conservative.)

- 1) Determine the upper depth of the flaw from the exam surface.
 $3.47 \text{ (metal path at 20% upper)} \times \cos \text{ of the measured angle } .5 = 1.735 \text{ inches depth.}$
- 2) Determine the lower depth of the flaw from the exam surface.
 $4.03 \text{ (metal path at 20% lower)} \times \cos \text{ of the measured angle } .5 = 2.015 \text{ inches depth.}$
- 3) Determine the depth of the flaw from the exam surface at the maximum amplitude point.
 $3.75 \text{ (metal path at maximum amplitude point)} \times \cos \text{ of the measured angle } .5 = 1.875 \text{ inches depth.}$
- 4) Determine the distance from the center line of the weld to the maximum amplitude point of the flaw.
 $3.75 \text{ (metal path at maximum amplitude point)} \text{ squared} = 14.0625 \text{ (a}^2\text{)}$
 $1.875 \text{ (depth at maximum amplitude point)} \text{ squared} = 3.5156 \text{ (b}^2\text{)}$
 $\sqrt{a^2 - b^2} = 3.2476 \text{ inches of surface distance to the flaw from the transducer exit point.}$
 $4.0 \text{ (Wmax)} - 3.2476 \text{ (surf dist)} = .7524 \text{ inches to the centerline of the weld.}$
- 5) Determine S by picking the smaller of the following;
 $S = 1.735 \text{ (result of 1)} = \text{distance between exam surface and the upper flaw tip}$
 $>> \text{OR} <<$
 $S = 6.0 \text{ (part "t")} - 2.015 \text{ (result of 2)} = 3.985 \text{ distance between the side opposite exam surface and the lower flaw tip}$
- 6) Determine 2d in though wall thickness.
 $2.015 \text{ (from step 2)} - 1.735 \text{ (from step 1)} = .28 \text{ inches.}$

Determination of surface or subsurface

$0.4d = (2d / 2) \times 0.4 = .058$

Compare to S (from step 5)

If S is less than 0.4d, the flaw is surface. $a = 2d + S = \text{N/A}$ inches.

If S is greater than or equal to 0.4a the flaw is sub-surface. $a = 2a / 2 = .14$ inches.

$l = .50 \text{ (for } a/l > 0.5, l = 2a)$

$t = 6.0 \text{ (part thickness)}$

$a = .15 \text{ (surf or sub surf, circle one)}$

$S = 1.7$



ISI Flaw Disposition Worksheet

Report No.: 2000 156Site/Unit: PT 2 1Procedure: ISI-UT-3APage: of Summary No.: 501733Procedure Revision/FC: 8 1Examination For: ISIWork Order No.: 0002321) Flaw Number 53) ISI Interval 3rd.OK Reviewer KSH2) Item Number B1.404) Code Edition & Addenda 1985 No AddendaOK Reviewer KSHFLAW TYPE: SUB SURFACE
PLANAR.5) Acceptance Standard IWB-3510OK Reviewer KSH

6) Calculations (See Below)

OK Reviewer KSH $a = .15$ $L = .30$ $t = 6.0$ $S = 1.5$

FROM TABLE IWB-3510-1 (4-12) wt.

ASPECT RATIO = $a/L = .15/.30 = .5$ ASPECT RATIO $a/t = .15/6.0 = .025\%$
0.50 7.64
Sub Surface Planar $y = S/a = 1.5/.15 = 10$ $y > 1$ $\therefore y = 1$ $a/t_{allow} = 7.6\%$ $a/t_{min} = .15/6.0 = .025\% \approx 2.5\%$ $\therefore a/t_{allow} > a/t_{min}$ $7.6\% > 2.5\%$ \therefore Flaw is acceptable by Code7) Results OK Reviewer KSH $a/L = .50$ Code allowable $a/t\% = 7.6$ Calculated $a/t\% = 2.5$ Laminar flaw surface area: $(0.75 | w) = NA$ 8) Table used for analysis OK Reviewer KSH IWB-3510-19) Was linear interpolation used? ☒ Yes ☐ No If no, why? NAVALUE CALL ON TABLE.10) Was IWA-3200 Significant Digits For Limiting Values followed? ☒ Yes ☐ No If no, why?11) The correct Code Edition and Addenda was available and used. ☒ Yes Preparer KSH OK Reviewer KSH12) Statement of acceptability or rejectability with basis. OK Reviewer KSH ☒ Accept ☐ Reject☒ (a/t) Code allowable > (a/t) calculated See☐ OEM flaw evaluation handbook (see attached analysis)☐ (a/t) Code allowable < (a/t) calculated

13) Prepared by and date

David M. Kest 5-26-2000

The results are correct and the methodology used is in accordance with applicable codes, standards, specifications and procedures.

14) Engineering review by and date

Karen D. Hall 5-30-00

This review assures that the results are correct and the methodology used is in accordance with applicable codes, standards, specifications and procedures.

15) Approved by and date

J. Ricketts 30 May 2000

This approval assures that all involved with this flaw sizing and flaw disposition were aware of the necessity that the results and the methodology are correct and in accordance with applicable codes, standards, specifications and procedures.

Flaw Sizing Calculations Using Metal Path for Vessel Welds > 2"
For surface and subsurface single planar flaws oriented in plane normal to pressure retaining surface

ASME SECT XI 1989 W/ NO ADDENDA INITIAL TO VERIFY

ISI Report # 2000u156
Flaw # 5

Evaluation Performed By: Greg P. White
Reviewed By: [Signature]

Date: 5-25-00
Date: 5-25-00

Length

Length of the flaw "L" is determined by finding the difference between L1 and L2 for perpendicular scans, W1 and W2 for parallel scans.

L and W values are from page of the UT report.

$l = 271.1$ (L2) - 270.8 (L1) = .30 inches.

Thickness

Thickness of the component at the location of the flaw, using UT or nom wall (circle one).

This value is from page of the UT report.

"t" = 6.0 inches

Calibration

The measured angle in the calibration block was 60 degrees

Calculations using metal path

From page of the UT report, Scan # 2

The flaw exhibited 20% DAC at 2.97 and 3.61 inches MP. Max amplitude is 3.29 inches MP with the transducer exit point at 3.6 inches (W) from the centerline of the weld and 271.0 inches (L) from the 0" reference. (Use of 20% DAC vs. 50% max amp for indications > 100% DAC is conservative.)

- 1) Determine the upper depth of the flaw from the exam surface.
2.97 (metal path at 20% upper) * COS of the measured angle .5 = 1.485 inches depth.
- 2) Determine the lower depth of the flaw from the exam surface.
3.61 (metal path at 20% lower) * COS of the measured angle .5 = 1.805 inches depth.
- 3) Determine the depth of the flaw from the exam surface at the maximum amplitude point.
3.29 (metal path at maximum amplitude point) * COS of the measured angle .5 = 1.645 inches depth.
- 4) Determine the distance from the center line of the weld to the maximum amplitude point of the flaw.
3.29 (metal path at maximum amplitude point) squared = 10.8241 (a²)
1.645 (depth at maximum amplitude point) squared = 2.7060 (b²)
 $\sqrt{a^2 - b^2} = \underline{2.8492}$ inches of surface distance to the flaw from the transducer exit point.
3.6 (Wmax) - 2.8492 (surf dist) = .7508 inches to the centerline of the weld.
- 5) Determine S by picking the smaller of the following;
S = 1.485 (result of 1) = distance between exam surface and the upper flaw tip
>> OR <<
S = 6.0 (part "t") - 1.805 (result of 2) = 4.195 distance between the side opposite exam surface and the lower flaw tip
- 6) Determine 2d in though wall thickness.
1.805 (from step 2) - 1.485 (from step 1) = .32 inches.

Determination of surface or subsurface

$0.4d = (2d / 2) * 0.4 = \underline{.084}$

Compare to S (from step 5)

If S is less than 0.4d, the flaw is surface. $a = 2d + S = \underline{N/A}$ inches.

If S is greater than or equal to 0.4d the flaw is sub-surface. $a = 2a / 2 = \underline{.16}$ inches.

$l = \underline{.30}$ (for $a/l > 0.5$, $l = 2a$)

$t = \underline{6.0}$ (part thickness)

$a = \underline{.16}$ (surf or sub surf, circle one)

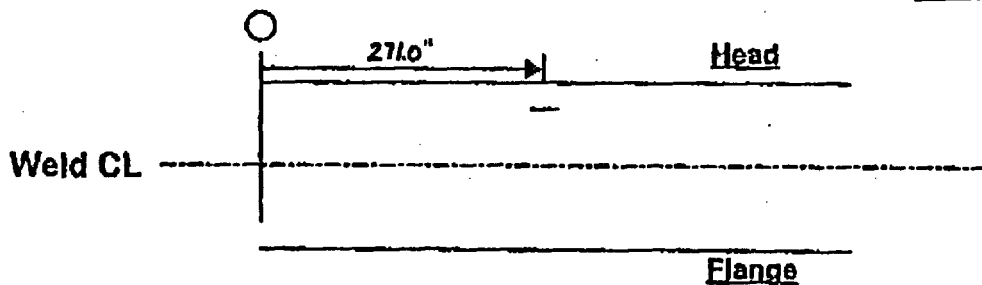
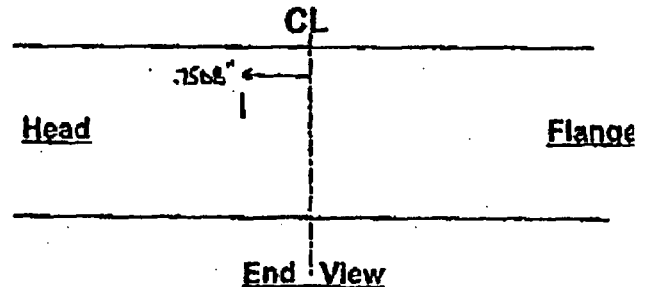
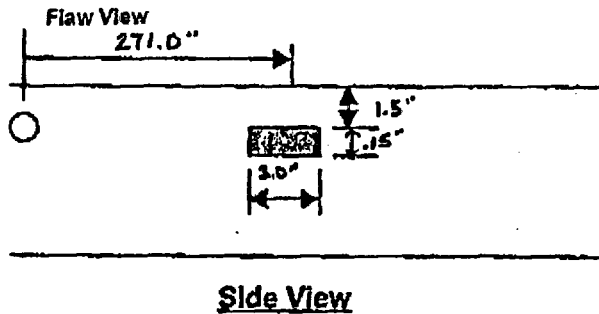
$S = \underline{1.5}$

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REPORT # 2000u156



ISI Flaw Sizing Worksheet

Report No. 2000W56Site/Unit: PI 1 2
Summary No.: 561733
Examination For: W-6 12' to 24'Procedure: ISE-UT-34
Procedure Revision/FC: 8 1 NA
Work Order No.: 0000232Page: of 1) Flaw Number 5
2) Item Number B.1.403) ISI Interval 5"
4) Code Edition & Addenda 1989 NA 104
5) Method UT
6) Flaw Sketch OK Reviewer SPCOK Reviewer SPC
OK Reviewer SPC7) Calculations ☒ OK Reviewer SPC Top View
Show determination of Surface or subsurface

Show determination of type of "a" to use

8) ISI-FE-1 Paragraph 7.0 - "Rounding-off Method" was used ☒ Yes Preparer OPW OK Reviewer SPC9) Code Flaw Dimensions ☒ OK Reviewer SPC
"I" 30 "a" 15 "nominal" NA "measured" 6.0 "S" 1.5 "w" NA10) Flaw Type ☒ OK Reviewer Surface Planar11) Flaw Characterization Figure OK Reviewer IWA-2270.112) Flaw Characterization Figure Number #113) Was IWA-3300 Flaw Characterization followed? ☒ Yes No If no, why?14) The correct Code Edition and Addenda was available and used. ☒ Yes Preparer OPW OK Reviewer SPC15) Prepared by and date J.M. WREN 5/25/0016) Review by and date Sean May 5/25/00

The results are correct and the methodology used is in accordance with applicable codes, standards, specifications and procedures.

The review assures that the results are correct and the methodology used is in accordance with applicable codes, standards, specifications and procedures.

PAGE 20 OF 26REPORT # 2000W56

MAY-25-00 THU 12:52



ISI Flaw Disposition Worksheet

Report No.: 2000U156

Site/Unit: PT2 1

Procedure: ISE-UT-3A

Page: of

Summary No.: 501733

Procedure Revision/FC: 8 1

Examination For: ISE

Work Order No.: 0200282

1) Flaw Number 6

3) ISI Interval 3rd.

OK Reviewer KH

2) Item Number 81.40

4) Code Edition & Addenda 1989 No Addenda

OK Reviewer KH

FLAW TYPE: SUB SURFACE
PLANAR.

5) Acceptance Standard EWB-3510

OK Reviewer KH

6) Calculations (See Below)

OK Reviewer KH

$$a = .15 \quad L = .50 \quad t = 6.0 \quad S = 1.6$$

FROM TABLE 3510-1 (4-12") t and L.

$$\text{ASPECT RATIO} = .15 / .50 = 0.3$$

$$\begin{array}{l} \text{ASPECT RATIO} \quad a/t\% \quad \text{Sub Surface PLANAR} \\ 0.30 \quad \quad \quad 4.44 \end{array}$$

$$Y = S/a = 1.6 / .15 = 10.67 \quad Y > 1 \therefore Y = 1$$

$$a/t_{\text{allowed}} = 4.4(1) = 4.4\% \quad a/t_m = .15 / 6 = .025 \approx 2.5\%$$

$a/t_{\text{allowed}} > a/t_m \quad 4.4\% > 2.5\%$ therefore flaw is acceptable by code.

7) Results OK Reviewer KH

$a/L = 0.3$ Code allowable $a/t\% = 4.4$ Calculated $a/t\% = 2.5$ Laminar flaw surface area: $(0.75 \mid w) = NA$

8) Table used for analysis OK Reviewer KH EWB-3510-1

9) Was linear interpolation used? ☒ Yes ☐ No If no, why? NA

VALUE FALL ON TABLE

10) Was IWA-3200 Significant Digits For Limiting Values followed? ☒ Yes ☐ No If no, why?

11) The correct Code Edition and Addenda was available and used. ☒ Yes Preparer DLW OK Reviewer KH

12) Statement of acceptability or rejectability with basis. OK Reviewer KH ☒ Accept ☐ Reject

☒ (a/t) Code allowable > (a/t) calculated DLW

☐ OEM flaw evaluation handbook (see attached analysis)

☐ (a/t) Code allowable < (a/t) calculated

13) Prepared by and date

Danuel A. White 5-26-2000

The results are correct and the methodology used is in accordance with applicable codes, standards, specifications and procedures.

14) Engineering review by and date

Karen L. Smith 5-30-00

This review assures that the results are correct and the methodology used is in accordance with applicable codes, standards, specifications and procedures.

15) Approved by and date

J. Ricker 30 May 2000

This approval assures that all involved with this flaw sizing and flaw disposition were aware of the necessity that the results and the methodology are correct and in accordance with applicable codes, standards, specifications and procedures.

PAGE 21 OF 26

REPORT # 2000U156

ATTACHMENT 3 PAGE 21 OF 26

Flaw Sizing Calculations Using Metal Path for Vessel Welds > 2" For surface and subsurface single planar flaws oriented in plane normal to pressure retaining surface

ASME SECT XI 1989 W/ NO ADDENDA *gpc* INITIAL TO VERIFY

ISI Report # 20004156
Flaw # 6

Evaluation Performed By: *gpc* Date: 5-25-00
Reviewed By: *gpc* Date: 5-25-00

Length

Length of the flaw "L" is determined by finding the difference between L1 and L2 for perpendicular scans, W1 and W2 for parallel scans.

L and W values are from page of the UT report.

$L = 279.7$ (L2) - 279.2 (L1) = .50 inches.

Thickness

Thickness of the component at the location of the flaw, using UT or nom wall (circle one).

This value is from page of the UT report.

"t" = 6.0 inches

Calibration

The measured angle in the calibration block was 60 degrees

Calculations using metal path

From page of the UT report, Scan # 2

The flaw exhibited 20% DAC at 3.13 and 3.69 inches MP. Max amplitude is 3.41 inches MP with the transducer exit point at 3.7 inches (W) from the centerline of the weld and 279.4 inches (L) from the 0° reference. (Use of 20% DAC vs. 50% max amp for indications > 100% DAC is conservative.)

- 1) Determine the upper depth of the flaw from the exam surface.
 3.13 (metal path at 20% upper) * COS of the measured angle .5 = 1.565 inches depth.
- 2) Determine the lower depth of the flaw from the exam surface.
 3.69 (metal path at 20% lower) * COS of the measured angle .5 = 1.845 inches depth.
- 3) Determine the depth of the flaw from the exam surface at the maximum amplitude point.
 3.41 (metal path at maximum amplitude point) * COS of the measured angle .5 = 1.705 inches depth.
- 4) Determine the distance from the center line of the weld to the maximum amplitude point of the flaw.
 3.41 (metal path at maximum amplitude point) squared = 11.6281 (a²)
 1.705 (depth at maximum amplitude point) squared = 2.9070 (b²)
 $\sqrt{a^2 - b^2} = 2.9532$ inches of surface distance to the flaw from the transducer exit point.
 3.7 (Wmax) - 2.9532 (surf dist) = .7468 inches to the centerline of the weld.
- 5) Determine S by picking the smaller of the following;
 $S = 1.565$ (result of 1) = distance between exam surface and the upper flaw tip
>> OR <<
 $S = 6.0$ (part "t") - 1.845 (result of 2) = 4.155 distance between the side opposite exam surface and the lower flaw tip
- 6) Determine 2d in though wall thickness.
 1.845 (from step 2) - 1.565 (from step 1) = .28 inches.

Determination of surface or subsurface

$0.4d = (2d / 2) * 0.4 = .056$

Compare to S (from step 5)

If S is less than 0.4d, the flaw is surface. $a = 2d + S =$ N/A inches.

If S is greater than or equal to 0.4a the flaw is sub-surface. $a = 2a / 2 =$.14 inches.

$l = .50$ (for $a/l > 0.5$, $l = 2a$)

$t = 6.0$ (part thickness)

$a = .15$ (surf or sub surf, circle one)

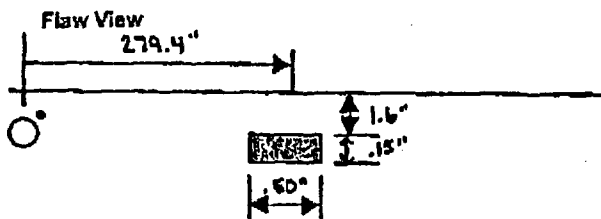
$s = 1.6$

PAGE 22 OF 26

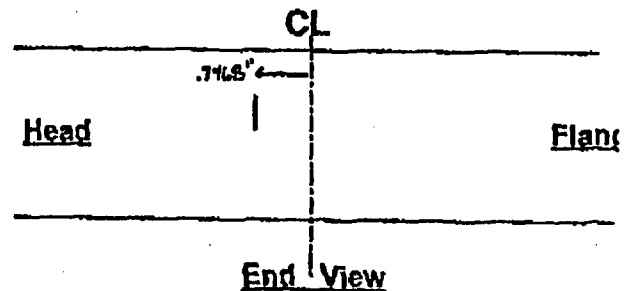
REPORT # 20004156



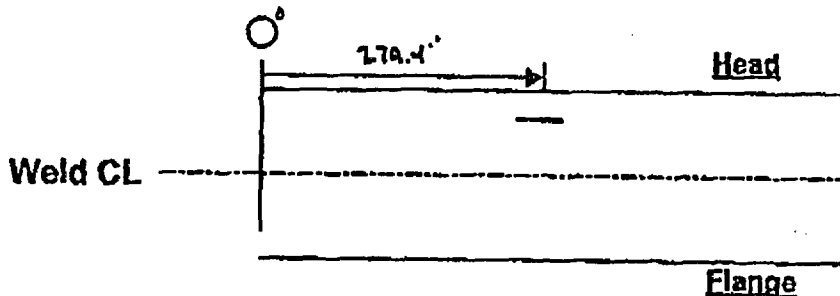
ISI Flaw Sizing Worksheet

Report No.: 2000U156Site/Unit: PI 1 2
Summary No.: 501733
Examination For: W-6 12' to 24'Procedure: IEI-UT 3A
Procedure Revision/FC: B 1 NA
Work Order No.: 0000232Page: of 1) Flaw Number 6
2) Item Number B 1.403) ISI Interval 3rd
4) Code Edition & Addenda 1989 N/A 100
5) Method UT
6) Flaw Sketch OK Reviewer SPCOK Reviewer SPC
OK Reviewer SPC

Side View



End View

7) Calculations OK Reviewer SPC Top View

Show determination of Surface or subsurface

See attached

Show determination of type of "a" to use

See attached8) ISI-FE-1 Paragraph 7.0 - "Rounding-off Method" was used ☒ Yes Preparer SPC OK Reviewer SPC9) Code Flaw Dimensions OK Reviewer SPC"l" .50 "a" .15 "t nominal" NA "t measured" 6.0 "s" 1.6 "w" NA10) Flaw Type OK Reviewer Subsurface Planar11) Flaw Characterization Figure OK Reviewer IWA-3320-112) Flaw Characterization Figure Number #113) Was IWA-3300 Flaw Characterization followed? • Yes ☒ No ☐ If no, why?

14) The correct Code Edition and Addenda was available and used

☒ Yes Preparer SPC OK Reviewer SPC

15) Prepared by and date

SPC WREN 5/25/00

16) Review by and date

SEAN WAH 5/25/00

The results are correct and the methodology used is in accordance with applicable codes, standards, specifications and procedures.

The review assures that the results are correct and the methodology used is in accordance with applicable codes, standards, specifications and procedures.

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MAY-25-00 THU 12:53



ISI Flaw Disposition Worksheet

Report No.: 20000156Site/Unit: PI 21Procedure: ISI-LT-3APage: of Summary No.: 501733Procedure Revision/FC: 8 1Examination For: Work Order No.: 00002321) Flaw Number 73) ISI Interval 3rd.OK Reviewer KH2) Item Number 81.404) Code Edition & Addenda 1989 No AddendaOK Reviewer KHFLAW TYPE: SUB SURFACE
PLANAR.5) Acceptance Standard IWB-3510OK Reviewer KH

6) Calculations (See Below)

OK Reviewer KH

$$a = .10" \quad L = .50" \quad t = 6.0" \quad S = 1.80$$

$$\text{ASPECT RATIO} = a/L = .10"/.50" = .20$$

$$Y = S/a = 1.80/.10" = 18 \quad Y \geq 1 \therefore Y = 1$$

$$a/t_{\text{allow}} = 3.3\% \quad a/t_m = .10"/6.0" = .0167 \approx 1.67\%$$

$\therefore a/t_{\text{allow}} > a/t_m \quad 3.3\% > 1.67\%$ Flaw is acceptable by Code.

7) Results OK Reviewer KHa/l = .20 Code allowable a/t% = 3.3 Calculated a/t% = 1.67 Laminar flaw surface area: $(0.75 \mid w) = \underline{NA}$ 8) Table used for analysis OK Reviewer KH IWB-3510-19) Was linear interpolation used? ☒ Yes ☐ No If no, why?VALUE FELL ON TABLE.10) Was IWA-3200 Significant Digits For Limiting Values followed? ☒ Yes ☐ No If no, why?11) The correct Code Edition and Addenda was available and used. ☒ Yes Preparer OCW OK Reviewer KH12) Statement of acceptability or rejectability with basis. OK Reviewer KH ☒ Accept ☐ Reject☒ (a/t) Code allowable > (a/t) calculated OCW☐ OEM flaw evaluation handbook (see attached analysis)☐ (a/t) Code allowable < (a/t) calculated

13) Prepared by and date

Donna White 5-26-2000

The results are correct and the methodology used is in accordance with applicable codes, standards, specifications and procedures.

14) Engineering review by and date

Karen Smith 5-30-00

This review assures that the results are correct and the methodology used is in accordance with applicable codes, standards, specifications and procedures.

15) Approved by and date

J. Rucker 30 May 2000

This approval assures that all involved with this flaw sizing and flaw disposition were aware of the necessity that the results and the methodology are correct and in accordance with applicable codes, standards, specifications and procedures.

PAGE 24 OF 26REPORT # 20000156PAGE 24 OF 26
ATTACHMENT 3

Flaw Sizing Calculations Using Metal Path for Vessel Welds > 2"
For surface and subsurface single planar flaws oriented in plane normal to pressure retaining surface

ASME SECT XI 1989 W/ NO ADDENDA 22 INITIAL TO VERIFY

ISI Report # 2000U156
Flaw # 7

Evaluation Performed By: Don P. W. Date: 5-25-00
Reviewed By: ALB Date: 5-25-00

Length

Length of the flaw "L" is determined by finding the difference between L1 and L2 for perpendicular scans, W1 and W2 for parallel scans.

L and W values are from page of the UT report.

$l = \underline{281.6} \text{ (L2)} - \underline{281.1} \text{ (L1)} = \underline{.50} \text{ inches.}$

Thickness

Thickness of the component at the location of the flaw, using UT or nom wall (circle one).

This value is from page of the UT report.

$"t" = \underline{6.0} \text{ inches}$

Calibration

The measured angle in the calibration block was 60 degrees

Calculations using metal path

From page of the UT report, Scan # 2

The flaw exhibited 20% DAC at 3.65 and 4.15 inches MP. Max amplitude is 3.90 inches MP with the transducer exit point at 4.2 inches (W) from the centerline of the weld and 281.4 inches (L) from the 0" reference. (Use of 20% DAC vs. 50% max amp for indications > 100% DAC is conservative.)

- 1) Determine the upper depth of the flaw from the exam surface.
 $\underline{3.65} \text{ (metal path at 20\% upper)} * \text{COS of the measured angle } \underline{.5} = \underline{1.825} \text{ inches depth.}$
- 2) Determine the lower depth of the flaw from the exam surface.
 $\underline{4.15} \text{ (metal path at 20\% lower)} * \text{COS of the measured angle } \underline{.5} = \underline{2.075} \text{ inches depth.}$
- 3) Determine the depth of the flaw from the exam surface at the maximum amplitude point.
 $\underline{3.90} \text{ (metal path at maximum amplitude point)} * \text{COS of the measured angle } \underline{.5} = \underline{1.95} \text{ inches depth.}$
- 4) Determine the distance from the center line of the weld to the maximum amplitude point of the flaw.
 $\underline{3.90} \text{ (metal path at maximum amplitude point) squared} = \underline{15.21} \text{ (a}^2\text{)}$
 $\underline{1.95} \text{ (depth at maximum amplitude point) squared} = \underline{3.8025} \text{ (b}^2\text{)}$
 $\sqrt{a^2 - b^2} = \underline{3.3776} \text{ inches of surface distance to the flaw from the transducer exit point.}$
 $\underline{4.2} \text{ (Wmax)} - \underline{3.3776} \text{ (surf dist)} = \underline{.8225} \text{ inches to the centerline of the weld.}$
- 5) Determine S by picking the smaller of the following;
 $S = \underline{1.825} \text{ (result of 1) = distance between exam surface and the upper flaw tip}$
 $\geq \text{OR} \leq$
 $S = \underline{6.0} \text{ (part "t")} - \underline{2.075} \text{ (result of 2) = } \underline{3.925} \text{ distance between the side opposite exam surface and the lower flaw tip}$
- 6) Determine 2d in though wall thickness.
 $\underline{2.075} \text{ (from step 2)} - \underline{1.825} \text{ (from step 1)} = \underline{.25} \text{ inches.}$

Determination of surface or subsurface

$0.4d = (2d / 2) * 0.4 = \underline{.05}$

Compare to S (from step 5)

If S is less than 0.4d, the flaw is surface. $a = 2d + S = \underline{N/A}$ inches.

If S is greater than or equal to 0.4a the flaw is sub-surface. $a = 2a / 2 = \underline{.125}$ inches.

$l = \underline{.50} \text{ (for } a/l > 0.5, l = 2a)$

$t = \underline{6.0} \text{ (part thickness)}$

$a = \underline{.10} \text{ (surf or sub surf, circle one)}$

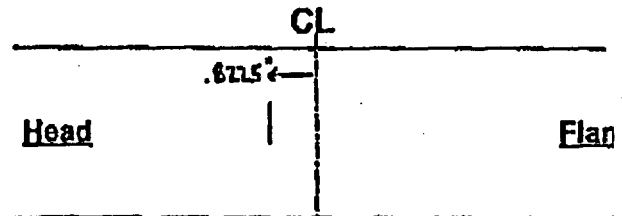
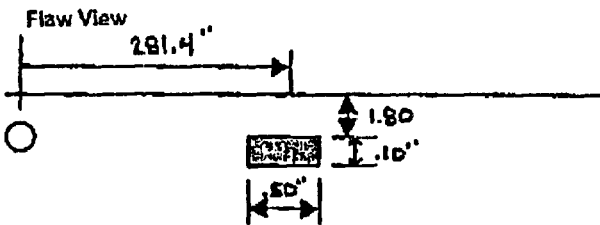
$S = \underline{1.8}$

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REPORT # 2000U156

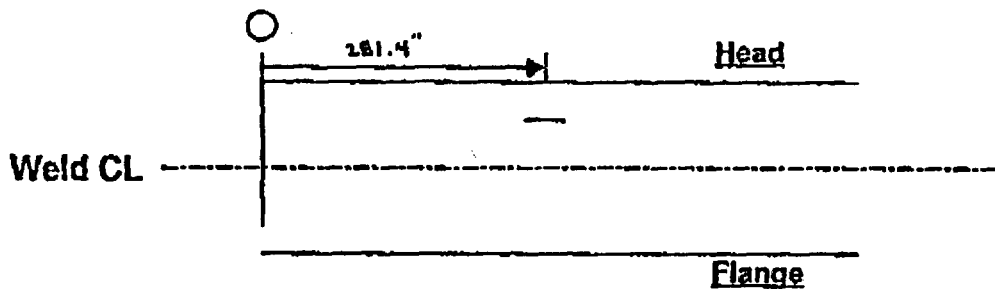


ISI Flaw Sizing Worksheet

Report No. 2000U156Site/Unit: PI 1 2
Summary No.: 501733
Examination For: W-6 12' + 24'Procedure: ISI-UT-3A
Procedure Revision/FC: 8 1 NA
Work Order No.: 0000232Page: of 1) Flaw Number 7
2) Item Number B1.403) ISI Interval 3"
4) Code Edition & Addenda 1989 NO APP
5) Method UT
6) Flaw Sketch OK Reviewer SPCOK Reviewer SPC
OK Reviewer SPC

Side View

End View

7) Calculations OK Reviewer SPC Top View
Show determination of Surface or subsurfaceSee attached

Show determination of type of "a" to use

See attached8) ISI-FE-1 Paragraph 7.0 - "Rounding-off Method" was used ☒ Yes Preparer SPC OK Reviewer SPC9) Code Flaw Dimensions OK Reviewer SPC" .50 "a" .10 "t nominal" NA "t measured" 6.0 "s" 1.80 "w" NA10) Flaw Type OK Reviewer SUBSURFACE Planar11) Flaw Characterization Figure OK Reviewer IWA-3320-112) Flaw Characterization Figure Number #1

13) Was IWA-3300 Flaw Characterization followed? • Yes No If no, why?

14) The correct Code Edition and Addenda was available and used

☒ Yes Preparer SPC OK Reviewer SPC

15) Prepared by and date

JERRY WREN 5/25/00

16) Review by and date

SEAN CLAY 5/25/00

The results are correct and the methodology used is in accordance with applicable codes, standards, specifications and procedures.

The review assures that the results are correct and the methodology used is in accordance with applicable codes, standards, specifications and procedures.

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REPORT # 2000U156

MAY-25-00 THU 12:54



UT Pipe Weld Examination

Site/Unit: PINGP / PI2 Procedure: SWI NDE-UT-11 Outage No.: P12RF2003
Summary No.: 501145 Procedure Rev.: 0 Report No.: 2003U005
Workscope: ISI Work Order No.: 0211922 Page: 1 of 6

Code: 1989 Code Cat.: B-J Location: Containment
Drawing No.: 2-ISI-33B Description: Elbow To Pump
System ID: RC
Component ID: W- 6/2LSU Size/Length: 31" / 116" Thickness/Diameter: 2.9" / 31"
Limitations: No scans on pump side due to configuration Start Time: 1100 Finish Time: 1145

Examination Surface: Inside ☐ Outside ☒ Surface Condition: Machined
Lo Location: Intrados of Elbow Wo Location: Centerline of Weld Couplant: Sonotrace 40 Batch No.: #00143
Temp. Tool Mfg.: PTC Instruments Serial No.: 3792 Surface Temp.: 80 °F

Cal. Report No.: 2003CA009, 2003CA010, 2003CA011

Angle Used	0	45	45T	60		
Scanning dB	37.0	88.0	83.0	N/A		

Indication(s): Yes ☒ No ☐ Scan Coverage: Upstream ☒ Downstream ☐ CW ☒ CCW ☒

Comments:

0 deg scan coverage 90%

Results: NAD ☐ IND ☐ GEO ☒

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

Examiner	Level	III	Signature	Date	Reviewer	Signature	Date
Blechinger, Todd P.			<i>Todd P. Blechinger</i>	9/17/2003	Jones, Thomas	<i>Tom Jones</i>	9/20/03
Examiner	Level	N/A	Signature	Date	Site Review	Signature	Date
N/A					Hanson, Shannon	<i>Shannon Hanson</i>	9/24/2003
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A					Daly, Gerald	<i>Gerald Daly</i>	2/6/07



Ultrasonic Indication Report

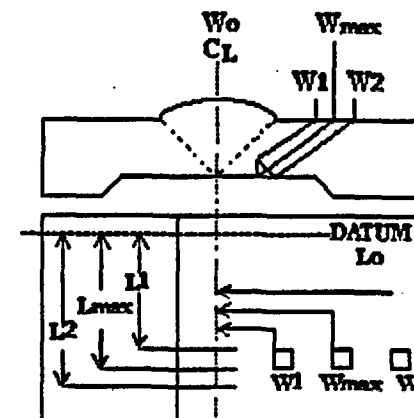
Site/Unit: PINGP / PI2
 Summary No.: 501145
 Workscope: ISI

Procedure: SWI NDE-UT-11
 Procedure Rev.: 0
 Work Order No.: 0211922

Outage No.: PI2RF2003
 Report No.: 2003U005
 Page: 2 of 6

Search Unit Angle: 45 °
 Wo Location: Weld CL
 Lo Location: Intrados of Elbow

- ☒ Piping Welds
☐ Ferritic Vessels $\geq 2"$ 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:

Scan #	Indication No.	% Of DAC	W Max		Forward Of Max		Backward Of Max		L1 Of Max	L Max	L2 Of Max	RBR Amp.	Remarks
			W	MP	W1	MP	W2	MP					
1	1	75	4.5"	4.49"					26.5"	29"	31.5"		Splitter Vane Geometry
1	2	75	4.5"	4.49"					84.5"	87"	89.5"		Splitter Vane Geometry

Examiner Level III Blechinger, Todd P.	Signature <i>T. P. Blechinger</i>	Date 9/17/2003	Reviewer Jones, Thomas	Signature <i>Tom Jones</i>	Date 9/20/03
Examiner Level N/A N/A	Signature	Date	Site Review Hanson, Shannon	Signature <i>Shannon Hanson</i>	Date 9/24/2003
Other Level N/A N/A	Signature	Date	ANII Review Daly, Gerald	Signature <i>Gerald Daly</i>	Date 26 SEP 03

Additional - UT Indication Data <edit from Setup>



Determination of Percent Coverage for UT Examinations - Pipe

Site/Unit: PINGP / PI2
Summary No.: 501145
Workscope: ISI

Procedure: SWI NDE-UT-11
Procedure Rev.: 0
Work Order No.: 0211922

Outage No.: PI2RF2003
Report No.: 2003U005
Page: 3 of 6

45 deg

Scan 1	<u>100.000</u>	% Length X	<u>96.000</u>	% volume of length / 100 =	<u>96.000</u>	% total for Scan 1
Scan 2	<u>0.000</u>	% Length X	<u>0.000</u>	% volume of length / 100 =	<u>0.000</u>	% total for Scan 2
Scan 3	<u>100.000</u>	% Length X	<u>90.000</u>	% volume of length / 100 =	<u>90.000</u>	% total for Scan 3
Scan 4	<u>100.000</u>	% Length X	<u>90.000</u>	% volume of length / 100 =	<u>90.000</u>	% total for Scan 4

Add totals and divide by # scans = 69.000 % total for 45 deg

Other deg - _____ (to be used for supplemental scans)

The data to be listed below is for coverage that was not obtained with the 45 deg scans.

Scan 1	_____	% Length X	_____	% volume of length / 100 =	_____	% total for Scan 1
Scan 2	_____	% Length X	_____	% volume of length / 100 =	_____	% total for Scan 2
Scan 3	_____	% Length X	_____	% volume of length / 100 =	_____	% total for Scan 3
Scan 4	_____	% Length X	_____	% volume of length / 100 =	_____	% total for Scan 4

Percent complete coverage

Add totals for each scan required and divide by # of scans to determine;

69.000 % Total for complete exam

Site Field Supervisor: Tom [Signature]

Date: 9/20/03



Supplemental Report

Report No.: 2003U005

Page: 4 of 6

Summary No.: 501145

Examiner: Blechliger, Todd P.

Level: III

Reviewer: Jones, Thomas *TH*

Date: 9/26/03

Examiner: N/A

Level: N/A

Site Review: Hanson, Shannon *MS*

Date: 9/24/2003

Other: N/A

Level: N/A

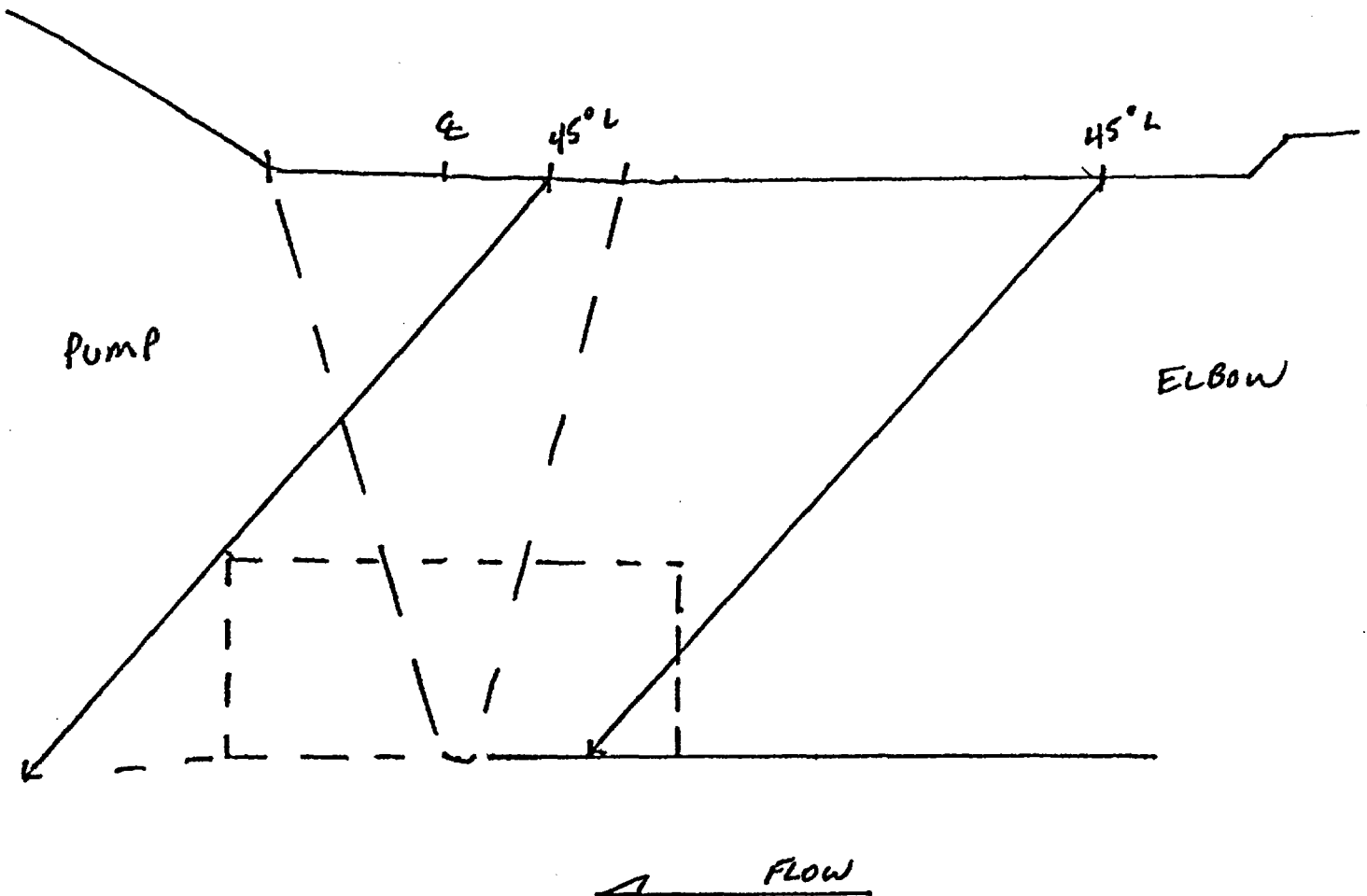
ANII Review: Daly, Gerald *GD*

Date: 26 SEP 03

Comments: W-6 Coverage Plot.

0 deg coverage 90% due to pump configuration. No 0 deg scan on pump due to configuration.

Sketch or Photo: J:\Ideas_Photos\PI2RFO2003\UT Images\2003U005_1a.bmp





Supplemental Report

Report No.: 2003U005

Page: 5 of 6

Summary No.: 501145

Examiner: Blechliger, Todd P.

Level: III

Reviewer: Jones, Thomas *TmJ*

Date: 9/20/03

Examiner: N/A

Level: N/A

Site Review: Hanson, Shannon *ShH*

Date: 9/24/07

Other: N/A

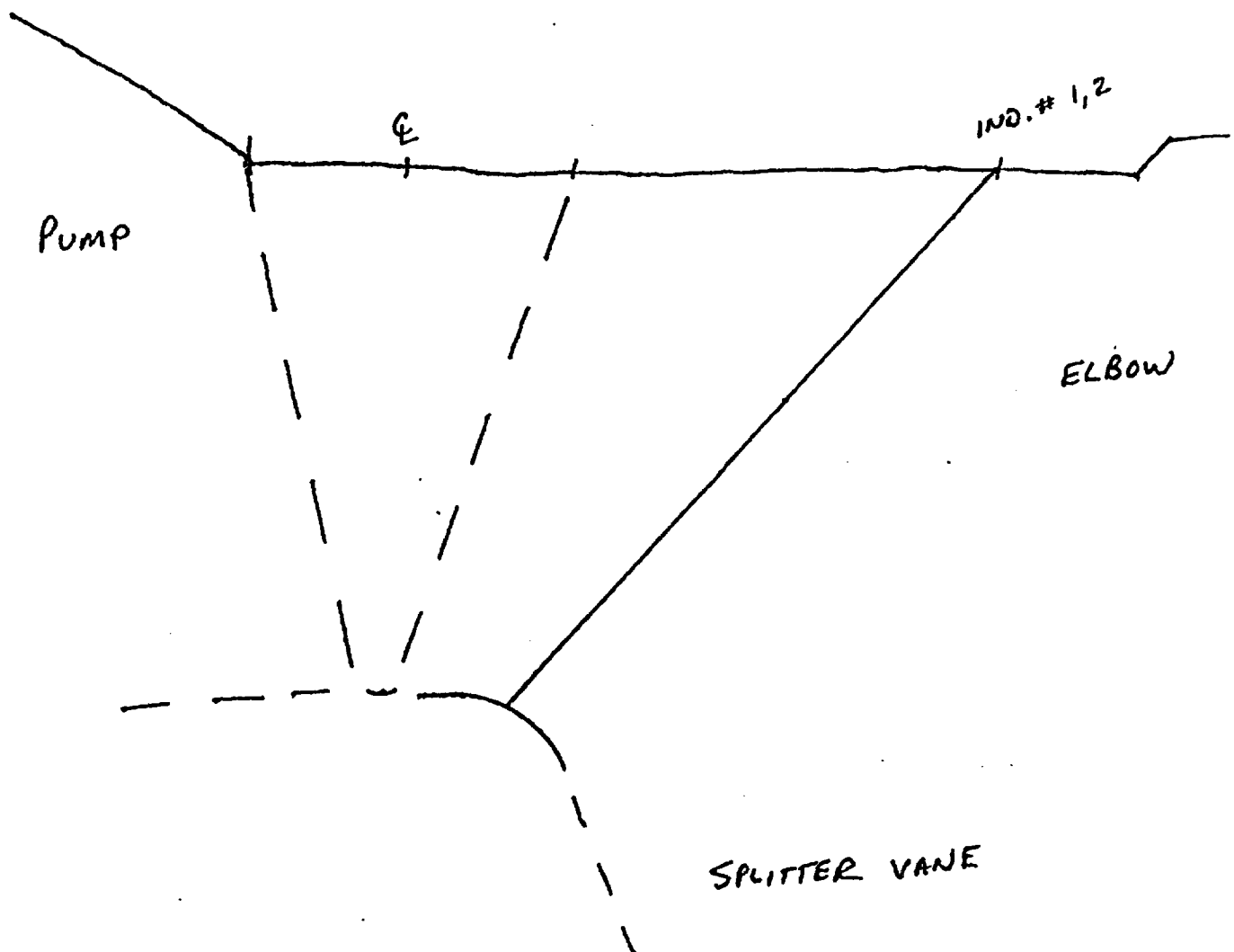
Level: N/A

ANII Review: Daly, Gerald *GD*

Date: 26 SEP 03

Comments: W-6 Indication Plot

Sketch or Photo: J:\Ideas_Photos\PI2RFO2003\UT Images\2003U005_2a.bmp





Supplemental Report

Report No.: 2003U005

Page: 6 of 6

Summary No.: 501145

Examiner: Blechliger, Todd P.

Level: III

Reviewer: Jones, Thomas *Hand*

Date: 9/20/03

Examiner: N/A

Level: N/A

Site Review: Hanson, Shannon *W-6*

Date: 9/24/03

Other: N/A

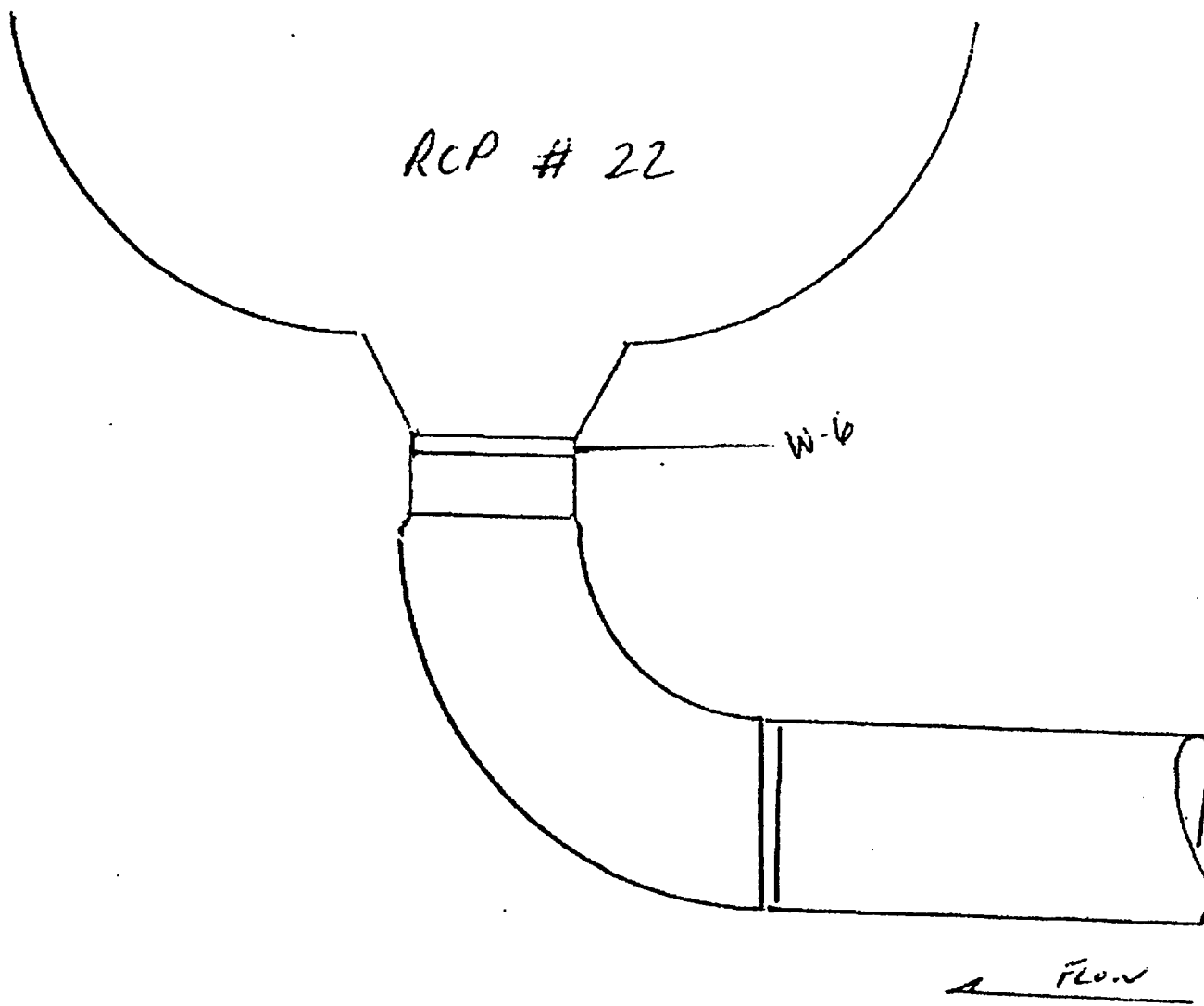
Level: N/A

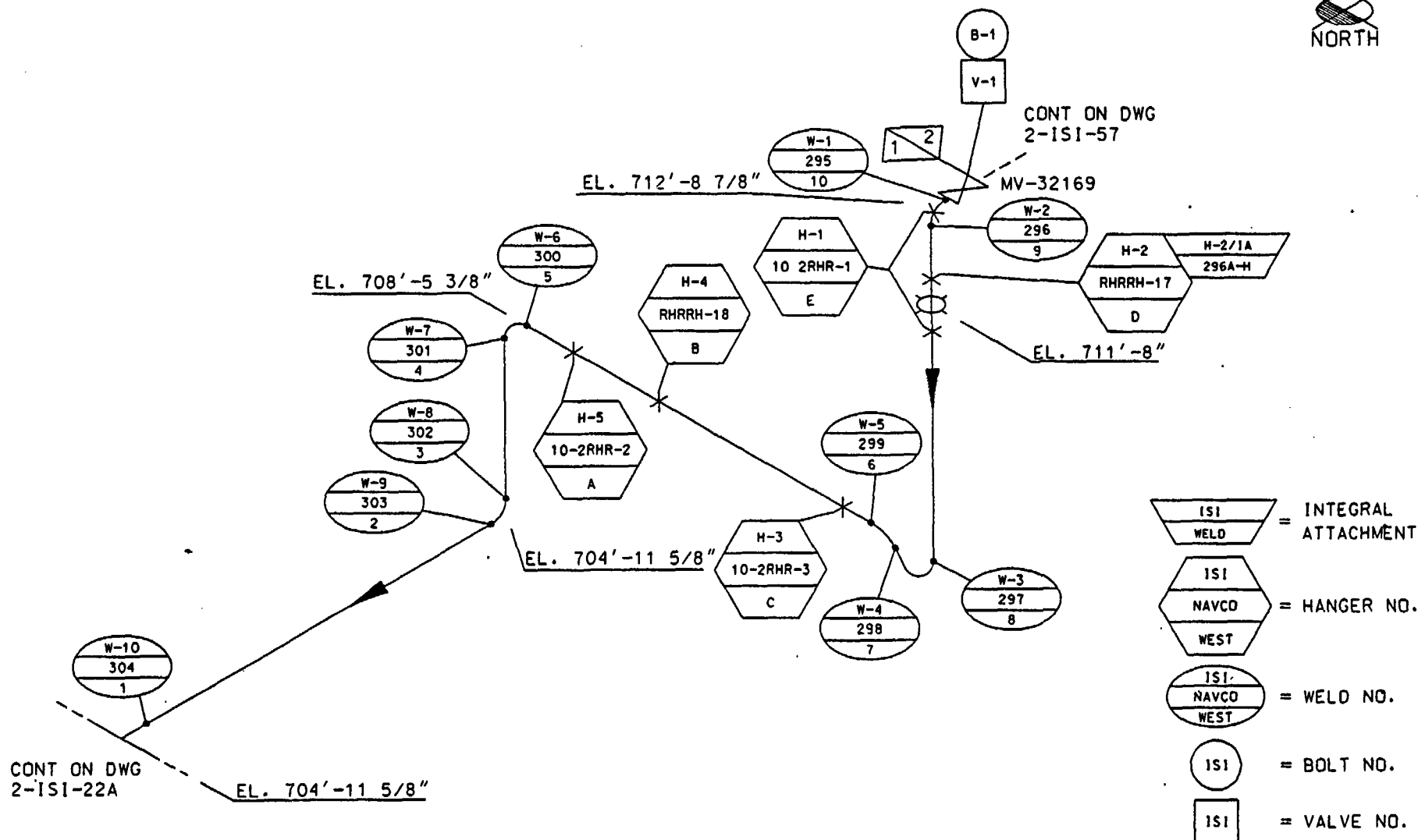
ANII Review: Daly, Gerald *J.R.O.*

Date: 26 Sept 03

Comments: General configuration

Sketch or Photo: J:\Ideal_Photos\PI2RFO2003\UT Images\2003U005_3a.bmp





REF: XH-1106-2552

FILE NO: 21021R05

NSP (M&SP)-PI-2		ISI
DWN: CADWorksCHKD:DSW	APPD:DSW	
SYSTEM:RHR RETURNE		
LINE: 10-2SI-26		
DWG:	2-ISI-21	REV: 06



UT Pipe Weld Examination

Site/Unit: PINGP / P12 Procedure: SWI NDE-UT-16A Outage No.: P12RF2003
Summary No.: 501900 Procedure Rev.: 0 Report No.: 2003U002
Workscope: ISI Work Order No.: 0211924 Page: 1 of 6

Code: 1989 Code Cat.: B-J Location: Containment
Drawing No.: 2-ISI-21 Description: Elbow to Pipe
System ID: SI
Component ID: W-2 Size/Length: 34" Thickness/Diameter: / 10"
Limitations: Sheet attached, supplemental report form Start Time: 1122 Finish Time: 1205

Examination Surface: Inside ☐ Outside ☒ Surface Condition: Ground Smooth
Lo Location: Elbow Outer Radius Wo Location: Centerline of Weld Couplant: Sonotrace 40 Batch No.: #00143
Temp. Tool Mfg.: PTC Instruments Serial No.: 3792 Surface Temp.: 88 °F

Cal. Report No.: 2003CA003, 2003CA004

Angle Used	0	45	45T	60		
Scanning dB	N/A	34.5	34.5	46.0		

Indication(s): Yes ☐ No ☒ Scan Coverage: Upstream ☒ Downstream ☒ CW ☒ CCW ☒

Comments:

Results: NAD ☒ IND ☐ GEO ☐

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

Examiner	Level II	Signature	Date	Reviewer	Signature	Date
Stevermer, Aaron			9/16/2003	Jones, Thomas		9/27/03
Examiner	Level II	Signature	Date	Site Review	Signature	Date
Bowne, Lowell V.			9/16/2003	Hanson, Shannon		9/28/07
Other	Level N/A	Signature	Date	ANII Review	Signature	Date
N/A				Daly, Gerald		07SEP03



Supplemental Report

Report No.: 2003U002

Page: 2 of 6

Summary No.: 501900

Examiner: Stevermer, Aaron

Level: II

Reviewer: Jones, Thomas

Date: 9/27/03

Examiner: Bowne, Lowell V.

Level: II

Site Review: Hanson, Shannon

Date: 9/28/03

Other: N/A

Level: N/A

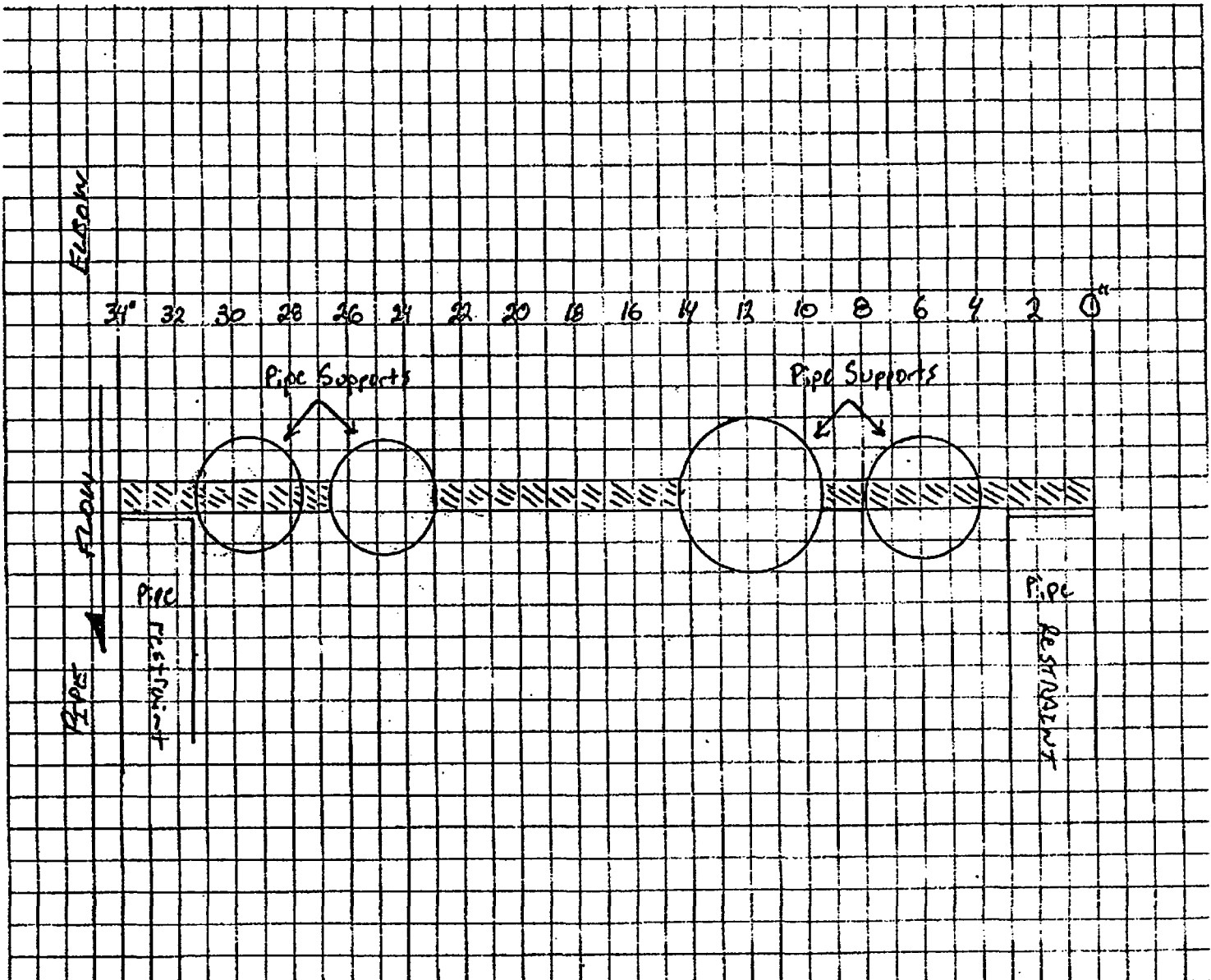
ANII Review: Daly, Gerald

Date: 10/28/03

Comments: Limitations for component W-2. RHR Return "B"

FOUR WELDED SUPPORT LUGS COVER WELD

Sketch or Photo: J:\ddeal_Photos\PI2RFO2003\UT Images\2003U002_1.bmp





Supplemental Report

Report No.: 2003U002

Page: 3 of 6

Summary No.: 501900

Examiner: Stevermer, Aaron

Level: II

Reviewer: Jones, Thomas

Date: 9/27/03

Examiner: Bowne, Lowell V.

Level: II

Site Review: Hanson, Shannon

Date: 9/28/03

Other: N/A

Level: N/A

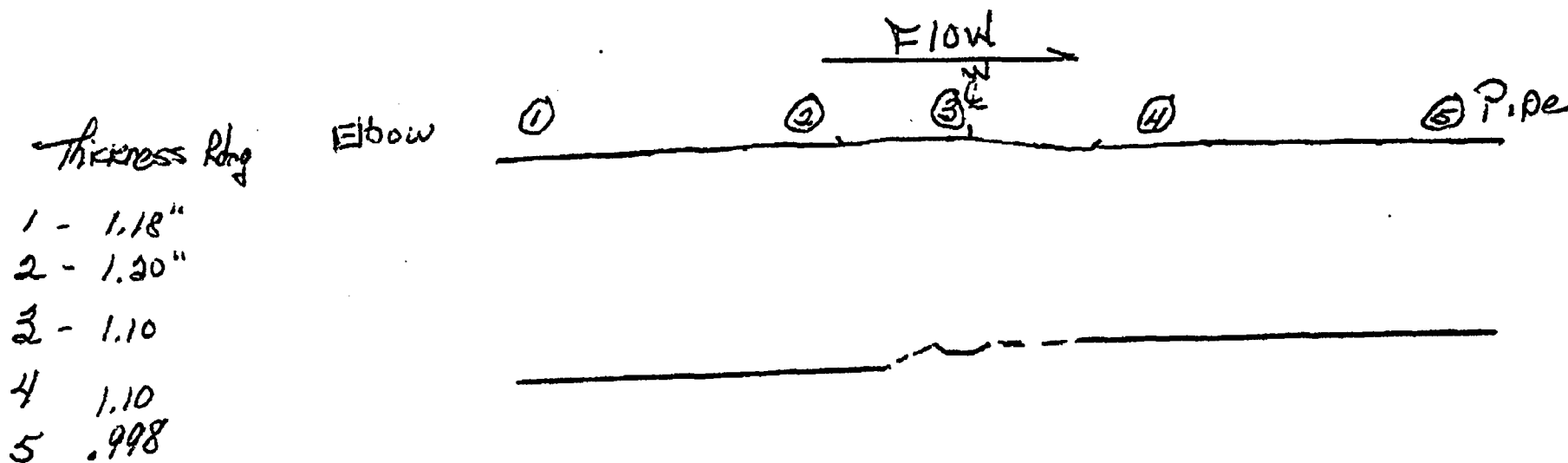
ANII Review: Daly, Gerald

Date: 27SEP03

Comments: Thickness readings and contour taken at 300 deg. for component W-2.

Sketch or Photo:

J:\ddeal_Photos\PI2RFO2003\UT Images\2003U002_2a.bmp





Supplemental Report

Report No.: 2003U002

Page: 4 of 6

Summary No.: 501900

Examiner: Stevermer, Aaron

Level: II

Reviewer: Jones, Thomas *gmj*

Date: 9/27/03

Examiner: Bowne, Lowell V.

Level: II

Site Review: Hanson, Shannon *TSF*

Date: 9/26/03

Other: N/A

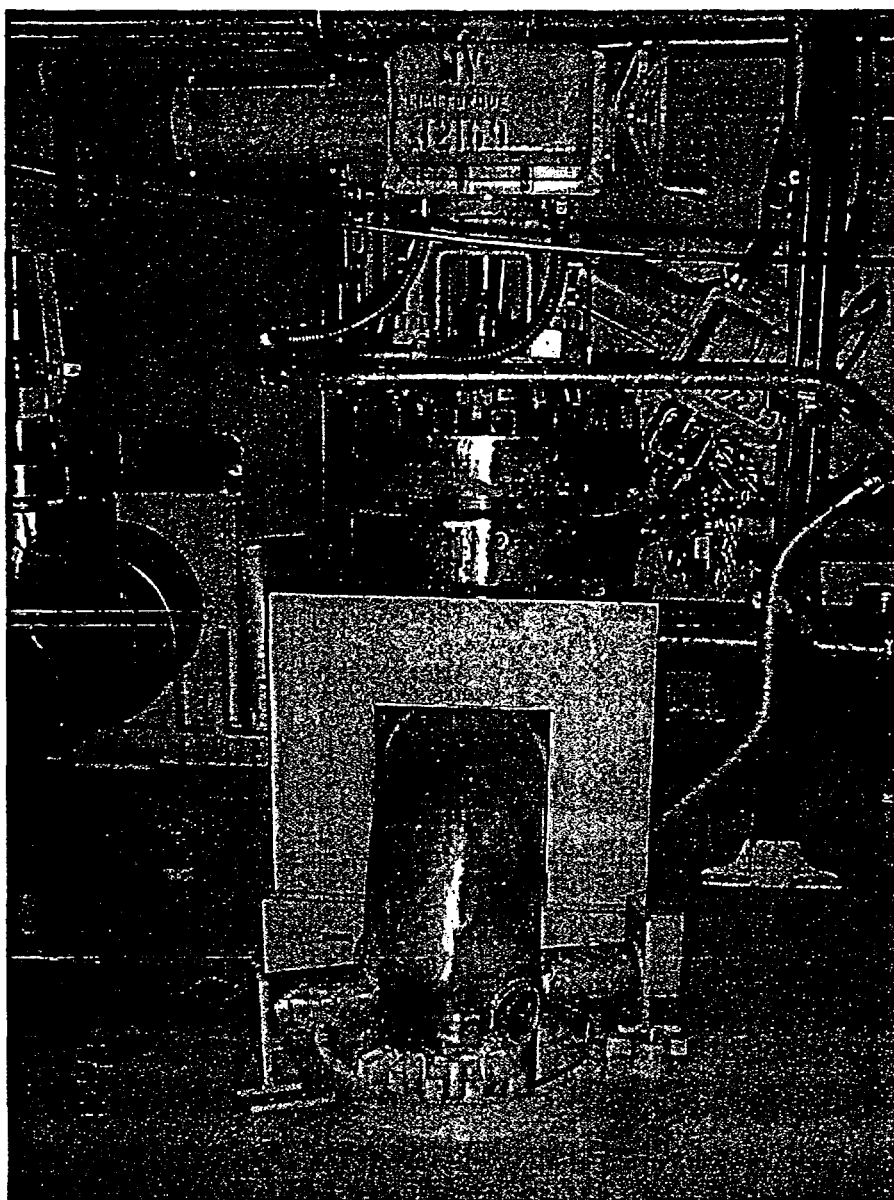
Level: N/A

ANII Review: Daly, Gerald *JD*

Date: 27SEP03

Comments: Overall picture of component with limitations

Sketch or Photo: J:\Ideas_Photos\PI2RFO2003\UT Images\2003U002_2.JPG





Supplemental Report

Report No.: 2003U002

Page: 5 of 6

Summary No.: 501900

Examiner: Stevermer, Aaron

Level: II

Reviewer: Jones, Thomas *CTM*

Date: 9/27/03

Examiner: Bowne, Lowell V.

Level: II

Site Review: Hanson, Shannon *Shh*

Date: 9/28/03

Other: N/A

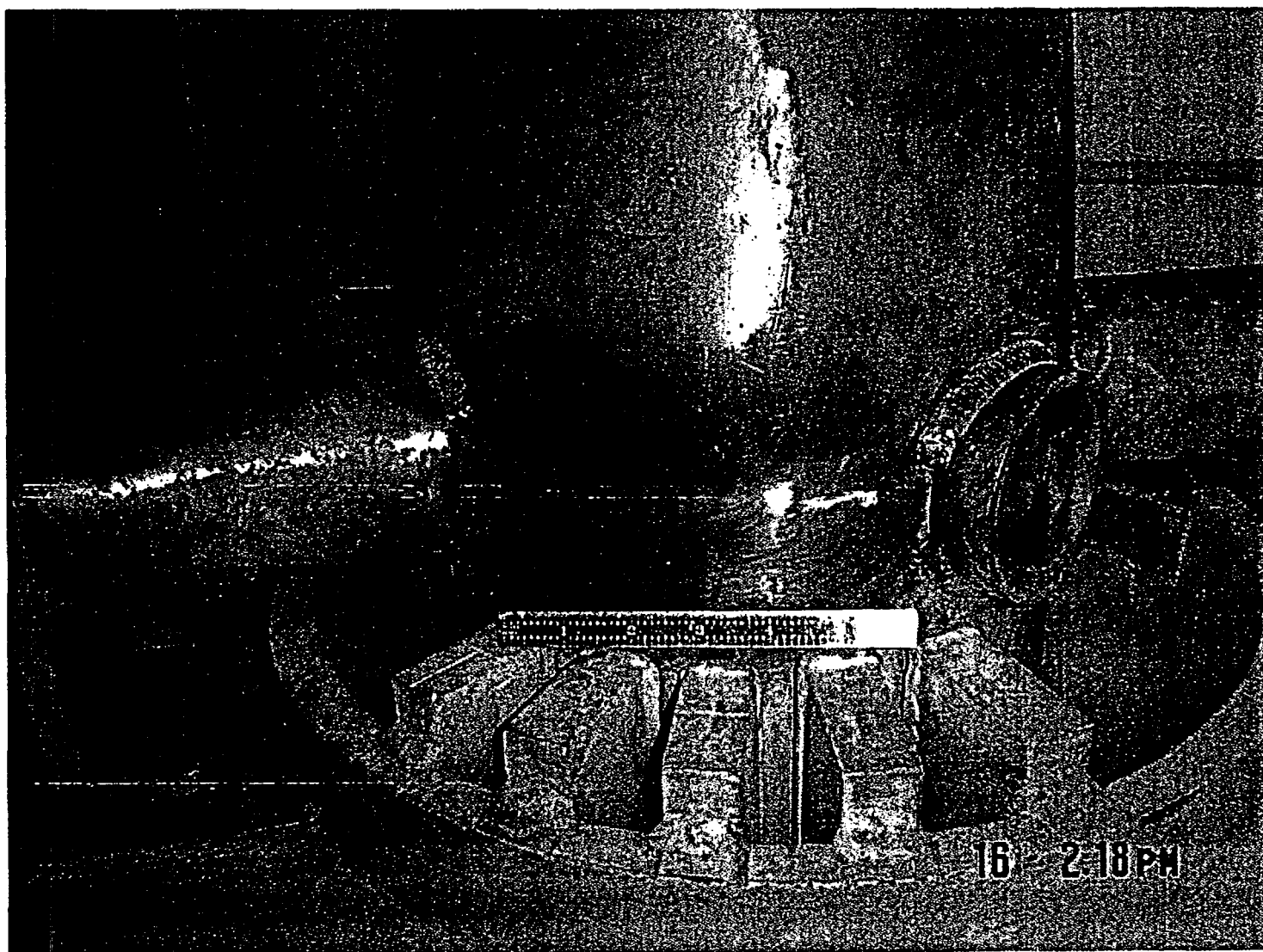
Level: N/A

ANII Review: Daly, Gerald *GD*

Date: 275603

Comments: Close up picture of limitations

Sketch or Photo: J:\ddeal_Photos\PI2RFO2003\UT Images\2003U002_3.JPG





Determination of Percent Coverage for UT Examinations - Pipe

Site/Unit: PINGP / PI2
Summary No.: 501900
Workscope: ISI

Procedure: SWI NDE-UT-16A
Procedure Rev.: 0
Work Order No.: 0211924

Outage No.: PI2RF2003
Report No.: 2003U002
Page: 6 of 6

45 deg

Scan 1	<u>44.000</u>	% Length X	<u>100.000</u>	% volume of length / 100 =	<u>44.000</u>	% total for Scan 1
Scan 2	<u>25.000</u>	% Length X	<u>100.000</u>	% volume of length / 100 =	<u>25.000</u>	% total for Scan 2
Scan 3	<u>44.000</u>	% Length X	<u>100.000</u>	% volume of length / 100 =	<u>44.000</u>	% total for Scan 3
Scan 4	<u>44.000</u>	% Length X	<u>100.000</u>	% volume of length / 100 =	<u>44.000</u>	% total for Scan 4

Add totals and divide by # scans = 39.250 % total for 45 deg

Other deg - _____ (to be used for supplemental scans)

The data to be listed below is for coverage that was not obtained with the 45 deg scans.

Scan 1	_____	% Length X	_____	% volume of length / 100 =	_____	% total for Scan 1
Scan 2	_____	% Length X	_____	% volume of length / 100 =	_____	% total for Scan 2
Scan 3	_____	% Length X	_____	% volume of length / 100 =	_____	% total for Scan 3
Scan 4	_____	% Length X	_____	% volume of length / 100 =	_____	% total for Scan 4

Percent complete coverage

Add totals for each scan required and divide by # of scans to determine;

39.250 % Total for complete exam

Site Field Supervisor: _____

Date: _____

9/27/03



Liquid Penetrant Examination

Site/Unit: PINGP / PI2Procedure: SWI NDE-PT-1Outage No.: PI2RF2003Summary No.: 501900Procedure Rev.: 0Report No.: 2003P012Workscope: ISIWork Order No.: 0211924Page: 1 of 4Code: 1989 Code Cat.: B-J Location: ContainmentDrawing No.: 2-ISI-21 Description: Elbow to PipeSystem ID: SIComponent ID: W-2 Size/Length: 34"Limitations: See attached drawing and Percent of Coverage SheetTemp. Tool Mfg.: PTC Instruments Serial No.: 3792 Surface Temp.: 88 °FComparator Block Temp.: Side A: N/A °F Side B: N/A °F Resolution: Not UsedLo/Wo Location: Elbow Outer Radius / Weld CL Surface Condition: Ground Smooth

	Cleaner	Penetrant	Remover	Developer
Brand	Magnaflux	Magnaflux	Magnaflux	Magnaflux
Type	SKC-S	SKL-HF/S	SKC-S	SKD-S2
Batch No.	94L07K	87C054	94L07K	95D07K
Time	Evap. 5 min	Dwell 15 min	Evap. 5 min	Develop 7 min
Time Exam Started: 1030		Time Exam Completed: 1120		

Indication No.	Loc L	Loc W	Diameter	Length	Type R/L	Remarks

Comments:

None

Results: NAD ☒ IND ☐ GEO ☐Percent Of Coverage Obtained > 90%: NoReviewed Previous Data: Yes

Examiner Level II Stevermer, Aaron	Signature <i>[Signature]</i>	Date 9/16/2003	Reviewer Jones, Thomas	Signature <i>[Signature]</i>	Date 9/18/03
Examiner Level II Bowne, Lowell V.	Signature <i>[Signature]</i>	Date 9/16/2003	Site Review Hanson, Shannon	Signature <i>[Signature]</i>	Date 9/21/03
Other Level N/A N/A	Signature	Date	ANII Review Daly, Gerald	Signature <i>[Signature]</i>	Date 9/25/03

PAGE 1 OF 4
ATTACHMENT 8



Determination of Percent Coverage for Surface Examinations

Site/Unit: PINGP / PI2 Procedure: SWI NDE-PT-1 Outage No.: PI2RF2003
Summary No.: 501900 Procedure Rev.: 0 Report No.: 2003P012
Workscope: ISI Work Order No.: 0211924 Page: 2 of 4

Area Required (as shown in applicable code reference drawing)

Length 34.000 * Width 2.100
= Total Area required 71.400 square inches

Coverage Achieved

Area examined 37.800 sq. in. / Total area required (100%) 71.400 sq. in.
= Percent coverage 0.529 % (area required - area of limitations = area examined)
52.9%

To determine length of a circumferential weld

Note - Diameter refers to actual external diameter not pipe size (see table below)

Diameter NA * (Pi) 3.1416
= Length NA inches

Pipe Size	Actual Diameter	(Length) Circumference		Pipe Size	Actual Diameter	(Length) Circumference
2	2.375	7.46		12	12.75	40.06
2.5	2.875	9.03		14	14.0	43.98
3	3.5	11.0		16	16.0	50.27
3.5	4.0	12.57		18	18.0	56.55
4	4.5	14.14		20	20.0	62.83
5	5.563	17.48		22	22.0	69.12
6	6.625	20.81		24	24.0	75.40
8	8.625	27.10		30	30.0	94.25
10	10.75	33.77				

Site Field Supervisor: Tom J. L. L. L.

Date: 9/18/03

PAGE 2 OF 4
ATTACHMENT 8



Supplemental Report

Report No.: 2003P012

Page: 3 of 4

Summary No.: 501900

Examiner: Stevermer, Aaron

Level: II

Reviewer: Jones, Thomas

Date: 9/18/03

Examiner: Bowne, Lowell V.

Level: II

Site Review: Hanson, Shannon

Date: 9/24/03

Other: N/A

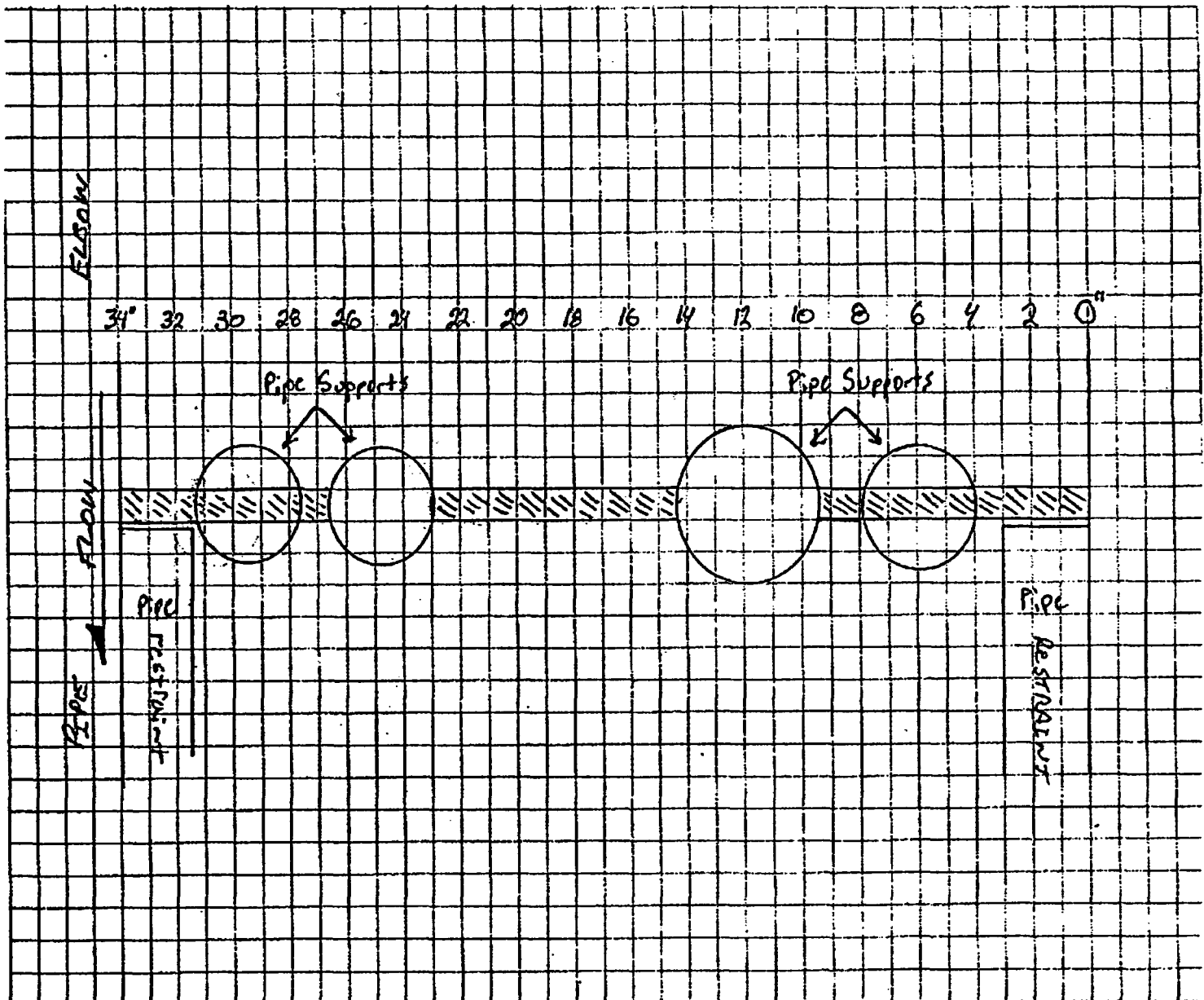
Level: N/A

ANII Review: Daly, Gerald

Date: 07/26/03

Comments: Limitations for component W-2. RHR Return "B"

Sketch or Photo: J:\Ideas_Photos\PI2RFO2003\PT Images\2003p012_1a.bmp



ATTACHMENT 8 PAGE 3 OF 4



Supplemental Report

Report No.: 2003P012

Page: 4 of 4

Summary No.: 501900

Examiner: Stevermer, Aaron

Level: II

Reviewer: Jones, Thomas

Date: 9/18/03

Examiner: Bowne, Lowell V.

Level: II

Site Review: Hanson, Shannon

Date: 9/25/03

Other: N/A

Level: N/A

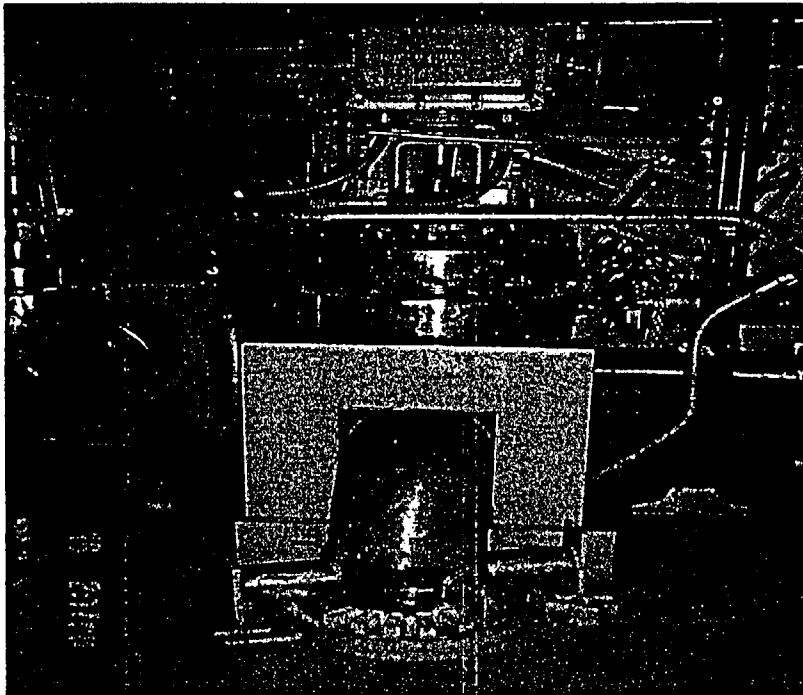
ANII Review: Daly, Gerald

Date: 5/25/03

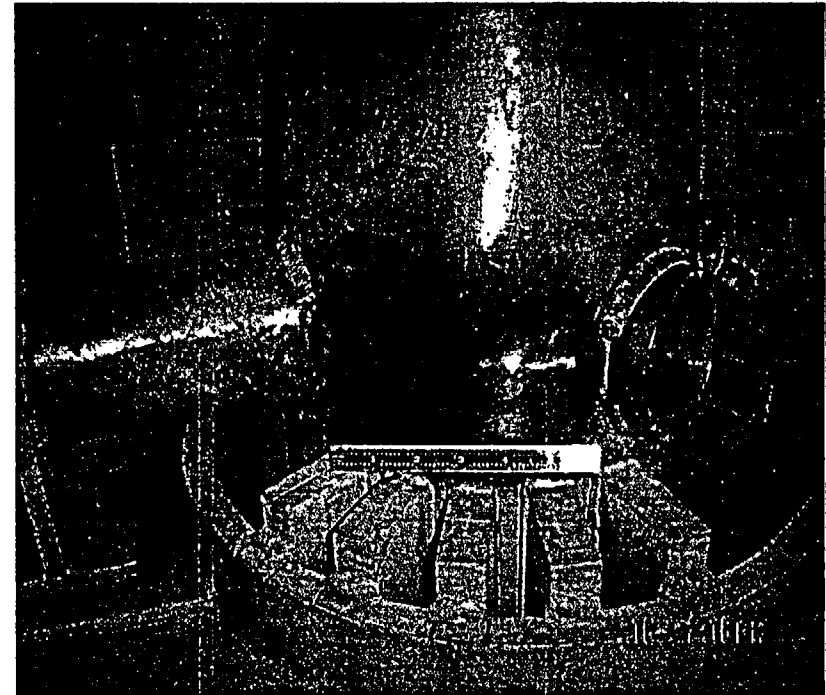
Comments:

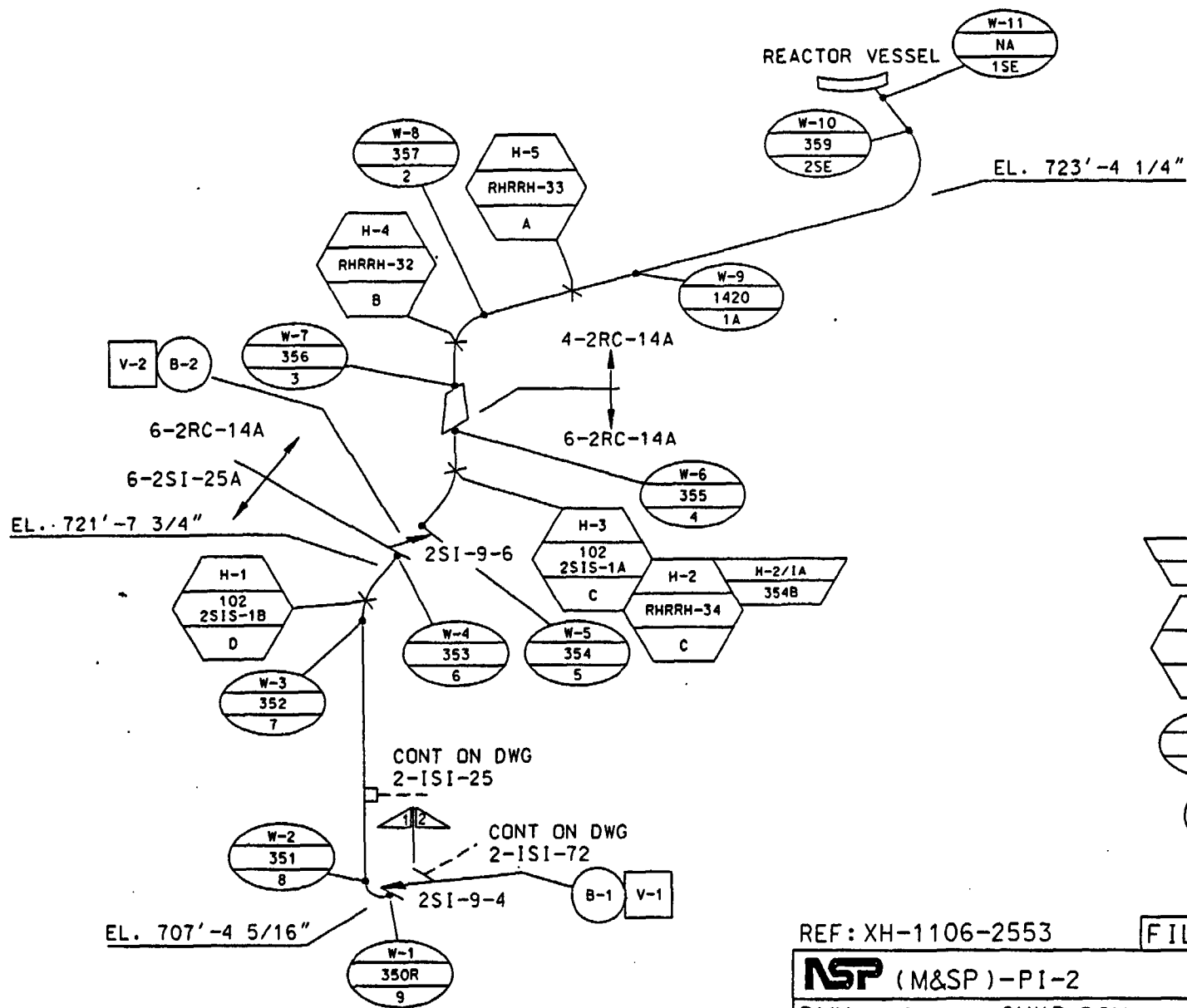
WELOED
FOUR WELOED SUPPORT LUGS COVER WELO

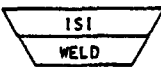
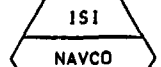



Sketch or Photo: J:\Ideas_Photos\PI2RFO2003\PT Images\2003P012_1.JPG



J:\Ideas_Photos\PI2RFO2003\PT Images\2003P012_2.JPG





-  = INTEGRAL ATTACHMENT
-  = HANGER NO.
-  = WELD NO.
-  = BOLT NO.
-  = VALVE NO.

4" & 6" REACTOR VESSEL SIS LOOP "A"

REF: XH-1106-2553		FILE NO: 21029R05
NSP (M&SP)-PI-2		ISI
DWN: CADWorksCHKD:DSW		APPD: DSW
SYSTEM: REACTOR VESSEL SAFETY INJECTION		
LINE: 4-2RC-14A, 6-2RC-14A, 6-2SI-25A		
DWG:	2-ISI-29	REV: 06



UT Pipe Weld Examination

Site/Unit: <u>PINGP / PI2</u>	Procedure: <u>SWI NDE-UT-16A</u>	Outage No.: <u>PI2RF2003</u>
Summary No.: <u>501813</u>	Procedure Rev.: <u>0</u>	Report No.: <u>2003U040</u>
Workscope: <u>ISI</u>	Work Order No.: <u>0211924</u>	Page: <u>1</u> of <u>5</u>

Code: <u>1989</u>	Code Cat.: <u>B-J</u>	Location: <u>715' CONTAINMENT</u>
Drawing No.: <u>2-ISI-29</u>	Description: <u>Pipe To Elbow</u>	
System ID: <u>SI</u>		
Component ID: <u>W-3</u>	Size/Length: <u>.70"</u>	Thickness/Diameter: <u>.750" / 6.0"</u>
Limitations: <u>Restraint obstructed upstream axial scanning</u>	Start Time: <u>1450</u>	Finish Time: <u>1520</u>

Examination Surface: <u>Inside</u> <u>Outside</u> <input checked="" type="checkbox"/>	Surface Condition: <u>Ground</u>	
Lo Location: <u>Extrados of elbow</u>	Wo Location: <u>Centerline of Weld</u>	Couplant: <u>Sonotrace 40</u> Batch No.: <u>#00143</u>
Temp. Tool Mfg.: <u>PTC Instruments</u>	Serial No.: <u>3774</u>	Surface Temp.: <u>78</u> °F
Cal. Report No.: <u>2003CA050, 2003CA051</u>		

Angle Used	0	45	45T	60	60 RL	
Scanning dB		36	36		61	

Indication(s): Yes ☐ No ☒ Scan Coverage: Upstream ☐ Downstream ☒ CW ☒ CCW ☒

Comments:

Results: NAD ☒ IND ☐ GEO ☐

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

Examiner	Level II	Signature	Date	Reviewer	Signature	Date
Howard, Dean		<i>Dean Howard</i>	10/1/2003	Wren, Jerry P.	<i>Jerry P. Wren</i>	10-3-03
Examiner	Level N/A	Signature	Date	Site Review	Signature	Date
N/A				Hanson, Shannon	<i>Shannon Hanson</i>	10/3/03
Other	Level N/A	Signature	Date	ANII Review	Signature	Date
N/A				Daly, Gerald	<i>Gerald P. Daly</i>	03 OCT 03



Limitation Record

Site/Unit: PINGP / PI2
Summary No.: 501813
Worksopce: ISI

Procedure: SWI NDE-UT-16A
Procedure Rev.: 0
Work Order No.: 0211924

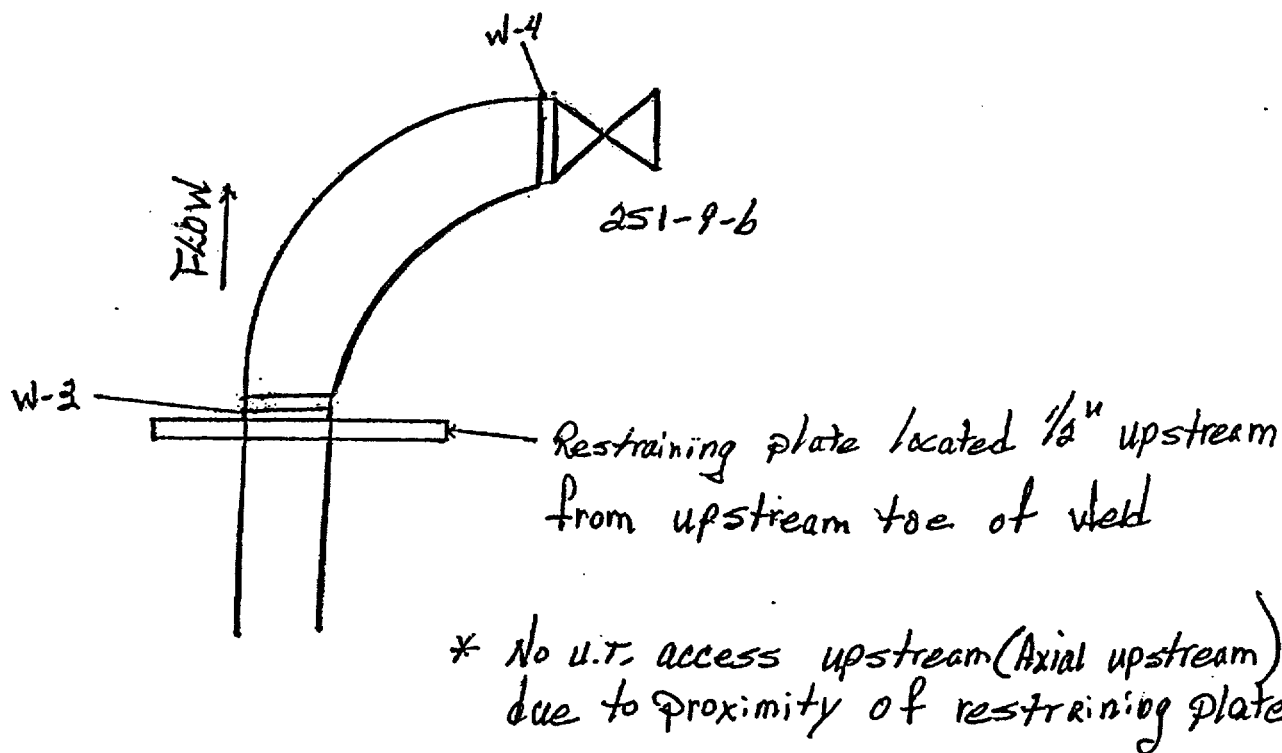
Outage No.: PI2RF2003
Report No.: 2003U040
Page: 2 of 5

Description of Limitation:

DWG 2-ISI-29 System Reactor Vessel Safety Injection (6")

Sketch of Limitation:

J:\Ideas_Photos\PI2RFO2003\UT Images\2003U040_2.bmp



Limitations removal requirements:

Although the examination was performed through 100% of the code required volume, procedure SWI NDE-UT-16A is not qualified for the detection of flaws on the far side of single side access exams. The techniques provided by this procedure were used for a best effort examination for flaws on the far side of the weld.

Radiation field:

Examiner	Level II	Signature	Date	Reviewer	Signature	Date
Howard, Dean		Dean Howard	10/1/2003	Wren, Jerry P.	Jerry Wren	10/3/03
Examiner	Level N/A	Signature	Date	Site Review	Signature	Date
N/A				Hanson, Shannon	Shannon Hanson	10/3/03
Other	Level N/A	Signature	Date	ANII Review	Signature	Date
N/A				Daly, Gerald	Gerald Daly	03 Oct 03

Additional - Limitation <edit from Setup>

20FS
PAGE
ATTACHMENT 10



Supplemental Report

Report No.: 2003U040

Page: 3 of 5

Summary No.: 501813

Examiner: Howard, Dean

Level: II

Reviewer: Wren, Jerry P.

Date: 10-3-03

Examiner: N/A

Level: N/A

Site Review: Hanson, Shannon

Date: 10/3/07

Other: N/A

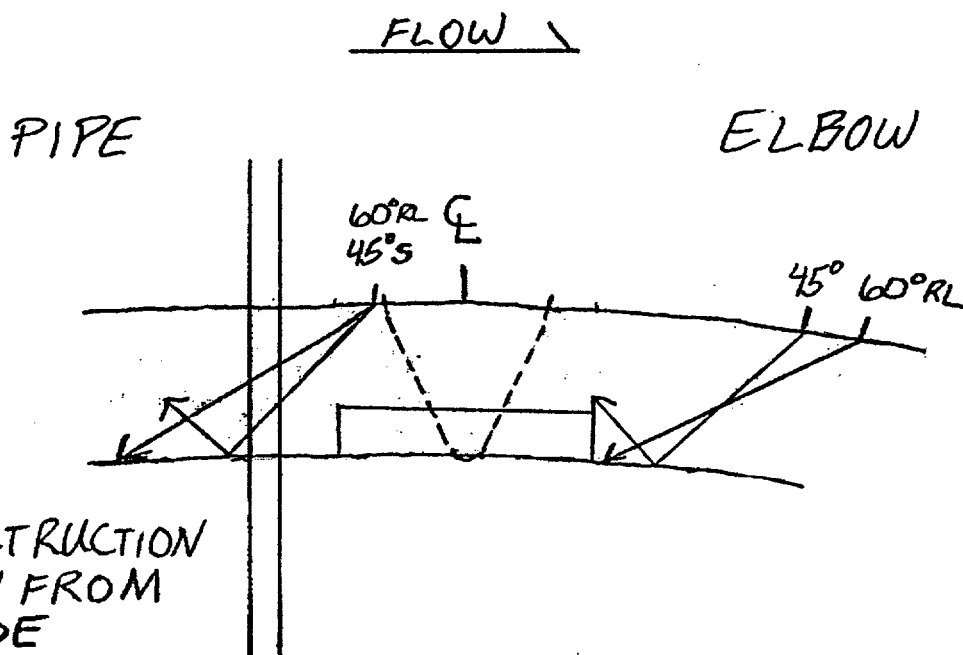
Level: N/A

ANII Review: Daly, Gerald

Date: 03 OCT 03

Comments: Exam coverage sketch

Sketch or Photo: J:\ddeal_Photos\PI2RFO2003\UT Images\2003U040_1.bmp



3 OF 5
PAGE
ATTACHMENT 10



Determination of Percent Coverage for UT Examinations - Pipe

Site/Unit: PINGP / PI2
Summary No.: 501813
Workscope: ISI

Procedure: SWI NDE-UT-16A
Procedure Rev.: 0
Work Order No.: 0211924

Outage No.: PI2RF2003
Report No.: 2003U040
Page: 4 of 5

45 deg

Scan 1	<u>100.000</u>	% Length X	<u>100.000</u>	% volume of length / 100 =	<u>100.000</u>	% total for Scan 1
Scan 2	<u>0.000</u>	% Length X	<u>0.000</u>	% volume of length / 100 =	<u>0.000</u>	% total for Scan 2
Scan 3	<u>100.000</u>	% Length X	<u>100.000</u>	% volume of length / 100 =	<u>100.000</u>	% total for Scan 3
Scan 4	<u>100.000</u>	% Length X	<u>100.000</u>	% volume of length / 100 =	<u>100.000</u>	% total for Scan 4

Add totals and divide by # scans = 75.000 % total for 45 deg

Other deg - _____ (to be used for supplemental scans)

The data to be listed below is for coverage that was not obtained with the 45 deg scans.

Scan 1	_____	% Length X	_____	% volume of length / 100 =	_____	% total for Scan 1
Scan 2	_____	% Length X	_____	% volume of length / 100 =	_____	% total for Scan 2
Scan 3	_____	% Length X	_____	% volume of length / 100 =	_____	% total for Scan 3
Scan 4	_____	% Length X	_____	% volume of length / 100 =	_____	% total for Scan 4

Percent complete coverage

Add totals for each scan required and divide by # of scans to determine;

75.000 % Total for complete exam

Site Field Supervisor: _____

Date: _____

10-3-03



Supplemental Report

Report No.: 2003U040

Page: 5 of 5

Summary No.: 501813

Examiner: Howard, Dean

Level: II

Reviewer: Wren, Jerry P.

Date: 10-3-03

Examiner: N/A

Level: N/A

Site Review: Hanson, Shannon

Date: 10/3/03

Other: N/A

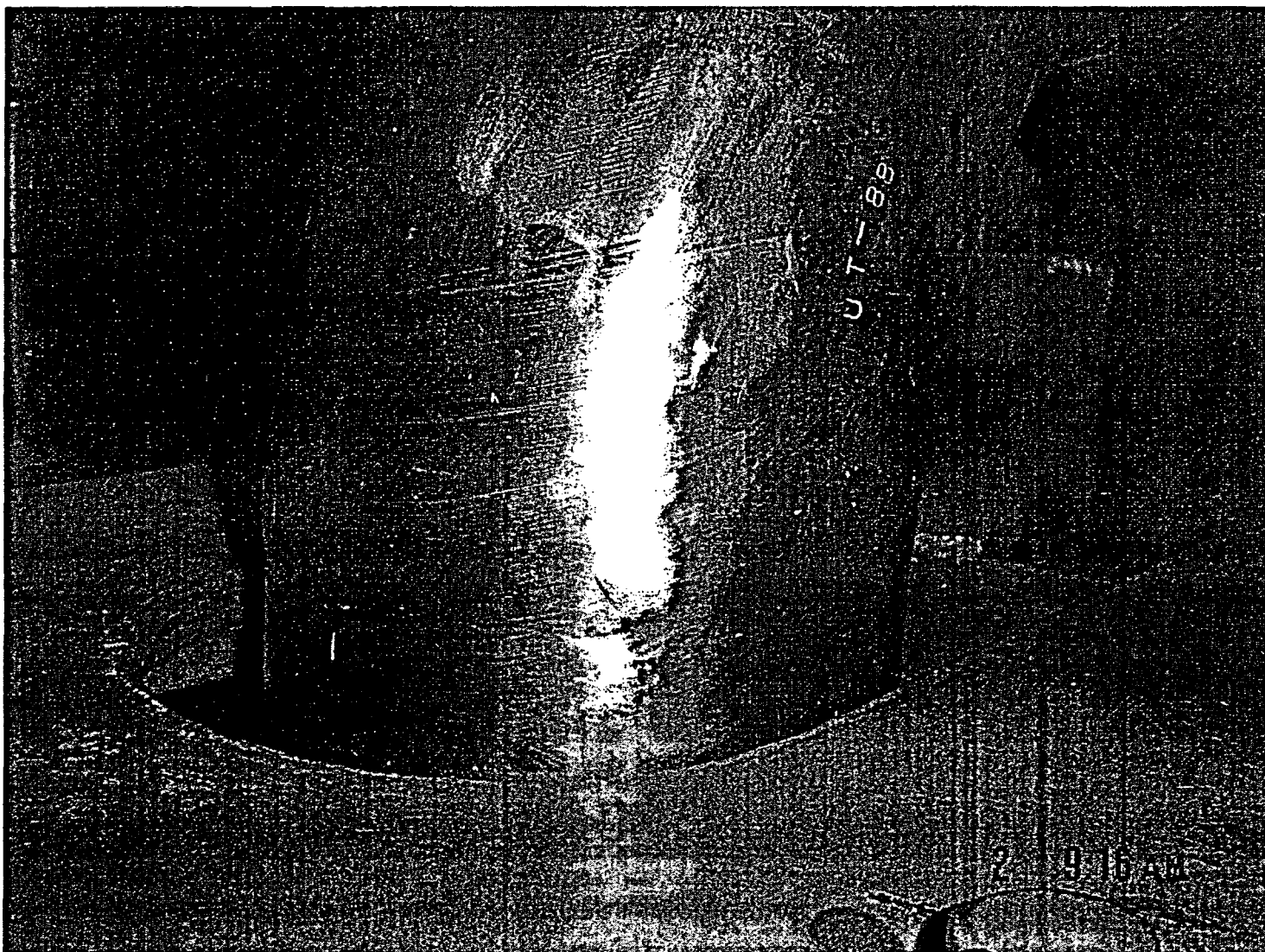
Level: N/A

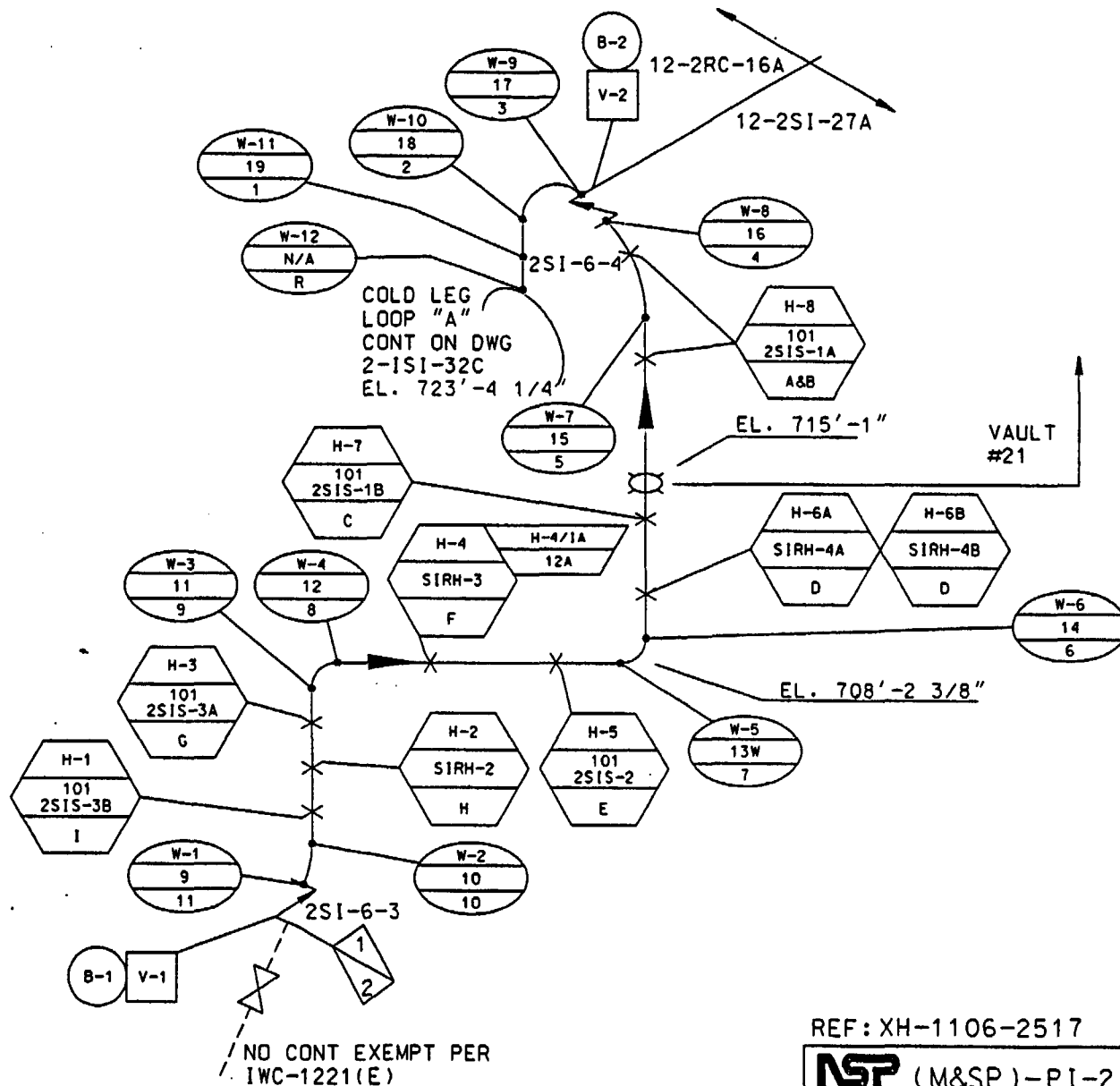
ANII Review: Daly, Gerald






Date: 030403

Comments: Photo of component

Sketch or Photo: J:\Ideal_Photos\PI2RFO2003\UT Images\2003U040_3.JPG





-  = INTEGRAL ATTACHMENT
-  = HANGER NO.
-  = WELD NO.
-  = BOLT NO.
-  = VALVE NO.

LOOP "A" ACCUMULATOR DISCHARGE

REF: XH-1106-2517

FILE NO: 21011R05

NSP (M&SP)-PI-2		ISI
DWN: CADWorksCHKD:DSW		APPD: DSW
SYSTEM: ACCUMULATOR DISCHARGE		
LINE: 12-2RC-16A, 12-2SI-27A		
DWG:	2-ISI-11	REV: 06



UT Pipe Weld Examination

Site/Unit: PINGP / PI2 Procedure: SWI NDE-UT-16A Outage No.: PI2RF2003
Summary No.: 501939 Procedure Rev.: 0 Report No.: 2003U015
Workscope: ISI Work Order No.: 0211922 Page: 1 of 4

Code: 1989 Code Cat.: B-J Location: Containment
Drawing No.: 2-ISI-11 Description: Nozzle To Pipe
System ID: RC
Component ID: W-12 Size/Length: 12" / 48 3/4" Thickness/Diameter: 2.950
Limitations: Single side examination due to component configuration Start Time: 1145 Finish Time: 1210

Examination Surface: Inside ☐ Outside ☒ Surface Condition: Smooth
Lo Location: OSR of U/S Elbow Wo Location: Centerline of Weld Couplant: Sonotrace 40 Batch No.: #00143
Temp. Tool Mfg.: PTC Instruments Serial No.: 3778 Surface Temp.: 101 °F

Cal. Report No.: 2003CA019

Angle Used	0	45	45T	60		
Scanning dB		55.2	55.2			

Indication(s): Yes ☐ No ☒ Scan Coverage: Upstream ☒ Downstream ☐ CW ☒ CCW ☒

Comments:

WO# 0211922 Location: Containment

Results: NAD ☒ IND GEO ☐

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

Examiner	Level	Signature	Date	Reviewer	Signature	Date
Stevermer, Aaron	II		9/17/2003	Jones, Thomas		9/22/03
Examiner	Level	Signature	Date	Site Review	Signature	Date
Bowne, Lowell V.	II		9/17/2003	Hanson, Shannon		9/24/03
Other	Level	Signature	Date	ANII Review	Signature	Date
N/A	N/A			Daly, Gerald		27SEP03



Determination of Percent Coverage for UT Examinations - Pipe

Site/Unit: PINGP / PI2
Summary No.: 501939
Workscope: ISI

Procedure: SWI NDE-UT-16A
Procedure Rev.: 0
Work Order No.: 0211922

Outage No.: PI2RF2003
Report No.: 2003U015
Page: 2 of 4

45 deg

Scan 1	<u>100.000</u>	% Length X	<u>100.000</u>	% volume of length / 100 =	<u>100.000</u>	% total for Scan 1
Scan 2	<u>0.000</u>	% Length X	<u>0.000</u>	% volume of length / 100 =	<u>0.000</u>	% total for Scan 2
Scan 3	<u>100.000</u>	% Length X	<u>50.000</u>	% volume of length / 100 =	<u>50.000</u>	% total for Scan 3
Scan 4	<u>100.000</u>	% Length X	<u>50.000</u>	% volume of length / 100 =	<u>50.000</u>	% total for Scan 4

Add totals and divide by # scans = 50.000 % total for 45 deg

Other deg - _____ (to be used for supplemental scans)

The data to be listed below is for coverage that was not obtained with the 45 deg scans.

Scan 1	_____	% Length X	_____	% volume of length / 100 =	_____	% total for Scan 1
Scan 2	_____	% Length X	_____	% volume of length / 100 =	_____	% total for Scan 2
Scan 3	_____	% Length X	_____	% volume of length / 100 =	_____	% total for Scan 3
Scan 4	_____	% Length X	_____	% volume of length / 100 =	_____	% total for Scan 4

Percent complete coverage

Add totals for each scan required and divide by # of scans to determine;

50.000 % Total for complete exam

Site Field Supervisor: Tom Jones L. III

Date: 9/22/03



Supplemental Report

Report No.: 2003U015

Page: 3 of 4

Summary No.: 501939

Examiner: Stevermer, Aaron

Level: II

Reviewer: Jones, Thomas

Date: 9/24/03

Examiner: Bowne, Lowell V.

Level: II

Site Review: Hanson, Shannon

Date: 9/24/2003

Other: N/A

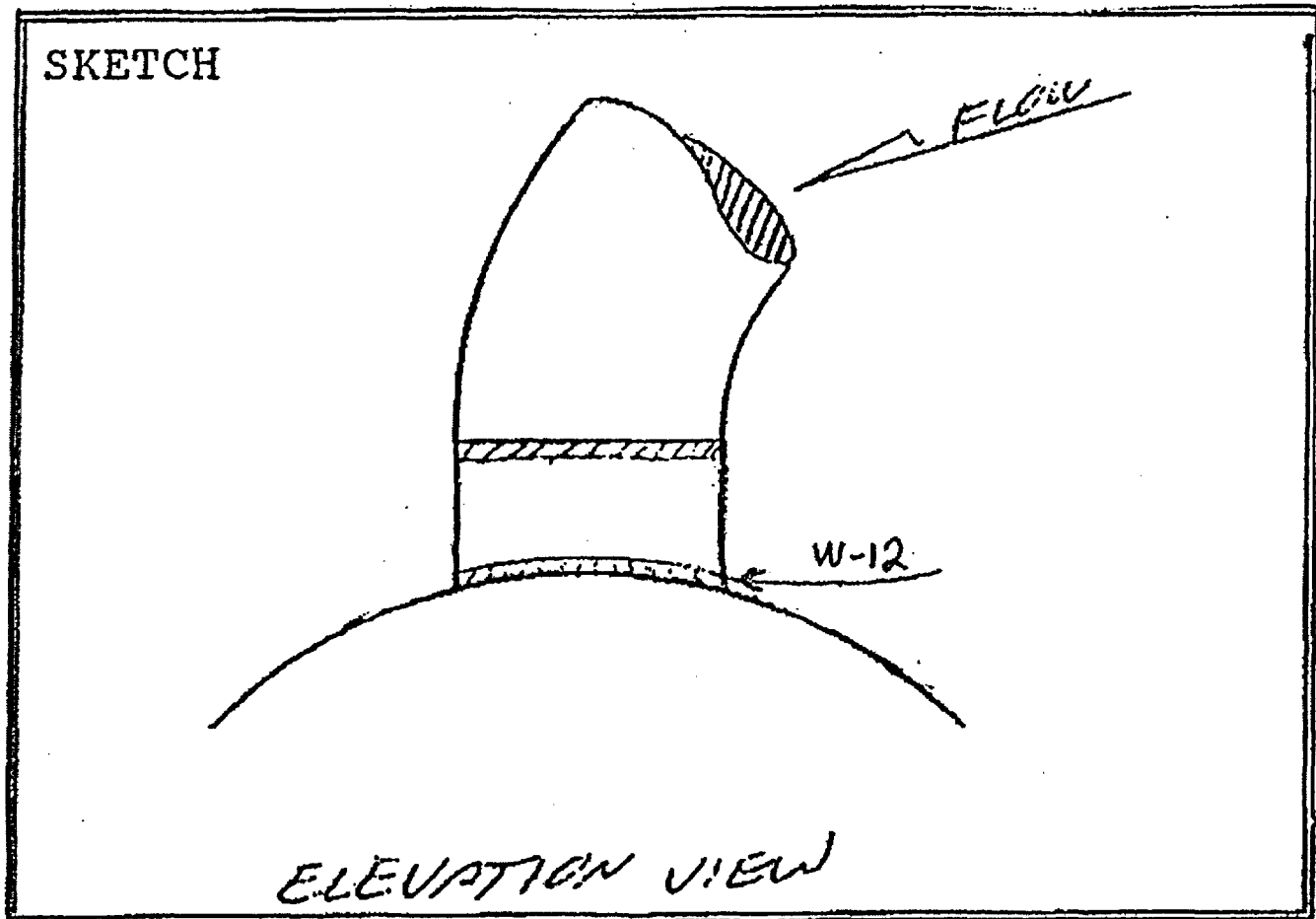
Level: N/A

ANII Review: Daly, Gerald

Date: 2/5/03

Comments: General configuration sketch

Sketch or Photo: J:\ddeal_Photos\PI2RFO2003\UT Images\2003U015_2a.bmp



ATTACHMENT 12 PAGE 3 OF 4



Limitation Record

Site/Unit: PINGP / P12
Summary No.: 501939
Workscope: ISI

Procedure: SWI NDE-UT-16A
Procedure Rev.: 0
Work Order No.: 0211922

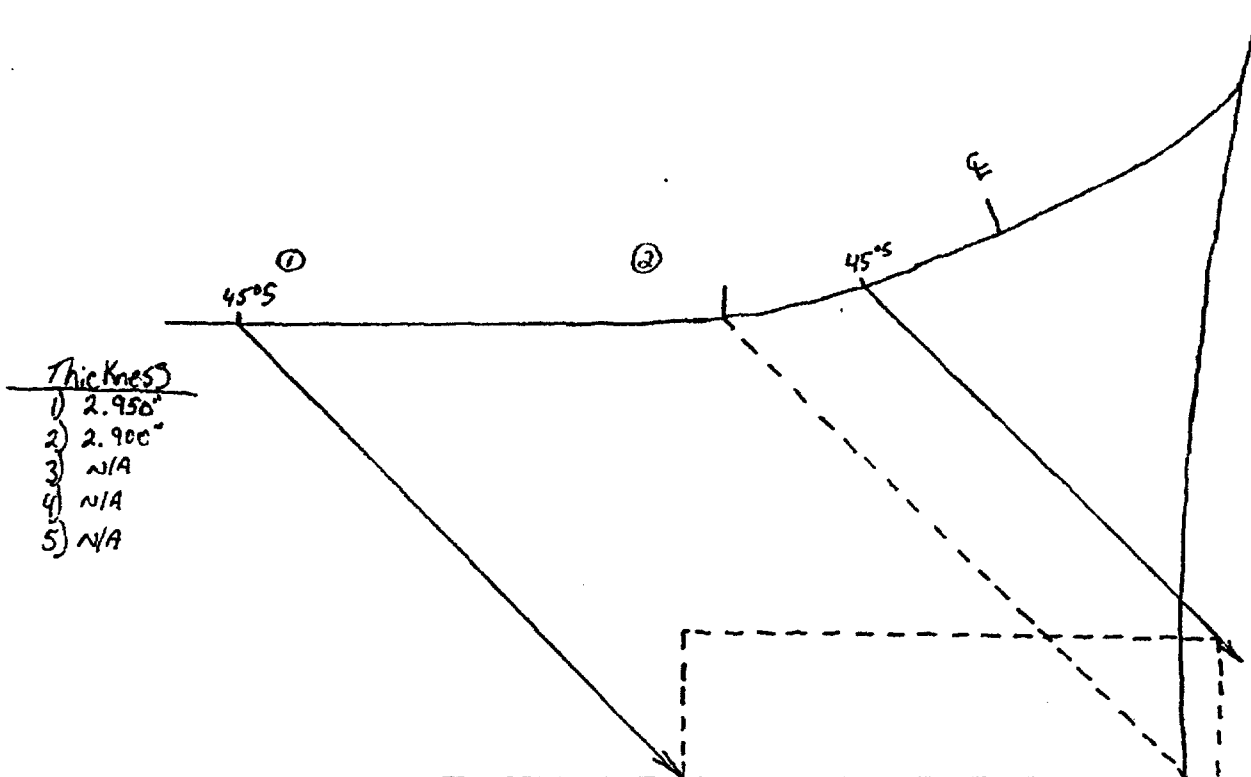
Outage No.: P12RF2003
Report No.: 2003U015
Page: 4 of 4

Description of Limitation:

Single sided exam - Although the examination was performed through 100% of the code required volume, procedure SWI NDE-UT-16A is not qualified for the detection of flaws on the far side of single side access exams. The techniques provided by this procedure were used for a best effort examination for flaws on the far side of the weld.

Sketch of Limitation:

J:\Ideal_Photos\PI2RFO2003\UT Images\2003U015_1a.bmp



Limitations removal requirements:

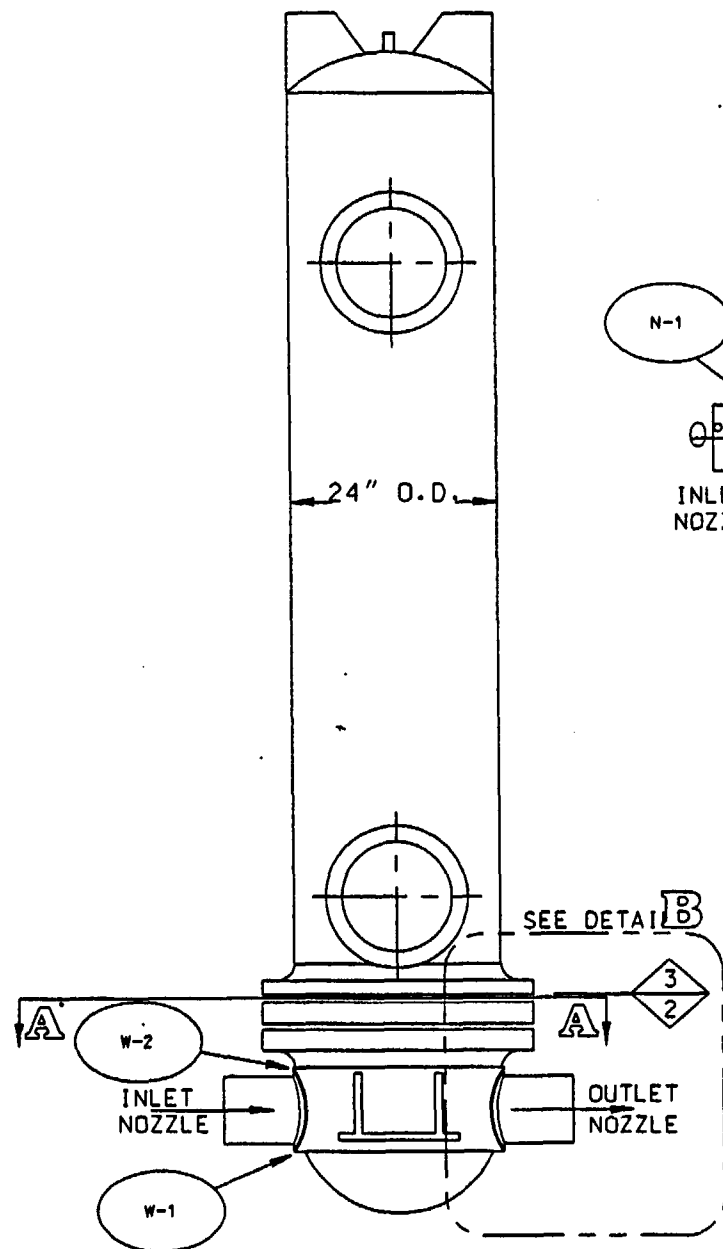
No scans were performed from the cold leg side of the weld due to configuration and attenuation. No 60 deg. RL was performed due to technique limitations based on thickness and diameter considerations falling outside of typical equipment parameters of the PDI Table 1 document.

Radiation field:

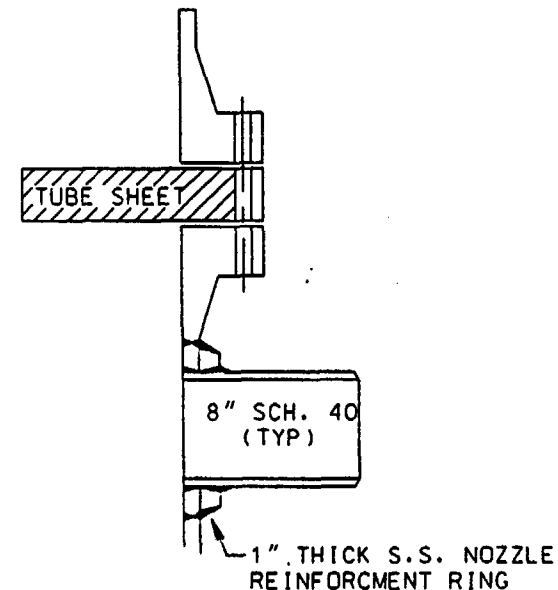
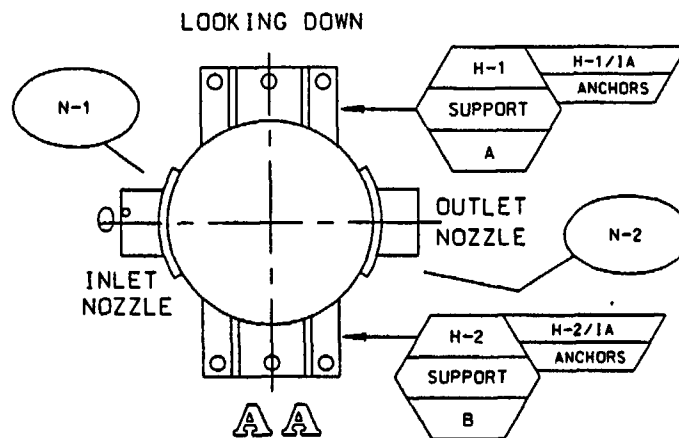
Examiner	Level II	Signature	Date	Reviewer	Signature	Date
Stevermer, Aaron			9/17/2003	Jones, Thomas	<i>[Signature]</i>	9/23/03
Examiner	Level II	Signature	Date	Site Review	Signature	Date
Bowne, Lowell V.			9/17/2003	Hanson, Shannon	<i>[Signature]</i>	9/24/2003
Other	Level N/A	Signature	Date	ANII Review	Signature	Date
N/A				Daly, Gerald	<i>[Signature]</i>	27SEP03

Additional - Limitation <edit from Setup>

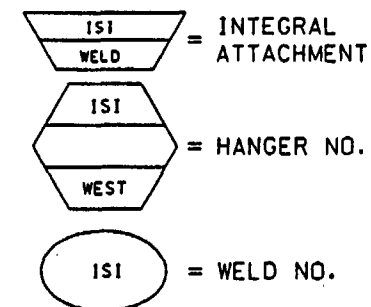
ATTACHMENT 12 PAGE 4 OF 4



RESIDUAL HEAT EXCHANGER 22



DETAIL B



NF-38298-3
XH-1-215
REF: XH-1001-1022 (MAN.) FILE NO:

NSP (M&SP)-		ISI
DWN:	CHKD:	APPD:
SYSTEM: RESIDUAL HEAT EXCHANGER 22		
LINE: NA		
DWG:	2-ISI-69B	REV: 02



UT Vessel Examination

Site/Unit: PINGP / P12 Procedure: SWI NDE-UT-16 Outage No.: P12RF2003
Summary No.: 501477 Procedure Rev.: 0 Report No.: 2003U035
Workscope: ISI Work Order No.: 0211925 Page: 1 of 5

Code: 1989 Code Cat.: C-A Location: RHR 22
Drawing No.: 2-ISI-69B Description: Head to Shell
System ID: RH
Component ID: W-1 Size/Length: 24" / 78" Thickness/Diameter: .50"
Limitations: * see sketch Start Time: 1205 Finish Time: 1239

Examination Surface: Inside ☐ Outside ☒ Surface Condition: Ground
Lo Location: N/A Wo Location: WCL Couplant: Sonotrace 40 Batch No.: #00143
Temp. Tool Mfg.: PTC Instruments Serial No.: 3796 Surface Temp.: 88 °F
Cal. Report No.: 2003CA043, 2003CA044

Angle Used

0	45	45T	60	60T	60 RL
N/A	26.5	26.5	N/A	N/A	57.0

Scanning dB

Indication(s): Yes ☐ No ☒ Scan Coverage: Upstream ☒ Downstream ☒ CW ☒ CCW ☒
Comments:
Location: RHR 22

Results: NAD ☒ IND ☐ GEO ☐
Percent Of Coverage Obtained > 90%: No Reviewed Previous Data: Yes

Examiner	Level II	Signature	Date	Reviewer	Signature	Date
Thomas, Travis		<i>[Signature]</i>	9/23/2003	Jones, Thomas	<i>[Signature]</i>	10/3/03
Examiner	Level II	Signature	Date	Site Review	Signature	Date
VanRuler, Christopher D.		<i>[Signature]</i>	9/23/2003	Hanson, Shannon	<i>[Signature]</i>	10/3/03
Other	Level N/A	Signature	Date	ANII Review	Signature	Date
N/A				Daly, Gerald	<i>[Signature]</i>	030003



Supplemental Report

Report No.: 2003U035

Page: 2 of 5

Summary No.: 501477

Examiner: Thomas, Travis

Level: II

Reviewer: Jones, Thomas

Date: 10/5/03

Examiner: VanRuler, Christopher D.

Level: II

Site Review: Hanson, Shannon

Date: 10/2/07

Other: N/A

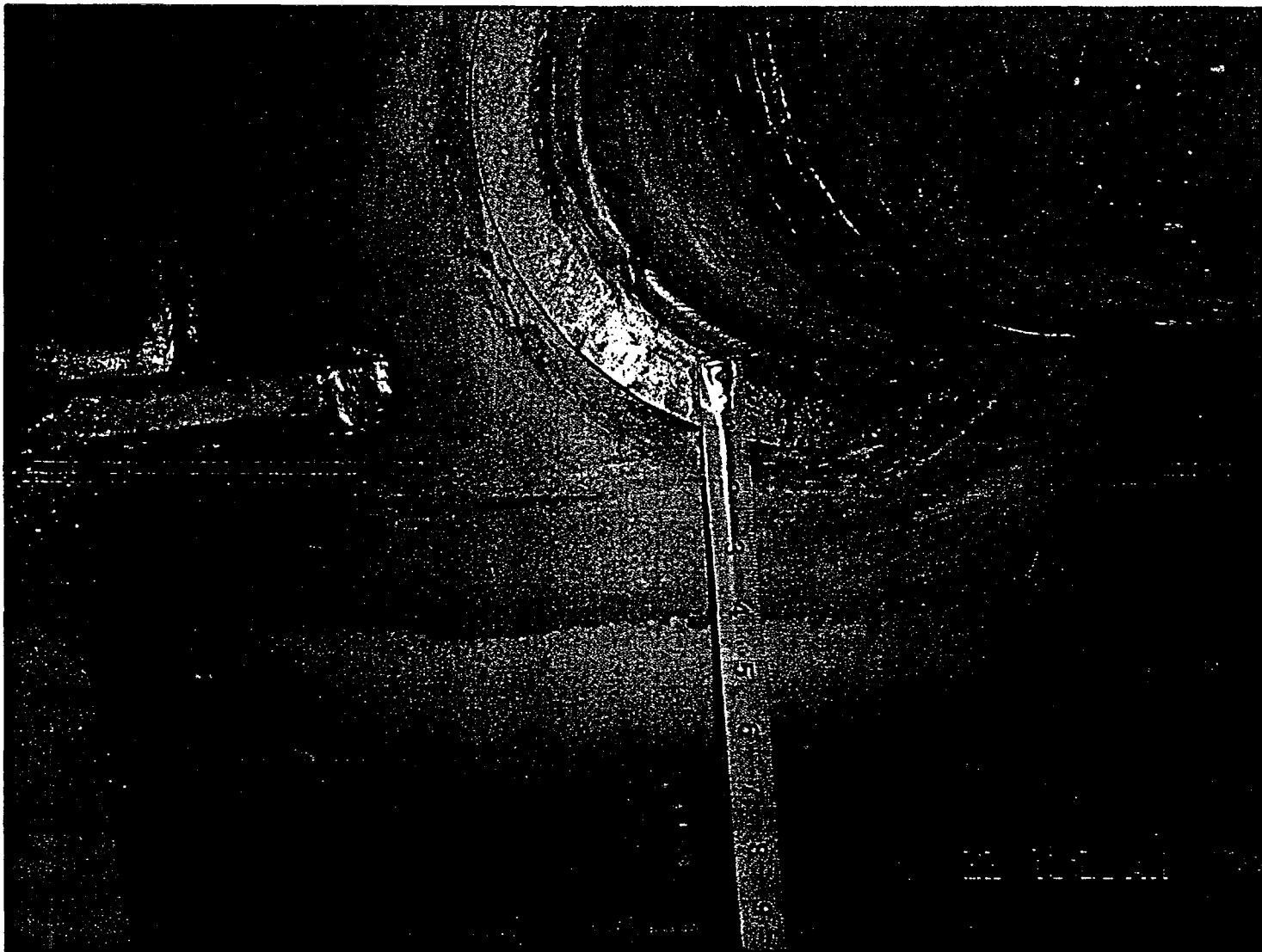
Level: N/A

ANII Review: Daly, Gerald

Date: 03Oct03

Comments: None

Sketch or Photo: J:\Ideas_Photos\PI2RFO2003\UT Images\2003U035_1.JPG





Supplemental Report

Report No.: 2003U035

Page: 3 of 5

Summary No.: 501477

Examiner: Thomas, Travis

Level: II

Reviewer: Jones, Thomas *gms*

Date: 10/3/03

Examiner: VanRuler, Christopher D.

Level: II

Site Review: Hanson, Shannon *SH*

Date: 10/2/03

Other: N/A

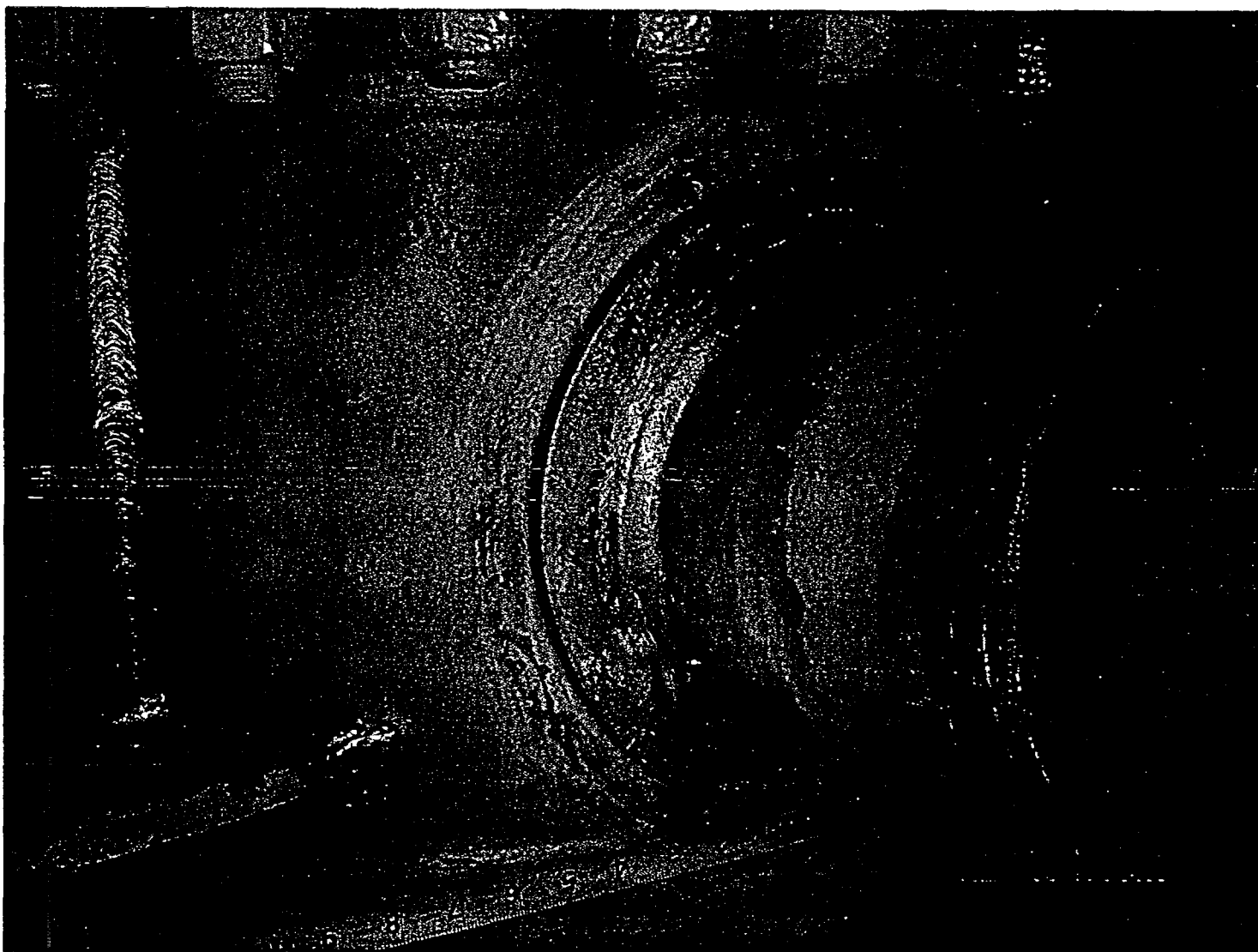
Level: N/A

ANII Review: Daly, Gerald *JD*

Date: 03 OCT 03

Comments: None

Sketch or Photo: J:\Ideal_Photos\PI2RFO2003\UT Images\2003U035_2.jpg





Determination of Percent Coverage for UT Examinations - Vessels

Site/Unit: PINGP / PI2 Procedure: SWI NDE-UT-16 Outage No.: PI2RF2003
Summary No.: 501477 Procedure Rev.: 0 Report No.: 2003U035
Workscope: ISI Work Order No.: 0211925 Page: 4 of 5

0 deg Planar

Scan N/A % Length X _____ % volume of length / 100 = _____ % total for 0 deg

45 deg

Scan 1 74.000 % Length X 100.000 % volume of length / 100 = 74.000 % total for Scan 1

Scan 2 74.000 % Length X 100.000 % volume of length / 100 = 74.000 % total for Scan 2

Scan 3 74.000 % Length X 100.000 % volume of length / 100 = 74.000 % total for Scan 3

Scan 4 74.000 % Length X 100.000 % volume of length / 100 = 74.000 % total for Scan 4

Add totals and divide by # scans = 74.000 % total for 45 deg

Other deg 60 RL

Scan 1 74.000 % Length X 100.000 % volume of length / 100 = 74.000 % total for Scan 1

Scan 2 74.000 % Length X 100.000 % volume of length / 100 = 74.000 % total for Scan 2

Scan 3 N/A % Length X _____ % volume of length / 100 = _____ % total for Scan 3

Scan 4 N/A % Length X _____ % volume of length / 100 = _____ % total for Scan 4

Add totals and divide by # scans = 74.000 % total for 60 RL deg

Percent complete coverage

Add totals for each angle and scan required and divide by # of angles to determine;

74.000 % Total for complete exam

Note:

Supplemental coverage may be achieved by use of other angles / methods. When used, the coverage for volume not obtained with angles as noted above shall be calculated and added to the total to provide the percent total for the complete examination.

Site Field Supervisor: Tom Lass Lu/III

Date: 10/3/03

Additional - Calculation Vessel <edit from Setup>

ATTACHMENT 14 PAGE 4 OF 5



Limitation Record

Site/Unit: PINGP / PI2
Summary No.: 501477
Workscope: ISI

Procedure: SWI NDE-UT-16
Procedure Rev.: 0
Work Order No.: 0211925

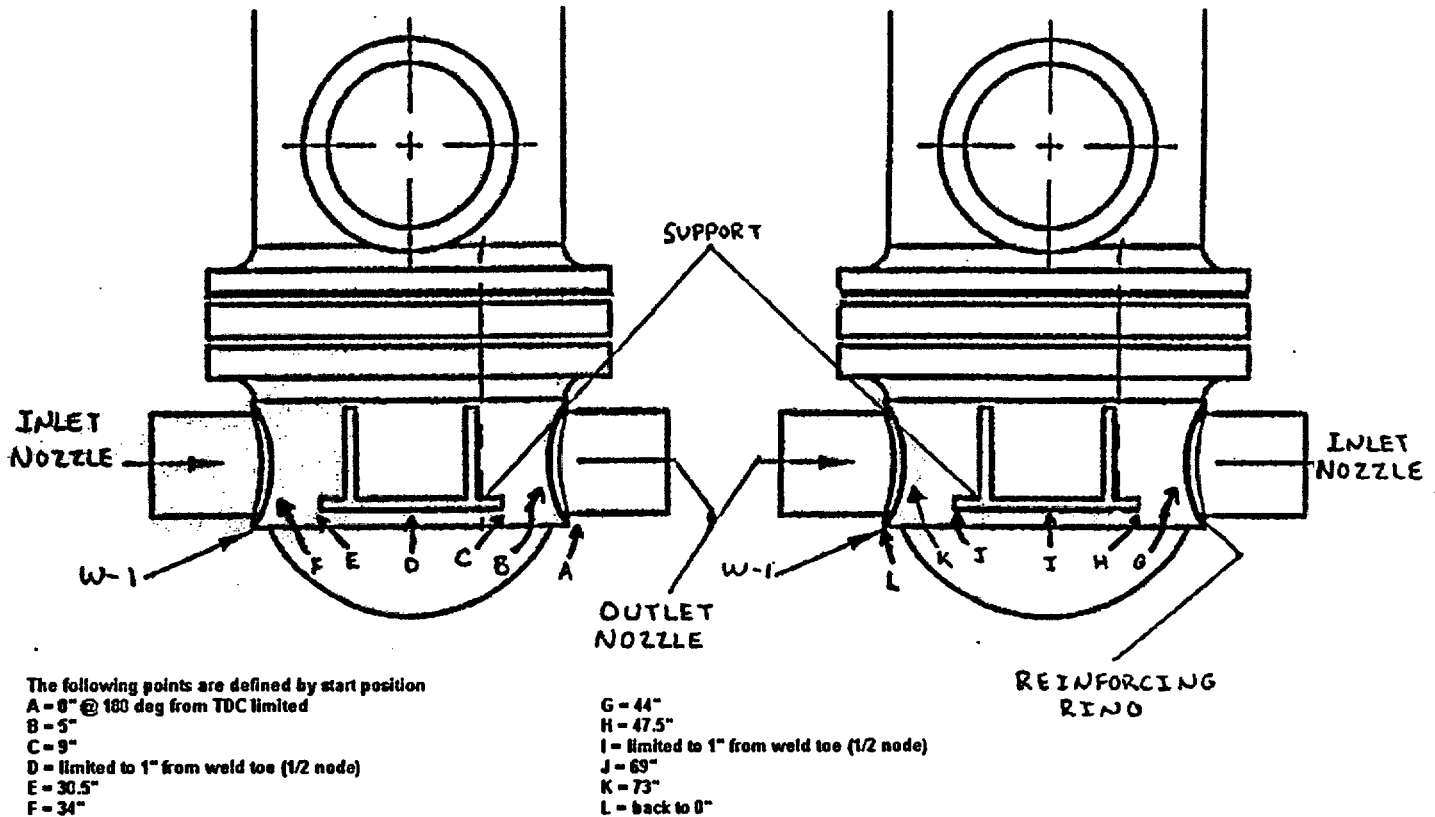
Outage No.: PI2RF2003
Report No.: 2003U035
Page: 5 of 5

Description of Limitation:

Point A @ bottom dead center of outlet nozzle to point B=5", Point B @ end of reinforcing ring to point C start of support=3.5", Point D is a support for 21.5" limited to 1" from weld toe (1/2 node), Point E is @ end of support to point F start of reinforcing ring limitation=4", Point F to point G end of reinforcing ring=10", Point G to point H start of support=3.5", Point I is a support for 21.5" limited to 1" from weld toe (1/2 node), Point J is @ end of support to point K start of reinforcing ring limitation=4", Point K to point L @ 0 deg=5".

Sketch of Limitation:

J:\Ideal_Photos\PI2RFO2003\UT Images\2003U035_1a.bmp



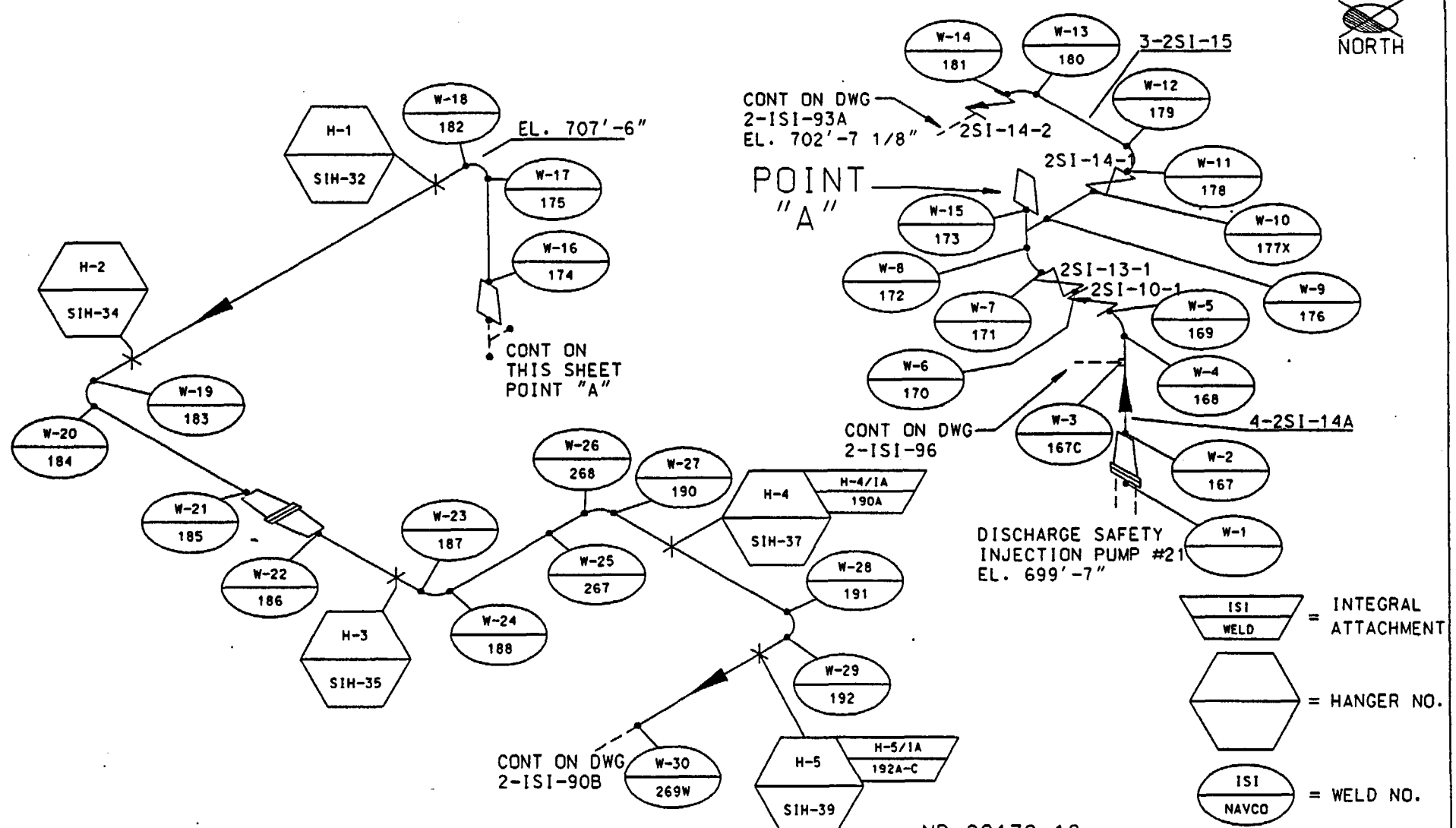
Limitations removal requirements:


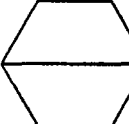

Radiation field:

Examiner	Level II	Signature	Date	Reviewer	Signature	Date
Thomas, Travis		<i>Thomas</i>	9/23/2003	Jones, Thomas	<i>Thomas</i>	10/3/03
Examiner	Level II	Signature	Date	Site Review	Signature	Date
VanRuler, Christopher D.		<i>VanRuler</i>	9/23/2003	Hanson, Shannon	<i>Hanson</i>	10/3/03
Other	Level N/A	Signature	Date	ANII Review	Signature	Date
N/A				Daly, Gerald	<i>Daly</i>	030703

Additional - Limitation <edit from Setup>

ATTACHMENT 14 PAGE 5 OF 5



-  = INTEGRAL ATTACHMENT
-  = HANGER NO.
-  = WELD NO.

ND-92172-18		FILE NO:2190AR01
REF: XH-1106-2510		
NSP (M&SP)-PI-2		ISI
DWN: CADWorksCHKD:DSW		APPD:DSW
SYSTEM: SAFETY INJECTION		
LINE: 3-2SI-15, 3-2SI-15A, 4-2SI-14A		
DWG:	2-ISI-90A	REV: 02

SAFETY INJECTION PUMP 21 DISCHARGE

2-ISI-90A



UT Pipe Weld Examination

Site/Unit: PINGP / PI2 Procedure: SWI NDE-UT-16A Outage No.: PI2RF2003
Summary No.: 505055 Procedure Rev.: 0 Report No.: 2003U010
Workscope: ISI Work Order No.: 0211924 Page: 1 of 4

Code: 1989 Code Cat.: C-F-1 Location: Aux Bldg 702'
Drawing No.: 2-ISI-90A Description: Valve to Elbow
System ID: SI
Component ID: W-11 Size/Length: 3" / 11.0" Thickness/Diameter: .438" / 3"
Limitations: No scans on valve due to configuration Start Time: 1330 Finish Time: 1455

Examination Surface: Inside ☐ Outside ☒ Surface Condition: Flat Topped
Lo Location: TDC Wo Location: Centerline of Weld Couplant: Sonotrace 40 Batch No.: #00143
Temp. Tool Mfg.: PTC Instruments Serial No.: 3792 Surface Temp.: 85 °F
Cal. Report No.: 2003CA012, 2003CA014

Angle Used	0	45	45T	60	70	
Scanning dB		41.5	41.5		52.5	

Indication(s): Yes No ☒ Scan Coverage: Upstream ☐ Downstream ☒ CW ☒ CCW ☒
Comments:
Location Aux. Bldg. 702' No previous data

Results: NAD ☒ IND ☐ GEO ☐
Percent Of Coverage Obtained > 90%: No Reviewed Previous Data: N/A

Examiner	Level	III	Signature	Date	Reviewer	Signature	Date
Blechniger, Todd P.			<i>[Signature]</i>	9/19/2003	Jones, Thomas	<i>[Signature]</i>	9/20/03
Examiner	Level	N/A	Signature	Date	Site Review	Signature	Date
N/A					Hanson, Shannon	<i>[Signature]</i>	9/24/2003
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A					Daly, Gerald	<i>[Signature]</i>	26 SEP 03



Determination of Percent Coverage for UT Examinations - Pipe

Site/Unit: PINGP / PI2 Procedure: SWI NDE-UT-16A Outage No.: PI2RF2003
Summary No.: 505055 Procedure Rev.: 0 Report No.: 2003U010
Workscope: ISI Work Order No.: 0211924 Page: 2 of 4

45 deg

Scan 1	<u>0.000</u>	% Length X	<u>0.000</u>	% volume of length / 100 =	<u>0.000</u>	% total for Scan 1
Scan 2	<u>100.000</u>	% Length X	<u>100.000</u>	% volume of length / 100 =	<u>100.000</u>	% total for Scan 2
Scan 3	<u>100.000</u>	% Length X	<u>50.000</u>	% volume of length / 100 =	<u>50.000</u>	% total for Scan 3
Scan 4	<u>100.000</u>	% Length X	<u>50.000</u>	% volume of length / 100 =	<u>50.000</u>	% total for Scan 4

Add totals and divide by # scans = 50.000 % total for 45 deg

Other deg - 70 (to be used for supplemental scans)

The data to be listed below is for coverage that was not obtained with the 45 deg scans.

Scan 1	_____	% Length X	_____	% volume of length / 100 =	_____	% total for Scan 1
Scan 2	<u>100.000</u>	% Length X	<u>100.000</u>	% volume of length / 100 =	<u>100.000</u>	% total for Scan 2
Scan 3	_____	% Length X	_____	% volume of length / 100 =	_____	% total for Scan 3
Scan 4	_____	% Length X	_____	% volume of length / 100 =	_____	% total for Scan 4

Percent complete coverage

Add totals for each scan required and divide by # of scans to determine;

50.00
~~75.000~~ % Total for complete exam
~~9.19-03~~

Site Field Supervisor:

Tom Jones LVI/III

Date:

9/22/03



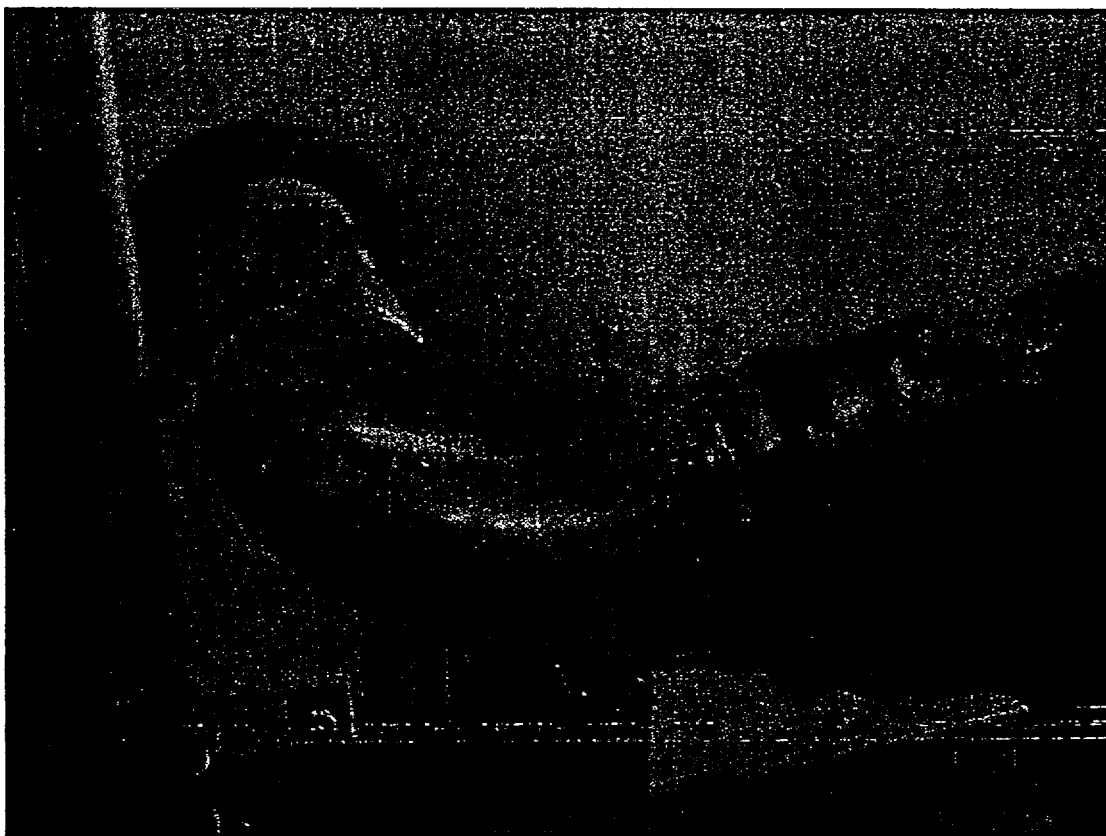
Limitation Record

Site/Unit: PINGP / PI2 Procedure: SWI NDE-UT-16A Outage No.: PI2RF2003
Summary No.: 505055 Procedure Rev.: 0 Report No.: 2003U010
Workscope: ISI Work Order No.: 0211924 Page: 3 of 4

Description of Limitation:

Valve body taper

Sketch of Limitation: J:\Ideal_Photos\PI2RFO2003\UT Images\2003U010_1.JPG



Limitations removal requirements:

Single sided exam - Although the examination was performed through 100% of the code required volume, procedure SWI NDE-UT-16A is not qualified for the detection of flaws on the far side of single side access exams. The techniques provided by this procedure were used for a best effort examination for flaws on the far side of the weld.

Radiation field:

Examiner	Level	III	Signature	Date	Reviewer	Signature	Date
Blechlner, Todd P.			<i>T.P. Blechlner</i>	9/19/2003	Jones, Thomas	<i>gmj</i>	9/22/03
Examiner	Level	N/A	Signature	Date	Site Review	Signature	Date
N/A					Hanson, Shannon	<i>WRL fm SH</i>	9/24/2003
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A					Daly, Gerald	<i>JDaly</i>	26 SEP 03

Additional - Limitation <edit from Setup>

ATTACHMENT 16 PAGE 3 OF 4



Supplemental Report

Report No.: 2003U010

Page: 4 of 4

Summary No.: 505055

Examiner: Blechinger, Todd P.

Level: III

Reviewer: Jones, Thomas

Date: 9/22/03

Examiner: N/A

Level: N/A

Site Review: Hanson, Shannon

Date: 9/24/2003

Other: N/A

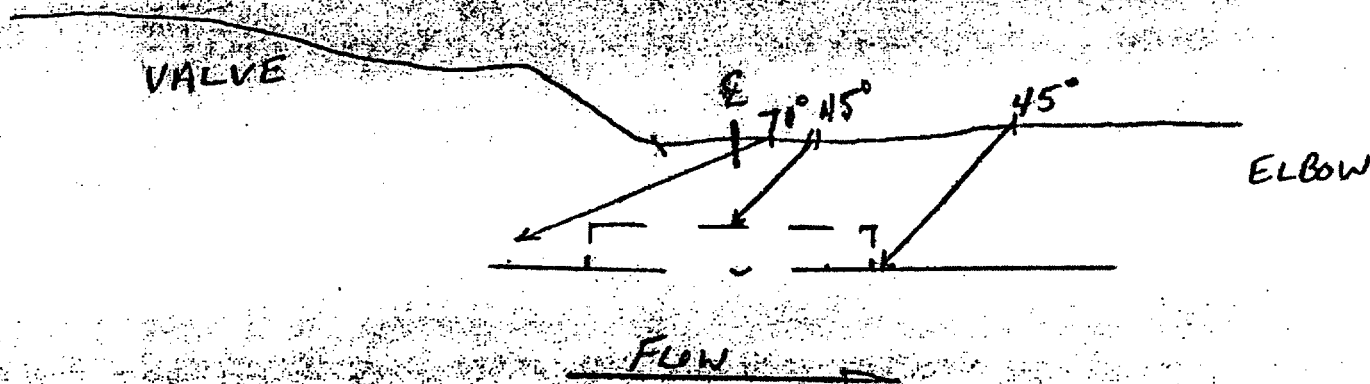
Level: N/A

ANII Review: Daly, Gerald

Date: 10/28/03

Comments: W-11 coverage plot

Sketch or Photo: J:\Ideal_Photos\PI2RFO2003\UT Images\2003U010_1a.bmp



ATTACHMENT 16



UT Pipe Weld Examination

Site/Unit:	<u>PINGP / PI2</u>	Procedure:	<u>SWI NDE-UT-16A</u>	Outage No.:	<u>PI2RF2003</u>
Summary No.:	<u>505058</u>	Procedure Rev.:	<u>0</u>	Report No.:	<u>2003U011</u>
Workscope:	<u>ISI</u>	Work Order No.:	<u>0211924</u>	Page:	<u>1</u> of <u>4</u>

Code:	<u>1989</u>	Code Cat.:	<u>C-F-1</u>	Location:	<u>Auxiliary Building</u>	
Drawing No.:	<u>2-ISI-90A</u>	Description:	<u>Elbow to Valve</u>			
System ID:	<u>SI</u>					
Component ID:	<u>W-14</u>	Size/Length:	<u>3" / 11.0"</u>	Thickness/Diameter:	<u>.438" / 3"</u>	
Limitations:	<u>No scans on valve due to configuration</u>		Start Time:	<u>1400</u>	Finish Time:	<u>1500</u>

Examination Surface:	Inside <input type="checkbox"/>	Outside <input checked="" type="checkbox"/>	Surface Condition:	<u>Flat Topped</u>			
Lo Location:	<u>TDC</u>	Wo Location:	<u>Centerline of Weld</u>	Couplant:	<u>Sonotrace 40</u>	Batch No.:	<u>#00143</u>
Temp. Tool Mfg.:	<u>PTC Instruments</u>	Serial No.:	<u>3792</u>	Surface Temp.:	<u>85</u> °F		
Cal. Report No.:	<u>2003CA012, 2003CA014</u>						

Angle Used	0	45	45T	60	70	
Scanning dB		41.5	41.5		52.5	

Indication(s): Yes ☐ No ☒ Scan Coverage: Upstream ☒ Downstream ☐ CW ☒ CCW ☒

Comments:

No previous data available

Results: NAD ☒ IND ☐ GEO ☐

Percent Of Coverage Obtained > 90%: No Reviewed Previous Data: N/A

Examiner	Level	III	Signature	Date	Reviewer	Signature	Date
Bleching, Todd P.			<i>Todd P. Bleching</i>	9/19/2003	Jones, Thomas	<i>Tom Jones</i>	9/22/03
Examiner	Level	N/A	Signature	Date	Site Review	Signature	Date
N/A					Hanson, Shannon	<i>WPH</i>	9/24/2003
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A					Daly, Gerald	<i>Gerald P. Daly</i>	06 SEP03

Supplemental Report

Report No.: 2003U011

Page: 2 of 4

Summary No.: 505058

Examiner: Blechinger, Todd P.

Level: III

Reviewer: Jones, Thomas

Date: 9/22/03

Examiner: N/A

Level: N/A

Site Review: Hanson, Shannon

Date: 9/24/03

Other: N/A

Level: N/A

ANII Review: Daly, Gerald

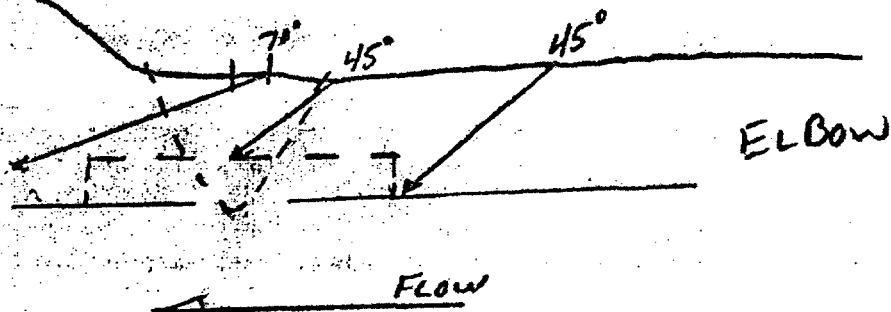
Date: 26 SEP 03

Comments: W-14 coverage plot

Sketch or Photo: J:\Ideal_Photos\PI2RFO2003\UT Images\2003U011_1a.bmp

ATTACHMENT 17 PAGE 2 OF 4

VALVE





Determination of Percent Coverage for UT Examinations - Pipe

Site/Unit:	<u>PINGP / PI2</u>	Procedure:	<u>SWI NDE-UT-16A</u>	Outage No.:	<u>PI2RF2003</u>
Summary No.:	<u>505058</u>	Procedure Rev.:	<u>0</u>	Report No.:	<u>2003U011</u>
Workscope:	<u>ISI</u>	Work Order No.:	<u>0211924</u>	Page:	<u>3</u> of <u>4</u>

45 deg

Scan 1	<u>100.000</u>	% Length X	<u>100.000</u>	% volume of length / 100 =	<u>100.000</u>	% total for Scan 1
Scan 2	<u>0.000</u>	% Length X	<u>0.000</u>	% volume of length / 100 =	<u>0.000</u>	% total for Scan 2
Scan 3	<u>100.000</u>	% Length X	<u>50.000</u>	% volume of length / 100 =	<u>50.000</u>	% total for Scan 3
Scan 4	<u>100.000</u>	% Length X	<u>50.000</u>	% volume of length / 100 =	<u>50.000</u>	% total for Scan 4

Add totals and divide by # scans = 50.000 % total for 45 deg

Other deg - 70 (to be used for supplemental scans)

The data to be listed below is for coverage that was not obtained with the 45 deg scans.

Scan 1	<u>100.000</u>	% Length X	<u>100.000</u>	% volume of length / 100 =	<u>100.000</u>	% total for Scan 1
Scan 2		% Length X		% volume of length / 100 =		% total for Scan 2
Scan 3		% Length X		% volume of length / 100 =		% total for Scan 3
Scan 4		% Length X		% volume of length / 100 =		% total for Scan 4

Percent complete coverage

Add totals for each scan required and divide by # of scans to determine;

50.00
~~100.00~~ % Total for complete exam
9.11.03

Site Field Supervisor:

TOM SOUTHERN

Date:

9/22/03

Limitation Record

Site/Unit: PINGP / PI2
 Summary No.: 505058
 Workscope: ISI

Procedure: SWI NDE-UT-16A
 Procedure Rev.: 0
 Work Order No.: 0211924

Outage No.: PI2RF2003
 Report No.: 2003U011
 Page: 4 of 4

Description of Limitation:

Valve body taper

Sketch of Limitation:

J:\Ideas_Photos\PI2RFO2003\UT Images\2003U011_1.JPG



Limitations removal requirements:

Single sided exam - Although the examination was performed through 100% of the code required volume, procedure SWI NDE-UT-16A is not qualified for the detection of flaws on the far side of single side access exams. The techniques provided by this procedure were used for a best effort examination for flaws on the far side of the weld.

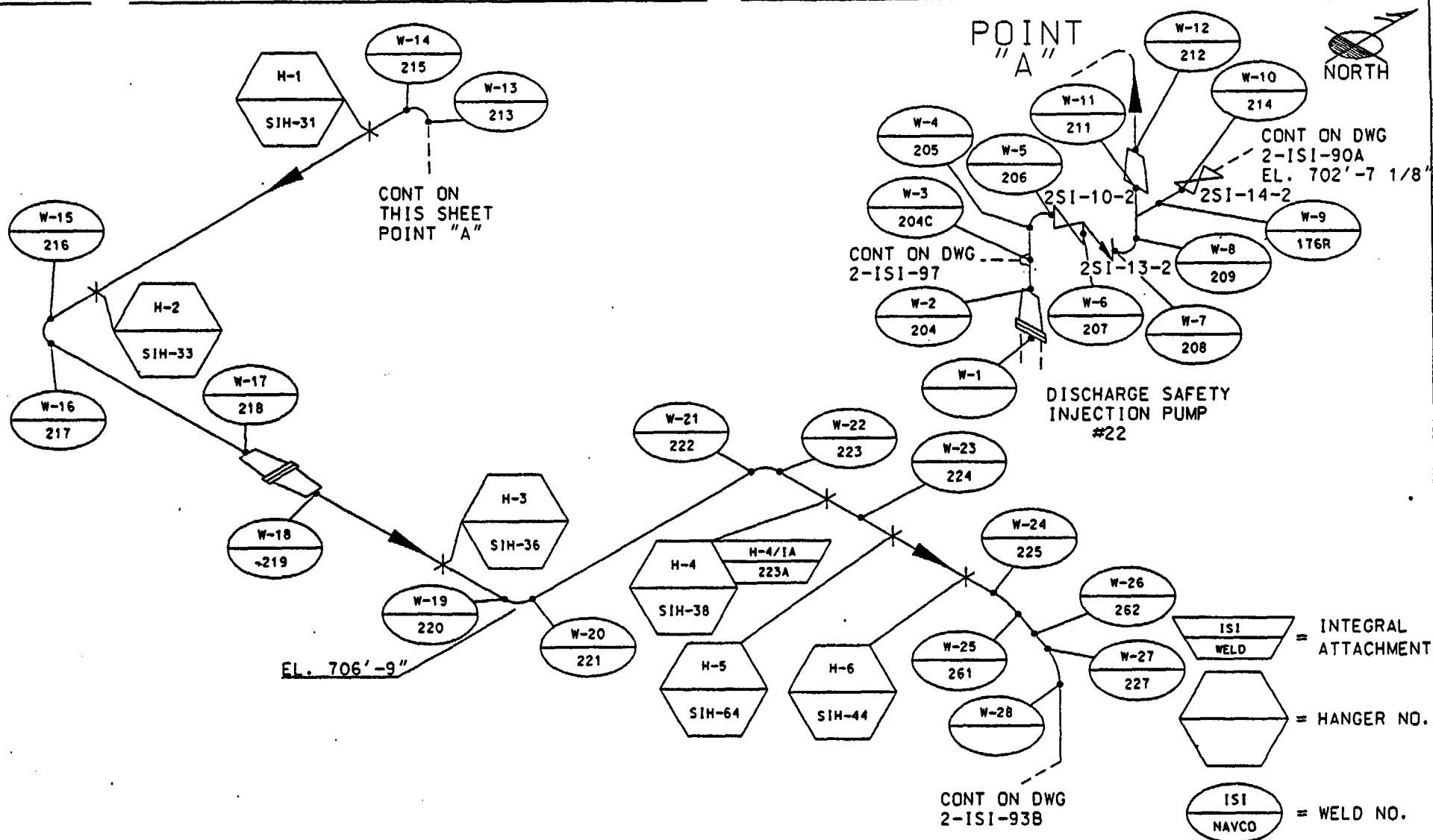
Radiation field:

Examiner	Level	III	Signature	Date	Reviewer	Signature	Date
Blechinger, Todd P.			<i>T.P. Blechinger</i>	9/19/2003	Jones, Thomas	<i>Thomas Jones</i>	9/22/03
Examiner	Level	N/A	Signature	Date	Site Review	Signature	Date
N/A					Hanson, Shannon	<i>W. R. Hanson</i>	9/24/03
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A					Daly, Gerald	<i>Gerald Daly</i>	26 SEP03

Additional - Limitation <edit from Setup>

PAGE 4 OF 4

ATTACHMENT 17



SAFETY INJECTION PUMP 22 DISCHARGE

REF: XH-1106-2510

FILE NO: 2193AR01

NSP

(M&SP)-PI-2

ISI

DWN: CADWorksCHKD:DSW

APPD: DSW

SYSTEM: SAFETY INJECTION

LINE: 3-2SI-15B, 4-2SI-14B, 3-2SI-15

DWG: 2-ISI-93A

REV: 02



UT Pipe Weld Examination

Site/Unit: <u>PINGP / PI2</u>	Procedure: <u>SWI NDE-UT-16A</u>	Outage No.: <u>PI2RF2003</u>
Summary No.: <u>505370</u>	Procedure Rev.: <u>0</u>	Report No.: <u>2003U026</u>
Workscope: <u>ISI</u>	Work Order No.: <u>0211924</u>	Page: <u>1</u> of <u>4</u>

Code: <u>1989</u>	Code Cat.: <u>C-F-1</u>	Location: <u>Auxiliary Building</u>
Drawing No.: <u>2-ISI-93A</u>	Description: <u>Pipe To Flange</u>	
System ID: <u>SI</u>		
Component ID: <u>W-17</u>	Size/Length: <u>3" / 11.0"</u>	Thickness/Diameter: <u>.438" / 3"</u>
Limitations: <u>No scans on flange due to configuration</u>	Start Time: <u>0950</u>	Finish Time: <u>1035</u>

Examination Surface: Inside <input type="checkbox"/> Outside <input checked="" type="checkbox"/>	Surface Condition: <u>As Welded</u>	
Lo Location: <u>TDC</u>	Wo Location: <u>Centerline of Weld</u>	Couplant: <u>Sonotrace 40</u>
Temp. Tool Mfg.: <u>PTC Instruments</u>	Serial No.: <u>3792</u>	Surface Temp.: <u>85</u> °F
Cal. Report No.: <u>2003CA026, 2003CA028</u>		

Angle Used	0	45	45T	60	70	
Scanning dB		41.5	41.5		52.5	

Indication(s): Yes ☐ No ☒ Scan Coverage: Upstream ☒ Downstream ☐ CW ☒ CCW ☒

Comments:
No previous data

Results: NAD ☒ IND ☐ GEO ☐

Percent Of Coverage Obtained > 90%: No Reviewed Previous Data: N/A

Examiner	Level	III	Signature	Date	Reviewer	Signature	Date
Bleching, Todd P.			<i>[Signature]</i>	9/20/2003	Jones, Thomas	<i>[Signature]</i>	9/22/03
Examiner	Level	N/A	Signature	Date	Site Review	Signature	Date
N/A					Hanson, Shannon	<i>[Signature]</i>	9/24/07
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A					Daly, Gerald	<i>[Signature]</i>	26SEP03



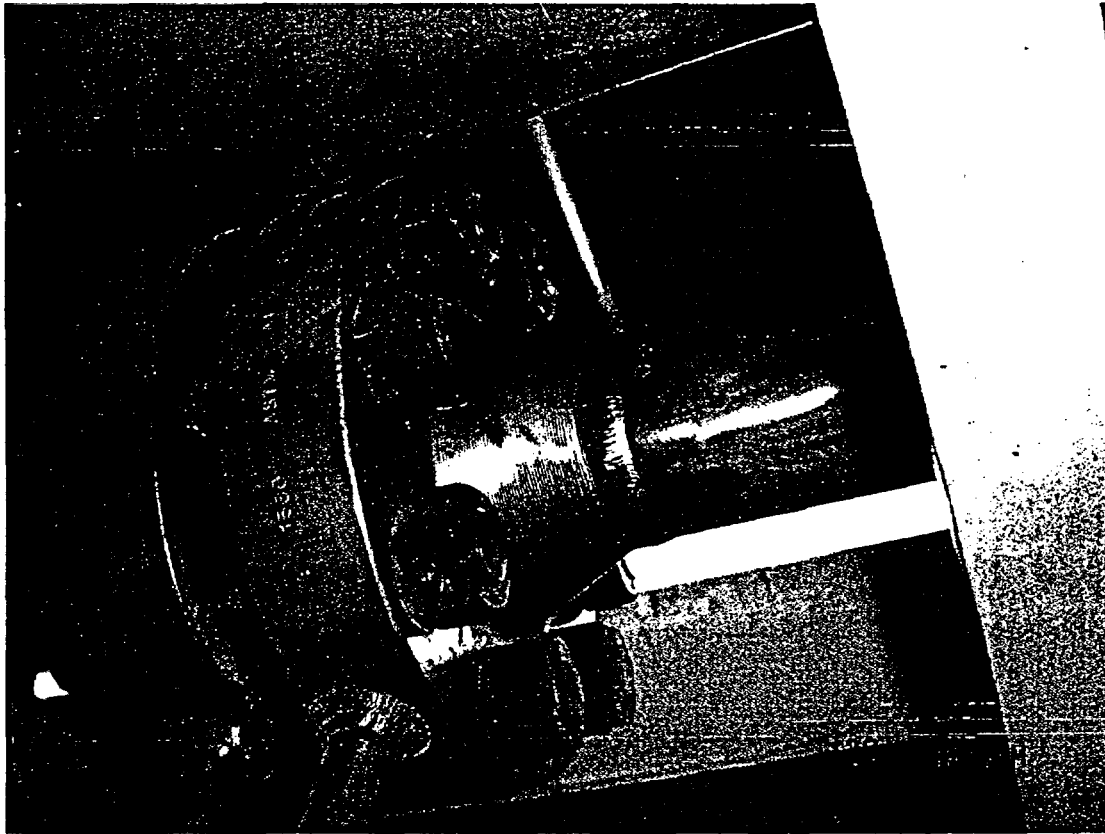
Limitation Record

Site/Unit:	PINGP / PI2	Procedure:	SWI NDE-UT-16A	Outage No.:	PI2RF2003
Summary No.:	505370	Procedure Rev.:	0	Report No.:	2003U026
Workscope:	ISI	Work Order No.:	0211924	Page:	2 of 4

Description of Limitation:

Flange configuration

Sketch of Limitation: J:\Ideal_Photos\PI2RFO2003\UT Images\2003U026_1.JPG



Limitations removal requirements:

Single sided exam - Although the examination was performed through 100% of the code required volume, procedure SWI NDE-UT-16A is not qualified for the detection of flaws on the far side of single side access exams. The techniques provided by this procedure were used for a best effort examination for flaws on the far side of the weld.

Radiation field:

Examiner	Level	III	Signature	Date	Reviewer	Signature	Date
Blechliger, Todd P.			<i>T.P. Blechliger</i>	9/20/2003	Jones, Thomas	<i>Th Jones</i>	9/22/03
Examiner	Level	N/A	Signature	Date	Site Review	Signature	Date
N/A					Hanson, Shannon	<i>Shannon Hanson</i>	9/24/03
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A					Daly, Gerald	<i>Gerald Daly</i>	06SEP07

Additional - Limitation <edit from Setup>

ATTACHMENT 19 PAGE 2 OF 4



Determination of Percent Coverage for UT Examinations - Pipe

Site/Unit: PINGP / PI2
Summary No.: 505370
Workscope: ISI

Procedure: SWI NDE-UT-16A
Procedure Rev.: 0
Work Order No.: 0211924

Outage No.: PI2RF2003
Report No.: 2003U026
Page: 3 of 4

45 deg

Scan 1	<u>100.000</u>	% Length X	<u>100.000</u>	% volume of length / 100 =	<u>100.000</u>	% total for Scan 1
Scan 2	<u>0.000</u>	% Length X	<u>0.000</u>	% volume of length / 100 =	<u>0.000</u>	% total for Scan 2
Scan 3	<u>100.000</u>	% Length X	<u>50.000</u>	% volume of length / 100 =	<u>50.000</u>	% total for Scan 3
Scan 4	<u>100.000</u>	% Length X	<u>50.000</u>	% volume of length / 100 =	<u>50.000</u>	% total for Scan 4

Add totals and divide by # scans = 50.000 % total for 45 deg

Other deg - 70 (to be used for supplemental scans)

The data to be listed below is for coverage that was not obtained with the 45 deg scans.

Scan 1	<u>100.000</u>	% Length X	<u>100.000</u>	% volume of length / 100 =	<u>100.000</u>	% total for Scan 1
Scan 2		% Length X		% volume of length / 100 =		% total for Scan 2
Scan 3		% Length X		% volume of length / 100 =		% total for Scan 3
Scan 4		% Length X		% volume of length / 100 =		% total for Scan 4

Percent complete coverage

Add totals for each scan required and divide by # of scans to determine;

50.00
~~TPS 75.000~~ % Total for complete exam
~~9-20-03~~

Site Field Supervisor:

Tom Sack

Date:

9/22/03



Supplemental Report

Report No.: 2003U026

Page: 4 of 4

Summary No.: 505370

Examiner: Blechinger, Todd P.

Level: III

Reviewer: Jones, Thomas

Date: 9/22/03

Examiner: N/A

Level: N/A

Site Review: Hanson, Shannon

Date: 9/24/03

Other: N/A

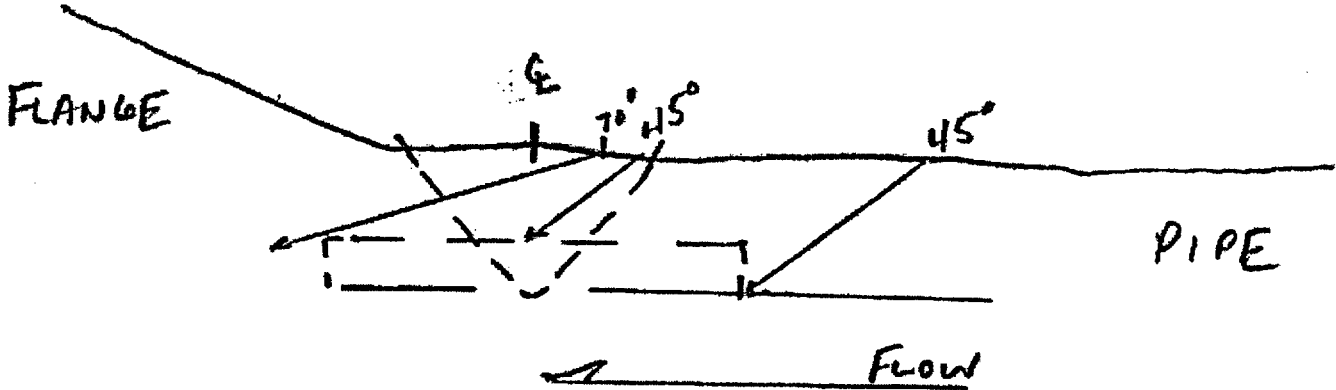
Level: N/A

ANII Review: Daly, Gerald

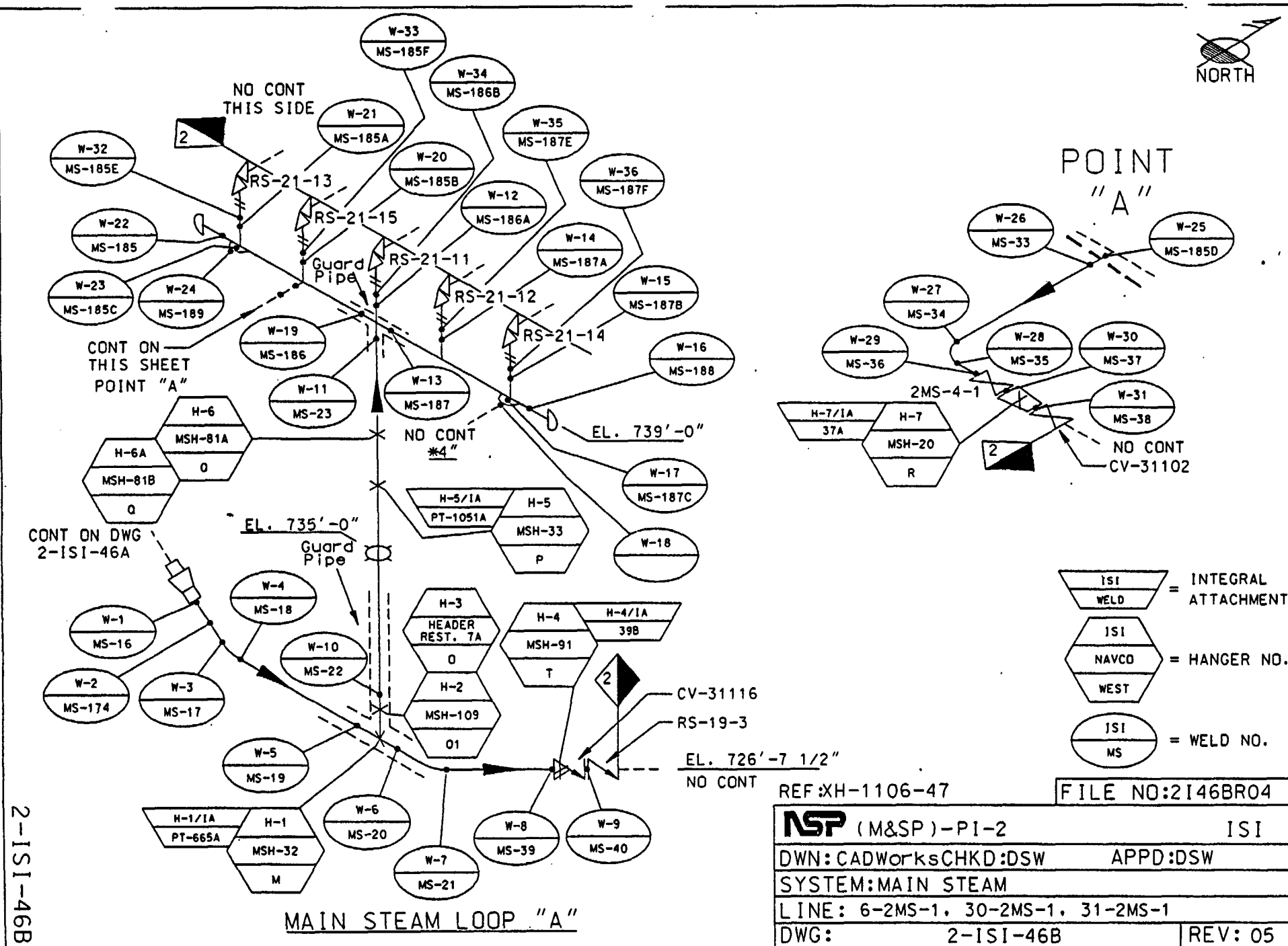
Date: 2/25/03

Comments: W-17 coverage plot

Sketch or Photo: J:\ddeal_Photos\PI2RFO2003\UT Images\2003U026_1a.bmp



ATTACHMENT 19 PAGE 4 OF 4





UT Pipe Weld Examination

Site/Unit: PINGP / PI2 Procedure: SWI NDE-UT-1A Outage No.: PI2RF2003
Summary No.: 500861 Procedure Rev.: 0 Report No.: 2003U029
Workscope: ISI Work Order No.: 0211927 Page: 1 of 3

Code: 1989 Code Cat.: C-F-2 Location: Aux. Bldg. 735'
Drawing No.: 2-ISI-46B Description: Sweepolet to Flanged Nozzle
System ID: MS
Component ID: W-36 Size/Length: 6" Thickness/Diameter: 1.031T
Limitations: No exam due to configuration. See photo Start Time: N/A Finish Time: N/A

Examination Surface: Inside Outside ☒ Surface Condition: Machined
Lo Location: N/A Wo Location: Centerline of Weld Couplant: N/A Batch No.: N/A
Temp. Tool Mfg.: Telatemp Serial No.: N/A Surface Temp.: N/A °F

Cal. Report No.: N/A

Angle Used	0	45	45T	60		
Scanning dB	N/A	N/A	N/A	N/A		

Indication(s): Yes ☐ No ☒ Scan Coverage: Upstream Downstream ☐ CW CCW ☐

Comments:

Location: Aux. Bldg. 735'. No exam performed due to configuration. See photo.

Results: NAD ☐ IND GEO ☐

Percent Of Coverage Obtained > 90%: 0 Reviewed Previous Data: N/A

Examiner	Level	Signature	Date	Reviewer	Signature	Date
Halling, David A.	II	<i>David A. Halling</i>	9/19/2003	Jones, Thomas	<i>Tom Jones</i>	9/28/03
Examiner	Level	Signature	Date	Site Review	Signature	Date
N/A	N/A			Hanson, Shannon	<i>Shannon Hanson</i>	9/29/03
Other	Level	Signature	Date	ANII Review	Signature	Date
N/A	N/A			Daly, Gerald	<i>Gerald Daly</i>	30 SEP 03



Supplemental Report

Report No.: 2003U029

Page: 2 of 3

Summary No.: 500861

Examiner: Halling, David A.

Level: II

Reviewer: Jones, Thomas

Date: 9/28/03

Examiner: N/A

Level: N/A

Site Review: Hanson, Shannon

Date: 9/28/03

Other: N/A

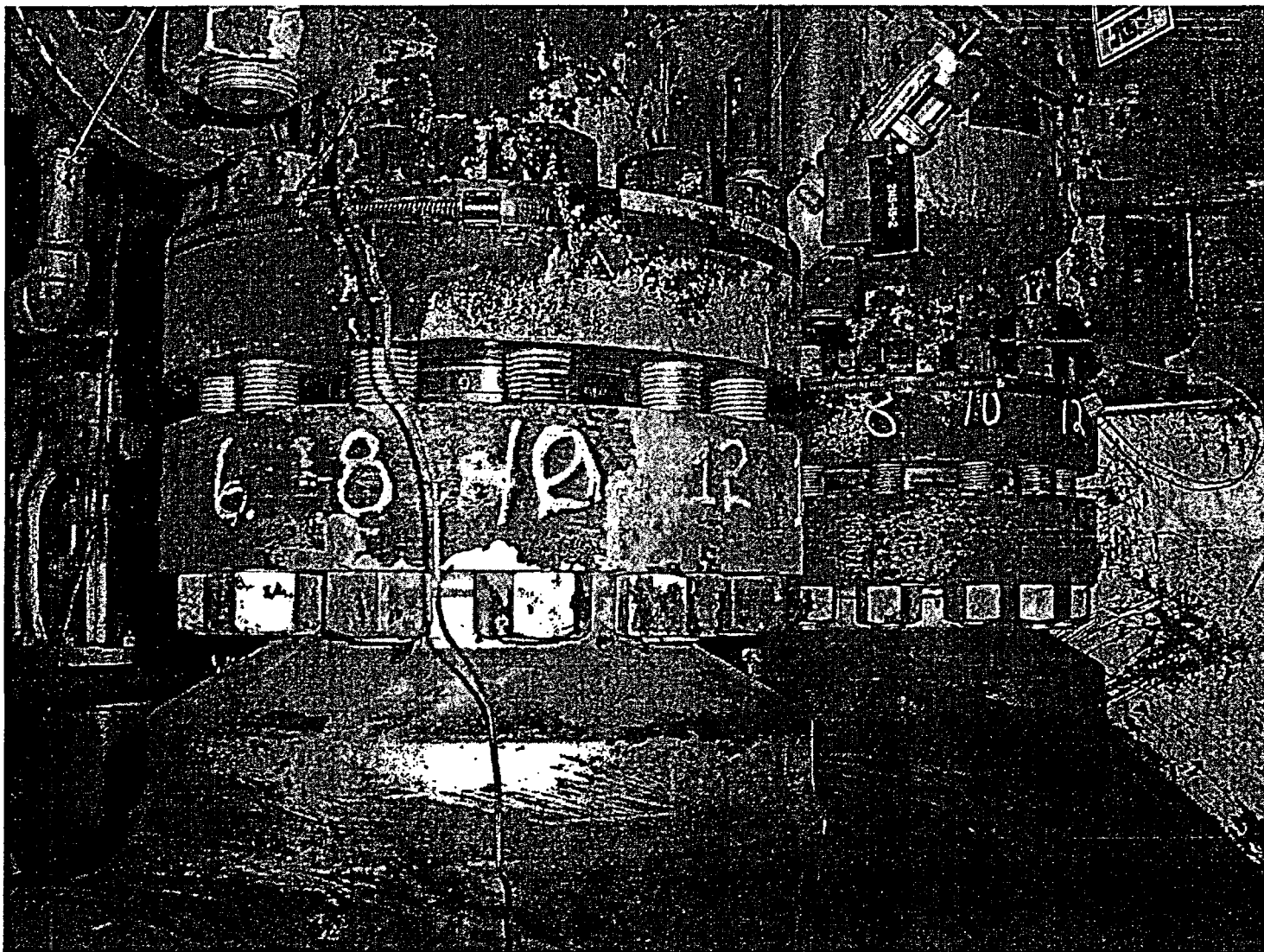
Level: N/A

ANII Review: Daly, Gerald

Date: 30SEP03

Comments: VT-1 Exam performed on flange weld interior. See 'Visual Examination of Welds' report #2003V115.

Sketch or Photo: J:\Ideal_Photos\PI2RFO2003\UT Images\2003U029_1.jpg



ATTACHMENT 21

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Determination of Percent Coverage for UT Examinations - Pipe

Site/Unit: PINGP / PI2
Summary No.: 500861
Workscope: ISI

Procedure: SWI NDE-UT-1A
Procedure Rev.: 0
Work Order No.: 0211927

Outage No.: PI2RF2003
Report No.: 2003U029
Page: 3 of 3

45 deg

Scan 1	<u>0.000</u>	% Length X	<u>0.000</u>	% volume of length / 100 =	<u>0.000</u>	% total for Scan 1
Scan 2	<u>0.000</u>	% Length X	<u>0.000</u>	% volume of length / 100 =	<u>0.000</u>	% total for Scan 2
Scan 3	<u>0.000</u>	% Length X	<u>0.000</u>	% volume of length / 100 =	<u>0.000</u>	% total for Scan 3
Scan 4	<u>0.000</u>	% Length X	<u>0.000</u>	% volume of length / 100 =	<u>0.000</u>	% total for Scan 4

Add totals and divide by # scans = 0.000 % total for 45 deg

Other deg - _____ (to be used for supplemental scans)

The data to be listed below is for coverage that was not obtained with the 45 deg scans.

Scan 1	_____	% Length X	_____	% volume of length / 100 =	_____	% total for Scan 1
Scan 2	_____	% Length X	_____	% volume of length / 100 =	_____	% total for Scan 2
Scan 3	_____	% Length X	_____	% volume of length / 100 =	_____	% total for Scan 3
Scan 4	_____	% Length X	_____	% volume of length / 100 =	_____	% total for Scan 4

Percent complete coverage

Add totals for each scan required and divide by # of scans to determine;

0.000 % Total for complete exam

Site Field Supervisor:

Tom Jants Lut III

Date:

9/28/03

SWI	LIMITATIONS TO NDE	NUMBER: SWI NDE-LTS-1
		REV: 0
		Page 1 of 13

ATTACHMENT 22

INFORMATION USE
<ul style="list-style-type: none">• <i>Procedure may be performed from memory.</i>• <i>User remains responsible for procedure adherence.</i>• <i>Procedure should be available, but not necessarily at, the work location.</i>

O.C. REVIEW DATE: NR	OWNER: T. Downing	EFFECTIVE DATE 6-23-03
---------------------------------------	------------------------------------	---

SWI	LIMITATIONS TO NDE	NUMBER: SWI NDE-LTS-1
		REV: 0
		Page 2 of 13

ATTACHMENT 22

1.0 PURPOSE

This procedure provides instruction for identifying, quantifying and recording of limitations encountered while performing NDE examinations under the ISI program.

2.0 REFERENCES

This procedure complies with the applicable portions of the following referenced documents:

- 2.1 American Society of Mechanical Engineers Boiler & Pressure Vessel Code:
 - Sections V and XI, 1989 edition, no addenda.
- 2.2 Nuclear Regulatory Commission Regulatory Guide - 1.150 "Ultrasonic Testing of Reactor Vessel Welds during Preservice and Inservice Examinations", (Rev. 1 dated Feb. 1983).
- 2.3 Code case N-460 - Alternative Examination Coverage for Class 1 and Class 2 Welds - Section XI, Division 1.
- 2.4 Procedure SWI NDE-0 "Equipment, Personnel and Material Reporting."
- 2.5 5AWI 14.6.0 "ISI Examination Program."

3.0 APPLICABILITY

- 3.1 This procedure is applicable to examinations performed at Prairie Island Nuclear Generating Plant.
- 3.2 This procedure is to be followed when it has been determined that there is a limitation which prevents obtaining full coverage of an area or volume as stated by the applicable examination procedure.
 - For ultrasonic examinations, this would mean less than all of the required scans and/or a reduction of required scan path for one or more scans.

SWI	LIMITATIONS TO NDE	NUMBER: SWI NDE-LTS-1
		REV: 0
		Page 3 of 13

4.0 DEFINITIONS

- 4.1 **Limitation** - something that limits, restraint: An obstacle to the performance of an examination procedure.
- 4.2 **Evaluation** - to determine the significance, worth, or condition of, usually by careful appraisal and study.
- 4.3 **Practical** - " of, relating to, or manifested in practice or action: not theoretical or ideal; concerned with voluntary action and ethical decisions. Useful." For this application this is interpreted to mean, for a specific case the benefits of a proposed action outweigh the negative aspects of that action.

5.0 PREREQUISITES

Personnel Requirements

- 5.1 Examination personnel certification and eye examinations **SHALL** be documented in accordance with SWI NDE-0.
- 5.2 Nondestructive examination personnel **SHALL** be certified to a minimum of Level I in the appropriate method to operate equipment and Level II to interpret test results.

6.0 EQUIPMENT

This item is not applicable to this procedure. If alternate methods are required to augment coverage, that work **SHALL** be done under a separate procedure.

ATTACHMENT 22

SWI	LIMITATIONS TO NDE	NUMBER: SWI NDE-LTS-1
		REV: 0
		Page 4 of 13

7.0 INSTRUCTIONS

7.1 Initial Examination

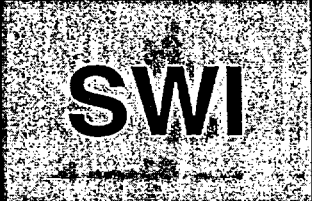
Where the examiner is not able to complete a full examination as dictated by applicable procedure, the following steps **SHALL** be taken:

- 7.1.1 Complete original examination on accessible portions.
- 7.1.2 Make sketch which includes dimensions defining location and size of limitations using a report format similar to that shown in Figure 3.
- 7.1.3 Describe the limitation including what it is and how it interferes with the exam. State what appears to be required to remove the limitation using a report format similar to that shown in Figure 3.
- 7.1.4 For volumetric examinations, construct a surface profile using a surface contour gauge and perform a thickness profile (typically one reading each 1/2" in a line) of the area that encompasses the code required volume. For UT that would include the available scanning surface.
- 7.1.5 Record radiation field information on the report (this may require assistance from the health physics group).
- 7.1.6 Sign and date the data sheet then forward it to the NDE Level III.

7.2 Evaluation

- 7.2.1 The data gathered by the initial examiner **SHALL** be reviewed by the NDE Level III or / designee to determine if alternate methods may be used to achieve additional coverage.
- 7.2.2 If alternate methods would provide additional coverage, a review of the benefit versus the required resources (radiation dose, time, cost etc.) to achieve that coverage **SHALL** be performed by the NDE Level III to determine if that action is practical (see Step 7.3).

ATTACHMENT 22

	LIMITATIONS TO NDE	NUMBER:
		SWI NDE-LTS-1
		REV: 0
		Page 5 of 13

- 7.2.3** If it is determined that the entire examination volume or area cannot be examined due to interference by another component or part geometry, a reduction in examination coverage on any Class 1 or Class 2 weld may be accepted provided the reduction in coverage for that weld is less than 10%. The applicable examination records **SHALL** identify both the cause and percentage of reduced examination coverage (see Step 7.4).

7.3 Alternate Methods to Achieve Coverage

- 7.3.1** For surface examinations, MT and PT may be interchanged / intermixed as appropriate to the material and the conditions.
- 7.3.2** For volumetric examinations, RT may be substituted for or augment UT assuming the ability to drain the line, and that the wall thickness / diameter is within a practical range.
- 7.3.3** For UT, use of other angles, full node or node and one half calibrations, skewed scans or approach from another surface to achieve additional coverage **SHALL** be considered.

7.4 Determining Coverage Achieved

When evaluation of initial and alternate examination methods results in examinations, which do not provide full coverage, a determination of percent coverage **SHALL** be made. The required examination coverage is defined by applicable figures in ASME Sect XI.

- 7.4.1** For surface examinations, a worksheet similar to that shown in Figure 4 **SHALL** be completed.

NOTE:	For ASME Section XI appendix VIII exams, code coverage may be limited by what the procedure has been demonstrated.
--------------	--

- 7.4.2** For volumetric examinations, a worksheet similar to that shown in Figure 5 or Figure 6 (ultrasonic examinations) **SHALL** be completed.

ATTACHMENT 22

SWI	LIMITATIONS TO NDE	NUMBER:
		SWI NDE-LTS-1
		REV: 0
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- 7.5 Should the evaluation show that 90% weld coverage has been achieved, attach all related information to the original NDE report and no further action is required.
- 7.6 Contractor procedures for performing examinations utilizing automated equipment (e.g. reactor vessel and nozzle safe-end exams) **SHALL** be reviewed by an NDE Level III in the appropriate method to ensure the requirements for identifying, quantifying and recording of limitations encountered are adequately addressed.
- 7.7 When it has been determined that the maximum examination coverage practically achievable for a code required item is less than required; a relief request is required to be submitted to the NRC (SAWI 14.6.0).

8.0 ACCEPTANCE CRITERIA

This item is not applicable to this procedure.

9.0 REPORTING

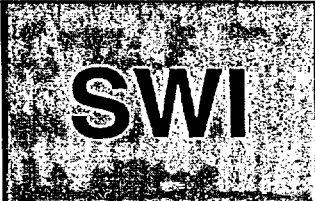
- 9.1 Information addressed in Figures 3, 4, 5 and 6 (as applicable) **SHALL** be reported.
- 9.2 Information for examinations that are required to meet Reg. Guide 1.150 **SHALL** also include the following from Appendix A - Alternate Method:

7.c "The best estimate of the portion of the volume required to be examined by the ASME Code that has not been effectively examined such as volumes of material near each surface because of near-field or other effects, volumes near interfaces between cladding and parent metal, volumes shadowed by laminar material defects, volumes shadowed by part geometry, volumes inaccessible to the transducer, volumes affected by electronic gating, and volumes near the surface opposite the transducer. Sketches and/or descriptions of the tools, fixtures and component geometry which contribute to incomplete coverage should be included."

9.3 Reference System

Recording of limitations **SHALL** be based on the reference system shown in the original examination procedure.

ATTACHMENT 22

	LIMITATIONS TO NDE	NUMBER: SWI NDE-LTS-1
		REV: 0
		Page 7 of 13

9.4 Documentation

A picture of the limitation should be taken and added to the description, preferably in a digital format.

10.0 RECORDS

- 10.1 Inservice inspection examinations **SHALL** be incorporated in the ISI records. See "ISI Examination Program."
- 10.2 Records of other examinations **SHALL** be the responsibility of the organization requesting the examination.

11.0 ATTACHMENTS

- 11.1 Figure 1 – Example of UT Scan Coverage
- 11.2 Figure 2 — Example of UT, One Sided Exam, Supplemental Coverage
- 11.3 Figure 3 – Limitation Data Sheet
- 11.4 Figure 4 – Determination of Percent Coverage for Surface Examinations
- 11.5 Figure 5 – Determination of Percent Coverage for UT Examinations -Pipe
- 11.6 Figure 6 — Determination of Percent Coverage for UT Examinations -Vessels

12.0 SUMMARY OF SIGNIFICANT CHANGES

NONE

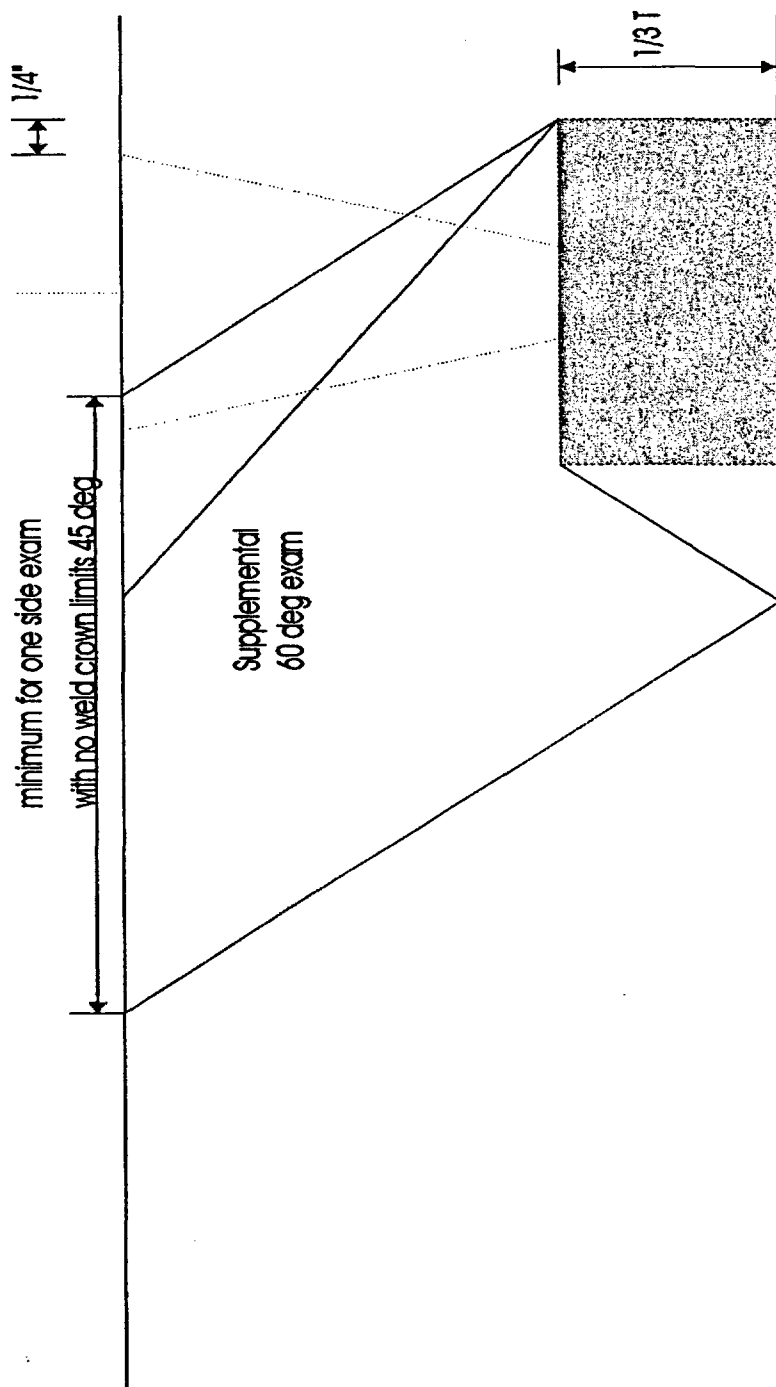
ATTACHMENT 22

SWI**LIMITATIONS TO NDE**

NUMBER:

SWI NDE-LTS-1REV: **0**

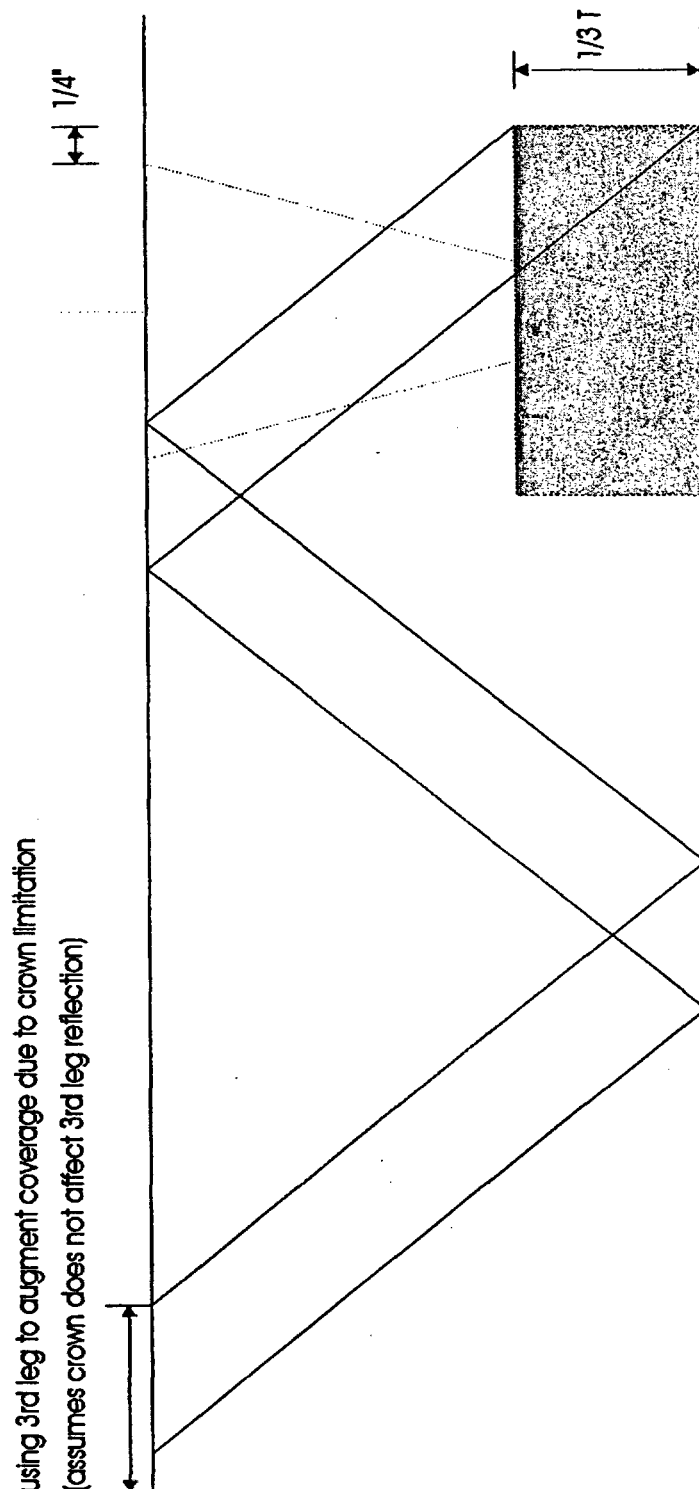
Page 8 of 13

Figure 1 - Example of UT scan coverage

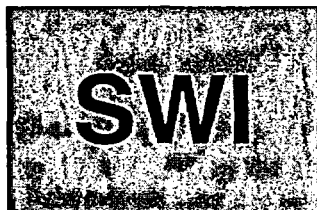
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SWI	LIMITATIONS TO NDE	NUMBER: SWI NDE-LTS-1
		REV: 0
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Figure 2 - Example of UT, One Sided Exam, Supplemental Coverage



ATTACHMENT 22



LIMITATIONS TO NDE

NUMBER:

SWI NDE-LTS-1

REV:

0

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Figure 3 -Limitation Data Sheet

TITLE: Limitations to NDE
NUMBER: SWI NDE-LTS-1 Revision 0

Figure 3
Limitation Data Sheet

Initial exam report # _____

Procedure # _____

ISO # _____

Item # _____

Description of Limitation _____

Sketch of Limitation

Limitation removal requirements _____

Radiation field _____

Examiner: _____

Date: _____

ATTACHMENT 22

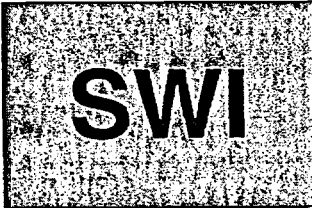
	LIMITATIONS TO NDE	NUMBER:
		SWI NDE-LTS-1
		REV: 0
		Page 11 of 13

Figure 4 –Determination of Percent Coverage for Surface Examinations

TITLE: Limitations to NDE
NUMBER: SWI NDE-LTS-1 Revision 0

Figure 4

Determination of Percent Coverage for Surface Examinations
This is a sample form only

Initial exam rpt # _____ Procedure # _____
 ISO # _____ Item # _____
 Applicable Code figure # _____

Area Required (as shown in applicable code reference drawing)

Length _____ * Width _____
 = Total area required _____ square inches

Coverage Achieved

Area examined _____ sq. in. / Total area required (100%) _____ sq. in.
 = Percent coverage _____ % (area required - area of limitations = area examined)

To determine length of a circumferential weld

Note - Diameter refers to actual external diameter not pipe size (see table below)

Diameter _____ *(Pi) 3.1416
 = Length _____ inches

Pipe Size	Actual Diameter	(Length) Circumference		Pipe Size	Actual Diameter	(Length) Circumference
2	2.375	7.46		12	12.75	40.06
2.5	2.875	9.03		14	14.0	43.98
3	3.5	11.0		16	16.0	50.27
3.5	4.0	12.57		18	18.0	56.55
4	4.5	14.14		20	20.0	62.83
5	5.563	17.48		22	22.0	69.12
6	6.625	20.81		24	24.0	75.40
8	8.625	27.10		30	30.0	94.25
10	10.75	33.77				

NDE Level III: _____ Date: _____

ATTACHMENT 22



LIMITATIONS TO NDE

NUMBER:

SWI NDE-LTS-1

REV:

0

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Figure 5 - Determination of Percent Coverage for UT Examinations -Pipe

TITLE: Limitations to NDE

NUMBER: SWI NDE-LTS-1 Revision 0

Figure 5

Determination of Percent Coverage for UT Examinations - PipeThis is a sample form only

Initial exam rpt # _____

Procedure # _____

ISO # _____

Item # _____

Applicable Code figure # _____

45 deg

Scan 1 _____ % length X _____ % volume of length / 100 = _____ % total for Scan 1

Scan 2 _____ % length X _____ % volume of length / 100 = _____ % total for Scan 2

Scan 3 _____ % length X _____ % volume of length / 100 = _____ % total for Scan 3

Scan 4 _____ % length X _____ % volume of length / 100 = _____ % total for Scan 4

Add totals and divide by # scans = _____ % total for 45 deg

Other deg - _____ (to be used for supplemental scans)

The data to be listed below is for coverage that was not obtained with the 45 deg scans.

Scan 1 _____ % length X _____ % volume of length / 100 = _____ % total for Scan 1

Scan 2 _____ % length X _____ % volume of length / 100 = _____ % total for Scan 2

Scan 3 _____ % length X _____ % volume of length / 100 = _____ % total for Scan 3

Scan 4 _____ % length X _____ % volume of length / 100 = _____ % total for Scan 4

Percent complete coverage

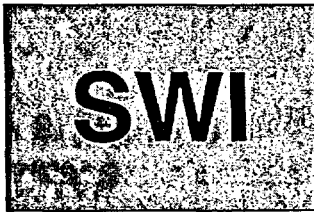
Add totals for each scan required and divide by # of scans to determine;

_____ % total for complete exam

Example - 45 deg scan 1 = 63% plus supplemental 60 deg scan 1 = 28% (of remaining required scan volume) for total of 91% coverage for scan 1 volume. Repeat for the remaining scans, add together and divide by the # of scans (typically 4).

NDE Level III: _____ Date: _____

ATTACHMENT 22



LIMITATIONS TO NDE

NUMBER:

SWI NDE-LTS-1

REV: 0

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Figure 6 - Determination of Percent Coverage for UT Examinations -Vessels

TITLE: Limitations to NDE

NUMBER: SWI NDE-LTS-1 Revision 0

Figure 6

Determination of Percent Coverage for UT Examinations - VesselsThis is a sample form only

Initial exam rpt # _____

Procedure # _____

ISO # _____

Item # _____

Applicable Code figure # _____

0 deg Planar

Scan _____ % length X _____ % volume of length / 100 = _____ % total for 0 deg

45 deg

Scan 1 _____ % length X _____ % volume of length / 100 = _____ % total for Scan 1

Scan 2 _____ % length X _____ % volume of length / 100 = _____ % total for Scan 2

Scan 3 _____ % length X _____ % volume of length / 100 = _____ % total for Scan 3

Scan 4 _____ % length X _____ % volume of length / 100 = _____ % total for Scan 4

Add totals and divide by # scans = _____ % total for 45 deg

60 deg

Scan 1 _____ % length X _____ % volume of length / 100 = _____ % total for Scan 1

Scan 2 _____ % length X _____ % volume of length / 100 = _____ % total for Scan 2

Scan 3 _____ % length X _____ % volume of length / 100 = _____ % total for Scan 3

Scan 4 _____ % length X _____ % volume of length / 100 = _____ % total for Scan 4

Add totals and divide by # scans = _____ % total for 60 deg

Percent complete coverage

Add totals for each angle and scan required and divide by # angles to determine;

_____ % total for complete exam

Note: Supplemental coverage may be achieved by use of other angles / methods. When used, the coverage for volume not obtained with angles as noted above shall be calculated and added to the total to provide the percent total for the complete examination.

NDE Level III: _____ Date: _____

ATTACHMENT 22