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April 5, 2001

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


Subject: Duke Energy Company  
Oconee Nuclear Station, Unit 1  
Docket Nos. 50-269  
Third Ten Year Inservice Inspection Interval  
Request for Relief No. 01-001

Pursuant to 10 CFR 50.55a(g)(5)(iii) and 50.55a(g)(6)(i), attached is a Request for Relief from requirements specified by the ASME Boiler and Pressure Vessel Code, Section XI, which Duke Energy (DUKE) has determined to be impractical.

Specifically, the attached Request for Relief addresses eleven (11) components, referenced as items A through K, for which DUKE personnel determined it is impractical to meet the volumetric requirements for ultrasonic examination of certain specified welds due to piping/vessel geometry, interferences, and existing examination technology. The request seeks relief to accept the portions of the weld volume that can be practically examined. Details of each weld are discussed in the attachment. Because the configurations of these welds, including interferences, are similar on all three Oconee Units, relief is requested for the listed welds on Unit 1 and the same welds on Units 2 and 3.

If there are any questions, please contact R. P. Todd at (864) 885-3418.

Very truly yours,

  
W. R. McCollum, Jr.  
Site Vice President

Attachment

A047

U. S. Nuclear Regulatory Commission  
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Page 2

xc w/att: L. A. Reyes, Regional Administrator  
U.S. Nuclear Regulatory Commission, Region II  
Atlanta Federal Center  
61 Forsyth St., SWW, Suite 23T85  
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D. E. LaBarge, Senior Project Manager, Section 1  
Project Directorate II  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation  
U. S. Nuclear Regulatory Commission  
Mail Stop O-14 H25  
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xc(w/o attch):

M. E. Shannon,  
NRC Senior Resident Inspector  
Oconee Nuclear Station

Mr. Virgil Autrey  
Division of Radioactive Waste Management  
Bureau of Land and Waste Management  
SC Dept. of Health & Environmental Control  
2600 Bull St.  
Columbia, SC 29201

## Duke Energy Corporation

### Oconee Nuclear Station Units 1, 2, & 3

#### Third 10-YEAR INTERVAL REQUEST FOR RELIEF NO. 01-01

Duke Energy Corporation has determined that conformance with certain ASME Section XI Code requirements is impractical. Therefore, pursuant to 10CFR50.55a(g)(5)(iii), Duke Energy requests relief from applicable portions of the code.

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

##### A. Unit 1 Pressurizer Relief Nozzle-to-Vessel Welds:

1-PZR-WP33-1 Item Number B03.110.005

##### B. Part 1, Pressurizer Sensing Nozzle-to-Vessel Weld. Part 2, Pressurizer Sensing Nozzle-to-Vessel Inside Radius Sections.

<u>Unit</u>	<u>ID Number</u>	<u>Item Number</u> (Part 1)	<u>Item Number</u> (Part 2)
1	1-PZR-WP26-1	B03.110.009	B03.120.009
1	1-PZR-WP26-2	B03.110.010	B03.120.010
1	1-PZR-WP26-3	B03.110.011	B03.120.011
1	1-PZR-WP26-7	B03.110.012	B03.120.012
2	2-PZR-WP26-1	B03.110.009	B03.120.009
2	2-PZR-WP26-2	B03.110.010	B03.120.010
2	2-PZR-WP26-3	B03.110.011	B03.120.011
2	2-PZR-WP26-7	B03.110.012	B03.120.012
3	3-PZR-WP26-1	B03.110.009	B03.120.009
3	3-PZR-WP26-2	B03.110.010	B03.120.010
3	3-PZR-WP26-3	B03.110.011	B03.120.011
3	3-PZR-WP26-7	B03.110.012	B03.120.012

C. Unit 1 Steam Generator A, Steam Outlet Nozzle to Shell Weld

<u>ID Number</u>	<u>Item Number</u>
1-SGA-WG23-1	C02.021.001

D. Unit 1 Reactor Coolant Pump 1A2 Inlet Nozzle-to-Safe End:

1-PIA2-9	B09.011.017
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E. Valve 1LP-47 to Pipe:

1-53A-02-65L	C05.011.006
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F. Valve 1HP-194 to Pipe:

1-51A-04-1C	C05.021.004
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G. Valve 1HP-118 to Elbow:

1-51A-01-118A	C05.021.048
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H. Valve 1HP-135 to Pipe:

1-51A-02-20B	C05.021.054
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I. Tee to Pipe:

1HP-193-17	C05.021.064
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J. Pipe to Flange:

1-51A-02-16BH	C05.021.086
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K. Valve 1HP-110 to Elbow:

1-51A-01-101A	C05.021.108
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For welds listed in Section I, paragraph B. (both Parts 1 and 2), all configurations, including interference, are the same for Units 1, 2, and 3. Therefore, all three units are being documented in this Request for Relief as described in NRC Inspection Report No. 50-269/95-05, 50-270/95-05, 50-287/95-05 dated May 5, 1995. While only two Unit 1 examinations from paragraph B. have been completed at this time, approximately the same configuration and examination coverage is expected; therefore, relief is also being sought for the remaining welds in Unit 1 and all of the same welds in Units 2 and 3. If, for some reason, the actual examination coverage of the welds referenced in this Request for Relief for Units 1, 2 and 3 are less than those listed for Unit 1 in Section IV as the reason for this request, additional Requests for Relief will be submitted on a case by case basis.

**II. Code Requirement:**

Examination Category B-D: Figure IWB-2500-7 (as modified by Code Case N-460). ASME Section V, Article 4, Paragraph T-424.1 states: "The volume shall be examined by moving the search unit over the examination surface so as to scan the entire examination volume."

Examination Category B-J: Figure IWB-2500-8.

**Note 1:** 10 CFR 50.55a(b)(2)(xv)(A) states: "When applying Supplements 2 and 3 to Appendix VIII, the following examination coverage criteria requirements must be used:

- (1) Piping must be examined in two axial directions and when examination in the circumferential direction is required, the circumferential examination must be performed in two directions, provided access is available.
- (2) Where examination from both sides is not possible, full coverage credit may be claimed from a single side for ferritic welds. Where examination from both sides is not possible on austenitic welds, full coverage credit from a single side may be claimed only after completing a successful single sided Appendix VIII demonstration using flaws on the opposite side of the weld."

10 CFR 50.55a(b)(2)(xvi)(B) states: "Examinations performed from one side of a ferritic or stainless steel pipe weld must be conducted with equipment, procedures, and personnel that have demonstrated proficiency with single sided examinations. To demonstrate equivalency to two sided examinations, the demonstration must be performed to the requirements of Appendix VIII as modified by this paragraph and 50.55a(b)(2)(xv)(A)."

Examination Category C-B: Figure IWC-2500-4 (a) or (b) (as modified by Code Case N-460). ASME Section V, Article 4, Paragraph T-424.1 states: "The volume shall be examined by moving the search unit over the examination surface so as to scan the entire examination volume."

Examination Category C-F-1: Figure IWC-2500-7.  
See Note 1 Above.

### **III. Code Requirement from which Relief is Requested:**

Examination Category B-D and C-B: Relief is being sought from the requirement to scan the entire examination volume.

Examination Category B-J and C-F-1: Relief is being sought from the requirement to perform examinations of stainless steel welds from one side using equipment, procedures, and personnel that have demonstrated proficiency with single sided examinations demonstrated to the requirements of Appendix VIII as modified by this paragraph and 50.55a(b)(2)(xv)(A).

#### IV. Basis for Relief:

- A. Pressurizer Nozzle-to-Vessel Weld 1-PZR-WP33-1 (Item B03.110.005) was examined to the maximum extent practical using ultrasonic techniques in accordance with the requirements of ASME Section XI, Appendix VIII, Supplements 4 and 6 of the 1995 Edition with the 1996 Addenda as administered by the Performance Demonstration Initiative (PDI). The qualifications were conducted on samples with access to both sides of the weld. Therefore, Duke Energy Corporation does not claim credit for a single sided examination. Reference Attachment A for a drawing of the Pressurizer.

This weld is limited to 37.1% coverage of the required volume because of the nozzle configuration and location of lifting lugs. In order to achieve more coverage, the nozzle would have to be re-designed to allow scanning from both sides of the weld.

- B. Pressurizer Sensing Nozzle-to-Vessel Welds 1-PZR-WP26-1 (Item B03.110.009) and 1-PZR-WP26-2 (Item B03.110.010) were examined to the maximum extent practical using ultrasonic techniques qualified in accordance with the requirements of ASME Section XI, Appendix VIII, Supplements 4 and 6 of the 1995 Edition with the 1996 Addenda as administered by the PDI.

These welds are limited to 26.41% coverage of the required volume because of the nozzle configuration. In order to achieve more coverage, the nozzle would have to be re-designed to allow scanning from both sides of the weld.

Pressurizer Sensing Nozzle-to-Vessel Inside Radius Sections for welds 1-PZR-WP26-1 (Item B03.120.009) and 1-PZR-WP26-2 (Item B03.120.010) were examined to the maximum extent practical using ultrasonic techniques in accordance with the requirements of ASME Section XI, Appendix I of the 1989 Edition. Reference Attachment A for a drawing of the Pressurizer.

These welds are limited to 61.82% coverage of the required volume. Limitations were caused by the ratio of the nozzle OD to the vessel thickness. When the nozzle OD is small in relation to the vessel thickness, more coverage can be obtained when scanning from the vessel side.

Nozzle inner radius sections were examined with the ultrasonic method to the maximum extent practical from the vessel wall. Calibration blocks and procedures were in accordance with ASME Section V, Article 4.

Duke Energy Corporation is investigating the use of computer modeling to resolve the coverage problem for future examinations.

- C. Steam Generator Steam Outlet Nozzle-to-Vessel Weld 1-SGA-WG23-1 (Item C02.021.001) was examined to the maximum extent practical using ultrasonic techniques in accordance with the requirements of ASME Section XI, Appendix VIII Supplements 4 and 6 of the 1995 Edition with the 1996 Addenda as administered by the PDI. Reference Attachment G for a drawing of the Steam Generator 1A.

This weld is limited to 31.58% coverage of the required volume because of the nozzle configuration. In order to achieve more coverage, the nozzle would have to be re-designed to allow scanning from both sides of the weld.

- D. Reactor Coolant Pump 1A2 Inlet Nozzle to Safe End weld 1-PIA2-9 (Item B09.011.017) is limited to 59.15% coverage of the required volume. Reference Attachment B for a drawing of the nozzle to safe end weld. In order to achieve more coverage, the nozzle would have to be re-designed to allow scanning from both sides of the weld.
- E. Valve 1LP-47 to Pipe Weld 1-53A-02-65L (Item C05.011.006) is limited to 61.00% coverage of the required volume. In order to achieve more coverage, the valve configuration would have to be re-designed to allow scanning from both sides of the weld. Reference Attachment H for a drawing of the valve to pipe weld.
- F. Valve 1HP-194 to Pipe Weld 1-51A-04-01C (Item C05.021.004) is limited to 61.24% coverage of the required volume because of the single sided access due to the valve configuration. In order to achieve more coverage, the valve configuration would have to be re-designed to allow scanning from both sides of the weld. Reference Attachment C for a drawing of the valve to pipe weld.
- G. Valve 1HP-118 to Elbow Weld 1-51A-01-118A (Item C05.021.048) This weld is limited to 59.56% coverage of the required volume because of single sided access due to the valve configuration. In order to achieve more coverage, the valve configuration would have to be re-designed to allow scanning from both sides of the weld. Reference Attachment D for a drawing of the valve to elbow weld.

- H. Valve 1HP-135 to Pipe Weld 1-51A-02-20B (Item C05.021.054) is limited to 58.10% coverage of the required volume because of the single sided access due to the valve configuration. In order to achieve more coverage, the valve configuration would have to be re-designed to allow scanning from both sides of the weld. Reference Attachment E for a drawing of the valve to pipe weld.
- I. Tee to Pipe Weld 1HP-193-17 (Item C05.021.064) is limited to 60.40% coverage of the required volume Reference Attachment F for a drawing of the tee to pipe weld. In order to achieve more coverage, the tee configuration would have to be re-designed to allow scanning from both sides of the weld.
- J. Pipe to Flange Weld 1-51A-02-16BH (Item C05.021.086) is limited to 58.10% coverage of the required volume. In order to achieve more coverage, the flange configuration would have to be re-designed to allow scanning from both sides of the weld. Reference Attachment E for a drawing of the pipe to flange weld.
- K. Valve 1HP-110 to Elbow Weld 1-51A-01-101A (Item Number C05.021.108) is limited to 60.16% coverage of the required volume. In order to achieve more coverage, the valve configuration would have to be re-designed to allow scanning from both sides of the weld. Reference Attachment D for a drawing of the valve to elbow weld.

Reference Attachment L for copies of the examination records for welds addressed in this request.

**V. Alternate Examinations or Testing:**

The use of radiography as an alternate volumetric examination of the welds/components referenced in this request is not a viable option. Restrictions to performing radiography are primarily due to inability to access the inside of the components to place film or to position a radiographic source. No additional examinations are planned during the current interval for ID Numbers: 1-PZR-WP33-1, 1-PZR-WP26-1, 1-PZR-WP26-2, 1-SGA-WG23-1, 1-PIA2-9, 1-53A-02-65L, 1-51A-04-1C, 1-51A-01-118A, 1-51A-02-20B, 1-51A-02-16BH, 1-51A-01-101A. Duke Energy Corporation will continue to use the most current ultrasonic techniques available to obtain maximum coverage for future examinations of these ID Numbers.



## **VI. Justification for the Granting of Relief:**

### General statement regarding B-J and C-F Piping Welds:

Current ultrasonic technology is not capable of reliably detecting or sizing flaws on the far side of austenitic weld configurations common to US nuclear plants. Duke Energy Corporation has demonstrated that the best available techniques were applied through the Performance Demonstration Initiative (PDI). The PDI Performance Demonstration Qualification Summary (PDQS) for austenitic piping certifies that examinations from one side are a "best effort". Therefore, coverage on the far side of the weld is not claimed.

The subject welds were examined to the maximum extent practical using ultrasonic techniques qualified in accordance with the requirements of ASME Section XI, Appendix VIII, Supplements 2 and 3 of the 1995 Edition with the 1996 Addenda as administered by the PDI.

Duke Energy will use pressure test and VT-2 visual examination to compliment the limited examination coverage. The Code requires (reference Table IWB-2500-1, Item Number B15.20) that a system leakage test be performed after each refueling outage. Additionally a system hydrostatic test (reference Table IWB-2500-1, Item Number B15.21) is required once during each 10-year inspection interval. These tests require a VT-2 visual examination for evidence of leakage. This testing will provide adequate assurance of pressure boundary integrity.

In addition to the above Code required examinations (volumetric and pressure test), there are other activities which provide a high level of confidence that, in the unlikely case that leakage did occur through these welds, it would be detected and isolated. Specifically, leakage from these welds would be detected by monitoring of the Reactor Coolant System (RCS), which is performed once each shift under procedure PT/1,2,3/A/0600/10, "RCS Leakage". This RCS leakage monitoring is a requirement of the Technical Specification 3.4.13, "Reactor Coolant System Leakage". Leakage is also evaluated in accordance with this Technical Specification. The leakage could be detected through several methods. One method is the RCS mass balance calculation. Another method is by use of the Reactor Building air particulate monitor. This monitor is sensitive to low leak rates; the iodine monitor, gaseous monitor and area monitor are capable of detecting any fission products in the coolant and will make these monitors sensitive to coolant leakage. In addition to the radiation monitors, a level indicator in the Reactor Building normal sump also monitors leakage. Another check would be a loss of level in the Letdown Storage Tank.

Duke Energy has examined the welds/components referenced in this request to the maximum extent possible utilizing the latest in examination techniques and equipment. Duke Energy will continue to perform ultrasonic examination of all welds/components identified in Section I of this request to the maximum extent practical, within the limits of original design and construction, in accordance with the requirements of ASME Section V, Article 4, and ASME Section XI, Appendix I, of the 1989 Edition, and Code Case N-460. Appendix VIII as administered by the PDI will be used to examine piping and pressure vessel welds within the scope of the PDI qualified procedures. This will provide reasonable assurance of weld/component integrity. Thus, an acceptable level of quality and safety will have been achieved, and allowing relief from the aforementioned Code requirements will not endanger public health and safety.

These welds were rigorously inspected by radiography and liquid penetrant examination during construction and verified to be free from unacceptable fabrication defects. Duke Energy will continue to ultrasonically examine the welds, and inside radius sections, to the extent practical within the limits of original design and construction. This will provide reasonable assurance of weld/component integrity. Thus, an acceptable level of quality and safety will have been achieved and allowing relief from the aforementioned Code requirements will not endanger public health and safety.

The Code requires 100% volumetric examination of all Pressurizer Nozzle-to-Vessel Welds and Inside Radius. However, the taper on the nozzle side of the weld restricts scanning and prevents complete volumetric coverage of Pressurizer Nozzle-to-Vessel Welds 1-PZR-WP33-1, 1-PZR-WP26-1, 1-PZR-WP26-2 and Inside Radius for 1-PZR-WP26-1, 1-PZR-WP26-2. Therefore, the 100% volumetric examination is impractical. To meet Code examination requirements, modifications to the nozzles would be necessary to allow scanning from both sides of the weld. Modification to this portion of the reactor coolant system would be impractical.

Duke Energy obtained 37.1% coverage of Pressurizer Nozzle-to-Vessel Weld 1-PZR-WP33.1 and 26.41% coverage of Pressurizer Nozzle-to-Vessel welds 1-PZR-WP26-1, 1-PZR-WP26-2 and 61.82% coverage of the inside radius of Pressurizer Nozzle-to-Vessel welds 1-PZR-WP26-1, and 1-PZR-WP26-2. It is recognized that this represents a small part of the required Code examination volume. However, in conjunction with the Code required VT-2 visual examination after each refueling outage and the 10-year hydrostatic test; Duke Energy believes this provides reasonable assurance of the continued structural integrity of the subject welds/components.

The Code requires 100% volumetric examination of all Steam Generator Nozzle-to-Vessel Welds. However, the taper on the nozzle side of the weld restricts scanning and prevents complete volumetric coverage of Steam Generator Nozzle-to-Vessel Weld 1-SGA-WG23-1. Therefore, the 100% volumetric examination is impractical. To meet Code examination requirements, modifications to the nozzles would be necessary to allow scanning from both sides of the weld. Modification to this portion of the reactor coolant system would be impractical.

Duke Energy obtained 31.58% coverage of Steam Generator Nozzle-to-Vessel Weld 1-SGA-WG23-1. It is recognized that this represents a small part of the required Code examination volume. However, in conjunction with the Code required VT-2 visual examination after each refueling outage and the 10-year hydrostatic test; Duke Energy believes this provides reasonable assurance of the continued structural integrity of the subject welds/components.

The Code requires 100% volumetric examination of the Reactor Coolant Pump 1A2 Inlet Nozzle to Safe End Weld; Valve 1LP-47 to Pipe Weld; Valve 1LP-17 to Reducer Weld; Valve 1LP-18 to Reducer Weld; Tee to Pipe Weld; Valve 1HP-194 to Pipe Weld; Valve 1HP-118 to Elbow Weld; Valve 1HP-135 to Pipe Weld; Tee to Pipe Weld; Pipe to Flange Weld and Valve 1HP-110 to Elbow Weld. However, the configuration of the welds restricts scanning and prevents complete volumetric coverage of the above mentioned welds.. Therefore, the 100% volumetric examination is impractical. To meet Code examination requirements, modifications to the configurations would be necessary to allow scanning from both sides of the weld. Modification of this nature would be impractical.

Duke Energy obtained less than 90% coverage on all the items listed in Section I of this Request for Relief (actual percentage of coverage obtained for each item is shown in Section IV). It is recognized that this represents a small part of the required Code examination volume. However, this level of examination, in conjunction with the Code required VT-2 visual examination after each refueling outage for class 1 items and once each period for class 2 items and the 10-year hydrostatic test, provides reasonable assurance of the continued structural integrity of the subject welds/components.

**VII. Implementation Schedule:**

Duke Energy Corporation will continue to use ultrasonic examination procedures to obtain maximum coverage to the extent practical for inspections in future intervals of the item numbers referenced in Section I of this Request for Relief. Some of the ultrasonic examinations referenced in Section I of this Request for Relief are planned during the current interval for the following item Numbers:

Unit 1 Items – B03.110.011, B03.110.012, B03.120.011, B03.120.012.

Units 2 & 3 Items -- B03.110.009, B03.110.010, B03.110.011, B03.110.012, B03.120.009, B03.120.010, B03.120.011, and B03.120.012.

The following individuals were involved in the development of this request for relief:

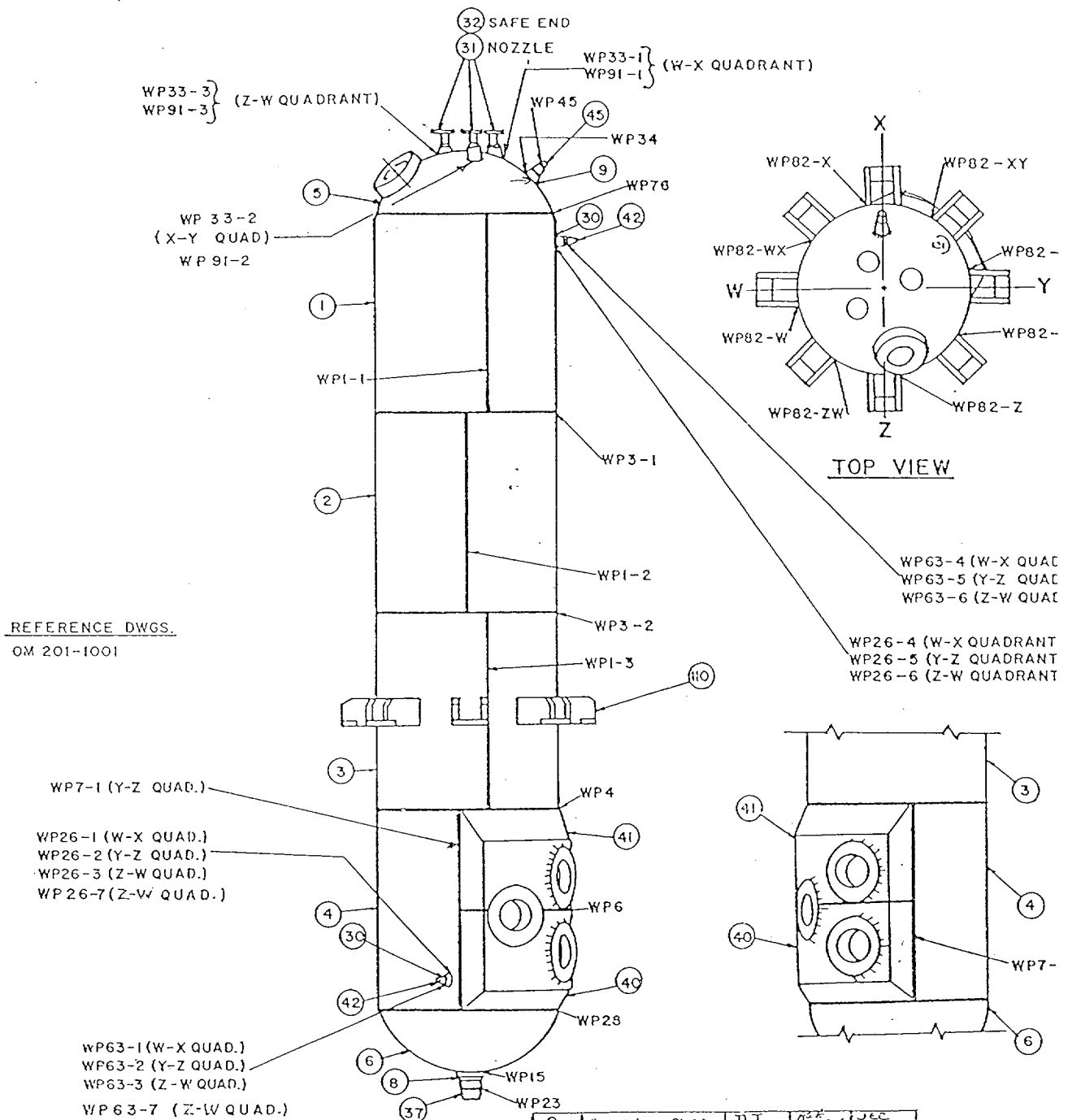
M. D. Leighton, Oconee Primary Systems provided input to Sections VI and V of this request as well.

J. J. McArdle III, NDE Level III provided input for Sections II, III, IV, and V of this request.

L. C. Keith, Oconee ISI Plan Manager compiled and completed this request.

Sponsored By: Larry C. Keith Date: 3-28-01

Approved By: R. Kevin Rhyme Date: 3/28/01

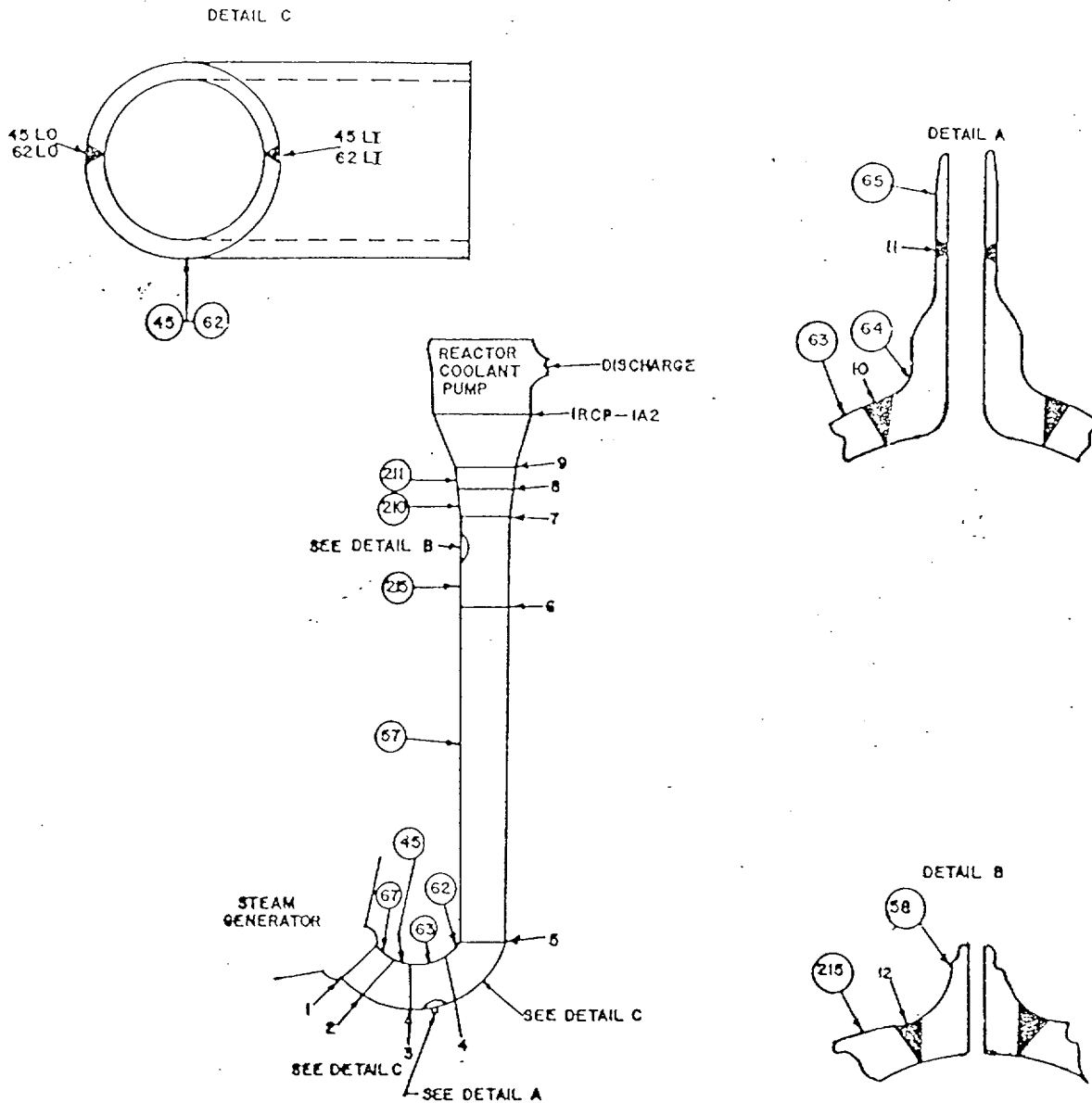


REFERENCE DWGS.  
OM 201-1001

NOTES:

1. ALL I.D. NUMBERS SHALL BE PRECEDED BY "IPRZ - "
2. PIECE NUMBERS ARE SHOWN IN CIRCLES.

2	REV. WELD QUAD.	REV. WELD QUAD.	REV. WELD QUAD.	REV. WELD QUAD.	TITLE
1	Lead. Ref. Dwgs.	AW5	HJH	JOB	PRESSURIZE
		7/23/81	7/23/81	7/23/81	
		AW5	THH	CAC	
0	ORIG.	6/21/81	11/2/81	7/21/81	DWG NO. ISI
NO.	REVISION	DRWN	RVWD	APPD	
		DATE	DATE	DATE	



REFERENCE DWG.

OM 201-738  
OM 201-1870  
OM 201-1845  
OM 201-448  
OM 201-535

NOTES:

1. ALL WELD NUMBERS SHALL BE PRECEDED BY "IA2"  
EXCEPT WELD IRCP-IA2

2. PIECE NUMBERS ARE SHOWN BY CIRCLES

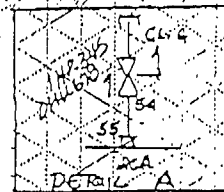
					TITLE PUMP IA2 SU PIPING
○	ORIG	DRWN	RVWD	APPD	
NO.	REVISION	DATE	DATE	DATE	DWG NO. ISI 0

SHEET 4

EN:OXφφ3φMG

[illegible]

B31.7  
PS-1501.3



FOR INFORMATION  
ONLY

CONT ÖN IHP-278

Note 1: All Flanges are 316 1/2 Material  
Note 2: All S/W Fittings are 304  
6000#

·CONT ON 1HP-277

3. WELDS 10C-11C, 11CA, 11CB, 51, 52 TRANSFERED  
SEE DRAWING IHP-277  
WELDS 21C-23C, 21CA, 21CB, 21CC, 21CE TRANSFERED  
SEE DRAWING IHP-278 FOR WTR

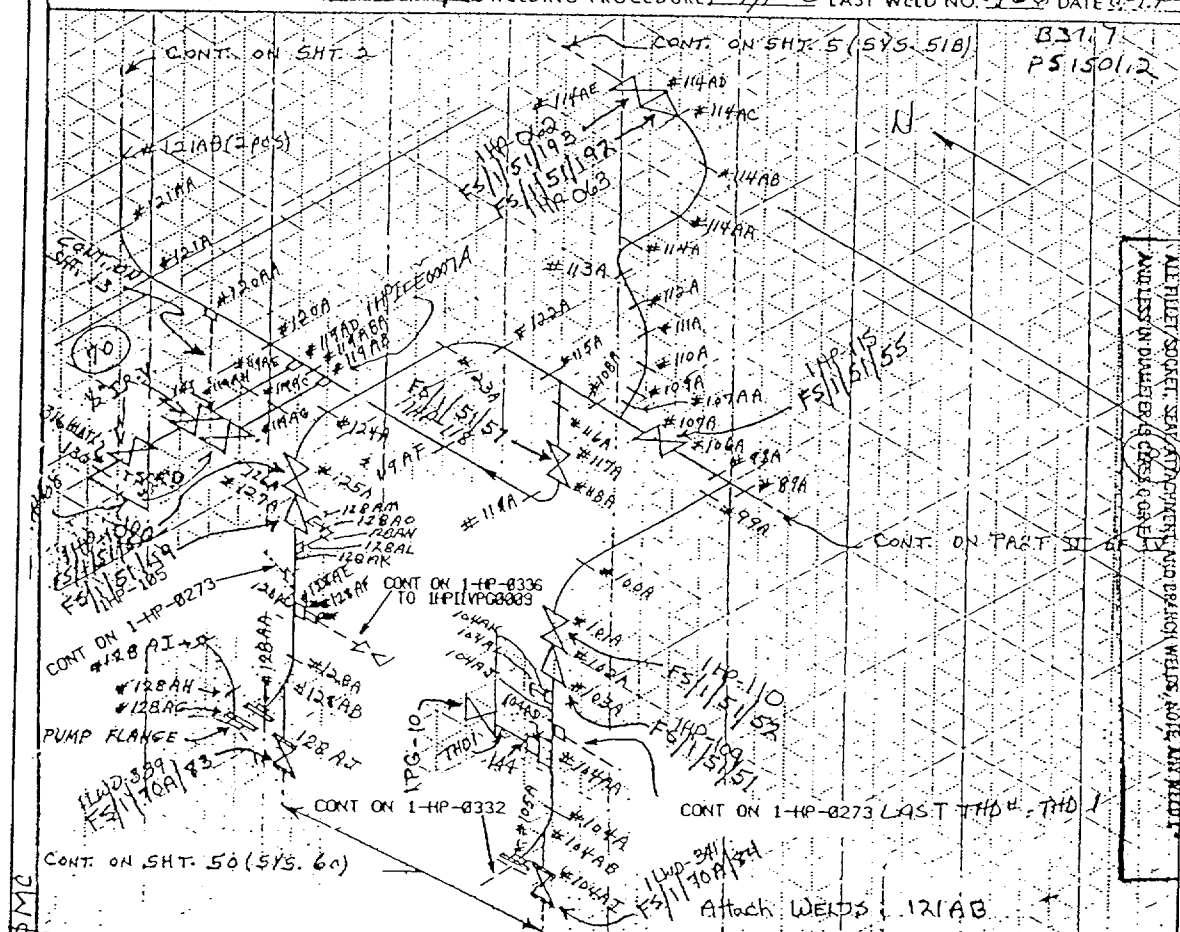
SIDE	PIANO	NO	WELD	NUM	WAG
7C	54	304	B	7C-6C	7C-6C
4H	67H	304	B	7C	
2A	3A	104	B	16C-20C, 22C-25C	18CB
				7C-14C	29C-42C
				14CA	
7C	33	304	B	7C, 15CA, 39CA, 39CB	
10	10	304	C	3CA, 54C	55
				17CA, 17CB	
					2-20

Attachments: Welds  
18CA, 14CA, 14CB, 33CA, 93CB, 31CA

REF DRAWING: O-479A,B,C

ISOMETRIC SKETCH

PROJECT OCONEE SYSTEM 57A SUB SYSTEMS (1) UNIT 1A ISO. NO. 1 REV. NO. 23  
PIPE - CRES/304  
CLASS BIC MATERIAL FG - CRES/316 WELDING PROCEDURE P-2/P-8 LAST WELD NO. 160 DATE 7-79



REF. DWG. NOS.		SIZE x WALL THICKNESS	WELD NUMBERS	NOT CODE	WELD NUMBERS	ISO. REV. NO.	CHANGES:	
DWG.	REV.						WELD NOS.	
4350		4" x .531"	89A, 98A, 106A-108A,	15	B	17	+ 112AN, 128AB	
435C			120A-122A, 121AA			18	+ 129	
436E			115A-119A, 119 AF, 117BA			19	- 127	
REF-101A-13		3" x .438"	99A-105A, 123A-128A	5	B	20	+ 130	
		1" x .250"	119AB-112AE, 128AJ,	0	C	21	Plus last weld no.	
		2" x .375"	109A-114A, 114BA-AE	5	B	22	+ 133	
		1" x .250"	104AA, 104AB, 128AB,	0	C	23	+ 134	
		128AF, 104AD,	280C, 120AA, 104AI,	0		24	+ 135	
117B, 111		1" x .187"	119AH, 119AG, 128AF-	6	C	25	+ 136	
3AW			128AI,					
117C								
268698								
*ALL WELD NUMBERS SHOWN ABOVE ARE PRECEDED BY		11		ISO. NO.				
DLA		12" x .281		104AJ-104AL, 128AK-128AL		6		
		1/2" x .188		130, 144		1		
		1/2" x .188		130, 144		1		

						DUKE POWER COMPANY OCONEE NUCLEAR STATION UNIT 1			
						TITLE: HIGH PRESSURE INJECTION SYSTEM FROM HIGH PRESSURE INJECTION PUMPS TO REACTOR INLET LINE LOOP A			
26	W098316692 DEL WELDS 140F-H	HLV	1/21/93	3/21/93		SYS.	51A	LINE NO.	
25	W098174149 ADD CONT TO 1-HP-0336 AT WELD 128AF	HLV	5/23/99	5/23/99		CODE	B31.7	DUKE CLASS	B
24	W098152958 REV CONT BETWEEN WELDS 183A & 184A TO 1-HP-0273	HLV	1/28/99	4/28/99		QA CONDITION	1	XI CLASS	
NO.	REVISION		DATE	DATE		PIPING SPEC.	PS-151.2		
						LOCATION	AUX BUILDING		
ERN: 0X0030MC LAST WELD NUMBER.					160	DWG. NO.	1-51A-0001-04 REV. 26		



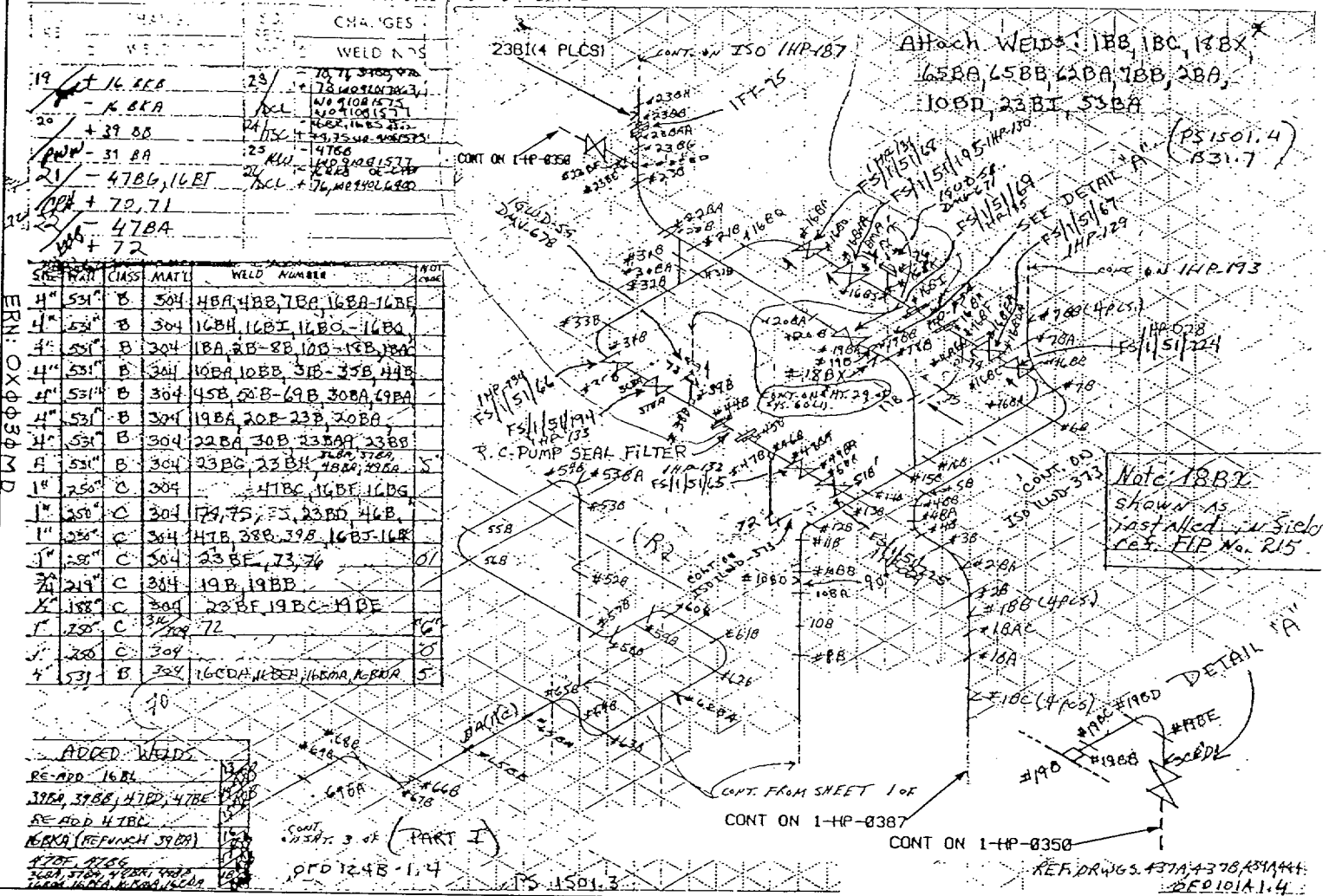
System = 51A UNIT #1 AUX.

LAST WELD = 76

CLASS B+C

PIPE - CRES/304  
FLC - CRES/316

SHEET 2 OF



ISO NOT FOR CONSTRUCTION SEE DESIGN DRAWING

DUKE POWER COMPANY  
OCONEE NUCLEAR STATION UNIT 1

TITLE:  
HIGH PRESURE INJECTION SYSTEM

NO.	REVISIONS	DATE	BY	DATE	SYN.	CODE	QA CONDITION	PIPING SPEC.	LOCATION	LINE NO.	DUKE CLASS	XI CLASS	REV.
28	WO98304471 REV CONT AT WELD 18C TO 1-HP-0387	12/19/99	HLV	12/19/99		831.7	1	PS-1501.3	AUX BUILDING		B.C		28
27	WO98177135 REVISE CONT AT WELDS 190E AND 23BF TO 1-HP-0350	12/9/99	HLV	12/14/99									

ERN:OX0030MD

LAST WELD NUMBER: 76

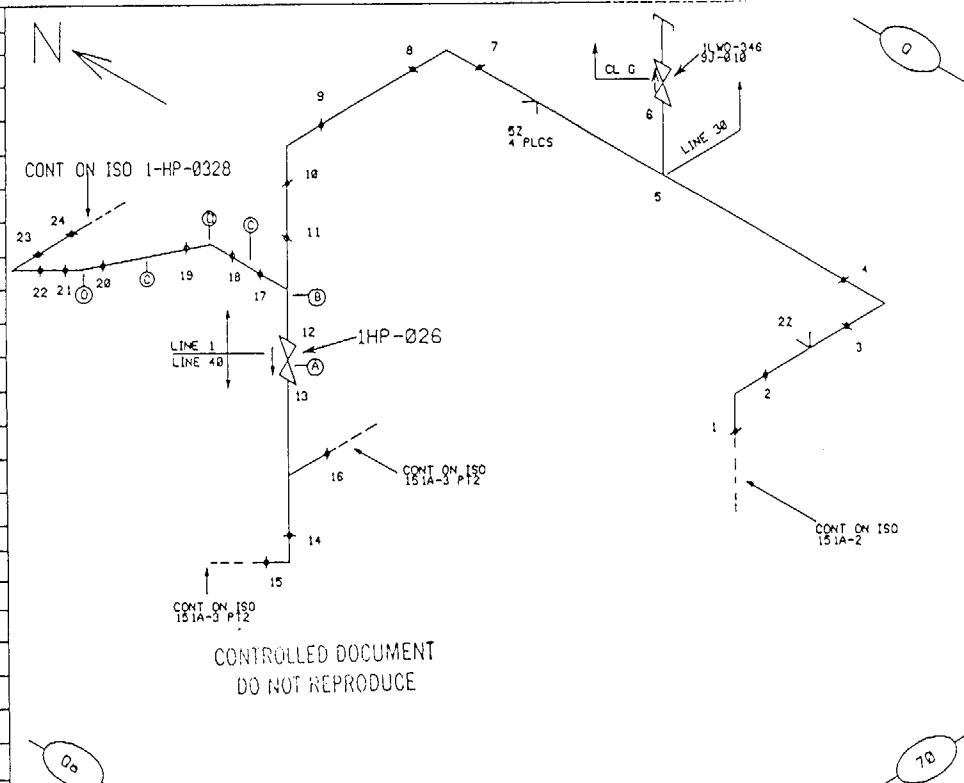
DWG. NO. 1-51A-0002

REV. 28

BILL OF MATERIAL		
ITEM	SIZE	DESCRIPTION
A	4"	VALVE, 1HP-26, DMV-1022, SS, SA351, CF8M, (BW)
B	4"x4"x2 1/2"	TEE, RED, SS, SA403, WP304, SMLS, SCH160, (BW)
C	2 1/2"	PIPE, SS, SA376, TP316, SMLS, SCH160
D	2 1/2"	ELL, 45, SS, SA403, WP304, SMLS, SCH160, (BW)
E		
F		
G		
H		
J		
K		
L		
M		
N		
P		

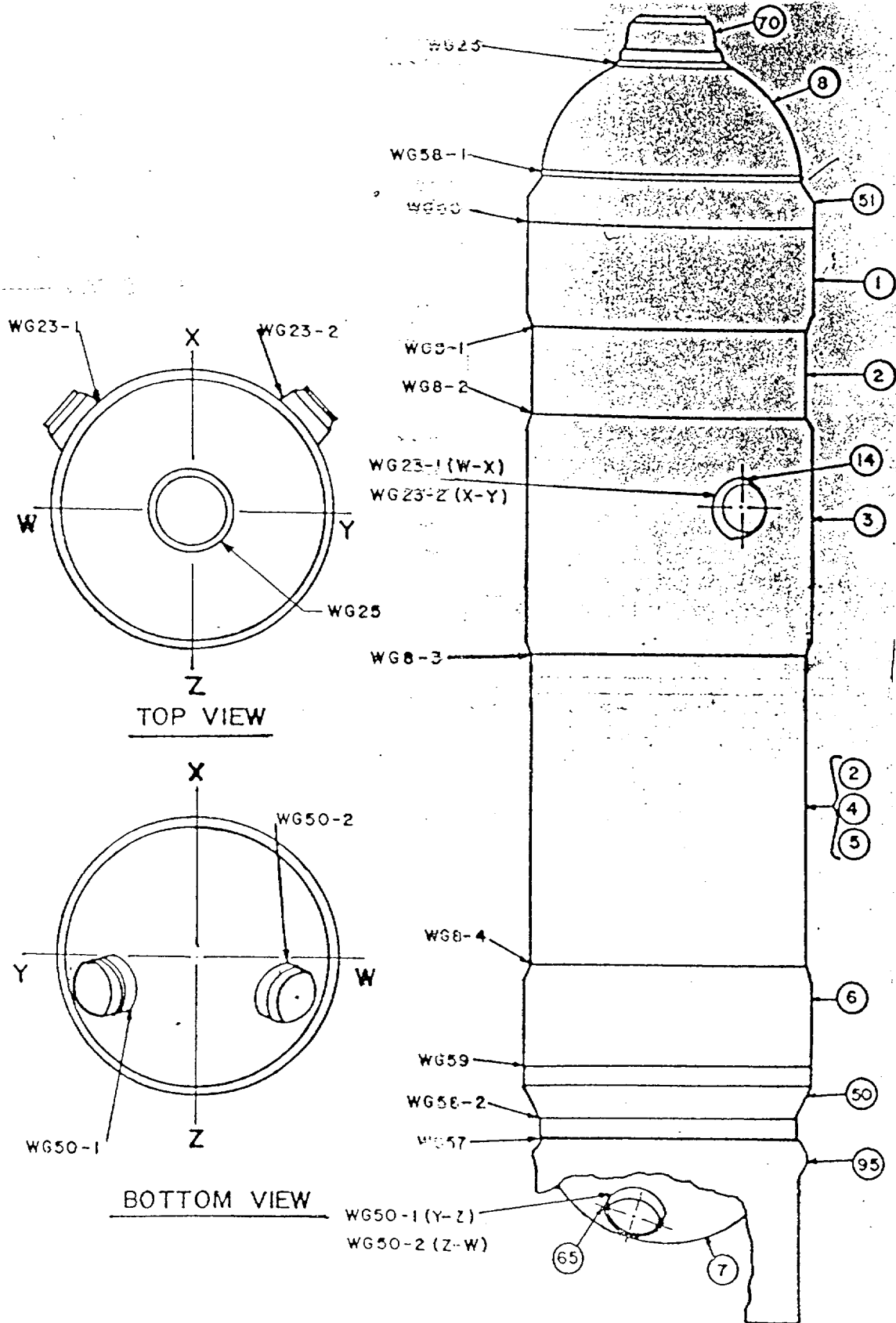
WELD CHART	
SIZE X WALL THICKNESS	WELD NUMBER
2 1/2" x .552	16
4" x .674	14, 15
4" x .531	1-4, 7-10
1" x .250	5, 6
2 1/2" x .375	22-24
ATTACHMENT	22, 52

NOTES:	
1. ISO ORIG. DRAWN AS	1-51A-0003-PART 2 SEE NOTE 8
2. ALL WELD NO's. SHALL BE PRECEDED BY	1HP193-
3. LAST WELD NO.	24
4. REF. LAYOUT DWG.	0-4390
5. REF. FLOW DWG.	101A-1.4
6. DESIGN TEMP.	200/150
7. DESIGN PRESS.	3040/3120
8. WELDS 1-10, 22, 52, 14-16, 22-24 TRANSFERED FROM 151A-3 PT.2 PER W.T.R. 342	1 0E10554 W097102969 REV CONT AT WELD 24 TO 1HP-0328 0 ADD WELDS 11-13, 17-21 PER 0E-7321 W0# 95028303
ERN: 0X00963V	NO. REVISION



CONTROLLED DOCUMENT  
DO NOT REPRODUCE

DUKE POWER COMPANY			
OCONEE NUCLEAR STATION UNIT 1			
TITLE: HIGH PRESSURE INJECTION			
REACTOR INLET LINE 1A2			
SYS.	HP	LINE NO.	1, 40 30
CODE CLASS	B31.7	DUKE CLASS	8 BC
QA CONDITION	1	XI CLASS	8 B
PIPING SPEC.	PS 1501.2	PS 1501.3	
LOCATION	AB RM 402 EL. 814'		
DWG. NO.	1HP-193	REV.	1



PRECEDED BY "ISGA-" CIRCLES.	1.	Add Topbot. Views & 126. Drawing	MWL	JH	JOE	TITLE	
			7-205	7-21-51	7-22	STEAM GENERATOR "A"	
	O.	ORIGINAL	AW5		CIC	WELD OUTLINE	
	NO.	REVISION	DRWN	FWWD	APPD	DWG NO.	REV.
			DATE	DATE	DATE	ISI-OCNI-003	1

FORM QR 27		REVISION 1	
DUKE POWER COMPANY CONSTRUCTION DEPARTMENT <b>ISOMETRIC SKETCH</b> <i>Part 1 of 4</i>			
PROJECT <u>OCDNEE</u> SYSTEM <u>53A</u> SUB SYSTEMS <u>(6.1)</u> UNIT <u>1</u> ISO. NO. <u>2</u> REV. NO. <u>   </u>			
CLASS <u>RfC</u> MATERIAL <u>304</u> WELDING PROCEDURE <u>P-2 op 10"</u> LAST WELD NO. <u>98</u> DATE <u>   </u>			

CONTROLLED DOCUMENT  
DO NOT REPRODUCE

REF. DWG. NOS.		SIZE x WALL THICKNESS	WELD NUMBERS	NDT CODE	ISO. REV. NO.	CHANGES		ISO. REV. NO.	CHANGES	
DWG.	REV.					WELD NOS.	WELD NOS.			
479R		10" x 1.125"	65L, 66L	8 3/4 5	14 6/8	Divided 4 Parts				
479D										
479D										
OFD-102A-12		1 1/2" x .281"	65LA	8 3/4 6						
		1" x .250"		8 3/4 6						

\*ALL WELD NUMBERS SHOWN ABOVE ARE PRECEDED BY THE ISO. NO.  
BLM

DUKE POWER COMPANY OCONEE NUCLEAR STATION UNIT 1			
TITLE: LOW PRESSURE INJECTION SYSTEM FROM THE DECAY HEAT COOLER "18" TO REACTOR VESSEL INLET			
SYS.		LINE NO.	
CODE		DUKE CLASS	
QA CONDITION		XI CLASS	
PIPING SPEC.			
NO.	REVISION	DRAWN BY DATE	TECH REVIEW DATE
ERN: 0X00300		LOCATION: REACTOR AND AUXILIARY BUILDING	
DWG. NO. 1-53A-0002-01		REV. 1	

# DUKE POWER COMPANY

## ULTRASONIC DATA SHEET FOR PLANAR REFLECTORS IN FERRITIC PRESSURE VESSELS

Station: OLONEE Unit: 1 Component/Weld ID: 1-PZR-WP33-1 Date: 12/19/00

Weld Length (in.): 26" Surface Condition: GROUND Lo 9.2.3 Exam Start: 0957 Exam Finish: 1030

Procedure No:  
NDE-620  
Revision: 8  
FC 00-0007

Scans  
70° 59 dB Zone I 60° 73 dB Zone II  
60° 73 dB Zone III Axial  
60° 73 dB Zone III Circ.

Configuration  
RELIEF NOZZLE TO HEAD  
Scan Surface: OD

Surface Temp. 68 ° F  
Pyrometer s/n: MCNDE-290  
Cal. Due Date: 1/17/01

Calibration Sheet No:  
0001117  
0001118  
0001119

Indication #	∠	MP <sub>max</sub>	% FSH	L <sub>max</sub>	W <sub>max</sub>	SU LOCATION	BEAM DIRECTION	SCAN	REMARKS
<u>NRI</u>	<u>70°</u>								
<u>NRI</u>	<u>60°</u>								<u>ZONE 1</u>
<u>NRI</u>	<u>60°</u>								<u>ZONE 2</u>
									<u>ZONE 3</u>

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

Examiner: Randy Mauldin Level: III Date: 12/19/00 Examiner: [Signature] Item No: B03.110.005  
Reviewed by: Gary Moss Level: II Date: 12-20-00 Authorized Inspector: [Signature] Date: 12/19/00  
Date: JAN 13 2001

**DUKE POWER COMPANY**  
**ISI LIMITATION REPORT**

FORM NDE-UT-4

Revision 1

Component/Weld ID: 1-PZR-WP33-1

Item No: B03.110.005

Remarks:

☒ NO SCAN      SURFACE      BEAM DIRECTION  
☐ LIMITED SCAN      ☐ 1 ☒ 2      ☒ 1 ☐ 2 ☐ cw ☐ ccw  
FROM L   N/A   to L   N/A   INCHES FROM WO   .5"   to   BEYOND    
ANGLE: ☐ 0 ☐ 45 ☒ 60 ☒ Other   70°   FROM   0   DEG to   360   DEG

DUE TO NOZZLE CONFIGURATION

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

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

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

Prepared By:

*Larry Mauldin*

Level:

*III*

Date: *12-19-00*

Sketch(s) attached

☒ yes

☐ no

Sheet   2   of   9  

Reviewed By:

*Larry Moss*

Date:

*12.20.00*

Authorized Inspector:

*C. T. [Signature]*

Date:

*JAN 12 2001*

Attachment L  
RFR 01-01  
Page 2 of 107

b  
for  
C

<b>DUKE POWER COMPANY</b> Limited Examination Coverage Worksheet						NDE-91-1 Revision 0	
<b>Examination Volume/Area Defined</b>							
<input type="checkbox"/> Base Metal <input type="checkbox"/> Weld <input type="checkbox"/> Near Surface <input type="checkbox"/> Bolting <input type="checkbox"/> Inner Radius							
Area Calculation				Volume Calculation			
<b>Coverage Calculations</b>							
Scan #	Angle	Beam Direction	Area Examined (sq.in.)	Length Examined (in.)	Volume Examined (cu.in.)	Volume Required (cu.in.)	Percent Coverage
	60						38.70
	70						35.50

AGGREGATE COVERAGE  $74.2 / 2 = 37.1\%$

			Item No: B03.110.005
Prepared By: Larry Mauldin	<i>Larry Mauldin</i>	Level: III	Date: 12/19/00
Reviewed By:	<i>Gary Moss</i>	Level: II	Date: 12-20-00

4 of 9

<b>DUKE POWER COMPANY</b> Limited Examination Coverage Worksheet						NDE-91-1 Revision 0	
<b>Examination Volume/Area Defined</b>							
<input checked="" type="checkbox"/> Base Metal <input checked="" type="checkbox"/> Weld <input type="checkbox"/> Near Surface <input type="checkbox"/> Bolting <input type="checkbox"/> Inner Radius							
Area Calculation				Volume Calculation			
SEE EXAM AREA DRWG. 7.4 SQ. IN. (ZONE 1)				7.4 SQ. IN X 21.6 IN. = 159.84 CU. IN.			
<b>Coverage Calculations</b>							
Scan #	Angle	Beam Direction	Area Examined (sq.in.)	Length Examined (in.)	Volume Examined (cu.in.)	Volume Required (cu.in.)	Percent Coverage
1	70°	2	3.7	21.6	79.92	159.84	
2	70°	1	1.4	21.6	30.24	159.84	
3	70°	CW	2.7	21.6	58.32	159.84	
4	70°	CCW	2.7	21.6	58.32	159.84	
					226.8	639.36	35.47

Item No: B03.110.005		
Prepared By: <i>Randy Mauldin</i>	Level: <i>III</i>	Date: <i>12-19-00</i>
Reviewed By: <i>Randy Moss</i>	Level: <i>II</i>	Date: <i>12-20-00</i>



5029

<b>DUKE POWER COMPANY</b> Limited Examination Coverage Worksheet						NDE-91-1  Revision 0	
<b>Examination Volume/Area Defined</b>							
<input checked="" type="checkbox"/> Base Metal <input checked="" type="checkbox"/> Weld <input type="checkbox"/> Near Surface <input type="checkbox"/> Bolting <input type="checkbox"/> Inner Radius							
Area Calculation				Volume Calculation			
SEE EXAM AREA DRWG. 23.6 SQ. IN. (ZONE 2 & 3)				23.6 SQ. IN. X 21.6 IN. = 509.76 CU. IN.			
<b>Coverage Calculations</b>							
Scan #	Angle	Beam Direction	Area Examined (sq.in.)	Length Examined (in.)	Volume Examined (cu.in.)	Volume Required (cu.in.)	Percent Coverage
1	60°	2	19.2	21.6	414.72	509.76	
2	60°	1	.1	21.6	2.16	509.76	
3	60°	CW	8.6	21.6	185.76	509.76	
4	60°	CCW	8.6	21.6	185.76	509.76	
					788.4	2039.04	38.67

Prepared By: <i>Larry Mauldin</i>		Level: <i>III</i>	Date: <i>12-19-00</i>
Reviewed By: <i>Larry Moss</i>		Level: <i>II</i>	Date: <i>12-20-00</i>

Item No: B03.110.005

CLONE LESSON RELIEF NOZZLE

# EXAM AREAS

## ZONE 1

$$\begin{aligned} ABKJ &= 2.5'' \times 1.0'' = 2.5 \text{ sq. in.} \\ JKLM &= \pi 3\frac{1}{4}''^2 - \pi 2\frac{1}{4}''^2 \times 18.9\% = 3.26 \text{ sq. in.} \\ LMOP &= \frac{1.0''}{2} (1.5 + 1.75) = 1.63 \text{ sq. in.} \\ 7.39 \text{ sq. in.} &= \underline{\underline{7.4 \text{ sq. in.}}} \end{aligned}$$

## ZONE 2 & 3

$$\begin{aligned} BCEG - DEF &= \frac{3.75}{2} (6.2 + 4.7) - \frac{.4 \times .4}{2} = 20.35 \text{ sq. in.} \\ GHND &= \frac{1.0''}{2} (1.8 + 3.2) = 2.5 \text{ sq. in.} \\ HIM &= \frac{2.9 \times .55}{2} = .79 \text{ sq. in.} \\ 23.64 &= \underline{\underline{23.6 \text{ sq. in.}}} \end{aligned}$$

NOTE:

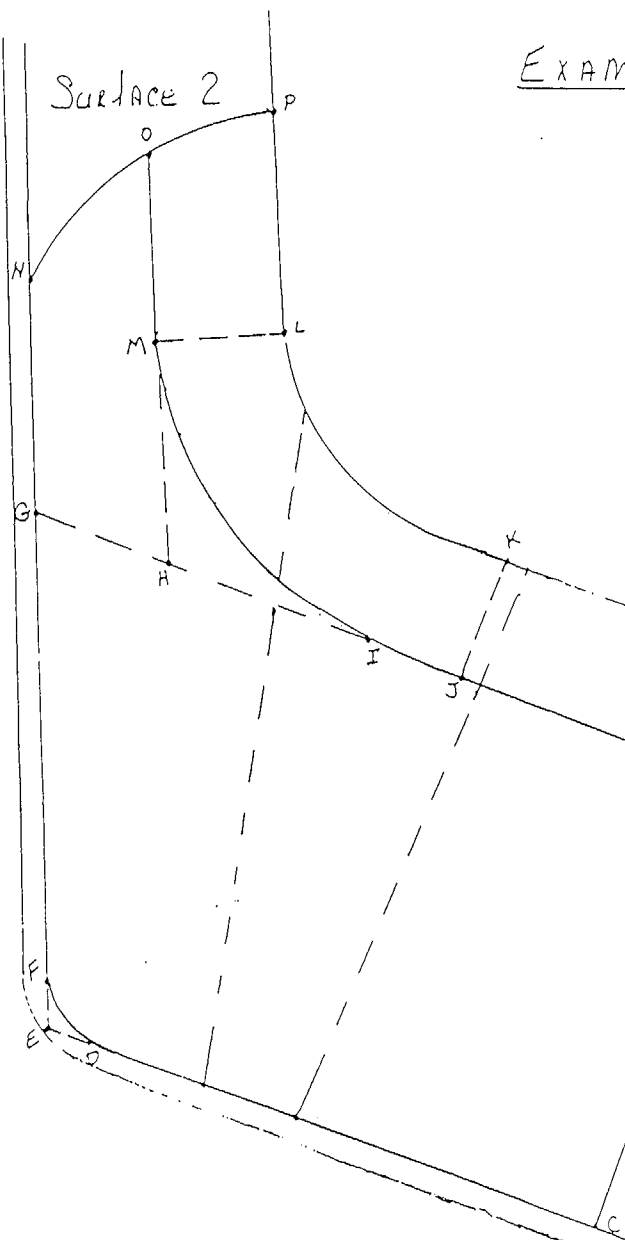
JKLM HAS A MULTIPLIER  
of 18.9%. THE RADIUS  
of ZONE IS 68' or  
18.9% of 360°

SCALE 1.0" = 1.0"

- ☐ - FULL COVERAGE
- ☒ - PARTIAL COVERAGE
- ☒ - NO COVERAGE

ITEM# B03,110,005  
I.D.# LPZR-WP 337  
BY: Larry Manna  
DATE: 12-79-00

PG. 6 of PG. 9

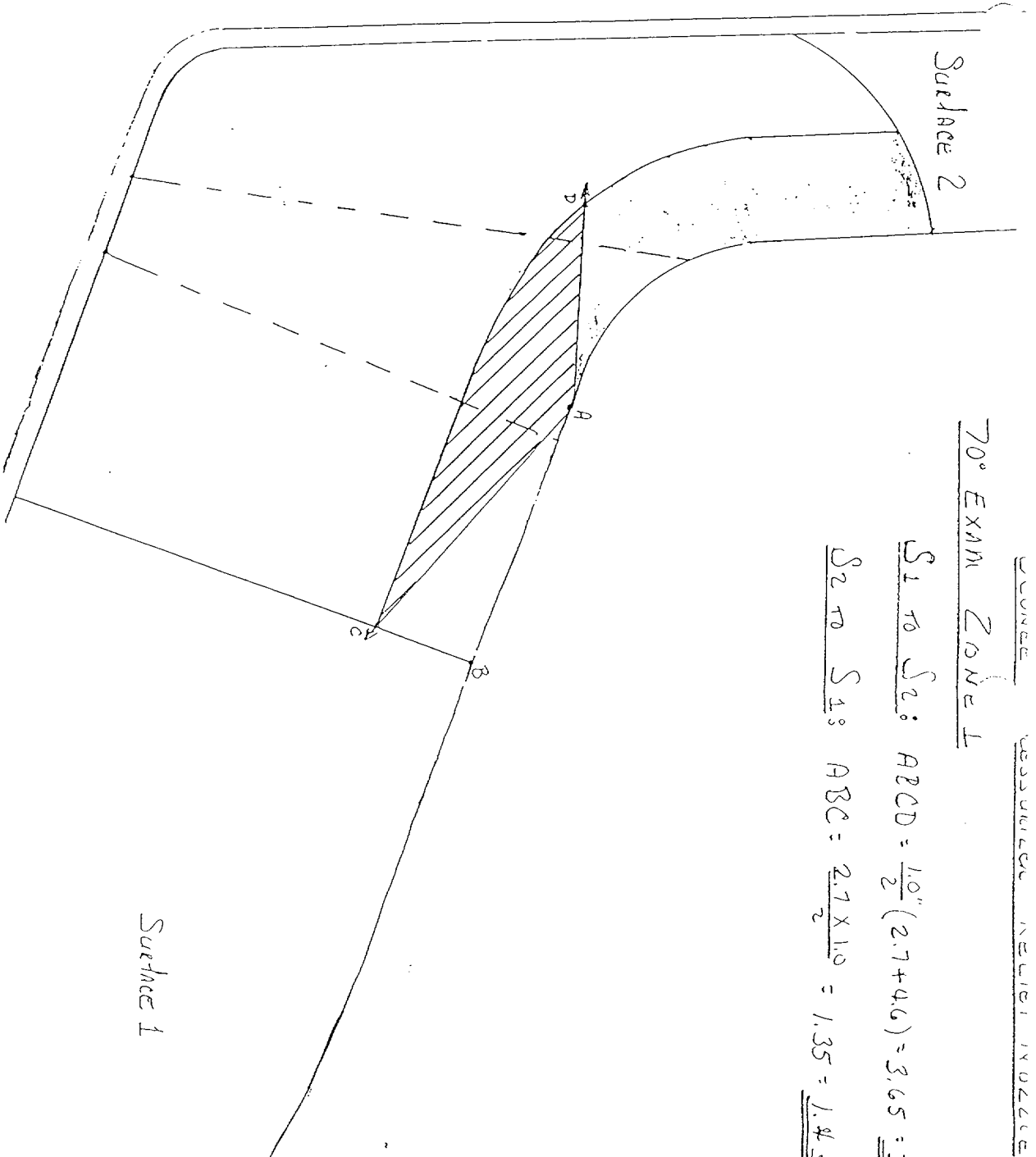


CURVE RECURVED INTERSECTION

70° EXAM ZONE 1

$$S_1 \text{ to } S_2: AB \cdot CD = \frac{1.0''}{2} (2.7 + 4.6) = 3.65 = \underline{\underline{3.75''}}$$

$$S_2 \text{ to } S_1: ABC = \frac{2.7 \times 1.0}{2} = 1.35 = \underline{\underline{1.45''}}$$



SCALE 1.0"=1.0"

- ☐ - Full Coverage
- ☒ - Partial Coverage
- ☒ - No Coverage

ITEM# 803.110.005  
I.D.# 1828-4/P33-1  
BY: Chris Thaidin  
DATE: 12.9.00

Pa. 7 of Pg. 9

# UCONEE PRESSURIZER RELIEF NOZZLE

60° EXAM ZONE L & 3

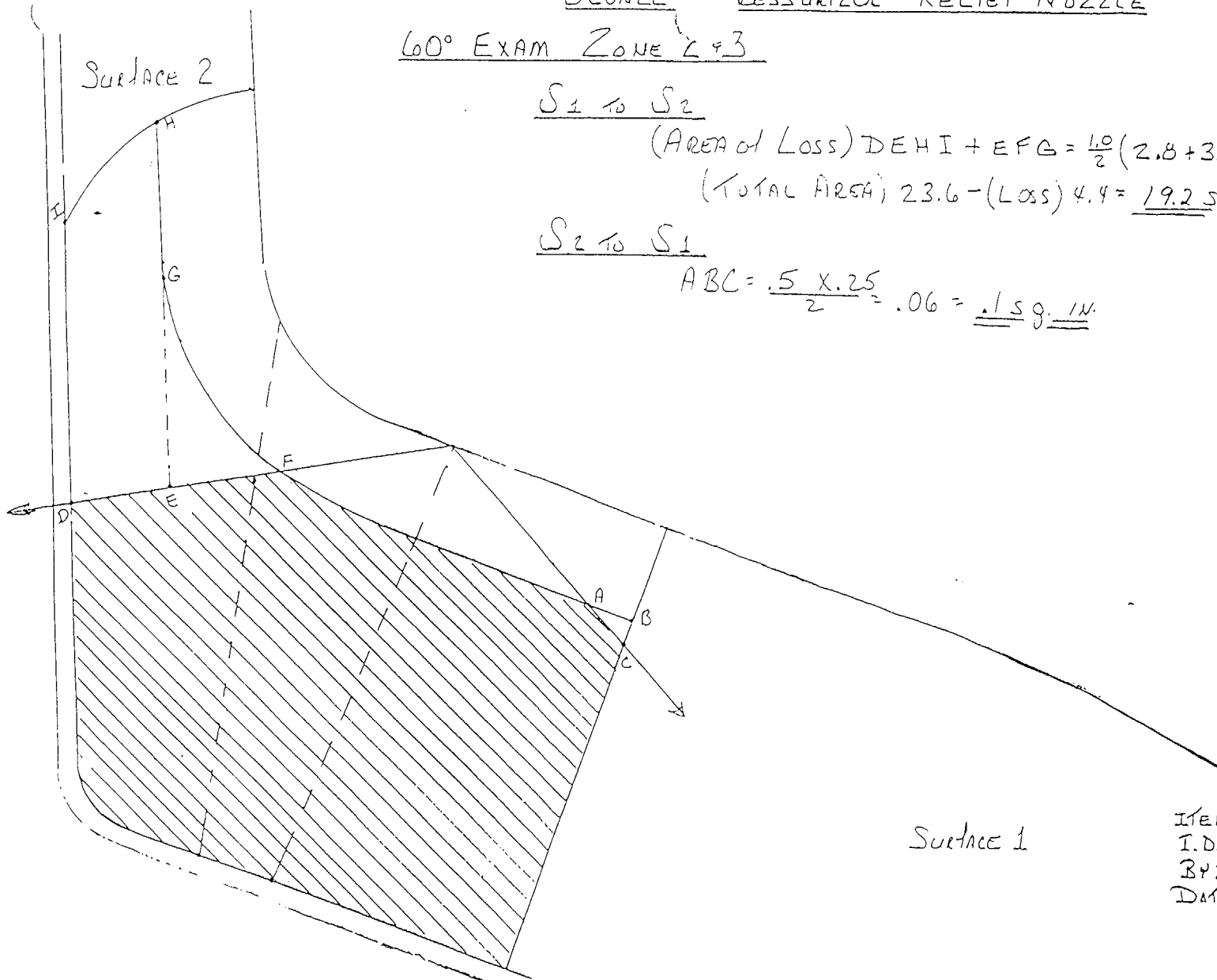
S<sub>1</sub> TO S<sub>2</sub>

$$(AREA OF LOSS) DEHI + EFG = \frac{1.0}{2} (2.8 + 3.7) + \frac{2.1 \times 1.1}{2} = 4.4 \text{ sq. in.}$$

$$(TOTAL AREA) 23.6 - (LOSS) 4.4 = \underline{19.2 \text{ sq. in. COVERAGE}}$$

S<sub>2</sub> TO S<sub>1</sub>

$$ABC = \frac{.5 \times .25}{2} = .06 = \underline{.1 \text{ sq. in.}}$$



SCALE 1.0" = 1.0"

- ☐ - FULL COVERAGE
- ☒ - PARTIAL COVERAGE
- ☒ - NO COVERAGE

ITEM# 803,110.005  
 I.D.# 1-P2R-WP33-1  
 BY: Lane Moulton  
 DATE: 12/19/00

Pg. 8 of Pg. 9

ANII 11/12 Date 11/12  
 HSBI&I Co.

# CONCRETE RESSURIZER RELIEF NOZZLE

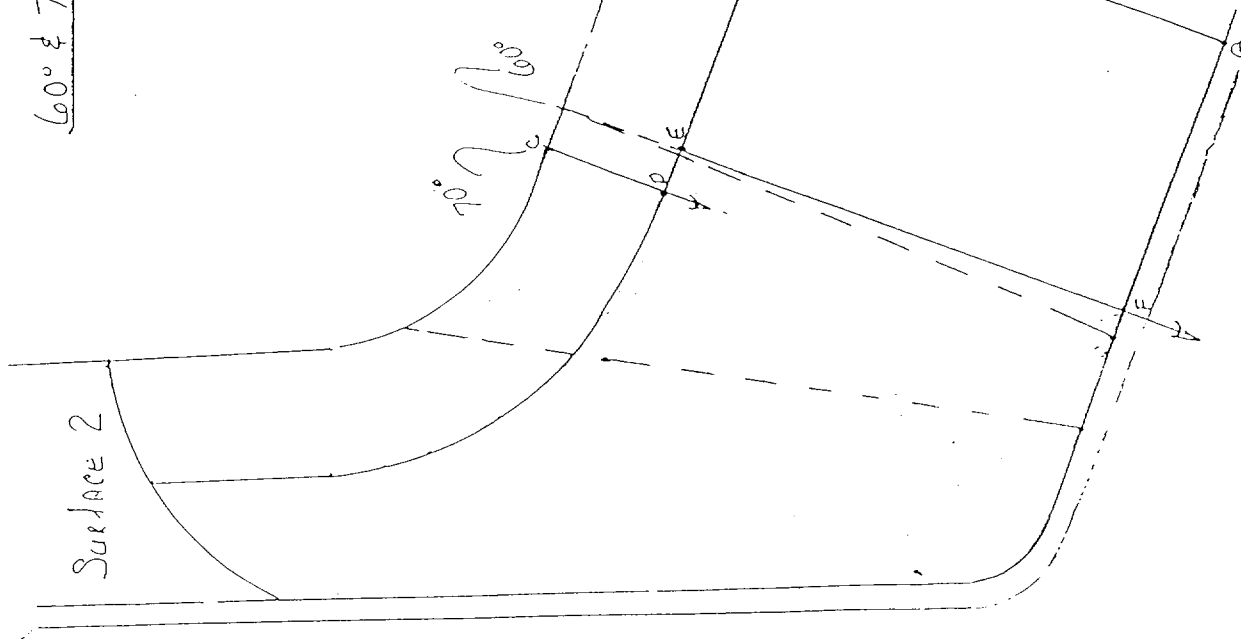
60° & 70° CIRC. WOUNDS

70° ZONE 1

ABCD 2.7' X 1.0" = 2.7 SQ. IN. COVERAGE

60° ZONE 2 & 3

BEFG 2.3' X 3.75" = 8.625 = 8.6 SQ. IN. COVERAGE



SCALE 1.0" = 1.0"

- ☐ - FULL COVERAGE
- ☒ - PARTIAL COVERAGE
- ☐ - NO COVERAGE

ITEM # 303.110.005  
I.D. # L.P2P-WP33-1  
BY: Larry Mauldin  
DATE: 12.19.00

Pa. 9 of Pg. 9

Attachment L  
RFR 01-01  
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ANII Date 11/11/01  
HSBI&I Co.

<b>DUKE POWER COMPANY</b>										Exam Start: 1315		Form NDE-UT-2A		
<b>ULTRASONIC EXAMINATION DATA SHEET FOR PLANAR REFLECTORS</b>										Exam Finish: 1335		Revision 4		
Station: Oconee			Unit: 1		Component/Weld ID: 1-PZR-WP26-1						Date: 12/6/00			
Weld Length (in.): 19.6			Surface Condition: AS GROUND			Lo: 9.2.3		Surface Temperature: 63 ° F						
Examiner: James L. Panel <i>James L. Panel</i>			Level: II		Scans: 45 <input type="checkbox"/> _____ dB    70 <input checked="" type="checkbox"/> 58.5 dB 45T <input type="checkbox"/> _____ dB    70T <input checked="" type="checkbox"/> 58.5 dB 60 <input checked="" type="checkbox"/> 73.5 dB 60T <input checked="" type="checkbox"/> 73.5 dB Other: _____ dB					Pyrometer S/N: MCNDE 27205				
Examiner:			Level:							Cal Due: 1/17/01				
Procedure: NDE-620    Rev: 8			FC: 00-07							Configuration: CIRC. WELD				
Calibration Sheet No: 0001089, 0001090, 0001091										S2 Flow S1 NOZZLE to SHELL Scan Surface: OD				
										Applies to NDE-680 only				
										Skew Angle: N/A				

IND #	<input checked="" type="checkbox"/>	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	20%dac HMA	20%dac HMA	20%dac HMA	20%dac HMA	20%dac HMA	DO NOT WRITE IN THIS SPACE			
						50%dac	50%dac	50%dac	50%dac	50%dac	50%dac				
						100%dac	100%dac	100%dac	100%dac	100%dac	100%dac				
NRI	60°														
NRI	70°														

Remarks:			
Limitations: (see NDE-UT-4) <input checked="" type="checkbox"/> 90% or greater coverage obtained: yes <input type="checkbox"/> no <input checked="" type="checkbox"/>			Sheet <u>1</u> of <u>15</u>
Reviewed By: <i>Larry Mauldin</i>	Level: <i>III</i>	Date: <i>12/18/00</i>	Authorized Inspector: <i>E. T. [Signature]</i> Date: <i>JAN 06 2001</i> Item No: B03.110.009

# DUKE POWER COMPANY

## ISI LIMITATION REPORT

FORM NDE-UT-4

Revision 1

Component/Weld ID: 1-PZR-WP26-1

Item No: B03.110.009

Remarks:

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

NOZZLE CONFIGURATION

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

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

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

Prepared By: David K B

Level: II

Date: 12/14/00

Sketch(s) attached ☒ yes ☐ no

Sheet 2 of 15

Reviewed By: Larry Mauder

Date: 12/18/00

Authorized Inspector: C. J. [Signature]

Date: JAN 06 2001

Attachment L  
 RFR 01-01  
 Page 11 of 167

3 OF 13

<b>DUKE POWER COMPANY</b> Limited Examination Coverage Worksheet						NDE-91-1	
						Revision 0	
<b>Examination Volume/Area Defined</b>							
<input type="checkbox"/> Base Metal <input type="checkbox"/> Weld <input type="checkbox"/> Near Surface <input type="checkbox"/> Bolting <input type="checkbox"/> Inner Radius							
Area Calculation				Volume Calculation			
<b>Coverage Calculations</b>							
Scan #	Angle	Beam Direction	Area Examined (sq.in.)	Length Examined (in.)	Volume Examined (cu.in.)	Volume Required (cu.in.)	Percent Coverage
1	70°				179.31	679.84	
2	60°				996.55	3772.04	
AGGREGATE COVERAGE					1175.86	4451.88	26.41

Prepared By: <i>David H. Z...</i>		Level: <i>II</i>	Date: <i>12/14/00</i>
Reviewed By: <i>Larry Mauder</i>		Level: <i>III</i>	Date: <i>12/18/00</i>



40F15

<b>DUKE POWER COMPANY</b> Limited Examination Coverage Worksheet						NDE-91-1	
						Revision 0	
<b>Examination Volume/Area Defined</b>							
<input type="checkbox"/> Base Metal <input type="checkbox"/> Weld <input type="checkbox"/> Near Surface <input type="checkbox"/> Bolting <input type="checkbox"/> Inner Radius							
Area Calculation				Volume Calculation			
ZONE 1 (SEE DRWG. FOR CALCULATIONS) 9.39 SQ. IN.				9.39 SQ. IN X 18.1 IN. = 170 CU. IN. (HEATER BUNDLE AREA IS 6 IN. LONG)			
<b>Coverage Calculations</b>							
Scan #	Angle	Beam Direction	Area Examined (sq.in.)	Length Examined (in.)	Volume Examined (cu.in.)	Volume Required (cu.in.)	Percent Coverage
1	70°	S2	3.8	12.1	45.98	113.62	
1	70°	S2	3.1	6	18.6	56.34	
2	70°	S1	1.5	12.1	18.15	113.62	
2	70°	S1	1.0	6	6	56.34	
3	70°	CW	2.9	12.1	35.09	113.62	
3	70°	CW	1.7	6	10.2	56.34	
4	70°	CCW	2.9	12.1	35.09	113.62	
4	70°	CCW	1.7	6	10.2	56.34	
					179.31	679.84	26.38

Item No: B03.110.009	
Prepared By: <i>David K. B.</i>	Level: <i>II</i> Date: <i>12/14/00</i>
Reviewed By: <i>Larry Moulder</i>	Level: <i>III</i> Date: <i>12/18/00</i>

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<b>DUKE POWER COMPANY</b> Limited Examination Coverage Worksheet						NDE-91-1	
						Revision 0	
<b>Examination Volume/Area Defined</b>							
<input checked="" type="checkbox"/> Base Metal		<input checked="" type="checkbox"/> Weld		<input type="checkbox"/> Near Surface		<input type="checkbox"/> Bolting	
<input type="checkbox"/> Inner Radius							
Area Calculation				Volume Calculation			
AREAS 2 & 3 (SEE DRWG. FOR CALCULATIONS) 52.1 SQ. IN.				52.1 SQ. IN. X 18.1 IN. = 943 CU. IN. (HEATER BUNDLE AREA IS 6 IN. LONG)			
<b>Coverage Calculations</b>							
Scan #	Angle	Beam Direction	Area Examined (sq.in.)	Length Examined (in.)	Volume Examined (cu.in.)	Volume Required (cu.in.)	Percent Coverage
1	60°	S1	.3	12.1	3.63	630.41	
1	60°	S1	0	6	0	312.6	
2	60°	S2	38.2	12.1	462.22	630.41	
2	60°	S2	29.3	6	175.8	312.6	
3	60°	CW	13.5	12.1	163.35	630.41	
3	60°	CW	2.35	6	14.1	312.6	
4	60°	CCW	13.5	12.1	163.35	630.41	
4	60°	CCW	2.35	6	14.1	312.6	
						996.55	3772.04
							26.42

			Item No: 803.110.009
Prepared By: <i>David R. Z...</i>	Level: <i>II</i>	Date: <i>12/14/00</i>	
Reviewed By: <i>Larry Mauldin</i>	Level: <i>III</i>	Date: <i>12/18/00</i>	

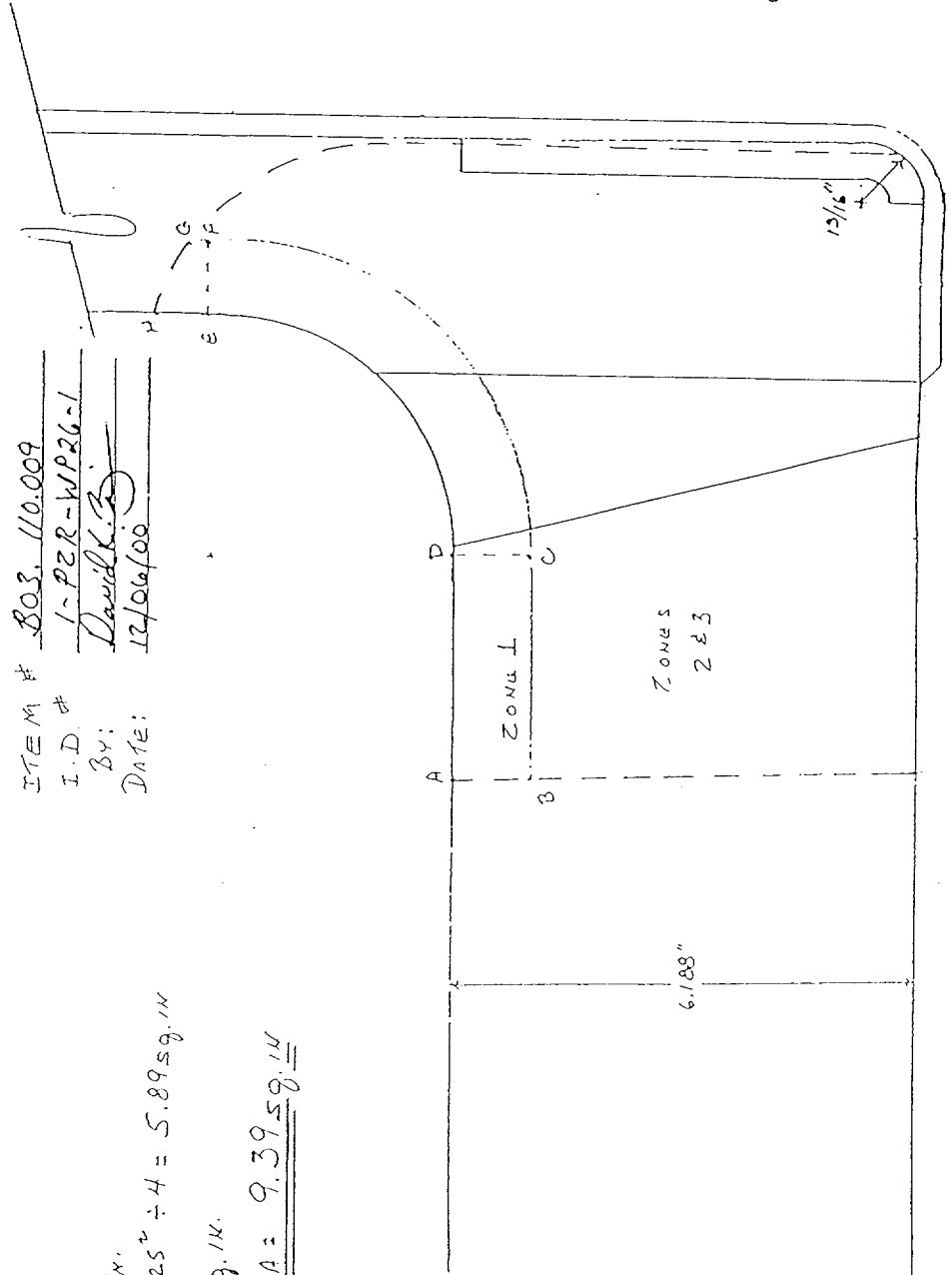
# OCONEE SENSING / SAMPLING NOZZLE

## EXAM AREAS

$ABCD \quad 3" \times 10" = 3.0 \text{ Sq. ft.}$   
 $CDEF \quad \pi \times 4.25^2 - \pi \times 3.25^2 \div 4 = 5.89 \text{ Sq. ft.}$   
 $EFGH \quad \frac{10}{2} (.7 + .3) = .5 \text{ Sq. ft.}$

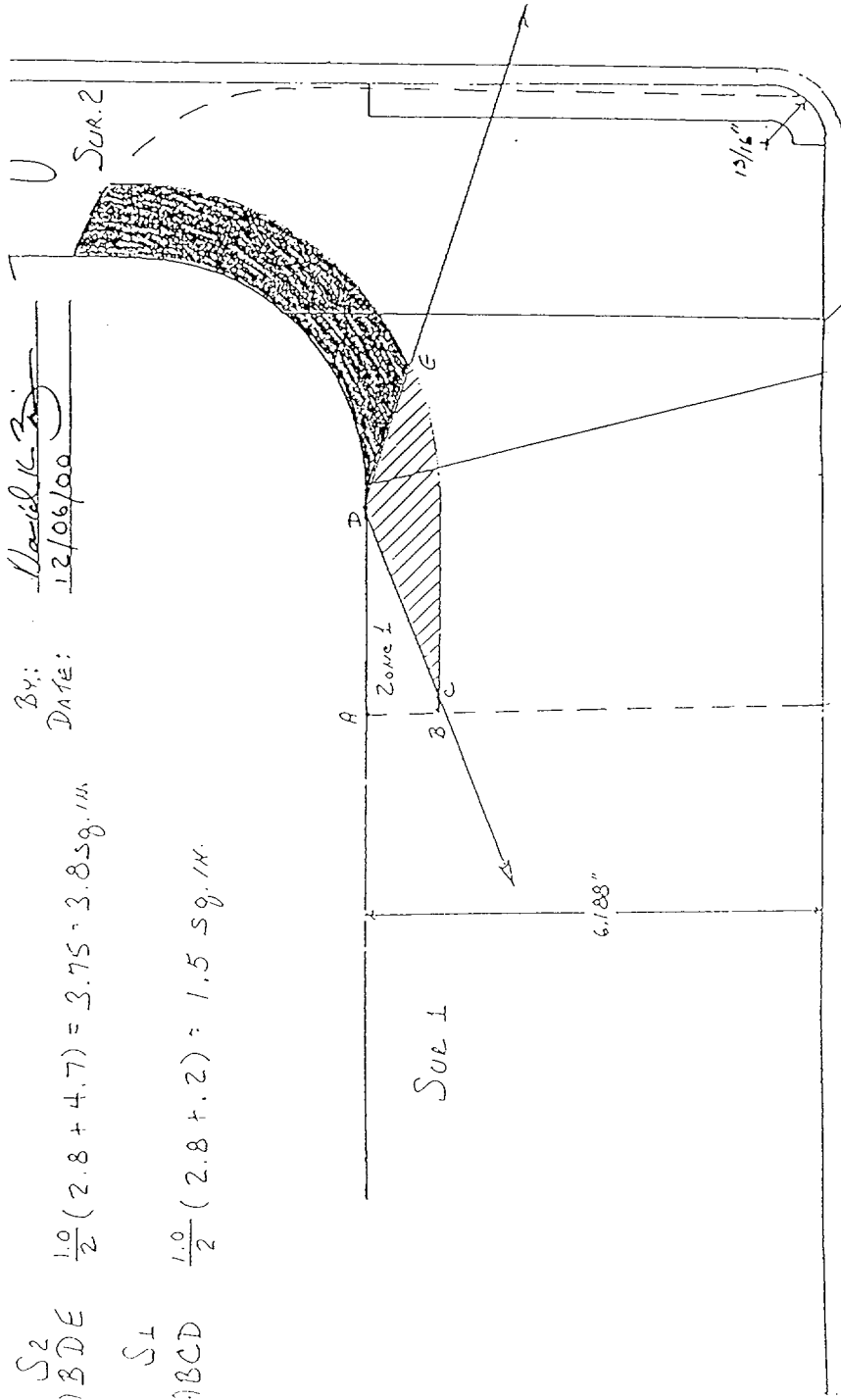
Zone 1 Area = 9.39 Sq. ft.

ITEM # BO3, 110.009  
 I.D. # 1-PER-WP26-1  
 BY: David K. B.  
 DATE: 12/06/00



ANII Date 1/6  
 HSB&I Co.

Scale: 1/2" = 1'-0"



By: David K. Z...  
Date: 12/06/00

$$\begin{aligned} S_2 \quad 1BDE & \quad \frac{1.0}{2} (2.8 + 4.7) = 3.75 \approx 3.8 \text{ sq. ft.} \\ S_1 \quad 1BCD & \quad \frac{1.0}{2} (2.8 + .2) = 1.5 \text{ sq. ft.} \end{aligned}$$

# OCCONEE SENSING SAMPLING NOZZLE HEATER BUNDLE AREA

INSPECTED AREA

ZONE 1

70° S<sub>1</sub> TO S<sub>2</sub>  
 ABDE + BFF  
 $1.0 \times 2.4 + \frac{1.0 \times 1.4}{2} = 3.1 \text{ sq. in.}$

S<sub>2</sub> TO S<sub>1</sub>  
 ABC  $\frac{2.4 \times .8}{2} = .96 = 1.0 \text{ sq. in.}$

ITEM # 803.110.009  
 I.D. # 1-PCR-WP26-1  
 BY: David E. [Signature]  
 DATE: 12/06/00

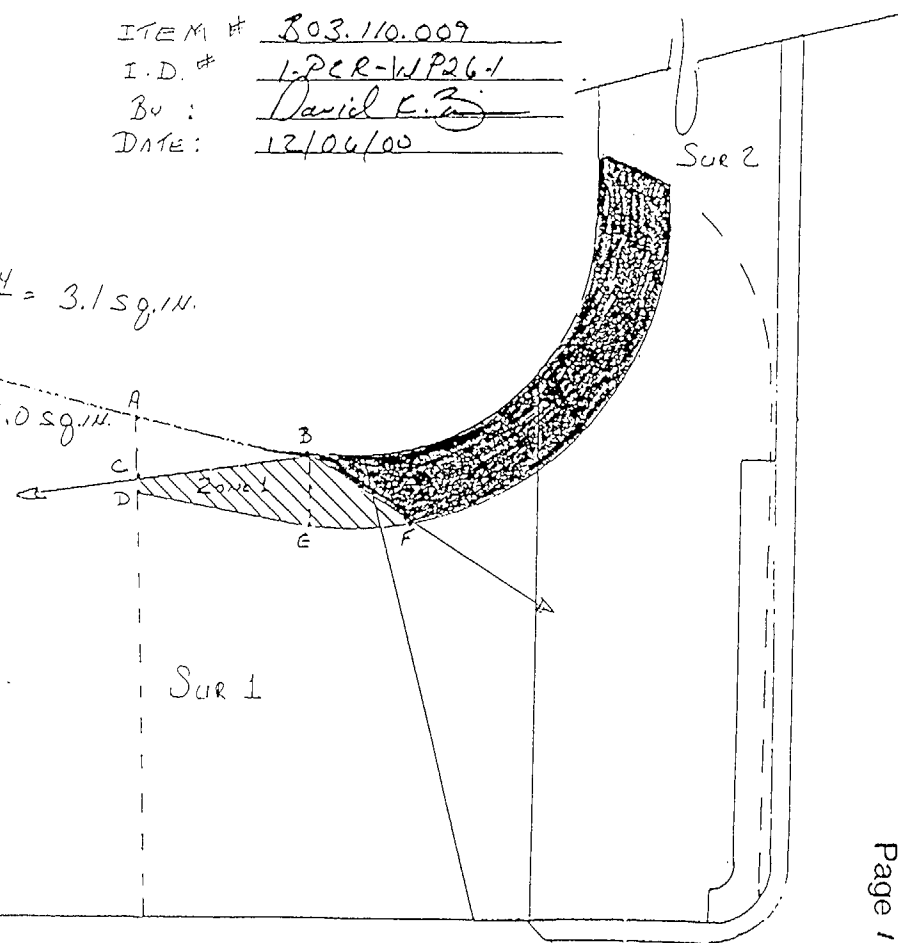
ANII 12/6 Date 12/6  
 HSB&I Co.

SCALE 1/2" = 1.0"

☐ FULL COVERAGE

☒ PARTIAL COVERAGE

☐ NO COVERAGE



# OCONEE SENSING / SAMPLING NOZZLE

INSPECTED AREA

ZONE 1

70° CW TO CCW

ABCD 1.0" X 2.9" = 2.9 sq. in.

CCW TO CW  
ABCD

1.0" X 2.9" = 2.9 sq. in.

ITEM # 303.110.009  
I.D. # 1-PRR-WP26-1  
By: David K. B.  
Date: 12/06/00

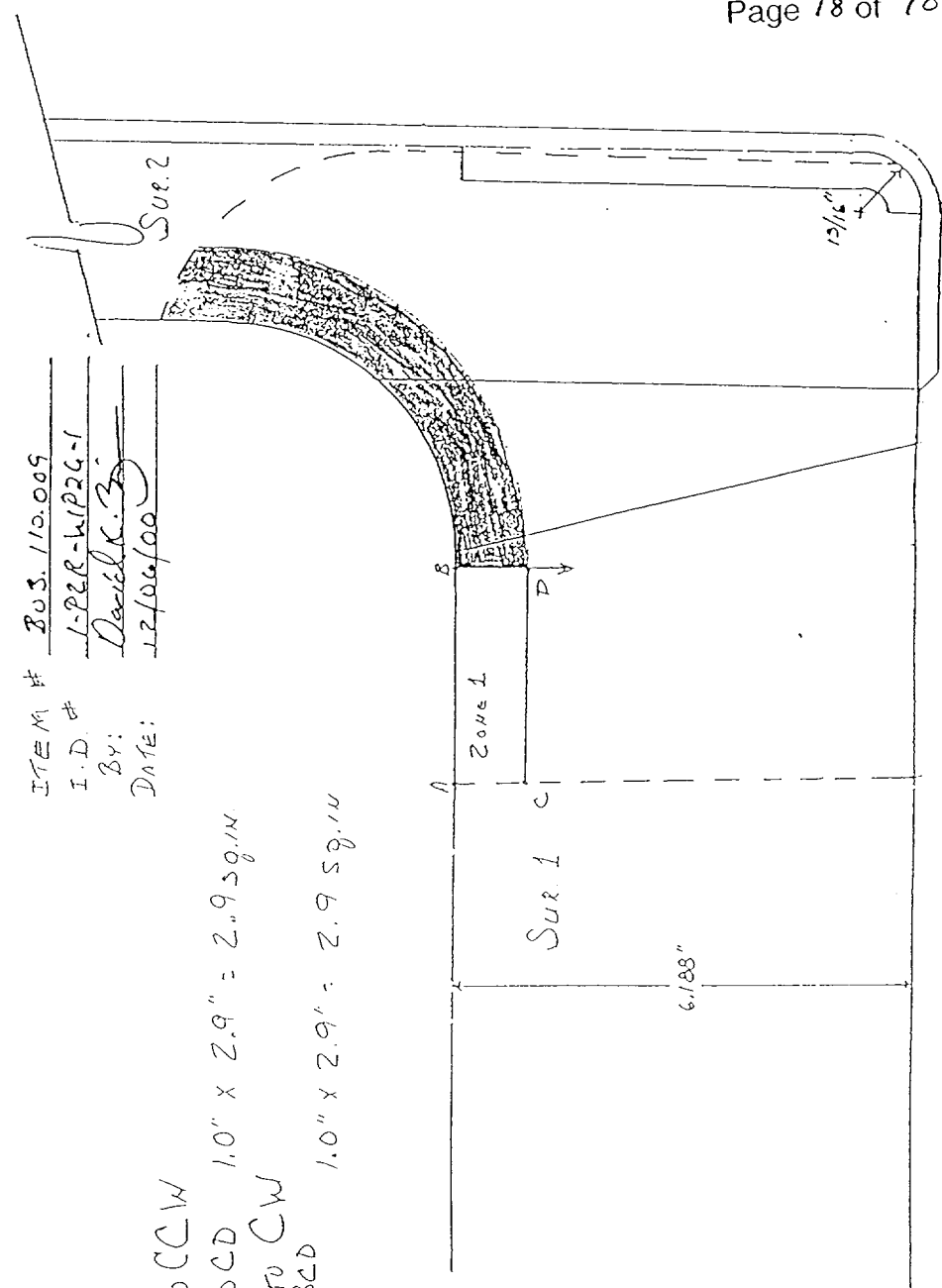
ANIL AK Date 1/4  
HSBI & Co.

SCALE 1/2" = 10'

☐ FULL COVERAGE

☒ PARTIAL COVERAGE

☒ NO COVERAGE



10 OF 15

BOONE SENSING SAMPLING NOZZLE  
HEATER BUNDLE AREA

ITEM # 303.110.009  
I.D. # 1-P2R.WP26.1  
BY: David K. B.  
DATE: 12/06/00

AREA INSPECTED

ZONE 1

70° CW TO CCW

$$ABCD \frac{1.0}{2} (1.6 + 1.8) = 1.7 \text{ Sq. ft.}$$

CCW TO CW

$$ABCD \frac{1.0}{2} (1.6 + 1.8) = 1.7 \text{ Sq. ft.}$$

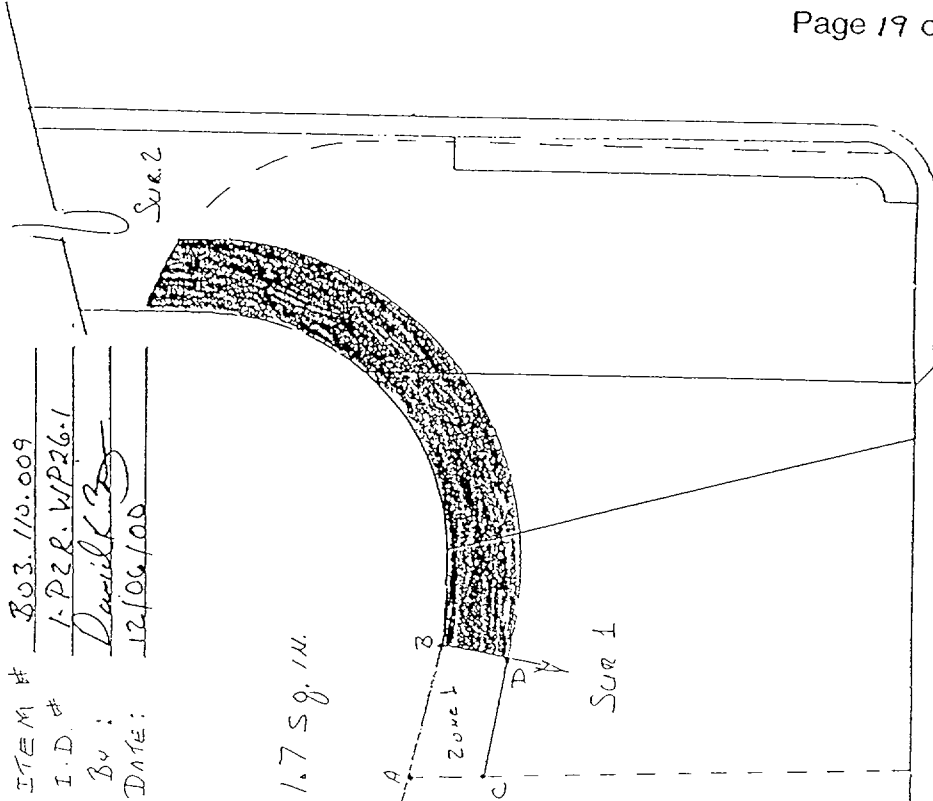
ANII Date 1/6  
HSBI&I Co.

Scale 1/2" = 1.0"

☐ FULL COVERAGE

☒ Partial Coverage

☐ NO COVERAGE



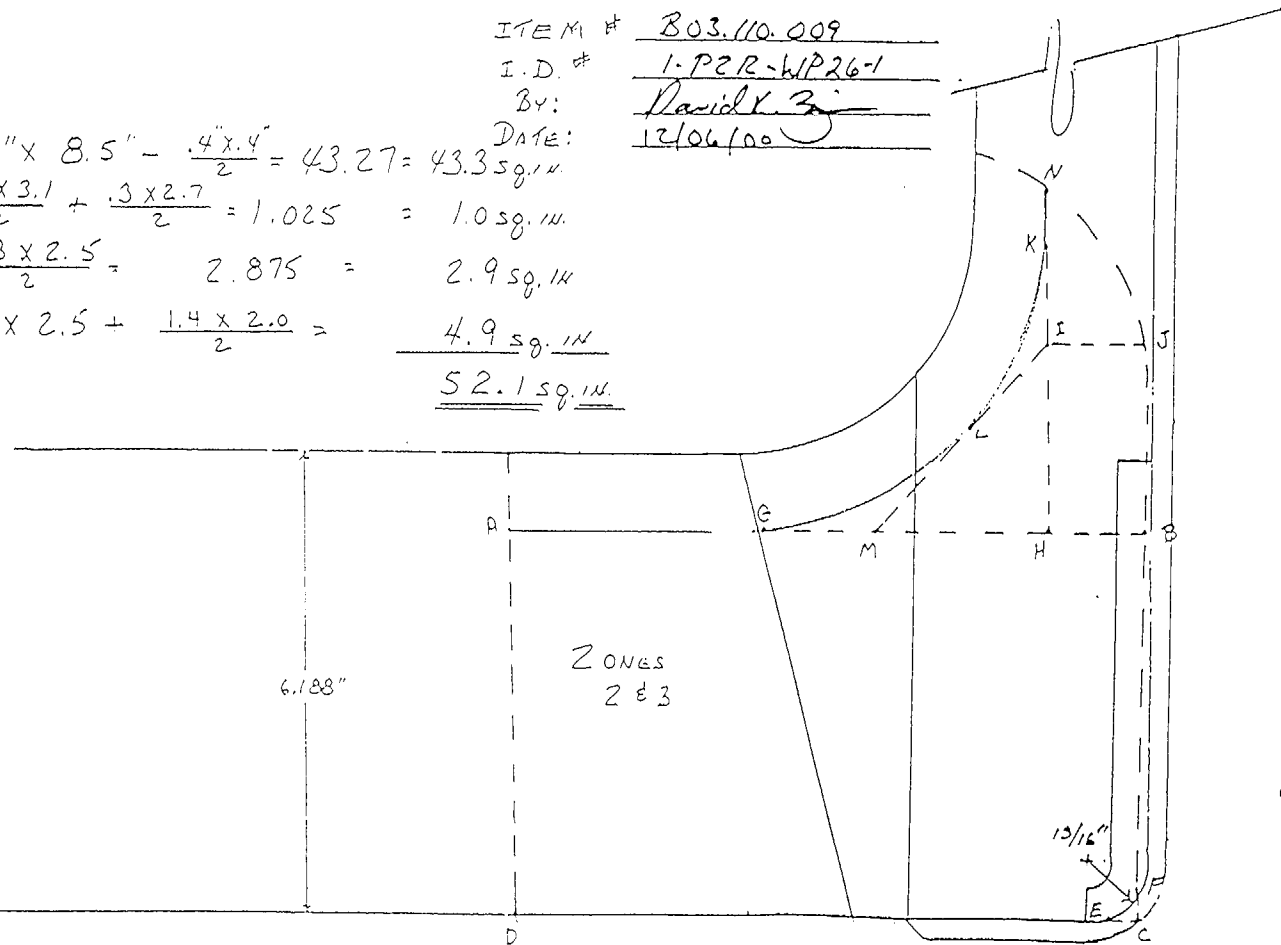
# OLONEE SENSING / SAMPLING NOZZLE

EXAM AREAS

ZONES 2 & 3

ABCD - CEF	$5.1" \times 8.5" - \frac{.4" \times .4"}{2} = 43.27 = 43.3 \text{ sq. in.}$
GLM + IKL	$\frac{.4 \times 3.1}{2} + \frac{.3 \times 2.7}{2} = 1.025 = 1.0 \text{ sq. in.}$
HIM	$\frac{2.3 \times 2.5}{2} = 2.875 = 2.9 \text{ sq. in.}$
BHIJ + JIN	$1.4 \times 2.5 + \frac{1.4 \times 2.0}{2} = 4.9 \text{ sq. in.}$
	<u><u>52.1 sq. in.</u></u>

ITEM # B03.110.009  
 I.D. # 1-P2R-WP26-1  
 BY: David K. Zi  
 DATE: 12/06/00



ANII 6 Date 7/6  
 HSB&I Co.

SCALE 1/2" = 10"

Attachment L  
 RFR 01-01  
 Page 20 of 107



# DCONEE SENSING / SAMPLING NOZZLE

INSPECTED AREAS

ZONES 2 & 3

60° S<sub>1</sub> to S<sub>2</sub>

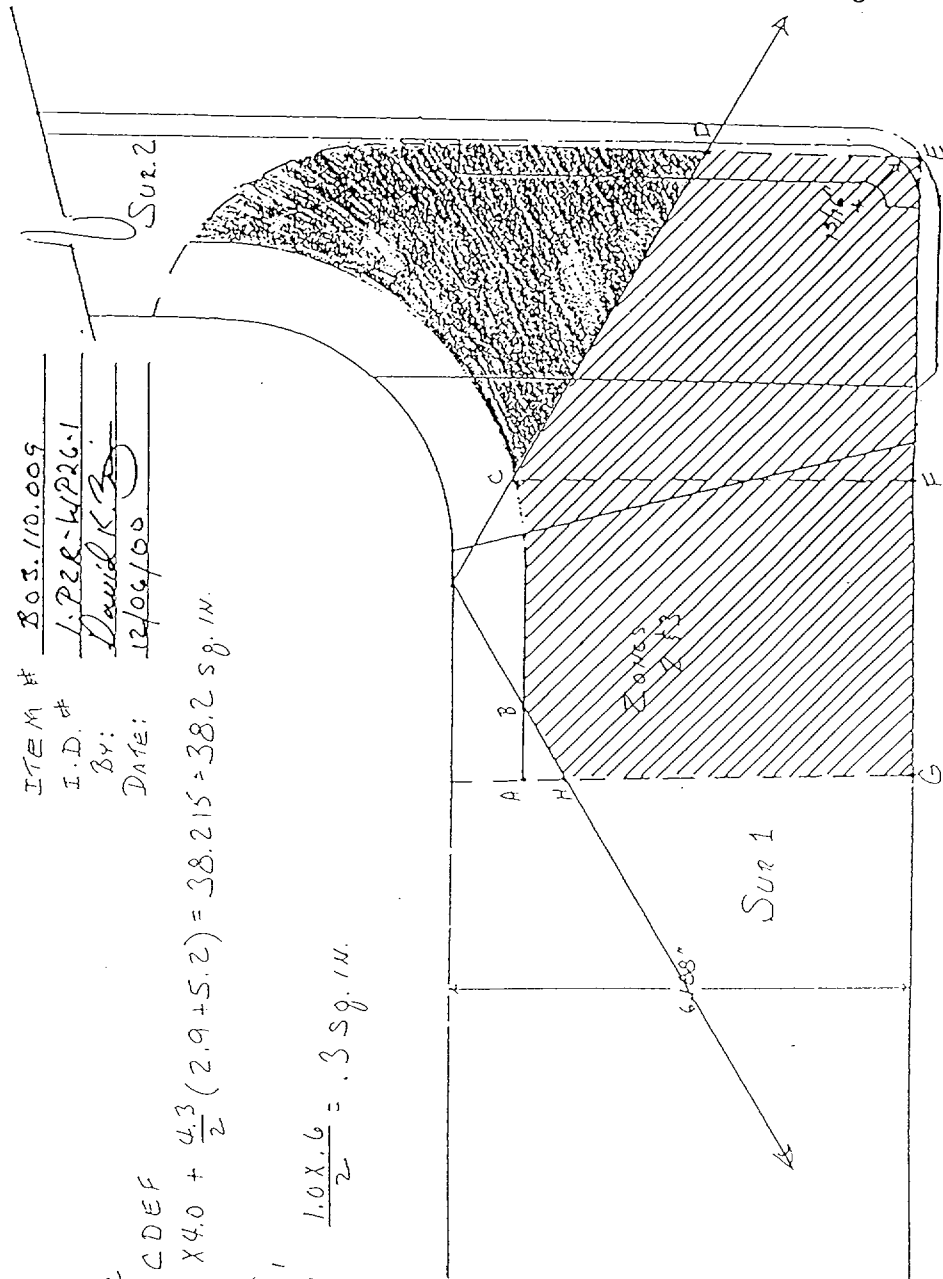
ACFG + CDEF

$$5.2 \times 4.0 + \frac{4.3}{2} (2.9 + 5.2) = 38.2 \text{ sq. in.}$$

S<sub>2</sub> to S<sub>1</sub>

$$ABH \quad \frac{1.0 \times .6}{2} = .3 \text{ sq. in.}$$

ITEM # 803.110.009  
I.D. # 1-P28-WP26-1  
BY: David K. B.  
DATE: 12/06/00



ANII 1/6 Date 1/6  
HSBI&I Co.

SCALE 1/2" = 1.0"

☐ FULL COVERAGE

☒ PARTIAL COVERAGE

☐ NO COVERAGE

# COONE SENSING SAMPLING NOZZLE

HEATER BUNDLE AREA

INSPECTED AREA

CONES 2 & 3

ITEM # B03.110.009  
I.D. # 1-P2P-WP26-1  
By: David K. B.  
Date: 12/06/02

$$60^\circ S_1 \text{ TO } S_2$$

$$ABE + BCDE$$

$$\frac{5 \times 2.8}{2} + \frac{5.2}{2} (2.8 + 8.2) = 29.3 \text{ sq. in.}$$

$$60^\circ S_2 \text{ TO } S_1$$

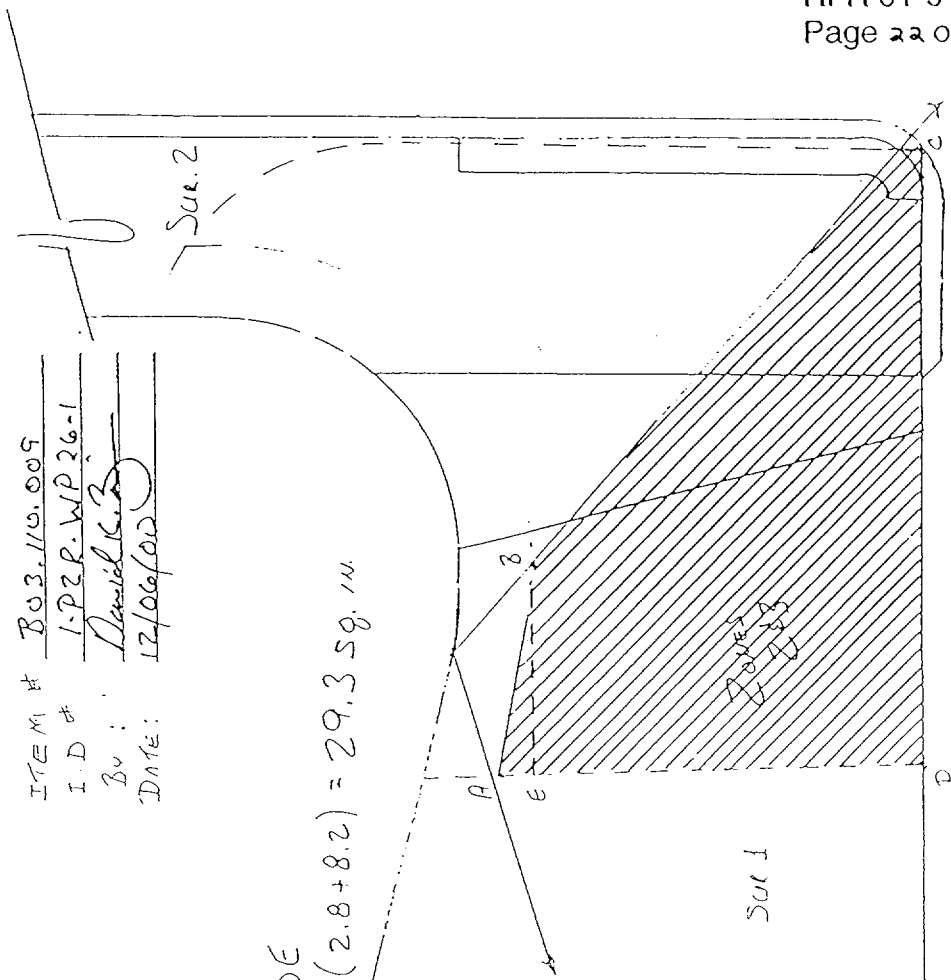
TOTAL LOSS

NOTE: HEATER BUNDLE SCAN AREA IS  
21% OF INSPECTION AREA.

ANII Date 1/6  
HSBI&I Co.

Scale 1/2" = 1.0"

- ☐ FULL COVERAGE
- ☒ Partial Coverage
- ☒ NO COVERAGE



# DOONEE SENSING / SAMPLING NOZZLE

INSPECTED AREA

ZONES 2 & 3

60°

CW to CCM

ABCD

2.6" X 5.2" = 13.52 = 13.5 sg. 111

CCW to CCM

ABCD

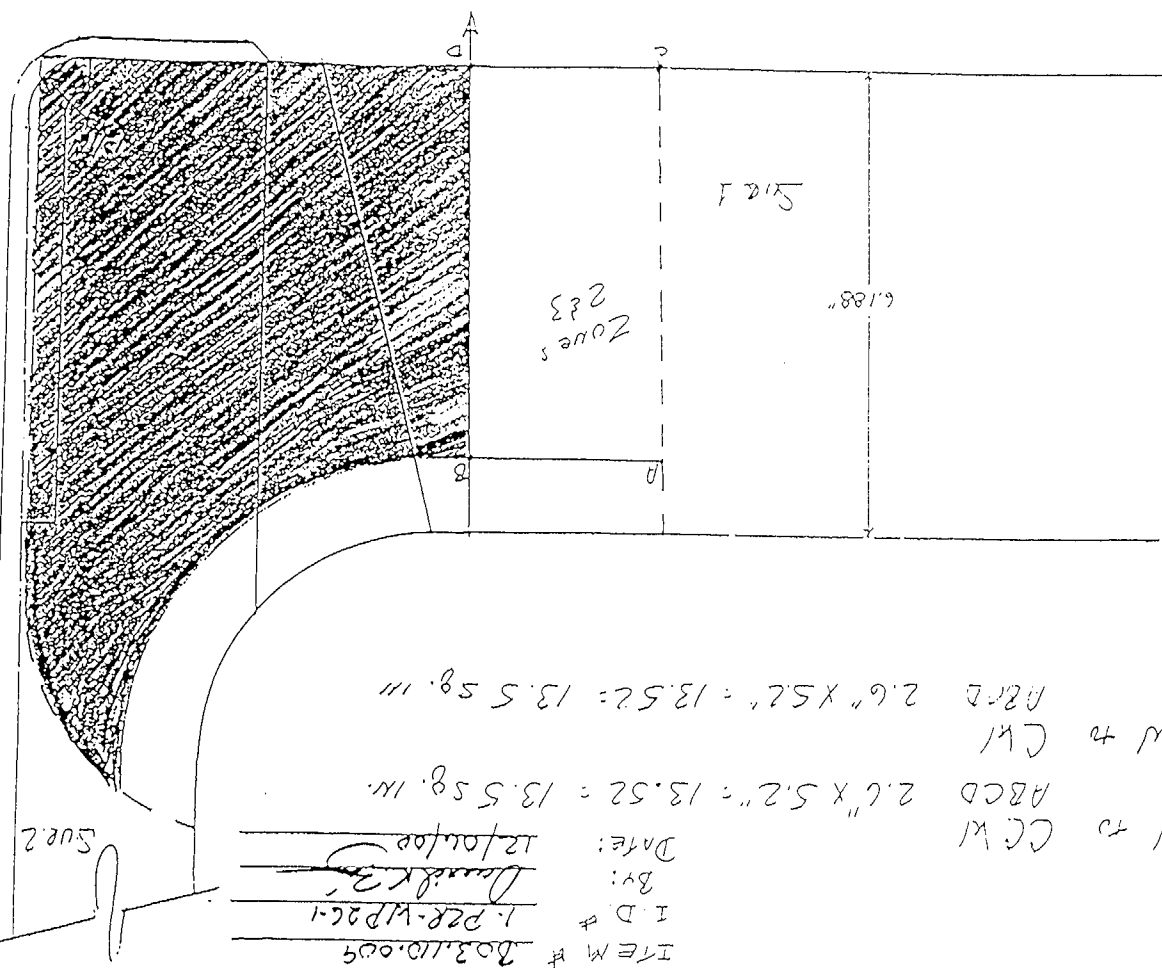
2.6" X 5.2" = 13.52 = 13.5 sg. 111

ITEM # 303.110.009

I.D. # 1.228-WP20-1

BY: Donnee

DATE: 12/01/00



ANIL 12 Date 12  
HSB181 Co.

SCALE 1/2" = 1.0"

☐ Full Coverage  
☒ Partial Coverage  
☐ No Coverage

15 OF 15

OCONEE SENSING SAMPLING NOZZLE  
HENNER BUNDLE AREA

ITEM # 803.110.009  
I.D # 1-P2R-WP26-1  
By: David R. [Signature]  
Date: 12/06/00

INSPECTED AREA

ZONE 2 & 3

60° CW TO ICW

$$ABC \frac{4.7 \times 1.0}{2} = 2.35 = 2.4 \text{ SQ. IN.}$$

60° CCW TO CW

$$ABC \frac{4.7 \times 1.0}{2} = 2.35 = 2.4 \text{ SQ. IN.}$$

NOTE: HENNER BUNDLE SCOV AREA IS  
21% OF INSPECTION AREA

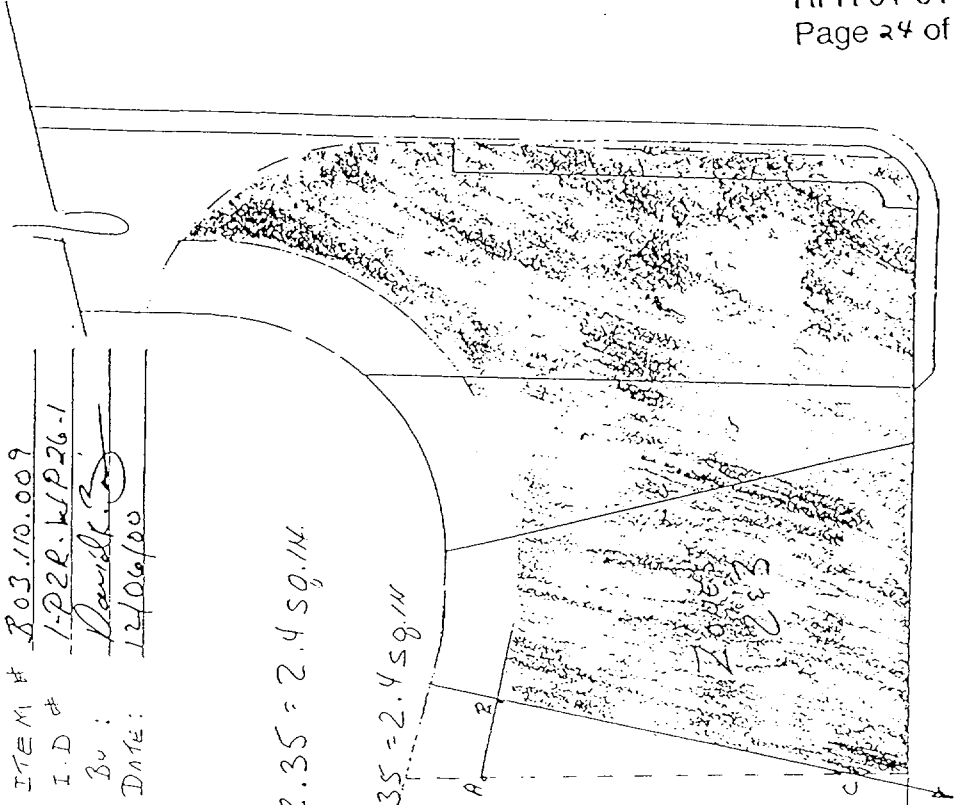
ANII <u>[Signature]</u>	Date <u>1/6</u>
HSBI&I Co.	

SCALE 1/2" = 1.0"

☐ FULL COVERAGE

☒ PARTIAL COVERAGE

☐ NO COVERAGE



# DUKE POWER COMPANY

## ULTRASONIC EXAMINATION DATA SHEET FOR PLANAR REFLECTORS

Exam Start: 1345

Form NDE-UT-2A

Exam Finish: 1407

Revision 4

Station: Oconee

Unit: 1

Component/Weld ID: 1-PZR-WP26-2

Date: 12/6/00

Weld Length (in.): 19.6

Surface Condition: AS GROUND

Lo: 9.2.3

Surface Temperature: 63 ° F

Examiner: James L. Panel Level: II

Scans:

Pyrometer S/N: MCNDE 27205

Cal Due: 1/17/01

Examiner: Level:

45 ☐ dB 70 ☒ 58.5 dB

Procedure: NDE-620 Rev: 8 FC: 00-07

45T ☐ dB 70T ☒ 58.5 dB

60 ☒ 73.5 dB

60T ☒ 73.5 dB

Other: dB

Configuration: CIRC. WELD

S2 Flow S1

NOZZLE to SHELL

Scan Surface: OD

Applies to NDE-680 only

Skew Angle: N/A

IND #	4	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	60°	32%	4.879	2.6	9.3	9.05	9.55	2.45	4.63	2.75	5.46	2	1	AXIAL	NO
NRI	70°														

Remarks:

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

Sheet 1 of 20

Reviewed By:

Level:

Date:

Authorized Inspector:

Date:

JAN 06 2001

Item No:

B03.110.010

# OZONE SENSING / SAMPLING NOZZLE

ITEM # B03.110.010  
I.D. # 1-PER-4/P26-2  
BY: James J. Paul  
DATE: 12/06/00

ANII Date 1/6  
HSBI & Co.

IND. 1  
(LOOK)

6.188"

13 1/8"

# DUKE POWER COMPANY

## ISI LIMITATION REPORT

FORM NDE-UT-4

Revision 1

Component/Weld ID: 1-PZR-WP26-2

Item No: B03.110.010

Remarks:

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

NOZZLE CONFIGURATION

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

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

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

Prepared By: *David K. B.*

Level: *II*

Date: *12/14/00*

Sketch(s) attached ☒ yes   ☐ no

Sheet *3* of *20*

Reviewed By: *Lucy Mauldin*

Date: *12/18/00*

Authorized Inspector: *E. J. [Signature]*

Date: *JAN 06 2001*

Attachment L  
 RFR 01-01  
 Page 27 of 167

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<b>DUKE POWER COMPANY</b> Limited Examination Coverage Worksheet						NDE-91-1	
						Revision 0	
<b>Examination Volume/Area Defined</b>							
<input type="checkbox"/> Base Metal <input type="checkbox"/> Weld <input type="checkbox"/> Near Surface <input type="checkbox"/> Bolting <input type="checkbox"/> Inner Radius							
Area Calculation				Volume Calculation			
<b>Coverage Calculations</b>							
Scan #	Angle	Beam Direction	Area Examined (sq.in.)	Length Examined (in.)	Volume Examined (cu.in.)	Volume Required (cu.in.)	Percent Coverage
1	70°				179.31	679.84	
2	60°				996.55	3772.04	
AGGREGATE COVERAGE					1175.86	4451.88	26.41

Prepared By: <i>David K. B.</i>		Level: <i>II</i>	Date: <i>12/14/00</i>
Reviewed By: <i>Larry Mauldin</i>		Level: <i>III</i>	Date: <i>12/18/00</i>



5 of 20

<b>DUKE POWER COMPANY</b> Limited Examination Coverage Worksheet						NDE-91-1 Revision 0	
<b>Examination Volume/Area Defined</b>							
<input checked="" type="checkbox"/> Base Metal <input checked="" type="checkbox"/> Weld <input type="checkbox"/> Near Surface <input type="checkbox"/> Bolting <input type="checkbox"/> Inner Radius							
Area Calculation				Volume Calculation			
AREAS 2 & 3 (SEE DRWG. FOR CALCULATIONS) 52.1 SQ. IN.				52.1 SQ. IN. X 18.1 IN. = 943 CU. IN. (HEATER BUNDLE AREA IS 6 IN. LONG)			
<b>Coverage Calculations</b>							
Scan #	Angle	Beam Direction	Area Examined (sq.in.)	Length Examined (in.)	Volume Examined (cu.in.)	Volume Required (cu.in.)	Percent Coverage

1	60°	S1	.3	12.1	3.63	630.41	
1	60°	S1	0	6	0	312.6	
2	60°	S2	38.2	12.1	462.22	630.41	
2	60°	S2	29.3	6	175.8	312.6	
3	60°	CW	13.5	12.1	163.35	630.41	
3	60°	CW	2.35	6	14.1	312.6	
4	60°	CCW	13.5	12.1	163.35	630.41	
4	60°	CCW	2.35	6	14.1	312.6	
					996.55	3772.04	26.42

Item No: B03.110.010		
Prepared By: <i>David J. Z...</i>	Level: <u>II</u>	Date: <u>12/14/00</u>
Reviewed By: <i>Larry Mauldin</i>	Level: <u>III</u>	Date: <u>12/18/00</u>

6 of 20

<b>DUKE POWER COMPANY</b>						NDE-91-1	
Limited Examination Coverage Worksheet						Revision 0	
<b>Examination Volume/Area Defined</b>							
<input type="checkbox"/> Base Metal <input type="checkbox"/> Weld <input type="checkbox"/> Near Surface <input type="checkbox"/> Bolting <input type="checkbox"/> Inner Radius							
Area Calculation				Volume Calculation			
ZONE 1 (SEE DRWG. FOR CALCULATIONS) 9.39 SQ. IN.				9.39 SQ. IN. X 18.1 IN. = 170 CU. IN. (HEATER BUNDLE AREA IS 6 IN. LONG)			
<b>Coverage Calculations</b>							
Scan #	Angle	Beam Direction	Area Examined (sq.in.)	Length Examined (in.)	Volume Examined (cu.in.)	Volume Required (cu.in.)	Percent Coverage
1	70°	S2	3.8	12.1	45.98	113.62	
1	70°	S2	3.1	6	18.6	56.34	
2	70°	S1	1.5	12.1	18.15	113.62	
2	70°	S1	1.0	6	6	56.34	
3	70°	CW	2.9	12.1	35.09	113.62	
3	70°	CW	1.7	6	10.2	56.34	
4	70°	CCW	2.9	12.1	35.09	113.62	
4	70°	CCW	1.7	6	10.2	56.34	
					179.31	679.84	26.38

			Item No:	B03.110.010
Prepared By:	<i>David J. Z.</i>	Level:	<i>II</i>	Date:
Reviewed By:	<i>Randy Thawler</i>	Level:	<i>III</i>	Date:

# OCONEE SENSING / SAMPLING NOZZLE

## INSPECTED AREA

### ZONE 1

70°-S<sub>1</sub> to S<sub>2</sub>  
ABDE

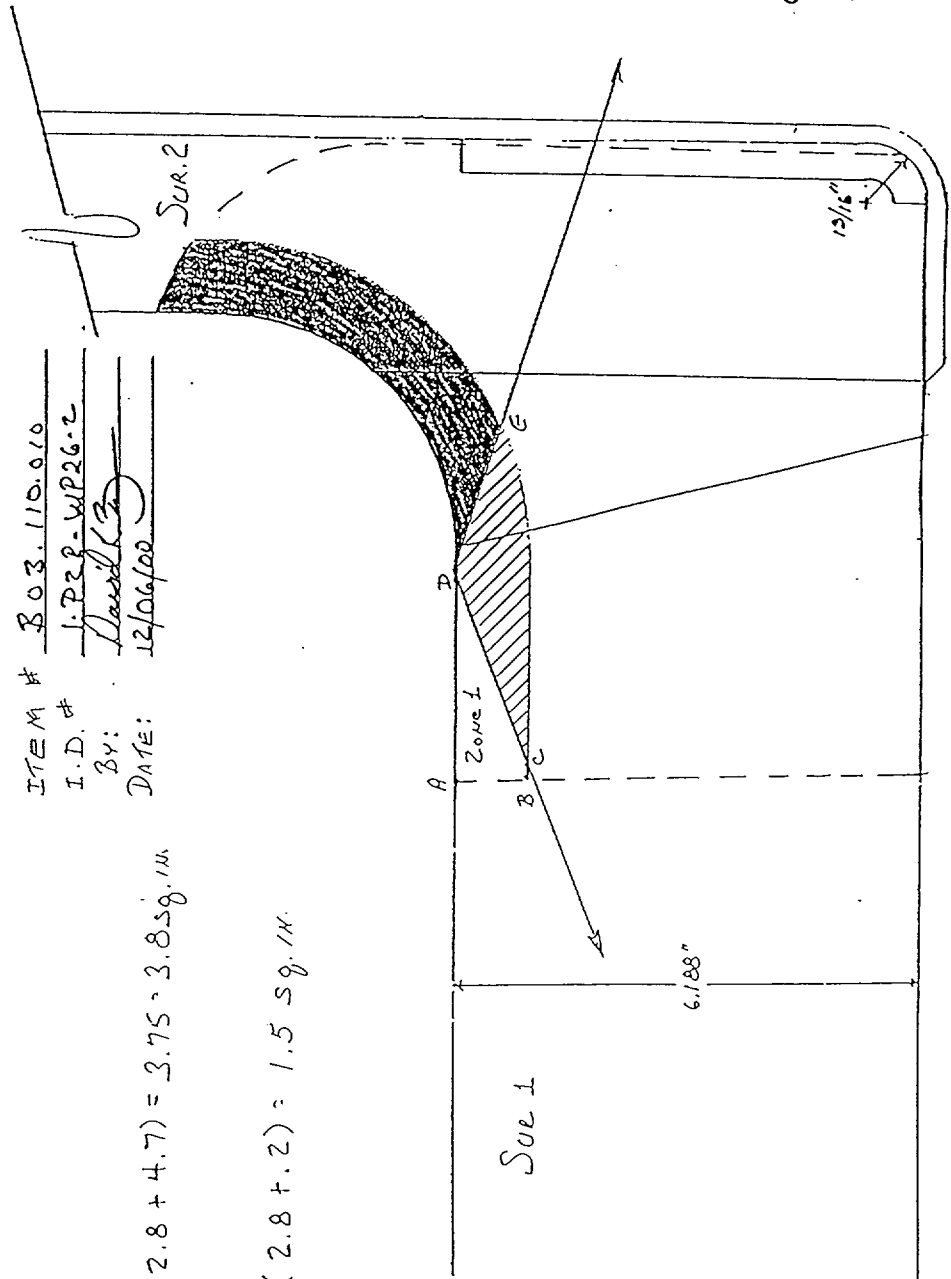
$$\frac{1.0}{2} (2.8 + 4.7) = 3.75 \sim 3.8 \text{ sq. ft.}$$

S<sub>2</sub> to S<sub>1</sub>

ABCD

$$\frac{1.0}{2} (2.8 + 2) = 1.5 \text{ sq. ft.}$$

ITEM # 803.110.010  
I.D. # 1-P28-WP26-2  
BY: David L. B.  
DATE: 12/06/00



ANII Date 1/6  
HSBI&I Co.

SCALE 1/2" = 1.0'  
☐ FULL COVERAGE  
☒ PARTIAL COVERAGE  
☐ NO COVERAGE

OCCUPY SENSING SAMPLING NOZZLE  
HEATER BUNDLE AREA

INSPECTED AREA

ZONE 1

70° S<sub>1</sub> TO S<sub>2</sub>

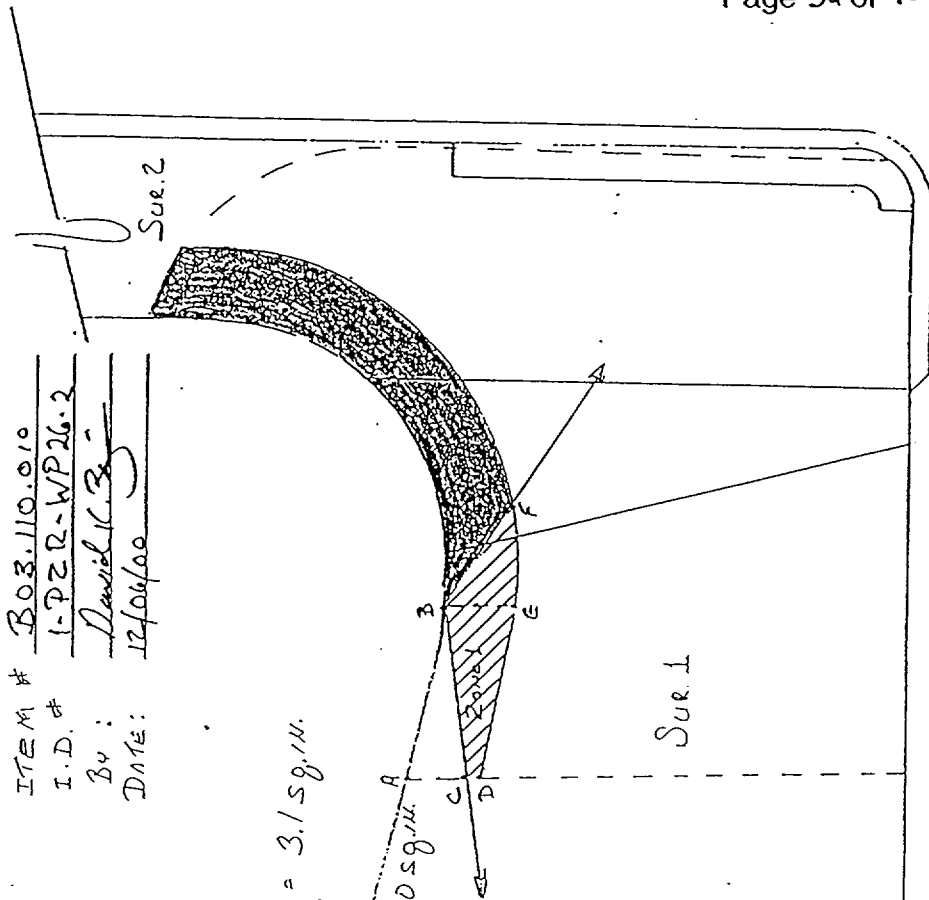
ABDE + BEF

$$1.0 \times 2.4 + \frac{1.0 \times 1.4}{2} = 3.1 \text{ sq. ft.}$$

S<sub>2</sub> TO S<sub>1</sub>

$$ABC \quad \frac{2.4 \times 1.8}{2} = .96 = 1.0 \text{ sq. ft.}$$

ITEM # B03.110.010  
I.D. # 1-PZR-WP26.2  
By: David K. B.  
Date: 12/04/00



ANII Date 1/6  
HSBI&I Co.

Scale 1/2" = 1.0"

- ☐ FULL COVERAGE
- ☒ PARTIAL COVERAGE
- ☐ NO COVERAGE

# DOONEE. SENSING / SAMPLING NOZZLE

INSPECTED AREA

Zone 1

70° CW to CCW

ABCD

1.0" x 2.9" = 2.9 sq.in.

CCW to CW

ABCD

1.0" x 2.9" = 2.9 sq.in.

6.188"

Zone 1

Sur. 1

Sur. 2

1 3/16"

SCALE 1/2" = 1.0"  
 Full Coverage  
 Partial Coverage  
 No Coverage

ANII Date 1/6  
 HSBIGI CO.

ITEM # 803.110.010  
 I.D.# 1-P2R-WP26.2  
 BY: David K. B.  
 Date: 12/06/00

BOONE SENSING SAMPLING NOZZLE  
HEATER BUNDLE AREA

ITEM # 303.110.010  
I.D. # 1-P2P-WIP26-2  
By: David K. B.  
Date: 12/06/00

AREA INSPECTED

ZONE 1

70° CW TO CCW

$$ABCD \frac{1.0}{2} (1.6 + 1.8) = 1.7 \text{ Sq. ft.}$$

CCW TO CW

$$ABCD \frac{1.0}{2} (1.6 + 1.8) = 1.7 \text{ Sq. ft.}$$

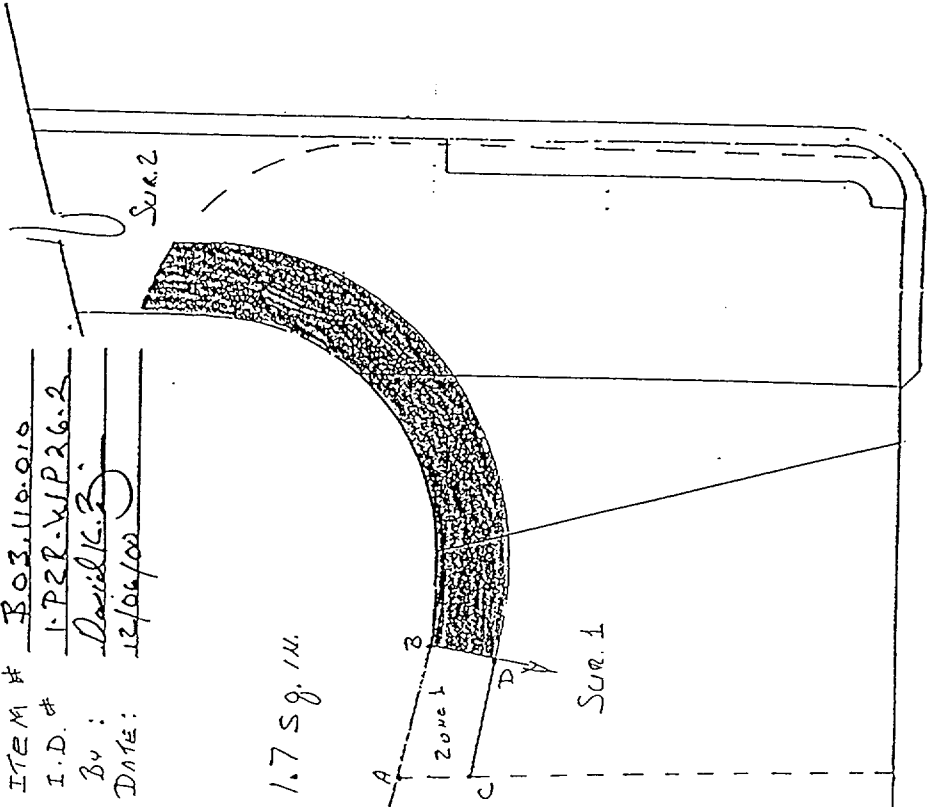
ANII Date 1/16  
HSB&I Co.

SCALE 1/2" = 1.0"

☐ FULL COVERAGE

☒ Partial Coverage

☒ No Coverage



# O'CONNOR SENSING / SAMPLING NOZZLE

## EXAM AREAS

ABCD  $3" \times 1.0" = 3.0 \text{ Sq. IN.}$

CDEF  $\pi \times 4.25^2 - \pi \times 3.25^2 \div 4 = 5.89 \text{ Sq. IN.}$

EFGH  $\frac{1.0}{2} (.7 + .3) = .5 \text{ Sq. IN.}$

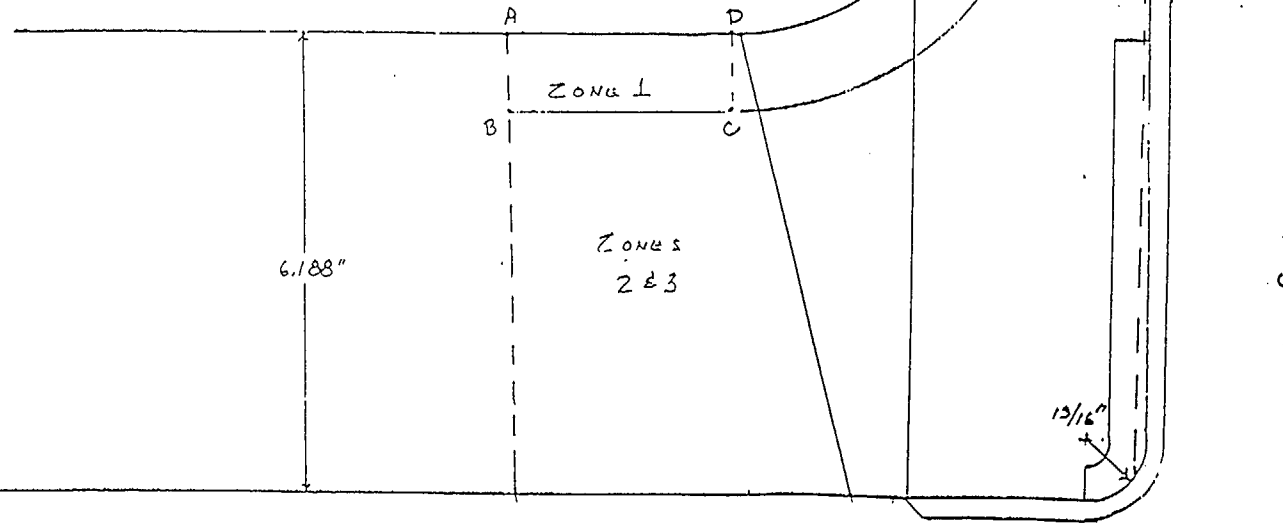
Zone 1 Area = 9.39 Sq. IN.

ITEM # 303.110.010

I.D. # 1-P2R-WP26-2

By: David K. Z.

DATE: 12/06/00



ANII 1/6 Date 1/6  
HSBI&I Co.

Scale:  $\frac{1}{2}" = 1.0"$

Attachment L  
RFR 01-01  
Page 35 of 107

# OCONEE SENSING/SAMPLING NOZZLE

## EXAM AREAS

### ZONES 2 & 3

ABCD-CEF

GLM+IKL

HIM

BHIJ + JIN

$$5.1" \times 8.5" - \frac{.4" \times .4"}{2} = 43.27 = 43.3 \text{ sq. in.}$$

$$\frac{.4 \times 3.1}{2} + \frac{.3 \times 2.7}{2} = 1.025 = 1.0 \text{ sq. in.}$$

$$\frac{2.3 \times 2.5}{2} = 2.875 = 2.9 \text{ sq. in.}$$

$$1.4 \times 2.5 + \frac{1.4 \times 2.0}{2} = 4.9 \text{ sq. in.}$$

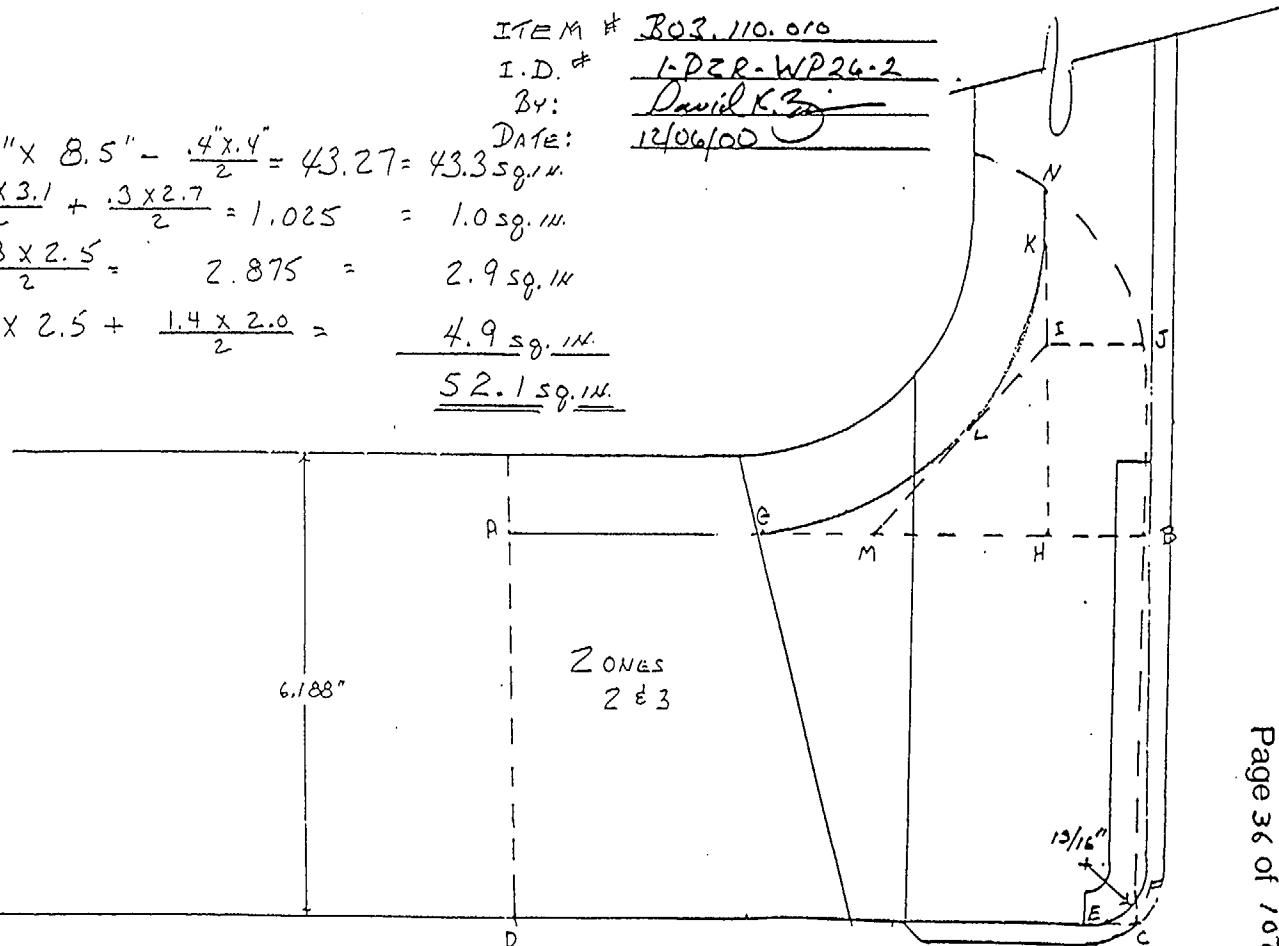
$$\underline{\underline{52.1 \text{ sq. in.}}}$$

ITEM # BO3.110.010

I.D. # 1-PER-WP24-2

By: David K. [Signature]

DATE: 12/06/00



ANII 12/16 Date 1/16  
HSBI&I Co.

SCALE 1/2" = 1.0"

Attachment L  
RFR 01-01  
Page 36 of 107



# OCONEE SENSING / SAMPLING NOZZLE

INSPECTED AREAS

ZONES 2 & 3

60° S<sub>1</sub> to S<sub>2</sub>

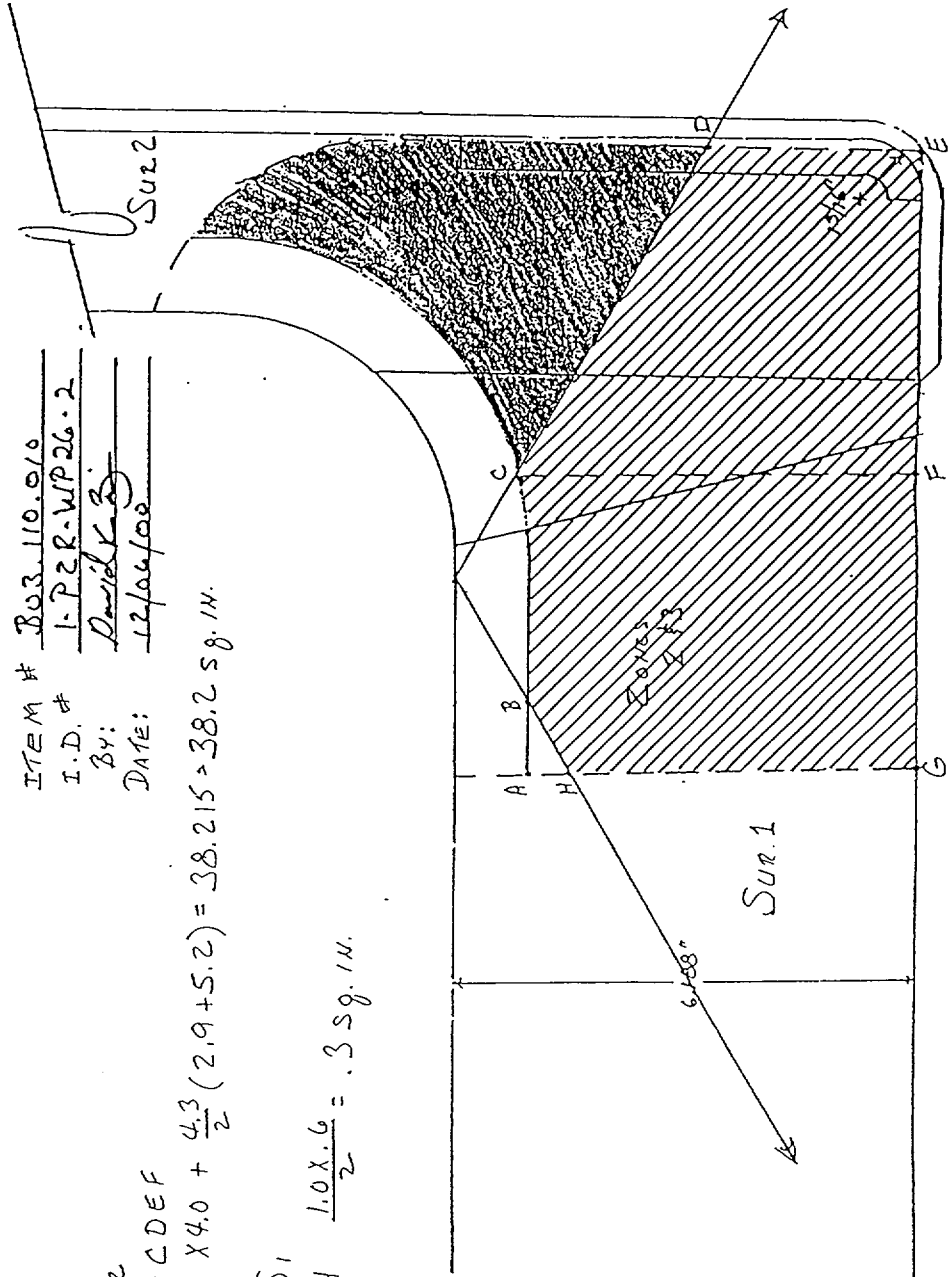
ACFG + CDEF

$$5.2 \times 4.0 + \frac{4.3}{2} (2.9 + 5.2) = 38.215 = 38.2 \text{ sq. ft.}$$

S<sub>2</sub> to S<sub>1</sub>

$$ABH \quad \frac{1.0 \times .6}{2} = .3 \text{ sq. ft.}$$

ITEM # 303.110.010  
I.D. # 1-P2R-WP26-2  
By: David V. B.  
DATE: 12/06/00



ANII Date 1/6  
HSBI&I Co.

SCALE 1/2" = 1.0"

☐ FULL COVERAGE

☒ PARTIAL COVERAGE

☐ NO COVERAGE

OCONEE SENSING SAMPLING NOZZLE  
HEATER BUNDLE AREA

INSPECTED AREA

ZONES 2 & 3

ITEM # B03.110.010  
 I.D. # 1-P2R-WP26.2  
 BY: David K. Z...  
 DATE: 12/04/00

60° S<sub>1</sub> TO S<sub>2</sub>

ABE + BCDE

$$\frac{.5 \times 2.8}{2} + \frac{5.2}{2} (2.8 + 8.2) = 29.3 \text{ sq. in.}$$

60° S<sub>2</sub> TO S<sub>1</sub>

TOTAL LOSS

NOTE: HEATER BUNDLE SCAN AREA IS  
 21% OF INSPECTION AREA.

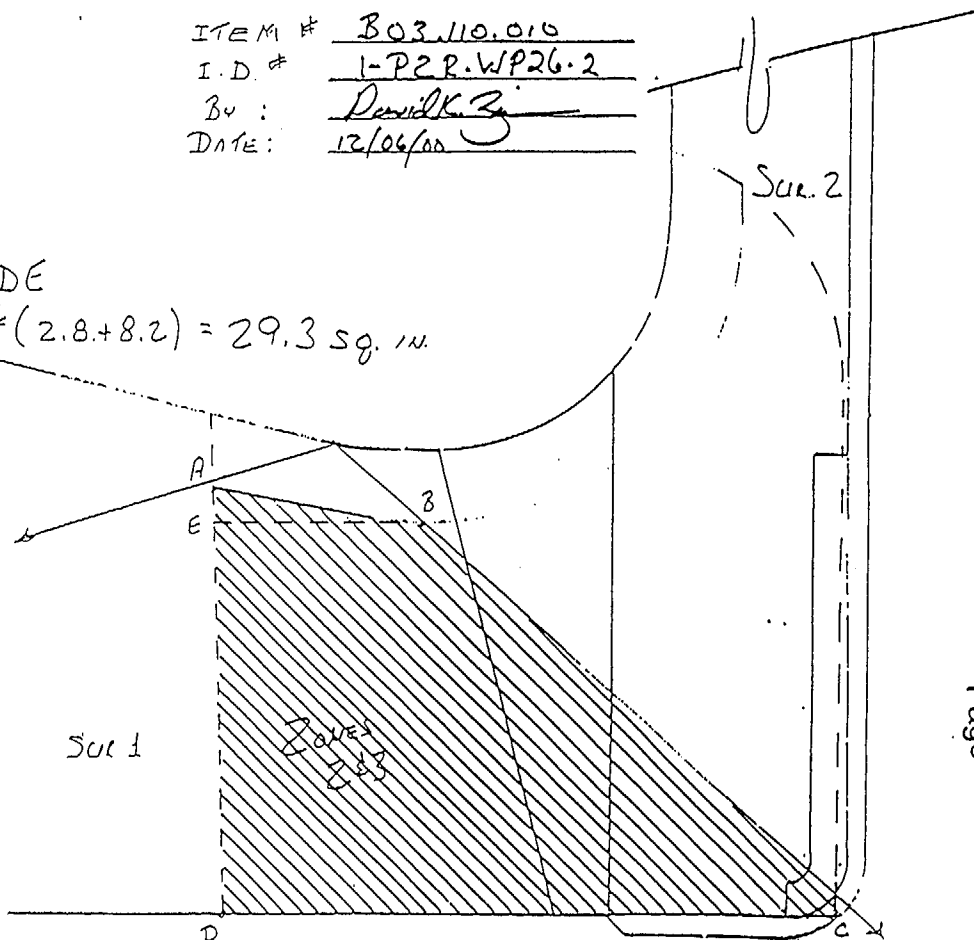
ANII ☒ Date 1/6  
 HSBI&I Co.

SCALE 1/2" = 1.0"

☐ FULL COVERAGE

☒ PARTIAL COVERAGE

☐ NO COVERAGE



Attachment L  
 RFR 01-01  
 Page 38 of 107

# CONCRETE SENSING / SAMPLING NOZZLE

## INSPECTED AREA

ZONES 2 & 3

60° CW to CCW

ABCD

CCW to CW

ABCD

ITEM # B03.110.010

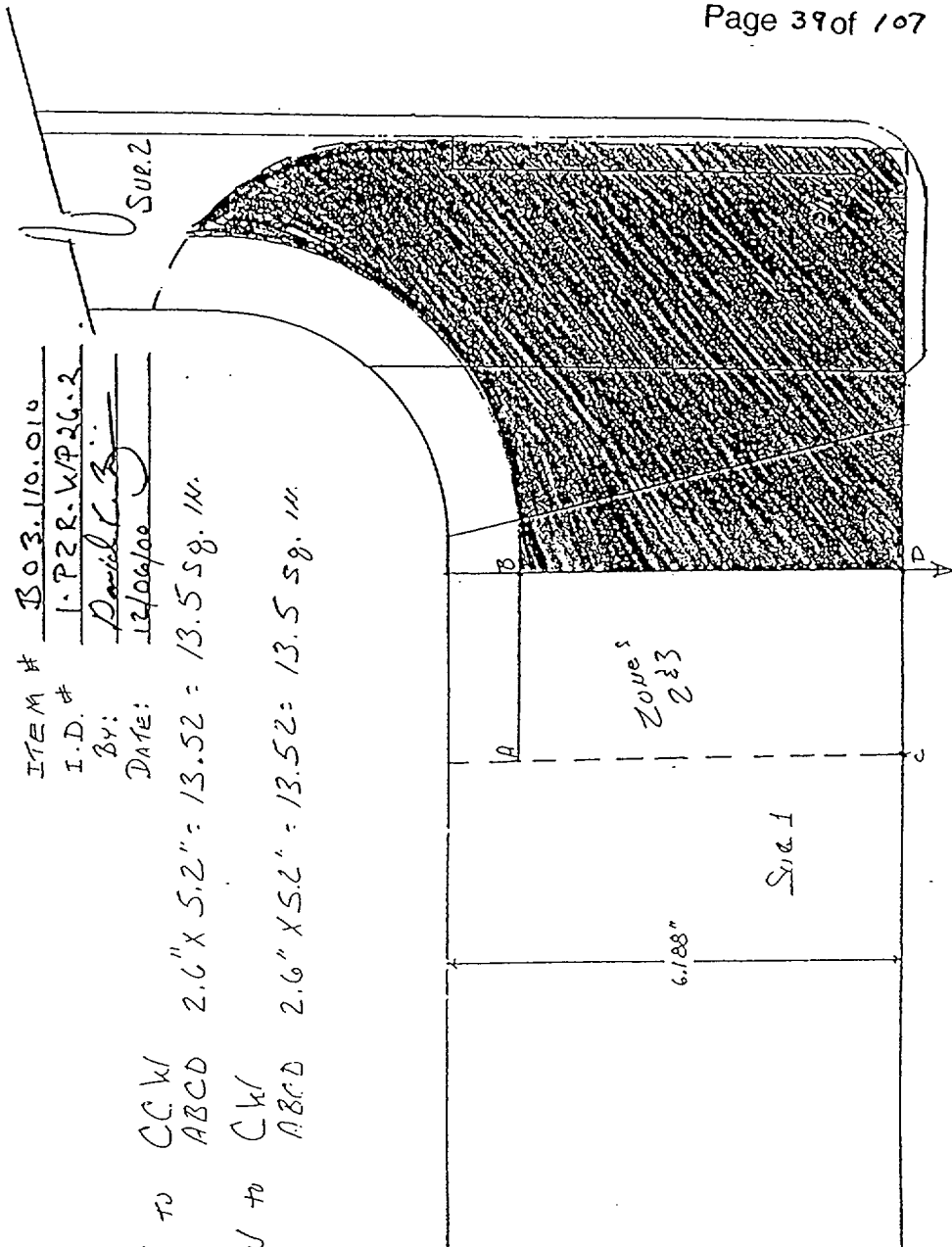
I.D. # 1-P2R-WP26.2

BY: David L. B.

DATE: 12/06/00

2.6" X 5.2" = 13.52 = 13.5 sq. in.

2.6" X 5.2" = 13.52 = 13.5 sq. in.



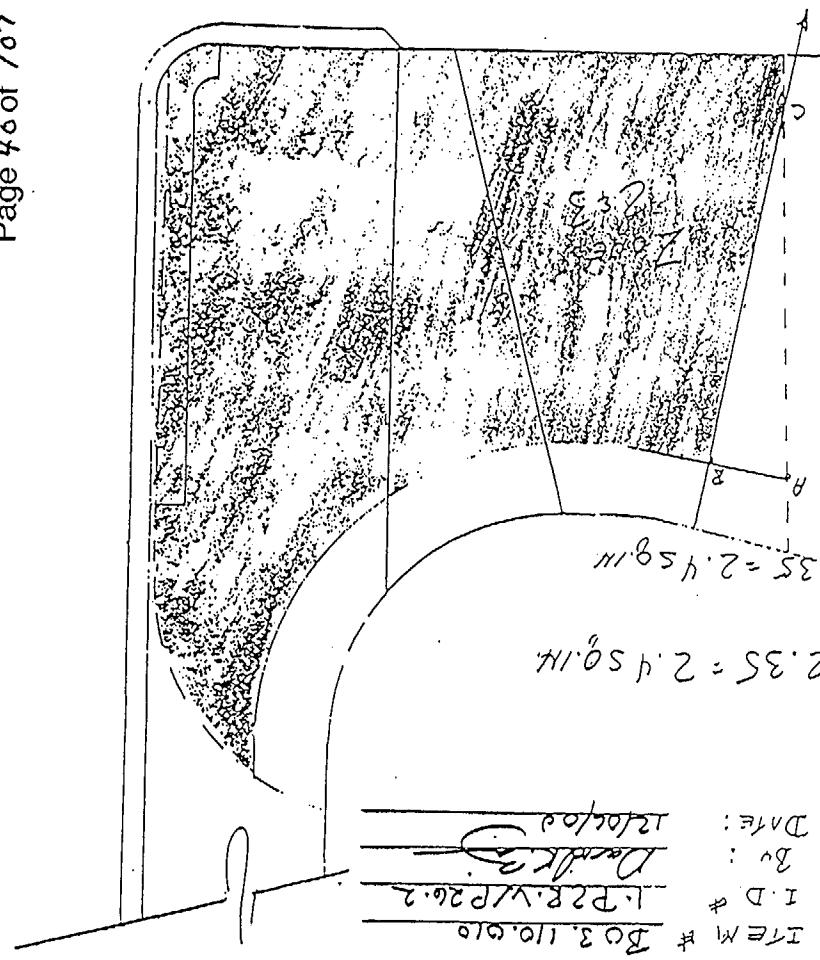
ANII CH Date 1/16  
HSB&I Co.

SCALE 1/2" = 1.0"

☐ FULL COVERAGE

☒ PARTIAL COVERAGE

☐ NO COVERAGE



ITEM # B03.110.010  
I.D. # L.P28.V/P26.2  
By: [Signature]  
Date: 12/04/00

DOUBLE SENSING SAMPLING NOTICE  
HENTER BUNDLE AREA

INSPECTED AREA  
ZONES 2 & 3

60' CW to ABC  
 $ABC = \frac{4.7 \times 1.0}{2} = 2.35 = 2.4 \text{ sq. ft.}$

60' CW to CW  
 $ABC = \frac{4.7 \times 1.0}{2} = 2.35 = 2.4 \text{ sq. ft.}$

Note: HENTER BUNDLE SAND AREA IS  
21% OF INSPECTION AREA

ANII Date 1/6  
HSB&I Co.

Scale 1/2" = 1.0"  
☐ Full Coverage  
☒ Partial Coverage  
☒ No Coverage

## DUKE POWER COMPANY

FORM NDE-UT-670A

## ULTRASONIC CALIBRATION SHEET FOR PLANAR FLAW SIZING

Revision 3

Station: Oconee	Unit: 1	Date: 12/14/00	Sheet Number: 0001092
Procedure: PDI-UT-7	Rev: E	FC: N/A	Couplant: ULTRAGEL II
Batch No: 98325	Examiner: David Zimmerman <i>David K. Zimmerman</i>	Level: II	Calibration Block ID: 50470
Pyrometer S/N: MCNDE 27021	Examiner:	Level:	Calibration Block Temp: 70° deg F
Cal. Due Date: 3/27/01			

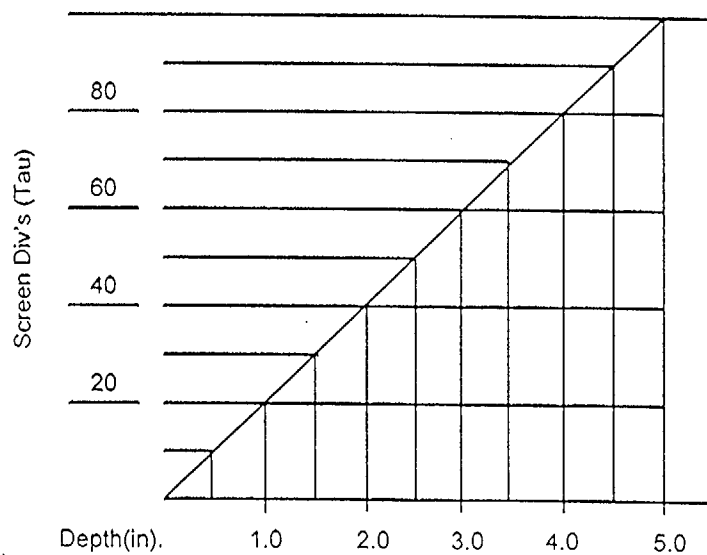
REFERENCE BLOCK	INSTRUMENT	SEARCH UNIT	SIMULATOR BLOCK
ID: 99-5917	<input type="checkbox"/> Staveley <input checked="" type="checkbox"/> Krautkramer	Type: Single <input checked="" type="checkbox"/> Dual <input type="checkbox"/>	ID: 99-5917
Type: DC	Model: USK-7D	Size: .500 Freq: 2.25 Mhz	Reflector Type: RADIUS
Mat'l: CS	S/N: 32810-4022	Manufacturer: KBA	CE-2: N/A Div's
		S/N: 0085LN	Depth: 1.5 in.
		Angle: 45° Wedge: MSW-QC	

## INSTRUMENT SETTINGS

Jack: T ☐ R ☒

Range	5.00
Delay	2.4
Vel	92.7
Units	IN.
Gain	46.0
Display	FULL
Freq	1-5M
Rej	OFF
Pulse	N/A
Damping	N/A
PRF/PRR	N/A
Pulser	HIGH
Pulse/Echo	<input checked="" type="checkbox"/> Dual <input type="checkbox"/>

## CALIBRATION



## Wave Mode

Shear ☐Long. ☐Bi-Modal ☐☐ PATT☐ M-PATT☒ HALT☐ 30-70-70 CE-2 Div's☐ 45° Full V "Mp

## CABLES

RG58 ☐RG174 ☒

# of connectors 0

Length: 6'

## INITIAL CAL

TIME INITIALS

0810 DLZ

## CAL CHECKS

0942 DLZ

1008 DLZ

1124 DLZ

Reviewed By: <i>Paul Moore</i>	Level: <i>E</i>	Date: 12-18-00	Authorized Inspector: <i>P. J. Smith</i>	Date: JAN 06 2001
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Attachment L  
RFR 01-01  
Page 41 of 107

17.05.20

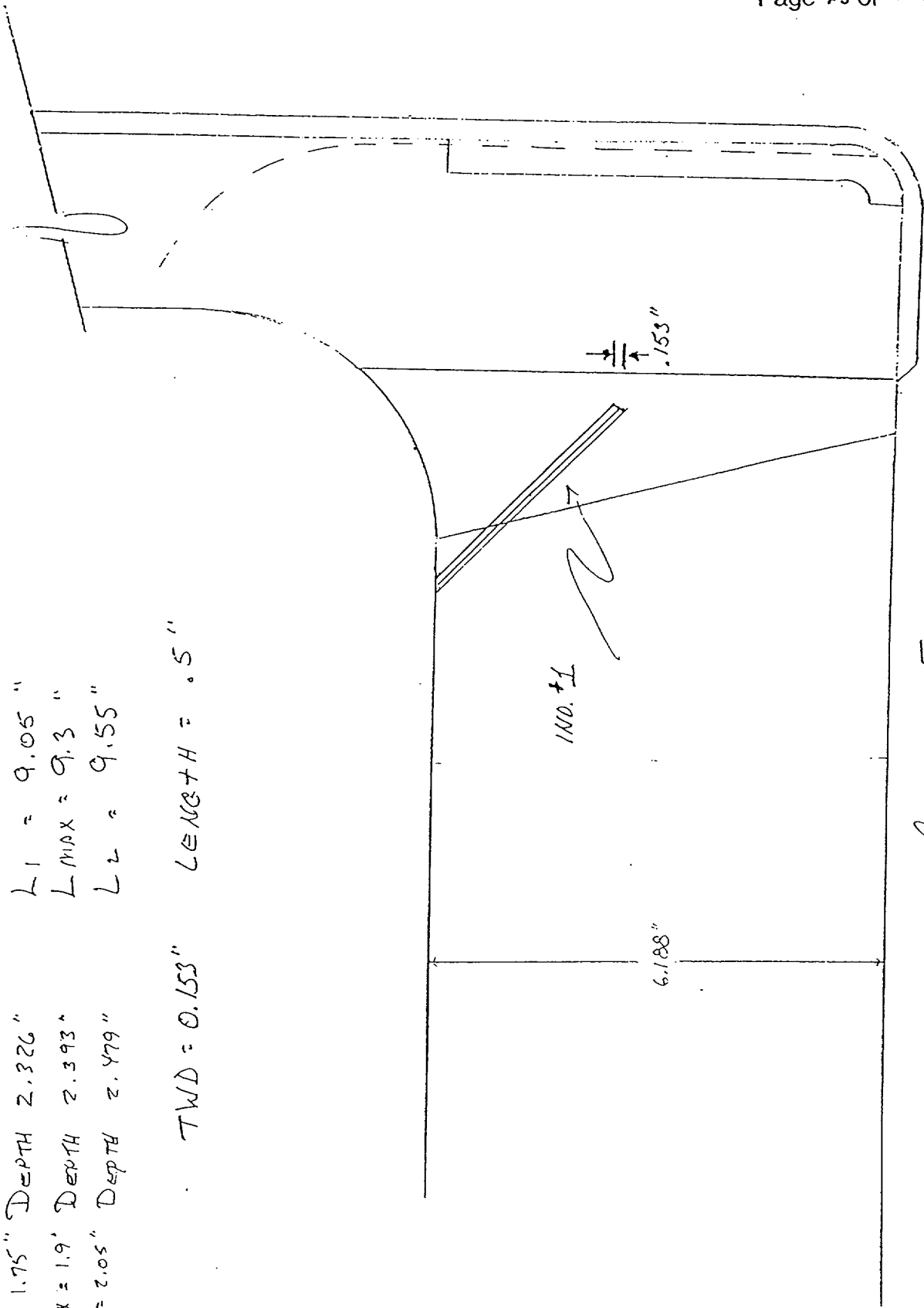
<b>DUKE POWER COMPANY</b> <b>Ultrasonic Data Sheet for Planar Flaw Sizing</b>					Exam Start: 0946		Form NDE-UT-670B		
					Exam Finish: 1007		Revision 1		
Station: Oconee			Unit: 1	Date: 12/14/00		Item No: B03.110.010			
Measured Wall Thickness: 6.187* in.			Material Type: C/S		Component/Weld ID: 1-PZR-WP26-2				
Surface Condition: AS GROUND			L max: 9.3" (from exam data sheet)			Pyrometer S/N: MCNDE 27021			
Examiner: David Zimmerman <i>David Zimmerman</i>			Level: II			Cal. Due Date: 3/27/01			
Examiner: Larry Mauldin <i>Larry Mauldin</i>			Level: III			Surface Temp: 63 ° F			
Procedure: NDE-620 Rev: 8 FC: 00-07					Calibration Sheet No: 0001092				
Ind.#	<i>4</i>	30-70-70	PATT	M-PATT	HALT	Full-V 45 °	Reported Thru-Wall	Exam Surface	Beam Direction
1	45°				0.153		0.153	O.D. (S1)	

Remarks: Subsurface a=0.077, L = 0.50, a/l = 0.154, a/t % = 1.3% * INCLUDES CLADDING THICKNESS.									
								Sheet 18 of 20	
Reviewed By: <i>Dave Moss</i>			Level: <i>D</i>		Date: 12.18.00		Authorized Inspector: <i>P.T. Smith</i>		Date: JAN 06 2001

19 of 20

$W_1 = 1.75"$  DEPTH 2.326"  
 $W_{MAX} = 1.9"$  DEPTH 2.393"  
 $W_2 = 2.05"$  DEPTH 2.479"

$TWD = 0.153"$        $LENGTH = .5"$



Daniel C. [Signature] 12/14/00 1-P2R-WP 26-2 B03.110.010

ANII ~~See~~ Date 1/6  
 HSBI&I Co.

**DUKE POWER COMPANY**  
**ULTRASONIC INDICATION RESOLUTION SHEET**

Form NDE-UT-8

Revision 1

Acceptance Standard:

INDICATION #1 IS A SUBSURFACE SCAN. THE MAXIMUM DEPTH OF 2.479" LESS THE MINIMUM DEPTH OF 2.326" EQUALS A THROUGH WALL DIMENSION OF 0.153". THIS CALCULATES TO AN A/L ASPECT RATIO OF .17. AFTER LINEAR INTERPOLATION WAS CALCULATED THERE WAS AN ACCEPTABLE A/T PERCENTAGE OF 3.1%. THE FLAW ACTUAL A/L PERCENTAGE WAS 1.3%. THIS IS AN ACCEPTABLE INDICATION IN ACCORDANCE WITH THE ACCEPTANCE STANDARDS OF ASME, SECTOIN XI, 1WA-3000, TABLE 1WB-3512-1.

Item No: B03.110.010

Acceptable Indications: IND. #1

Rejectable Indications:

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

Examiner: David Zimmerman    Level: II    Date: 12/14/00

Sheet 20 of 20

Reviewer: Gary Moore    Level: II    Date: 12-18-00

Authorized Inspector: C. J. [Signature]

Date: JAN 06 2001

Attachment L  
 RFR 01-01  
 Page 44 of 107



# DUKE POWER COMPANY

## ULTRASONIC EXAMINATION DATA SHEET FOR PLANAR REFLECTORS

Exam Start: 1010

Form NDE-UT-2A

Exam Finish: 1032

Revision 4

Station: Ocone

Unit: 1

Component/Weld ID: 1-PZR-WP26-1

Date: 12/6/00

Weld Length (in.): 19.6

Surface Condition: AS GROUND

Lo: 9.2.3

Surface Temperature: 59 ° F

Examiner: David Zimmerman

Level: II

Scans:

Pyrometer S/N: MCNDE 27205

Examiner: James L. Panel

Level: II

45 ☐ dB 70 ☒ 78.0 dB

Cal Due: 1/17/01

Procedure: NDE-680

Rev: 2

FC:

45T ☐ dB 70T ☒ 78.0 dB

Configuration: INNER RADIUS

N/A

60 ☒ 60.5 dB

S2 Flow S1

NOZZLE to SHELL

Calibration Sheet No:

0001066, 0001065

60T ☒ 60.5 dB

Scan Surface: OD

Applies to NDE-680 only

Other: dB

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
4														
					20%dac HMA	20%dac HMA	20%dac HMA	20%dac HMA	20%dac HMA	20%dac HMA				
					50%dac	50%dac	50%dac	50%dac	50%dac	50%dac				
					100%dac	100%dac	100%dac	100%dac	100%dac	100%dac				
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:

DEC 28 2000

Item No:

B03.120.009

<b>DUKE POWER COMPANY</b> <b>Limited Examination Coverage Worksheet</b>						NDE-91-1  Revision 0	
<b>Examination Volume/Area Defined</b>							
<input type="checkbox"/> Base Metal <input type="checkbox"/> Weld <input type="checkbox"/> Near Surface <input type="checkbox"/> Bolting <input checked="" type="checkbox"/> Inner Radius							
<b>Area Calculation</b>				<b>Volume Calculation</b>			
5.4" X .5" + (.8125 SQ x PI - .3125 SQ x PI / 4) = 3.14 SQ. IN.				3.14 SQ. IN. X 2.56" (INNER CIRCUMFERENCE) = 8.04 CU. IN. (.54" ON HEATER BUNDLE AREA 2.02" NOT ON HEATER BUNDLE AREA)			
<b>Coverage Calculations</b>							
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	2.1	2.02	4.24	6.34	66.88
2	60°/70°	CCW	2.1	2.02	4.24	6.34	66.88
		HEATER	BUNDLE	AREA			0.00
1	60°/70°	CW	1.36	.54	0.73	1.7	42.94
2	60°/70°	CCW	1.36	.54	0.73	1.7	42.94
					9.94	16.08	61.82

Item No: B03.120.009

Prepared By: *David K. [Signature]*

Level: II

Date: 12/06/00

Reviewed By: *Randy Mauldin*

Level: III

Date: 12-11-00

# CONCRETE SENSING / SAMPLING NOZZLE

## INNER RADIUS INSPECTION AREA

ABEF + EFGH =

$$5.4 \times .5 + (.8125^2 \times \pi - .3125^2 \times \pi \div 4) = 3.14$$

$$\underline{\underline{3.14 \text{ sq. in.}}}$$

ITEM # B03.120.009

I.D. # L-PZ R. W/P 2G-1

By: David K. B.

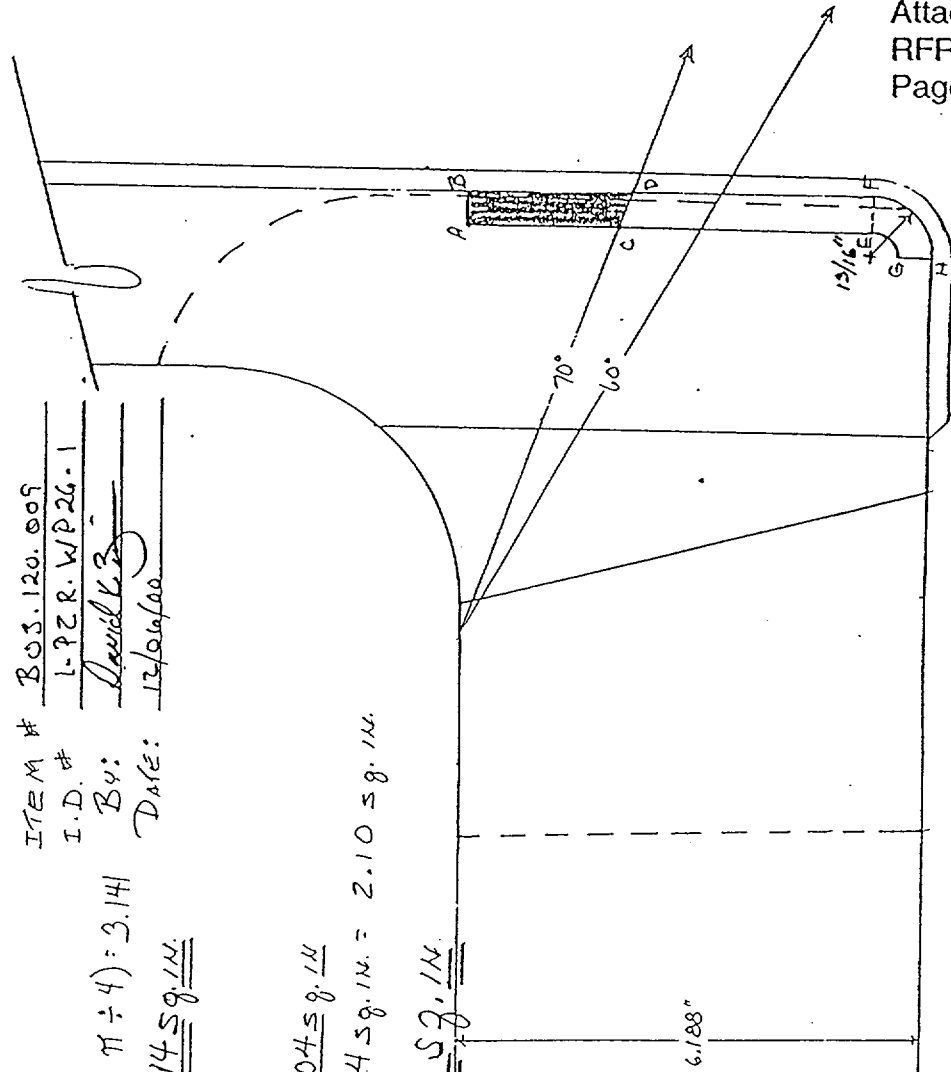
Date: 12/06/00

## INSPECTED AREA

$$\text{Loss: } ABCD = \frac{5}{2} (2.0 + 2.15) = 1.04 \text{ sq. in.}$$

$$\text{TOTAL AREA } 3.14 \text{ sq. in.} - 1.04 \text{ sq. in.} = 2.10 \text{ sq. in.}$$

$$\underline{\underline{\text{COVERAGE } 2.1 \text{ sq. in.}}}$$



ANII ☒ Date 12/18  
HSBI&I Co.

☐ Full Coverage  
☒ No Coverage

O'CONNOR SENSING SAMPLING NOZZLE  
HEATER BUNDLE AREA

INSPECTED AREA

LOSS:  $ABCD = \frac{.5}{2} (3.4 + 3.7) = 1.775 = 1.78 \text{ sq. in.}$

TOTAL AREA  $3.14 \text{ sq. in.} - 1.78 \text{ sq. in.} = 1.36 \text{ sq. in.}$

COVERAGE 1.36 sq. in.

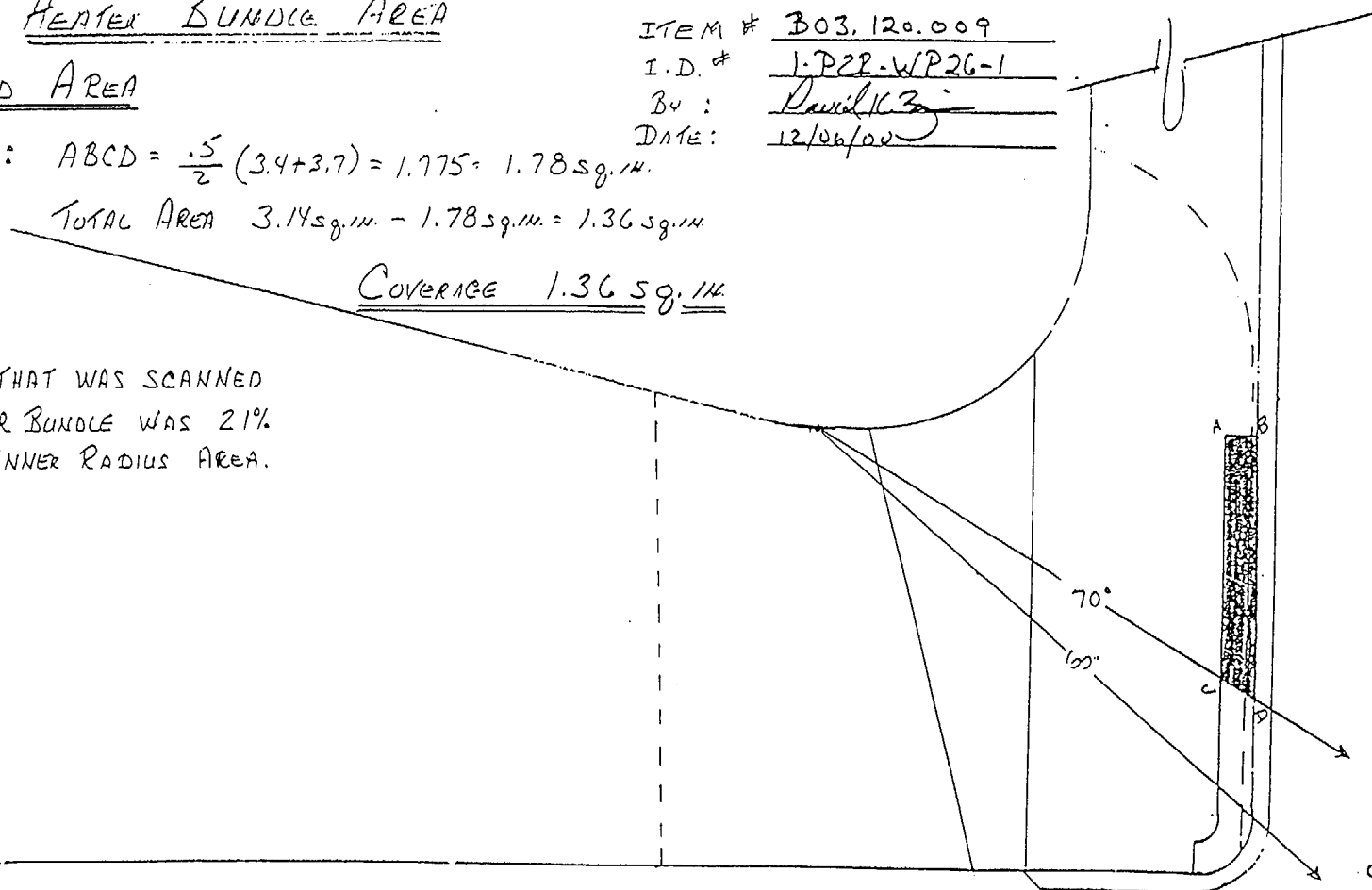
NOTE: AREA OF EXAM THAT WAS SCANNED  
 FROM THE HEATER BUNDLE WAS 21%  
 OF THE TOTAL INNER RADIUS AREA.

ITEM # 303,120,009  
 I.D. # 1-P22-WP26-1  
 BY: David K. Z...  
 DATE: 12/06/00

ANII 12 Date 12/24  
 HSB&I Co.

☐ FULL COVERAGE

☒ NO COVERAGE



<b>DUKE POWER COMPANY</b>										Exam Start: 1042		Form NDE-UT-2A	
<b>ULTRASONIC EXAMINATION DATA SHEET FOR PLANAR REFLECTORS</b>										Exam Finish: 1104		Revision 4	
Station: Ocone			Unit: 1		Component/Weld ID: 1-PZR-WP26-2						Date: 12/6/00		
Weld Length (in.): 19.6			Surface Condition: AS GROUND			Lo: 9.2.3		Surface Temperature: 59 ° F					
Examiner: David Zimmerman <i>David Zimmerman</i> Level: II			FC: N/A			Scans: 45 <input type="checkbox"/> _____ dB    70 <input checked="" type="checkbox"/> 78.0 dB 45T <input type="checkbox"/> _____ dB    70T <input checked="" type="checkbox"/> 78.8 dB 60 <input checked="" type="checkbox"/> 60.5 dB 60T <input checked="" type="checkbox"/> 60.5 dB Other: _____ dB			Pyrometer S/N: MCNDE 27205				
Examiner: James L. Panel <i>James L. Panel</i> Level: II									Cal Due: 1/17/01				
Procedure: NDE-680 Rev: 2									Configuration: INNER RADIUS				
Calibration Sheet No: 0001066, 0001065									S2 _____ Flow _____ S1 _____				
						NOZZLE to SHELL			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	20%dac HMA	20%dac HMA	20%dac HMA	20%dac HMA	20%dac HMA			DO NOT WRITE IN THIS SPACE	
						50%dac	50%dac	50%dac	50%dac	50%dac	50%dac				
						100%dac	100%dac	100%dac	100%dac	100%dac	100%dac				
NRI	60°														
NRI	70°														

Remarks:			
Limitations: (see NDE-UT-4) <input type="checkbox"/> 90% or greater coverage obtained: yes <input type="checkbox"/> no <input checked="" type="checkbox"/>			
Reviewed By: <i>Gayle Moss</i>		Level: II    Date: 12/16/00 Authorized Inspector: <i>[Signature]</i> Date: DEC 28 2000	
		Sheet <u>1</u> of <u>4</u> Item No: B03.120.010	

Attachment L  
 RFR 01-01  
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<b>DUKE POWER COMPANY</b> Limited Examination Coverage Worksheet					NDE-91-1 Revision 0		
<b>Examination Volume/Area Defined</b>							
<input type="checkbox"/> Base Metal <input type="checkbox"/> Weld <input type="checkbox"/> Near Surface <input type="checkbox"/> Bolting <input checked="" type="checkbox"/> Inner Radius							
<b>Area Calculation</b>				<b>Volume Calculation</b>			
$5.4" \times .5" + (.8125 \text{ SQ.} \times \text{PI} - .3125 \text{ SQ} \times \text{PI} / 4) = 3.14 \text{ SQ. In.}$				$3.14 \text{ SQ. IN.} \times 2.56" (\text{INNER CIRCUMFERENCE}) = 8.04 \text{ CU. IN.}$ (.54" ON HEATER BUNDLE AREA 2.02" NOT ON HEATER BUNDLE AREA)			
<b>Coverage Calculations</b>							
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	2.1	2.02	4.24	6.34	66.88
2	60°/70°	CCW	2.1	2.02	4.24	6.34	66.88
		HEATER BUNDLE		AREA			0.00
1	60°/70°	CW	1.36	.54	0.73	1.7	42.94
2	60°/70°	CCW	1.36	.54	0.73	1.7	42.94
					9.94	16.08	61.82

Item No: B03.120.010	
Prepared By: <i>David K. 3</i>	Level: <i>II</i> Date: <i>12/06/00</i>
Reviewed By: <i>Larry Mauldin</i>	Level: <i>III</i> Date: <i>12-11-00</i>

# OCONEE SENSING / SAMPLING NOZZLE

## INNER RADIUS INSPECTION AREA

ABEF + EFGH =

$$5.4 \times .5 + (.8125^\circ \times \pi - .3125^\circ \times \pi \div 4) = 3.141$$

3.14 sq. in.

ITEM # B03.120.010

I.D. # 1-PCR-WP26-2

By: David K. [Signature]

Date: 12/06/00

## INSPECTED AREA

$$\text{Loss: } ABCD = \frac{.5}{2} (2.0 + 2.15) = 1.04 \text{ sq. in.}$$

$$\text{TOTAL AREA } 3.14 \text{ sq. in.} - 1.04 \text{ sq. in.} = 2.10 \text{ sq. in.}$$

COVERAGE 2.1 sq. in.

ANII Q Date 12/28  
HSBI&I Co.

6.188"

70°

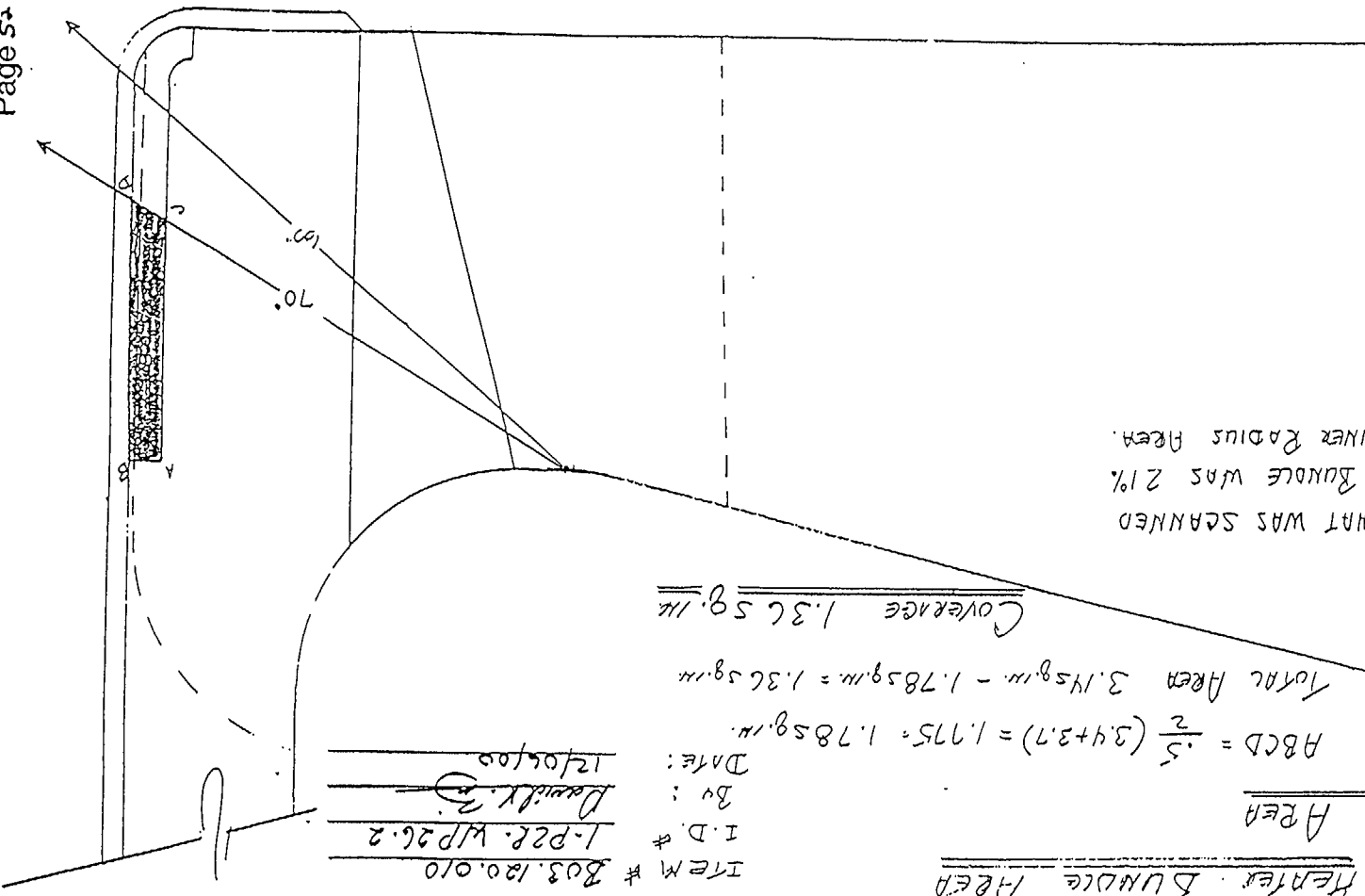
60°

13/16"

Attachment L  
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☐ FULL COVERAGE  
☒ NO COVERAGE

3084



Decoupe Sensing Sampling Nozzle  
 Heater Bundle Area

ITEM # 803.120.010  
 I.D. # 1-P22. WP26.2  
 Rev: 12/05/00  
 Date: 12/05/00

Loss:  $ABCD = \frac{\pi}{2} (3.4 + 3.7) = 1.775 \cdot 1.785g_{in}$   
 Total Area  $3.145g_{in} - 1.785g_{in} = 1.365g_{in}$   
 Coverage  $1.365g_{in}$

Note: Area of Exam that was scanned from the heater bundle was 21% of the total inner radius area.

ANII ~~Date~~ <sup>12/1</sup>  
 HSB&I Co.  
☐ Full Coverage  
☒ No Coverage



# Oconee #1

## EOC19

### NO DATA

CALIBRATION SHEET # 0001054-45° + 60°  
# 0001055-60° L  
# \_\_\_\_\_  
COMPONENT I.D.# 1-PIA2-9  
ITEM # 309.011.017

Attachment L  
RFR 01-01  
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1 of 6

DUKE POWER COMPANY										Exam Start: 1105		NDE-UT-3A		
ULTRASONIC EXAMINATION DATA SHEET FOR LAMINAR REFLECTORS										Exam Finish: 1115		Revision 2		
Station: Oconee			Unit: 1		Component/Weld ID: 1-PIA2-9						Date: 12/5/00			
Nominal Material Thickness (in): 2.33			Weld Length (in.): 114.6			Surface Temperature: 62° Deg F								
Measured Material Thickness (in): 2.8			Lo: 9.1.1.3			Pyrometer S/N: MCNDE 27008								
Surface Condition: AS GROUND			Calibration Sheet No: 0001053			Cal Due: 3/26/01								
Examiner: James H. Resor <i>James H. Resor</i> Level: II						Configuration: CIRC. WELD S2 Flow S1 PIPE to SAFE-END								
Examiner: Winfred C. Leeper <i>Winfred C. Leeper</i> Level: II														
Procedure: NDE-640 Rev: 1 FC: *														
IND NO.	<i>4</i>	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°													

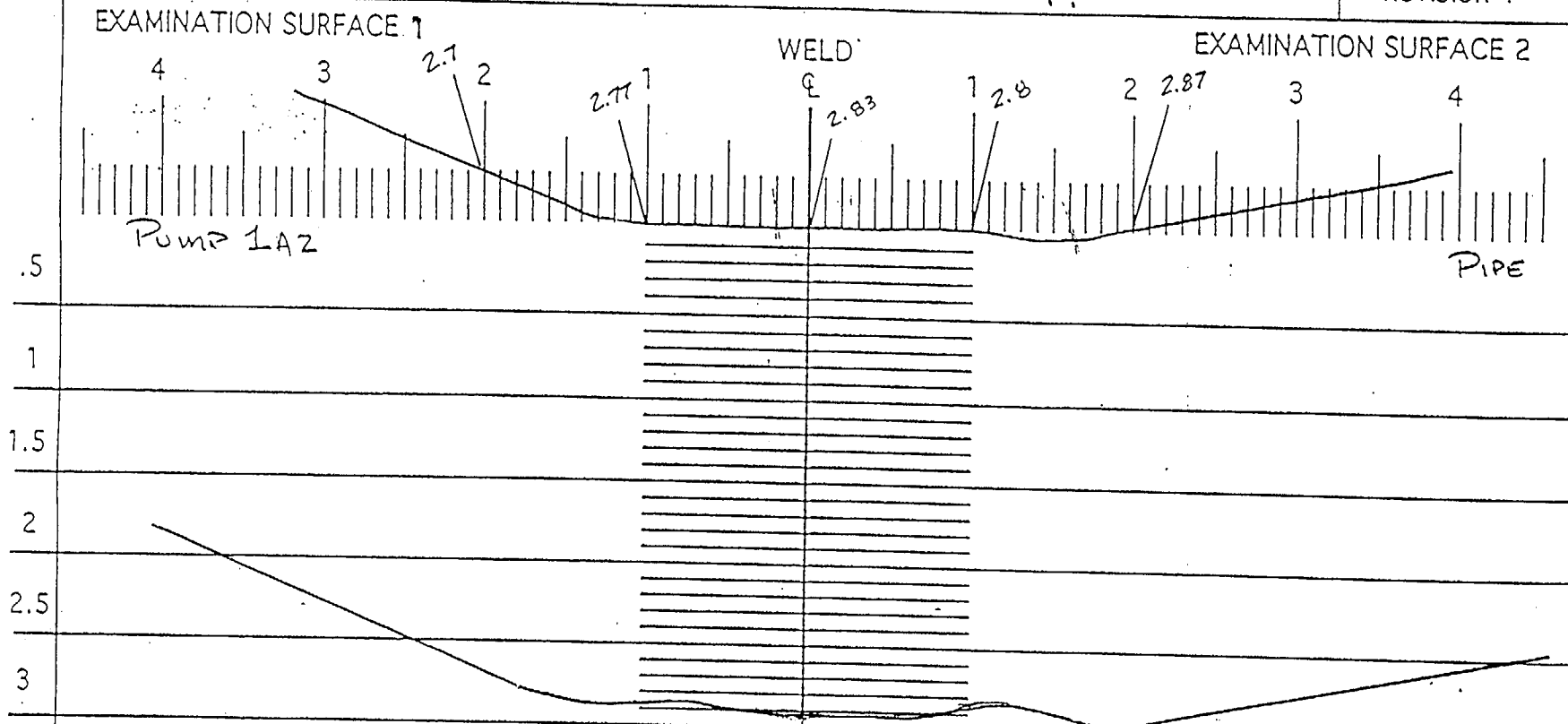
Remarks: *FC 95-18, 95-19			
		Limitations: see NDE-UT-4 <input type="checkbox"/> None: <input checked="" type="checkbox"/>	
		Sheet <u>2</u> of <u>5</u>	
Reviewed By: <i>Larry Moss</i>	Level: <i>D</i>	Date: <i>12.11.00</i>	Authorized Inspector: <i>C. J. [Signature]</i> Date: <i>DEC 28 2000</i>
		Item No: B09.011.017	

Attachment L  
 RFR 01-01  
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DUKE POWER COMPANY  
UT PROFILE/PLOT SHEET

NDE-UT-5

Revision 1



Component ID/Weld No. 1-P1A2-9

Remarks:

Examiner: *James H. Brown*

Reviewed By: *Ray Moore*

Authorized Inspector: *E. T. [Signature]*

Item No: B09211.017

Level: II

Date: 12-6-00

Level: II

Date: 12-11-00

Date: DEC 28 2000

Profile taken  
at: Rt 0

180 Sheet 2 of 5

Attachment L  
RFR 01-01  
Page 55 of 107

**DUKE POWER COMPANY**  
**ISI LIMITATION REPORT**

FORM NDE-UT-4

Revision 1

Component/Weld ID: 1-PIA2-9

Item No: B09.011.017

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      0.0"      to      2.5"       
 ANGLE: ☐ 0 ☐ 45 ☒ 60 ☐ Other      FROM      0      DEG to      360      DEG

DUE TO WELD /HAZ  
CONFIGURATION.

☒ NO SCAN  
☐ LIMITED SCAN  
 SURFACE ☒ 1 ☐ 2  
 BEAM DIRECTION ☐ 1 ☒ 2 ☐ cw ☐ ccw  
 FROM L      N/A      to L      N/A      INCHES FROM WO      0.0"      to      BEYOND       
 ANGLE: ☐ 0 ☐ 45 ☒ 60 ☐ Other      FROM      0      DEG to      360      DEG

DUE TO PUMP 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

Prepared By: *Jonathan H. Besor*

Level: *II*

Date: *12-6-00*

Sketch(s) attached ☒ yes ☐ no

Sheet *4 of 5* of *5*

Reviewed By: *Paul M. Moss*

Date: *12-11-00*

Authorized Inspector: *E. J. [Signature]*

Date: *DEC 28 2000*

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 RFR 01-01  
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40/50m  
50/6

<b>DUKE POWER COMPANY</b> <b>Limited Examination Coverage Worksheet</b>						NDE-91-1 Revision 0	
<b>Examination Volume/Area Defined</b>							
<input checked="" type="checkbox"/> Base Metal <input checked="" type="checkbox"/> Weld <input type="checkbox"/> Near Surface <input type="checkbox"/> Bolting <input type="checkbox"/> Inner Radius							
<b>Area Calculation</b>				<b>Volume Calculation</b>			
.93 X 2.5 = 2.325"				2.325 X 114.6 = 266.44			
<b>Coverage Calculations</b>							
Scan #	Angle	Beam Direction	Area Examined (sq.in.)	Length Examined (in.)	Volume Examined (cu.in.)	Volume Required (cu.in.)	Percent Coverage
1	45°	CW	2.325	114.6	266.44	266.44	100.00
2	45°	CCW	2.325	114.6	266.44	266.44	100.00
3	60°	S2	0	114.6	0	266.44	0.00
4	60°	S1	.851	114.6	97.52	266.44	36.60
	SHEAR	WAVE	AGGREGATE	COVERAGE	630.4	1065.74	59.15
3	60°L	S1	.75	114.6	85.9	266.4	32.24

RL WAVE COVERAGE 32% X 25% (1 SCAN) = 8% OF TOTAL WELD.

Item No: B09.011.017		
Prepared By: <i>James H. Byson</i>	Level: <u>II</u>	Date: <u>12-4-00</u>
Reviewed By: <i>Randy Moulder</i>	Level: <u>III</u>	Date: <u>12-11-00</u>

Subject LIMITED COVERAGE ON 1-PLAZ-9 (36.5" PIPE)

BOG. 011.017

Prob No.

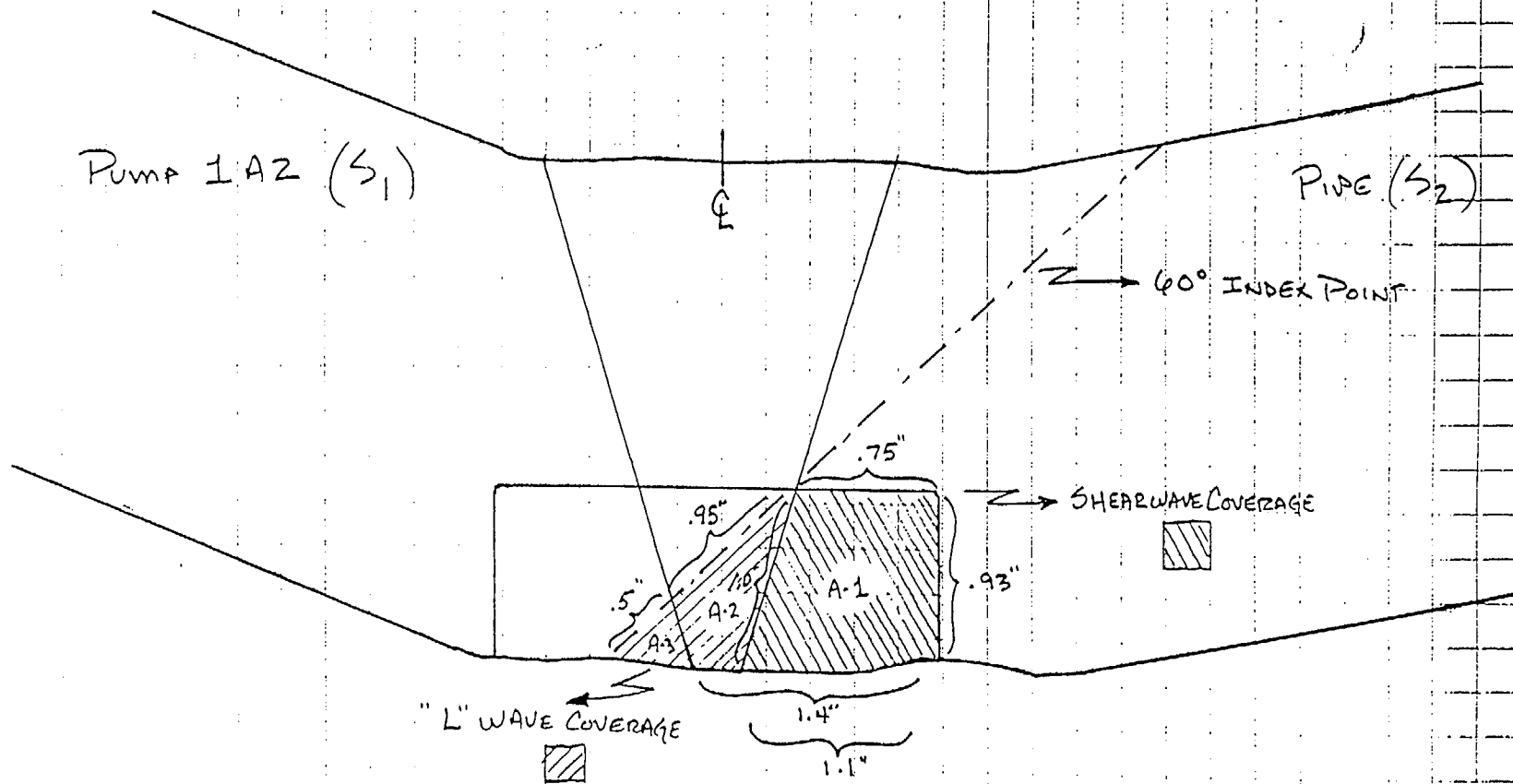
By JAMIE RESOR

Checked by

Date 12-6-00

Date

ANII Date 12/6/00  
HSBI&I Co.



TOTAL AREA OF INTEREST =  $.93 \times 2.5 = 2.325 \text{ sq}$  WELD LENGTH = 114.6"  
VOLUME REQUIRED =  $2.325 \times 114.6 = 266.44 \text{ cu in.}$

$$\begin{aligned} \text{AREA 1} &= A = \frac{h}{2} (a+b) \\ A &= \frac{.93}{2} (.75 + 1.1) \\ A &= .44 (1.85) \\ A &= .851 \end{aligned}$$

$$\begin{aligned} \text{AREA 2} &= A = \frac{h}{2} (a+b) \\ A &= \frac{1.0}{2} (.95 + .3) \\ A &= .5 (1.25) \\ A &= .625 \end{aligned}$$

$$\begin{aligned} \text{AREA 3} &= \frac{bh}{2} = \frac{.5 \times .5}{2} \\ A &= .125 \end{aligned}$$

# DUKE POWER COMPANY

## ULTRASONIC DATA SHEET FOR PLANAR REFLECTORS IN FERRITIC PRESSURE VESSELS

Station: <u>OCONEE</u>	Unit: <u>1</u>	Component/Weld ID: <u>1-SGA-WG23-1</u>	Date: <u>12/3/00</u>
Weld Length (in.): <u>91.06"</u>	Surface Condition: <u>GROUND</u>	<u>L 9.2.3</u>	Exam Start: <u>1155</u> Exam Finish: <u>1225</u>

Procedure No: <u>NDE-620</u>  Revision: <u>8</u>  FC <u>00-007</u>	Scans 70° <u>    </u> dB Zone I    60° <u>72</u> dB Zone II 60° <u>72</u> dB Zone III Axial 60° <u>72</u> dB Zone III Circ.	Configuration <u>NOZZLE TO SHELL</u>  Scan Surface: OD	Surface Temp. <u>72 ° F</u> Pyrometer s/n: <u>MCNDE 27008</u> Cal. Due Date: <u>3/26/01</u>	Calibration Sheet No: <u>0001051</u> <u>0001052</u>
---	--	---	---	---

Indication #	∠	MP <sub>max</sub>	% FSH	L <sub>max</sub>	W <sub>max</sub>	SU LOCATION	BEAM DIRECTION	SCAN	REMARKS
<u>NRI</u>	<u>60°</u>								<u>ZONE 2 &amp; 3</u>

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

Examiner: ME Houser Level: II Date: 12/3/00 Examiner: [Signature] Item No: COZ.021.001  
 Reviewed by: Gary Moss Level: II Date: 12-13-00 Authorized Inspector: [Signature] Date: DEC 28 2000

# DUKE POWER COMPANY ISI LIMITATION REPORT

FORM NDE-UT-4

Revision 1

Component/Weld ID: 1-SGA-WG23-1

Item No: C02.021.001

Remarks:

☒ NO SCAN      SURFACE      BEAM DIRECTION  
☐ LIMITED SCAN      ☐ 1 ☒ 2      ☒ 1 ☐ 2 ☒ cw ☒ ccw  
 FROM L   N/A   to L   N/A   INCHES FROM WO   \*   to   \*    
 ANGLE: ☐ 0 ☐ 45 ☒ 60 ☐ Other        FROM   0   DEG to   360   DEG

\* NO SCAN FROM BLEND RADIUS OF NOZZLE WELD & NOZZLE SURFACE.

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

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

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

Prepared By: MZ Houser

Level: II

Date: 12/3/00

Sketch(s) attached ☒ yes ☐ no

Sheet 2 of 4

Reviewed By: Gay Moss

Date: 12-13-00

Authorized Inspector: C. T. [Signature]

Date: DEC 28 2000

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 RFR 01-01  
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3054

<b>DUKE POWER COMPANY</b> Limited Examination Coverage Worksheet						NDE-91-1 Revision 0	
<b>Examination Volume/Area Defined</b>							
<input checked="" type="checkbox"/> Base Metal <input checked="" type="checkbox"/> Weld <input type="checkbox"/> Near Surface <input type="checkbox"/> Bolting <input type="checkbox"/> Inner Radius							
Area Calculation				Volume Calculation			
2.25 IN. X 3.8 IN. = 8.55 SQ. IN.				8.55 SQ. IN. X 91.1 IN. = 778.9 CU. IN.			
<b>Coverage Calculations</b>							
Scan #	Angle	Beam Direction	Area Examined (sq.in.)	Length Examined (in.)	Volume Examined (cu.in.)	Volume Required (cu.in.)	Percent Coverage
1	60°	2	8.55	91.1	778.9	778.9	100.00
2	60°	1	0.0	91.1	0	778.9	0.00
3	60°	CW	1.125	91.1	102.5	778.9	13.16
4	60°	CCW	1.125	91.1	102.5	778.9	13.16
					983.9	3115.6	31.58

Item No: C02.021.001	
Prepared By: <i>JE Houser</i>	Level: <i>II</i> Date: <i>12-3-00</i>
Reviewed By: <i>Larry Maulder</i>	Level: <i>III</i> Date: <i>12-13-00</i>

# STEAM OUTLET NOZZLE

EXAM AREA:

$$ABCD = 2.25" \times 3.8" = \underline{8.55 \text{ sq. in.}}$$

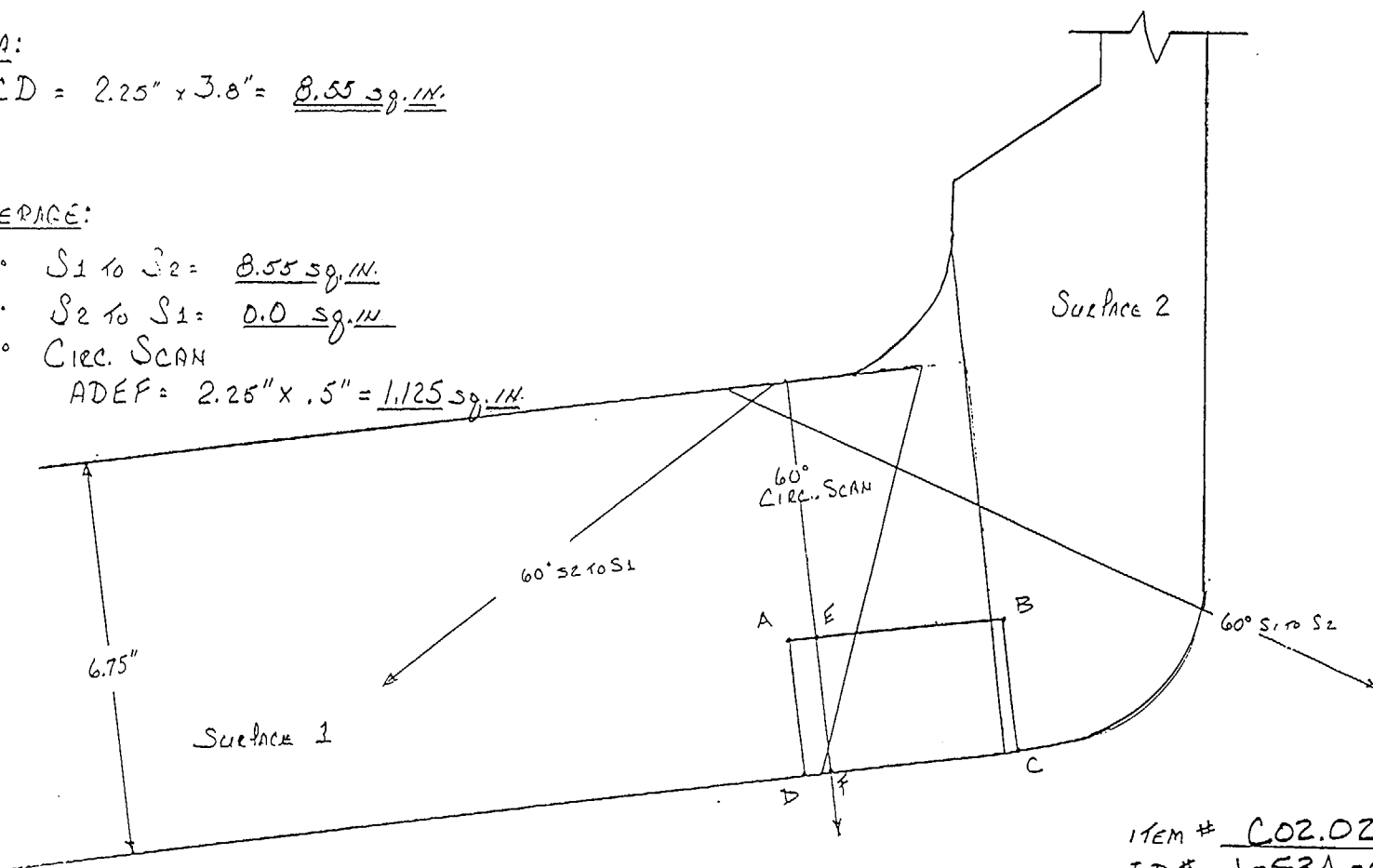
AREA OF COVERAGE:

$$60^\circ S_1 \text{ to } S_2 = \underline{8.55 \text{ sq. in.}}$$

$$60^\circ S_2 \text{ to } S_1 = \underline{0.0 \text{ sq. in.}}$$

60° CIRC. SCAN

$$ADEF = 2.25" \times .5" = \underline{1.125 \text{ sq. in.}}$$



ITEM # C02.021.001

I.D.# 1-S3A-01-28L

BY: [Signature]

DATE: 12/3/00

ANII [Signature] Date 12/18  
HSBI&I Co.

**DUKE POWER COMPANY**  
**ULTRASONIC INDICATION RECORD FOR PIPING**

FORM NDE-UT-10

Revision 0

Station: Ocone Unit: 1 Component/Weld ID: 1-53A-02-65L Date: 12/7/00

Surface Condition: AS GROUND Item No: C05.011.006

Examiner: Gayle E. Houser Level: II Procedure: NDE-600 Rev: 13 FC: N/A

Examiner: Winfred C. Leeper Level: II Lo: 9.1.1.1 Configuration: CIRC. WELD

Calibration Sheet No: 0001068, 0001069 S2 PIPE to S1 VALVE Scan Surface: OD

IND #	4	% FSH	Mp Max	W Max	L Max	L1 20 % FSH	L2 20 % FSH	Beam Dir.	Exam Surf.	Scan	Damps	Remarks
1	60°	668	2.06	.700	0°	360°	360°	1	2	AX	NO	
2	60°	200	1.94	1.4	26.25	360°	360°	1	2	AX	NO	
NRI	45°											

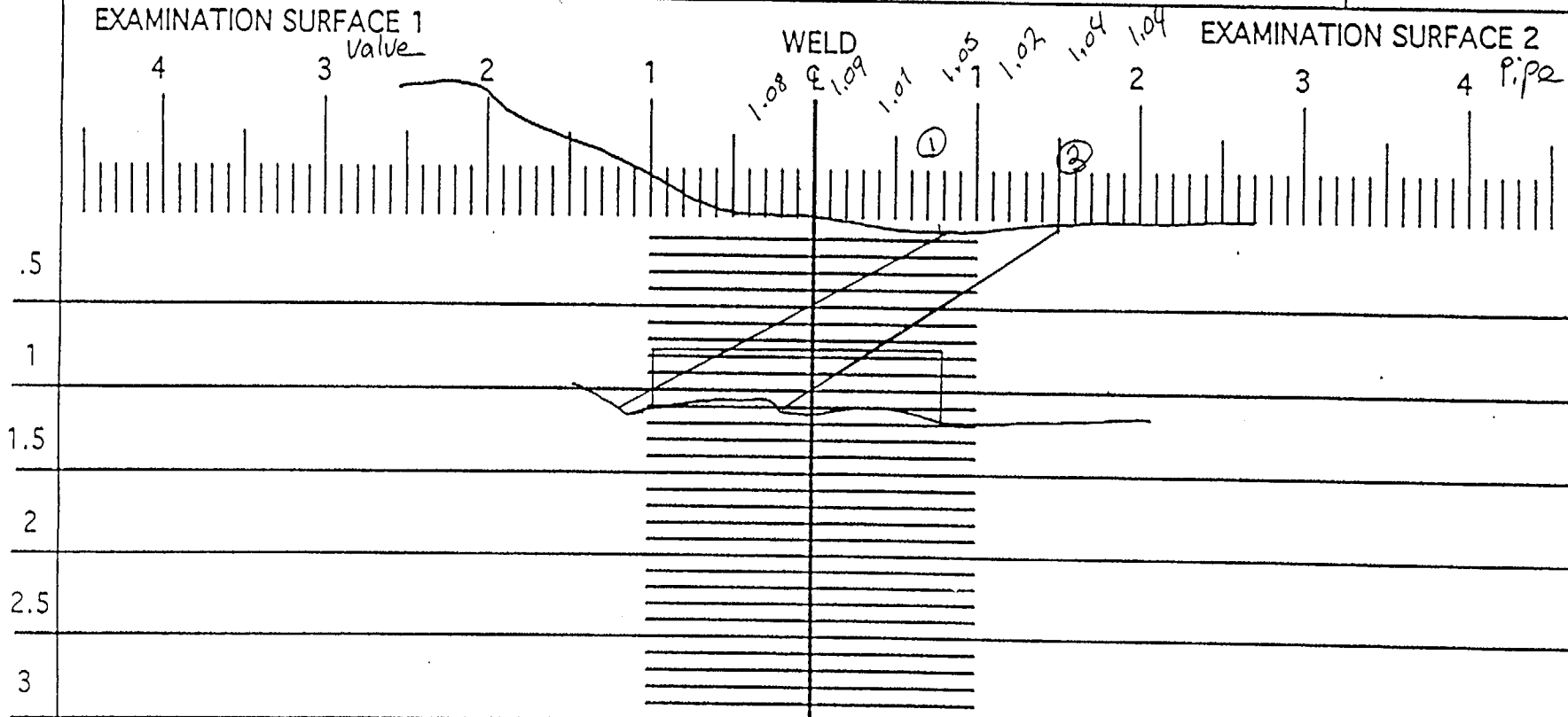
Attachment L  
 RFR 01-01  
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Reviewed By: *Gayle Houser* Level: *II* Date: 12-14-00 Authorized Inspector: *[Signature]* Date: DEC 28 2000 Sheet 1 of 8

DUKE POWER COMPANY  
UT PROFILE/PLOT SHEET

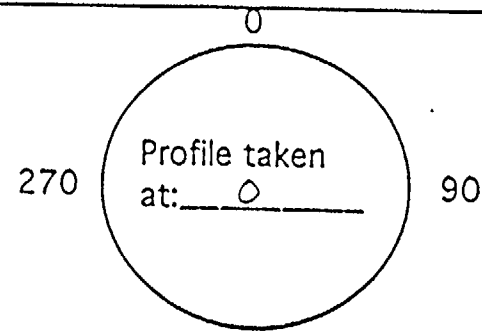
NDE-UT-5

Revision 1



Component ID/Weld No. 1-53A-02-65L

Remarks:



Examiner: Winfred P. Leeger Level: II Date: 12-7-00

Reviewed By: Sam M. Mors Level: M Date: 12-14-00

Authorized Inspector: Carl S. Smith Date: DEC 28 2000

180 Sheet 2 of 8

**DUKE POWER COMPANY**  
**ISI LIMITATION REPORT**

FORM NDE-UT-4

Revision 1

Component/Weld ID: 1-53A-02-65L

Item No: C05.011.006

Remarks:

☒ NO SCAN      SURFACE      BEAM DIRECTION  
☐ LIMITED SCAN      ☒ 1 ☐ 2      ☐ 1 ☒ 2 ☐ cw ☐ ccw  
FROM L   0   to L  33.75  INCHES FROM WO   CL  to  BEYOND   
ANGLE: ☐ 0 ☐ 45 ☒ 60 ☐ Other        FROM   0  DEG to  360  DEG

NO SCAN DUE TO VALVE  
CONFIGURATION.

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

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

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

Prepared By: ME Houser

Level: II

Date: 12/7/00

Sketch(s) attached ☐ yes ☒ no

Sheet  3  of  8 

Reviewed By: Dan Mon

Date: 12-14-00

Authorized Inspector: C. L. Smith

Date: DEC 28 2000

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**DUKE POWER COMPANY**  
**ULTRASONIC INDICATION RESOLUTION SHEET**

Form NDE-UT-8

Revision 1

Acceptance Standard:


IND. #1 IS A 360° INTERMITTANT INDICATION DUE TO ID VALVE GEOMETRY. CONDITION VERIFIED WITH 0° CONTOURS, PROFILES AND RT FILM REVIEW. IND. #2 IS A 360° INTERMITTANT INDICATION DUE TO ID ROOT GEOMETRY. CONDITION VERIFIED WITH 0° CONTOURS, PROFILES AND RT FILM REVIEW. A 70° SHEAR AND 60°L WAS ALSO USED FOR CONFIRMATION.

Item No: C05.011.006

Acceptable Indications: IND. #1 & #2

Rejectable Indications:

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

Examiner:	Level:	Date:		Sheet <u>34</u> of <u>8</u>
Gayle E. Houser <i>GE Houser</i>	II	12/7/00		
Reviewer:	Level:	Date:	Authorized Inspector:	Date:
<i>Gary Moss</i>	<i>D</i>	12.14.00	<i>Gayle E. Houser</i>	DEC 28 2000

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<b>DUKE POWER COMPANY</b>						NDE-91-1	
Limited Examination Coverage Worksheet						Revision 0	
<b>Examination Volume/Area Defined</b>							
<input checked="" type="checkbox"/> Base Metal <input checked="" type="checkbox"/> Weld <input type="checkbox"/> Near Surface <input type="checkbox"/> Bolting <input type="checkbox"/> Inner Radius							
Area Calculation				Volume Calculation			
1.65 X .375 = .618 SQ. IN.				.618 SQ. IN. X 33.8 = 20.88 CU. IN.			
<b>Coverage Calculations</b>							
Scan #	Angle	Beam Direction	Area Examined (sq.in.)	Length Examined (in.)	Volume Examined (cu.in.)	Volume Required (cu.in.)	Percent Coverage
1	45°	CW	.618	33.8	20.88	20.88	100.00
2	45°	CCW	.618	33.8	20.88	20.88	100.00
3	60°	S1	.272	33.8	9.19	20.88	44.01
4	60°	S2	0	33.8	0	20.88	0.00
	SHEAR	WAVE	AGGREGATE	COVERAGE	50.95	83.52	61.00
3	60°RL	S1	.342	33.8	11.55	20.88	55.32

RL WAVE COVERAGE 55.3% X 25% (1 SCAN) = 13.8 = 13.8%

Item No: C05.011.006	
Prepared By: <i>ME Hansen</i>	Level: <i>II</i> Date: <i>12/17/00</i>
Reviewed By: <i>Randy Moulden</i>	Level: <i>III</i> Date: <i>12/24/00</i>

DUKE POWER COMPANY  
UT PROFILE/PLOT SHEET

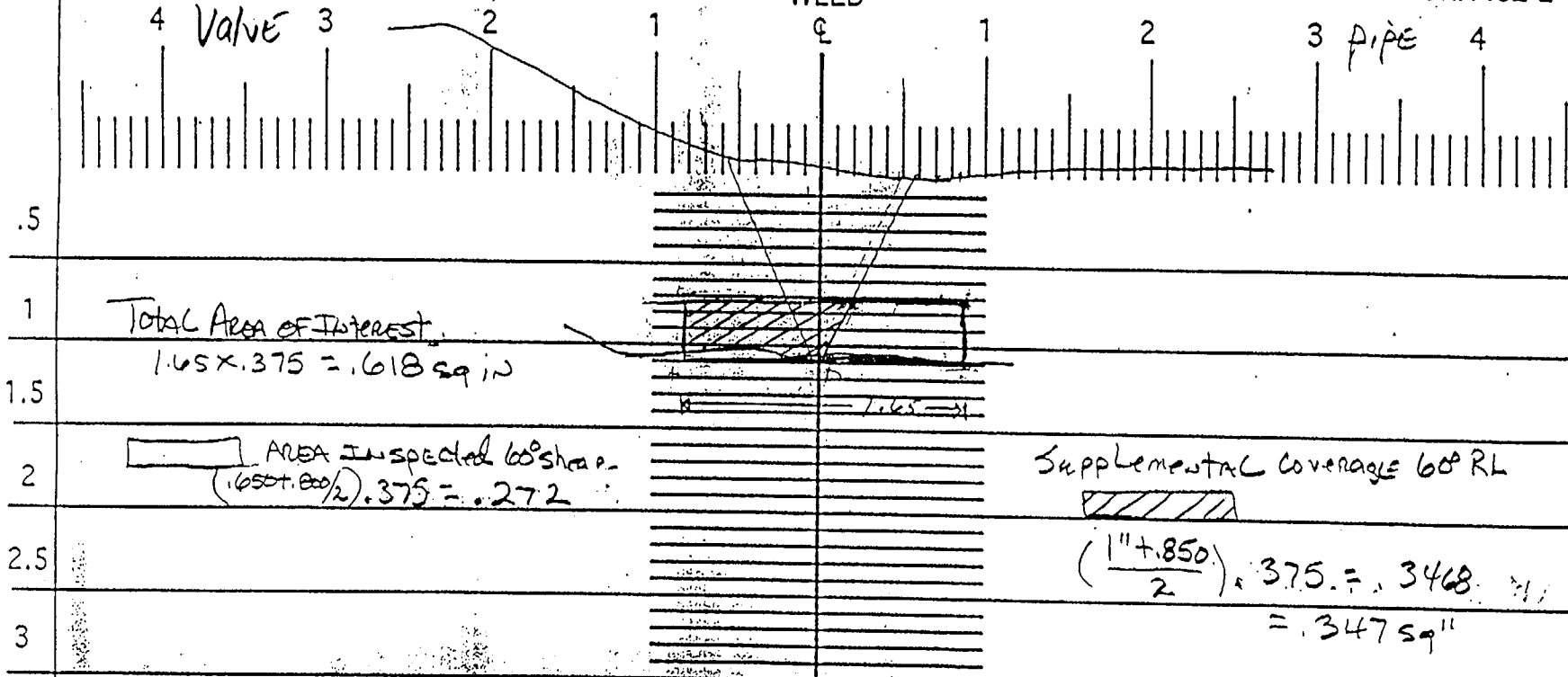
NDE-UT-5

Revision 1

EXAMINATION SURFACE 1

EXAMINATION SURFACE 2

WELD



Component ID/Weld No. 1-53A-02-65 R

Remarks:

Examiner: J.C. Sawyer

Reviewed By: Gary Moss

Authorized Inspector: C.T. [Signature]

Item No: C05.011.006

Level: II

Date: 12/7/00

Level: II

Date: 12/14/00

Date: DEC 28 2000

270

Profile taken  
at: 60

90

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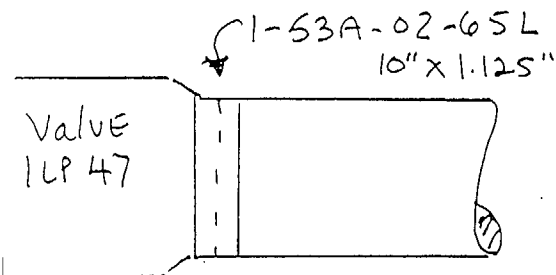
**DUKE POWER COMPANY**  
**ULTRASONIC THICKNESS MEASUREMENT REPORT**

FORM NDE-940B

REVISION 1

Station: <u>BALS</u>	Unit: <u>1</u>	Date: <u>12-7-00</u>	Sheet number:
Procedure: <u>NDE 940</u>	Rev: <u>1</u>	F/C: <u>N/A</u>	Couplant: <u>Ultracal II</u>
Examiner: <u>DE Houser</u>	Level: <u>II</u>	Calibration Block ID: <u>513M-SS</u>	Batch No: <u>98325</u>
Examiner:	Level:	Calibration Block Temp: <u>57°F</u>	Pyrometer S/N: <u>MCNDE 27008</u> Cal. due: <u>010326</u>
<b>INSTRUMENT</b>		<b>TRANSDUCER</b>	
Model No: <u>USK-7d</u>	Type: Single <input type="checkbox"/> Dual <input checked="" type="checkbox"/>	Frequency: <u>4</u> Mhz	Size: <u>3.5 x 10</u>
Serial No: <u>32810-4022</u>	Manufacturer: <u>KRAUTER</u>		Serial No: <u>57463-01322</u>

SKETCH OF EXAMINED ITEM



ACCEPTANCE STANDARD:

RESULTS: Nominal wall = 1.125  
Min wall = .984

Low Readings were found starting at 3:00 thru 9:00. (Using 12:00 as top of pipe & looking CW with flow). Low areas are concentrated mainly on the pipe side of the centerline in the weld metal only. Readings in these areas range from .959 @ 9:00 to .916 at 5:00. Base metal was not below nominal wall.

CABLES

RG62 ☐

RG174 ☒

Length: 10'

Initial Calibration Time: 1250

CAL CHECKS

Time	Initials
1308	DEH

MARKS:	Component/Item No: <u>1-53A-02-65L/C05.011.006</u>
VIEWED BY: <u>Harry Moss</u>	LEVEL: <u>II</u>
DATE: <u>12-14-00</u>	

ANII 62 Date 1/3/01  
HSBI&I Co.

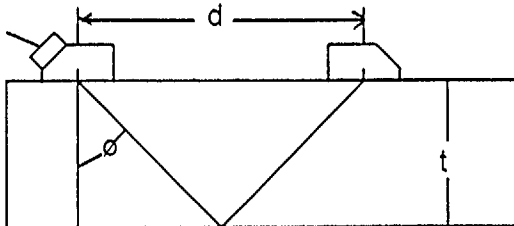
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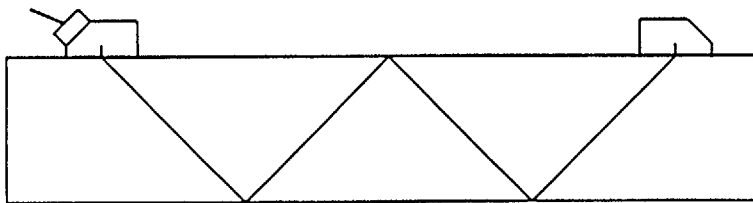
**DUKE POWER COMPANY**  
**ULTRASONIC BEAM ANGLE MEASUREMENT RECORD**

Form NDE-UT-9

Revision 3



$$\tan \phi = \frac{(d/2)}{t}$$



For thin wall pipe use 2nd Vee path

$$\tan \phi = \frac{(d/2)}{2t}$$

1. Take thickness measurements between wedge locations.
2. Place search unit on straight turn of pipe, and peak the signal.
3. Measure distance (d) between exit points.
4. Calculate beam angle with formula as shown using measured wall thickness.
5. Use the measured beam angle to determine coverage and when plotting any indications.

Pipe Size: \_\_\_\_\_ 10" \_\_\_\_\_

Pipe Schedule: \_\_\_\_\_ 140 \_\_\_\_\_

Nominal 45 deg: d=   0   ; t=   0   ; measured angle=   0.00   deg

Nominal 60 deg: d=  2.55  ; t=   1   ; measured angle=  51.89  deg

Nominal 70 deg: d=   0   ; t=   0   ; measured angle=   0.00   deg

Item No.  
C05.011.006

Examiner Gayle E. Houser <i>GE Houser</i>	Level II	Date 12/7/00	Examiner <i>EC</i>	Level II	Date 12-14-00
Reviewed By <i>Gayle Moss</i>	Level II	Date 12-14-00	Authorized Inspector <i>EC</i>	Date DEC 28 2000	

Attachment L  
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DUKE POWER COMPANY										Exam Start: 0952		NDE-UT-3A		
ULTRASONIC EXAMINATION DATA SHEET FOR LAMINAR REFLECTORS										Exam Finish: 0954		Revision 2		
Station: Oconee			Unit: 1		Component/Weld ID: 1-51A-04-1C						Date: 12/14/00			
Nominal Material Thickness (in): 0.674				Weld Length (in.): 14.13				Surface Temperature: 54° Deg F						
Measured Material Thickness (in): .703				Lo: 9.1.1.1				Pyrometer S/N: MCNDE 27008						
Surface Condition: AS GROUND				Calibration Sheet No: 0001086				Cal Due: 3/26/01						
Examiner: Jay A. Eaton			Level: II					Configuration: CIRC.WELD S2 Flow S1 PIPE to VALVE						
Examiner: Gayle E. Houser			Level: II											
Procedure: NDE-640 Rev: 1 FC: *														
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 <input checked="" type="checkbox"/> None: <input type="checkbox"/>					Sheet 1 of 9				
Reviewed By: Gary Moss			Level: II		Date: 12-18-00		Authorized Inspector: [Signature]			Date: JAN 06 2001		Item No: C05.021.004		

DUKE POWER COMPANY  
UT PROFILE/PLOT SHEET

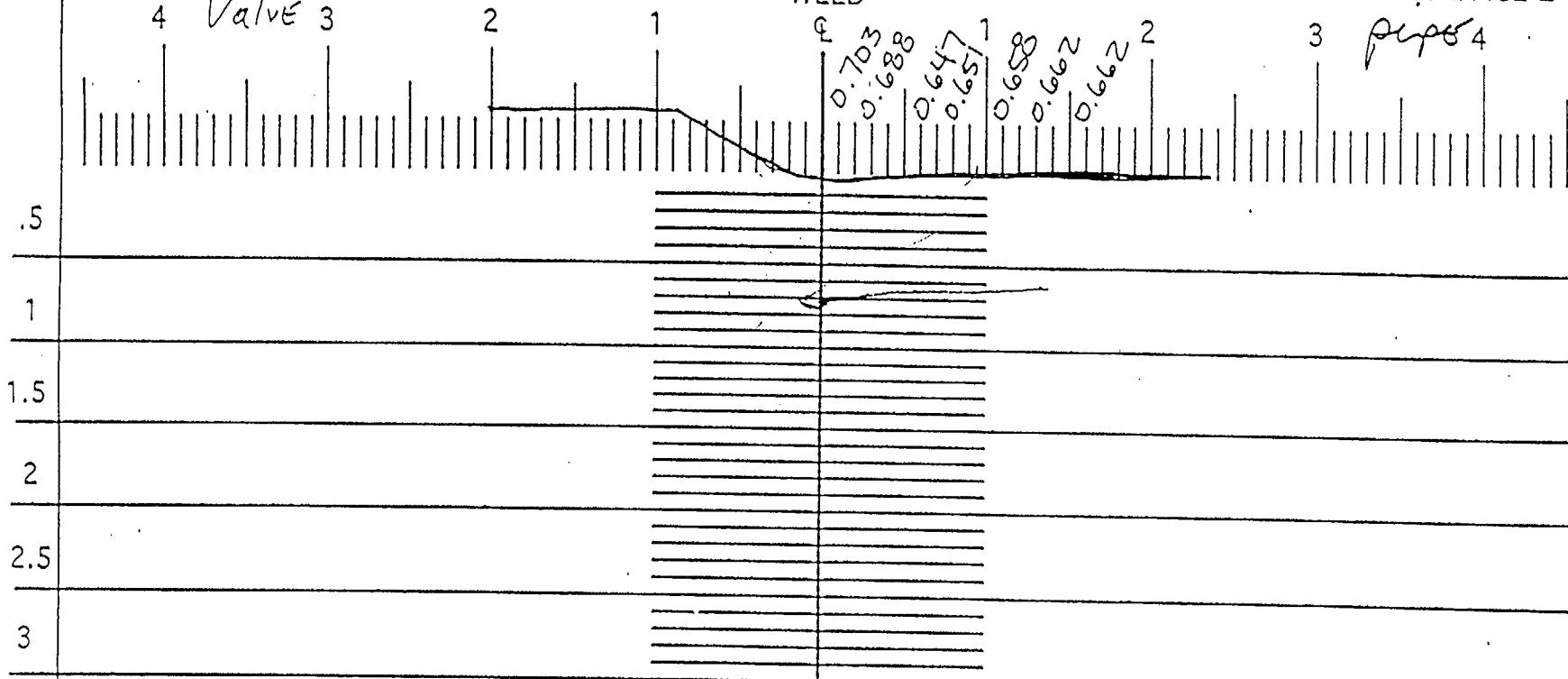
NDE-UT-5

Revision 1

EXAMINATION SURFACE 1

WELD

EXAMINATION SURFACE 2



Component ID/Weld No. 1-SIA-04-1C

: Remarks:

Examiner:

Reviewed By:

Authorized Inspector:

Item No: C05.021.004

Level: II

Level: I

Date: 12/14/00

Date: 12-18-00

Date: JAN 06 2001

270

Profile taken  
at: 9.1.1.1

90


180 Sheet 2 of 9

Attachment L  
RFR 01-01  
Page 72 of 107

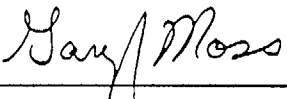

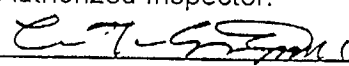
**DUKE POWER COMPANY**  
**ULTRASONIC INDICATION RECORD FOR PIPING**

FORM NDE-UT-10

Revision 0

Station: Oconee		Unit: 1		Component/Weld ID: 1-51A-04-1C				Date: 12/14/00				
Surface Condition: AS GROUND				Item No: C05.021.004								
Examiner: Jay A. Eaton		Level: II		Procedure: NDE-600		Rev: 13		FC: N/A				
Examiner: Gayle E. Houser		Level: II		Lo: 9.1.1.1		Configuration:		CIRC.				
Calibration Sheet No: 0001088, 0001087				S1 VALVE to S2 PIPE				Scan Surface: OD				
IND #		% FSH	Mp Max	W Max	L Max	L1 20 % FSH	L2 20 % FSH	Beam Dir.	Exam Surf.	Scan	Damps	Remarks
1	60°S	80	1.2	0.9	0+0"	360°	INT.	S1	S2	AXIAL	NO	
2	60°L	60	1.23	0.9	0+0"	360°	INT.	S1	S2	AXIAL	NO	
NRI	38°											

Attachment L  
 RFR 01-01  
 Page 73 of 107

Reviewed By: 	Level: 	Date: 12-18-00	Authorized Inspector: 	Date: JAN 06 2001	Sheet <u>3</u> of <u>9</u>
--	--	----------------	--	-------------------	----------------------------

## Revision 1

EXAMINATION SURFACE 2

Page 4

3

Date: JAN 06 2001

180 Sheet 4 of 9

# DUKE POWER COMPANY ISI LIMITATION REPORT

FORM NDE-UT-4

Revision 1

Component/Weld ID: 1-51A-04-1C

Item No: C05.021.004

Remarks:

☒ NO SCAN      SURFACE      BEAM DIRECTION  
☐ LIMITED SCAN      ☒ 1 ☐ 2      ☒ 1 ☐ 2 ☐ cw ☐ ccw  
FROM L 0 to L 14.13 INCHES FROM WO CL to BEYOND  
ANGLE: ☐ 0 ☐ 45 ☒ 60 ☐ Other FROM 0 DEG to 360 DEG

NO SCAN DUE TO VALVE  
CONFIGURATION.

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

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

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

Prepared By: MEH

Level: 3A

Date: 12/14/00

Sketch(s) attached ☒ yes ☐ no

Sheet 5 of 9

Reviewed By: Harry Moss

Date: 12.18.00

Authorized Inspector:

E. J. [Signature]

Date: JAN 06 2001

## DUKE POWER COMPANY

Form NDE-UT-8

## ULTRASONIC INDICATION RESOLUTION SHEET

Revision 1

## Acceptance Standard:

IND. #1 - 60° & IND. #2 - 60°L ARE GEOMETRIC REFLECTORS FROM WELD ROOT CONFIGURATION. THIS WAS VERIFIED USING A 70° WEDGE ON THE 60° CALIBRATION, A WSY-70 BI-MODAL TRANSDUCER AND REVIEW OF THE RT FILM.

Item No: C05.021.004

Acceptable Indications: IND. #1 - 60°S &amp; IND. #2 - 60°L

## Rejectable Indications:

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

Examiner:

Jay A. Eaton

Level:

II

Date:

12/14/00

Sheet 6 of 9

Reviewer:

Jay A. Moss

Level:

II

Date:

12-18-00

Authorized Inspector:

C. L. Freeman

Date:

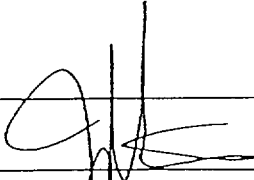
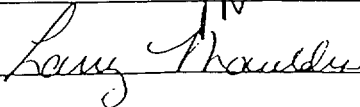
JAN 06 2001

Attachment L  
RFR 01-01  
Page 76 of 107



<b>DUKE POWER COMPANY</b>						NDE-91-1	
Limited Examination Coverage Worksheet						Revision 0	
<b>Examination Volume/Area Defined</b>							
<input checked="" type="checkbox"/> Base Metal		<input checked="" type="checkbox"/> Weld		<input type="checkbox"/> Near Surface		<input type="checkbox"/> Bolting	
						<input type="checkbox"/> Inner Radius	
Area Calculation				Volume Calculation			
1.0 X .22 - .22 SQ. IN.				.22 X 21.16 - 4.65 CU. IN.			
<b>Coverage Calculations</b>							
Scan #	Angle	Beam Direction	Area Examined (sq.in.)	Length Examined (in.)	Volume Examined (cu.in.)	Volume Required (cu.in.)	Percent Coverage
1	45°	CW	.22	21.16	4.65	4.65	100.00
2	45°	CCW	.22	21.16	4.65	4.65	100.00
3	60°	S1	.099	21.16	2.09	4.65	44.95
4	60°	S2	0	0	0	4.65	0.00
	SHEAR	WAVE	AGGREGATE	COVERAGE	11.39	18.6	61.24
4	60L	S1	.129	21.16	2.72	4.65	58.49

58% OF 25% (1 SCAN) = 14.5% SUPPLEMENTAL COVERAGE

		Item No: C05.021.004	
Prepared By: 	Level: II	Date: 12/14/00	
Reviewed By: 	Level: III	Date: 12-18-00	

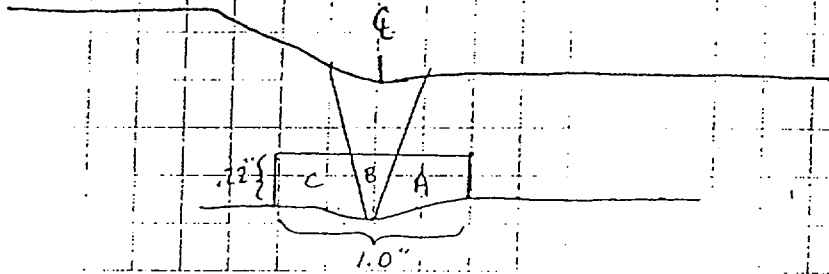
Station ONS Unit I Rev. File No. Sheet 9 of 9Subject C05.021.004 1-51A-04-1C.654" T 6.74" D 21.16" RBy JAMIE RESORDate 12-14-00Prob No. LIMITED UT EXAM

Checked by

Date

AREA CALCULATION

$$1.0" \times .22 = .22 \text{ in}^2$$



L-WAVE AREA = "B+C"

$$A = \frac{bh}{2} (a+b)$$

$$A = \frac{.22}{2} (a+b)$$

$$A = .11 (.4+.5)$$

$$A = .099 = \text{AREA "C"}$$

AREA "B" =

$$A = \frac{bh}{2}$$

$$A = \frac{.2 \times .3}{2}$$

$$A = .03$$

AREA "B+C" = .129 L-WAVE COVERAGE (SUPPLEMENTAL)

VOLUME CALCULATION

$$.22" \times 21.16" = 4.65$$

SHEAR WAVE AREA = "A"

$$A = \frac{bh}{2} (a+b)$$

$$A = \frac{.22}{2} (a+b)$$

$$A = .11 (.4+.5)$$

$$A = .099 = \text{AREA "A"}$$

$$.099 \times 21.16 = 2.09 \text{ in}^3$$

# NO DATA

CALIBRATION SHEET # 0001018 - 45' & 60'  
# 0001019 - 60°L  
# \_\_\_\_\_  
COMPONENT I.D.# 1-51A-01-118A  
ITEM # C05.021.048

Attachment L  
RFR 01-01  
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2302

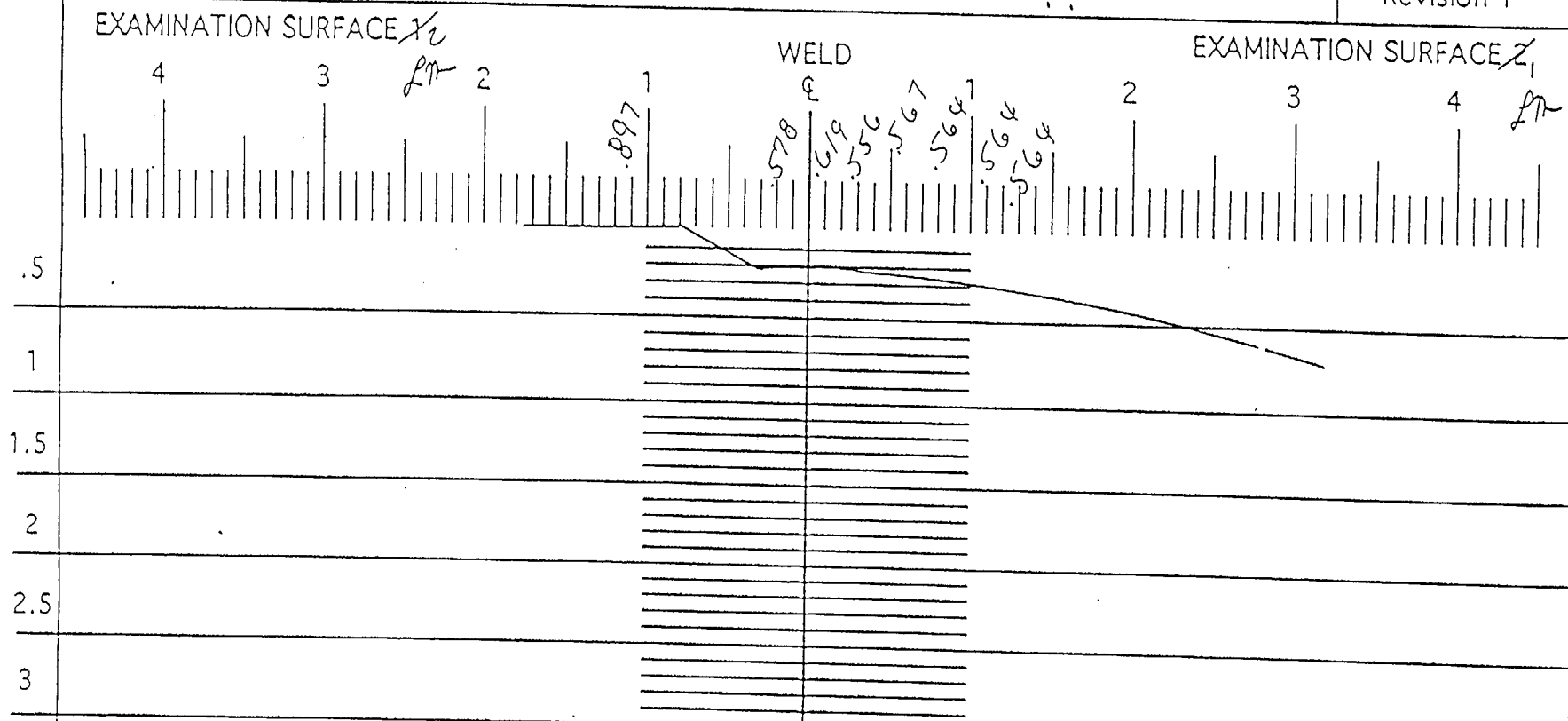
DUKE POWER COMPANY										Exam Start: 0922		NDE-UT-3A		
ULTRASONIC EXAMINATION DATA SHEET FOR LAMINAR REFLECTORS										Exam Finish: 0928		Revision 2		
Station: Oconee			Unit: 1		Component/Weld ID: 1-51A-01-118A						Date: 8/28/00			
Nominal Material Thickness (in): 0.531			Weld Length (in.): 14.1"			Surface Temperature: 95° Deg F								
Measured Material Thickness (in): .564"			Lo: 9.1.1.2			Pyrometer S/N: MCNDE 27205								
Surface Condition: AS GROUND			Calibration Sheet No: 0001017			Cal Due: 1/17/01								
Examiner: Larry Mauldin <i>Larry Mauldin</i> Level: III						Configuration: Valve (1HP-118) to Elbow  S2 Flow S1  VALVE to ELBOW								
Examiner: Marion T. Weaver <i>Marion T. Weaver</i> Level: II														
Procedure: NDE-640 Rev: 1 FC: *														
IND NO.		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													

Remarks: *95-18 & 95-19					
		Limitations: see NDE-UT-4 <input type="checkbox"/> None: <input checked="" type="checkbox"/>		Sheet <u>2</u> of <u>6</u>	
Reviewed By: <i>Larry Moss</i>		Level: <u>D</u> Date: <u>8-31-00</u>		Authorized Inspector: <i>[Signature]</i> Date: <u>DEC 25 2000</u>	
				Item No: C05.021.048	

DUKE POWER COMPANY  
UT PROFILE/PLOT SHEET

NDE-UT-5

Revision 1



Component ID/Weld No.

1-51A-01-118A

: Remarks:

Examiner:

*Larry Thaulder*

Item No:

COS 021048

Level: *III*

Date: 8-28-00

Reviewed By:

*Dan Moss*

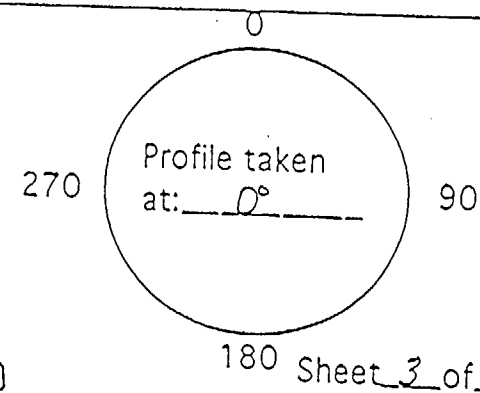
Level: *D*

Date: 8-31-00

Authorized Inspector:

*C. T. G. F. F. F.*

Date: DEC 25 2000



Sheet 3 of 6

# DUKE POWER COMPANY ISI LIMITATION REPORT

FORM NDE-UT-4

Revision 1

Component/Weld ID: 1-51A-01-118A

Item No: C05.021.048

Remarks:

☒ NO SCAN      SURFACE      BEAM DIRECTION  
☐ LIMITED SCAN      ☐ 1 ☒ 2      ☒ 1 ☐ 2 ☐ cw ☐ ccw  
 FROM L \_\_\_\_\_ to L \_\_\_\_\_ INCHES FROM WO \_\_\_\_\_ .3" to \_\_\_\_\_ BEYOND \_\_\_\_\_  
 ANGLE: ☐ 0 ☐ 45 ☒ 60 ☐ Other \_\_\_\_\_ FROM \_\_\_\_\_ 0 DEG to \_\_\_\_\_ 360 DEG

DUE TO VALVE CONFIGURATION.

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

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

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

Prepared By: Larry Mauldin *Larry Mauldin*

Level: III

Date: 8/28/00

Sketch(s) attached ☒ yes ☐ no

Sheet 4 of 6

Reviewed By: *Larry Moss*

Date: 8/31/00

Authorized Inspector: *[Signature]*

Date: DEC 25 2000

Attachment L  
 RFR 01-01  
 Page 83 of 107

<b>DUKE POWER COMPANY</b> <b>Limited Examination Coverage Worksheet</b>						NDE-91-1 Revision 0	
<b>Examination Volume/Area Defined</b>							
<input checked="" type="checkbox"/> Base Metal <input checked="" type="checkbox"/> Weld <input type="checkbox"/> Near Surface <input type="checkbox"/> Bolting <input type="checkbox"/> Inner Radius							
Area Calculation				Volume Calculation			
0.185 in. x 1.1 in. = .2035 = .204 sq.in.				.204 sq.in. x 14.1 in. = 2.8764 = 2.876 cu.in.			
<b>Coverage Calculations</b>							
Scan #	Angle	Beam Direction	Area Examined (sq.in.)	Length Examined (in.)	Volume Examined (cu.in.)	Volume Required (cu.in.)	Percent Coverage
1	60°	2	.078	14.1	1.1	2.876	
2	60°	1	0.0	14.1	0	2.876	
3	45°	CW	0.204	14.1	2.876	2.876	
4	45°	CCW	0.204	14.1	2.876	2.876	
TOTAL	SHEAR	WAVE	AGGREGATE	COVERAGE	6.852	11.504	59.56
1	60°RL	2	0.125	14.1	1.763	14.1	12.50

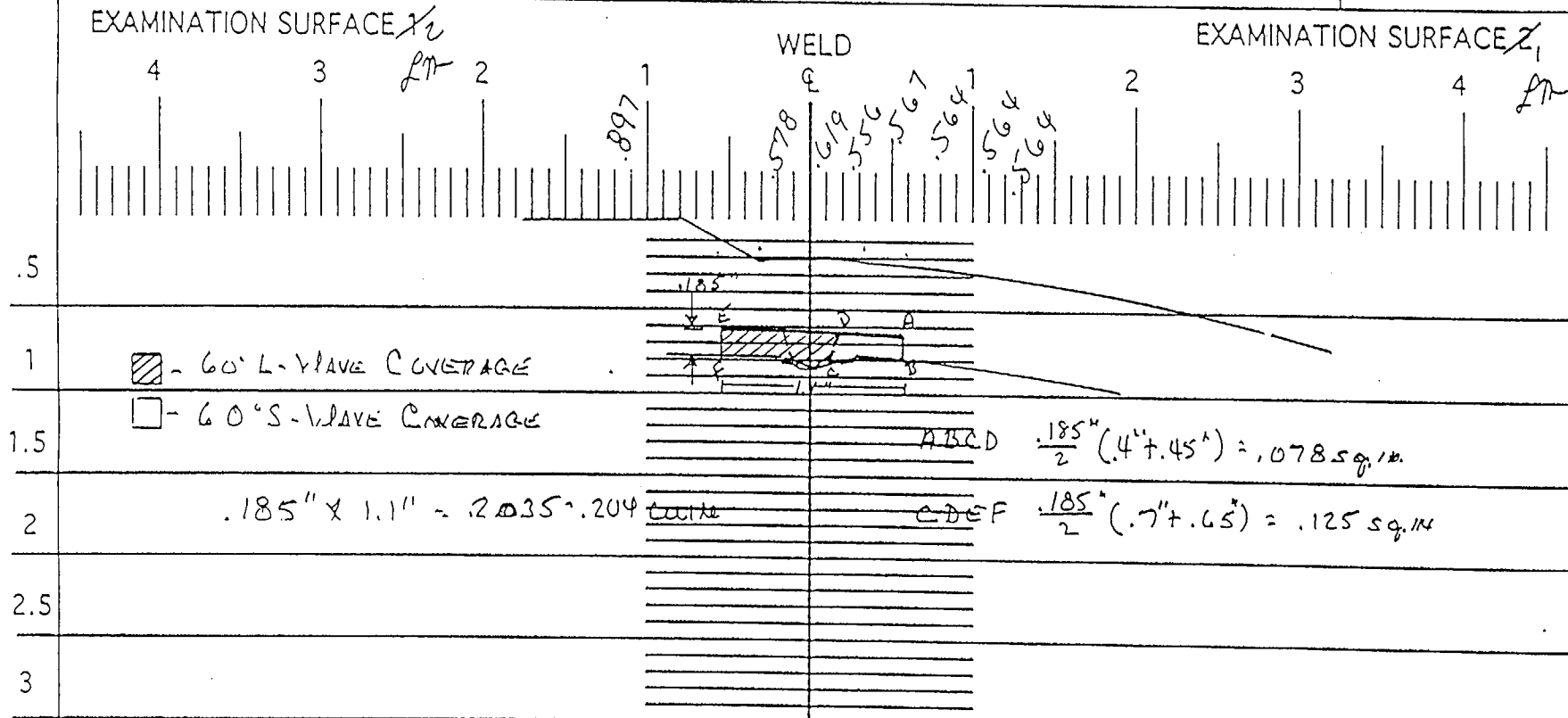
RL WAVE SUPPLEMENTAL COVERAGE     12.5% OF 25% (1 SCAN) = 3.125% OF TOTAL WELD

Item No: C05.021.048	
Prepared By: Larry Mauldin <i>Larry Mauldin</i>	Level: III     Date: 8/28/00
Reviewed By: <i>Harry Moss</i>	Level: <i>ID</i> Date: <i>11/29/00</i>

DUKE POWER COMPANY  
UT PROFILE/PLOT SHEET

NDE-UT-5

Revision 1



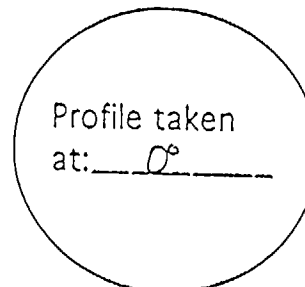
Component ID/Weld No. 1-S1A-01-118A

: Remarks:

Examiner: *Randy Thraulder* Item No: C05 021 048  
Reviewed By: *Dan Moss* Level: *II* Date: 8-28-00  
Authorized Inspector: *Q. L. Smith* Level: *II* Date: 8-31-00

Date: DEC 25 2000

270



Profile taken  
at: 0°

90

180 Sheet 6 of 6



# Oconee #1

## EOC19

### NO DATA

CALIBRATION SHEET # 0001082-45°+60°  
# 0001084-60°L  
# \_\_\_\_\_  
COMPONENT I.D.# 1-51A-02-20B  
ITEM # C05.021.054

ANII 10/16 Date 1/16  
HSB&I Co.

SHEET 40P5

DUKE POWER COMPANY										Exam Start: 0939		NDE-UT-3A		
ULTRASONIC EXAMINATION DATA SHEET FOR LAMINAR REFLECTORS										Exam Finish: 0942		Revision 2		
Station: Oconee		Unit: 1		Component/Weld ID: 1-51A-02-20B						Date: 12/14/00				
Nominal Material Thickness (in): 0.531				Weld Length (in.): 14.1				Surface Temperature: 70° Deg F						
Measured Material Thickness (in): .514				Lo: 9.1.1.1				Pyrometer S/N: MCNDE 27021						
Surface Condition: AS GROUND				Calibration Sheet No: 0001080				Cal Due: 3/27/01						
Examiner: James L. Panel <i>James L. Panel</i> Level: II								Configuration: CIRC.						
Examiner: James H. Resor <i>James H. Resor</i> Level: II								S2 Flow S1						
Procedure: NDE-640 Rev: 1 FC: *								PIPE to VALVE						
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 <input type="checkbox"/> None: <input checked="" type="checkbox"/>		Sheet 2 of 5	
Reviewed By: <i>Gay/Mox</i>		Level: <i>D</i> Date: 12-18-00		Authorized Inspector: <i>[Signature]</i> Date: JAN 06 2001	
				Item No: C05.021.054	

DUKE POWER COMPANY  
UT PROFILE/PLOT SHEET

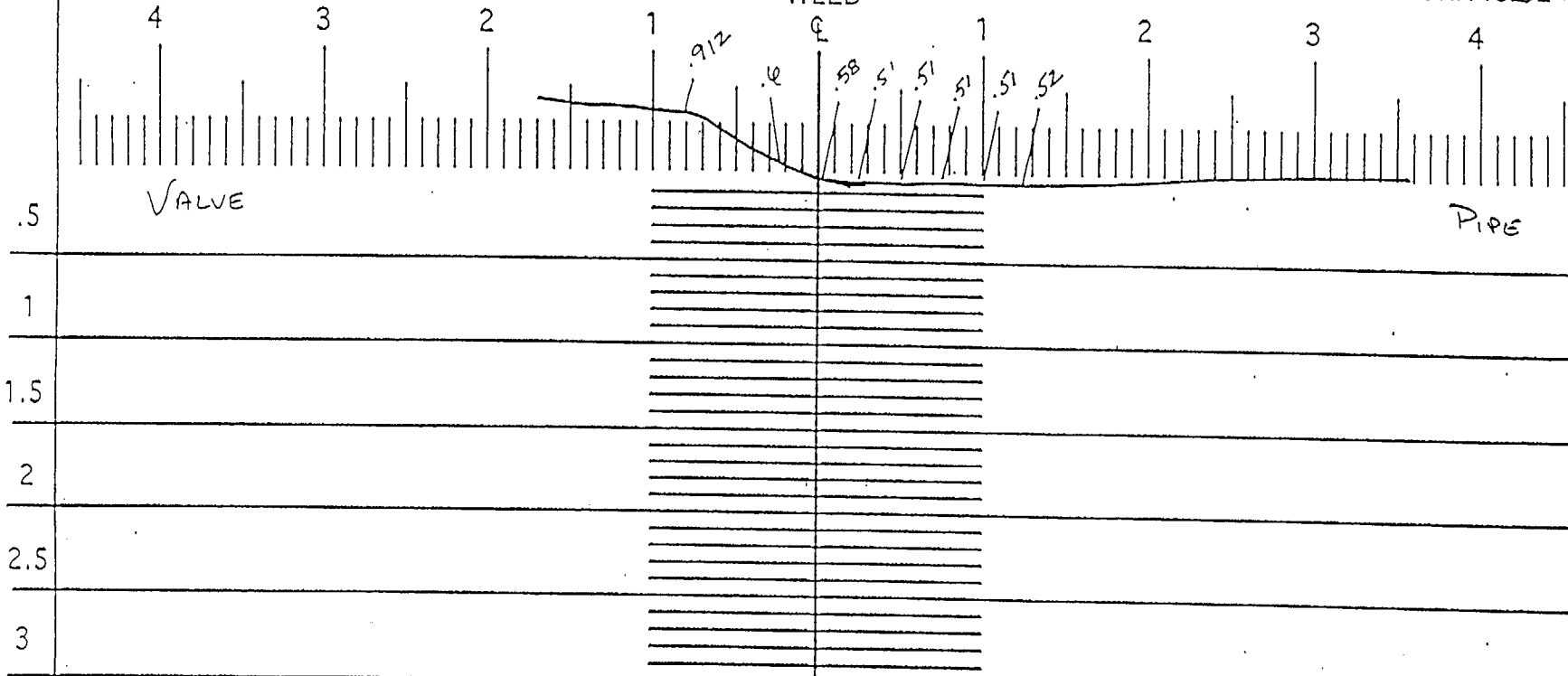
NDE-UT-5

Revision 1

EXAMINATION SURFACE 12

WELD

EXAMINATION SURFACE 21



Component ID/Weld No. 1-51A-0220 B

Remarks:

Item No: C05.021.054

Examiner: *James Bern*

Level: II

Date: 12-14-00

Reviewed By: *Barry Mon*

Level: II

Date: 12-18-00

Authorized Inspector: *Carl S. Smith*

Date: JAN 06 2001

Profile taken  
at: 9.1.1.1 (Top)

180 Sheet 3 of 5

Attachment L  
RFR 01-01  
Page 88 of 107

5 of 5

<b>DUKE POWER COMPANY</b> Limited Examination Coverage Worksheet						NDE-91-1	
						Revision 0	
<b>Examination Volume/Area Defined</b>							
<input checked="" type="checkbox"/> Base Metal <input checked="" type="checkbox"/> Weld <input type="checkbox"/> Near Surface <input type="checkbox"/> Bolting <input type="checkbox"/> Inner Radius							
Area Calculation				Volume Calculation			
1.3 X .177 = .230 SQ. IN.				.230 X 14.1 = 3.24 CU. IN.			
<b>Coverage Calculations</b>							
Scan #	Angle	Beam Direction	Area Examined (sq.in.)	Length Examined (in.)	Volume Examined (cu.in.)	Volume Required (cu.in.)	Percent Coverage
1	45°	CW	.230	14.1	3.24	3.24	100.00
2	45°	CCW	.230	14.1	3.24	3.24	100.00
3	60°	S1	.075	14.1	1.05	3.24	32.41
4	60°	S2	0	0	0	3.24	0.00
SHEAR AGGREGATE %					7.53	12.96	58.10
4	60L	S1	.135	14.1	1.9	3.24	58.64

58% OF 25% (1 SCAN) = 14.5% OF TOTAL WELD

Item No: C05.021.054	
Prepared By: <i>James A. Ponder</i>	Level: <i>II</i> Date: <i>12/14/00</i>
Reviewed By: <i>Larry Mauldin</i>	Level: <i>III</i> Date: <i>12/29/00</i>

Subject 005.021.054 West 20 B

Ripe to Wave

531 T 4.5" D

Prob No. Limited UT Exam

Checked by

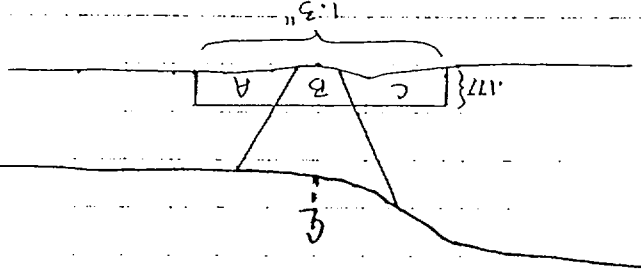
Date

Area Calculation

$$1.3 \times 1.17 = 2.30 \text{ in}^2$$

$$2.30 \times 14.1 = 3.24 \text{ in}^3$$

Volume Calculation



Shear Wave Area = "A"

$$A = \frac{1}{2} (a+b)$$

$$A = \frac{1}{2} (.35 + .5)$$

$$A = .088 (.85)$$

$$A = .075$$

$$\text{Area "A"} = .075 \times 14.1 =$$

$$\text{Shear Wave Volume} = 1.05 \text{ in}^3$$

$$A = \frac{1}{2} (a+b)$$

$$A = \frac{1}{2} (.4 + .2)$$

$$\text{Area "B"} = .06$$

$$\text{L-Wave Area} = .06 + .075$$

$$A = .135$$

$$\text{L-Wave Volume} = .135 \times 14.1 = 1.9$$

ANII	Date
HSB&I Co.	

# Oconee #1

## EOC19

### NO DATA

CALIBRATION SHEET # 0001008-45° + 60°  
# 0001010 - 60° L  
#                       
COMPONENT I.D.# 1-HP-193-17  
ITEM # C05.021.064

ANII See Data 12/24  
HSBI&I Co.

<b>DUKE POWER COMPANY</b>										Exam Start: 1442		NDE-UT-3A		
<b>ULTRASONIC EXAMINATION DATA SHEET FOR LAMINAR REFLECTORS</b>										Exam Finish: 1446		Revision 2		
Station: Oconee			Unit: 1		Component/Weld ID: 1HP-193-17					Date: 8/16/00				
Nominal Material Thickness (in): 0.375				Weld Length (in.): 10"				Surface Temperature: 98° Deg F						
Measured Material Thickness (in): .373				Lo: 9.1.1.1				Pyrometer S/N: OCNDE30014						
Surface Condition: AS GROUND				Calibration Sheet No: 0001007				Cal Due: 10/11/00						
Examiner: Larry Mauldin <i>Larry Mauldin</i>			Level: III					Configuration: Tee to Pipe S2 Flow S1 TEE to PIPE						
Examiner: _____			Level: _____											
Procedure: NDE-640 Rev: 1 FC: *														
IND NO.		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													

Remarks: *95-18 & 95-19					
		Limitations: see NDE-UT-4 <input checked="" type="checkbox"/> None: <input type="checkbox"/>		Sheet <u>2</u> of <u>6</u>	
Reviewed By: <i>Gary Moss</i>		Level: <u>B</u> Date: <u>8-22-00</u>		Authorized Inspector: <i>C. J. Smith</i> Date: <u>DEC 25 2000</u>	
				Item No: C05.021.064	

DUKE POWER COMPANY  
UT PROFILE/PLOT SHEET

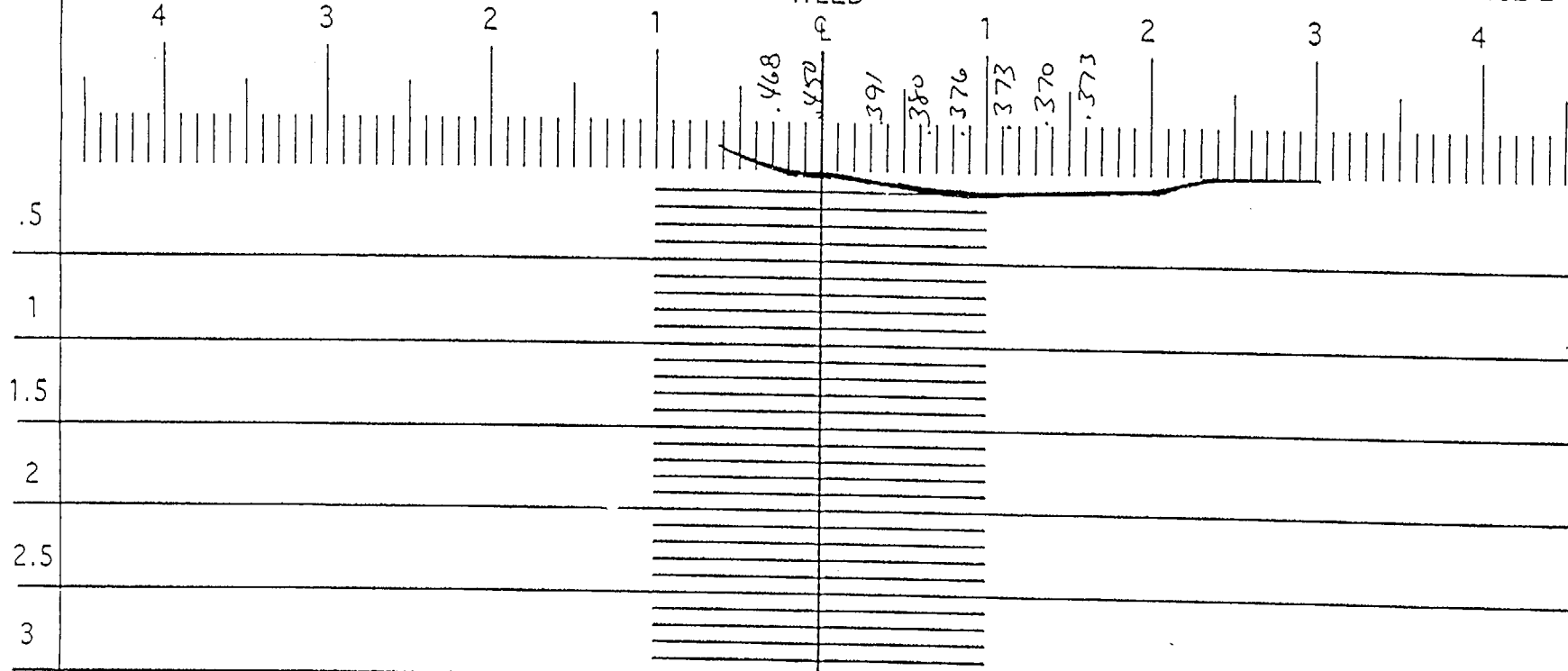
NDE-UT-5

Revision 1

EXAMINATION SURFACE 1

WELD

EXAMINATION SURFACE 2

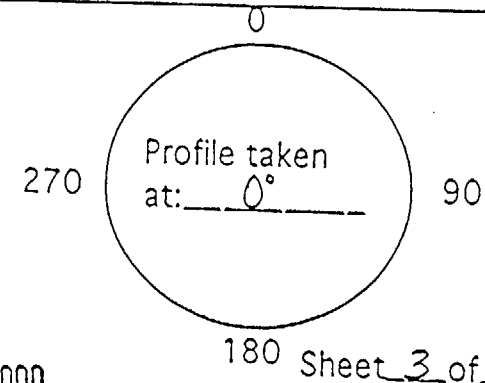


Component ID/Weld No. 1-HP-193-17

Remarks:

Examiner: Larry Mueller Item No: COS, 021, 064  
Reviewed By: Edy Mon Level: III Date: 8-16-00  
Authorized Inspector: C. H. S. S. S. Level: II Date: 8-22-00

Date: DEC 25 2000



180 Sheet 3 of 6



# DUKE POWER COMPANY

## ISI LIMITATION REPORT

FORM NDE-UT-4

Revision 1

Component/Weld ID: 1HP-193-17

Item No: C05.021.064

Remarks:

☒ NO SCAN      SURFACE      BEAM DIRECTION  
☐ LIMITED SCAN      ☐ 1 ☒ 2      ☒ 1 ☐ 2 ☐ cw ☐ ccw  
 FROM L   N/A   to L   N/A   INCHES FROM WO   .5"   to   BEYOND    
 ANGLE: ☐ 0 ☐ 45 ☒ 60 ☐ Other        FROM   0   DEG to   360   DEG

DUE TO TEE CONFIGURATION

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

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

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

Prepared By: Larry Mauldin

Level: III

Date: 8/16/00

Sketch(s) attached ☐ yes ☒ no

Sheet 4 of 6

Reviewed By:

Date: 8-22-00

Authorized Inspector:

DEC 25 2000

Attachment L  
 RFR 01-01  
 Page 74 of 107

DUKE POWER COMPANY  
UT PROFILE/PLOT SHEET

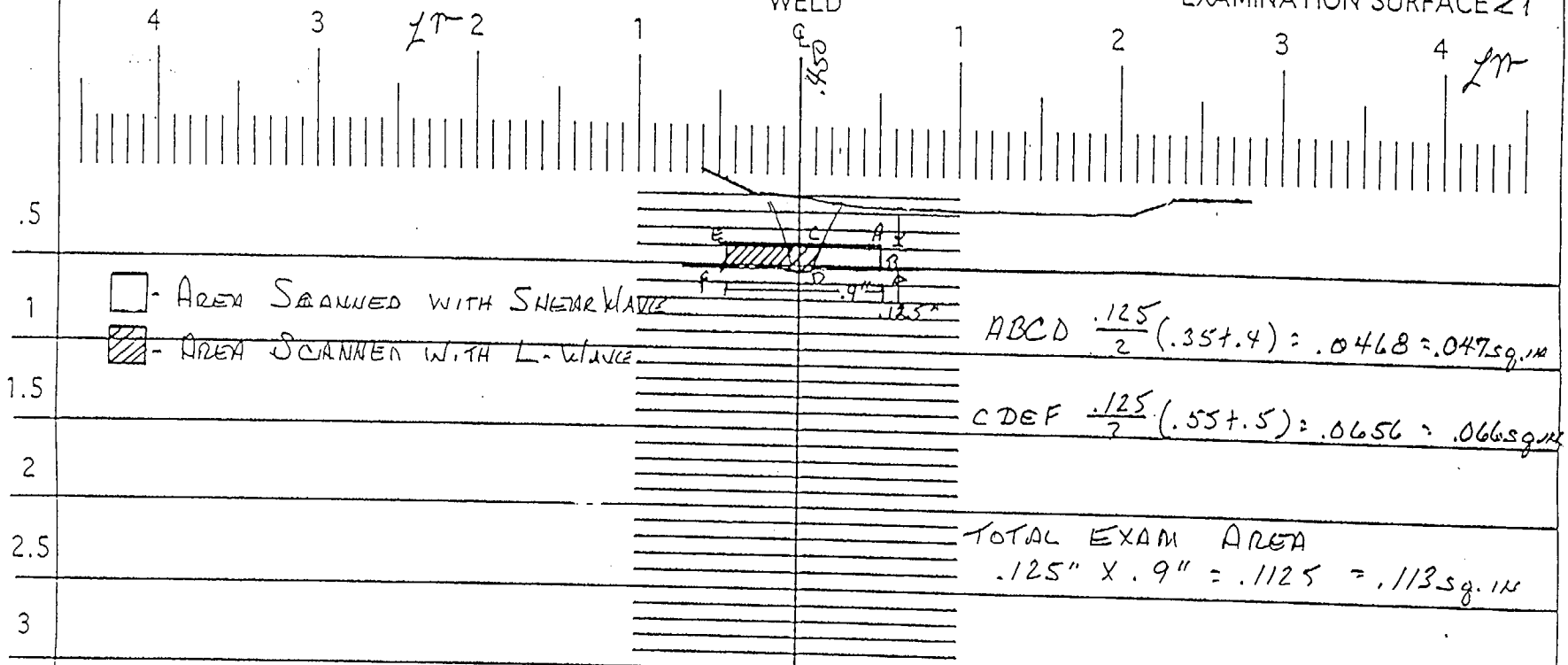
NDE-UT-5

Revision 1

EXAMINATION SURFACE  $\lambda_L$

WELD

EXAMINATION SURFACE  $\lambda_1$



Component ID/Weld No. 1-HP-193-17

Remarks:

Examiner:

*Sam Maule*

Item No: C05.021.064

Level: III

Date: 8-16-00

Reviewed By:

*Sam Moss*

Level: II

Date: 8-30-00

Authorized Inspector:

*C. G. [Signature]*

Date: DEC 25 2000

270

Profile taken  
at: 0°

90

180 Sheet 5 of 6

609

<b>DUKE POWER COMPANY</b> Limited Examination Coverage Worksheet						NDE-91-1 Revision 0	
<b>Examination Volume/Area Defined</b>							
<input checked="" type="checkbox"/> Base Metal <input checked="" type="checkbox"/> Weld <input type="checkbox"/> Near Surface <input type="checkbox"/> Bolting <input type="checkbox"/> Inner Radius							
Area Calculation				Volume Calculation			
.125" x .9" = .1125" = .113 sq.in.				.113 sq.in. x 10 in. = 1.13 cu.in.			
<b>Coverage Calculations</b>							
Scan #	Angle	Beam Direction	Area Examined (sq.in.)	Length Examined (in.)	Volume Examined (cu.in.)	Volume Required (cu.in.)	Percent Coverage
1	60°	2	.047	10	0.47	1.13	
2	60°	1	0.0	10	0	1.13	
3	45°	CW	.113	10	1.13	1.13	
4	45°	CCS	.113	10	1.13	1.13	
TOTAL	SHEAR	WAVE	AGGREGATE	COVERAGE	2.73	4.52	60.40
1	60°RL	2	0.066	10	0.66	1.13	58.41

RL WAVE SUPPLEMENTAL COVERAGE 58.41% OF 25% (1 SCAN) = 14.6% OF TOTAL WELD

Item No: C05.021.064	
Prepared By: Larry Mauldin <i>Larry Mauldin</i>	Level: III     Date: 8/16/00
Reviewed By: <i>Harry Moss</i>	Level: II     Date: 11-29-00

# Oconee #1

# EOC 19

# NO DATA

CALIBRATION SHEET # 0001083-45° + 60°

# 0001084-60°L

##

COMPONENT I.D.# 1.51A-02-16BH

ITEM # C05.021.086

ANII 14 Date 7/6  
HSE 1 Co.

Attachment L  
RFR 01-01  
Page 77 of 107

1 of 5

DUKE POWER COMPANY										Exam Start: 0945		NDE-UT-3A		
ULTRASONIC EXAMINATION DATA SHEET FOR LAMINAR REFLECTORS										Exam Finish: 0947		Revision 2		
Station: Ocone			Unit: 1		Component/Weld ID: 1-51A-02-16BH						Date: 12/14/00			
Nominal Material Thickness (in): 0.531				Weld Length (in.): 14.1				Surface Temperature: 70° Deg F						
Measured Material Thickness (in): .519				Lo: 9.1.1.1				Pyrometer S/N: MCNDE 27021						
Surface Condition: AS GROUND				Calibration Sheet No: 0001079				Cal Due: 3/27/01						
Examiner: James L. Panel <i>James L. Panel</i> Level: II			Configuration: CIRC. S2 Flow S1 PIPE to FLANGE											
Examiner: James H. Resor <i>James H. Resor</i> Level: II														
Procedure: NDE-640 Rev: 1 FC: *														
IND NO.	<i>4</i>	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 <input type="checkbox"/> None: <input checked="" type="checkbox"/>		Sheet <u>2</u> of <u>5</u>				
Reviewed By: <i>Gary Moss</i>			Level: <i>B</i>		Date: <i>12-18-00</i>		Authorized Inspector: <i>[Signature]</i>		Date: <i>JAN 06 2001</i>		Item No: C05.021.086	

DUKE POWER COMPANY  
UT PROFILE/PLOT SHEET

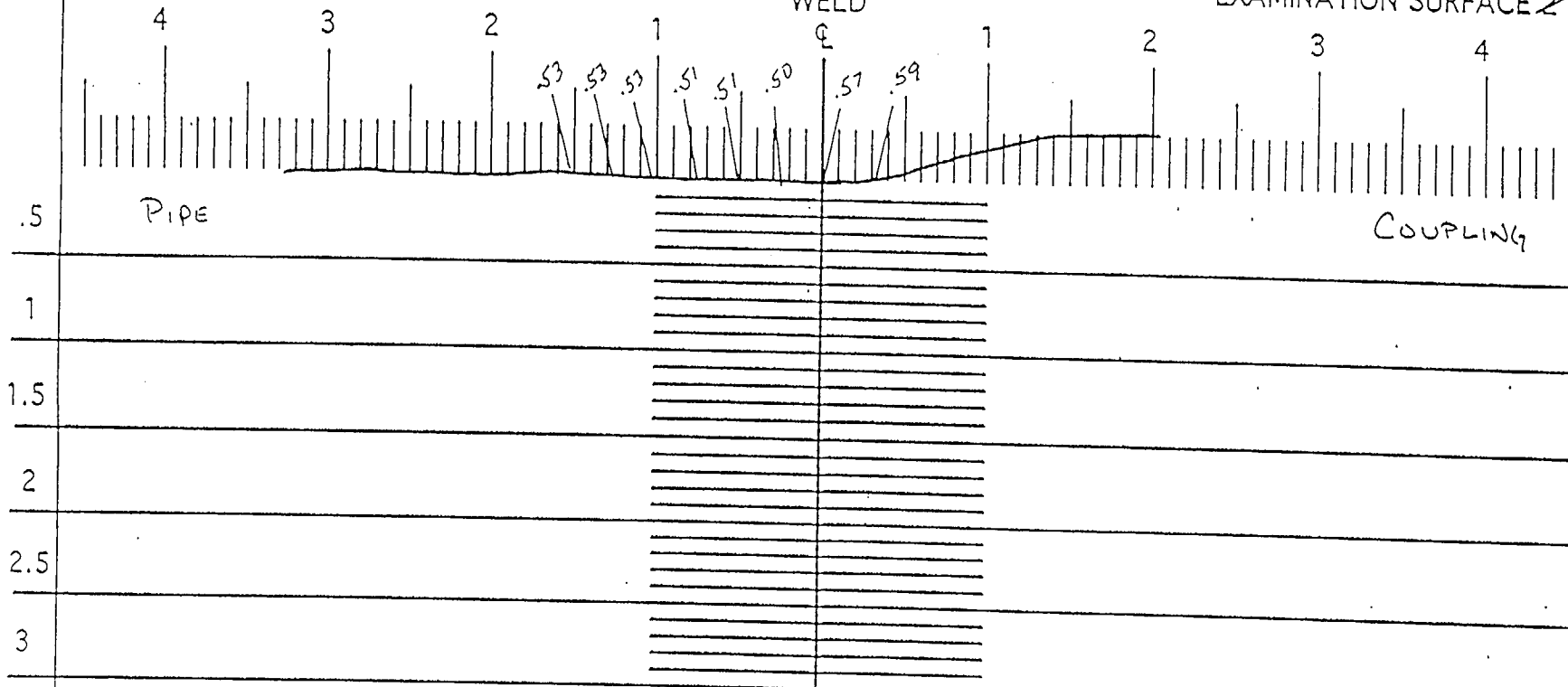
NDE-UT-5

Revision 1

EXAMINATION SURFACE 2/2

WELD

EXAMINATION SURFACE 2/1



Component ID/Weld No. 1-51A-02-16 BH

Remarks:

Examiner: *James H. Bess*

Reviewed By: *Don Mon*

Authorized Inspector: *E. J. Smith*

Item No: C05-021-086

Level: II

Date: 12-14-00

Level: B

Date: 12-18-00

Date: JAN 06 2001

270

Profile taken  
at: 9.1.1.1 (Top)

90

180 Sheet 3 of 5

4085

<b>DUKE POWER COMPANY</b>						NDE-91-1	
Limited Examination Coverage Worksheet						Revision 0	
<b>Examination Volume/Area Defined</b>							
<input checked="" type="checkbox"/> Base Metal <input checked="" type="checkbox"/> Weld <input type="checkbox"/> Near Surface <input type="checkbox"/> Bolting <input type="checkbox"/> Inner Radius							
Area Calculation				Volume Calculation			
1.3 X .177 = .230 SQ. IN.				.230 X 14.1 = 3.24 CU. IN.			
<b>Coverage Calculations</b>							
Scan #	Angle	Beam Direction	Area Examined (sq.in.)	Length Examined (in.)	Volume Examined (cu.in.)	Volume Required (cu.in.)	Percent Coverage
1	45°	CW	.230	14.1	3.24	3.24	100.00
2	45°	CCW	.230	14.1	3.24	3.24	100.00
3	60°	S1	.075	14.1	1.05	3.24	32.41
4	60°	S2	0	0	0	3.24	0.00
SHEAR AGGREGATE			%		7.53	12.96	58.10
SUPPLEMENTAL COVERAGE							0.00
4	60L	S1	.135	14.1	1.9	3.24	58.64

58% OF 25% (1 SCAN) = 14.5 % OF TOTAL WELD

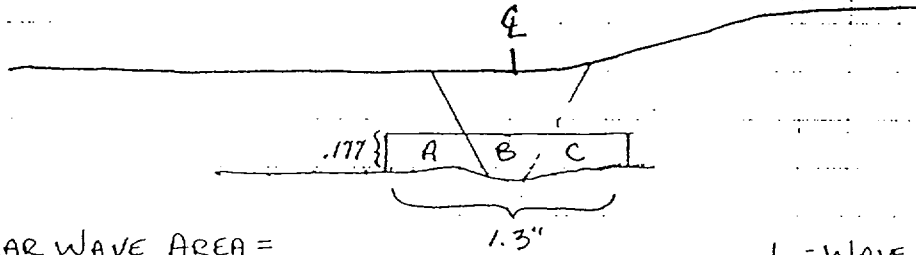
			Item No:	C05.021.086
Prepared By:	<i>James L. Powell</i>	Level:	II	Date: 12/14/00
Reviewed By:	<i>Randy Moulden</i>	Level:	III	Date: 12/24/00
			ANII <input checked="" type="checkbox"/> Date <u>1/6</u> HSBI&I Co.	

Station ONS Unit 1 Rev. \_\_\_\_\_ File No. \_\_\_\_\_ Sheet 5 of 5Subject COS.021.086 NEW# 16 BH PIPE TO COUPLING.531" T 4.5" DBy JAMIE RESOR Date 12-14-00Prob No. LIMITED UT EXAM

Checked by \_\_\_\_\_ Date \_\_\_\_\_

## AREA CALCULATION

$$1.3 \times .177 = .230 \text{ m}^2$$



SHEAR WAVE AREA =

$$A = \frac{h}{2} (a+b)$$

$$A = \frac{.177}{2} (.35 + .5)$$

$$A = .088 (.85)$$

$$A = .075$$

$$\text{AREA "A"} = .075 \times 14.1 =$$

$$\text{SHEAR WAVE VOLUME} = 1.05 \text{ m}^3$$

## VOLUME CALCULATION

$$.230 \times 14.1 = 3.24 \text{ m}^3$$

L-WAVE AREA = "B" + "C"

$$A = \frac{h}{2} (a+b)$$

$$A = \frac{.177}{2} (.35 + .5)$$

$$A = .088 (.85)$$

$$A = .075 = \text{AREA "C"}$$

$$A = \frac{h}{2} (a+b)$$

$$A = \frac{.2}{2} (.4 + .2)$$

$$\text{AREA "B"} = .06$$

$$\text{L-WAVE AREA} = .06 + .075$$

$$A = .135$$

$$\text{L-WAVE VOLUME} = .135 \times 14.1 = 1.9$$

ANII	Date	11/6
HSBI&I Co.		



# NO DATA

CALIBRATION SHEET # 0001015 - 45° + 60°  
# 0001016 - 60° L  
# \_\_\_\_\_  
\_\_\_\_\_  
COMPONENT I.D.# 1-51A-01-101A  
ITEM # C05.021.108

7 of 6

DUKE POWER COMPANY										Exam Start: 0921		NDE-UT-3A		
ULTRASONIC EXAMINATION DATA SHEET FOR LAMINAR REFLECTORS										Exam Finish: 0924		Revision 2		
Station: Oconee			Unit: 1		Component/Weld ID: 1-51A-01-101A						Date: 8/24/00			
Nominal Material Thickness (in): 0.438			Weld Length (in.): 11"			Surface Temperature: 95° Deg F								
Measured Material Thickness (in): .439			Lo: 9.1.1.2			Pyrometer S/N: MCNDE 27205								
Surface Condition: AS GROUND			Calibration Sheet No: 0001014			Cal Due: 1/17/01								
Examiner: Marion T. Weaver <i>Marion T. Weaver</i> Level: II						Configuration: Elbow to Valve (1HP-110)								
Examiner: David Zimmerman <i>David K. Zimmerman</i> Level: II														
Procedure: NDE-640 Rev: 1 FC: *						S2 Flow S1 VALVE to ELBOW								
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													

Remarks: *95-18 & 95-19														
					Limitations: see NDE-UT-4 <input type="checkbox"/> None: <input checked="" type="checkbox"/>					Sheet 2 of 6				
Reviewed By: <i>Gay Moss</i>			Level: B		Date: 8.30.00		Authorized Inspector: <i>[Signature]</i>			Date: DEC 25 2000		Item No: C05.021.108		

DUKE POWER COMPANY  
UT PROFILE/PLOT SHEET

NDE-UT-5

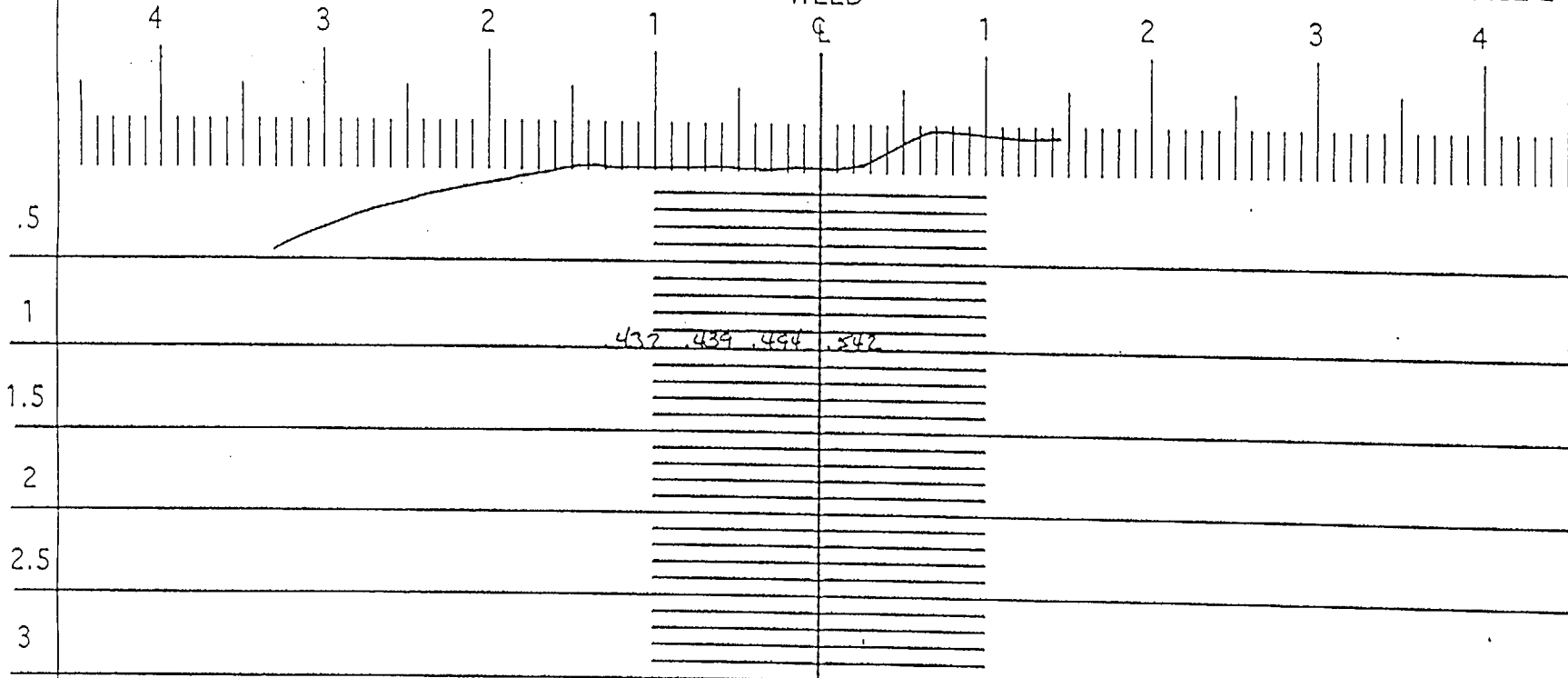
Revision 1

EXAMINATION SURFACE 1 ELBOW

WELD

VALVE

EXAMINATION SURFACE 2



Component ID/Weld No.

1-51A-01-101A

Remarks:

Examiner: David K. Brown

Reviewed By: Sam Morris

Authorized Inspector: [Signature]

Item No: C05.021.108

Level: II

Date: 8/24/00

Level: IS

Date: 8-30-00

Date DEC 25 2000

270

Profile taken  
at: 60

90

180 Sheet 3 of 6

# DUKE POWER COMPANY

## ISI LIMITATION REPORT

FORM NDE-UT-4

Revision 1

Component/Weld ID: 1-51A-01-101A

Item No: C05.021.108

Remarks:

☒ NO SCAN      SURFACE      BEAM DIRECTION  
☐ LIMITED SCAN      ☐ 1 ☒ 2      ☒ 1 ☐ 2 ☐ cw ☐ ccw  
 FROM L   N/A   to L   N/A   INCHES FROM WO   .3"   to   BEYOND    
 ANGLE: ☐ 0 ☐ 45 ☒ 60 ☐ Other            FROM   0   DEG to   360   DEG

DUE TO VALVE CONFIGURATION

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

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

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

Prepared By: David K. Zimmerman

Level: II

Date: 8/24/00

Sketch(s) attached ☒ yes ☐ no

Sheet 4 of 6

Reviewed By:

*Gary Moss*

Date: 8.30.00

Authorized Inspector:

*C. J. [Signature]*

Date: DEC 25 2000

Attachment L  
 RFR 01-01  
 Page 1 of 17

DUKE POWER COMPANY  
UT PROFILE/PLOT SHEET

NDE-UT-5

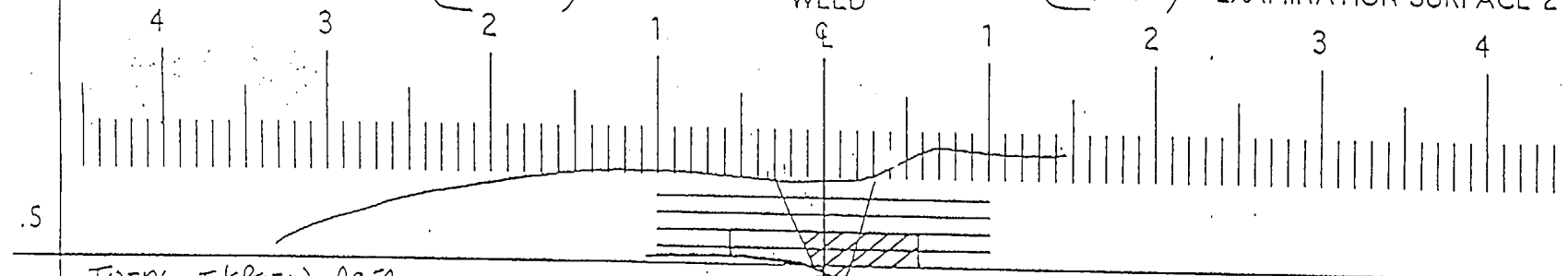
Revision 1

EXAMINATION SURFACE 1 (ELBOW)

WELD

(VALVE)

EXAMINATION SURFACE 2



TOTAL INSPECTION AREA

$$0.165" \times 1.1 = 0.1815 \text{ in}^2 \approx 0.182 \text{ in}^2$$

AREA OF CORRELATION - 60.5

$$\frac{0.165"}{2} (0.4" + 0.5") = 0.074 \text{ in}^2$$

AREA OF CORRELATION - 60.1

$$\frac{0.165"}{2} (0.7" + 0.6") = 0.107 \text{ in}^2$$

Component ID/Weld No.

1-51A-01-101A

Remarks:

Item No: COS.021.108

Examiner: David K. Z.

Level: II

Date: 8/24/00

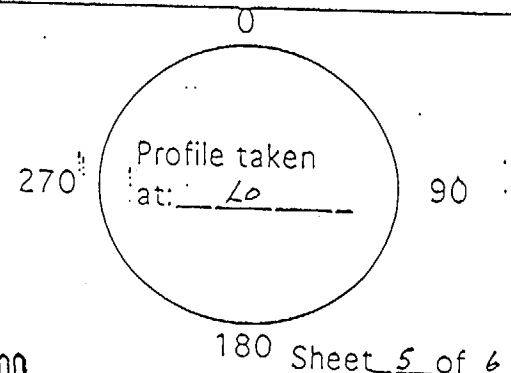
Reviewed By: Gary Ploss

Level: II

Date: 8/30/00

Authorized Inspector: C.C. = S. S. S.

Date: DEC 25 2000



<b>DUKE POWER COMPANY</b>						NDE-91-1	
Limited Examination Coverage Worksheet						Revision 0	
<b>Examination Volume/Area Defined</b>							
<input checked="" type="checkbox"/> Base Metal		<input checked="" type="checkbox"/> Weld		<input type="checkbox"/> Near Surface		<input type="checkbox"/> Bolting	
				<input type="checkbox"/> Inner Radius			
Area Calculation				Volume Calculation			
0.165" X 1.1" = 0.1815 = .182 SQ.IN.				.182 SQ.IN. X 11" = 2.002 CU.IN.			
<b>Coverage Calculations</b>							
Scan #	Angle	Beam Direction	Area Examined (sq.in.)	Length Examined (in.)	Volume Examined (cu.in.)	Volume Required (cu.in.)	Percent Coverage
1	60°	2	.074	11	0.814	2.002	
2	60°	1	0.0	11	0	2.002	
3	45°	CW	0.182	11	2.002	2.002	
4	45°	CCW	.182	11	2.002	2.002	
TOTAL	SHEAR	WAVE	AGGREGATE	COVERAGE	4.818	8.008	60.16
1	60°RL	2	0.107	11	1.177	2.002	58.79

RL WAVE SUPPLEMENTAL COVERAGE 58.79% OF 25% (1 SCAN) = 14.6975 = 14.7% OF TOTAL WELD

		Item No:	C05.021.108
Prepared By: David K. Zimmerman	<i>David K. Zimmerman</i>	Level: II	Date: 8/24/00
Reviewed By:	<i>Larry Mauldin</i>	Level: III	Date: 11-29-00

Page 6 of 6

ANII *HS* Date *11/25*  
 HSB&I Co.