Duke Energy

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May 10, 2000

U. S. Nuclear Regulatory Commission
Document Control Desk
Washington, D.C. 20555-0001

Subject: McGuire Nuclear Station Unit 1
Docket No. 50-369
Relief Request 99-003

Pursuant to 10CFR50.55a(g)(5)(iii), Duke Energy Corporation requests relief from certain ASME Section XI requirements as described in the attached Relief Request 99-003. This relief request addresses limited examinations performed during EOC-13 for Unit 1. These examinations were performed to the requirements of the 1989 ASME Section XI Code.

Duke has determined that hardship or unusual difficulty would be encountered in certain instances without a compensatory increase in quality and safety. The specific instances are described in detail in the attached relief request.

Questions on this matter should be directed to Norman T. Simms, McGuire Licensing and Compliance, at (704) 875-4685.

Sincerely,

H B Barron

H. B. Barron, Vice President
McGuire Nuclear Station

Attachments

A047

cc: Mr. L. A Reyes
Regional Administrator, Region II
U. S. Nuclear Regulatory Commission
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Office of Nuclear Reactor Regulation
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bxc w/ att: RCG Files
Master File # 1.3.2.13
NRIA File/ELL

ATTACHMENTS

RELIEF REQUEST NO. 99-003

Duke Energy Corporation

Station McGuire Unit 1

SECOND 10-YEAR INTERVAL REQUEST FOR RELIEF NO. 99-003

Pursuant to 10CFR50.55a (g) (5) (iii), Duke Energy Corporation has determined that compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety. Conformance with examination requirements of ASME Section XI is not practical. Information is therefore being submitted in support of this determination and request is being sought for relief from the applicable ASME Section XI requirement (s).

I. System / Components(s) for Which Relief is Requested:

ASME Section XI Class 1 Components listed below:

Examination Category B-D: (Full Penetration Welds of Nozzles in Vessels)

Pressurizer (Nozzle-to-Vessel Welds)

ID Numbers	Item Numbers	End of Cycle
1PZR-13	B03.110.003	13

Pressurizer (Nozzle Inside Radius Section)

ID Numbers	Item Numbers	End of Cycle
1PZR-13R	B03.120.003	13
1PZR-14R	B03.120.004	13

Steam Generator (Nozzle Inside Radius Section)

ID Numbers	Item Numbers	End of Cycle
1SGB-INLET	B03.140.003	13
1SGB-OUTLET	B03.140.004	13

Examination Category B-F: (Pressure Retaining Dissimilar Metal Welds)

Steam Generator (Nozzle-to-Safe End Butt Welds)

ID Numbers	Item Numbers	End of Cycle
1SGB-INLET-W5SE	B05.070.003	13
1SGB-OUTLET-W6SE	B05.070.004	13

ASME Section XI Class 2 Components listed below:

Examination Category C-A: (Pressure Retaining Welds in Pressure Vessels)

Containment Spray Heat Exchanger (Tubesheet-to-Shell Weld)

ID Numbers	Item Numbers	End Of Cycle
1BCSHX-SH-48	C01.030.010	13

Examination Category C-F-1: (Pressure Retaining Welds in Austenitic Stainless Steel or High Alloy Piping)

Piping Circumferential Weld (Auxiliary Feedwater Nozzle-to-Safe End)

ID Numbers	Item Numbers	End Of Cycle
1SGB-W261	C05.011.220	13

II. Code Requirement:

ASME Boiler and Pressure Vessel Code, Section XI, 1989 Edition Table IWB-2500, lists the following requirements for each Examination Category as shown below:

"Examination Category B-D, Full Penetration Welds of Nozzles in Vessels- Inspection Program B; Figure Number IWB-2500-7 (b)"

"Examination Category B-F, Pressure Retaining Dissimilar Metal Welds; Figure Number IWB-2500-8"

"Examination Category C-A, Pressure Retaining Welds in Pressure Vessels; Figure Number IWC-2500-2"
Note (1) adds the words "Includes essentially 100% of the weld length."

"Examination Category C-F-1, Pressure Retaining Welds in Austenitic Stainless Steel or High Alloy Piping"; Figure Number IWC-2500-7 requires "100% of each weld requiring examination."

III. Code Requirement from Which Relief Is Requested:

Relief is requested from the requirement of examining essentially 100% of the weld length. Due to part geometry and actual physical barriers, obtaining greater than 90% of the weld volume as outlined in Code Case N-460, which is utilized by Duke Energy, is not possible.

Examination Category B-D: Full Penetration Welds of Nozzles in Vessels

Pressurizer (Nozzle-to-Vessel Welds)

Item Numbers	Actual Coverage Obtained	
B03.110.003	64.04%	**See Note 1**

Note 1

ASME Section V, Article 4, T-441.3.2 Scanning Requirements, 1989 Editions with no addenda as modified by Code Case N-460.

This paragraph requires scanning of the examination volume(s) using two angle beams and a straight beam from both sides of the weld.

When scanning for reflectors parallel to the weld, the angle beams shall be aimed at right angles to the weld axis, with the search unit(s) manipulated so that the ultrasonic beams pass through the entire volume of weld metal. The adjacent base metal in the examination volume must be completely scanned by two angle beams, but need not be completely scanned by both angle beams from both

directions (any combination of two angle beams will satisfy the requirement).

When scanning for reflectors transverse to the weld, the angle beam units shall be aimed parallel to the axis of longitudinal and circumferential welds. The search unit shall be manipulated so that the ultrasonic beams pass through all of the examination volume. Scanning shall be done in two directions, 180 degrees to each other to the extent possible. Areas blocked by geometric conditions shall be examined from at least one direction.

Examination Category B-D: Full Penetration Welds of Nozzles in Vessels (Inside Radius Sections)

Pressurizer (Nozzle Inside Radius Section)

Item Numbers	Actual Coverage Obtained	
B03.120.003	62.79%	**See Note 2**
B03.120.004	62.79%	**See Note 2**

Steam Generator (Nozzle Inside Radius Section)

Item Numbers	Actual Coverage Obtained	
B03.140.003	83.28%	**See Note 2**
B03.140.004	83.28%	**See Note 2**

Note 2

Examination Volume as shown in ASME 1989 Section XI, Figure IWB-2500-7(b)

Examination Category B-F: Pressure Retaining Dissimilar Metal Welds

Steam Generator (Nozzle-to-Safe End Butt Welds)

Item Numbers	Actual Coverage Obtained	
B05.070.003	75.00%	**See Note 3**
B05.070.004	75.00%	**See Note 3**

ASME Section XI Class 2 Components listed below:

Examination Category C-A

Containment Spray Heat Exchanger Tubesheet-to-Shell Weld

Item Numbers	Actual Coverage Obtained	
C01.030.010	22.14%	**See Note 3**

Examination Category C-F-1

Piping Circumferential Weld (Auxiliary Feedwater Nozzle-to-Safe End)

Item Numbers	Actual Coverage Obtained	
C05.011.220	50.00%	**See Note 3**

Note 3

ASME Section XI, Appendix III, Paragraph III-4420, 1986 Edition with no addenda as modified by Code Case N-460. The examination shall be performed using a sufficiently long examination beam path to provide coverage of the required examination volume in two-beam path directions. The examination shall be performed from two sides of the weld, where practicable, or from one side of the weld, as a minimum.

IV. Basis for Relief:

ASME Section XI Class 1 Components listed below:

Examination Category B-D, Items B03.110, B03.120., B03.140., Full Penetration Welds of Nozzles in Vessels

During the ultrasonic examination of the Pressurizer Safety Nozzle to Upper Head 1PZR-13 (Item Number B03.110.003) shown in Attachment 1, coverage of required examination volume could not be obtained. The examination coverage was limited to 64.04%. Single-

sided access caused by the nozzle geometry resulted in limited coverage of the required volume. In order to achieve more coverage, the nozzle would have to be redesigned to allow access from both sides.

During the ultrasonic examination of the Pressurizer Safety Nozzle to Upper Head (Inside Radius Sections) 1PZR-13R (Item Number B03.120.003) and 1PZR-14R (Item Number B03.120.004), shown in Attachment 1, coverage of the required examination volume could not be obtained. The examination coverage was limited to 62.79%. **See Note 4**

During the ultrasonic examination of the Steam Generator Nozzles (Nozzle Inside Radius Section):

1SGB-Inlet (B03.140.003) and
1SGB-Outlet (B03.140.004), shown in Attachment 1, coverage of required examination volume could not be obtained. The examination coverage was limited to 83.28%. **See Note 4**

Note 4

Limitations are caused by the ratio of the nozzle O.D. to the vessel thickness. When the nozzle O.D. is large in relation to the vessel thickness, less coverage can be obtained when scanning from the vessel side. Examinations from the nozzle boss and O.D. blend radius using compound angles, determining which angles to use, metal paths to calibrate for and area of coverage is not accurate with manual calculations.

Examination Category B-F Items B05.070., Pressure Retaining Dissimilar Metal Welds

During the ultrasonic examination of the Steam Generator Nozzle-to-Safe End Butt Welds:

1SGB-Inlet-W5SE (B05.070.003) and
1SGB-Outlet W6SE (B05.070.004), shown in Attachment 2, coverage of required examination volume could not be obtained. The examination coverage was limited to 75.00%. Material characteristics and single sided

access caused by the component geometry prevents two-beam path direction coverage of the examination volume.

The most effective ultrasonic technique for the examination of dissimilar metal welds uses refracted longitudinal waves. The longitudinal wave is preferred as the austenitic weld metal and buttering when present create highly attenuative barriers to shear wave ultrasound. Longitudinal waves provide superior penetration and improved signal to noise ratio over shear waves. However, the longitudinal wave is affected by mode conversion when it strikes the inside surface of the safe end or pipe at any angle other than a right angle to the surface.

The calculations below show that a 45° refracted longitudinal wave striking the inside surface of a pipe will produce a 22.9° refracted shear wave in addition to the normally expected 45° reflected longitudinal wave.

$\sin^{-1} = (\sin 45° \times V_s) \div V_L$

$= (0.707 \times 0.123) \div 0.223$

Where: $\sin^{-1}$ is the shear wave angle

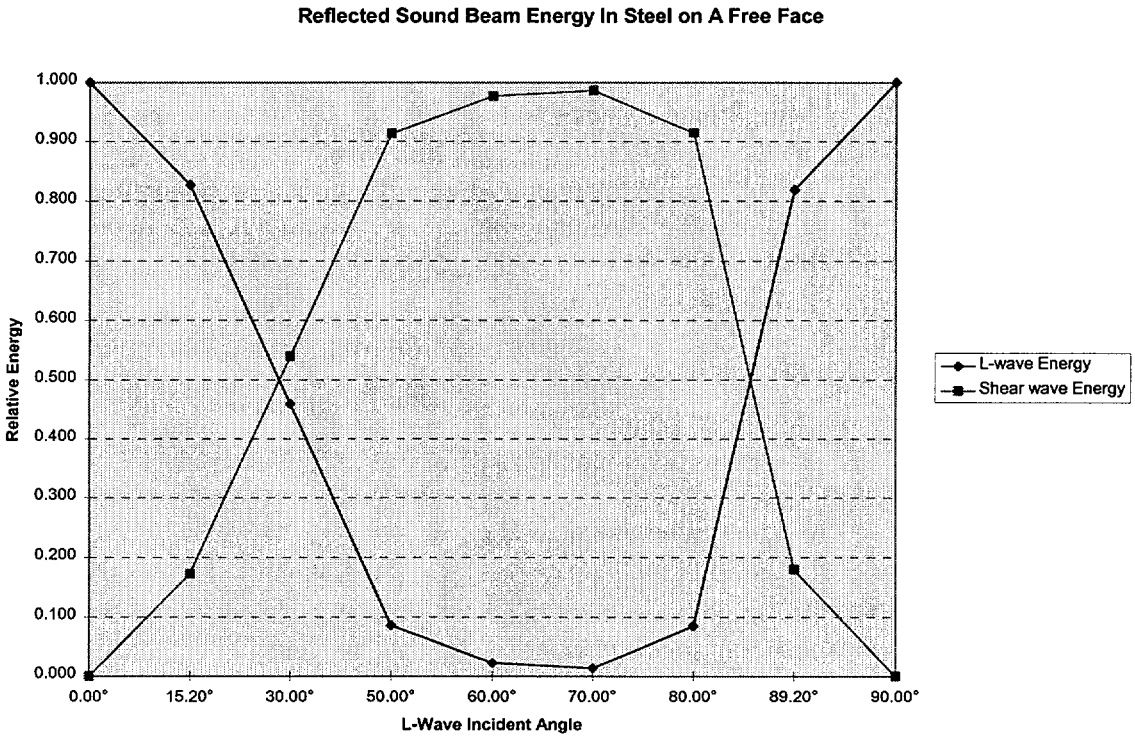
V_s is the shear wave velocity of the stainless steel safe end/pipe material in inches/µsec.

V_L is the longitudinal wave velocity of the stainless steel safe/pipe end material in inches/µsec.

As shown in the graph[1] (page 8), the mode conversion process creates two sound beams of differing intensities reflecting off of the inside surface. At incident angles greater than 30° the shear wave will predominate. However, the shear wave is attenuated and scattered by the austenitic weld metal and the layer of buttering. The examination sensitivity is degraded to such an extent that any examination using the second sound path leg is meaningless. Therefore, the two-beam path direction coverage requirement is impractical.

[1] Firestone, F. A. : Tricks with the Supersonic Reflectoscope, *J. Soc. Nondestructive Testing*, vol. 7, no. 2 Fall 1948.

In order to obtain the required two-beam path direction coverage, welds would have to be re-designed to allow scanning from both sides.



ASME Section XI Class 2 Components listed below:

Examination Category C-A, Items C1.30 Pressure Retaining Welds in Pressure Vessels

During the ultrasonic examination of the Containment Spray Heat Exchanger Tubesheet-to-Shell Weld 1BCSHX-SH-48 (C01.030.010) shown in Attachment 3, and 5, coverage of the required examination volume was limited to 22.14%, limited scanning area was caused by the proximity of equipment support beams that prevented scanning significant areas of the weld. In order to achieve more coverage these obstructions would have to be moved away from the weld.

Examination Category C-F-1, Items C5.11 Pressure Retaining Welds in Austenitic Stainless Steel or High Alloy Piping

During the ultrasonic examination of the Auxiliary Feedwater Nozzle-to-Safe End weld 1SGB-W261 (C05.011.220) shown in Attachment 4, two-beam path direction coverage of the required volume could not be achieved. Material characteristics (dissimilar metal weld) and single sided access caused by the nozzle geometry limited the coverage to 50% of the required volume.

The same ultrasonic techniques used for the Steam Generator Primary Inlet and Outlet Nozzle-to-Safe End welds are used for the Auxiliary Feedwater Nozzle-to-Safe End weld. In order to obtain the required two-beam path direction coverage the weld would have to be re-designed to allow scanning from both sides.

V. Alternate Examinations or Testing:

The use of radiography as an alternate volumetric examination for all the above listed components is not practical due to component thickness and geometric configurations. Other restrictions making radiography impractical are the physical barriers prohibiting access for placement of source, film, image quality indicator, etc.

VI. Justification for the Granting of Relief

Examination Category B-D, Items B03.110, B03.120., B03.140., Full Penetration Welds of Nozzles in Vessels

During the ultrasonic examination of the Pressurizer Surge Nozzle to Lower Head 1PZR-13 (Item Number B03.110.003), coverage of the required examination volume could not be obtained. The examination coverage was limited to 64.04% due to single sided access caused by the nozzle geometry resulting in limited

coverage of the required volume. In order to achieve more coverage the nozzle would have to be redesigned to allow access from both sides. Therefore, the 100% volumetric examination is impractical for this weld. The imposition of this requirement would create a considerable burden on Duke Energy Corporation.

During the ultrasonic examination of the Pressurizer Nozzle to Upper Head Welds (Inside Radius Sections):

1PZR-13R (Item Number B03.120.003)
1PZR-14R (Item Number B03.120.004), coverage of the required examination volume could not be obtained. The examination coverage was limited to 62.79%, limitations are caused by the ratio of the nozzle O.D. to the vessel thickness. **See Note 5**

During the ultrasonic examination of the Steam Generator (Nozzle Inside Radius Sections):

1SGB-Inlet (B03.140.003)
1SGB-Outlet (B03.140.004), coverage of the required examination volume could not be obtained. The examination coverage was limited to 83.28%, limitations are caused by the ratio of the nozzle O.D. to the vessel thickness.
See Note 5

Note 5

When the nozzle O. D. is large in relation to the vessel thickness, less coverage can be obtained when scanning from the vessel side. Examinations from the nozzle boss and O. D. blend radius using compound angles, determining which angles to use, metal paths to calibrate for and area of coverage is not accurate with manual calculations. In order to achieve more coverage these nozzles would have to be redesigned. Therefore, the 100% volumetric examination is impractical for these welds. The imposition of this requirement would create a considerable burden on Duke Energy Corporation.

The five welds listed above are located within the reactor coolant loop. These welds are not exposed

to significant neutron fluence and are not prone to negative material property changes (i.e., embrittlement) associated with neutron bombardment. These welds were rigorously inspected by radiography and dye penetrant during construction and verified to be free from unacceptable fabrication defects. If a leak were to occur at any of the welds in question, the reactor coolant leakage calculation which is normally performed daily (although required by Technical Specifications Surveillance Requirements 3.4.13.1 to be performed every 72 hours) would provide an early indication of leakage. Several other indicators such as containment radiation monitors EMF-38,-39, and -40, the containment floor and equipment sump levels, containment humidity instruments and the ventilation unit condensate drain tank level would provide early indication of weld leakage for prompt Operations and Engineering evaluation.

Examination Category B-F Items B05.070., Pressure Retaining Dissimilar Metal Welds

During the ultrasonic examination of the Steam Generator Nozzle-to-Safe End Butt Welds:

1SGB-Inlet-W5SE (B05.070.003)
1SGB-Outlet-W6SE (B05.070.004), coverage of the required examination volume could not be obtained. The examination coverage was limited to 75.00%,
These Dissimilar Metal Butt welds are limited due to material characteristics and single-sided access caused by the component geometry prevents two-beam path direction coverage of the examination volume. In order to obtain the required two-beam path direction coverage, these welds would have to be re-designed to allow scanning from both sides.

These Nozzle-to-Safe End welds listed above are located on the reactor coolant loop piping. These welds are not exposed to significant neutron fluence and are not prone to negative material property changes (i.e., embrittlement) associated with neutron bombardment. These welds were rigorously inspected by

radiography and dye penetrant during construction and verified to be free from unacceptable fabrication defects. If a leak were to occur at any of the welds in question, the reactor coolant leakage calculation which is normally performed daily (although required by Technical Specifications Surveillance Requirements 3.4.13.1 to be performed every 72 hours) would provide an early indication of leakage. Several other indicators such as containment radiation monitors EMF-38,-39, and -40, the containment floor and equipment sump levels, containment humidity instruments and the ventilation unit condensate drain tank level would provide early indication of weld leakage for prompt Operations and Engineering evaluation.

ASME Section XI Class 2 Components listed below:

Examination Category C-A, Items C1.30 Pressure Retaining Welds in Pressure Vessels

During the ultrasonic examination of the Containment Spray Shell to Tubesheet weld 1BCSHX-SH-48 (C01.030.010), coverage of the required examination volume was limited to 22.14% due to the proximity of support beams that prevented scanning significant areas of the weld. The Containment Spray Heat Exchanger Support beams block access to most of the shell-to-tubesheet weld with minimal clearance between the vessel and the support. This steel frame provides vertical support for the vessel and cannot be disassembled without providing temporary vertical supports for the vessel. The shell-to-tubesheet weld is not in an area, which has shown degradation on other heat exchangers due to erosion/corrosion.

The Shell to Tubesheet Weld on the 1B Containment Spray Heat Exchanger forms the pressure boundary for the raw water cooling supply for this heat exchanger. A leak in this weld would be detected by actuation of the safety-related sump pumps for this room. In addition, unexpected level indications in the floor drain tank (to which the sump pumps discharge to) will prompt investigation and identification of the leak by either Operations or Chemistry personnel. This heat exchanger is one of two safety-related vessels

maintained in a non-operational standby mode. Failure of the weld in question would be of little consequence unless of such a magnitude as to constitute a major flood which is difficult to postulate given the volume examined and low pressures and temperatures to which the weld is exposed to during all modes of operation.

Examination Category C-F-1, Items C5.11 Pressure Retaining Welds in Austenitic Stainless Steel or High Alloy Piping

During the ultrasonic examination of the Auxiliary Feedwater Nozzle-to-Safe End weld 1SGB-W261 (C05.011.220), two-beam path direction coverage of the required volume could not be achieved. Material characteristics (dissimilar metal weld) and single sided access caused by the nozzle geometry limited the to coverage to 50% of the required volume.

If a leak were to occur at the weld in question Auxiliary Feedwater (CA) Nozzle], there are methods by which the leak could be identified for prompt Engineering evaluation.

The CA nozzles are equipped with thermal sleeves to limit thermal shock due to auxiliary feedwater injections. McGuire operates the CA nozzles consistent with the stress and fatigue qualifications provided by the Manufacturer (BWI).

A leak at a CA nozzle would result in the following:

a) Increased containment humidity. This parameter is indicated in the control room and is monitored periodically by Operations.

b) Increased S/G enclosure temperature. This parameter is continuously monitored by Operations via an OAC alarm.

c) Increased input into the Ventilation Unit Condensate Drain Tank (VUCDT). This parameter is monitored continuously by Operations via an OAC alarm.

Note 6

The above parameters would be used to identify a leak in the steam generator enclosure, but could not specifically identify the CA nozzle as the source of leakage. A containment entry would be required to identify the exact source of the leakage.

Also, a containment walkdown is performed when the unit reaches Mode 3 (full temperature / pressure) during the unit shutdown for each refueling outage. This walkdown should identify any leak at the weld in question.

Concerning the consequences of a leak at the CA nozzle (affects on CA system operation): Any leakage would result in a portion of the CA flow bypassing the steam generator, and therefore being unavailable to maintain steam generator levels. Very small leaks (< 1 gpm) would have no discernible effect on CA system operation. Leaks that approach 5 gpm would need to be evaluated for system operability effects. McGuire has specific Safety Analysis for accidents where minor and major main feedwater system pipe breaks are postulated.

Replacement or re-design of any of these Class 1 or Class 2 items is not a viable alternative. Duke Energy believes the amount of coverage obtained for these examinations provides reasonable assurance of the continued structural integrity of the subject welds.

VII. Implementation Schedule:

Duke Energy Corporation will continue to use ultrasonic examination procedures to obtain maximum coverage to the extent practical of the Item Numbers referenced in Section I of this Request for Relief. No additional ultrasonic examinations are planned during the current interval for the welds referenced in Section I of this request.

These examinations will continue to be scheduled in accordance with the requirements of ASME Section XI for future inspection intervals at McGuire Nuclear Station, Unit 1.

VIII. References:

Attachment 1. Drawings of Examination Category B-D affected welds/examination areas, and details including calculation methods for:

B03.110.003
B03.120.003
B03.120.004
B03.140.003
B03.140.004

Attachment 2. Drawings of Examination Category B-F affected welds, and details including calculation methods for:

B05.070.003
B05.070.004

Attachment 3. Drawings of Examination Category C-A affected welds, and details including calculation methods for:

C01.030.010

Attachment 4. Drawings of Examination Category C-F-1 affected welds, and details including calculation methods for:

C05.011.220

Attachment 5. Detailed drawings of the Containment Spray Heat Exchanger:

C01.030.010

The following individuals were involved in the development of this request for relief. Richard H. Benoit (Civil Engineering/NGD), Kenneth N. Pitser, Hoang V. Dinh, Jack W. Knost, Eric G. Blough (McGuire Engineering) provided input to the engineering justification (section VI.) for granting relief. Jim McArdle (NDE Level III) provided sections III., IV., and V. Gary Scarboro (McGuire ISI Plan Manager) compiled and completed the request.

Sponsored By: Gary D Scarboro Date 4-5-2000

Approved By: R. Kevin Rhyne Date 4/5/00

SERIAL No. 99-003
ATTACHMENT 1
PAGE 1 of 25

Form NDE-620
Revision 0

DUKE POWER COMPANY
ULTRASONIC DATA SHEET FOR PLANAR REFLECTORS IN FERRITIC PRESSURE VESSELS

Station: McGUIRE	Unit: 1	Component/Weld ID: 1PZR-13	Date: 9/30/99
Weld Length (in.): 50.3"	Surface Condition: GROUND	L_0 9.2.3	Exam Start: 1009 / Exam Finish: 1105

Procedure No:	Scans	Configuration		Calibration Sheet No:
NDE-620 Revision: 8 FC N/A	70° 58 dB Zone I 60° 79 dB Zone II 60° 79 dB Zone III Axial 60° 79 dB Zone III Circ.	NOZZLE TO HEAD Scan Surface: OD	Surface Temp. 76 °F Pyrometer s/n: MCNDE 27021 Cal. Due Date: 11/17/99	9901057 9901058 9901059

Indication #	∠	MP_{max}	% FSH	L_{max}	W_{max}	SU LOCATION	BEAM DIRECTION	SCAN ⊥ =	REMARKS
1	60	3.6	25	8.75	3.75	HEAD	NOZZLE	⊥	ZONE II LENGTH = 0.6"
NRI	70								

> 90% Coverage obtained: yes ☐ no ☑ (see NDE-UT-4) Limitation report is required

Examiner: [signature] Level: II Date: 9/30/99 Examiner: [signature] Level: III Date: 9.30.99 Item No: B03.110.003

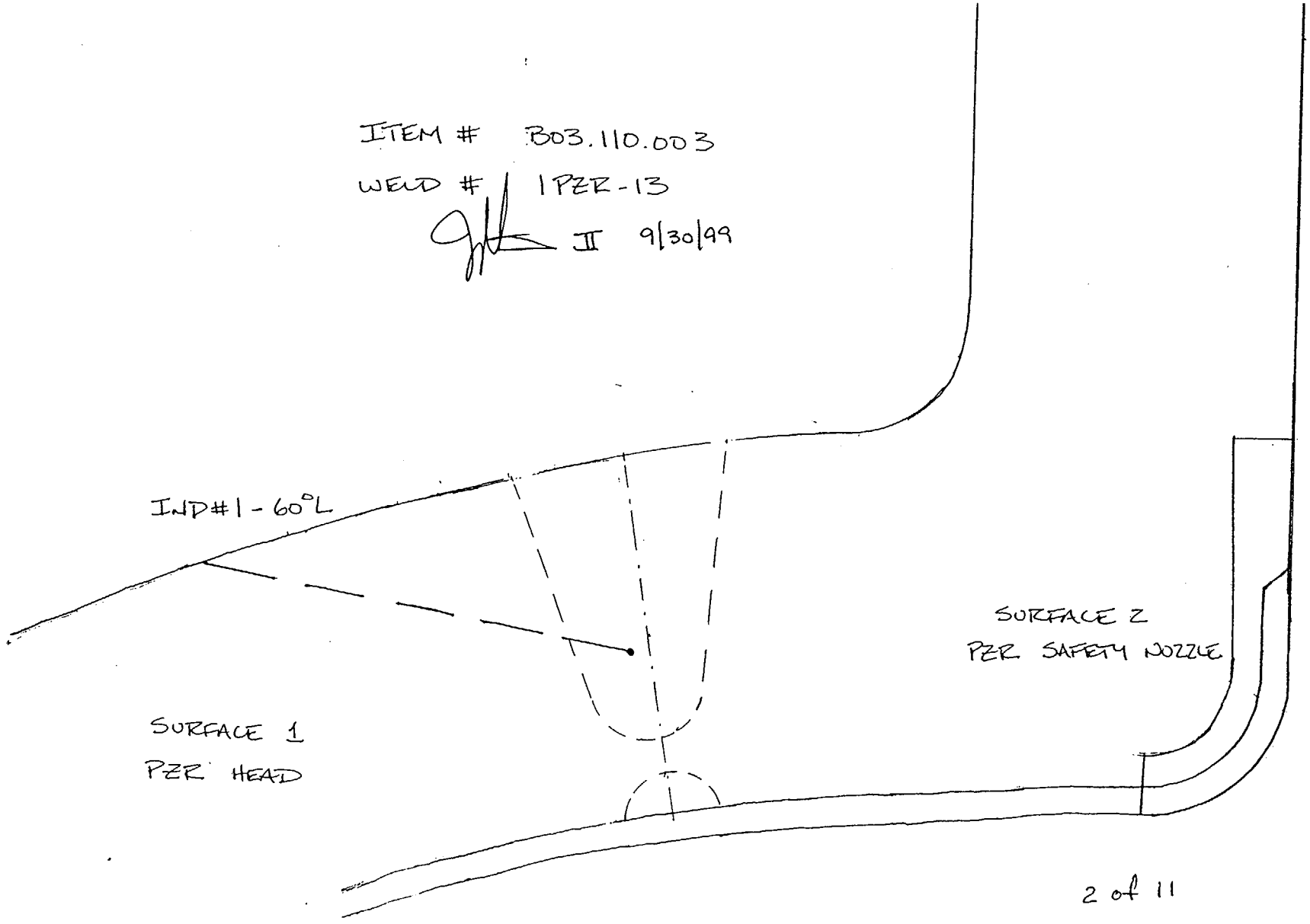
Reviewed by: [signature] Level: II Date: 10-5-99 Authorized Inspector: [signature] Date: 10-6-99

11-1-99

ITEM # B03.110.003

WELD # 1PZR-13

II 9/30/99



DUKE POWER COMPANY

ULTRASONIC INDICATION RESOLUTION SHEET

Form NDE-UT-8

Revision 1

Acceptance Standard:

IWB3512-1, ASME SECTION XI - IND.1-60°L IS A SEPERATE INDICATION DUE TO SLAG/t=2.95",2a =.05 a =.025 l =.6,a/l =.025/.6 =0.04,a/t =.025/2.95x100=0.84 % MAXIMUM ALLOWABLE = 3.3 %

Item No: B03.110.003

Acceptable Indications: IND. #1 - 60°L

Rejectable Indications:

These indications have been compared with previous ultrasonic data ☒ Yes ☐ No previous data available

Examiner:	Level: II	Date: 9/30/99	[redacted]	Sheet 3 of 11
Reviewer: Rod Sheffield	Level: II	Date: 10-5-99	Authorized Inspector:	Date: 10-6-99

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11-1-99

DUKE POWER COMPANY
ISI LIMITATION REPORT

FORM NDE-UT-4
Revision 1

Component/Weld ID: 1PZR-13 | Item No: B03.110.003 | Remarks:

☒ NO SCAN
☐ LIMITED SCAN
SURFACE: ☐ 1 ☒ 2
BEAM DIRECTION: ☒ 1 ☐ 2 ☐ cw ☐ ccw
FROM L _____ to L _____ INCHES FROM WO 1.0 to BEYOND
ANGLE: ☐ 0 ☐ 45 ☒ 60 ☐ Other 70° FROM 0 DEG to 360 DEG

Remarks: DUE TO NOZZLE CONFIGURATION.

☐ NO SCAN
☐ LIMITED SCAN
SURFACE: ☐ 1 ☐ 2
BEAM DIRECTION: ☐ 1 ☐ 2 ☐ cw ☐ ccw
FROM L _____ to L _____ INCHES FROM WO _____ to _____
ANGLE: ☐ 0 ☐ 45 ☐ 60 ☐ Other _____ FROM ____ DEG to ____ DEG

☐ NO SCAN
☐ LIMITED SCAN
SURFACE: ☐ 1 ☐ 2
BEAM DIRECTION: ☐ 1 ☐ 2 ☐ cw ☐ ccw
FROM L _____ to L _____ INCHES FROM WO _____ to _____
ANGLE: ☐ 0 ☐ 45 ☐ 60 ☐ Other _____ FROM ____ DEG to ____ DEG

☐ NO SCAN
☐ LIMITED SCAN
SURFACE: ☐ 1 ☐ 2
BEAM DIRECTION: ☐ 1 ☐ 2 ☐ cw ☐ ccw
FROM L _____ to L _____ INCHES FROM WO _____ to _____
ANGLE: ☐ 0 ☐ 45 ☐ 60 ☐ Other _____ FROM ____ DEG to ____

Prepared By: Larry Maulden Level: III Date: 9.30.99 | Sketch(s) attached ☒ yes ☐ no | Sheet 4 of 11

Reviewed By: Rod Sheffield Date: 10-5-99 | Authorized Inspector: [illegible] Date: 10-6-99

R GJ 11-1-99

DUKE POWER COMPANY
Limited Examination Coverage Worksheet

NDE-91-1

Revision 0

Examination Volume/Area Defined

☐ Base Metal ☐ Weld ☒ Near Surface ☐ Bolting ☐ Inner Radius

Area Calculation	Volume Calculation
ZONE 1 = 1.0/2 X (5.0 + 4.8) = 4.9 Sq. In.	4.9 X 50.3 (CIRC) = 246.47 Cu. In.

Coverage Calculations

Scan #	Angle	Beam Direction	Area Examined (sq.in.)	Length Examined (in.)	Volume Examined (cu.in.)	Volume Required (cu.in.)	Percent Coverage
1	70°	S1	4.7	50.3	236.41	246.47	95.92
2	70°	S2	.9	50.3	45.27	246.47	18.37
3	70°	CW	3.8	50.3	191.14	246.47	77.55
4	70°	CCW	3.8	50.3	191.14	246.47	77.55
					663.96	985.88	67.35

ATTACHMENT 1
PAGE 5 of 25

Item No: B03.110.003

Prepared By: Larry Moulder Level: III Date: 10-1-99

Reviewed By: Rod Sheffield Level: II Date: 10-5-99

RS 11-1-99

DUKE POWER COMPANY
Limited Examination Coverage Worksheet

NDE-91-1

Revision 0

Examination Volume/Area Defined

☒ Base Metal ☒ Weld ☐ Near Surface ☐ Bolting ☐ Inner Radius

Area Calculation	Volume Calculation
ZONE 2 & 3 2.1/2 X (4.8 + 4.4) = 9.7 Sq. In.	9.7 Sq. In. X 50.3 (CIRC.) = 487.91 Cu. In.

Coverage Calculations

Scan #	Angle	Beam Direction	Area Examined (sq.in.)	Length Examined (in.)	Volume Examined (cu.in.)	Volume Required (cu.in.)	Percent Coverage
1	60°	S1	9.7	50.3	487.91	487.91	100.00
2	60°	S2	.7	50.3	35.21	487.91	7.22
3	60°	CW	6.9	50.3	347.07	487.91	71.13
4	60°	CCW	6.9	50.3	347.07	487.97	71.13
					1217.26	1951.64	62.37

Item No: B03.110.003

Prepared By: Larry Moulder Level: III Date: 10-1-99

Reviewed By: Rod Sheffield Level: II Date: 10-5-99

ATTACHMENT 1
PAGE 6 of 25

R2
11-1-9

DUKE POWER COMPANY
Limited Examination Coverage Worksheet

NDE-91-1

Revision 0

Examination Volume/Area Defined

☒ Base Metal ☒ Weld ☒ Near Surface ☐ Bolting ☐ Inner Radius

Area Calculation	Volume Calculation

Coverage Calculations

Scan #	Angle	Beam Direction	Area Examined (sq.in.)	Length Examined (in.)	Volume Examined (cu.in.)	Volume Required (cu.in.)	Percent Coverage
		ZONE 1			663.96	985.88	67.35
		ZONE 2 & 3			1217.26	1951.64	62.37
			AGGREGATE	COVERAGE	1881.22	2937.52	64.04

ATTACHMENT 1
PAGE 7 of 25

Item No: B03 110 003

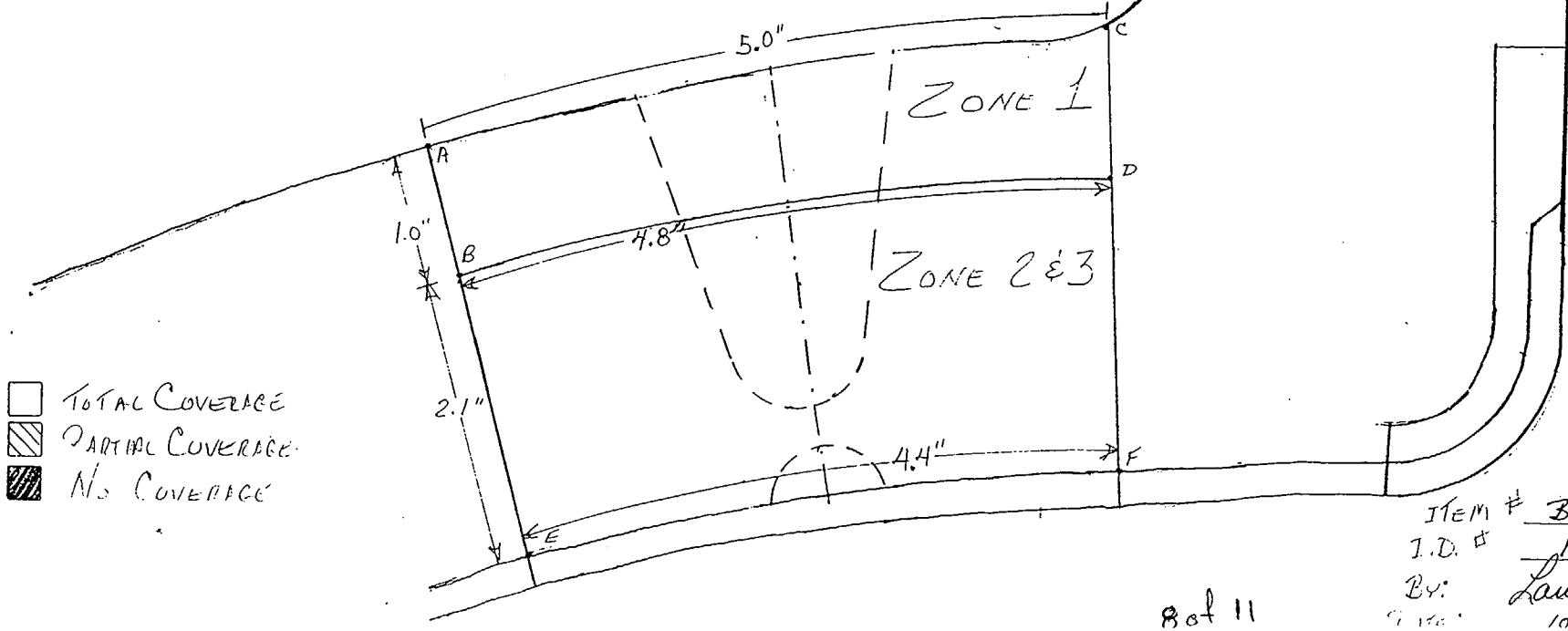
Prepared By:	Larry Maulden	Level: III	Date: 10-1-99
Reviewed By:	Rod Sheffield	Level: II	Date: 10-5-99

PRESSURIZER SAFETY & RELIEF NOZZLE

EXAM AREA:

ZONE 1 ABCD = $\frac{1.0}{2}(5.0 + 4.8) = 4.9$ sq. in.

ZONE 2 & 3 BDEF = $\frac{2.1}{2}(4.8 + 4.4) = 9.66 = 9.7$ sq. in



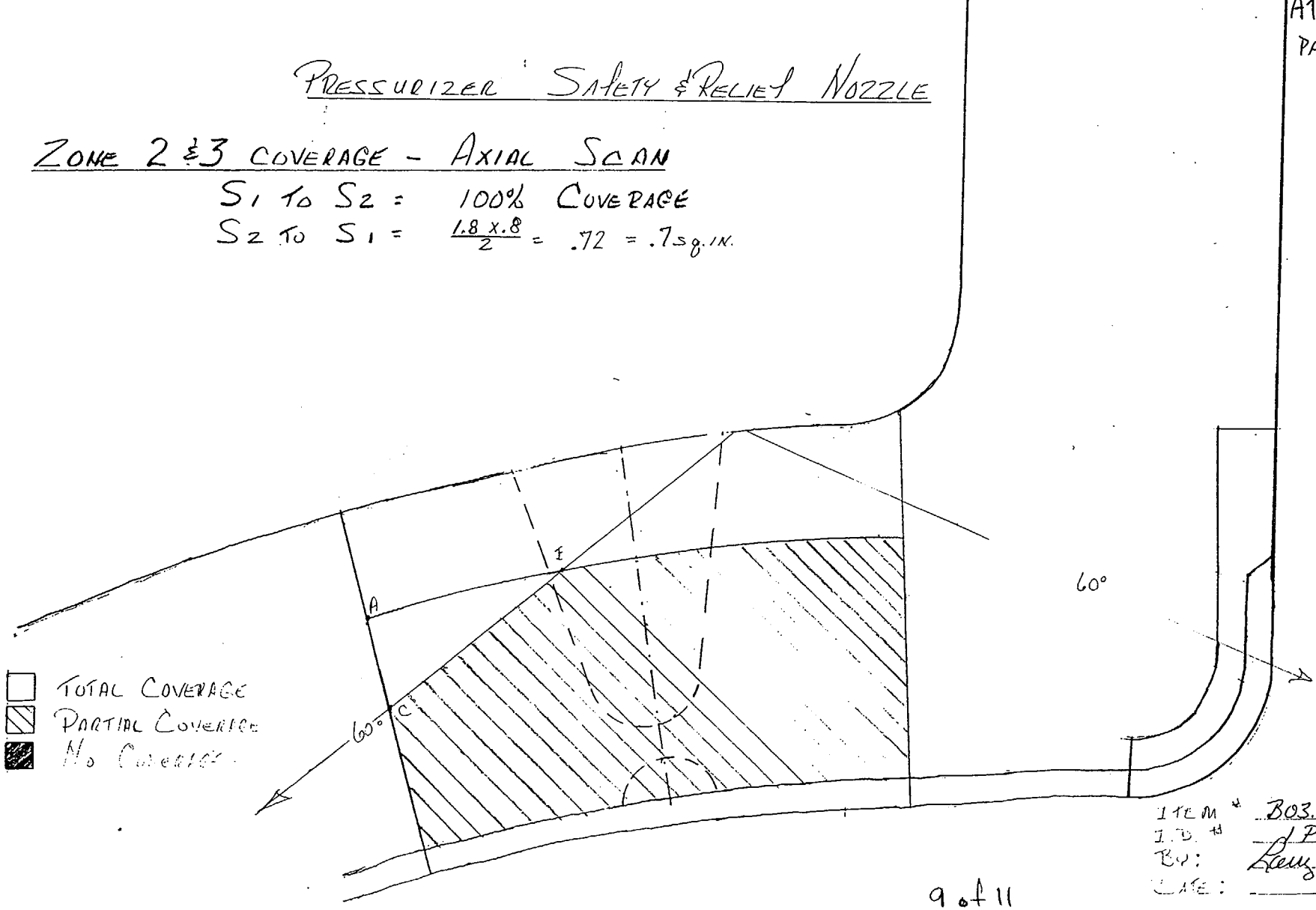
ITEM # B03.110.003
I.D. # 1PZR-13
BY: Larry Maulden LTII
10-1-99

PRESSURIZER SAFETY & RELIEF NOZZLE

ZONE 2 & 3 COVERAGE - AXIAL SCAN

S_1 TO S_2 = 100% COVERAGE

S_2 TO S_1 = $\frac{1.8 \times .8}{2} = .72 = .7$ sq. IN.



ITEM # B03.110.003
I.D. # PZR-13
BY: Larry Mauldin L III
DATE: 10-1-99

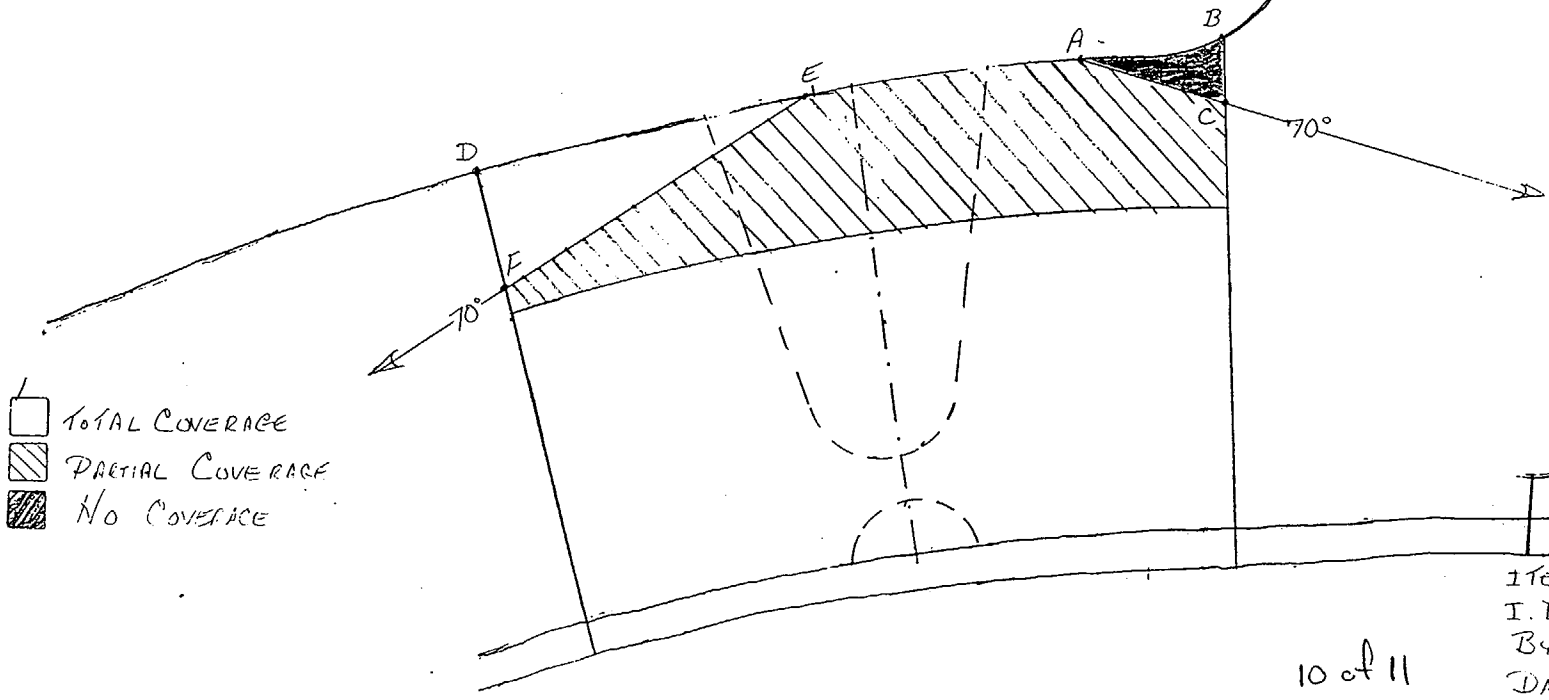
PRESSURIZER SAFETY & RELIEF NOZZLE

ZONE 1 COVERAGE - AXIAL SCAN

S_1 TO S_2 = ABC $\frac{.95 \times .35}{2} = .16625$

4.9 (TOTAL COVERAGE) - .16625 = 4.733 = 4.7 sq. in.

S_2 TO S_1 = DEF $\frac{2.2 \times .8}{2} = .88 = .9$ sq. in.



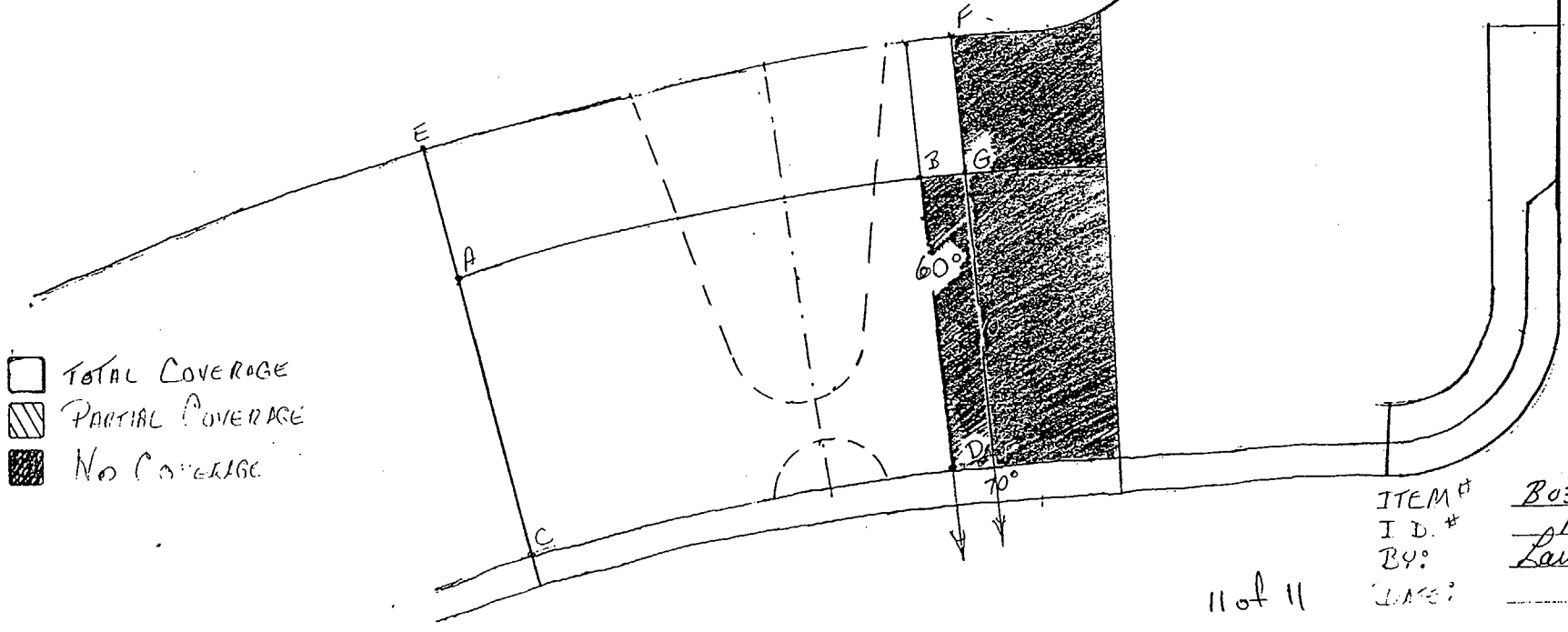
ITEM # B03.110.003
I.D. # PZR-13
BY: Larry Moulder L III
DATE: 10-1-99

PRESSURIZER SAFETY & RELIEF NOZZLE

ZONE 2 & 3 COVERAGE - CIRC. SCAN

60° CW & CCW = $\frac{2.1}{2}(3.45+3.1) = 6.8775 = 6.9$ sq. in (ABCD)

70° CW & CCW = AEFG $\frac{1.0}{2}(3.9+3.75) = 3.825 = 3.8$ sq. in.



ITEM # B03. 110. 003
I.D. # 1 PZR-13
BY: Larry Mauldin L III
DATE: 10-1-99

SERIAL NO. 99-003
ATTACHMENT 1
PAGE 12 of 25

DUKE POWER COMPANY

ULTRASONIC EXAMINATION DATA SHEET FOR PLANAR REFLECTORS

Exam Start: 1109
Exam Finish: 1127
Form NDE-UT-2A
Revision 4

Station: McGUIRE | Unit: 1 | Component/Weld ID: 1PZR-13R | Date: 9/30/99

Weld Length (in.): N/A | Surface Condition: AS GROUND | Lo: 9.2.3

Surface Temperature: 76° ° F
Pyrometer S/N: MCNDE 27021
Cal Due: 11/17/99

Examiner: Jay A. Eaton Level: II
Examiner: Larry Mauldin Level: III

Procedure: NDE-680 Rev: 2
FC: N/A

Calibration Sheet No:
9901055, 9901056

Scans:
45 ☐ ____ dB 70 ☐ ____ dB
45T ☐ ____ dB 70T ☒ 57.5 dB
60 ☐ ____ dB
60T ☒ 56 dB
Other: ____ dB

Configuration: Nozzle to Head
Nozzle Flow Head
S2 to S1
Scan Surface: OD

Applies to NDE-680 only
Skew Angle: 14°

IND #	∡	Max % Ref	Mp Max	W Max	L Max	L1	L2	W1	Mp1	W2	Mp2	Beam Dir.	Exam Surf.	Scan	Damps
		DO NOT WRITE IN THIS SPACE				20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	DO NOT WRITE IN THIS SPACE			
NRI	60°														
NRI	70°														

Remarks:

Limitations: (see NDE-UT-4) ☐ 90% or greater coverage obtained: yes ☐ no ☒

Sheet 1 of 3

Reviewed By: Rod Sheffield Level: II Date: 10-4-99

Authorized Inspector: [signature] Date: 10-6-99

Item No: B03.120.003

R GO 11-1-99

DUKE POWER COMPANY
Limited Examination Coverage Worksheet

NDE-91-1

Revision 0

Examination Volume/Area Defined

☐ Base Metal ☐ Weld ☐ Near Surface ☐ Bolting ☒ Inner Radius

Area Calculation	Volume Calculation
** See Attached Sheets **	1.72 Sq. In. X 47.5 In. = 81.7 Cu. In.

Coverage Calculations

Scan #	Angle	Beam Direction	Area Examined (sq.in.)	Length Examined (in.)	Volume Examined (cu.in.)	Volume Required (cu.in.)	Percent Coverage
1	60°/70°	CW	1.08	47.5	51.3	81.7	62.79
2	60°/70°	CW	1.08	47.5	51.3	81.7	62.79
					102.6	163.4	62.79

ATTACHMENT 1
PAGE 13 of 25

		Item No:	B03.120.003
Prepared By: Larry Mauldin	Level: III		Date: 10-1-99
Reviewed By: Rod Sheffield	Level: II		Date: 10-4-99

RGL 11-1-99

2 of 3

NOZZLE INNER RADIUS

AREA of INTEREST

$\pi \times 1''^2 - \pi \times .5''^2 \div 4 =$

$3.1415 - .7853 \div 4 = .589$ sq. in. (RADIUS)

$ABCD = 2.25'' \times .5'' = 1.125$ sq. in (NOZZLE)

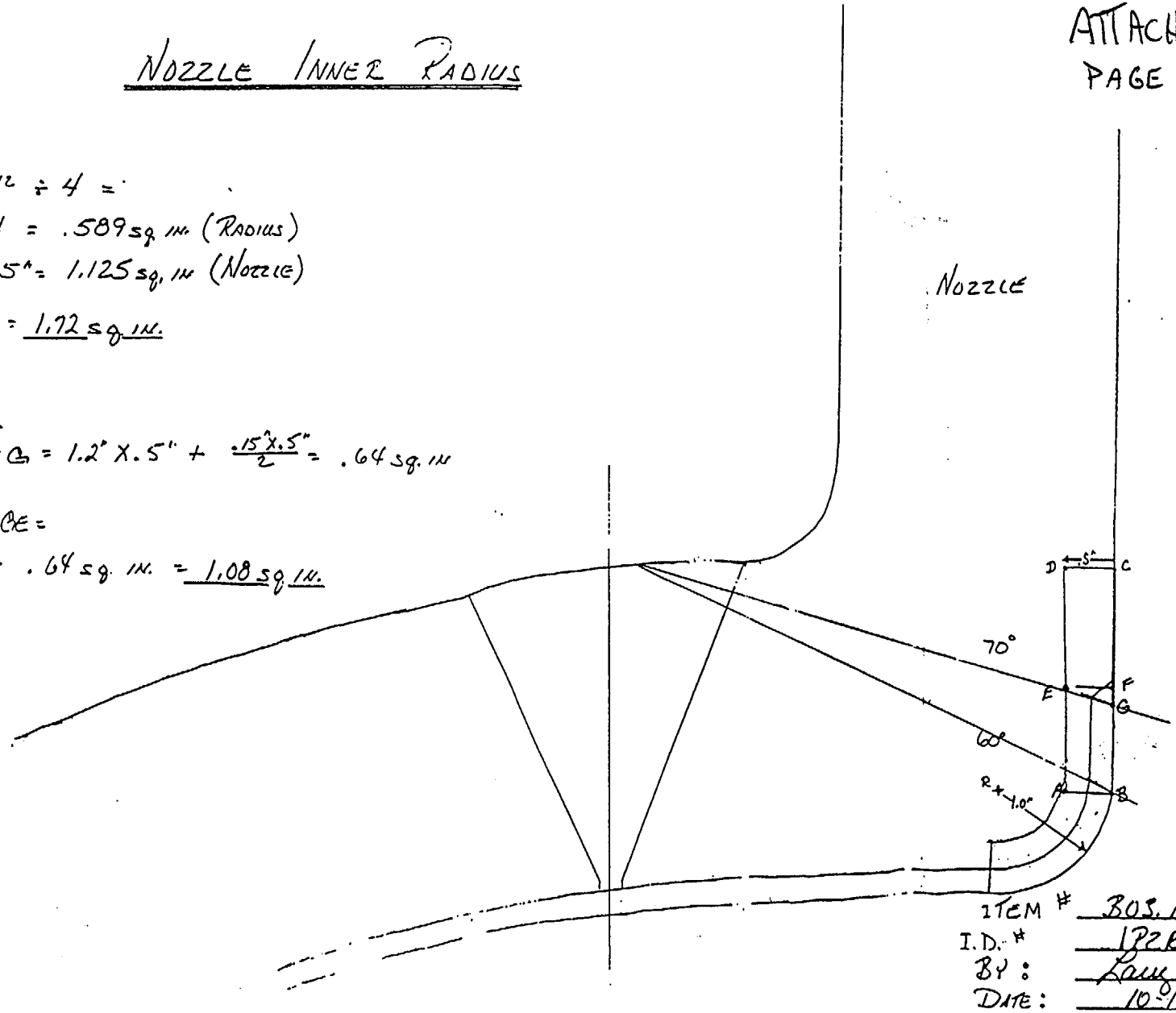
$1.125 + .589 = \underline{1.72 \text{ sq. in.}}$

AREA of LOSS

$CDEF + EFG = 1.2'' \times .5'' + \frac{.15'' \times .5''}{2} = .64$ sq. in

AREA of COVERAGE =

1.72 sq. in $- .64$ sq. in. $= \underline{1.08 \text{ sq. in.}}$



ITEM # 305.120.003
I.D. # 172R-13R
BY: Larry Thornton
DATE: 10-1-99

DUKE POWER COMPANY

ULTRASONIC EXAMINATION DATA SHEET FOR PLANAR REFLECTORS

Exam Start: 1127	Form NDE-UT-2A	
Exam Finish: 1150	Revision 4	

Station: McGUIRE	Unit: 1	Component/Weld ID: 1PZR-14R	Date: 9/30/99
Weld Length (in.): N/A	Surface Condition: AS GROUND	Lo: 9.2.3	Surface Temperature: 76° ° F

Examiner: Jay A. Eaton Level: II

Examiner: Larry Mauldin Level: III

Procedure: NDE-680 Rev: 2

FC: N/A

Calibration Sheet No: 9901055, 9901056

Scans:

45 ☐ ____ dB 70 ☐ ____ dB

45T ☐ ____ dB 70T ☒ 57.5 dB

60 ☐ ____ dB

60T ☒ 56 dB

Other: ____ dB

Pyrometer S/N: MCNDE 27021

Cal Due: 11/17/99

Configuration: Nozzle To Head

Nozzle S2 Flow to Head S1

Scan Surface: OD

Applies to NDE-680 only

Skew Angle: 14°

IND #	∡	Max % Ref	Mp Max	W Max	L Max	L1	L2	W1	Mp1	W2	Mp2	Beam Dir.	Exam Surf.	Scan	Damps
		DO NOT WRITE IN THIS SPACE				20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	DO NOT WRITE IN THIS SPACE			
NRI	60°														
NRI	70°														

Remarks:

Limitations: (see NDE-UT-4) ☐ 90% or greater coverage obtained: yes ☐ no ☒

Sheet 1 of 3

Reviewed By:	Level:	Date:	Authorized Inspector:	Date:	Item No:
Rod Sheffield	II	10-4-99		10-6-99	B03.120.004

R 3 11-1-99

DUKE POWER COMPANY
Limited Examination Coverage Worksheet

NDE-91-1

Revision 0

Examination Volume/Area Defined

☐ Base Metal ☐ Weld ☐ Near Surface ☐ Bolting ☒ Inner Radius

Area Calculation	Volume Calculation
** See Attached Sheets **	1.72 Sq. In. X 47.5 In. = 81.7 Cu. In.

Coverage Calculations

Scan #	Angle	Beam Direction	Area Examined (sq.in.)	Length Examined (in.)	Volume Examined (cu.in.)	Volume Required (cu.in.)	Percent Coverage
1	60°/70°	CW	1.08	47.5	51.3	81.7	62.79
2	60°/70°	CW	1.08	47.5	51.3	81.7	62.79
					102.6	163.4	62.79

ATTACHMENT 1
PAGE 16 of 25

		Item No:	B03.120.004
Prepared By: Larry Mauldin	Level: III		Date: 10-1-99
Reviewed By: Rod Sheffield	Level: I		Date: 10-4-99

R 10-1-99

NOZZLE INNER RADIUS

AREA of INTEREST

$\pi \times 1''^2 - \pi \times .5''^2 \div 4 =$

$3.1415 - .7853 \div 4 = .589$ sq in (RADIUS)

ABCD = 2.25" x .5" = 1.125 sq. in (NOZZLE)

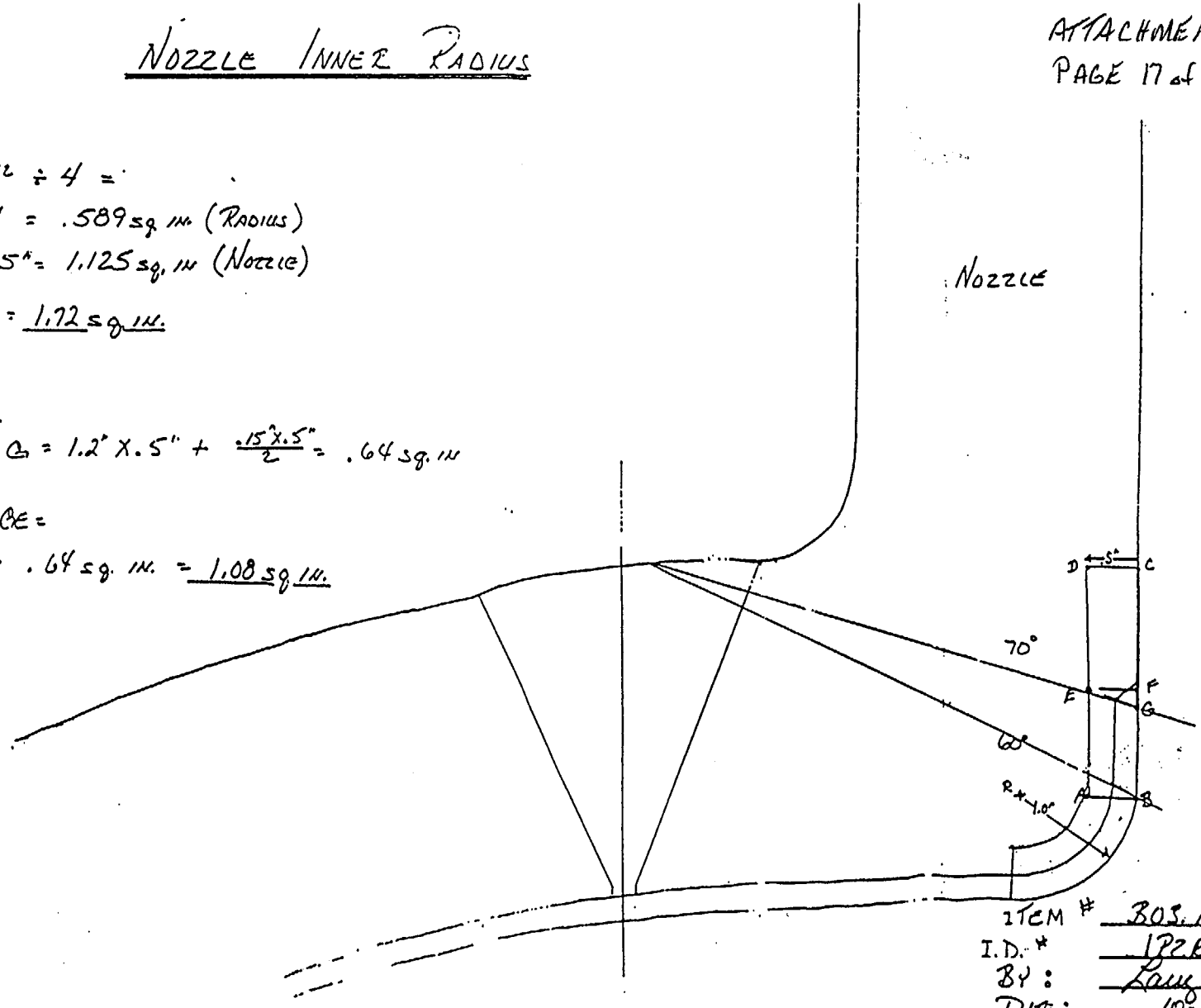
1.125 + .589 = 1.72 sq in.

AREA of LOSS

CDEF + EFG = 1.2" x .5" + $\frac{.15" \times .5"}{2}$ = .64 sq. in

AREA of COVERAGE =

1.72 sq. in − .64 sq. in. = 1.08 sq in.



ITEM # 305.120.004
I.D. # 1PZR-14R
BY: Larry Thornton
DATE: 10-1-99

DUKE POWER COMPANY

ULTRASONIC EXAMINATION DATA SHEET FOR PLANAR REFLECTORS

Exam Start: 1051	Form NDE-UT-2A	
Exam Finish: 1135	Revision 4	

Station: McGUIRE	Unit: 1	Component/Weld ID: 1SGB-INLET	Date: 10/12/99
Weld Length (in.): 94.25	Surface Condition: MACHINED	Lo: 9.2.3	Surface Temperature: 75 ° F
Examiner: Jay A. Eaton	Level: II	Scans:	Pyrometer S/N: MCNDE 27017
Examiner: James H. Resor	Level: II	45 ☐ ____ dB 70 ☒ 66 dB	Cal Due: 1/15/00
Procedure: NDE-680 Rev: 2	FC: N/A	45T ☐ ____ dB 70T ☐ ____ dB	Configuration: INNER RADIUS
		60 ☒ 64.5 dB	N/A Flow N/A
		60T ☐ ____ dB	N/A to N/A
Calibration Sheet No: 9901089, 9901090		Other: ____ dB	Scan Surface: OD
			Applies to NDE-680 only
			Skew Angle: 23°&23.5°

IND #	∡	Max % Ref	Mp Max	W Max	L Max	L1	L2	W1	Mp1	W2	Mp2	Beam Dir.	Exam Surf.	Scan	Damps
		DO NOT WRITE IN THIS SPACE				20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	DO NOT WRITE IN THIS SPACE			
NRI	60°														
NRI	70°														

Remarks:

Limitations: (see NDE-UT-4) ☒ 90% or greater coverage obtained: yes ☐ no ☒ Sheet 1 of 4

Reviewed By:	Level:	Date:	Authorized Inspector:	Date:	Item No:
Rod Sheffield	II	10-18-99		10-18-99	B03.140.003

R 11-1-99

DUKE POWER COMPANY
ISI LIMITATION REPORT

FORM NDE-UT-4
Revision 1

Component/Weld ID: 1SGB-INLET | Item No: B03.140.003 | Remarks:

☐ NO SCAN
☒ LIMITED SCAN
SURFACE: ☒ 1 ☐ 2
BEAM DIRECTION: ☐ 1 ☒ 2 ☒ cw ☒ ccw
FROM L 0 - 22.0" to L 0 - 42.5" INCHES FROM WO N/A to N/A
ANGLE: ☐ 0 ☐ 45 ☒ 60 ☒ Other 70° FROM N/A DEG to N/A DEG
Remarks: SUPPORT CORNER IS 1.0 FROM C/L OF NOZZLE OD RADIUS

☐ NO SCAN
☒ LIMITED SCAN
SURFACE: ☒ 1 ☐ 2
BEAM DIRECTION: ☐ 1 ☒ 2 ☒ cw ☒ ccw
FROM L N/A to L N/A INCHES FROM WO C/L + 6" to C/L + 10"
ANGLE: ☐ 0 ☐ 45 ☒ 60 ☒ Other 70° FROM 176 DEG to 184 DEG
Remarks: ELECTRICAL BOX ON HEAD

☒ NO SCAN
☐ LIMITED SCAN
SURFACE: ☐ 1 ☒ 2
BEAM DIRECTION: ☐ 1 ☒ 2 ☒ cw ☒ ccw
FROM L N/A to L N/A INCHES FROM WO C/L RADIUS to BEYOND
ANGLE: ☐ 0 ☐ 45 ☒ 60 ☒ Other 70° FROM 0 DEG to 360 DEG
Remarks: LIMITED ON NOZZLE C/L OF BLEND RADIUS

☐ NO SCAN
☐ LIMITED SCAN
SURFACE: ☐ 1 ☐ 2
BEAM DIRECTION: ☐ 1 ☐ 2 ☐ cw ☐ ccw
FROM L to L INCHES FROM WO to
ANGLE: ☐ 0 ☐ 45 ☐ 60 ☐ Other FROM DEG to
Remarks:

Prepared By: [signature] Level: II Date: 10/13/99 **Sketch(s) attached** ☒ yes ☐ no Sheet 2 of 4

Reviewed By: Larry Trawlder Date: 10-14-99 Authorized Inspector: [signature] Date: 10-18-99

VR 11-1-99

DUKE POWER COMPANY
Limited Examination Coverage Worksheet

NDE-91-1

Revision 0

Examination Volume/Area Defined

☐ Base Metal ☐ Weld ☐ Near Surface ☐ Bolting ☒ Inner Radius

Area Calculation	Volume Calculation
TOTAL AREA = 5.98 SQ. IN.	5.98 SQ. IN. X 30 IN DIA. TT = 563.6 IN. CU.

Coverage Calculations

Scan #	Angle	Beam Direction	Area Examined (sq.in.)	Length Examined (in.)	Volume Examined (cu.in.)	Volume Required (cu.in.)	Percent Coverage
	60/70	23.5/23° SKEW	4.98	94.25	469.37	563.6	83.28

ATTACHMENT 1
PAGE 20 of 25

			Item No:	B03.140.003	
Prepared By:	[signature]	Level:	II	Date:	10/13/99
Reviewed By:	Larry Maulden	Level:	III	Date:	10-14-99

10-14-99

1 SGB - INLET NOZZLE

AREA CALCULATION

$$\frac{\sin^2 R\pi - 4.5\,in^2 R\pi}{4} = 3.73\,in^2$$

$4.5\,in \times 0.5\,in = \underline{2.25\,in^2}$

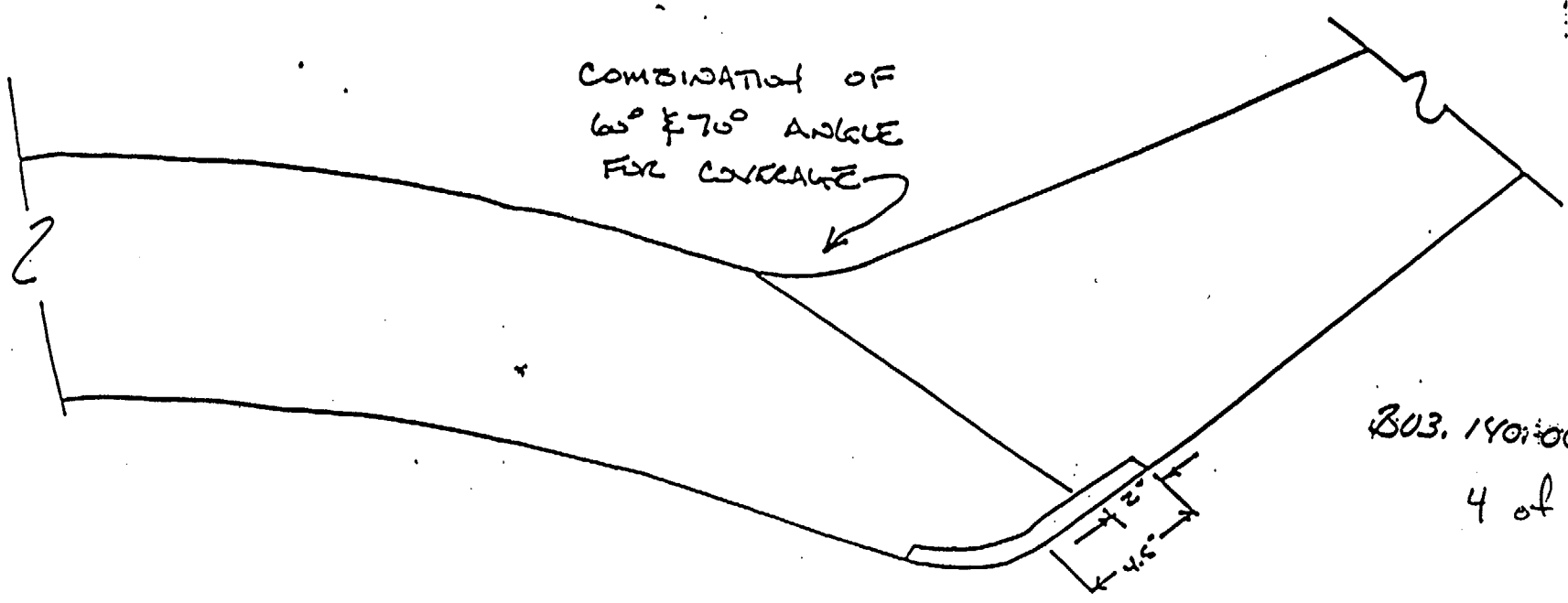
TOTAL AREA $= 5.98\,in^2$

TOTAL % COVERAGE

$$\frac{4.98\,in^2}{5.98\,in^2} = 83.3 \times 100 = \boxed{83.3\,\%}$$

AREA INSPECTED

$5.98\,in^2 - (2.0\,in \times 0.5\,in) = 4.98\,in^2$



DUKE POWER COMPANY

ULTRASONIC EXAMINATION DATA SHEET FOR PLANAR REFLECTORS

Exam Start: 1051	Form NDE-UT-2A	
Exam Finish: 1135	Revision 4	

Station: McGUIRE	Unit: 1	Component/Weld ID: 1SGB-OUTLET	Date: 10/12/99
Weld Length (in.): 94.25	Surface Condition: MACHINED	Lo: 9.2.3	Surface Temperature: 75 ° F

Examiner: Jay A. Eaton Level: II

Examiner: James H. Resor Level: II

Procedure: NDE-680 Rev: 2

FC: N/A

Calibration Sheet No: 9901089, 9901090

Scans:

45 ☐ ____ dB 70 ☒ 66 dB

45T ☐ ____ dB 70T ☐ ____ dB

60 ☒ 64.5 dB

60T ☐ ____ dB

Other: ____ dB

Pyrometer S/N: MCNDE 27017

Cal Due: 1/15/00

Configuration: INNER RADIUS

N/A Flow N/A

N/A to N/A

Scan Surface: OD

Applies to NDE-680 only

Skew Angle: 23°&23.5°

IND #	∡	Max % Ref	Mp Max	W Max	L Max	L1	L2	W1	Mp1	W2	Mp2	Beam Dir.	Exam Surf.	Scan	Damps
		DO NOT WRITE IN THIS SPACE				20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	DO NOT WRITE IN THIS SPACE			
NRI	60°														
NRI	70°														

Remarks:

Limitations: (see NDE-UT-4) ☒ 90% or greater coverage obtained: yes ☐ no ☒

Sheet 1 of 4

Reviewed By:	Level:	Date:	Authorized Inspector:	Date:	Item No:
Rod Sheffield	II	10-18-99	[illegible]	10-18-99	B03.140.004

11-1-99

DUKE POWER COMPANY
ISI LIMITATION REPORT

FORM NDE-UT-4
Revision 1

Component/Weld ID: 1SGB-OUTLET | Item No: B03.140.004 | Remarks:

☐ NO SCAN
☒ LIMITED SCAN
SURFACE: ☒ 1 ☐ 2
BEAM DIRECTION: ☐ 1 ☒ 2 ☒ cw ☒ ccw
FROM L 0 + 23.5 to L 0 + 43.8 INCHES FROM WO N/A to N/A
ANGLE: ☐ 0 ☐ 45 ☒ 60 ☒ Other 70° FROM N/A DEG to N/A DEG
Remarks: SUPPORT CORNER IS 1.0 FROM C/L OF NOZZLE OD RADIUS

☒ NO SCAN
☐ LIMITED SCAN
SURFACE: ☐ 1 ☒ 2
BEAM DIRECTION: ☐ 1 ☒ 2 ☒ cw ☒ ccw
FROM L N/A to L N/A INCHES FROM WO C/L RADIUS to BEYOND
ANGLE: ☐ 0 ☐ 45 ☒ 60 ☒ Other 70° FROM 0 DEG to 360 DEG
Remarks: LIMITED ON NOZZLE FROM C/L OF BLEND RADIUS

☐ NO SCAN
☐ LIMITED SCAN
SURFACE: ☐ 1 ☐ 2
BEAM DIRECTION: ☐ 1 ☐ 2 ☐ cw ☐ ccw
FROM L _____ to L _____ INCHES FROM WO _____ to _____
ANGLE: ☐ 0 ☐ 45 ☐ 60 ☐ Other _____ FROM ____ DEG to ____ DEG

☐ NO SCAN
☐ LIMITED SCAN
SURFACE: ☐ 1 ☐ 2
BEAM DIRECTION: ☐ 1 ☐ 2 ☐ cw ☐ ccw
FROM L _____ to L _____ INCHES FROM WO _____ to _____
ANGLE: ☐ 0 ☐ 45 ☐ 60 ☐ Other _____ FROM ____ DEG to ____

Prepared By: [signature] Level: II Date: 10/13/99 **Sketch(s) attached** ☒ yes ☐ no Sheet 2 of 4

Reviewed By: Larry Maulden Date: 10-14-99 Authorized Inspector: [signature] Date: 10-18-99

R 11-1-99

DUKE POWER COMPANY Limited Examination Coverage Worksheet	NDE-91-1 Revision 0

Examination Volume/Area Defined

☐ Base Metal ☐ Weld ☐ Near Surface ☐ Bolting ☒ Inner Radius

Area Calculation	Volume Calculation
TOTAL AREA = 5.98 SQ. IN.	5.98 SQ. IN. X 30 IN. DIA. TT = 563.6 IN. CU.

Coverage Calculations

Scan #	Angle	Beam Direction	Area Examined (sq.in.)	Length Examined (in.)	Volume Examined (cu.in.)	Volume Required (cu.in.)	Percent Coverage
	60/70	23.5/23°SKEW	4.98	94.25	469.37	563.6	83.28

ATTACHMENT 1
PAGE 24 of 25

			Item No:	B03.140.004	
Prepared By:		Level:	II	Date:	10/13/99
Reviewed By:	Larry Mauldin	Level:	III	Date:	10-14-99

1 SGB - OUTLET NOZZLE

AREA CALCULATION

$$\frac{\sin^2 R\pi - 4.5\,in^2 R\pi}{4} = 3.73\,in^2$$

$4.5\,in \times 0.5\,in = \underline{2.25\,in^2}$

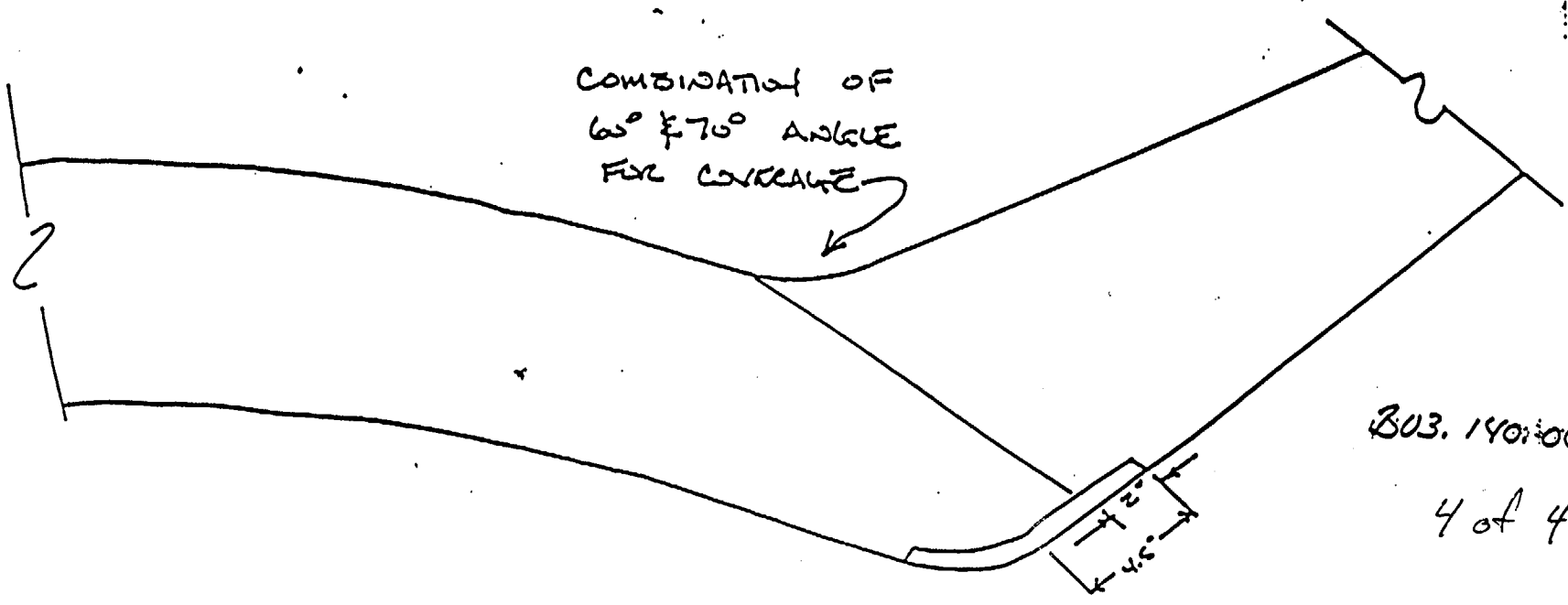
TOTAL AREA $= 5.98\,in^2$

TOTAL % COVERAGE

$$\frac{4.98\,in^2}{5.98\,in^2} = 83.3 \times 100 = \boxed{83.3\,\%}$$

AREA INSPECTED

$5.98\,in^2 - (2.0\,in \times 0.5\,in) = 4.98\,in^2$



B03.140.004

4 of 4

SERIAL NO. 99-003
ATTACHMENT 2
PAGE 1 of 8

DUKE POWER COMPANY

ULTRASONIC EXAMINATION DATA SHEET FOR PLANAR REFLECTORS

Exam Start: 0933
Exam Finish: 1011
Form NDE-UT-2A
Revision 4

Station: McGUIRE | Unit: 1 | Component/Weld ID: 1SGB-INLET-W5SE | Date: 10/12/99

Weld Length (in.): 121 | Surface Condition: MACHINED | Lo: 9.1.1.1

Surface Temperature: 75 ° F
Pyrometer S/N: MCNDE 27017
Cal Due: 1/15/00

Examiner: Larry Mauldin Level: III
Examiner: James L. Panel Level: II

Procedure: NDE-930 Rev: 1
FC: N/A

Calibration Sheet No:
9901091, 9901092

Scans:
45 ☒ 68.5 dB 70 ☐ ____ dB
45T ☒ 68.5 dB 70T ☐ ____ dB
60 ☐ ____ dB
60T ☐ ____ dB
Other: Remarks* dB

Configuration: CIRC
S2 Flow S1
INLET to SAFE END
Scan Surface: OD

Applies to NDE-680 only
Skew Angle: N/A

IND #	∡	Max % Ref	Mp Max	W Max	L Max	L1	L2	W1	Mp1	W2	Mp2	Beam Dir.	Exam Surf.	Scan	Damps
		DO NOT WRITE IN THIS SPACE				20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	DO NOT WRITE IN THIS SPACE			
NRI	33L°														
NRI	45L°														

Remarks: * 33RL- 62.5/67 DB

Limitations: (see NDE-UT-4) ☐ 90% or greater coverage obtained: yes ☐ no ☒

Sheet 1 of 4

Reviewed By: Rod Stuffel Level: II Date: 10-28-99
Authorized Inspector: [signature] Date: 10-19-99
Item No: B05.070.003

R GH 11-1-99

ATTACHMENT 2
PAGE 2 of 8

DUKE POWER COMPANY
ISI LIMITATION REPORT

FORM NDE-UT-4
Revision 1

Component/Weld ID: 1SGB-INLET-W5SE | Item No: B05.070.003 | Remarks:

☒ NO SCAN
☐ LIMITED SCAN

SURFACE: ☒ 1 ☐ 2
BEAM DIRECTION: ☐ 1 ☒ 2 ☐ cw ☐ ccw

FROM L 0 to L 121.0 INCHES FROM WO N/A to N/A

ANGLE: ☐ 0 ☒ 45 ☐ 60 ☐ Other _____ FROM 0 DEG to 360° DEG

Remarks: DUE TO NOZZLE CONFIGURATION

☐ NO SCAN
☐ LIMITED SCAN

SURFACE: ☐ 1 ☐ 2
BEAM DIRECTION: ☐ 1 ☐ 2 ☐ cw ☐ ccw

FROM L _____ to L _____ INCHES FROM WO _____ to _____

ANGLE: ☐ 0 ☐ 45 ☐ 60 ☐ Other _____ FROM ____ DEG to ____ DEG

☐ NO SCAN
☐ LIMITED SCAN

SURFACE: ☐ 1 ☐ 2
BEAM DIRECTION: ☐ 1 ☐ 2 ☐ cw ☐ ccw

FROM L _____ to L _____ INCHES FROM WO _____ to _____

ANGLE: ☐ 0 ☐ 45 ☐ 60 ☐ Other _____ FROM ____ DEG to ____ DEG

☐ NO SCAN
☐ LIMITED SCAN

SURFACE: ☐ 1 ☐ 2
BEAM DIRECTION: ☐ 1 ☐ 2 ☐ cw ☐ ccw

FROM L _____ to L _____ INCHES FROM WO _____ to _____

ANGLE: ☐ 0 ☐ 45 ☐ 60 ☐ Other _____ FROM ____ DEG to ____

Prepared By: Larry Thaulder Level: III Date: 10-13-99 | **Sketch(s) attached** ☒ yes ☐ no | Sheet 2 of 4

Reviewed By: Rod Sheffield Date: 10-14-99 | Authorized Inspector: [illegible] Date: 10-18-99

R GH 11-1-99

DUKE POWER COMPANY
Limited Examination Coverage Worksheet

NDE-91-1

Revision 0

Examination Volume/Area Defined

☒ Base Metal ☒ Weld ☐ Near Surface ☐ Bolting ☐ Inner Radius

Area Calculation	Volume Calculation
3.2" X 1.25" = 4 SQ. IN.	4 SQ. IN. X 121" (WELD LENGTH) = 484 CU. IN.

Coverage Calculations

Scan #	Angle	Beam Direction	Area Examined (sq.in.)	Length Examined (in.)	Volume Examined (cu.in.)	Volume Required (cu.in.)	Percent Coverage
1	33	1	4	121	484	484	100.00
2	45	2	0	121	0	484	0.00
3	45	CW	4	121	484	484	100.00
4	45	CW	4	121	484	484	100.00
		TOTAL	AGGREGATE	COVERAGE	1452	1936	75.00

ATTACHMENT 2 PAGE 3 of 8

Item No: B05.070.003

Prepared By: Larry Mauldin Level: III Date: 10-13-99

Reviewed By: Rod Sheffield Level: II Date: 10-14-99

11-1-99

Form 00184 (R4-88)

DUKE POWER COMPANY

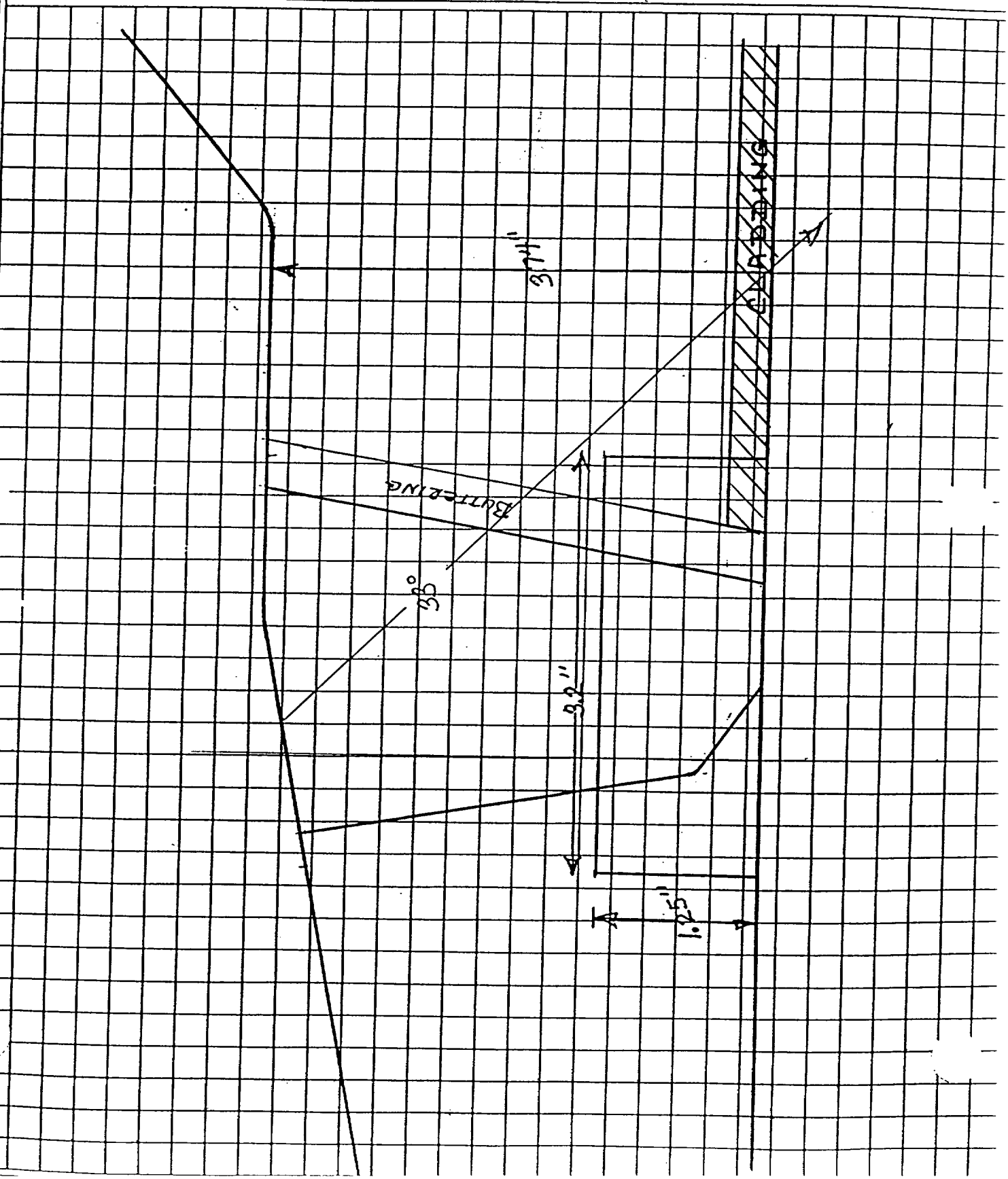
Station McGUIRE Unit 1 Rev. ____ File No. ____ Sheet 4 of 4

Subject SAFE END TO NOZZLE

ISC-B-INLET-W5SE By Larry Mauldin Date 10-13-99

Prob No. B05.070.003 Checked By ____ Date ____

ATTACHMENT 2
PAGE 4 of 8



DUKE POWER COMPANY

ULTRASONIC EXAMINATION DATA SHEET FOR PLANAR REFLECTORS

Exam Start: 1015 | Form NDE-UT-2A
Exam Finish: 1045 | Revision 4

Station: McGUIRE | Unit: 1 | Component/Weld ID: 1SGB-OUTLET-W6SE | Date: 10/12/99

Weld Length (in.): 121 | Surface Condition: MACHINED | Lo: 9.1.1.1 | Surface Temperature: 75 ° F

Examiner: Larry Mauldin *Larry Mauldin* Level: III
Examiner: James L. Panel *James L Panel* Level: II

Pyrometer S/N: MCNDE 27017
Cal Due: 1/15/00

Procedure: NDE-930 Rev: 1 | FC: N/A

Scans:
45 ☒ 68.5 dB 70 ☐ ____ dB
45T ☒ 68.5 dB 70T ☐ ____ dB
60 ☐ ____ dB
60T ☐ ____ dB
Other: Remarks* dB

Configuration: CIRC
S2 Flow S1
OUTLET to SAFE END
Scan Surface: OD

Calibration Sheet No:
9901091, 9901092

Applies to NDE-680 only
Skew Angle: N/A

IND #	∡	Max % Ref	Mp Max	W Max	L Max	L1	L2	W1	Mp1	W2	Mp2	Beam Dir.	Exam Surf.	Scan	Damps
		DO NOT WRITE IN THIS SPACE				20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	DO NOT WRITE IN THIS SPACE			
NRI	33L°														
NRI	45L°														

Remarks: *33RL-62.5/67 DB

Limitations: (see NDE-UT-4) ☐ 90% or greater coverage obtained: yes ☐ no ☒ | Sheet 1 of 4

Reviewed By: Rod Sheffield | Level: II | Date: 10-18-99
Authorized Inspector: [signature] | Date: 10-18-99
Item No: B05.070.004

R
GO
11-1-99

DUKE POWER COMPANY
ISI LIMITATION REPORT

FORM NDE-UT-4
Revision 1

Component/Weld ID: 1SGB-OUTLET-W6SE Item No: B05.070.004 Remarks:

☒ NO SCAN
☐ LIMITED SCAN

SURFACE: ☒ 1 ☐ 2
BEAM DIRECTION: ☐ 1 ☒ 2 ☐ cw ☐ ccw

FROM L 0 to L 121.0 INCHES FROM WO N/A to N/A

ANGLE: ☐ 0 ☒ 45 ☐ 60 ☐ Other _____ FROM 0 DEG to 360° DEG

DUE TO NOZZLE CONFIGURATION

☐ NO SCAN
☐ LIMITED SCAN

SURFACE: ☐ 1 ☐ 2
BEAM DIRECTION: ☐ 1 ☐ 2 ☐ cw ☐ ccw

FROM L _____ to L _____ INCHES FROM WO _____ to _____

ANGLE: ☐ 0 ☐ 45 ☐ 60 ☐ Other _____ FROM ____ DEG to ____ DEG

☐ NO SCAN
☐ LIMITED SCAN

SURFACE: ☐ 1 ☐ 2
BEAM DIRECTION: ☐ 1 ☐ 2 ☐ cw ☐ ccw

FROM L _____ to L _____ INCHES FROM WO _____ to _____

ANGLE: ☐ 0 ☐ 45 ☐ 60 ☐ Other _____ FROM ____ DEG to ____ DEG

☐ NO SCAN
☐ LIMITED SCAN

SURFACE: ☐ 1 ☐ 2
BEAM DIRECTION: ☐ 1 ☐ 2 ☐ cw ☐ ccw

FROM L _____ to L _____ INCHES FROM WO _____ to _____

ANGLE: ☐ 0 ☐ 45 ☐ 60 ☐ Other _____ FROM ____ DEG to ____

Prepared By: Larry Mauldin Level: III Date: 10-13-99 **Sketch(s) attached** ☒ yes ☐ no Sheet 2 of 4

Reviewed By: Rod Sheffield Date: 10-14-99 Authorized Inspector: [signature] Date: 10-19-99

R GJ 11-1-99

DUKE POWER COMPANY
Limited Examination Coverage Worksheet

NDE-91-1

Revision 0

Examination Volume/Area Defined

☒ Base Metal ☒ Weld ☐ Near Surface ☐ Bolting ☐ Inner Radius

Area Calculation	Volume Calculation
3.2" X 1.25" = 4 SQ. IN.	4 SQ. IN. X 121" (WELD LENGTH) = 484 CU. IN.

Coverage Calculations

Scan #	Angle	Beam Direction	Area Examined (sq.in.)	Length Examined (in.)	Volume Examined (cu.in.)	Volume Required (cu.in.)	Percent Coverage
1	33	1	4	121	484	484	100.00
2	45	2	0	121	0	484	0.00
3	45	CW	4	121	484	484	100.00
4	45	CW	4	121	484	484	100.00
		TOTAL	AGGREGATE	COVERAGE	1452	1936	75.00

ATTACHMENT 2
PAGE 7 of 8

Item No: B05.070.004

Prepared By: Larry Maulden Level: III Date: 10-13-99

Reviewed By: Rod Sheffield Level: II Date: 10-14-99

R GX 11-1-99

Form 00184 (R4-88)

DUKE POWER COMPANY

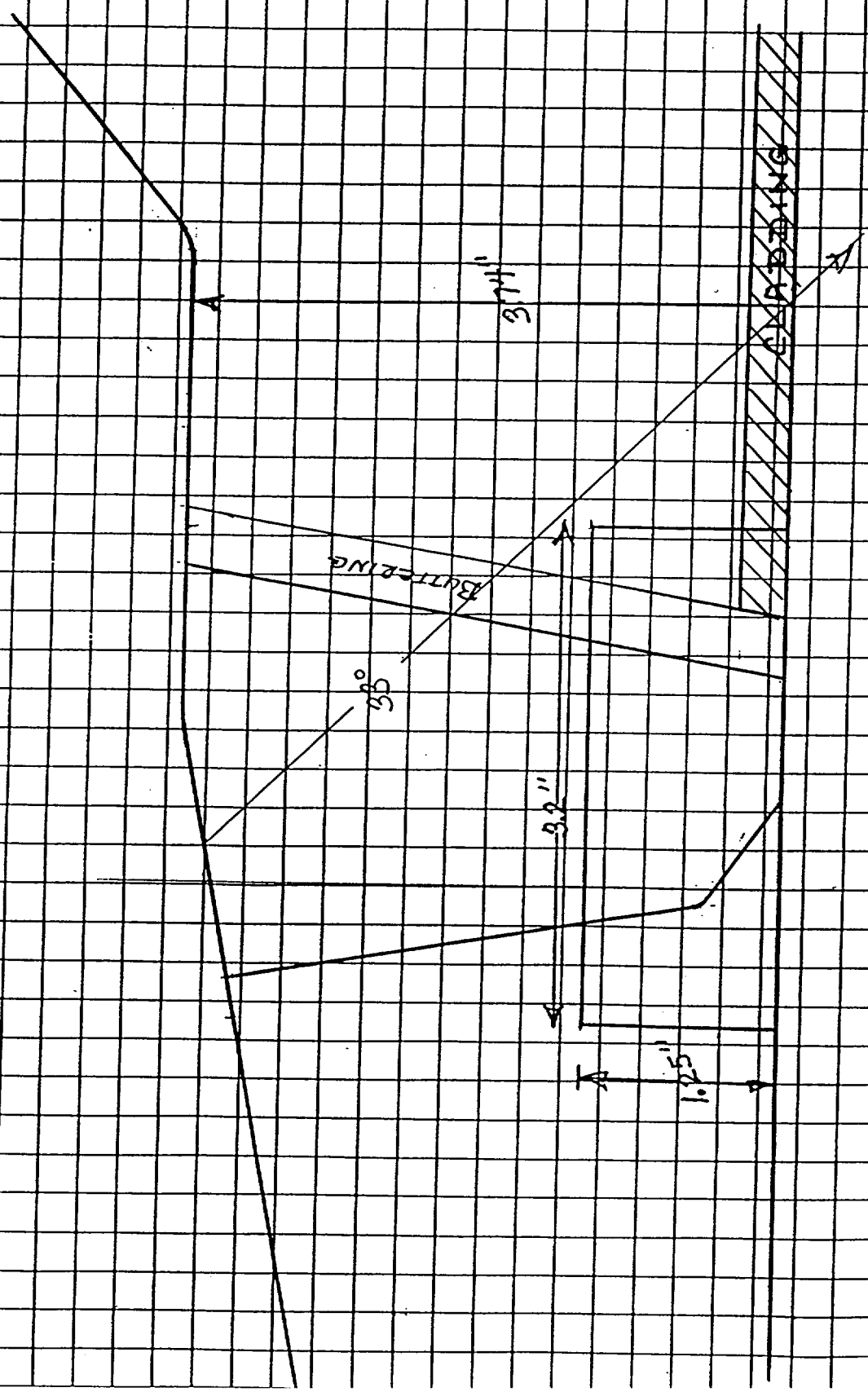
Station McGUIRE Unit 1 Rev. ____ File No. ____ Sheet 4 Of 4

Subject SAFE END TO NOZZLE

ISG-B-OUTLET-W6SE By Larry Maulden Date 10-13-

Prob No. B05.070.004 Checked By ____ Date ____

ATTACHMENT 2
PAGE 8 of 8



SERIAL NO. 99-003
ATTACHMENT 3
PAGE 1 of 8

DUKE POWER COMPANY
ULTRASONIC EXAMINATION DATA SHEET FOR LAMINAR REFLECTORS

Exam Start: 1106		NDE-UT-3A
Exam Finish: 1128		Revision 2

Station: McGUIRE	Unit: 1	Component/Weld ID: 1BCSHX-SH-48	Date: 9/17/99
Nominal Material Thickness (in): 0.625		Weld Length (in.): 175"	Surface Temperature: 83° Deg F
Measured Material Thickness (in): 0.675		Lo: 0°	Pyrometer S/N: MCNDE 27017
Surface Condition: AS GROUND		Calibration Sheet No: 9901022	Cal Due: 1/15/00
Examiner: David Zimmerman DKZ Level: II			Configuration:
Examiner: Winfred C. Leeper Level: II			S1 Flow S2
Procedure: NDE-640 Rev: 1 FC: *			T-SHEET to SHELL

IND NO.	4	Ampl ≥ rem BW LOB	L1 ≥ rem BW LOB	W1 ≥ rem BW LOB	Mp1 ≥ rem BW LOB	W2 ≥ rem BW LOB	Mp2 ≥ rem BW LOB	L2 ≥ rem BW LOB	W1 ≥ rem BW LOB	Mp1 ≥ rem BW LOB	W2 ≥ rem BW LOB	Mp2 ≥ rem BW LOB	Exam Surf.	Damps
NRI	0°													

Remarks: * FC 95-18, 95-19

	Limitations: see NDE-UT-4 ☒ None: ☐	Sheet 1 of 8
Reviewed By: Larry Maulda Level: III Date: 10-5-99	Authorized Inspector: Date: 10-8-99	Item No: C01.030.010

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ATTACHMENT 3
PAGE 2 of 8

DUKE POWER COMPANY

ULTRASONIC EXAMINATION DATA SHEET FOR PLANAR REFLECTORS

Exam Start: 1134 | Exam Finish: 1205 | Form NDE-UT-2A | Revision 4

Station: McGUIRE | Unit: 1 | Component/Weld ID: 1BCSHX-SH-48 | Date: 9/17/99

Weld Length (in.): 175" | Surface Condition: AS GROUND | Lo: 0°

Surface Temperature: 83 ° F

Examiner: David Zimmerman DKZ by FB Level: II

Examiner: Winfred C. Leeper Level: II

Pyrometer S/N: MCNDE 27017

Cal Due: 1/15/00

Procedure: NDE-630 Rev: 2 | FC: 99-02

Configuration: S1 Flow S2

T-SHEET to SHELL

Scan Surface: OD

Calibration Sheet No: 9901023, 9901024

Scans:

45 ☒ 34.5 dB 70 ☐ ____ dB

45T ☒ 34.5 dB 70T ☐ ____ dB

60 ☐ ____ dB

60T ☐ ____ dB

Other: ____ dB

Applies to NDE-680 only

Skew Angle: N/A

IND #	∡	Max % Ref	Mp Max	W Max	L Max	L1	L2	W1	Mp1	W2	Mp2	Beam Dir.	Exam Surf.	Scan	Damps
		DO NOT WRITE IN THIS SPACE				20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	DO NOT WRITE IN THIS SPACE			
1	45°	120	1.125	0.55	10.0	360°	INT	N/A	N/A	N/A	N/A	2	1	AXIAL	NO

Remarks:

Limitations: (see NDE-UT-4) ☒ 90% or greater coverage obtained: yes ☐ no ☒

Sheet 2 of 8

Reviewed By: Larry Maulda Level: III Date: 10-5-99

Authorized Inspector: [signature] Date: 10-8-99

Item No: C01.030.010

RG 11/2/99

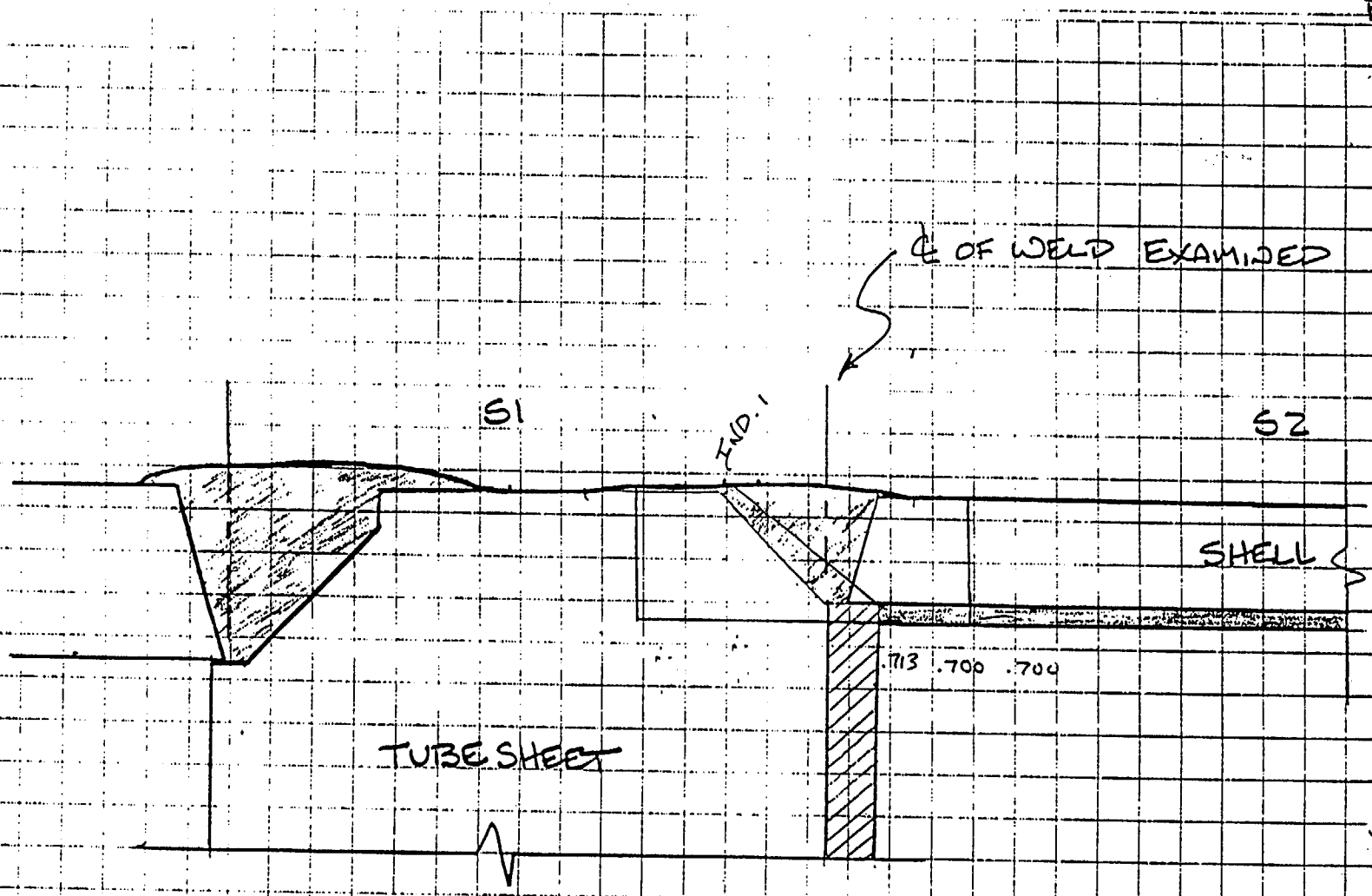
ATTACHMENT 3
PAGE 3 of 8

Station McGuire Unit 1 Rev. ___ File No. ___ Sheet 3 of 8

Subject Containment Spray Hx 1B Shell to Tubesheet

Item # C01.030.010 By [signature] Date 9/17/99

Prob No. Weld # 1BCSHX-SH-48 Checked by [signature] Date 10-5-99



EXAMINATION AREA OF WELD

2" x 0.7" = 1.4 in²

Stock Code No. 89203

Form # 00184(R-8

DUKE POWER COMPANY ULTRASONIC INDICATION RESOLUTION SHEET	Form NDE-UT-8 Revision 1

Acceptance Standard:

INDICATION #1 - 45° IS A GEOMETRIC REFLECTOR DUE TO TUBESHEET TO SHELL INTERFACE. THIS WAS DETERMINED FROM DESIGN DRAWINGS.

Item No: C01.030.010

Acceptable Indications: IND. #1 - 45°

Rejectable Indications:

These indications have been compared with previous ultrasonic data ☐ Yes ☒ No previous data available

Examiner:	Level:	Date:	[redacted]	Sheet 4 of 8
David Zimmerman	II	9/17/99		
Reviewer:	Level:	Date:	Authorized Inspector:	Date:
Larry Moulder	III	10-5-99		10-8-99

11/2/99

DUKE POWER COMPANY
ISI LIMITATION REPORT

FORM NDE-UT-4
Revision 1

Component/Weld ID: 1BCSHX-SH-48 | Item No: C01.030.010 | Remarks:

	SURFACE	BEAM DIRECTION	Remarks
☒ NO SCAN ☐ LIMITED SCAN FROM L 12.0" to L 28.0" ANGLE: ☒ 0 ☒ 45 ☐ 60 ☐ Other _____	☒ 1 ☒ 2 INCHES FROM WO S1 + 1.5 to S2 + .5 FROM ____ DEG to ____ DEG	☒ 1 ☒ 2 ☒ cw ☒ ccw	16" DUE TO ONLY 4 CORNERS BEING ACCESSIBLE TO BE GROUND AND INSPECTED.
☒ NO SCAN ☐ LIMITED SCAN FROM L 38.0" to L 50.0" ANGLE: ☒ 0 ☒ 45 ☐ 60 ☐ Other _____	☒ 1 ☒ 2 INCHES FROM WO S1 + 1.5 to S2 + .5 FROM ____ DEG to ____ DEG	☒ 1 ☒ 2 ☒ cw ☒ ccw	12" DUE TO ONLY 4 CORNERS BEING ACCESSIBLE TO BE GROUND AND INSPECTED.
☒ NO SCAN ☐ LIMITED SCAN FROM L 60.0" to L 72.0" ANGLE: ☒ 0 ☒ 45 ☐ 60 ☐ Other _____	☒ 1 ☒ 2 INCHES FROM WO S1 + 1.5 to S2 + .5 FROM ____ DEG to ____ DEG	☒ 1 ☒ 2 ☒ cw ☒ ccw	12" DUE TO ONLY 4 CORNERS BEING ACCESSIBLE TO BE GROUND AND INSPECTED.
☒ NO SCAN ☐ LIMITED SCAN FROM L 81.0" to L 96.0" ANGLE: ☒ 0 ☒ 45 ☐ 60 ☐ Other _____	☒ 1 ☒ 2 INCHES FROM WO S1 + 1.5 to S2 + .5 FROM ____ DEG to ____	☒ 1 ☒ 2 ☒ cw ☒ ccw	15" DUE TO ONLY 4 CORNERS BEING ACCESSIBLE TO BE GROUND AND INSPECTED.

Prepared By: Winfred C. Leeper | Level: II | Date: 10-6-99 | **Sketch(s) attached** ☒ yes ☐ no | Sheet 5 of 8

Reviewed By: Larry Moulder | Date: 10-5-99 | Authorized Inspector: [illegible] | Date: 10-8-99

R 11/2/99

ATTACHMENT 3
PAGE 6 of 8

DUKE POWER COMPANY
ISI LIMITATION REPORT

FORM NDE-UT-4
Revision 1

Component/Weld ID: 1BCSHX-SH-48 | Item No: C01.030.010 | Remarks:

☒ NO SCAN
☐ LIMITED SCAN

SURFACE: ☒ 1 ☒ 2
BEAM DIRECTION: ☒ 1 ☒ 2 ☒ cw ☒ ccw

FROM L 106.0" to L 115.0" INCHES FROM WO S1 + 1.5 to S2 + .5
ANGLE: ☒ 0 ☒ 45 ☐ 60 ☐ Other _____ FROM ____ DEG to ____ DEG

Remarks: 9" DUE TO ONLY 4 CORNERS BEING ACCESSIBLE TO BE GROUND AND INSPECTED.

☒ NO SCAN
☐ LIMITED SCAN

SURFACE: ☒ 1 ☒ 2
BEAM DIRECTION: ☒ 1 ☒ 2 ☒ cw ☒ ccw

FROM L 125.0" to L 141.0" INCHES FROM WO S1 + 1.5 to S2 + .5
ANGLE: ☒ 0 ☒ 45 ☐ 60 ☐ Other _____ FROM ____ DEG to ____ DEG

Remarks: 16" DUE TO ONLY 4 CORNERS BEING ACCESSIBLE TO BE GROUND AND INSPECTED.

☒ NO SCAN
☐ LIMITED SCAN

SURFACE: ☒ 1 ☒ 2
BEAM DIRECTION: ☒ 1 ☒ 2 ☒ cw ☒ ccw

FROM L 150.0" to L 160.0" INCHES FROM WO S1 + 1.5 to S2 + .5
ANGLE: ☒ 0 ☒ 45 ☐ 60 ☐ Other _____ FROM ____ DEG to ____ DEG

Remarks: 10" DUE TO ONLY 4 CORNERS BEING ACCESSIBLE TO BE GROUND AND INSPECTED.

☒ NO SCAN
☐ LIMITED SCAN

SURFACE: ☒ 1 ☒ 2
BEAM DIRECTION: ☒ 1 ☒ 2 ☒ cw ☒ ccw

FROM L 170.0" to L 2.5" INCHES FROM WO S1 + 1.5 to S2 + .5
ANGLE: ☒ 0 ☒ 45 ☐ 60 ☐ Other _____ FROM ____ DEG to ____

Remarks: 175" CIRCUMFERENCE 7.5" LENGTH LIMITATION. DUE TO ONLY 4 CORNERS BEING ACCESSIBLE TO BE GROUND & INS

Prepared By: Winfred C. Leggett Level: II Date: 10-6-99 | **Sketch(s) attached** ☒ yes ☐ no | Sheet 6 of 8

Reviewed By: Larry Mauldin Date: 10-5-99 | Authorized Inspector: [illegible] Date: 10-8-99

R 11/2/99

ATTACHMENT 3
PAGE 7 of 8

DUKE POWER COMPANY
Limited Examination Coverage Worksheet

NDE-91-1

Revision 0

Examination Volume/Area Defined

☒ Base Metal ☒ Weld ☐ Near Surface ☐ Bolting ☐ Inner Radius

Area Calculation	Volume Calculation
SEE ATTACHED SKETCH = 1.4 SQ. IN.	SEE NDE-UT-4. ONLY 77.5" OF 175" TOTAL WELD LENGTH INSPECTED.

Coverage Calculations

Scan #	Angle	Beam Direction	Area Examined (sq.in.)	Length Examined (in.)	Volume Examined (cu.in.)	Volume Required (cu.in.)	Percent Coverage
1-4	45°	ALL	1.4	77.5	108.5	245	44.29
1-4	45°	ALL	0.0	97.5	0	245	0.00
					108.5	490	22.14

Item No: C01.030.010

Prepared By: Winfred C. Leeper Level: II Date: 9-17-99

Reviewed By: Larry Mauldin Level: III Date: 10-5-99

R GH 11/2/99

Stock Code No. 89203 Form # 00184(R-8

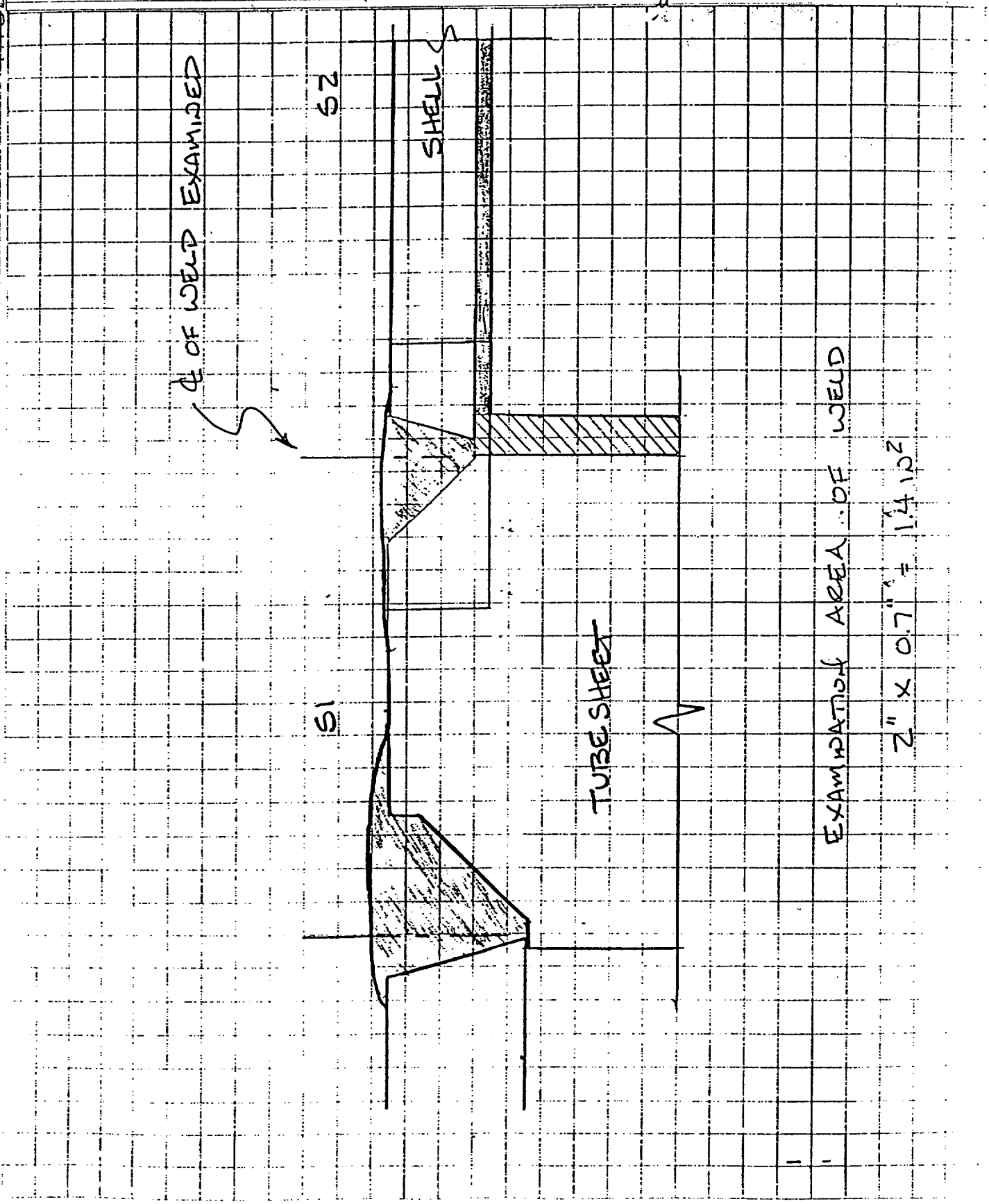
Station McGUIRE Unit 1 Rev. ____ File No. ____ Sheet 8 Of 8

Subject CONTAINMENT SPRAY HX 1B SHELL TO TUBESHEET

ITEM # C01.030.010 By Daniel C. [illegible] Date 9/17/99

Prob No. WELD # Checked by Larry Thaulder Date 10.5.99

ATTACHMENT 3 PAGE 8 of 8



SERIAL NO 99-003
ATTACHMENT 4
PAGE 1 of 4

DUKE POWER COMPANY

ULTRASONIC EXAMINATION DATA SHEET FOR PLANAR REFLECTORS

Exam Start: 0915 | Form NDE-UT-2A
Exam Finish: 0934 | Revision 4

Station: McGUIRE | Unit: 1 | Component/Weld ID: 1SGB-W261 | Date: 10/7/99

Weld Length (in.): 23.55 | Surface Condition: AS GROUND | Lo: 9.1.1.1 | Surface Temperature: 80 ° F

Examiner: Jay A. Eaton Level: II
Examiner: B. Dale Jolly Level: II
Procedure: NDE-610 Rev: 4 FC: *
Calibration Sheet No: 9901077, 9901078

Scans:
45 ☒ 66.4 dB 70 ☐ ____ dB
45T ☐ ____ dB 70T ☐ ____ dB
60 ☐ ____ dB
60T ☐ ____ dB
Other: 38° = 58 dB

Pyrometer S/N: MCNDE 27017
Cal Due: 1/15/00
Configuration: PIPE TO REDUCER
S2 Flow S1
Safe End to Nozzle
Scan Surface: OD
Applies to NDE-680 only
Skew Angle: N/A

IND #	∡	Max % Ref	Mp Max	W Max	L Max	L1	L2	W1	Mp1	W2	Mp2	Beam Dir.	Exam Surf.	Scan	Damps
		DO NOT WRITE IN THIS SPACE				20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	DO NOT WRITE IN THIS SPACE			
NRI	38°	CIRC													
NRI	38°	TANG.													
NRI	45L	AXIAL													

Remarks: *FC 97-01 & 98-20 45L SCANNED AT REF + 6db DUE TO SIGNAL/NOISE RATIO

Limitations: (see NDE-UT-4) ☒ 90% or greater coverage obtained: yes ☐ no ☒ | Sheet 1 of 4

Reviewed By: Larry Maulden Level: III Date: 10-7-99
Authorized Inspector: [illegible] Date: 10-8-99
Item No: C05.011.220

R 10-8-99

ATTACHMENT 4
PAGE 2 of 4

DUKE POWER COMPANY
ISI LIMITATION REPORT

FORM NDE-UT-4
Revision 1

Component/Weld ID: 1SGB-W261 | Item No: C05.011.220 | Remarks:

☒ NO SCAN
☐ LIMITED SCAN

SURFACE: ☒ 1 ☐ 2
BEAM DIRECTION: ☐ 1 ☒ 2 ☒ cw ☒ ccw

FROM L N/A to L N/A
INCHES FROM WO CL + 0" to CL + 6"
ANGLE: ☐ 0 ☒ 45 ☐ 60 ☐ Other 38
FROM 0 DEG to 360 DEG

Remarks: NOZZLE TAPER

☐ NO SCAN
☐ LIMITED SCAN

SURFACE: ☐ 1 ☐ 2
BEAM DIRECTION: ☐ 1 ☐ 2 ☐ cw ☐ ccw

FROM L _____ to L _____
INCHES FROM WO _____ to _____
ANGLE: ☐ 0 ☐ 45 ☐ 60 ☐ Other _____
FROM ____ DEG to ____ DEG

☐ NO SCAN
☐ LIMITED SCAN

SURFACE: ☐ 1 ☐ 2
BEAM DIRECTION: ☐ 1 ☐ 2 ☐ cw ☐ ccw

FROM L _____ to L _____
INCHES FROM WO _____ to _____
ANGLE: ☐ 0 ☐ 45 ☐ 60 ☐ Other _____
FROM ____ DEG to ____ DEG

☐ NO SCAN
☐ LIMITED SCAN

SURFACE: ☐ 1 ☐ 2
BEAM DIRECTION: ☐ 1 ☐ 2 ☐ cw ☐ ccw

FROM L _____ to L _____
INCHES FROM WO _____ to _____
ANGLE: ☐ 0 ☐ 45 ☐ 60 ☐ Other _____
FROM ____ DEG to ____ DEG

☐ NO SCAN
☐ LIMITED SCAN

SURFACE: ☐ 1 ☐ 2
BEAM DIRECTION: ☐ 1 ☐ 2 ☐ cw ☐ ccw

FROM L _____ to L _____
INCHES FROM WO _____ to _____
ANGLE: ☐ 0 ☐ 45 ☐ 60 ☐ Other _____
FROM ____ DEG to ____

Prepared By: [signature] Level: II Date: 10/7/99 **Sketch(s) attached** ☒ yes ☐ no Sheet 2 of 4

Reviewed By: Larry Mauldin Date: 10-7-99 Authorized Inspector: [signature] Date: 10-8-99

R
CH
11-8-99

DUKE POWER COMPANY
Limited Examination Coverage Worksheet

NDE-91-1

Revision 0

Examination Volume/Area Defined

☒ Base Metal ☒ Weld ☐ Near Surface ☐ Bolting ☐ Inner Radius

Area Calculation	Volume Calculation
1.2" x .38" = 0.456 IN SQ.	0.456 IN SQ. x 23.5" = 10.72 IN CU.

Coverage Calculations

Scan #	Angle	Beam Direction	Area Examined (sq.in.)	Length Examined (in.)	Volume Examined (cu.in.)	Volume Required (cu.in.)	Percent Coverage
1	45°	S2	0	0	0	10.72	0.00
2	45°	S1	0.456	23.5	10.72	10.72	100.00
3	45°	CW/CCW	0	0	0	10.72	0.00
4	45°	CCW/CW	0.456	23.5	10.72	10.72	100.00
			AGGREGATE	COVERAGE	21.44	42.88	50.00

ATTACHMENT 4
PAGE 3 of 4

Item No: C05.011.220

Prepared By:	[signature]	Level: II	Date: 10/7/99	
Reviewed By:	Larry Thandler	Level: III	Date: 10-7-99	

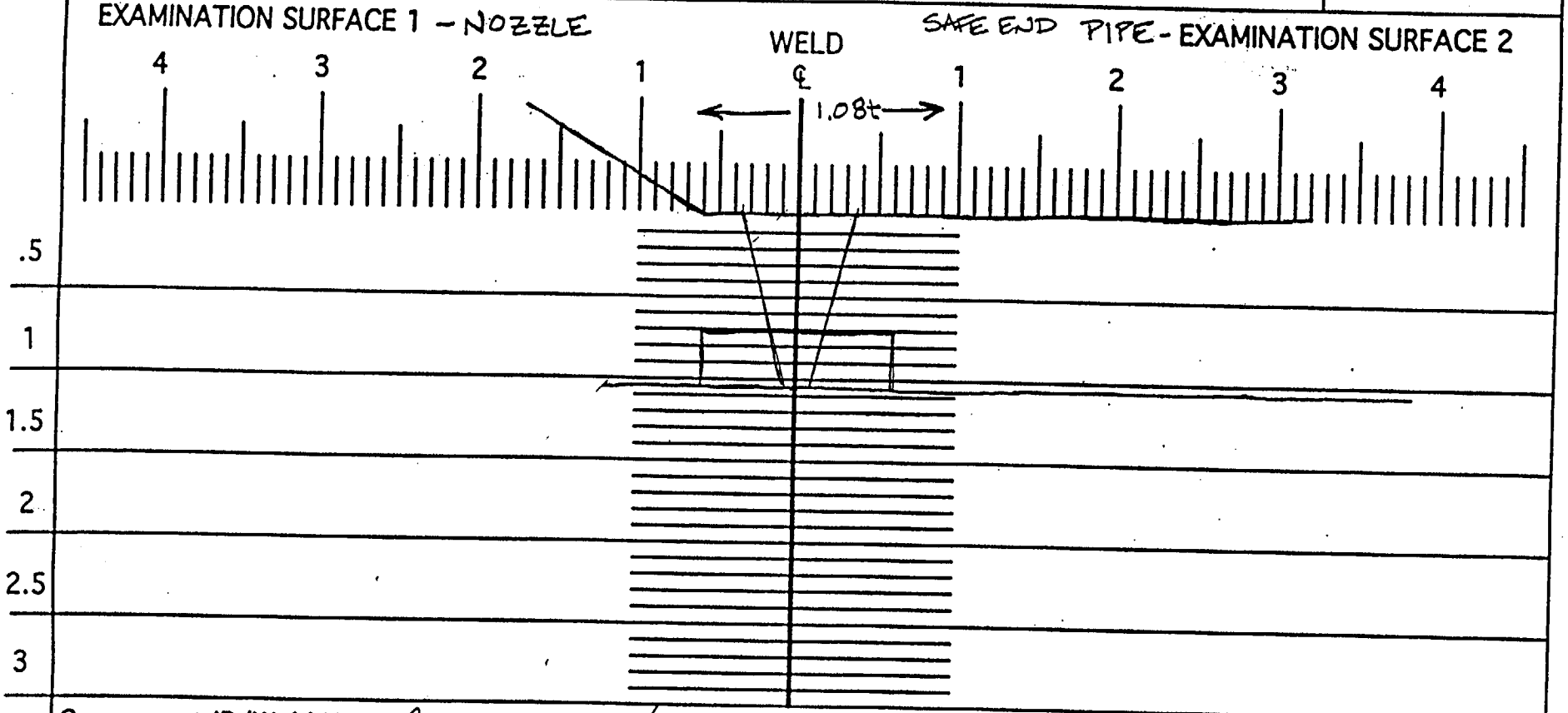
ATTACHMENT 4
PAGE 4 of 4

DUKE POWER COMPANY

UT PROFILE/PLOT SHEET

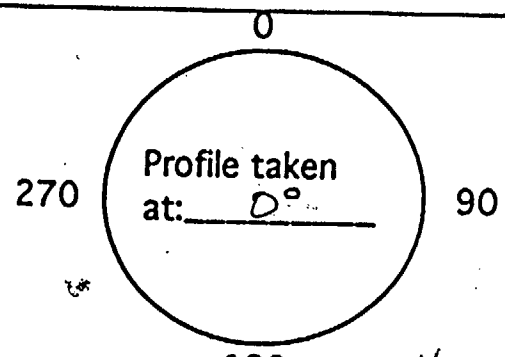
NDE-UT-5

Revision 1



Component ID/Weld No. C05.011.220/ 1SGB-W261

: Remarks:



Item No: C05.011.220

Examiner:	Level: II	Date: 10/7/99
Reviewed By:	Level: III	Date: 10.7.99
Authorized Inspector:		Date: 10-8-99

Sheet 4 of 4

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11-8-99

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D-1

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DWG. NO. MC-1220-32 McGUIRE NUCLEAR STATION UNITS 1 & 2 AUXILIARY BUILDING HEAT EXCHANGER SUPPORTS MISCELLANEOUS STEEL

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