NMC
Committed to Nuclear Excellence

Nuclear Management Company, LLC
Prairie Island Nuclear Generating Plant
1717 Wakonade Dr. East • Welch MN 55089

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. Solymossy
Site Vice President, Prairie Island Nuclear Generating Plant

cc: (see next page)

A047

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."

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.

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

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

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).

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

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).

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

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.

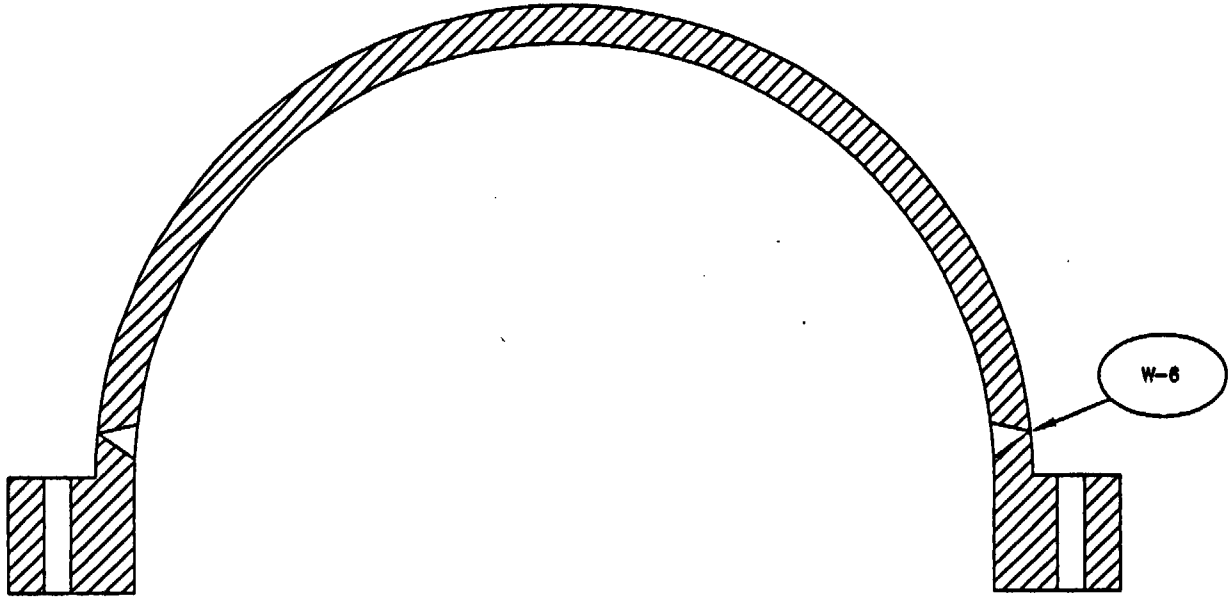
All in-service inspections at Prairie Island Unit 2 have been completed to the greatest extent practical. When limitations to required inspections are encountered, Prairie Island Procedure SWI NDE-LTS-1, "Limitations to NDE," was applied. SWI NDE-LTS-1 (Attachment 22) is used when an ASME Section XI 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.

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



ISI = WELD NO.

REF:	FILE NO: 21041R05
NSP (M&SP)– PI–2	ISI
DWN: CADWorks CHKD: APPD:	
SYSTEM: REACTOR VESSEL HEAD WELD	
LINE: NA	
DWG: 2–ISI–41	REV: 05

ATTACHMENT 1 PAGE 1 OF 1

UT Vessel Examination

NMC

Site/Unit: PINGP / 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: 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	
Scanning dB	33.3	52.3	52.3	63	63	

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	Signature	Date	Reviewer	Signature	Date
Howard, Dean	II	Dean Howard	9/23/2003	Jones, Thomas	Thomas Jones Lvl III	9/26/03
Examiner	Level	Signature	Date	Site Review	Signature	Date
Stevermer, Aaron	II	[signature]	9/23/2003	Hanson, Shannon	[signature] for SH	10/2/03
Other	Level	Signature	Date	ANII Review	Signature	Date
N/A	N/A			Daly, Gerald	[signature]	030003

ATTACHMENT 2 PAGE 1 OF 4

Determination of Percent Coverage for UT Examinations - Vessels

ATTACHMENT 2 PAGE 2 OF 4.

Site/Unit:	PINGP / 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 Luttit Date: 9/24/03

Additional - Calculation Vessel <edit from Setup>

Limitation Record

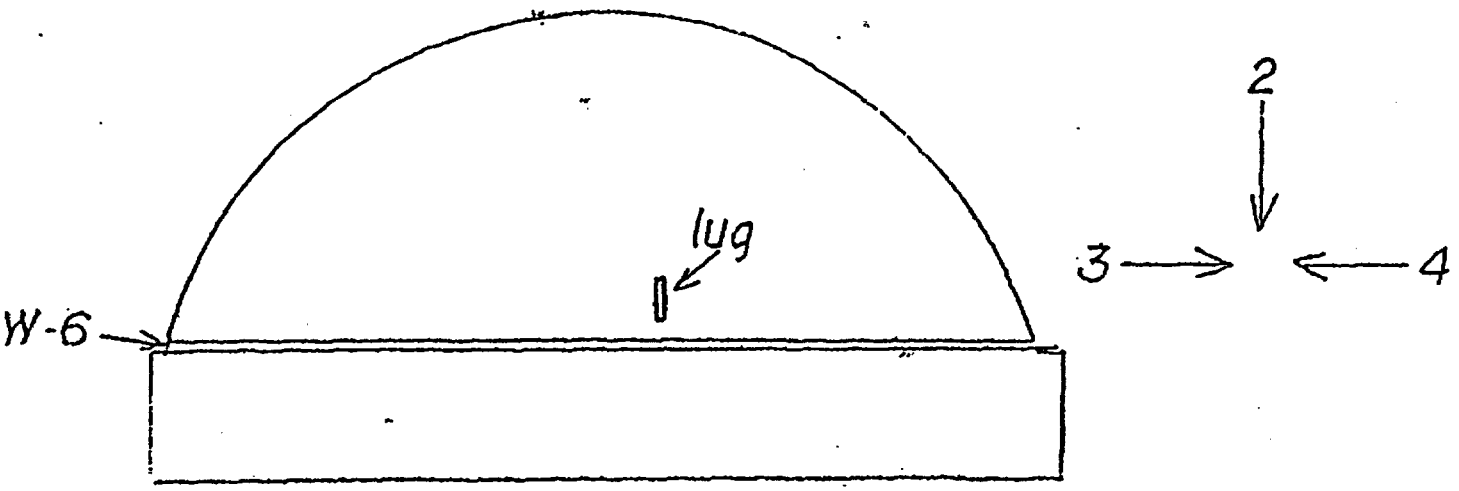
Site/Unit:	PINGP / PI2	Procedure:	SWI NDE-UT-3A	Outage No.:	PI2RF2003
Summary No.:	501733	Procedure Rev.:	0	Report No.:	2003U033
Workscope:	ISI	Work Order No.:	0305010	Page:	3 of 4

ATTACHMENT 2 PAGE 3 OF 4

Description of Limitation:

5.50" WIDE LIFTING LUG

Sketch of Limitation: J:\Iddeal_Photos\PI2RFO2003\UT Images\2003U033_1.bmp



Limitations removal requirements:

None

Radiation field:

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

Additional - Limitation <edit from Setup>

Supplemental Report

Report No.: 2003U033

Page: 4 of 4

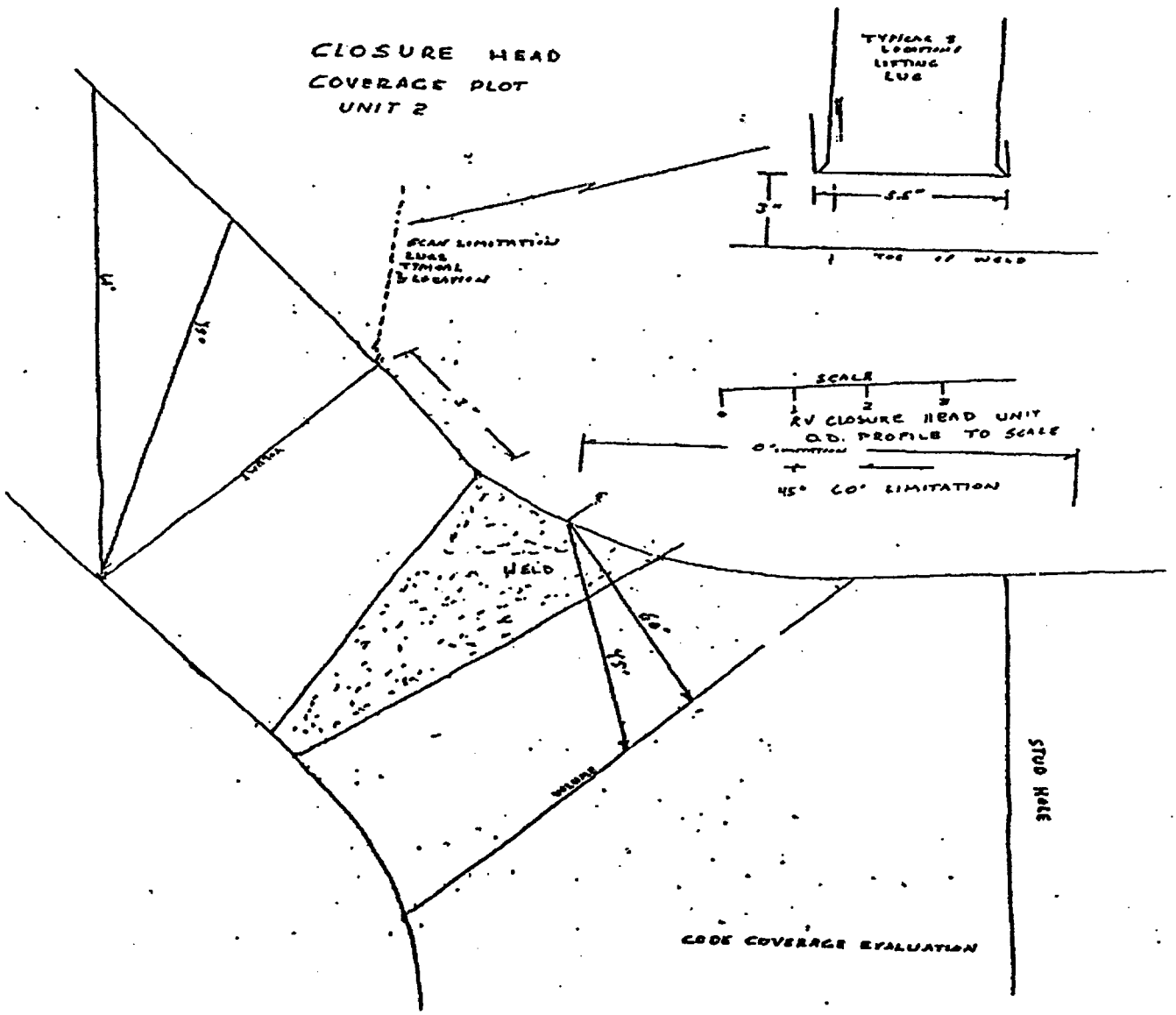
Summary No.: 501733

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:	030CT03

ATTACHMENT 2 PAGE 4 OF 4

Comments: None

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



Additional - Supplemental Reports <edit from Setup>

UT Vessel Examination

Report No.: 2000U156

Site/Unit: NSP / PI2 | Procedure: ISI-UT-3A | Page: 1 of 5

Summary No.: 501733 | Procedure Revision/FC: 8 /

Examination For: ISI | Work Order No.: 0000232

Applicable Code: 1989 | ISO Drawing No.: 2-isi-41 | Location: Containment

Description: Head to Flange

System ID: RV

Component ID: W-6 | Size/Length: N/A | Thick/Dia: 6.00"

Limitations: See attached limitation data sheets. | Start Time: 08:00 | Finish Time: 18:30

Examination Surface: Inside ☐ Outside ☑ | Surface Condition: Blended

Temp. Tool MFG: Telatemp | Serial No.: NSP 118 | Surface Temp.: 75 °F | Couplant: Sonotrace 40 | Batch No.: #98243

Angle Used	0	45	45T	60	60T	
Scanning dB	20/13	20/12	20/12	20/23	20/23	N/A

Lo Location: Stud Hole #1 | Wo Location: Centerline of Weld

Cal Sheet No.: 2000CA162, 2000CA163, 2000CA164

Indication(s): Yes ☑ No ☐ | Scan Coverage WRT Weld: Upstream ☐ Downstream ☑ CW ☑ CCW ☑

Comments:

Examined from 12' to 24' only.

PAGE 1 OF 26
REPORT # 2000U156

Results: NAD ☐ IND ☑ GEO ☐

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

Examiner	Level	Signature	Date	Reviewer	Signature	Date
Carlin, William D.	I	W. Carlin	5/20/2000	Halling, David A.	D.A. Halling	5/30/00
Examiner	Level	Signature	Date	Site Review	Signature	Date
Auer, Robert G.	I	D.A. Halling for R.G. Auer	5/20/2000	Kinney, Charles R.	[illegible]	5-31-00
Other	Level	Signature	Date	ANII Review	Signature	Date
N/A	I			Heater, Stephen B.	[illegible]	6-1-00

ATTACHMENT 3 PAGE 1 OF 26

Ultrasonic In ation Report

Report No.: 2000U156

Page: 2 of 5

Site/Unit: NSP / PI2

Summary No.: 501733

Examination For: ISI

Procedure: ISI-UT-3A

Procedure Revision/FC: 8 /

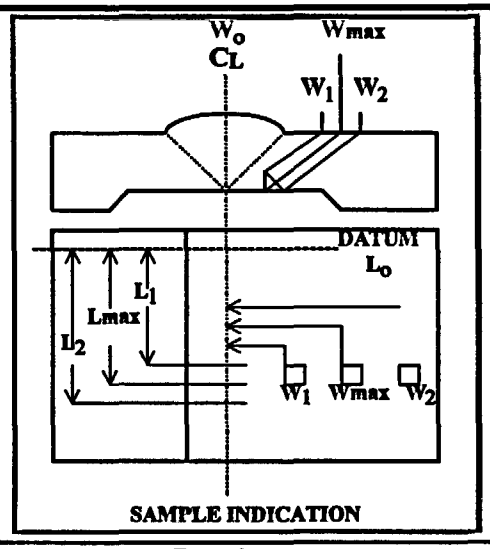
Work Order No.: 0000232

Search Unit Angle: 60 °

Wo Location: Weld Centerline

Lo Location: #1 Bolt Hole

- ○ Piping Welds
- ◉ Ferritic Vessels ≥ 2"T
- ○ Other _____



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

Scan #	Indication No.	% Of DAC	W Max W	W Max MP	Forward 50% Of Max W1	Forward 50% Of Max MP	Backward 50% Of Max W2	Backward 50% Of Max MP	L1 50% Of Max	L Max	L2 50% Of Max	RBR Amp.	Remarks
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	4.5	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	Signature	Date	Reviewer	Signature	Date
Carlin, William D. /	III	W. Carlin	5/20/2000	Halling, David A. /	D A Halling	5/30/00
Auer, Robert G. /	II	DA Halling for R.G. Auer	5/20/2000	Site Review Kinney, Charles R. /	[signature]	5-31-00
Other N/A /	Level N/A			ANII Review Heater, Stephen B. /	[signature]	6-1-00

PAGE 2 OF 26
REPORT # 2000U156

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ATTACHMENT 3 PAGE 2 OF 26

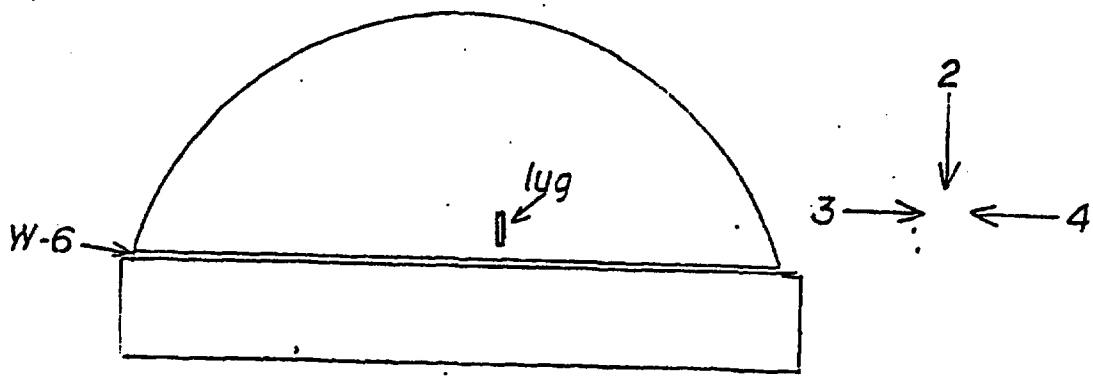
Limitation Record

Site/Unit:	NSP / PI2	Procedure:	ISI-UT-3A	Report No.:	2000U156
Summary No.:	501733	Procedure Revision/FC:	8 /	Page:	3 of 5
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:\IDDEAL50\PI2RFO2000\PI2 SUPPLEMENTAL\PI2 SUPPLEMENTAL UT\2000U1



Limitations removal requirements:

None

Radiation field: 8 - 12 mR / hr

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

PAGE 3 OF 26

REPORT # 2000U156

ATTACHMENT 3 PAGE 3 OF 26

Supplemental Report

Report No.: 2000U156

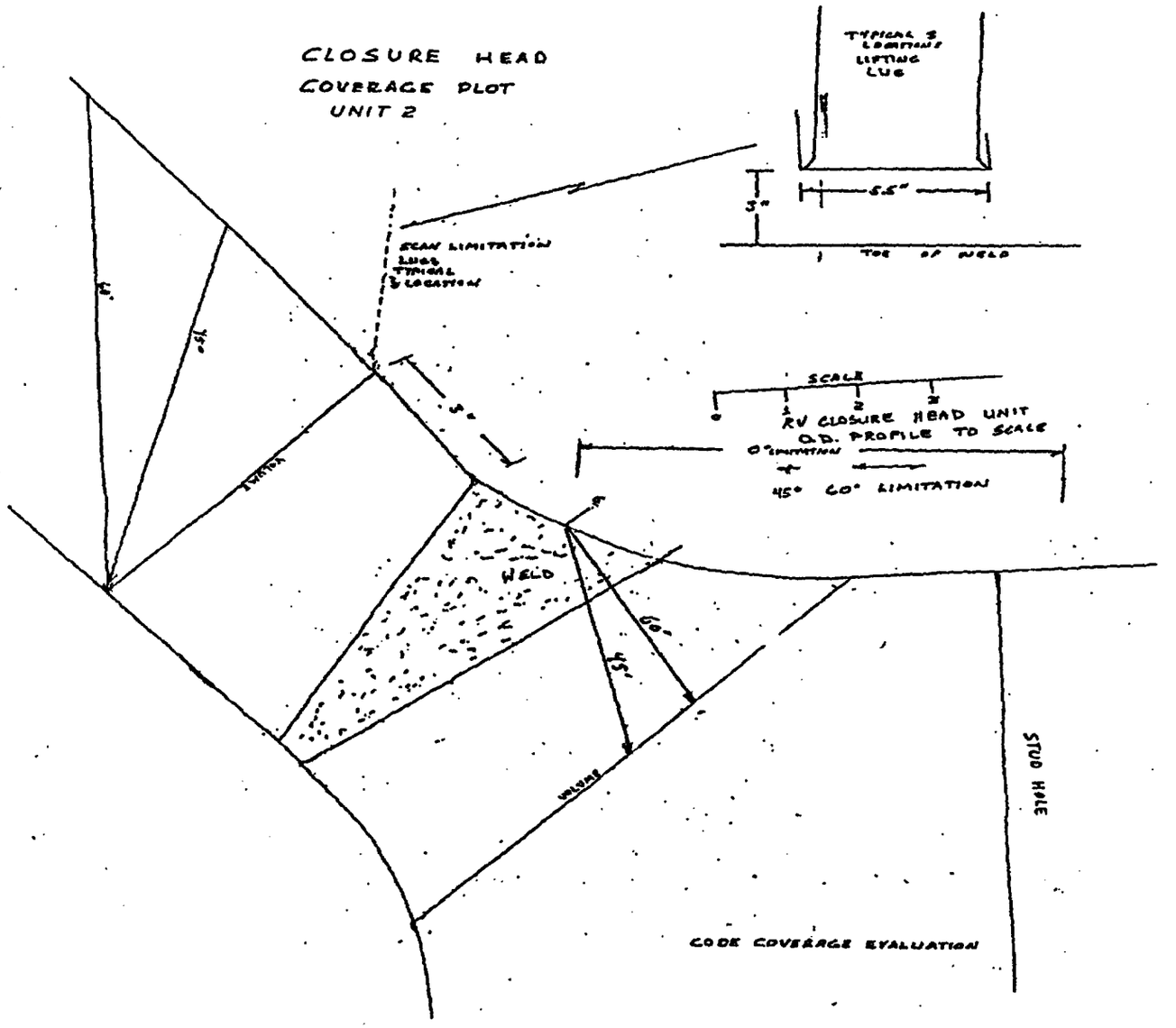
Page: 4 of 5

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:\IDDEAL50\PI2RFO2000\PI2 SUPPLEMENTAL\PI2 SUPPLEMENTAL UT\2000U1



Determination of Percent Coverage for UT Examinations - Vessels

Report No.: 2000U156

Site/Unit: NSP / PI2 | Procedure: ISI-UT-3A | Page: 5 of 5

Summary No.: 501733 | Procedure Revision/FC: 8 /

Examination For: ISI | Work Order No.: 0000232

ATTACHMENT 3 PAGE 5 OF 26

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: [signature] Date: 5-31-00

ISI Flaw Disposition Worksheet

Report No.: 2000U156

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 1 | 3) ISI Interval 3rd | OK Reviewer KSK

2) Item Number B1.40 | 4) Code Edition & Addenda 1989 No Addm. | OK Reviewer KSK

5) Acceptance Standard IWB-3510-1 | OK Reviewer KSK

6) Calculations (See Below) | OK Reviewer CAK for KSK 6-1-00

FLAW TYPE: SUB SURFACE PLANAR.

$a = .15$ $\ell = .30$ $t = 6.0''$ $S = 1.4$.

ASPECT RATIO $= a/\ell = .15/.30 = .50$

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

ASPECT RATIO	SUB SURFACE FLAWS
0.50	$a/t,\% = 7.6$

$t_{nominal} = 6.0''$ $Y = S/a = 1.4/.15 > 1.0$

$\therefore Y = 1$

$a/t\%_{allowed} = 7.6(1) = 7.6\%$ $a/t_{actual} = .15''/6.0'' = .025 \approx 2.5\%$

$a/t\%$ allowed $>$ $a/t\%$ actual $7.6\% > 2.5\%$ $\therefore$ FLAW is acceptable by Code. TABLE IWB-3510-1

7) Results OK Reviewer KSK

a/l = .50 Code allowable a/t% = 7.6 Calculated a/t% = 2.5 Laminar flaw surface area: (0.75 l w) = N/A

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

9) 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 DWW OK Reviewer KSK

12) Statement of acceptability or rejectability with basis. OK Reviewer KSK Accept Reject

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

13) Prepared by and date

Daniel A Whitsel 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

Kenneth S Kirk 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.

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 # 20004156 Evaluation Performed By: Date: 5-25-00
Flaw # 1 Reviewed By: 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 (a^2)
1.585 (depth at maximum amplitude point) squared = 2.5122 (b^2)
$\sqrt{a^2 - b^2}$ = 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

ISI Flaw Sizing Worksheet

Report No.: 20000156

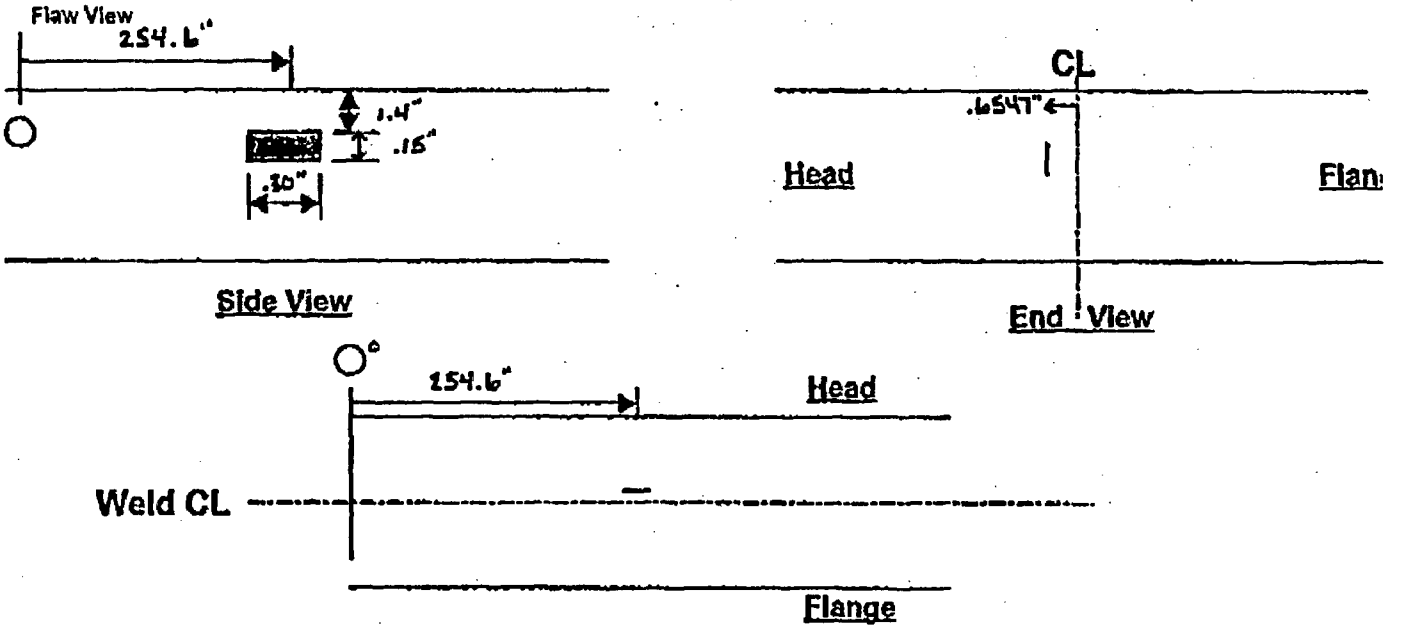
Site/Unit: DI 1 2
Summary No.: 501733
Examination For: W-6 12'-24'

Procedure: ISI-UT-3A
Procedure Revision/FC: 8 1 NA
Work Order No.: 0000232

Page. ____ of ____

1) Flaw Number 1
2) Item Number B 1.40

3) ISI Interval 3rd — OK Reviewer SPC
4) Code Edition & Addenda 1989 No Add. — OK Reviewer SPC
5) Method UT
6) Flaw Sketch — OK Reviewer SPC



7) Calculations — OK Reviewer SPC

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 X Yes Preparer JPW OK Reviewer SPC

9) Code Flaw Dimensions OK Reviewer SPC

"l" .30 "a" .15 "t nominal" 6.0" "t measured" 6.0" "S" 1.4 "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 X Yes Preparer JPW OK Reviewer SPC

15) Prepared by and date
JERRY WREN 5/25/00
The results are correct and the methodology used is in accordance with applicable codes, standards, specifications and procedures.

16) Review by and date
SEAN CLAY 5/25/00
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 26
REPORT # 20000156

ISI Flaw Disposition Worksheet

Report No.: 2000U156

Site/Unit: PI2 1 | Procedure: ISI-UT-3A | Page: ____ of ____

Summary No.: 501733 | Procedure Revision/FC: 8 1

Examination For: ISI | Work Order No.: 00002232

1) Flaw Number 2 | 3) ISI Interval 3rd. | OK Reviewer KSh

2) Item Number B1.40 | 4) Code Edition & Addenda 1989 No Addm. | OK Reviewer KSh

5) Acceptance Standard IWB-3510-1 | OK Reviewer KSh

FLAW TYPE: SUB SURFACE PLANAR | 6) Calculations (See Below) | OK Reviewer KSh

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

ASPECT RATIO $= a/\ell = .15/.6 = 0.25$

$Y = S/a = 1.5/.15 = 10 \therefore Y > 1 \quad Y = 1$

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

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

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

$a/t\%$ allow $= 3.8\%$

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

7) Results OK Reviewer KSh

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

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

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

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 DSW OK Reviewer KSh

12) Statement of acceptability or rejectability with basis. OK Reviewer KSh 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 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 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 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 # 20004156 Evaluation Performed By: ___ Date: 5-25-00
Flaw # 2 Reviewed By: ___ 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 (L2) - 255.0 (L1) = .6 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 2.96 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.)

1) Determine the upper depth of the flaw from the exam surface.
2.96 (metal path at 20% upper) * COS of the measured angle .5 = 1.48 inches depth.

2) Determine the lower depth of the flaw from the exam surface.
3.58 (metal path at 20% lower) * COS of the measured angle .5 = 1.79 inches depth.

3) Determine the depth of the flaw from the exam surface at the maximum amplitude point.
3.27 (metal path at maximum amplitude point) * COS of the measured angle .5 = 1.635 inches depth.

4) Determine the distance from the center line of the weld to the maximum amplitude point of the flaw.
3.27 (metal path at maximum amplitude point) squared = 10.6923 (a^2)
1.635 (depth at maximum amplitude point) squared = 2.6732 (b^2)
$\sqrt{a^2 - b^2}$ = 2.8318 inches of surface distance to the flaw from the transducer exit point.
3.5 (Wmax) – 2.8318(surf dist) = .6682 inches to the centerline of the weld.

5) Determine S by picking the smaller of the following:
S = 1.48 (result of 1) = distance between exam surface and the upper flaw tip
>> OR <<
S = 6.0 (part "t") – 1.79 (result of 2) = 4.21 distance between the side opposite exam surface and the lower flaw tip

6) Determine 2d in though wall thickness.
1.79 (from step 2) – 1.48 (from step 1) = .31 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 = N/A inches.
If S is greater than or equal to 0.4a the flaw is sub-surface. a = 2a / 2 = .165 inches.

l = .60 (for a/l > 0.6, l = 2a) t = 6.0 (part thickness)
a = .15 (surf or sub surf, circle one) S = 1.5

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

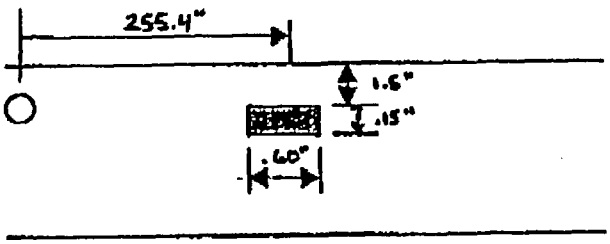
1) Flaw Number 2 | 3) ISI Interval 3rd | OK Reviewer SPC

2) Item Number B1.40 | 4) Code Edition & Addenda 1989 NO ADD. | OK Reviewer SPC

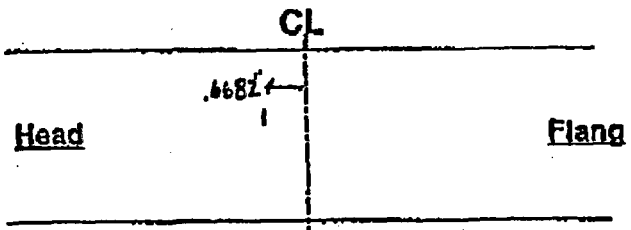
5) Method UT

6) Flaw Sketch OK Reviewer SPC

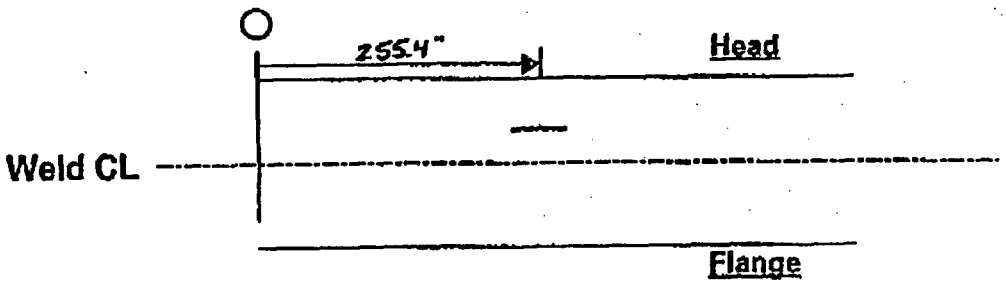
Flaw View



Side View



End View



Top View

7) Calculations OK Reviewer SPC

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 X Yes Preparer JPW 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 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. X Yes Preparer JPW OK Reviewer SPC

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

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

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

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

ATTACHMENT 3

ISI Flaw Disposition Worksheet

Report No.: 2000U156

Site/Unit: PA2 1 | Procedure: ISI-UT-3A | Page: ____ of ____

Summary No.: 501733 | Procedure Revision/FC: 8 1

Examination For: | Work Order No.: 0000232

1) Flaw Number 3 | 3) ISI Interval 3rd. | OK Reviewer KSL

2) Item Number B1.40 | 4) Code Edition & Addenda 1989 No Addm. | OK Reviewer KSL

5) Acceptance Standard IWB-3510-1 | OK Reviewer KSL

6) Calculations (See Below) | OK Reviewer KSL

FLAW TYPE: SUB SURFACE PLANAR

$a = .15$ $\ell = .30$ $t_n = 6.0$ $s = 1.7$

aspect ratio $= a/\ell = .15/.30 = .50$

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

ASPECT RATIO	SUB SURFACE FLAW
.50	7.64

$y = s/a = 1.7/.15 = 11$ $y > 1$ ∴ $y = 1$

$a/t\%_{allow} = 7.6\%$ $a/t\%_{act} = .15/6.0 = .025 \times 2.5\%$

$a/t\%_{allow} > a/t\%_{act}$ $7.6\% > 2.5\%$ ∴ FLAW is acceptable by Code

7) Results OK Reviewer KSL

a/l = .50 Code allowable a/t% = 7.6 Calculated a/t% = 2.5 Laminar flaw surface area: (0.75 l w) = NA

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

9) Was linear interpolation used? Yes No If no, why? DEW

VALUES 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 KSL

12) Statement of acceptability or rejectability with basis. OK Reviewer KSL 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 [signature] 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 [signature] 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 [signature] 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.

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 gcw **INITIAL TO VERIFY**

ISI Report # 20004156 Evaluation Performed By: [signature] Date: 5-25-00
Flaw # 3 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 = 266.7 (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.)

1) 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.

2) 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.

3) 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.

4) 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 (a^2)
1.82 (depth at maximum amplitude point) squared = 3.3124 (b^2)
$\sqrt{a^2 - b^2}$ = 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.

5) Determine S by picking the smaller of the following;
S = 1.68 (result of 1) = distance between exam surface and the upper flaw tip
>> OR <<
S = 6.0 (part "t") – 1.96 (result of 2) = 4.08 distance between the side opposite exam surface and the lower flaw tip

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

l = .30 (for a/l > 0.6, l = 2a) t = 6.0 (part thickness)
a = .15 (surf or sub surf, circle one) S = 1.7

MAY-25-00 THU 12:50 P.05

NSP

ISI Flaw Sizing Worksheet

Report No.: 20001156

Site/Unit: PI 1 2 | Procedure: ISI-UT-3A | Page: ____ of ____

Summary No.: 501733 | Procedure Revision/FC: 8 / NA

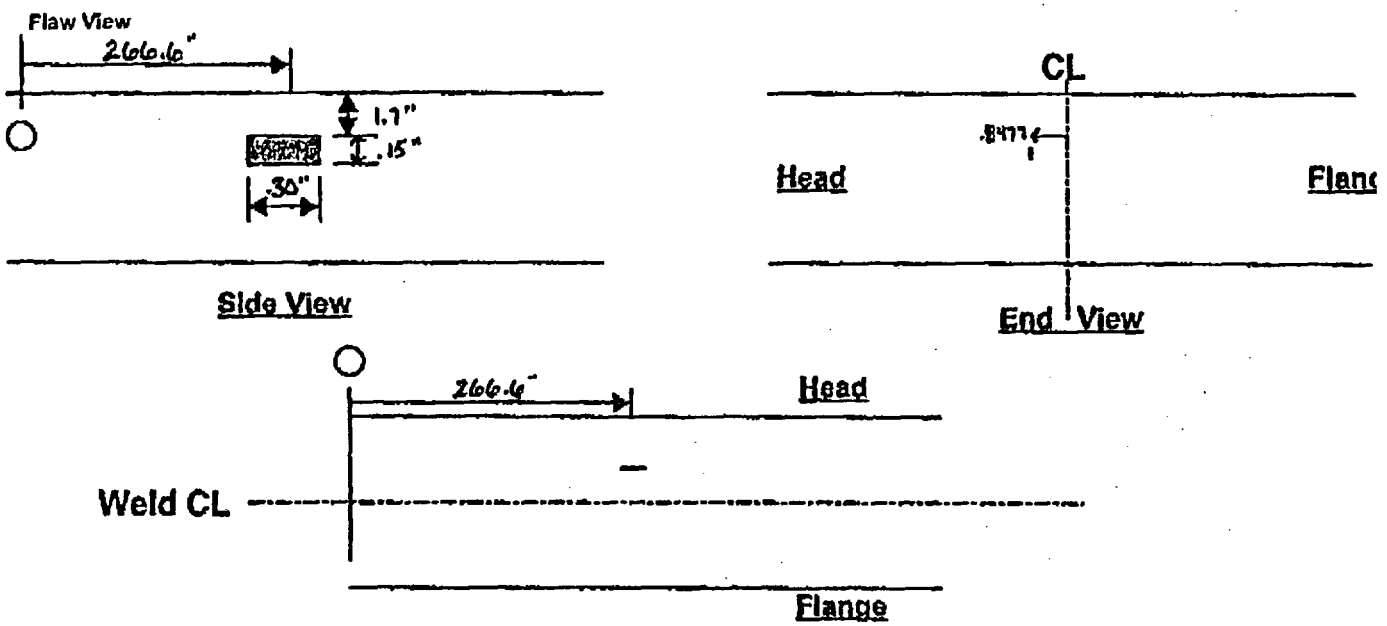
Examination For: W-6 12' ~ 24' | Work Order No.: 00060232

1) Flaw Number: 3 | 3) ISI Interval: 3rd | OK Reviewer: SPC

2) Item Number: B1.40 | 4) Code Edition & Addenda: 1989 NO ADD | OK Reviewer: SPC

5) Method: UT

6) Flaw Sketch | OK Reviewer: SPC



7) Calculations | OK Reviewer: SPC

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 X Yes | Preparer: SPW | OK Reviewer: SPC

9) Code Flaw Dimensions | OK Reviewer: SPC

"l" .30 "a" .15 "t nominal" NA "t measured" 6.0 "S" 1.7 "w" = NA

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 X Yes | Preparer: SPW | OK Reviewer: SPC

15) Prepared by and date: [signature] 5/25/00

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

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

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

REPORT # 20001156

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.: 00006232

1) Flaw Number 4 | 3) ISI Interval 3rd. | OK Reviewer KJL

2) Item Number B1.40 | 4) Code Edition & Addenda 1989 No Addenda. | OK Reviewer KJL

FLAW TYPE: SUBSURFACE PLANAR | 5) Acceptance Standard IWB-3510-1 | OK Reviewer KJL

6) Calculations (See Below) | OK Reviewer KJL

$l = .50$ $a = .15$ $t = 6.0$ $s = 1.7$

aspect ratio $= a/l = .15/.50 = 0.30$

$y = s/a = 1.7/.15 = 11.3$ $y > 1$ ∴ $y = 1$

$a/t\%_{act} = .15/6.0 = .025 = 2.5\%$

$a/t_{allowed} = 4.4\%$ $a/t_{allowed} > a/t\%_{cal}$ $4.4\% > 2.5\%$

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

ASPECT RATIO	a/t SUBSURFACE FLAW
0.30	4.44

∴ $a/t_{allow} > a/t_{meas}$ $4.4\% > 2.5\%$ FLAW IS acceptable by Code.

7) Results OK Reviewer KJL

a/l = 0.30 Code allowable a/t% = 4.4 Calculated a/t% = 2.5 Laminar flaw surface area: (0.75 l w) = NA

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

9) 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 KJL

12) Statement of acceptability or rejectability with basis. OK Reviewer KJL 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 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 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 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.

ATTACHMENT 3

ISI Flaw Sizing Worksheet

Report No.: 20000156

Site/Unit: PI 1 2 | Procedure: 7-E-UT-3A | Page ____ of ____

Summary No.: 501733 | Procedure Revision/FC: 8 1 NA

Examination For: W-6 12' to 24' | Work Order No.: 0000232

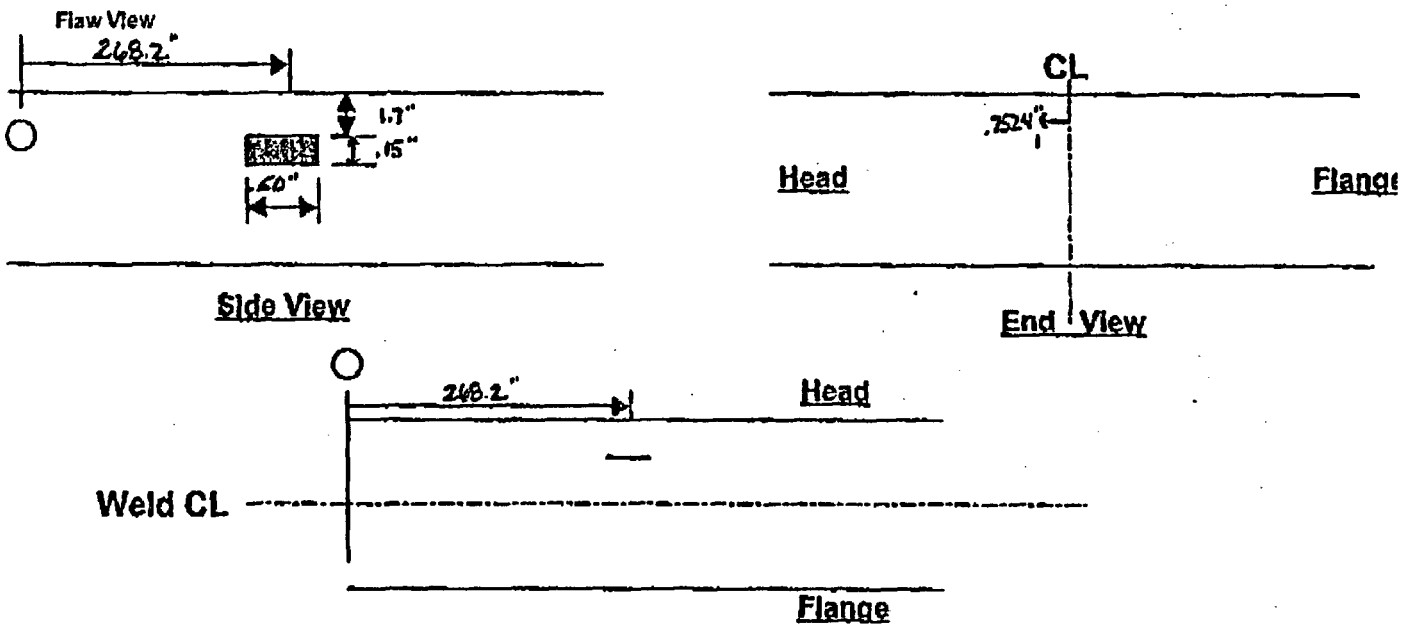
1) Flaw Number: 4 | 3) ISI Interval: 5th | OK Reviewer: SPC

2) Item Number: B1.40 | 4) Code Edition & Addenda: 1989 No Add. | OK Reviewer: SPC

5) Method: UT

6) Flaw Sketch | OK Reviewer: SPC

Flaw View



7) Calculations | OK Reviewer: SPC

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 X Yes | Preparer: [illegible] | 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" = N/A

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 X Yes | Preparer: [illegible] | OK Reviewer: SPC

15) Prepared by and date: JERRY WREN 5/25/00

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

16) Review by and date: SEAN CRAU 5/25/00

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

MAY-25-00 THU 12:51 P.08

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 # 20004156 Evaluation Performed By: _____ Date: 5-25-00
Flaw # 4 Reviewed By: _____ 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 (L2) - 267.9 (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 3.47 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. 50% max amp for indications > 100% DAC is conservative.)

1) Determine the upper depth of the flaw from the exam surface.
3.47 (metal path at 20% upper) * COS of the measured angle .5 = 1.735 inches depth.

2) Determine the lower depth of the flaw from the exam surface.
4.03 (metal path at 20% lower) * COS of the measured angle .5 = 2.015 inches depth.

3) Determine the depth of the flaw from the exam surface at the maximum amplitude point.
3.75 (metal path at maximum amplitude point) * COS of the measured angle .5 = 1.875 inches depth.

4) Determine the distance from the center line of the weld to the maximum amplitude point of the flaw.
3.75 (metal path at maximum amplitude point) squared = 14.0625 (a^2)
1.875 (depth at maximum amplitude point) squared = 3.5156 (b^2)
$\sqrt{a^2 - b^2}$ = 3.2476 inches of surface distance to the flaw from the transducer exit point.
4.0 (Wmax) – 3.2476 (surf dist) = .7524 inches to the centerline of the weld.

5) Determine S by picking the smaller of the following;
S = 1.735 (result of 1) = distance between exam surface and the upper flaw tip
>> OR <<
S = 6.0 (part "t") – 2.015 (result of 2) = 3.985 distance between the side opposite exam surface and the lower flaw tip

6) Determine 2d in though wall thickness.
2.015 (from step 2) – 1.735 (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 = 1.7

NSP

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 5 | 3) ISI Interval 3rd. | OK Reviewer KJH

2) Item Number B1.40 | 4) Code Edition & Addenda 1985 No Addenda. | OK Reviewer KJH

FLAW TYPE: SUB SURFACE PLANAR. | 5) Acceptance Standard IWB-3510 | OK Reviewer KJH

6) Calculations (See Below) | OK Reviewer KJH

$a = .15$ $\ell = .30$ $t = 6.0$ $S = 1.5$

ASPECT RATIO $= a/\ell = .15/.30 = .5$

$Y = S/a = 1.5/.15 = 10$ $Y > 1$ ∴ $Y = 1$

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

ASPECT RATIO	a/t % Sub Surface planar
0.50	7.64

$a/t\%_{allow} = 7.6\%$ $a/t\%_{measured} = .15/6.0 = .025\% = 2.5\%$

∴ $a/t_{allow} > a/t_m$ $7.6\% > 2.5\%$ ∴ FLAW is acceptable by Code

7) Results OK Reviewer KJH

a/l = .50 Code allowable a/t% = 7.6 Calculated a/t% = 2.5 Laminar flaw surface area: (0.75 l w) = NA

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

9) Was linear interpolation used? ☒ Yes ● No If no, why? DCW

VALUE CELL 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 DCW OK Reviewer KJH

12) Statement of acceptability or rejectability with basis. OK Reviewer KJH ● Accept ○ Reject

- ● (a/t) Code allowable > (a/t) calculated DCW
- ● OEM flaw evaluation handbook (see attached analysis)
- ● (a/t) Code allowable < (a/t) calculated

13) Prepared by and date
David Wickett 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 Rithell 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 Rikes 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 # 20004156 Evaluation Performed By: [signature] Date: 5-25-00
Flaw # 5 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 = 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 (a^2)
1.645 (depth at maximum amplitude point) squared = 2.7060 (b^2)
$\sqrt{a^2 - b^2}$ = 2.6492 inches of surface distance to the flaw from the transducer exit point.
3.6 (Wmax) – 2.6492 (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 = .064*
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 = .16 inches.

l = .30 (for a/l > 0.5, l = 2a) t = 6.0 (part thickness)
a = .16 (surf or sub surf, circle one) S = 1.5

ISI Flaw Sizing Worksheet

Report No. 20000156

Site/Unit: PI 1 2 | Procedure: ISI-UT-34 | Page: ____ of ____

Summary No.: 561733 | Procedure Revision/FC: 8 1 NA

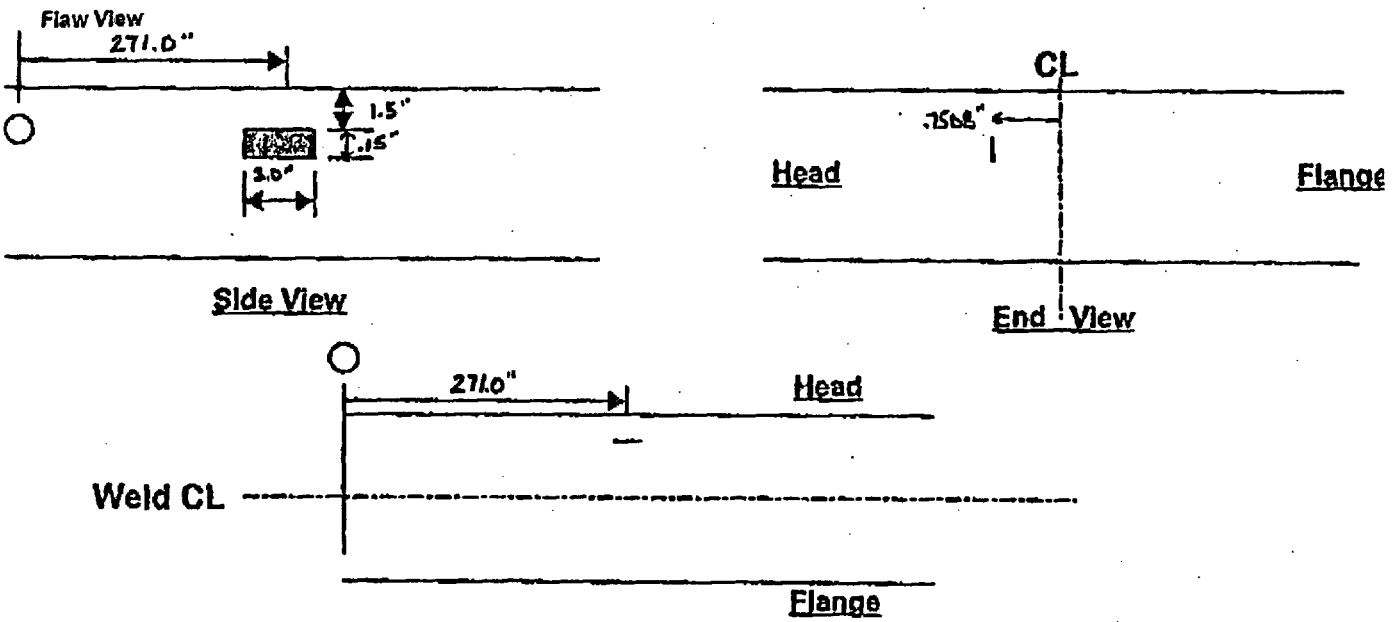
Examination For: W-6 12" to 24" | Work Order No.: 00002332

1) Flaw Number 5 | 3) ISI Interval 3rd | OK Reviewer SPC

2) Item Number B1.40 | 4) Code Edition & Addenda 1989 NB 144 | OK Reviewer SPC

5) Method UT

6) Flaw Sketch OK Reviewer SPC



7) Calculations OK Reviewer SPC

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 X Yes Preparer JPW OK Reviewer SPC

9) Code Flaw Dimensions OK Reviewer SPC

"l" .30 "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 OK Reviewer IWA-3370.1

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. X Yes Preparer JPW OK Reviewer SPC

15) Prepared by and date
Jim Wren 5/25/00
The results are correct and the methodology used is in accordance with applicable codes, standards, specifications and procedures.

16) Review by and date
Sean Clay 5/25/00
The review assures that the results are correct and the methodology used is in accordance with applicable codes, standards, specifications and procedures.

MAY-25-00 THU 12:52 P.10

ISI Flaw Disposition Worksheet

Report No.: 20000U156

Site/Unit: PT2 1 | Procedure: ISI-UT-3A | Page: ____ of ____

Summary No.: 501733 | Procedure Revision/FC: 8 1

Examination For: ISI | Work Order No.: 0000282

1) Flaw Number 6 | 3) ISI Interval 3rd. | OK Reviewer KJL

2) Item Number B1.40 | 4) Code Edition & Addenda 1989 No Addenda | OK Reviewer KJL

FLAW TYPE: SUB SURFACE PLANAR. | 5) Acceptance Standard IWB-3510 | OK Reviewer KJL

6) Calculations (See Below) | OK Reviewer KJL

a=.15 l=.50 t=6.0 s=1.6

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

aspect ratio	a/t% sub surface planar
0.30	4.44

ASPECT RATIO = .15/.50 = 0.3

Y = S/a = 1.6/.15 = 10.67 Y>1 ∴ Y=1

a/t allowed = 4.4(1) = 4.4% a/t m = .15/6 = .025 ≈ 2.5%

a/t allowed > a/t m 4.4% > 2.5% therefore flaw is acceptable by Code

7) Results OK Reviewer KJL

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

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

9) Was linear interpolation used? Yes No If no, why? N/A

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 [illegible] OK Reviewer KJL

12) Statement of acceptability or rejectability with basis. OK Reviewer KJL Accept Reject

- (a/t) Code allowable > (a/t) calculated [illegible]
- OEM flaw evaluation handbook (see attached analysis)
- (a/t) Code allowable < (a/t) calculated

13) Prepared by and date Daniel 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 Kenneth Lindell 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 Rickey 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 # 20000156 Evaluation Performed By: [signature] Date: 5-25-00
Flaw # 6 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 = 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 (a^2)
1.705 (depth at maximum amplitude point) squared = 2.9070 (b^2)
$\sqrt{a^2 - b^2}$ = 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

MAY-25-00 THU 12:52 P.11

ISI Flaw Sizing Worksheet

Report No.: 20000156

Site/Unit: PI 1 2 | Procedure: IEI-UT 3A | Page: ____ of ____

Summary No.: 501733 | Procedure Revision/FC: 8 1 NA

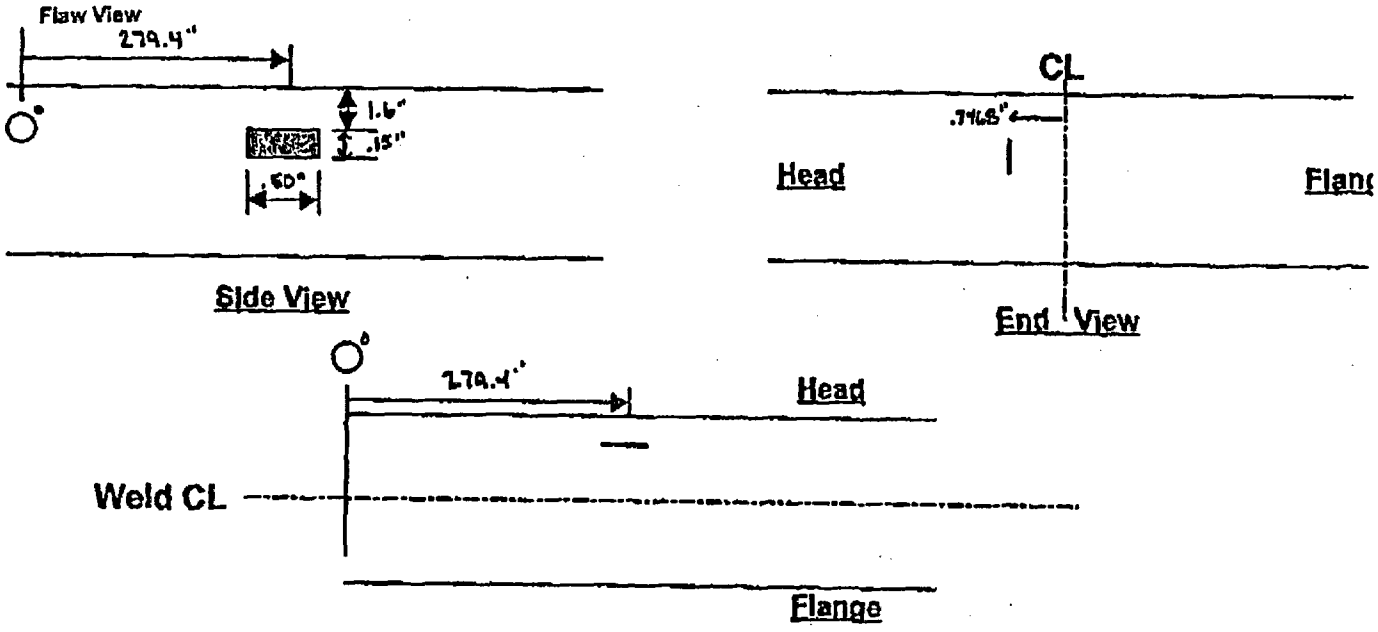
Examination For: W-6 12' to 24' | Work Order No.: 0000232

1) Flaw Number: 6 | 3) ISI Interval: 3rd | OK Reviewer: SPC

2) Item Number: B 1.40 | 4) Code Edition & Addenda: 1989 No Add. | OK Reviewer: SPC

5) Method: UT

6) Flaw Sketch | OK Reviewer: SPC



7) Calculations | OK Reviewer: SPC

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 X Yes | Preparer: [illegible] | OK Reviewer: SPC

9) Code Flaw Dimensions | OK Reviewer: SPC

"l" .50 "a" .15 "t nominal" NA "t measured" 6.0 "s" 1.6 "w" = NA

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 X Yes | Preparer: [illegible] | OK Reviewer: SPC

15) Prepared by and date: SEAN WREN 5/25/00

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

16) Review by and date: SEAN WREN 5/25/00

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

NSP

ISI Flaw Disposition Worksheet

Report No.: 20000 U 156

Site/Unit: PI 2 1 | Procedure: ISI-UT-3A | Page: ____ of ____

Summary No.: 501733 | Procedure Revision/FC: 8 1

Examination For: | Work Order No.: 0000232

1) Flaw Number 7 | 3) ISI Interval 3rd. | OK Reviewer KJK

2) Item Number B1.40 | 4) Code Edition & Addenda 1989 No Addenda | OK Reviewer KJK

5) Acceptance Standard IWB-3510 | OK Reviewer KJK

FLAW TYPE: SUB SURFACE PLANAR. | 6) Calculations (See Below) | OK Reviewer KJK

a = .10" l = .50" t = 6.0" S = 1.80

aspect ratio = a/l = .10"/.50" = .20

Y = S/a = 1.80/.10" = 18 Y > 1 ∴ Y = 1

a/t% allowed = 3.3% a/t m = .10"/6.0" = .0167 ≈ 1.67%

∴ a/t% allow > a/t% m 3.3% > 1.67% Flaw is acceptable by Code.

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

aspect ratio	a/t% allow sub surface Planar
0.20	3.34

7) Results OK Reviewer KJK

a/l = .20 Code allowable a/t% = 3.3 Calculated a/t% = 1.67 Laminar flaw surface area: (0.75 l w) = NA

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

9) 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 KJK

12) Statement of acceptability or rejectability with basis. OK Reviewer KJK 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 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 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 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 26

REPORT # 20000 U 156

ATTACHMENT 3 PAGE 24 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 INITIAL TO VERIFY

ISI Report # 2000U156 Evaluation Performed By: [signature] Date: 5-25-00
Flaw # 7 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 = 281.6 (L2) - 281.1 (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 3.65 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.
3.65 (metal path at 20% upper) * COS of the measured angle .5 = 1.825 inches depth.

2) Determine the lower depth of the flaw from the exam surface.
4.15 (metal path at 20% lower) * COS of the measured angle .5 = 2.075 inches depth.

3) Determine the depth of the flaw from the exam surface at the maximum amplitude point.
3.90 (metal path at maximum amplitude point) * COS of the measured angle .5 = 1.95 inches depth.

4) Determine the distance from the center line of the weld to the maximum amplitude point of the flaw.
3.90 (metal path at maximum amplitude point) squared = 15.21 (a^2)
1.95 (depth at maximum amplitude point) squared = 3.8025 (b^2)
$\sqrt{a^2 - b^2}$ = 3.3775 inches of surface distance to the flaw from the transducer exit point.
4.2 (Wmax) – 3.3775 (surf dist) = .8225 inches to the centerline of the weld.

5) Determine S by picking the smaller of the following;
S = 1.825 (result of 1) = distance between exam surface and the upper flaw tip
>> OR <<
S = 6.0 (part "t") – 2.075 (result of 2) = 3.925 distance between the side opposite exam surface and the lower flaw tip

6) Determine 2d in though wall thickness.
2.075 (from step 2) – 1.825 (from step 1) = .25 inches.

Determination of surface or subsurface
0.4d = (2d / 2) * 0.4 = .05
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 = .125 inches.

l = .50 (for a/l > 0.5, l = 2a) t = 6.0 (part thickness)
a = .10 (surf or sub surf, circle one) S = 1.8

MAY-25-00 THU 12:53 P.13

ISI Flaw Sizing Worksheet

Report No. 2000U156

Site/Unit: PI 1 2 Procedure: IEI-UT-3A Page ____ of ____

Summary No.: 501733 Procedure Revision/FC 8 / NA

Examination For: W-6 12' to 24' Work Order No: 00002332

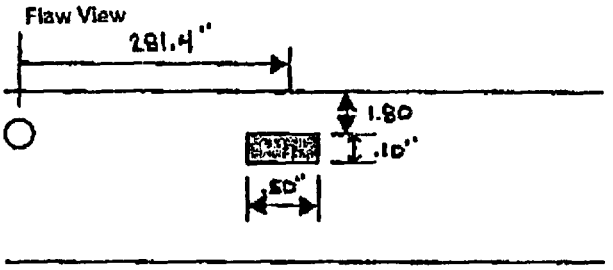
1) Flaw Number 7 3) ISI Interval 3rd OK Reviewer SPC

2) Item Number B1.40 4) Code Edition & Addenda 1989 NO Add. OK Reviewer SPC

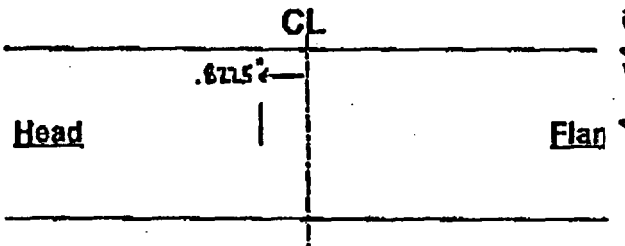
5) Method UT

6) Flaw Sketch OK Reviewer SPC

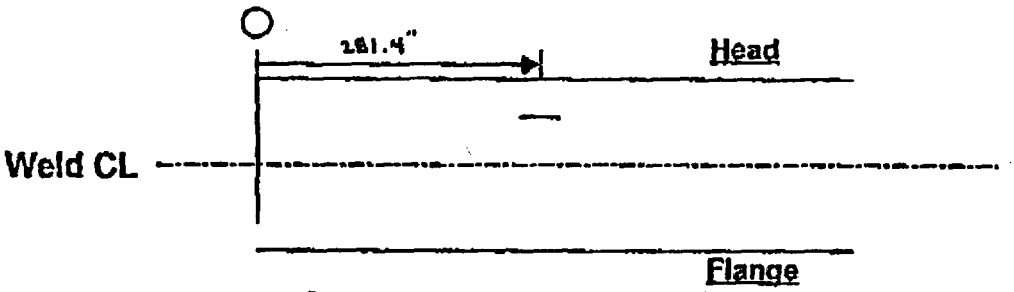
Flaw View



Side View



End View



Top View

7) Calculations OK Reviewer SPC

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 X Yes Preparer [illegible] OK Reviewer SPC

9) Code Flaw Dimensions OK Reviewer SPC

"l" .50 "a" .10" "t nominal" NA "t measured" 6.0 "s" 1.80 "w" = NA

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?

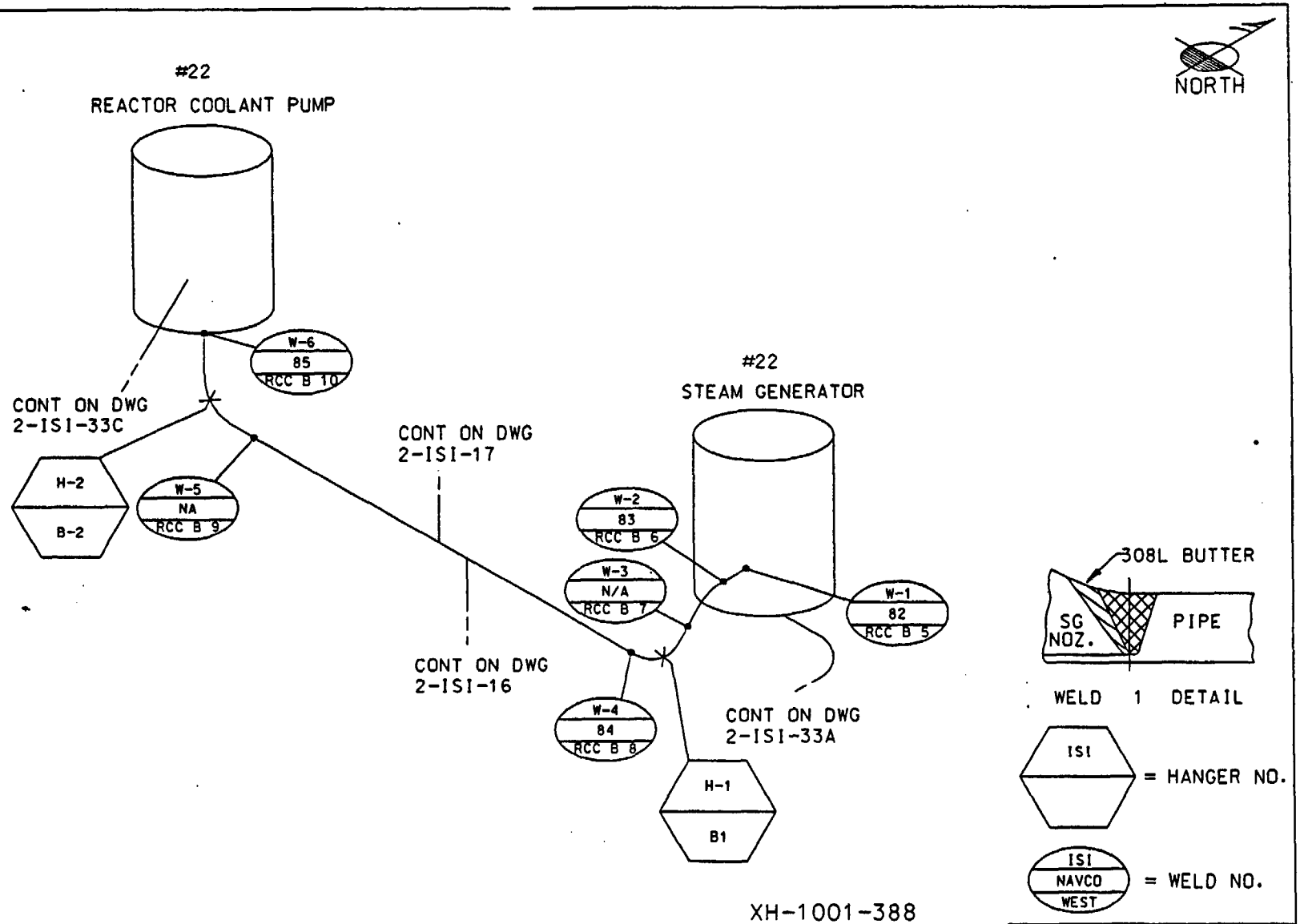
14) The correct Code Edition and Addenda was available and used X Yes Preparer [illegible] OK Reviewer SPC

15) Prepared by and date JESSY WREN 5/25/00

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

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

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



REACTOR COOLANT LOOP "B"

XH-1001-388
REF: XH-1106-7028

FILE NO:2I33BR01

NSP (M&SP)-PI-2 ISI

DWN:CADWorksCHKD:DSW APPD:DSW

SYSTEM:REACTOR COOLANT

LINE: 31-2RC-2B

DWG: 2-ISI-33B REV: 02

ATTACHMENT 4 PAGE 1 OF 1

UT Pipe Weld Examination

Site/Unit: PINGP / PI2 | Procedure: SWI NDE-UT-11 | Outage No.: PI2RF2003

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	Signature	Date	Reviewer	Signature	Date
Blechinger, Todd P.	III	Todd P. Blechinger	9/17/2003	Jones, Thomas	Thomas Jones Lvl III	9/20/03
Examiner	Level	Signature	Date	Site Review	Signature	Date
N/A	N/A			Hanson, Shannon	for SH	9/24/2003
Other	Level	Signature	Date	ANII Review	Signature	Date
N/A	N/A			Daly, Gerald	Gerald D. Daly	26SEP03

ATTACHMENT 5 PAGE 1 OF 6

Ultrasonic Indication Report

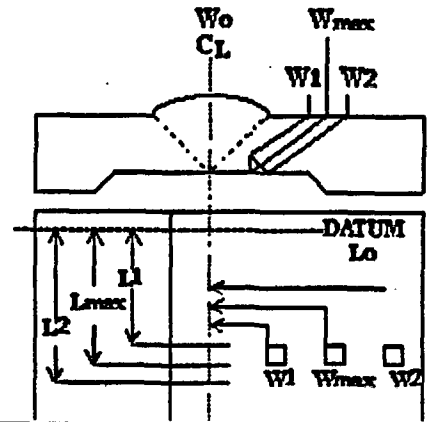
Site/Unit:	PINGP / PI2	Procedure:	SWI NDE-UT-11	Outage No.:	PI2RF2003
Summary No.:	501145	Procedure Rev.:	0	Report No.:	2003U005
Workscope:	ISI	Work Order No.:	02 11922	Page:	2 of 6

Search Unit Angle: 45 °

Wo Location: Weld CL

Lo Location: Intrados of Elbow

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



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

Comments:

Scan #	Indication No.	% Of DAC	W Max W	W Max MP	Forward Of Max W1	Forward Of Max MP	Backward Of Max W2	Backward Of Max MP	L1 Of Max	L Max	L2 Of Max	RBR Amp.	Remarks
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 Todd P. Blechinger	Date 9/17/2003	Reviewer Jones, Thomas	Signature Tom Jones Lvl III	Date 9/20/03
Examiner Level N/A N/A	Signature	Date	Site Review Hanson, Shannon	Signature for SH	Date 9/24/2003
Other Level N/A N/A	Signature	Date	ANII Review Daly, Gerald	Signature	Date 26SEP03

Additional - UT Indication Data <edit from Setup>

ATTACHMENT 5 PAGE 2 OF 6

Determination of Percent Coverage for UT Examinations - Pipe

ATTACHMENT 5 PAGE 3 OF 6

Site/Unit:	PINGP / PI2	Procedure:	SWI NDE-UT-11	Outage No.:	PI2RF2003
Summary No.:	501145	Procedure Rev.:	0	Report No.:	2003U005
Workscope:	ISI	Work Order No.:	0211922	Page:	3 of 6

45 deg

Scan 1	100.000	% Length X	96.000	% volume of length / 100 =	96.000	% total for Scan 1
Scan 2	0.000	% Length X	0.000	% volume of length / 100 =	0.000	% total for Scan 2
Scan 3	100.000	% Length X	90.000	% volume of length / 100 =	90.000	% total for Scan 3
Scan 4	100.000	% Length X	90.000	% volume of length / 100 =	90.000	% 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 [illegible] Lv/III Date: 9/20/03

Additional - Calculation Pipe <edit from Setup>

Supplemental Report

Report No.: 2003U005

Page: 4 of 6

PAGE 4 OF 6

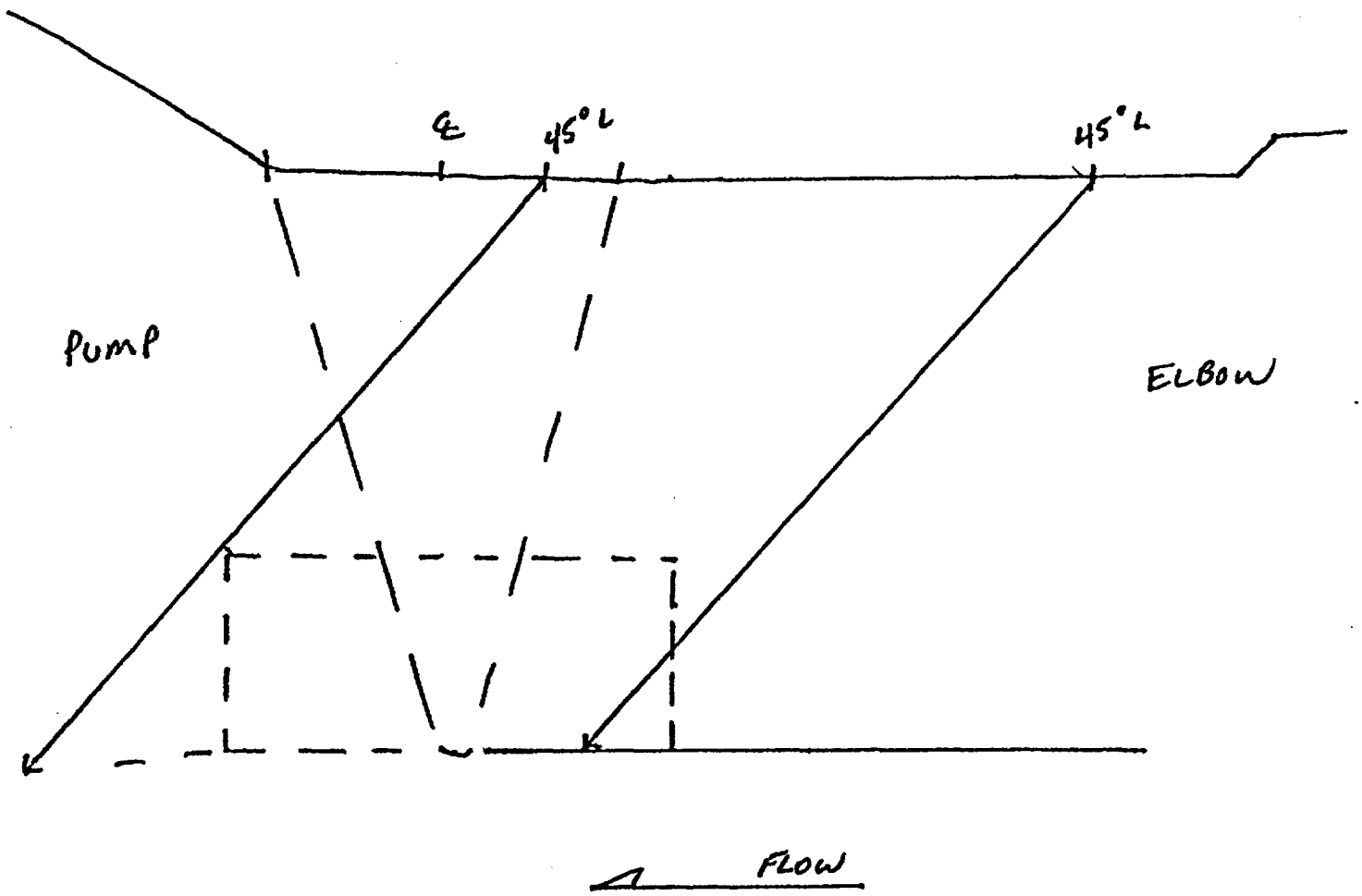
ATTACHMENT 5

Summary No.: 501145

Examiner:	Blechinger, Todd P.	Level:	III	Reviewer:	Jones, Thomas	Date:	9/20/03
Examiner:	N/A	Level:	N/A	Site Review:	Hanson, Shannon (M) for SH	Date:	9/24/2003
Other:	N/A	Level:	N/A	ANII Review:	Daly, Gerald	Date:	26SEP03

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:\Iddeal_Photos\PI2RFO2003\UT Images\2003U005_1a.bmp



Supplemental Report

Report No.: 2003U005

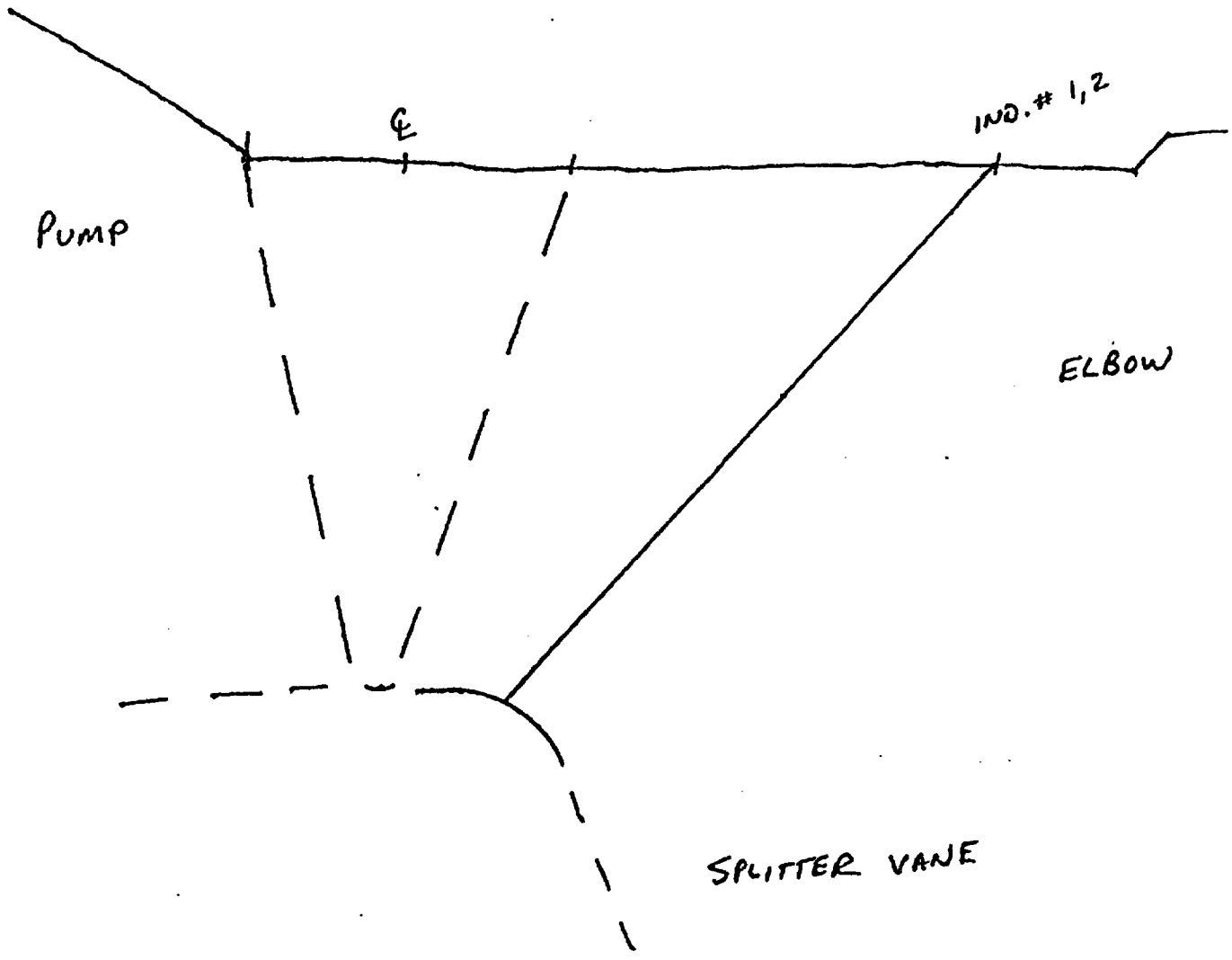
Page: 5 of 6

Summary No.: 501145

Examiner:	Blechinger, Todd P.	Level:	III	Reviewer:	Jones, Thomas	Date:	9/20/03
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-6 Indication Plot

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



Additional - Supplemental Reports <edit from Setup>

ATTACHMENT 5 PAGE 5 OF 6

Supplemental Report

Report No.: 2003U005

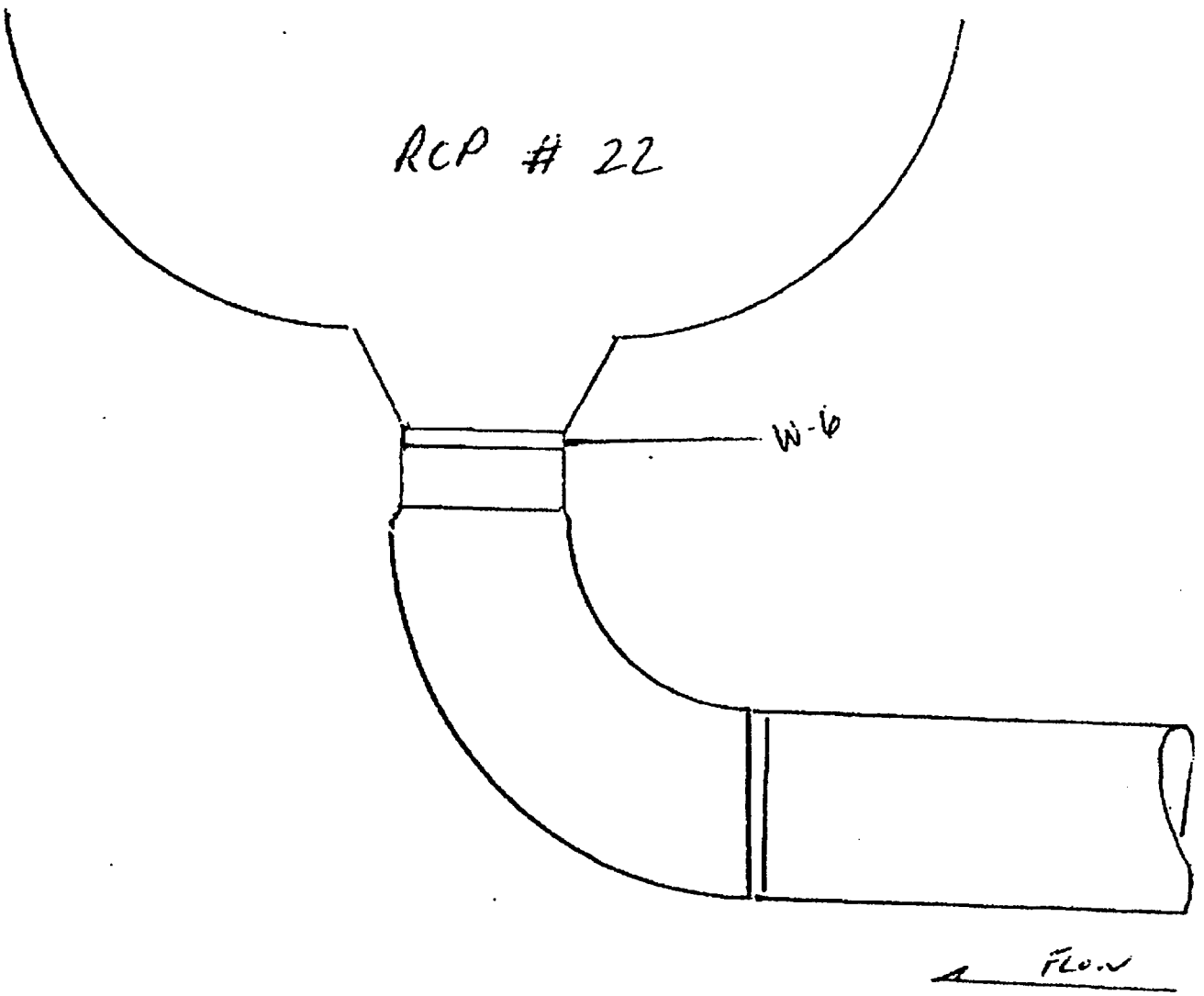
Page: 6 of 6

Summary No.: 501145

Examiner:	Blechinger, Todd P.	Level:	III	Reviewer:	Jones, Thomas	Date:	9/20/03
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: General configuration

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



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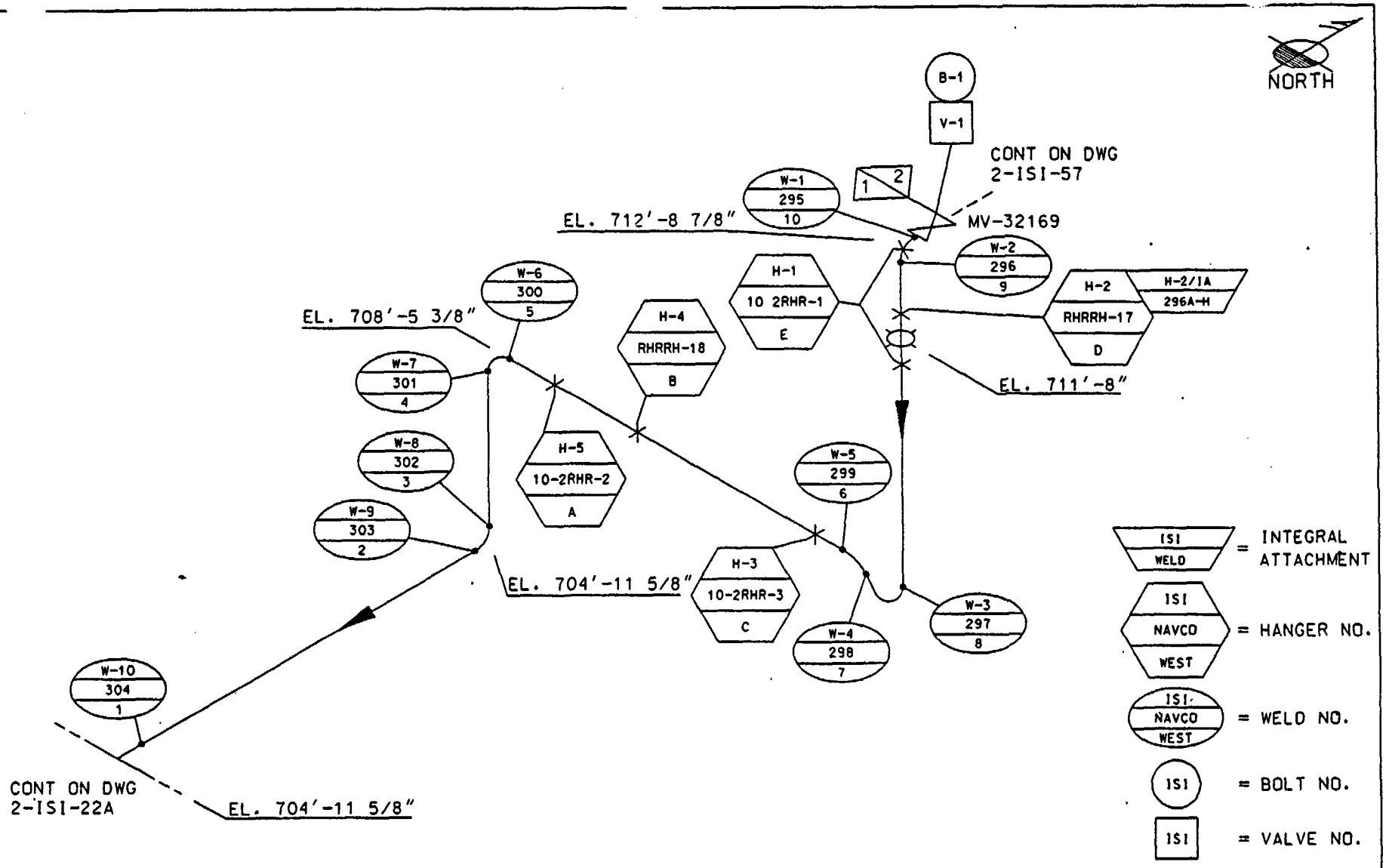
ATTACHMENT 5 PAGE 6 OF 6



10" RHR RETURN LOOP "B"

REF: XH-1106-2552	FILE NO:21021R05
NSP (M&SP)-PI-2	ISI
DWN: CADWorks CHKD: DSW	APPD: DSW
SYSTEM: RHR RETURNE	
LINE: 10-2SI-26	
DWG: 2-ISI-21	REV: 06

ATTACHMENT 6 PAGE 1 OF 1

UT Pipe Weld Examination

Site/Unit:	PINGP / PI2	Procedure:	SWI NDE-UT-16A	Outage No.:	PI2RF2003
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 Stevermer, Aaron	Signature	Date 9/16/2003	Reviewer Jones, Thomas	Signature	Date 9/27/03
Examiner Level II Bowne, Lowell V.	Signature	Date 9/16/2003	Site Review Hanson, Shannon	Signature for SH	Date 9/28/03
Other Level N/A N/A	Signature	Date	ANII Review Daly, Gerald	Signature	Date 09SEP03

ATTACHMENT 7 PAGE 1 OF 6

Supplemental Report

Report No.: 2003U002

Page: 2 of 6

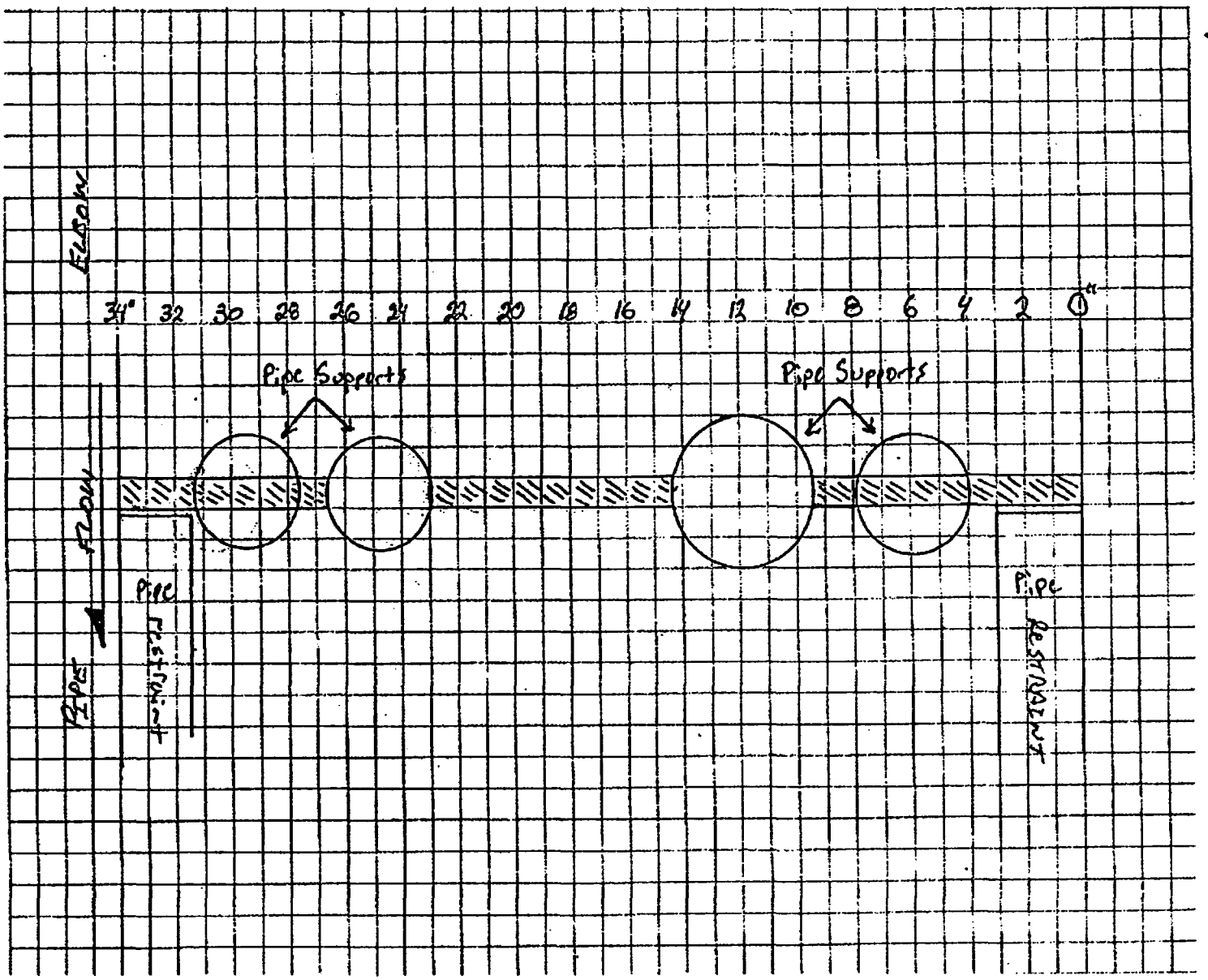
Summary No.: 501900

Examiner:	Stevermer, Aaron	Level:	II	Reviewer:	Jones, Thomas	Date:	9/27/03
Examiner:	Bowne, Lowell V.	Level:	II	Site Review:	Hanson, Shannon	Date:	9/26/03
Other:	N/A	Level:	N/A	ANII Review:	Daly, Gerald	Date:	20SEP03

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

FOUR WELDED SUPPORT LUGS COVER WELD

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



Additional - Supplemental Reports <edit from Setup>

ATTACHMENT 7 PAGE 2 OF 6

Supplemental Report

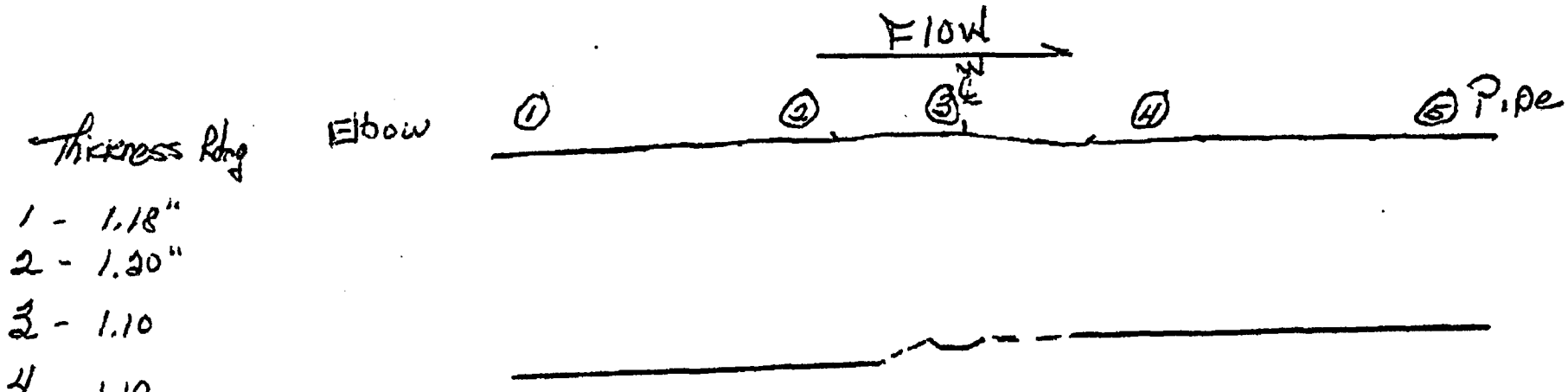
Report No.: 2003U002

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: 27 Sep 03

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

Sketch or Photo: J:\Iddeal_Photos\PI2RFO2003\UT Images\2003U002_2a.bmp



Additional - Supplemental Reports <edit from Setup>

Supplemental Report

Report No.: 2003U002

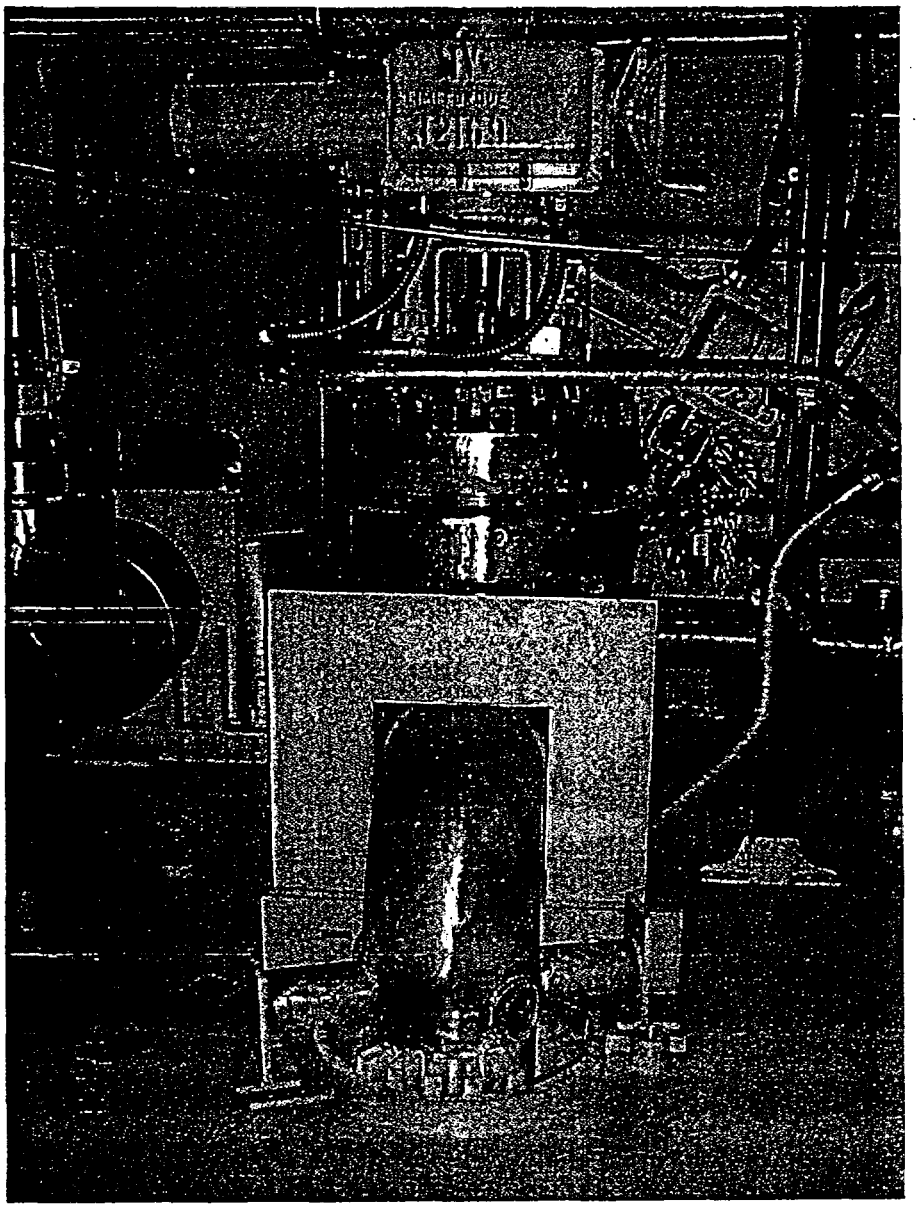
Page: 4 of 6

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:	9/26/03
Other:	N/A	Level:	N/A	ANII Review:	Daly, Gerald	Date:	27SEP03

Comments: Overall picture of component with limitations

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



Additional - Supplemental Reports <edit from Setup>

PAGE 4 OF 6

ATTACHMENT 7

Supplemental Report

Report No.: 2003U002

Page: 5 of 6

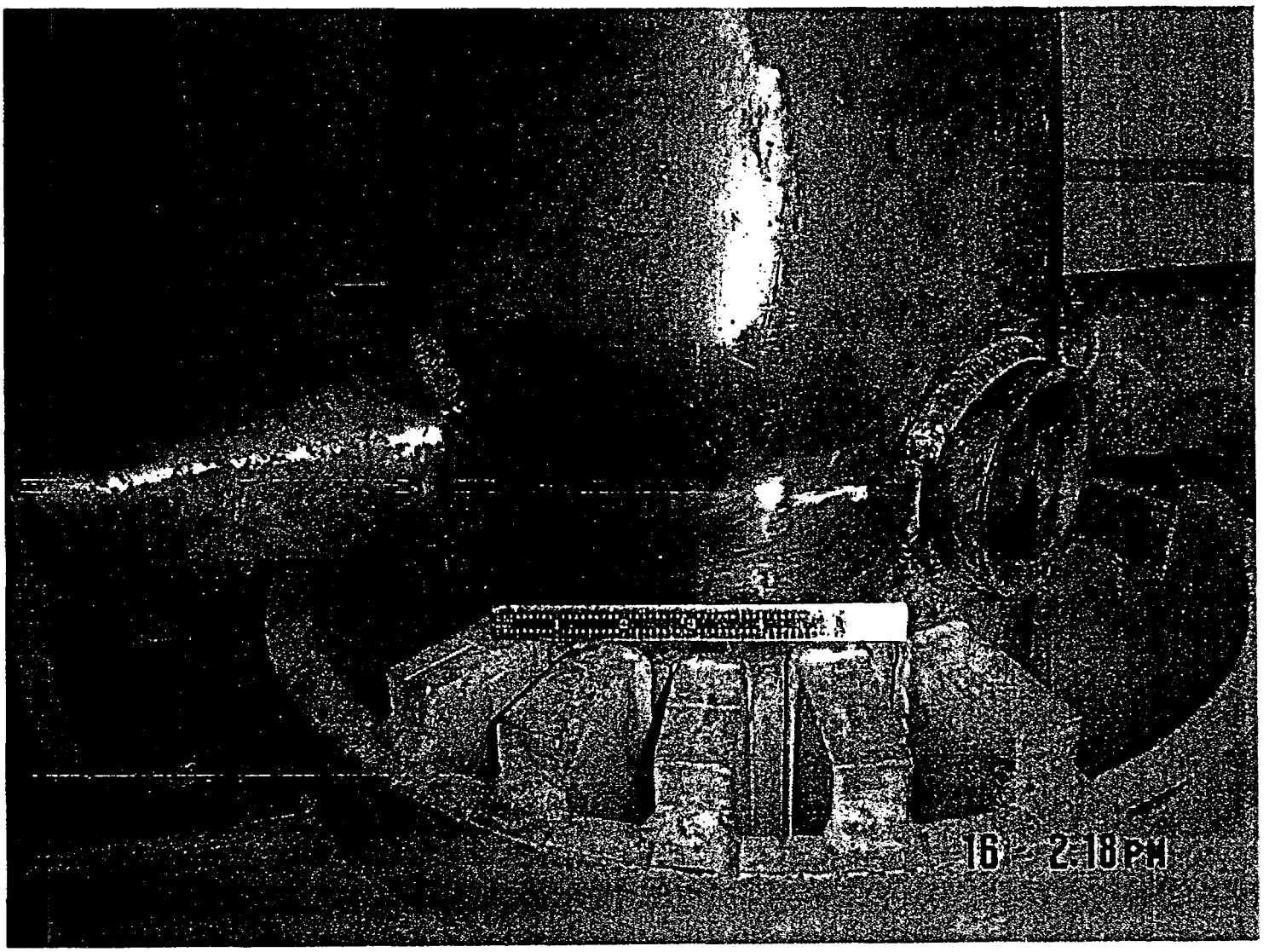
ATTACHMENT 7 PAGE 5 OF 6

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:	9/22/03
Other:	N/A	Level:	N/A	ANII Review:	Daly, Gerald	Date:	27SEP03

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	Procedure:	SWI NDE-UT-16A	Outage No.:	PI2RF2003
Summary No.:	501900	Procedure Rev.:	0	Report No.:	2003U002
Workscope:	ISI	Work Order No.:	0211924	Page:	6 of 6

ATTACHMENT 7 PAGE 6 OF 6

45 deg

Scan 1	44.000	% Length X	100.000	% volume of length / 100 =	44.000	% total for Scan 1
Scan 2	25.000	% Length X	100.000	% volume of length / 100 =	25.000	% total for Scan 2
Scan 3	44.000	% Length X	100.000	% volume of length / 100 =	44.000	% total for Scan 3
Scan 4	44.000	% Length X	100.000	% volume of length / 100 =	44.000	% 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: Tom Sells Lvl III Date: 9/27/03

Additional - Calculation Pipe <edit from Setup>

Liquid Penetrant Examination

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:	1 of 4

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"

Limitations: See attached drawing and Percent of Coverage Sheet

Temp. Tool Mfg.: PTC Instruments Serial No.: 3792 Surface Temp.: 88 °F

Comparator Block Temp.: Side A: N/A °F Side B: N/A °F Resolution: Not Used

Lo/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%: No Reviewed Previous Data: Yes

Examiner Level II Stevermer, Aaron	Signature	Date 9/16/2003	Reviewer Jones, Thomas	Signature Tom Jones Lv/III	Date 9/18/03
Examiner Level II Bowne, Lowell V.	Signature	Date 9/16/2003	Site Review Hanson, Shannon	Signature for SH	Date 9/24/03
Other Level N/A N/A	Signature	Date	ANII Review Daly, Gerald	Signature	Date 27SEP03

ATTACHMENT 8 PAGE 1 OF 4

Determination of Percent Coverage for Surface Examinations

ATTACHMENT 8 PAGE 2 OF 4

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 Jall Lvl III Date: 9/18/03

Supplemental Report

Report No.: 2003P012

Page: 3 of 4

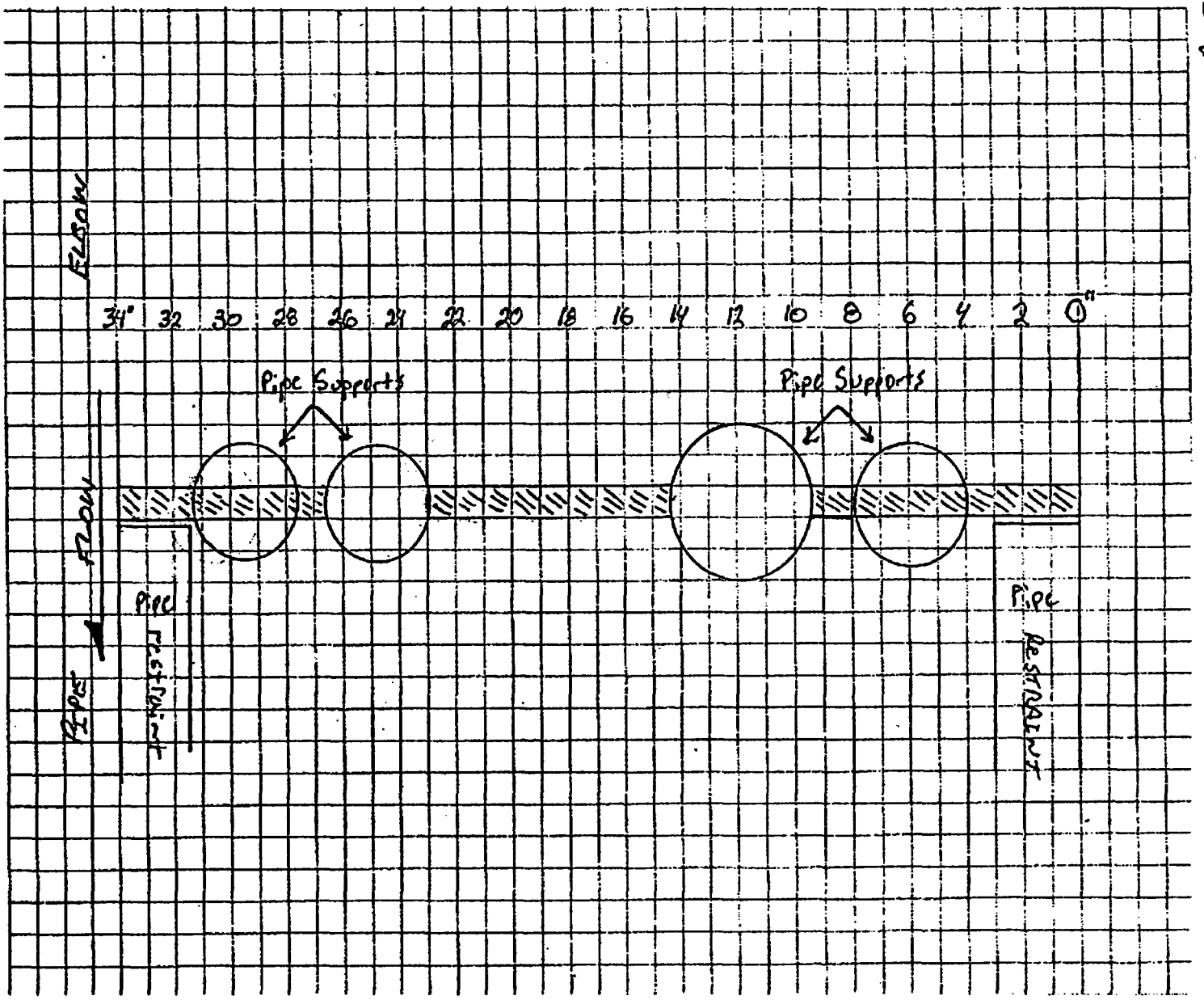
ATTACHMENT 8 PAGE 3 OF 4

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 for SH	Date:	9/24/03
Other:	N/A	Level:	N/A	ANII Review:	Daly, Gerald	Date:	25SEP03

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

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



Supplemental Report

Report No.: 2003P012

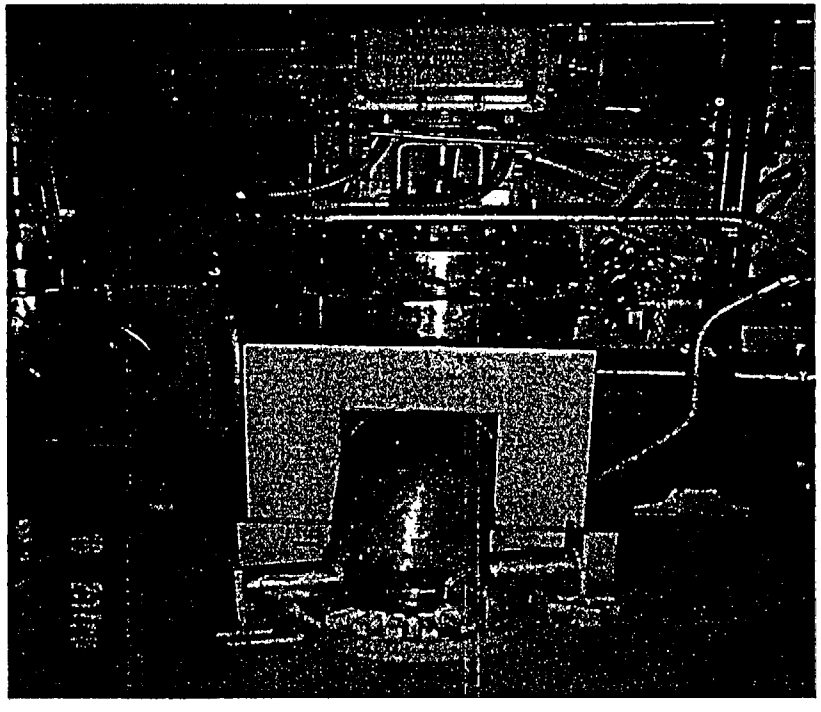
Page: 4 of 4

Summary No.: 501900

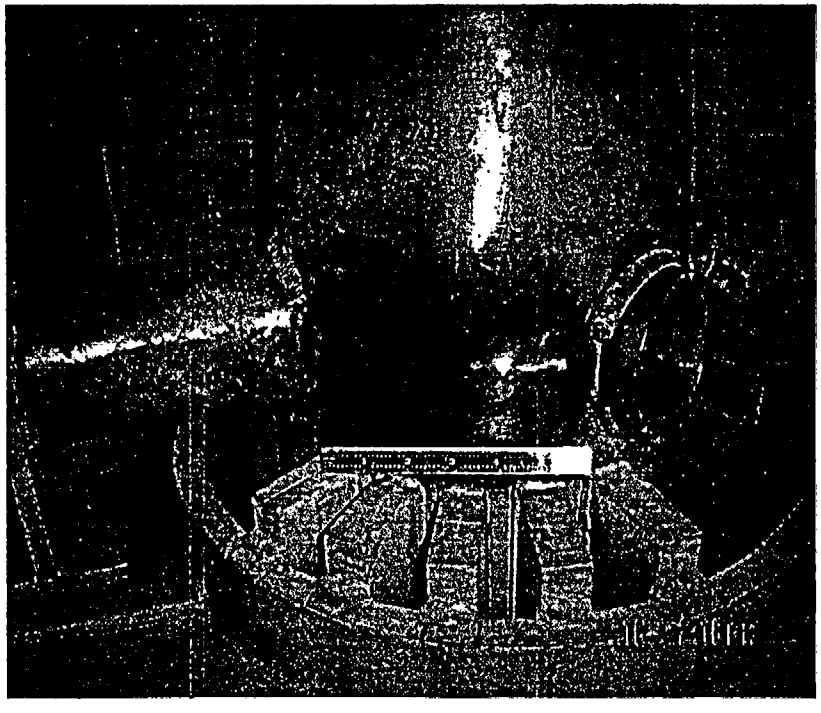
Examiner:	Stevermer, Aaron	Level:	II	Reviewer:	Jones, Thomas		Date: 9/18/03
Examiner:	Bowne, Lowell V.	Level:	II	Site Review:	Hanson, Shannon		Date: 9/25/03
Other:	N/A	Level:	N/A	ANII Review:	Daly, Gerald		Date: 9/25/03

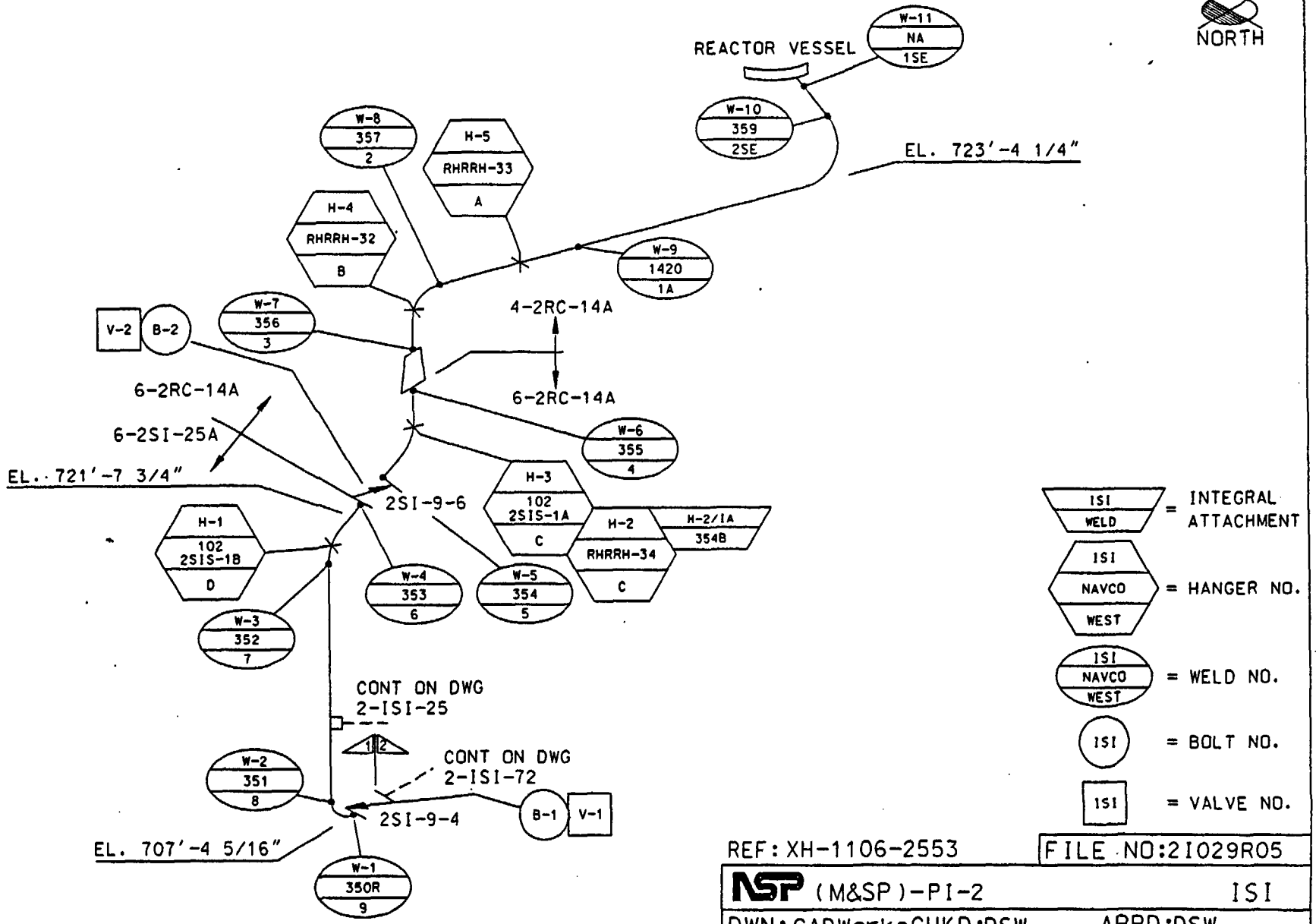
Comments:
FOUR WELDED WELDED SUPPORT LUGS COVER WELD

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



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





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

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

ATTACHMENT 9 PAGE 1 OF 1

UT Pipe Weld Examination

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

Code: 1989 Code Cat.: B-J Location: 715' CONTAINMENT

Drawing No.: 2-ISI-29 Description: Pipe To Elbow

System ID: SI

Component ID: W- 3 Size/Length: .70" Thickness/Diameter: .750" / 6.0"

Limitations: Restraint obstructed upstream axial scanning Start Time: 1450 Finish Time: 1520

Examination Surface: Inside Outside ☑ Surface Condition: Ground

Lo Location: Extrados of elbow Wo Location: Centerline of Weld Couplant: Sonotrace 40 Batch No.: #00143

Temp. Tool Mfg.: PTC Instruments Serial No.: 3774 Surface Temp.: 78 °F

Cal. Report No.: 2003CA050, 2003CA051

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 Howard, Dean	Signature Dean Howard	Date 10/1/2003	Reviewer Wren, Jerry P.	Signature LV. III	Date 10-3-03
Examiner Level N/A N/A	Signature	Date	Site Review Hanson, Shannon	Signature for SH	Date 10/3/03
Other Level N/A N/A	Signature	Date	ANII Review Daly, Gerald	Signature	Date 03OCT03

ATTACHMENT 10 PAGE 1 OF 5

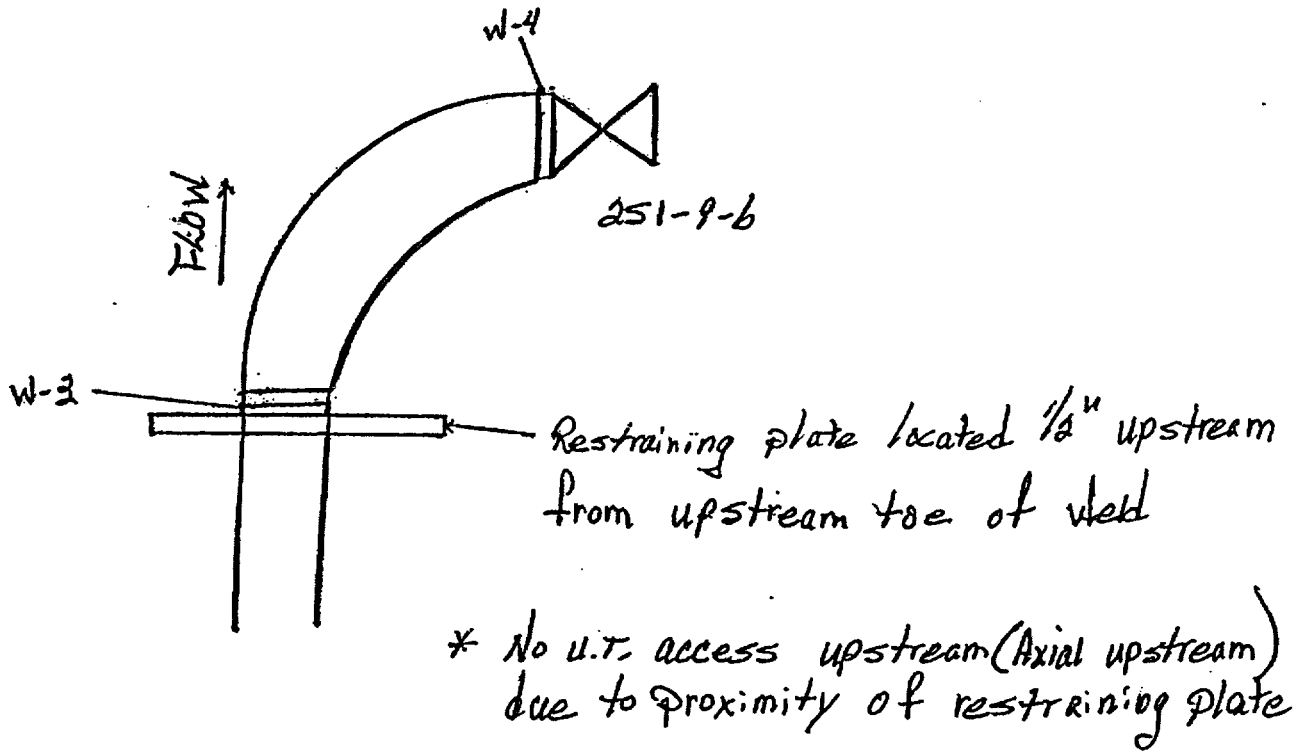
Limitation Record

Site/Unit:	PINGP / PI2	Procedure:	SWI NDE-UT-16A	Outage No.:	PI2RF2003
Summary No.:	501813	Procedure Rev.:	0	Report No.:	2003U040
Workscope:	ISI	Work Order No.:	0211924	Page:	2 of 5

Description of Limitation:

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

Sketch of Limitation: J:\Iddeal_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 Howard, Dean	Level II	Signature Dean Howard	Date 10/1/2003	Reviewer Wren, Jerry P.		Signature	Date 10-3-03
Examiner N/A	Level N/A	Signature	Date	Site Review Hanson, Shannon		Signature	Date 10/3/03
Other N/A	Level N/A	Signature	Date	ANII Review Daly, Gerald		Signature	Date 030CT03

Additional - Limitation <edit from Setup>

ATTACHMENT 10 PAGE 2 OF 5

Supplemental Report

Report No.: 2003U040

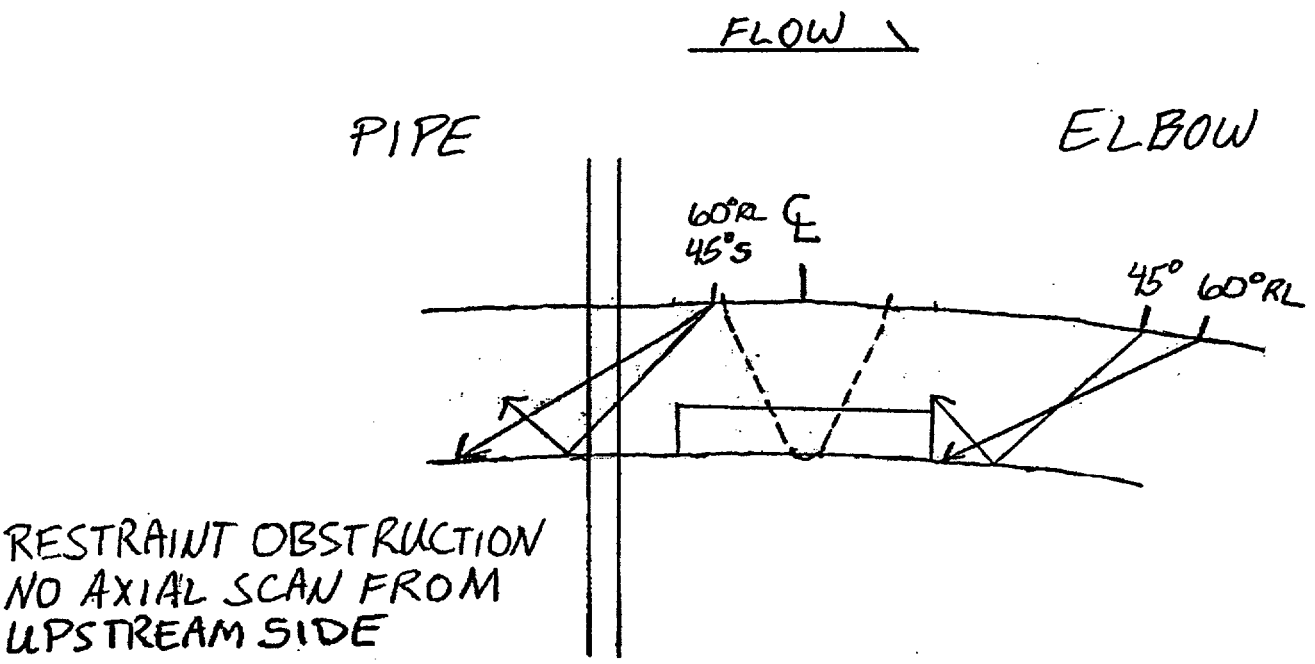
Page: 3 of 5

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:	10/3/03
Other:	N/A	Level:	N/A	ANII Review:	Daly, Gerald	Date:	03OCT03

Comments: Exam coverage sketch

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



ATTACHMENT 10 PAGE 3 OF 5

Determination of Percent Coverage for UT Examinations - Pipe

Site/Unit:	PINGP / PI2	Procedure:	SWI NDE-UT-16A	Outage No.:	PI2RF2003
Summary No.:	501813	Procedure Rev.:	0	Report No.:	2003U040
Workscope:	ISI	Work Order No.:	0211924	Page:	4 of 5

ATTACHMENT 10 PAGE 4 OF 5

45 deg

Scan 1	100.000	% Length X	100.000	% volume of length / 100 =	100.000	% total for Scan 1
Scan 2	0.000	% Length X	0.000	% volume of length / 100 =	0.000	% total for Scan 2
Scan 3	100.000	% Length X	100.000	% volume of length / 100 =	100.000	% total for Scan 3
Scan 4	100.000	% Length X	100.000	% volume of length / 100 =	100.000	% 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: [signature] Date: 10-3-03

Additional - Calculation Pipe <edit from Setup>

Supplemental Report

Report No.: 2003U040

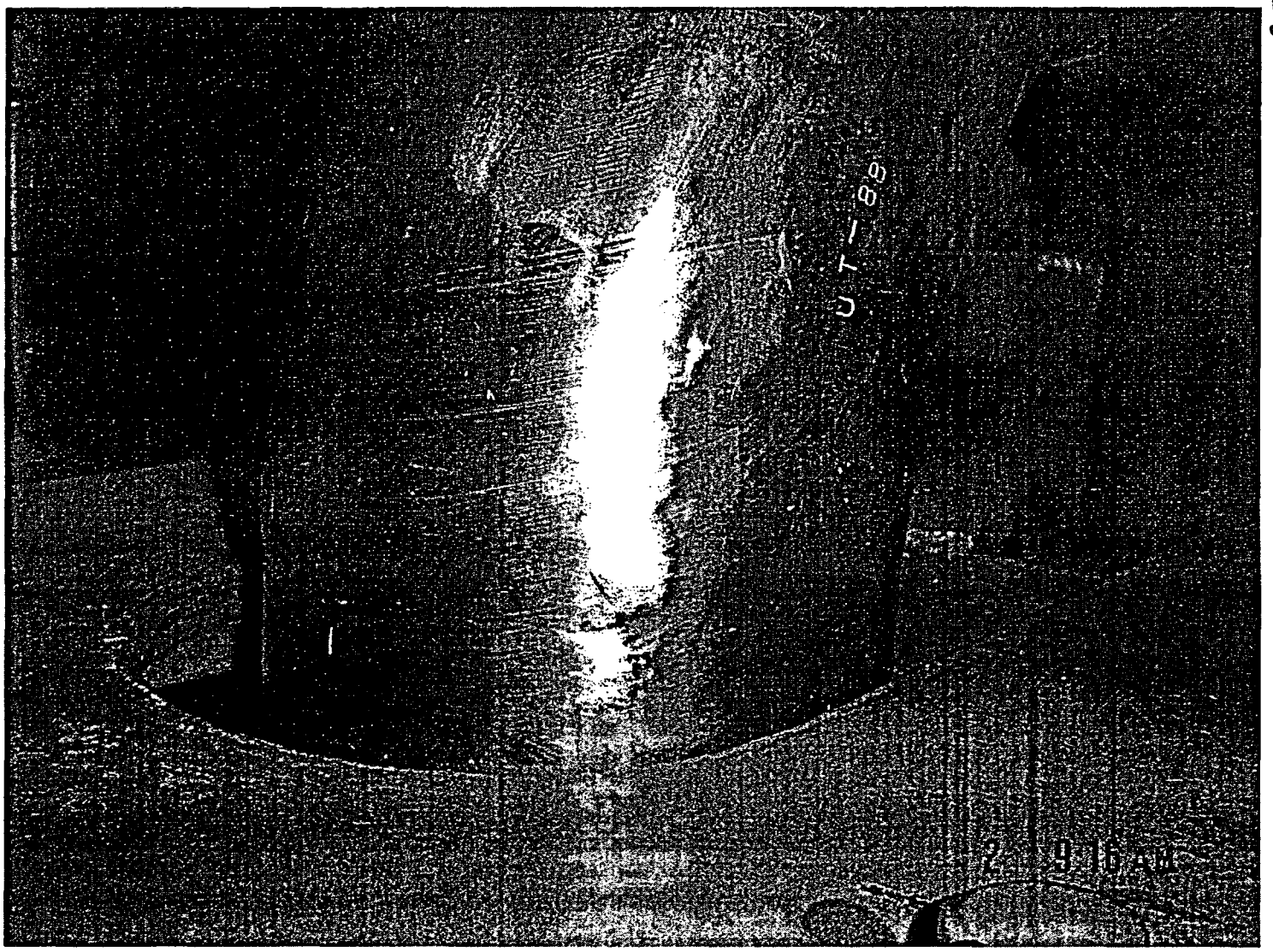
Page: 5 of 5

Summary No.: 501813

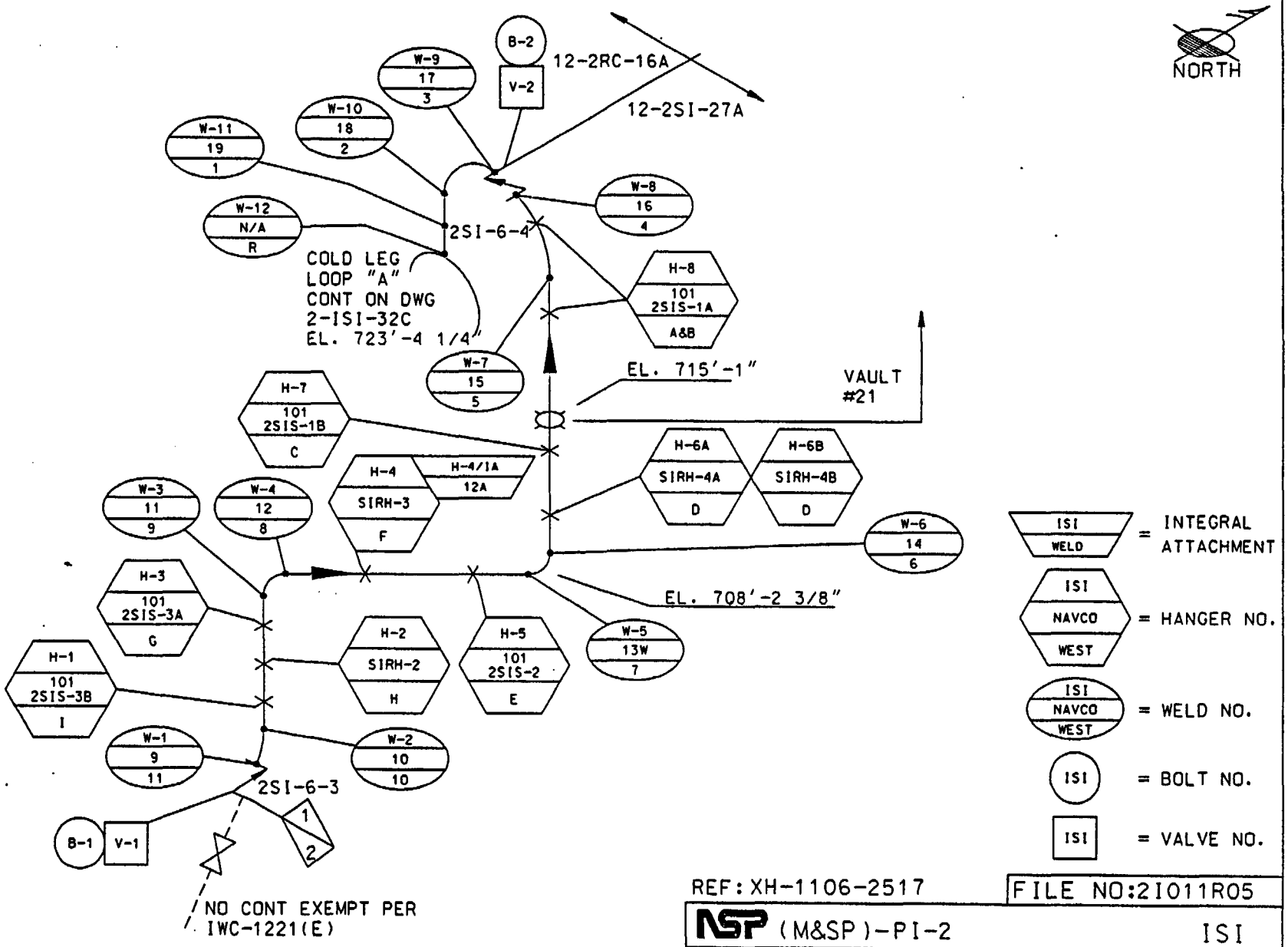
Examiner:	Howard, Dean	Level:	II	Reviewer:	Wren, Jerry P.	Date:	10-3-03
Examiner:	N/A	Level:	N/A	Site Review:	Hanson, Shannon	Date:	10/3/03
Other:	N/A	Level:	N/A	ANII Review:	Daly, Gerald	Date:	030ct03

Comments: **Photo of component**

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



ATTACHMENT 10 PAGE 5 OF 5



LOOP "A" ACCUMULATOR DISCHARGE

REF: XH-1106-2517	FILE NO:2I011R05
NSP (M&SP)-PI-2	ISI
DWN: CADWorks CHKD: DSW	APPD: DSW
SYSTEM: ACCUMULATOR DISCHARGE	
LINE: 12-2RC-16A, 12-2SI-27A	
DWG: 2-ISI-11	REV: 06

ATTACHMENT 11 PAGE 1 OF 1

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

ATTACHMENT 12 PAGE 1 OF 4

Determination of Percent Coverage for UT Examinations - Pipe

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:	2 of 4

ATTACHMENT 12 PAGE 2 OF 4

45 deg

Scan 1	100.000	% Length X	100.000	% volume of length / 100 =	100.000	% total for Scan 1
Scan 2	0.000	% Length X	0.000	% volume of length / 100 =	0.000	% total for Scan 2
Scan 3	100.000	% Length X	50.000	% volume of length / 100 =	50.000	% total for Scan 3
Scan 4	100.000	% Length X	50.000	% volume of length / 100 =	50.000	% 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 Davis L.v/III Date: 9/22/03

Additional - Calculation Pipe <edit from Setup>

Supplemental Report

Report No.: 2003U015

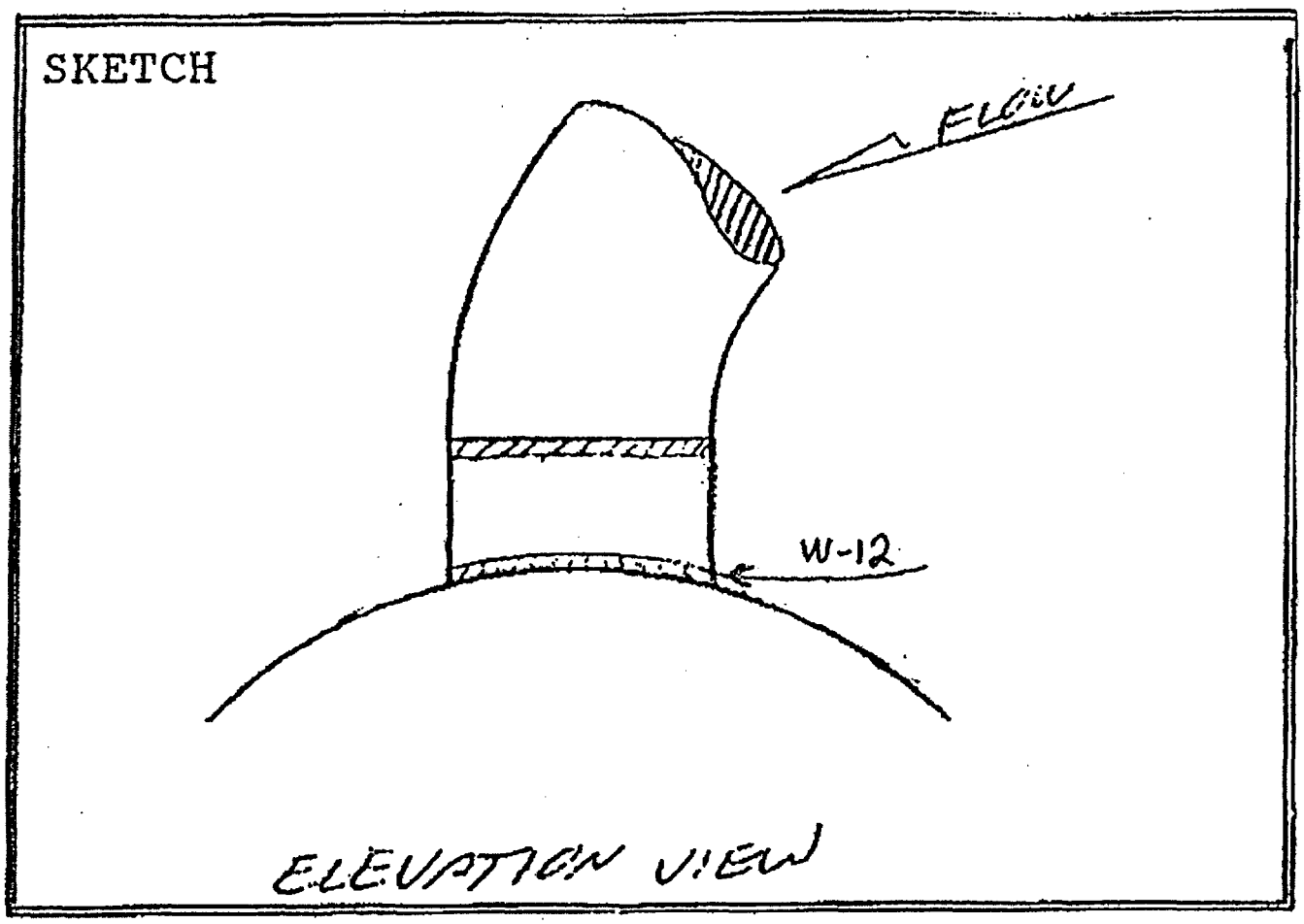
Page: 3 of 4

Summary No.: 501939

Examiner:	Stevermer, Aaron	Level:	II	Reviewer:	Jones, Thomas	Date:	9/22/03
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:	9/25/03

Comments: General configuration sketch

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



Additional - Supplemental Reports <edit from Setup>

ATTACHMENT 12 PAGE 3 OF 4

Limitation Record

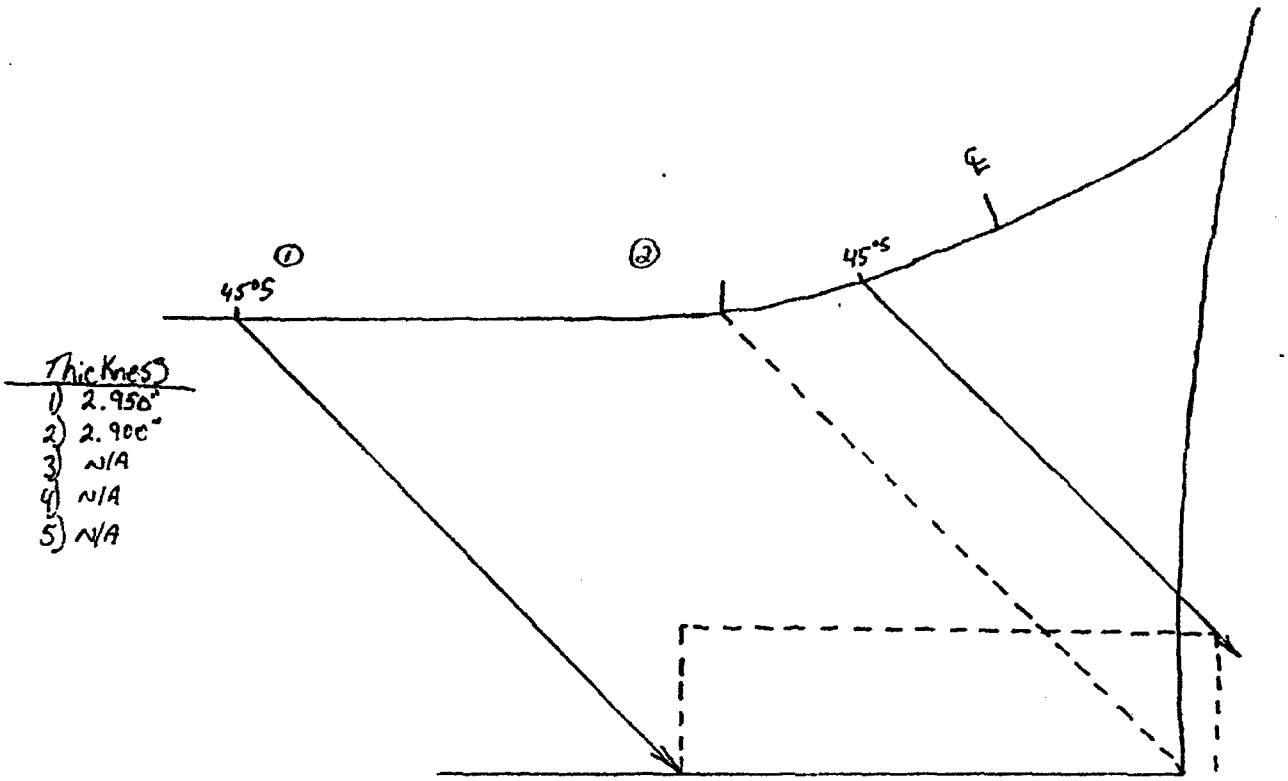
Site/Unit:	PINGP / PI2	Procedure:	SWI NDE-UT-16A	Outage No.:	PI2RF2003
Summary No.:	501939	Procedure Rev.:	0	Report No.:	2003U015
Workscope:	ISI	Work Order No.:	0211922	Page:	4 of 4

ATTACHMENT 12 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:\Iddeal_Photos\PI2RFO2003\UT Images\2003U015_1a.bmp



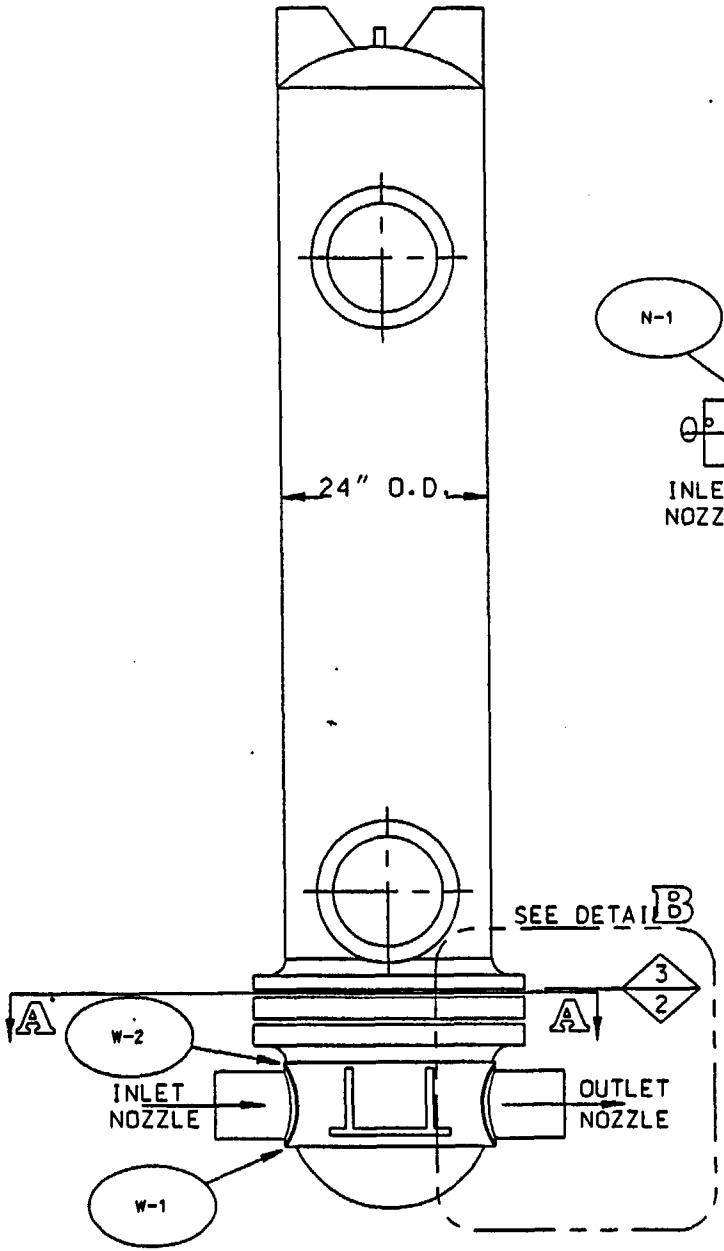
Limitations removal requirements:

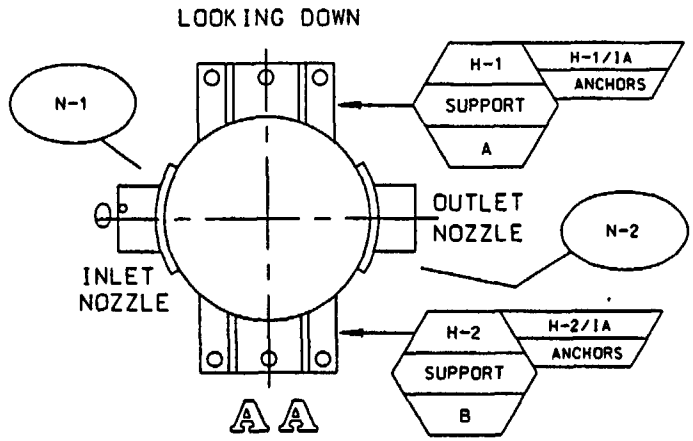
No scans were performed from the cold leg side of the weld due to configuration and attenuation. No 60 deg. RL was performed due to technique limitiations based on thickness and diameter considerations falling outside of typical equipment parameters of the PDI Table 1 document.

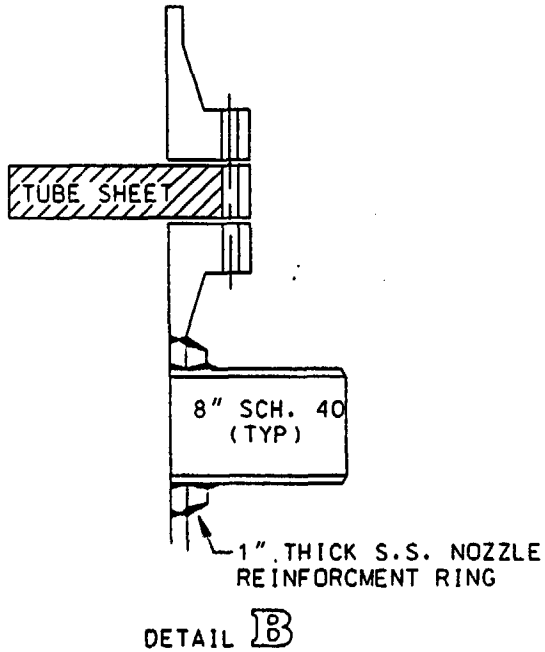
Radiation field:

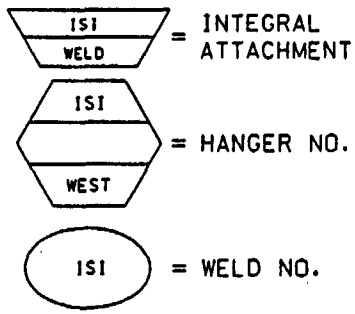
Examiner Stevermer, Aaron	Level II	Signature	Date 9/17/2003	Reviewer Jones, Thomas	Signature	Date 9/22/03
Examiner Bowne, Lowell V.	Level II	Signature	Date 9/17/2003	Site Review Hanson, Shannon	Signature W Brouelet for SH	Date 9/24/2003
Other N/A	Level N/A	Signature	Date	ANII Review Daly, Gerald	Signature	Date 25SEP03

Additional - Limitation <edit from Setup>









RESIDUAL HEAT EXCHANGER 22

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

ATTACHMENT 13 PAGE 1 OF 1

UT Vessel Examination

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: 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
Scanning dB	N/A	26.5	26.5	N/A	N/A	57.0

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	Signature	Date	Reviewer	Signature	Date
Thomas, Travis	II	[signature]	9/23/2003	Jones, Thomas	[signature] Lvl III	10/3/03
Examiner	**Level**	**Signature**	**Date**	**Site Review**	**Signature**	**Date**
VanRuler, Christopher D.	II	[signature]	9/23/2003	Hanson, Shannon	[signature] for SH	10/3/03
Other	**Level**	**Signature**	**Date**	**ANII Review**	**Signature**	**Date**
N/A	N/A			Daly, Gerald	[signature]	030603

ATTACHMENT 14 PAGE 1 OF 5

Supplemental Report

Report No.: 2003U035

Page: 2 of 5

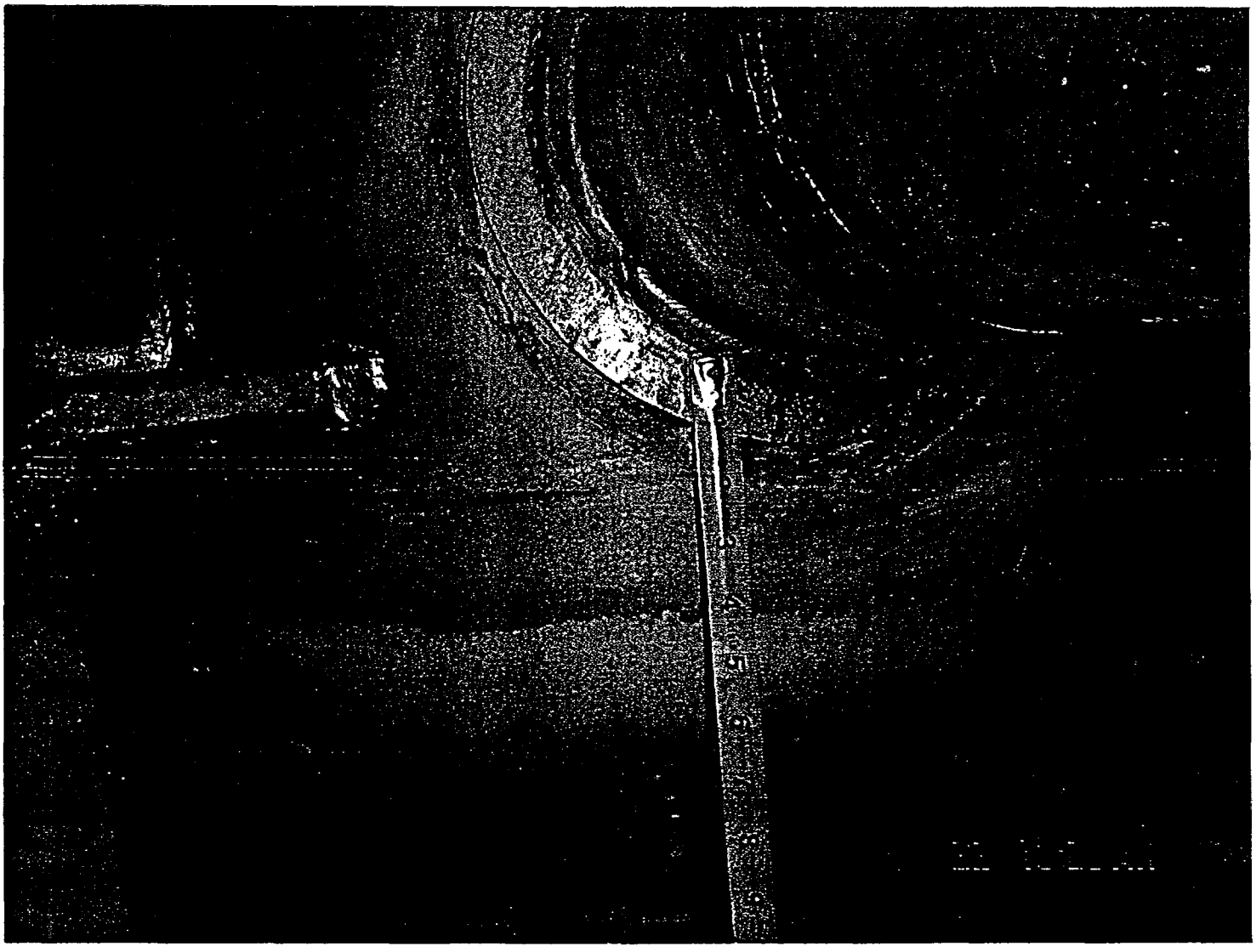
ATTACHMENT 14 PAGE 2 OF 5

Summary No.: 501477

Examiner:	Thomas, Travis	Level:	II	Reviewer:	Jones, Thomas	Date:	10/3/03
Examiner:	VanRuler, Christopher D.	Level:	II	Site Review:	Hanson, Shannon	Date:	10/3/03
Other:	N/A	Level:	N/A	ANII Review:	Daly, Gerald	Date:	03OCT03

Comments: None

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



Supplemental Report

Report No.: 2003U035

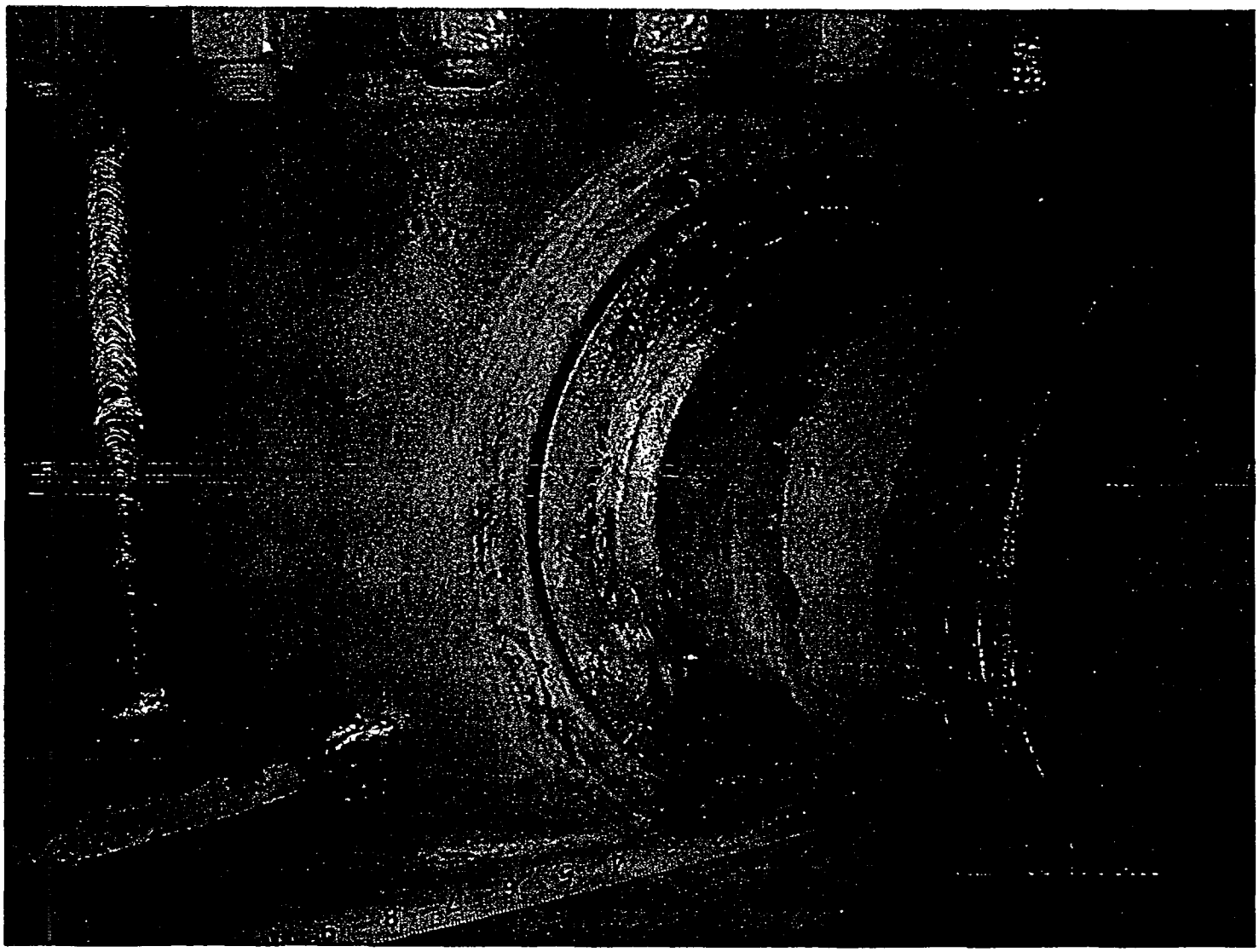
Page: 3 of 5

Summary No.: 501477

Examiner:	Thomas, Travis	Level:	II	Reviewer:	Jones, Thomas	Date:	10/3/03
Examiner:	VanRuler, Christopher D.	Level:	II	Site Review:	Hanson, Shannon	Date:	10/3/03
Other:	N/A	Level:	N/A	ANII Review:	Daly, Gerald	Date:	03OCT03

Comments: None

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



Additional - Supplemental Reports <edit from Setup>

ATTACHMENT 14 PAGE 3 OF 5

Determination of Percent Coverage for UT Examinations - Vessels

ATTACHMENT 14 PAGE 4 OF 5

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: [signature] Lv/III Date: 10/3/03

Additional - Calculation Vessel <edit from Setup>

Limitation Record

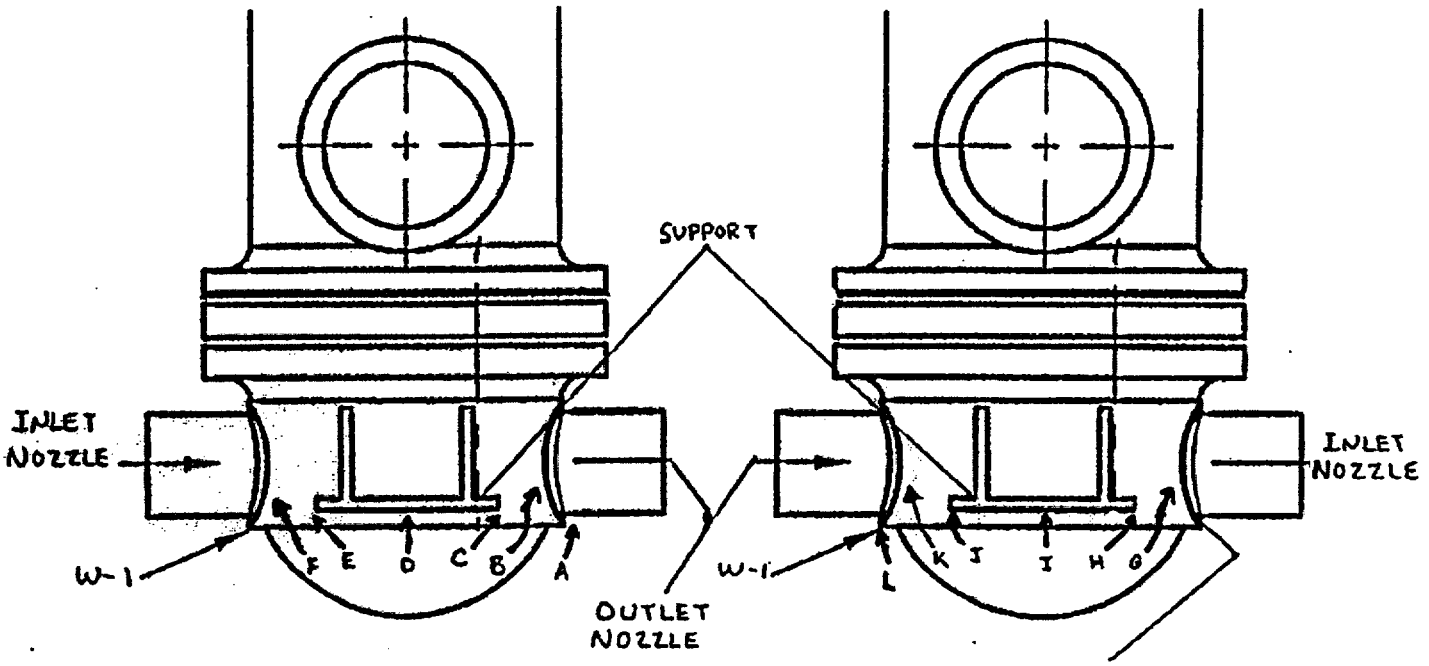
Site/Unit:	PINGP / PI2	Procedure:	SWI NDE-UT-16	Outage No.:	PI2RF2003
Summary No.:	501477	Procedure Rev.:	0	Report No.:	2003U035
Workscope:	ISI	Work Order No.:	0211925	Page:	5 of 5

ATTACHMENT 14 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 reinfocing 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 reforcing ring limitation=4", Point K to point L @ 0 deg=5".

Sketch of Limitation: J:\Iddeal_Photos\PI2RFO2003\UT Images\2003U035_1a.bmp



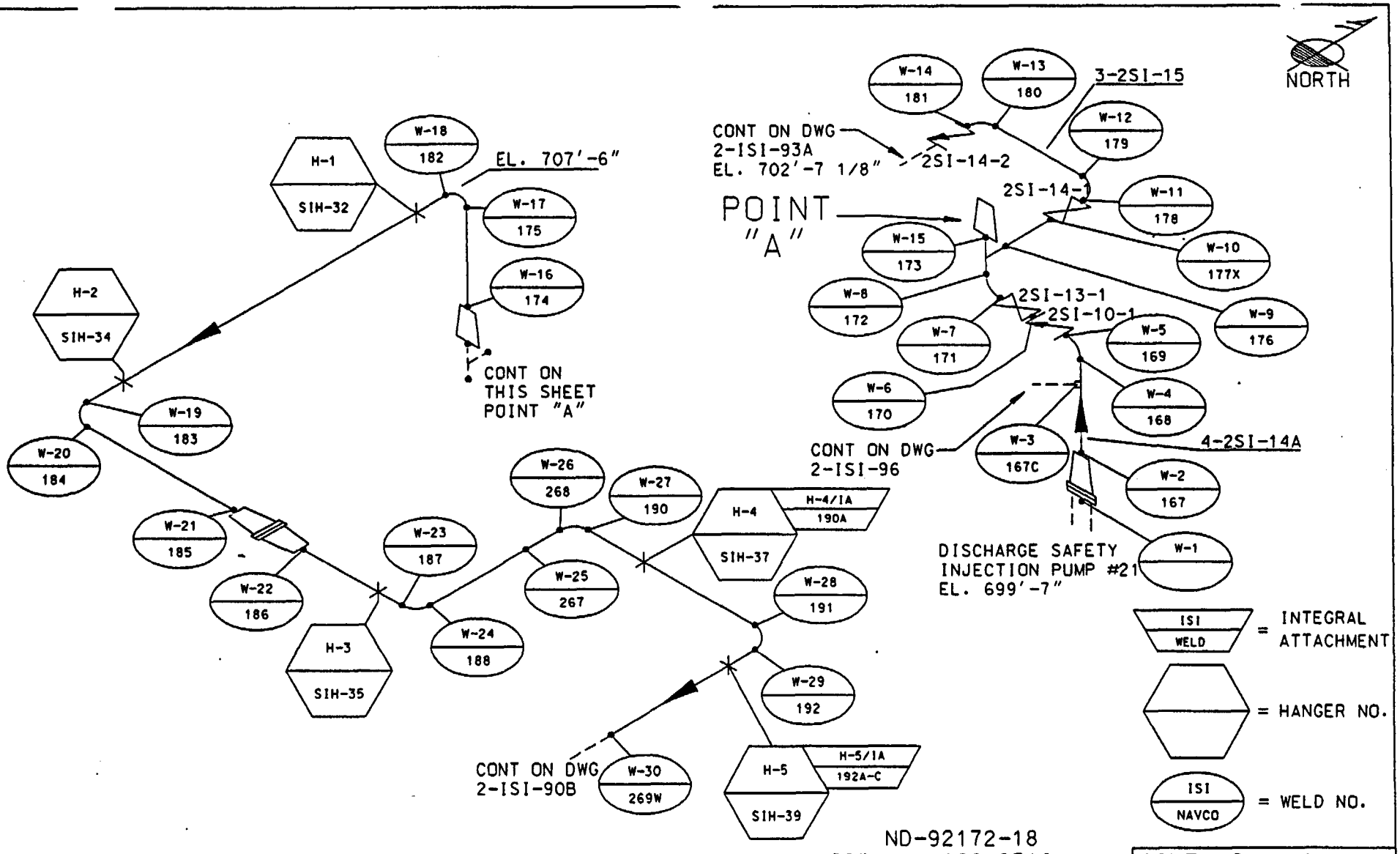
The following points are defined by start position
A = 0" @ 180 deg from TDC limited
B = 5"
C = 9"
D = limited to 1" from weld toe (1/2 node)
E = 30.5"
F = 34"
G = 44"
H = 47.5"
I = limited to 1" from weld toe (1/2 node)
J = 69"
K = 73"
L = back to 0"

Limitations removal requirements:

Radiation field:

Examiner	Level II	Signature	Date	Reviewer		Signature	Date
Thomas, Travis			9/23/2003	Jones, Thomas			10/3/03
Examiner	Level II	Signature	Date	Site Review		Signature	Date
VanRuler, Christopher D.		FOR CHRIS VAN RULER	9/23/2003	Hanson, Shannon			10/3/03
Other	Level N/A	Signature	Date	ANII Review		Signature	Date
N/A				Daly, Gerald			03 OCT 03

Additional - Limitation <edit from Setup>



ND-92172-18
REF:XH-1106-2510

FILE NO:2190AR01

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

ATTACHMENT 15 PAGE 1 OF 1

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 Blechinger, Todd P.	Signature	Date 9/19/2003	Reviewer Jones, Thomas	Signature	Date
Examiner Level N/A N/A	Signature	Date	Site Review Hanson, Shannon	Signature for SH	Date 9/24/2003
Other Level N/A N/A	Signature	Date	ANII Review Daly, Gerald	Signature	Date 26SEP03

ATTACHMENT 16 PAGE 1 OF 4

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

ATTACHMENT 16 PAGE 2 OF 4

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	100.000	% volume of length / 100 =	100.000	% total for Scan 2
Scan 3	100.000	% Length X	50.000	% volume of length / 100 =	50.000	% total for Scan 3
Scan 4	100.000	% Length X	50.000	% volume of length / 100 =	50.000	% 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	100.000	% Length X	100.000	% volume of length / 100 =	100.000	% 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;

TPB ~~75.000~~ 50.00 % Total for complete exam
9.19.03

Site Field Supervisor: Tom Jones Lvl III Date: 9/22/03

Additional - Calculation Pipe <edit from Setup>

Limitation Record

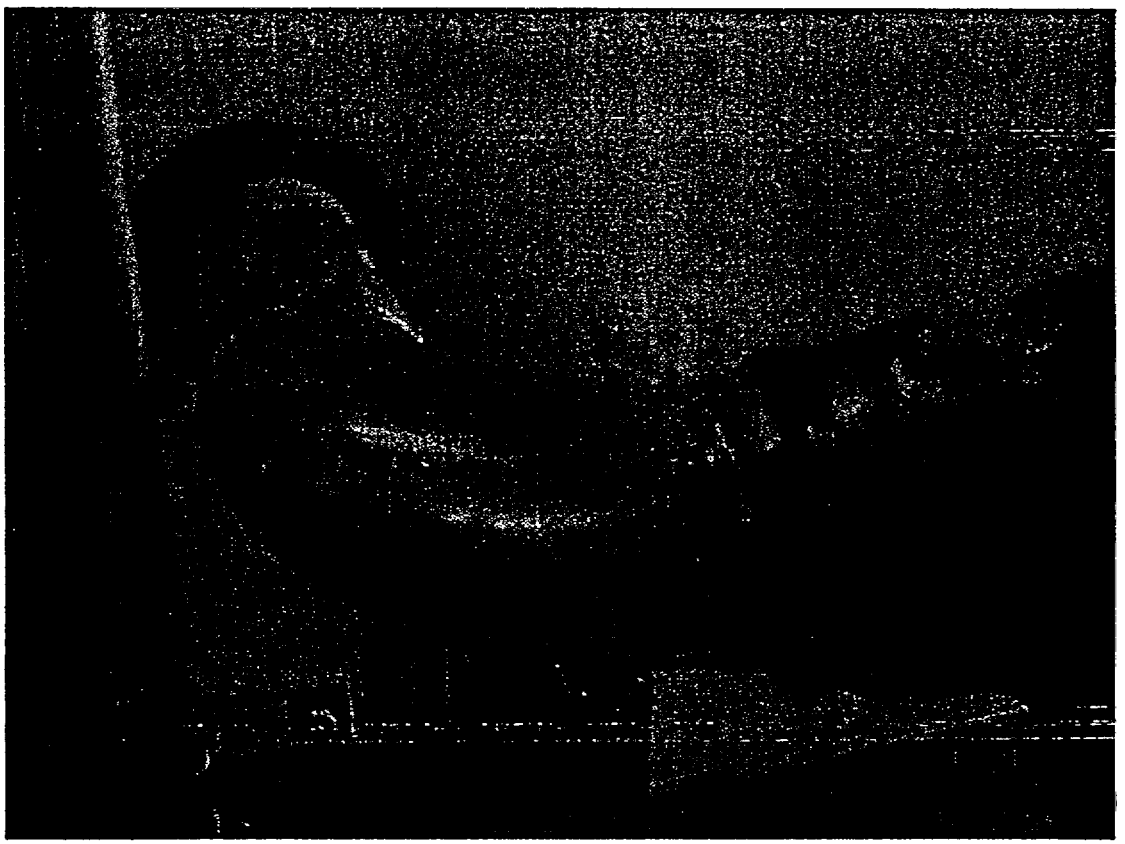
Site/Unit:	PINGP / PI2	Procedure:	SWI NDE-UT-16A	Outage No.:	PI2RF2003
Summary No.:	505055	Procedure Rev.:	0	Report No.:	2003U010
Workscope:	ISI	Work Order No.:	0211924	Page:	3 of 4

ATTACHMENT 16 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 Blechinger, Todd P.	Signature	Date 9/19/2003		Reviewer Jones, Thomas	Signature	Date 9/22/03	
Examiner Level N/A N/A	Signature	Date		Site Review Hanson, Shannon	Signature for SH	Date 9/24/2003	
Other Level N/A N/A	Signature	Date		ANII Review Daly, Gerald	Signature	Date 26SEP03	

Additional - Limitation <edit from Setup>

Supplemental Report

Report No.: 2003U010

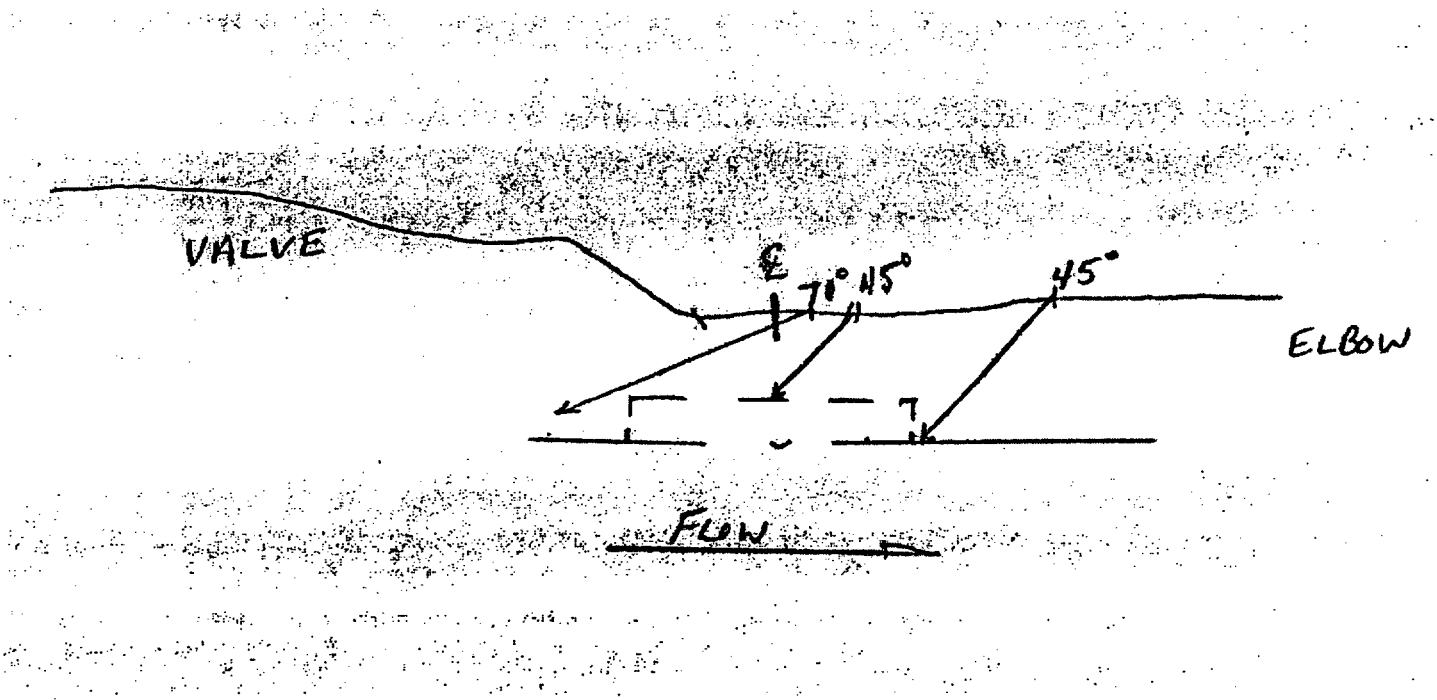
Page: 4 of 4

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:	26 SEP 03

Comments: W-11 coverage plot

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



ATTACHMENT 16 PAGE 4 OF 4

Additional - Supplemental Reports <edit from Setup>

UT Pipe Weld Examination

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

Code: 1989 Code Cat.: C-F-1 Location: Auxiliary Building

Drawing No.: 2-ISI-90A Description: Elbow to Valve

System ID: SI

Component ID: W-14 Size/Length: 3" / 11.0" Thickness/Diameter: .438" / 3"

Limitations: No scans on valve due to configuration Start Time: 1400 Finish Time: 1500

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:

No previous data available

Results: NAD ☑ IND ☐ GEO

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

Examiner Level III Blechinger, Todd P.	Signature	Date 9/19/2003	Reviewer Jones, Thomas	Signature	Date 9/22/03
Examiner Level N/A N/A	Signature	Date	Site Review Hanson, Shannon	Signature for SH	Date 9/29/2003
Other Level N/A N/A	Signature	Date	ANII Review Daly, Gerald	Signature	Date 06 SEP 03

ATTACHMENT 17 PAGE 1 OF 4

Supplemental Report

Report No.: 2003U011

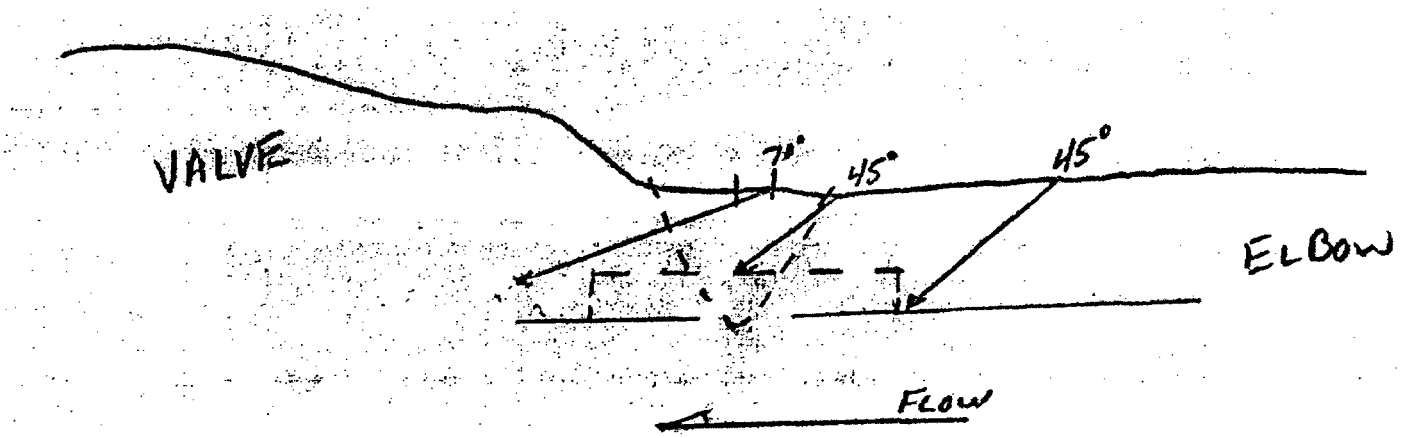
Page: 2 of 4

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:	26SEP03

Comments: W-14 coverage plot

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



ATTACHMENT 17 PAGE 2 OF 4

Determination of Percent Coverage for UT Examinations - Pipe

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

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ATTACHMENT 17

45 deg

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

TMB ~~75.000~~ 50.00 % Total for complete exam
9-11-03

Site Field Supervisor: Tom Scott Lutt Date: 9/22/03

Additional - Calculation Pipe <edit from Setup>

Limitation Record

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

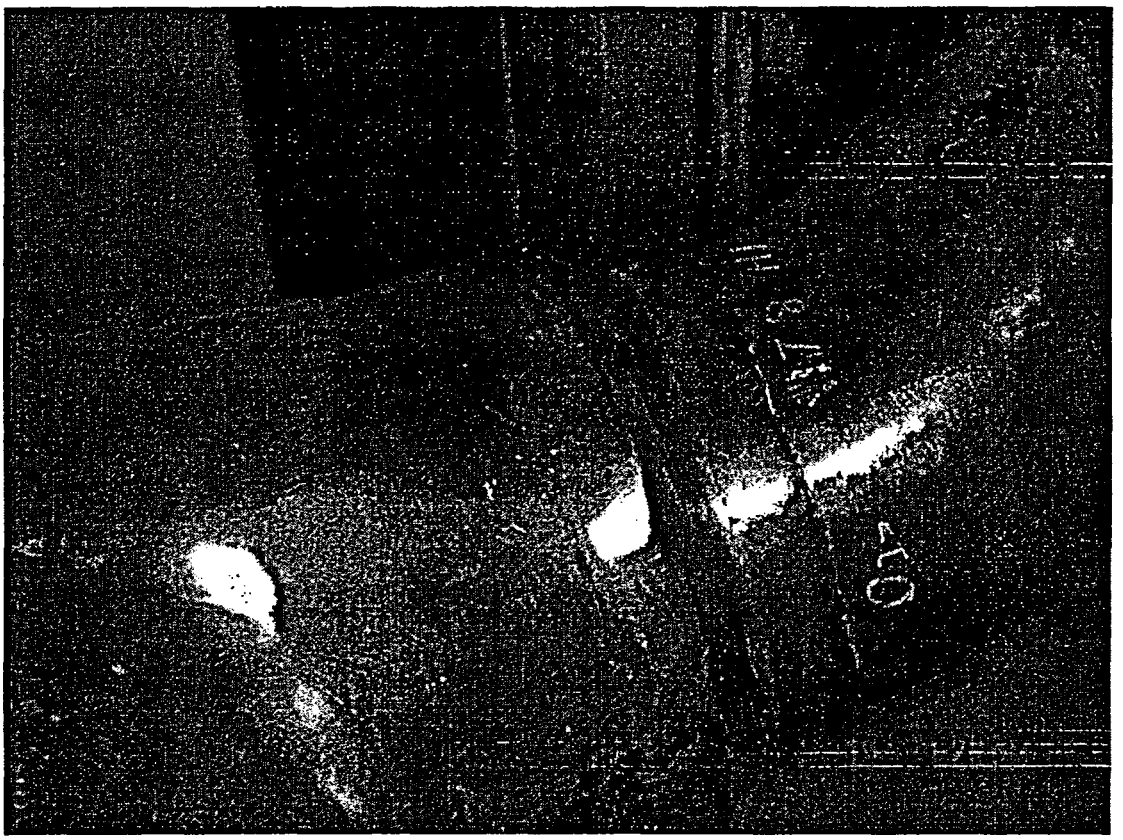
PAGE 4 OF 4

Description of Limitation:

Valve body taper

ATTACHMENT 17

Sketch of Limitation: J:\Iddeal_Photos\PI2RFO2003\UT Images\2003U011_1.JPG



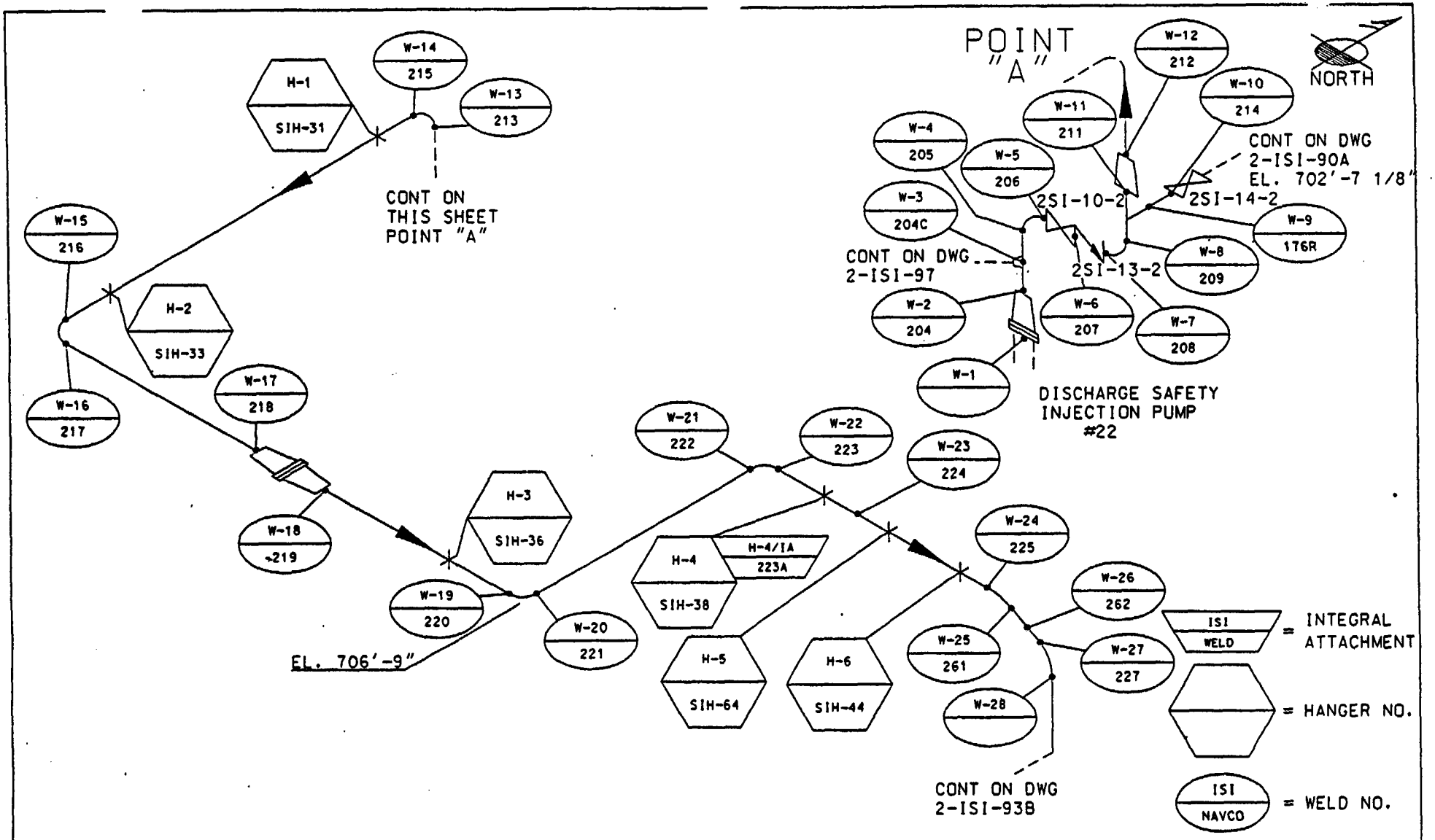
Limitations removal requirements:

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 Blechinger, Todd P.	Level III	Signature	Date 9/19/2003	Reviewer Jones, Thomas	Signature		Date 9/22/03
Examiner N/A	Level N/A	Signature	Date	Site Review Hanson, Shannon	Signature	for SH	Date 9/24/03
Other N/A	Level N/A	Signature	Date	ANII Review Daly, Gerald	Signature		Date 26 SEP 03

Additional - Limitation <edit from Setup>



REF: XH-1106-2510 | FILE NO: 2193AR01

NSP (M&SP)-PI-2 ISI

DWN: CADWorks CHKD: DSW APPD: DSW

SYSTEM: SAFETY INJECTION

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

DWG: 2-ISI-93A REV: 02

SAFETY INJECTION PUMP 22 DISCHARGE

2-ISI-93A

ATTACHMENT 18 PAGE 1 OF 1

UT Pipe Weld Examination

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:	1 of 4

Code: 1989 Code Cat.: C-F-1 Location: Auxiliary Building

Drawing No.: 2-ISI-93A Description: Pipe To Flange

System ID: SI

Component ID: W-17 Size/Length: 3" / 11.0" Thickness/Diameter: .438" / 3"

Limitations: No scans on flange due to configuration Start Time: 0950 Finish Time: 1035

Examination Surface: Inside ☐ Outside ☑ Surface Condition: As Welded

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.: 2003CA026, 2003CA028

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 Blechinger, Todd P.	Signature	Date 9/20/2003	Reviewer Jones, Thomas	Signature Thomas Jones Lutzi	Date 9/22/03
Examiner Level N/A N/A	Signature	Date	Site Review Hanson, Shannon	Signature for SH	Date 9/24/03
Other Level N/A N/A	Signature	Date	ANII Review Daly, Gerald	Signature	Date 26SEP03

ATTACHMENT 19 PAGE 1 OF 4

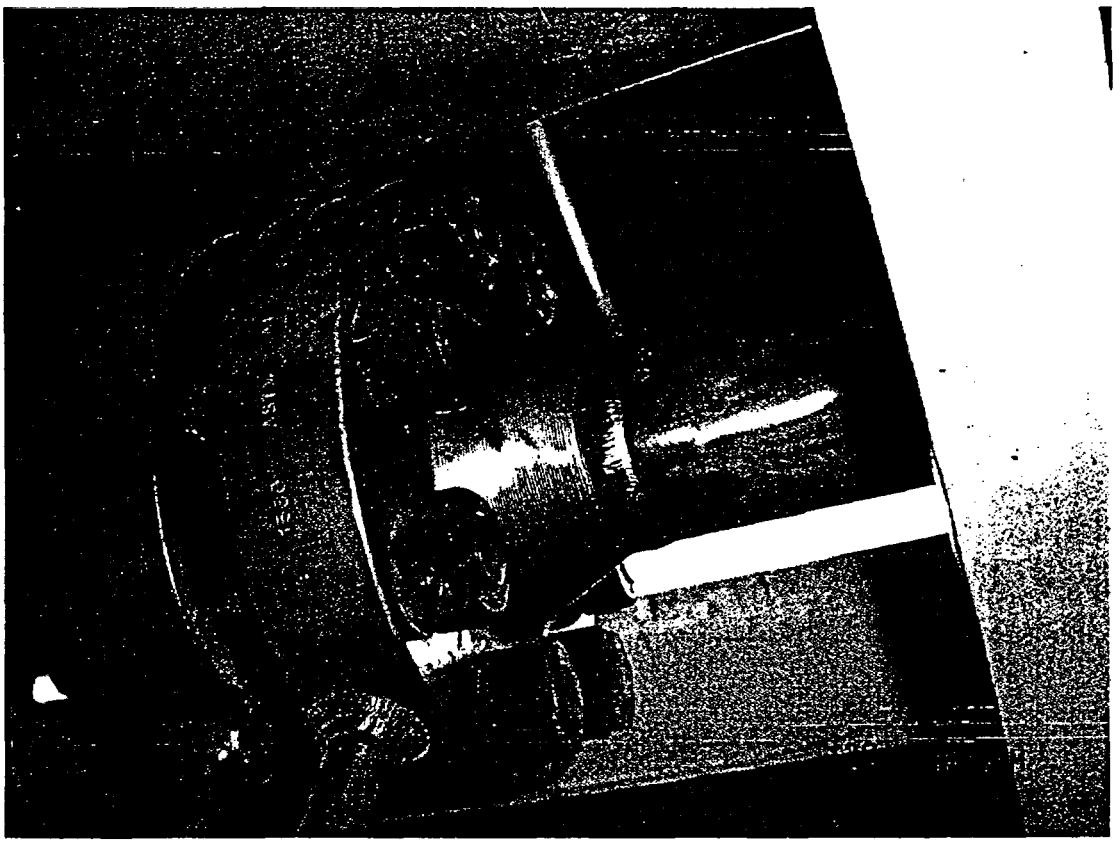
Limitation Record

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:\Ddeal_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 Blechinger, Todd P.	Signature	Date 9/20/2003		Reviewer Jones, Thomas	Signature	Date 9/22/03	
Examiner Level N/A N/A	Signature	Date		Site Review Hanson, Shannon	Signature for SH	Date 9/24/03	
Other Level N/A N/A	Signature	Date		ANII Review Daly, Gerald	Signature	Date 09SEP03	

Additional - Limitation <edit from Setup>

ATTACHMENT 19 PAGE 2 OF 4

Determination of Percent Coverage for UT Examinations - Pipe

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:	3 of 4

ATTACHMENT 19 PAGE 3 OF 4

45 deg

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

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

Site Field Supervisor: Tom Saul Lt III Date: 9/22/03

Additional - Calculation Pipe <edit from Setup>

Supplemental Report

Report No.: 2003U026

Page: 4 of 4

Summary No.: 505370

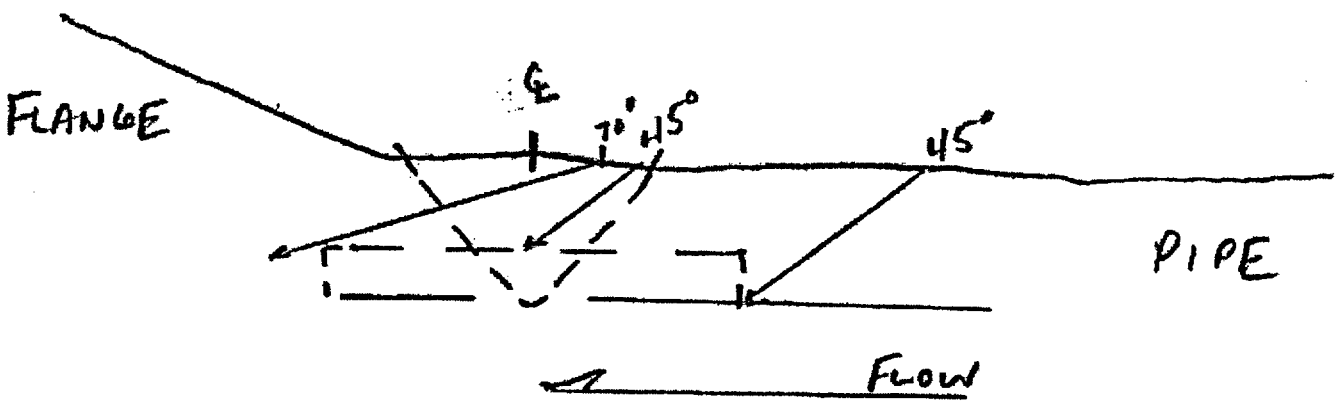
Examiner:	Blechinger, Todd P.	Level:	III	Reviewer:	Jones, Thomas	Date:	9/22/03
Examiner:	N/A	Level:	N/A	Site Review:	Hanson, Shannon	Date:	9/24/03
Other:	N/A	Level:	N/A	ANII Review:	Daly, Gerald	Date:	26SEP03

PAGE 4 OF 4

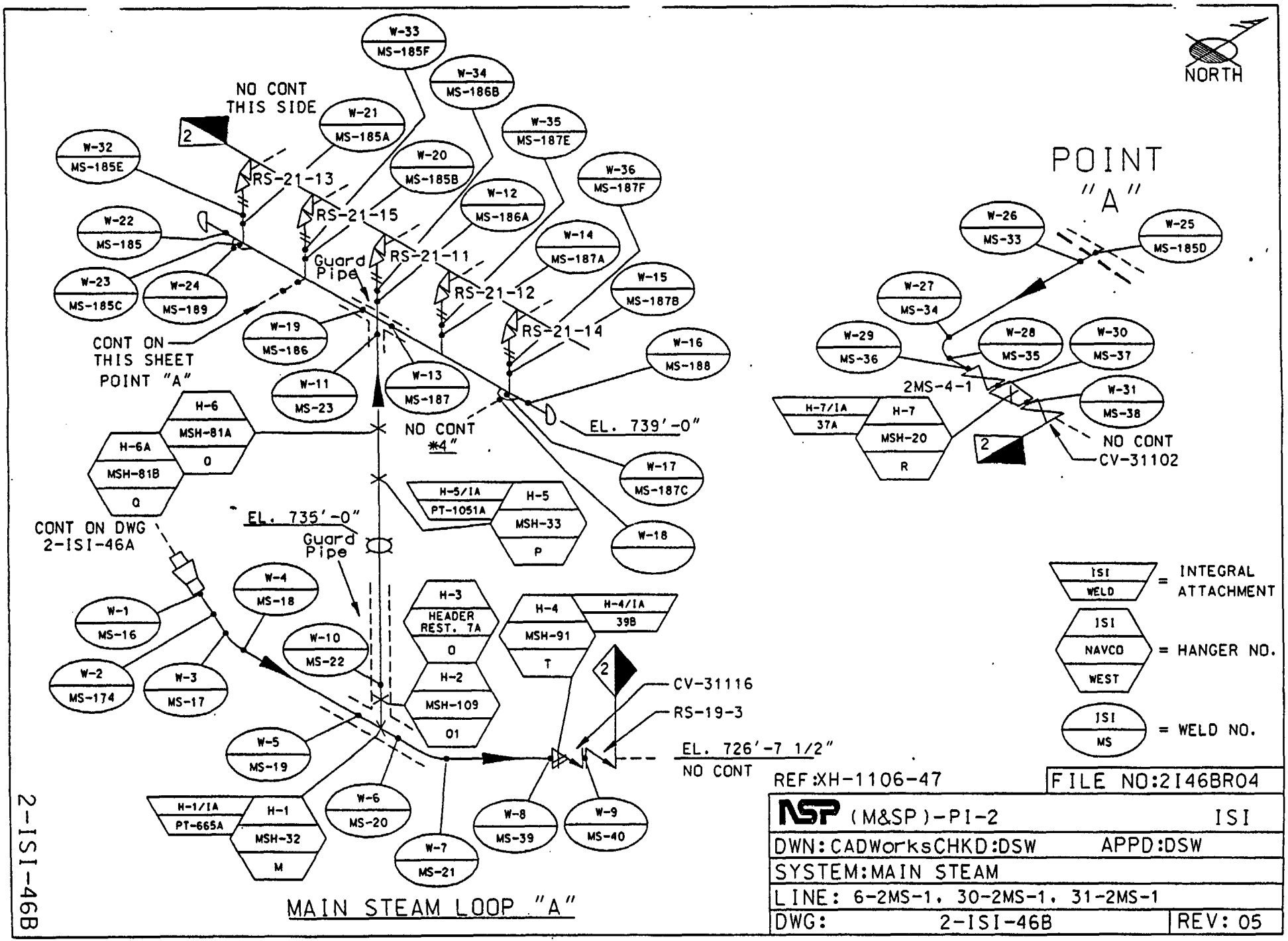
Comments: W-17 coverage plot

ATTACHMENT 19

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



Additional - Supplemental Reports <edit from Setup>



ATTACHMENT 20 PAGE 1 OF 1

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: NA Batch No.: NA

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 Halling, David A.	Level II	Signature	Date 9/19/2003	Reviewer Jones, Thomas	Signature	Level III	Date 9/28/03
Examiner N/A	Level N/A	Signature	Date	Site Review Hanson, Shannon	Signature		Date 9/29/03
Other N/A	Level N/A	Signature	Date	ANII Review Daly, Gerald	Signature		Date 30SEP03

ATTACHMENT 21 PAGE 1 OF 3

Supplemental Report

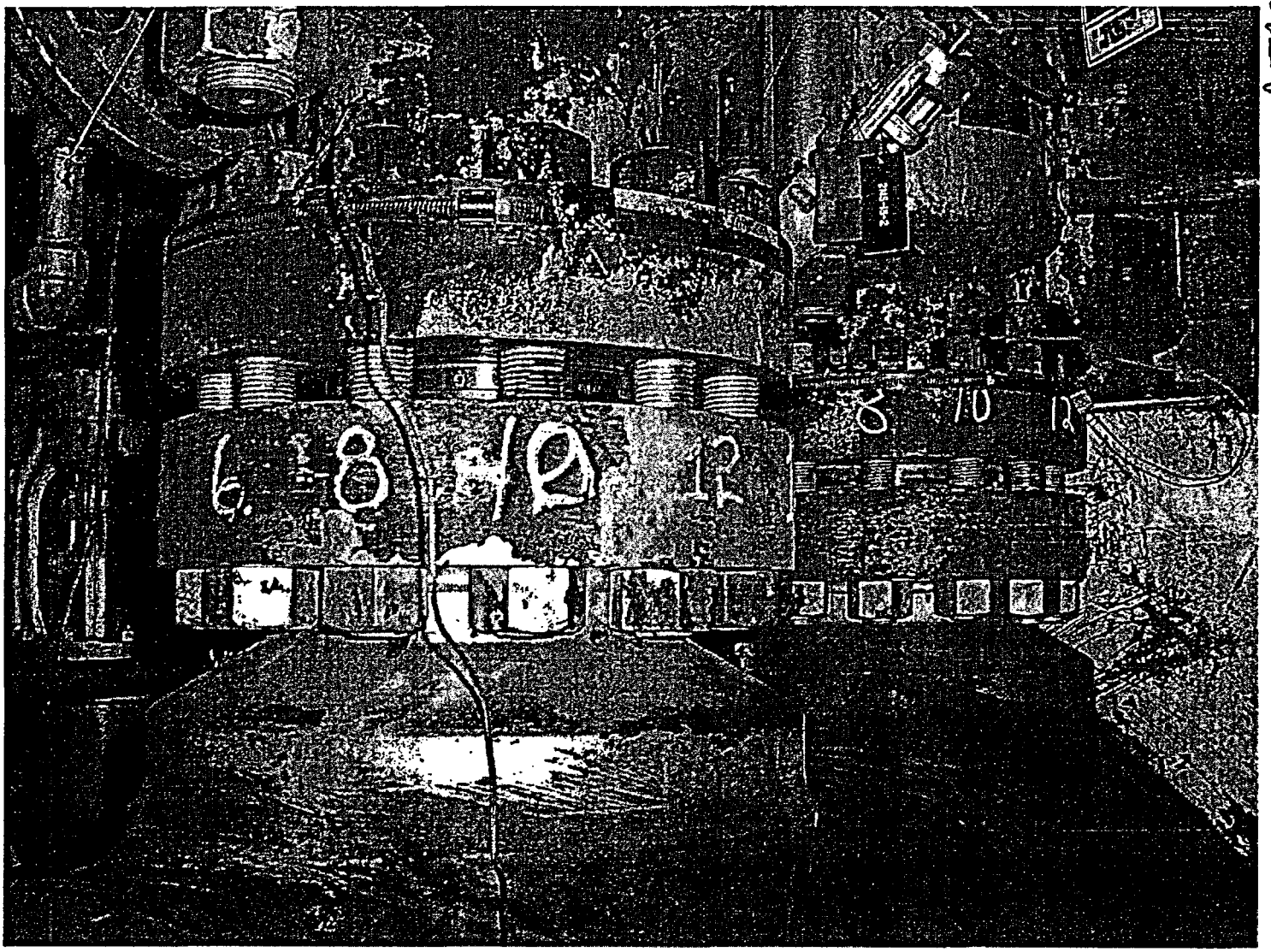
Report No.: 2003U029

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:	9/29/03
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:\Iddeal_Photos\PI2RFO2003\UT Images\2003U029_1.jpg



Additional - Supplemental Reports <edit from Setup>

ATTACHMENT 21 PAGE 2 OF 3

Determination of Percent Coverage for UT Examinations - Pipe

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:	3 of 3

ATTACHMENT 21 PAGE 3 OF 3

45 deg

Scan 1	0.000	% Length X	0.000	% volume of length / 100 =	0.000	% total for Scan 1
Scan 2	0.000	% Length X	0.000	% volume of length / 100 =	0.000	% total for Scan 2
Scan 3	0.000	% Length X	0.000	% volume of length / 100 =	0.000	% total for Scan 3
Scan 4	0.000	% Length X	0.000	% volume of length / 100 =	0.000	% 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 Jones Lvl III Date: 9/28/03

Additional - Calculation Pipe <edit from Setup>

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

ATTACHMENT 22

INFORMATION USE
• *Procedure may be performed from memory.*
• *User remains responsible for procedure adherence.*
• *Procedure should be available, but not necessarily at, the work location.*

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

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.

ATTACHMENT 22

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

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

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

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 (5AWI 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

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

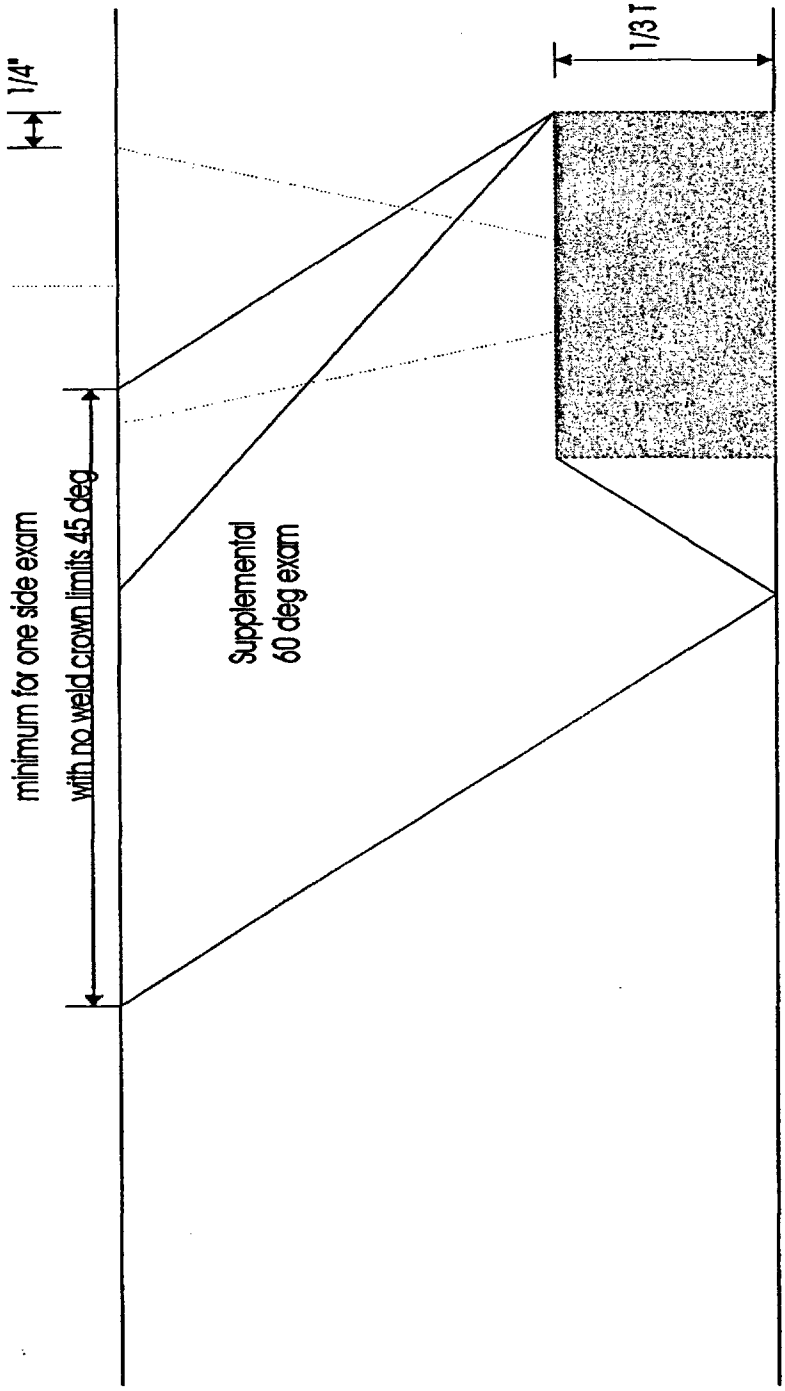
11.6 Figure 6 — Determination of Percent Coverage for UT Examinations -Vessels

12.0 SUMMARY OF SIGNIFICANT CHANGES

NONE

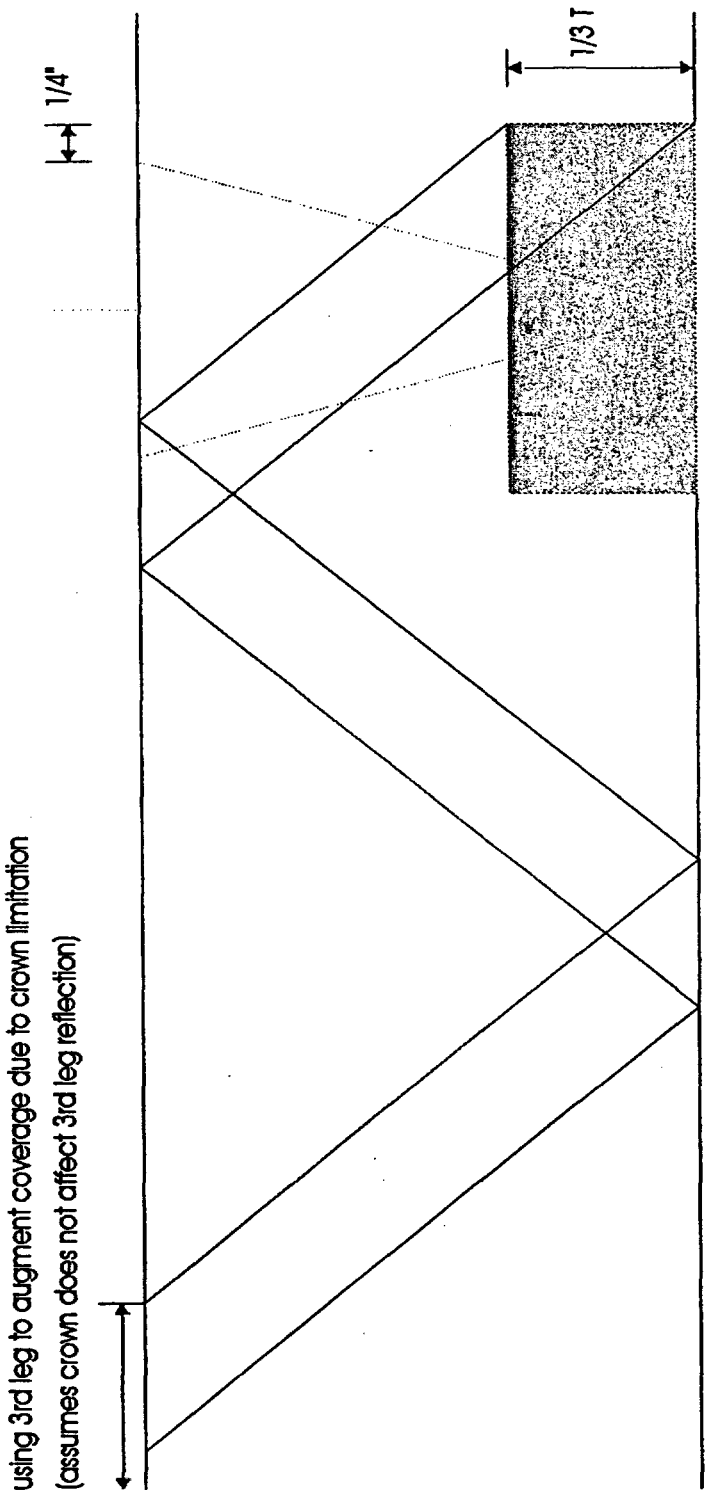
ATTACHMENT 22

Figure 1 - Example of UT scan coverage



ATTACHMENT 2a

Figure 2 - Example of UT, One Sided Exam, Supplemental Coverage



ATTACHMENT 22

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

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

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 - Pipe
This 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

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 - Vessels
This 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: _____