



**Duke Energy**

Oconee Nuclear Station  
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W. R. McCollum, Jr.  
Vice President

August 6, 2001

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

SUBJECT: Oconee Nuclear Station - Unit 2  
Docket No. 50-270  
Third Ten Year Inservice Inspection Interval  
Request for Relief No. 01-011

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 Corporation (DUKE) has determined to be impractical.

Specifically, the attached Request for Relief addresses five (5) inspections on four (4) components 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.

Questions regarding this request may be directed to Robert Douglas at (864) 885-3073.

Very truly yours,



W. R. McCollum, Jr.

Attachment:

Request for Alternative, Serial Number 01-011

A047

xc w/att:

L. A. Reyes, Regional Administrator  
U.S. Nuclear Regulatory Commission, Region II  
Atlanta Federal Center  
61 Forsyth St., SW, Suite 23T85  
Atlanta, GA 30303

D. E. Labarge, Senior Project Manager (ONS)  
Office of Nuclear Reactor Regulation  
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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 2**

**Third 10-YEAR INTERVAL REQUEST FOR RELIEF NO. 01-011**

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 2 Steam Generator A Primary Inlet Nozzle-to-Vessel Weld

<u>Unit</u>	<u>ID Number</u>	<u>Item Number</u>
2	2-SGA-WG25	B03.130.005

B. Unit 2 Steam Generator A Primary Inlet Nozzle-to-Vessel Inside Radius Section:

<u>Unit</u>	<u>ID Number</u>	<u>Item Number</u>
2	2-SGA-WG25	B03.140.005

C. Unit 2 Steam Generator A, Shell to Shell Weld

<u>ID Number</u>	<u>Item Number</u>
2-SGA-WG8-1	C01.010.001

D. Unit 2 Steam Generator A, Upper Tubesheet to Shell Weld

<u>ID Number</u>	<u>Item Number</u>
2-SGA-WG60	C01.030.001

E. Valve 2HP-120 to Pipe:

<u>ID Number</u>	<u>Item Number</u>
2HP-341-V1	C05.021.044

**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 C-A: Figure IWC-2500-1 (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.  
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)."

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

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

Examination Category C-F-1: Relief is being sought from the requirement to perform examinations of stainless steel piping 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. Steam Generator 2A Nozzle-to-Vessel Weld 2-SGA-WG25 (Item B03.130.005) 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 Generator.

This weld is limited to 57.98% 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.

- B. Steam Generator 2A Nozzle-to-Vessel Inside Radius Section for welds 2-SGA-WG25 (Item B03.140.005) was 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 Generator.

This weld is limited to 70.21% coverage of the required volume. Limitations were caused by the ratio of the nozzle OD to the vessel thickness. When the nozzle OD is large in relation to the vessel thickness, less 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. Unit 2 Steam Generator A Shell to Shell Weld 2-SGA-WG8-1 (Item C01.010.001) 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 A for a drawing of the Steam Generator 2A.

This weld is limited to 50.89% coverage of the required volume because of the taper configuration. In order to achieve more coverage, the weld would have to be re-designed to allow scanning from both sides.

- D. Unit 2 Steam Generator A Upper Tubesheet to Shell Weld 2-SGA-WG60 (Item C01.030.001) 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 A for a drawing of the Steam Generator 2A.

This weld is limited to 42.15% coverage of the required volume because of the configuration, and a support hanger and support pad interfering with UT scans. In order to achieve more coverage, the weld would have to be re-designed to allow scanning from both sides.

- E. Valve 2HP-120 to Pipe Weld 2HP-341-V1 (Item C05.021.044) is limited to 61.34% 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 B for a drawing of the valve to pipe weld.

Reference Attachment C 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 limited access for placement of film and component geometry. No additional examinations are planned during the current interval for ID Numbers:

2-SGA-WG25, 2-SGA-WG8-1, 2-SGA-WG60, 2HP-341-V1. 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 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 weld was 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 testing and VT-2 visual examination to compliment the limited examination coverage. The Code requires (reference Table IWB-2500-1, Item Number B15.030 and Table IWC-2500-1, Item Numbers C07.010 and C07.30) that a system leakage test be performed after each refueling outage for Class 1 items and a functional/system inservice test once each period for Class 2 items. Additionally a system hydrostatic test (reference Table IWB-2500-1, Item Number B15.031 and Table IWC-2500-1, Item Numbers C07.020 and C07.40) 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 Steam Generator 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 Steam Generator Nozzle-to-Vessel Weld 2-SGA-WG25. 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 57.98% coverage of Steam Generator Nozzle-to-Vessel Weld 2-SGA-WG25 and 70.21% coverage of the Inside Radius.

The Code requires 100% volumetric examination of all Steam Generator Shell to Shell Welds. However, taper configuration of the weld restricts scanning and prevents complete volumetric coverage of Steam Generator Shell to Shell Weld 2-SGA-WG8-1. 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 50.89% coverage of Steam Generator Shell to Shell Weld 2-SGA-WG8-1.

The Code requires 100% volumetric examination of all Steam Generator Upper Tubesheet to Shell Welds. However, configuration of the weld and Supports restrict scanning and prevents complete volumetric coverage of Steam Generator Upper Tubesheet to Shell Weld 2-SGA-WG60. Therefore, the 100% volumetric examination is impractical. To meet Code examination requirements, modifications to the Steam Generator 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 42.15% coverage of Steam Generator Upper Tubesheet to Shell Weld 2-SGA-WG60.

The Code requires 100% volumetric examination of the Valve 2HP-120 to Pipe Weld 2HP-341-V1. However, the valve configuration restricts scanning and prevents complete volumetric coverage of the above mentioned weld. 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 61.34% coverage of the Valve 2HP-120 to Pipe Weld 2HP-341-V1.

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 less than 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.

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

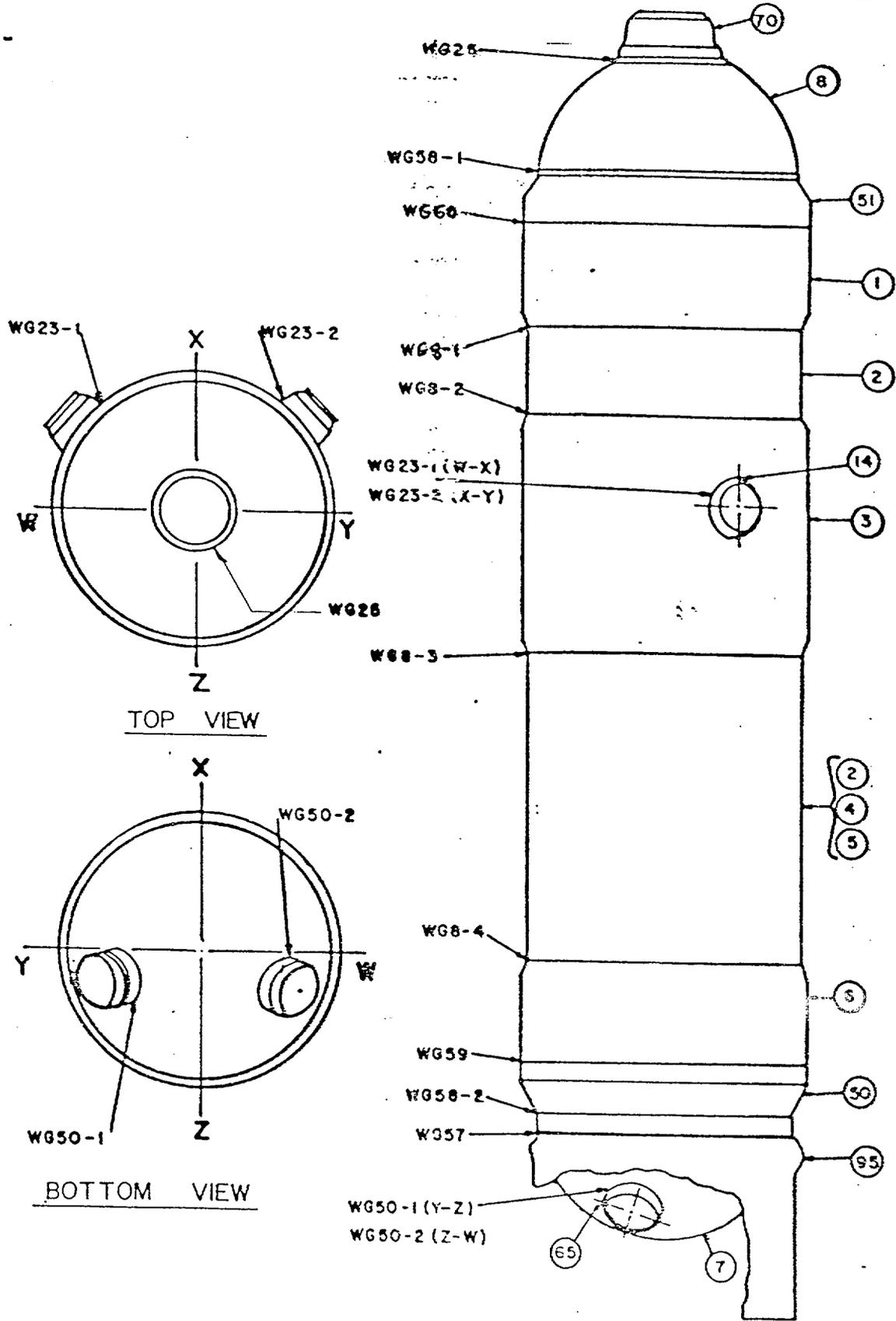
B. W. Carney Jr., Oconee Engineering provided input to Sections V and VI of this request.

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: 7-11-01

Approved By: R. Kevin Rhyme Date: 7/11/01



ALL BE PRECEDED BY "25GA" WORK IN CIRCLES	1	ILLUSTRATION OF WELDED HEADERS SHOWN AS PER PER. DRAWINGS	V-11 9-1-81 7-1-81	AJK 10-1-81 7-1-81	TMM 7-1-81 7-1-81	TITLE STEAM GENERATOR "A" WELD OUTLINE
	O	ORIGINAL	AWS 6/20/81	10-1-81 10-1-81	TMM 7-1-81	DWG NO. ISI-OCN2-003
	NO.	REVISION	DRVN DATE	RVWD DATE	APPD DATE	REV. 1

BILL OF MATERIALS							
ITEM	TYPE	SPEC.	GRADE	DESCRIPTION	CONST.	SIZE	QTY.
A	SS	SA378	TP304	PIPE	SHLS	1/2"	162
B	SS	SA182	F304	COUPLING, HALF (SV)	FOR	1/2"	6000*
C	SS	SA182	F304	CAP (SV)	FOR	1/2"	6000*
D	SS	SA182	F316	2" x 7/16" 316-1-1 DRV-TLW VALVE, 2HP-120 (SV)		2 1/2"	162
E							
F							
G							
H							
J							
K							
L							
M							
N							
P							
Q							
R							
S							
T							
U							
V							
W							
X							
Y							
Z							

NOTES:

1. WELDS TRANSFERRED FROM 2-51A-0028-02

WELD TRANSFER CHART

ORIG. WELD NUMBER	SIZE X WALL THICKNESS	REV. WELD NUMBER	ORIG. WELD NUMBER	SIZE X WALL THICKNESS	REV. WELD NUMBER
77	2 1/2" X .375				
78	2 1/2" X .375				
79	2 1/2" X .375				
84	2 1/2" X .375				
85	2 1/2" X .375				
86	2 1/2" X .562				
86A	2 1/2" X .562				
87	2 1/2" X .562				
88	2 1/2" X .562				
89	2 1/2" X .375				

- ALL WELD NOS SHALL BE PRECEDED BY 2-HP-0341
- LAST WELD NO. 94 LAST THO JOINT \* N/A
- REF. LAYOUT DRAWING Q-1435A
- REF. FLOW DIAGRAM QFD-181A-2.4
- DESIGN TEMP./DESIGN PRESS. 289° / 3848, 3120 PSIG
- VALVE HAS PIPE EXTENSIONS ON BOTH ENDS (VENDOR SUPPLIED)
- WELDS V1 & V2 ARE VENDOR WELDS THEY ARE BEING ADDED TO THE ISO FOR LOCATION TO PERFORM ADDITIONAL NDE (REF PIP-1-099-0995)

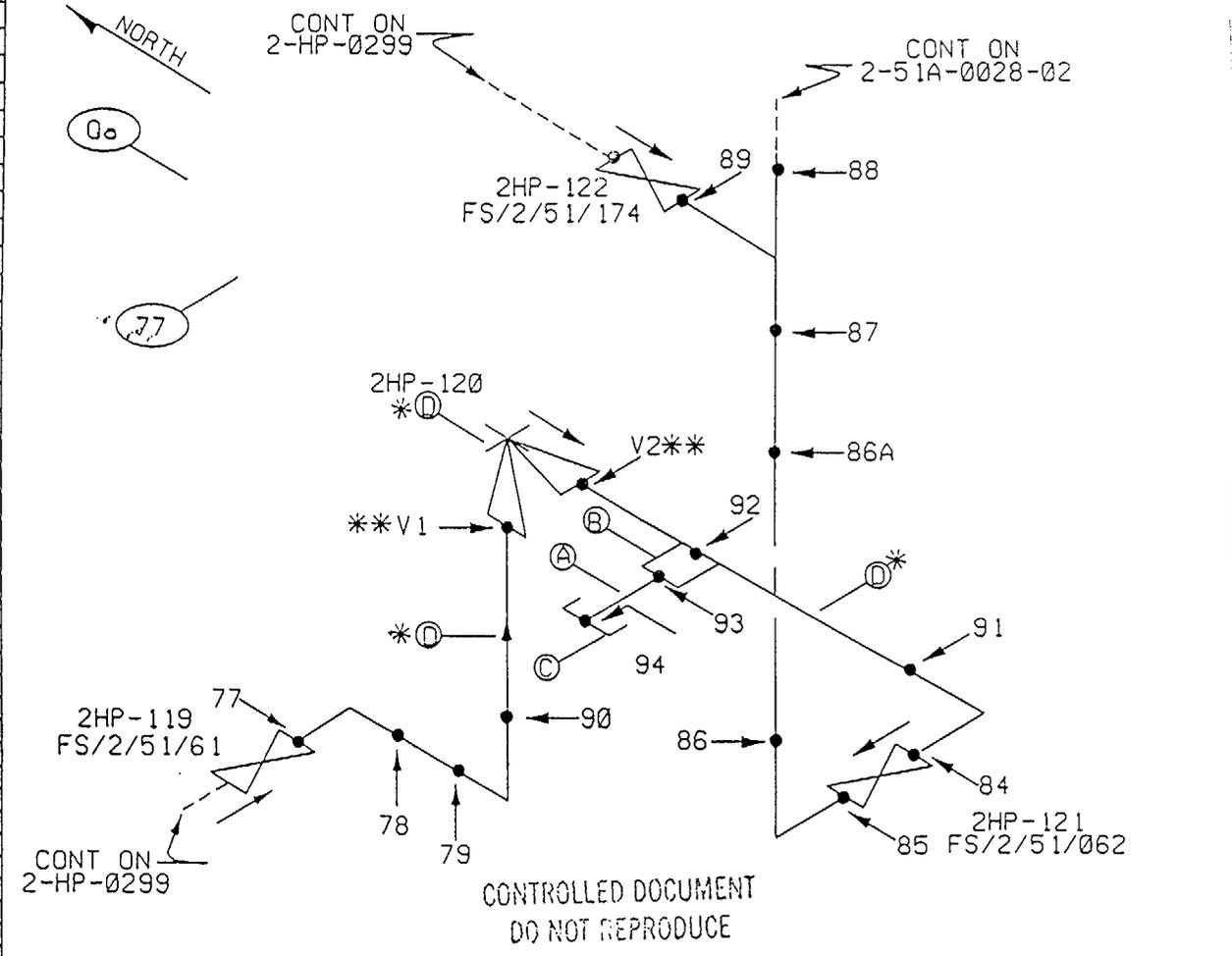
FRN:OX0098RT

\* SEE NOTE 7  
\*\*SEE NOTE 8

DUKE POWER COMPANY OCONEE NUCLEAR STATION UNIT 2			
TITLE: HIGH PRESSURE INJECTION FROM HP-P2A TO REACTOR INLET LINE "2A2"			
SYS.	HP	LINE NO.	32
CODE	B31.7	DUKE CLASS	B
QA CONDITION	1	XI CLASS	8
PIPING SPEC.	P.S. 1501.2		
LOCATION	AUX BLDG EAST PEN ROOM 407		
NO.	REVISIONS	DWG. NO.	2-HP-0341
		REV.	1

0E11490 0098156091 REV MATL IDENTIFIERS B & C IN CONFIGURATION WERE REVISED  
0E-11490 WO 98156091  
TRANSFER WELDS PER NOTE 1 ADD WELDS 90-94, MATL A-D

NO. REVISIONS



CONTROLLED DOCUMENT  
DO NOT REPRODUCE

<b>DUKE POWER COMPANY</b>				Exam Start: 1105	Form NDE-UT-2A
				<b>ULTRASONIC EXAMINATION DATA SHEET FOR PLANAR REFLECTORS</b>	
Station: Oconee	Unit: 2	Component/Weld ID: 2-SGA-WG25			Date: 5/17/01
Weld Length (in.): 152.8	Surface Condition: AS GROUND	Lo: 9.2.3	Surface Temperature: <u>72</u> ° <u>F</u>		
Examiner: Larry Mauldin <i>Larry Mauldin</i> Level: III	Scans:		Pyrometer S/N: <u>MCNDE 27008</u>		
Examiner: David Zimmerman <i>David Zimmerman</i> Level: II	45 <input type="checkbox"/> _____ dB	70 <input type="checkbox"/> _____ dB	Cal Due: <u>8/20/01</u>		
Procedure: NDE-970 Rev: 0	45T <input type="checkbox"/> _____ dB	70T <input type="checkbox"/> _____ dB	Configuration: <u>Nozzle to Head</u>		
NDE-640 Rev: 1	60 <input checked="" type="checkbox"/> <u>63</u> dB		<u>S2</u> Flow <u>S1</u>		
Calibration Sheet No: 0102095, 0102094	60T <input checked="" type="checkbox"/> <u>63</u> dB		<u>NOZZLE</u> to <u>HEAD</u>		
	Other: <u>0° @ 21</u> dB		Scan Surface: <u>OD</u>		
			Applies to NDE-680 only		
			Skew Angle:		

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
		<b>DO NOT WRITE IN THIS SPACE</b>				20%dac HMA		<b>DO NOT WRITE IN THIS SPACE</b>							
						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		0°													
NRI		60°													

Remarks: *FC 00-08 (NDE-970)			
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>13</u>
Reviewed By: <i>Gary Moss</i>	Level: <u>II</u>	Date: <u>5-19-01</u>	Authorized Inspector: <i>C. J. [Signature]</i> Date: <u>MAY 29 2001</u> Item No: B03.130.005

Attachment C  
 Request for Relief 01-011  
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<b>DUKE POWER COMPANY</b>				Exam Start: 1117	Form NDE-UT-2A	
				<b>ULTRASONIC EXAMINATION DATA SHEET FOR PLANAR REFLECTORS</b>		Exam Finish: 1130
Station: Ocone	Unit: 2	Component/Weld ID: 2-SGA-WG25			Date: 5/17/01	
Weld Length (in.): 152.8	Surface Condition: AS GROUND		Lo: 9.2.3	Surface Temperature: <u>72</u> ° <u>F</u>		
Examiner: Winfred C. Leeper <i>Winfred Leeper</i> Level: II	FC: 00-08		Scans:		Pyrometer S/N: <u>MCNDE 27008</u>	
Examiner: James L. Panel <i>James Panel</i> Level: II			45 <input checked="" type="checkbox"/> <u>55.5</u> dB	70 <input type="checkbox"/> _____ dB	Cal Due: <u>8/20/01</u>	
Procedure: NDE-970 Rev: 0			45T <input checked="" type="checkbox"/> <u>55.5</u> dB	70T <input type="checkbox"/> _____ dB	Configuration: <u>CIRC. WELD</u>	
Calibration Sheet No: 0102096			60 <input type="checkbox"/> _____ dB	S2 _____ Flow _____ S1 _____		
			60T <input type="checkbox"/> _____ dB	NOZZLE to HEAD		
			Other: _____ dB	Scan Surface: OD		
			Applies to NDE-680 only			
			Skew Angle:			

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
		<b>DO NOT WRITE IN THIS SPACE</b>				20%dac HMA		<b>DO NOT WRITE IN THIS SPACE</b>							
						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	45°														

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>2</u> of <u>13</u>
Reviewed By: <i>Ray Moss</i>	Level: <u>B</u>	Date: <u>5-19-01</u>	Authorized Inspector: <i>[Signature]</i>	Date: <u>MAY 29 2001</u>	Item No: B03.130.005

Attachment C  
 Request for Relief 01-011  
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**DUKE POWER COMPANY  
ISI LIMITATION REPORT**

FORM NDE-UT-4

Revision 1

Component/Weld ID: 2-SGA-WG25

Item No: B03.130.005

Remarks:

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   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. Z...*                      Level: II                      Date: 05/17/01                      Sketch(s) attached  yes  no                      Sheet 3 of 13

Reviewed By: *Ray M*                      Date: 5/19/01                      Authorized Inspector: *[Signature]*                      Date: MAY 29 2001

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<b>DUKE POWER COMPANY</b>		NDE-91-1
<b>Limited Examination Coverage Worksheet</b>		Revision 0
<b>Examination Volume/Area Defined</b>		
<input 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. 18 SQ. IN.		18 SQ. IN. X 152.8 IN = 2750.4 CU. IN.

Coverage Calculations							
Scan #	Angle	Beam Direction	Area Examined (sq.in.)	Length Examined (in.)	Volume Examined (cu.in.)	Volume Required (cu.in.)	Percent Coverage
1	0	NA	15.7	152.8	2399	2750.4	87.22
2	45	2	16.1	152.8	2460.1	24750.4	9.94
3	45	1	3.4	152.8	519.5	2750.4	18.89
4	60	2	16.9	152.8	2582.3	2750.4	93.89
5	60	1	1.0	152.8	15.3	2750.4	0.56
6	45	CW	8.4	152.8	1283.5	2750.4	46.67
7	45	CCW	8.4	152.8	1283.5	2750.4	46.67
8	60	CW	8.4	152.8	1283.5	2750.4	46.67
9	60	CCW	8.4	152.8	1283.5	2750.4	46.67
					13247.7	24753.6	53.52

		Item No: B03.130.005
Prepared By: <i>Larry Mauldin</i>	Level: <i>III</i>	Date: <i>5-17-01</i>
Reviewed By: <i>Gay Moss</i>	Level: <i>II</i>	Date: <i>5-19-01</i>

ANII *62* Date *5/24*  
 HSB&I Co.

50F13

<b>DUKE POWER COMPANY</b> Limited Examination Coverage Worksheet	NDE-91-1
	Revision 0

Examination Volume/Area Defined				
<input checked="" 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
SEE EXAM AREA DRWG 73.7 SQ. IN	73.7 SQ. IN X 152.8 IN. = 11261.36 CU. IN.

Coverage Calculations							
Scan #	Angle	Beam Direction	Area Examined (sq.in.)	Length Examined (in.)	Volume Examined (cu.in.)	Volume Required (cu.in.)	Percent Coverage
1	0	NA	40.6	152.8	6203.7	11261.4	55.09
2	45	1/2	48.9	152.8	7471.9	11261.4	66.35
3	60	1/2	53	152.8	8098.4	11261.4	71.91
4	45/60	CW	39.2	152.8	5989.8	11261.4	53.19
5	45/60	CCW	39.2	152.8	5989.8	11261.4	53.19
					33756.6	56307	59.95

ANII *10/24* Date *5/24*  
HSBI&I Co.

Item No: B03.130.005

Prepared By: <i>Randy Mauldin</i>	Level: <i>III</i>	Date: <i>5-17-01</i>
Reviewed By: <i>Randy Moss</i>	Level: <i>II</i>	Date: <i>5-19-01</i>

6 of 13

<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			
<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
BASE					33753.6	56307	59.95
WELD					13247.7	24753.6	53.52
					47001.3	81060.6	57.98

ANII ~~6/2~~ Date ~~5/22~~  
 HSBI&I Co.

Item No: B03.130.005

Prepared By: <i>Larry Mauldin</i>	Level: <i>III</i>	Date: <i>5-17-01</i>
Reviewed By: <i>Larry Moss</i>	Level: <i>II</i>	Date: <i>5-20-01</i>

OCONEE NOZZLE TO UPPER HEAD (GENERATOR)

EXAM AREAS:

BASE MATERIAL:

$ABC = \pi R^2 \div 4 = \pi 4^2 \div 4 = 12.566 \text{ sq. in.}$

$BCDF = 2.2' \times 4.0' = 8.8 \text{ sq. in.}$

$BEF = \frac{2.2 \times .5}{2} = .55 \text{ sq. in.}$

$DFG = \frac{6.3 \times 4}{2} = 12.6 \text{ sq. in.}$

$HIJK = \frac{8}{2} (4.0 + 5.8) = 39.2 \text{ sq. in.}$

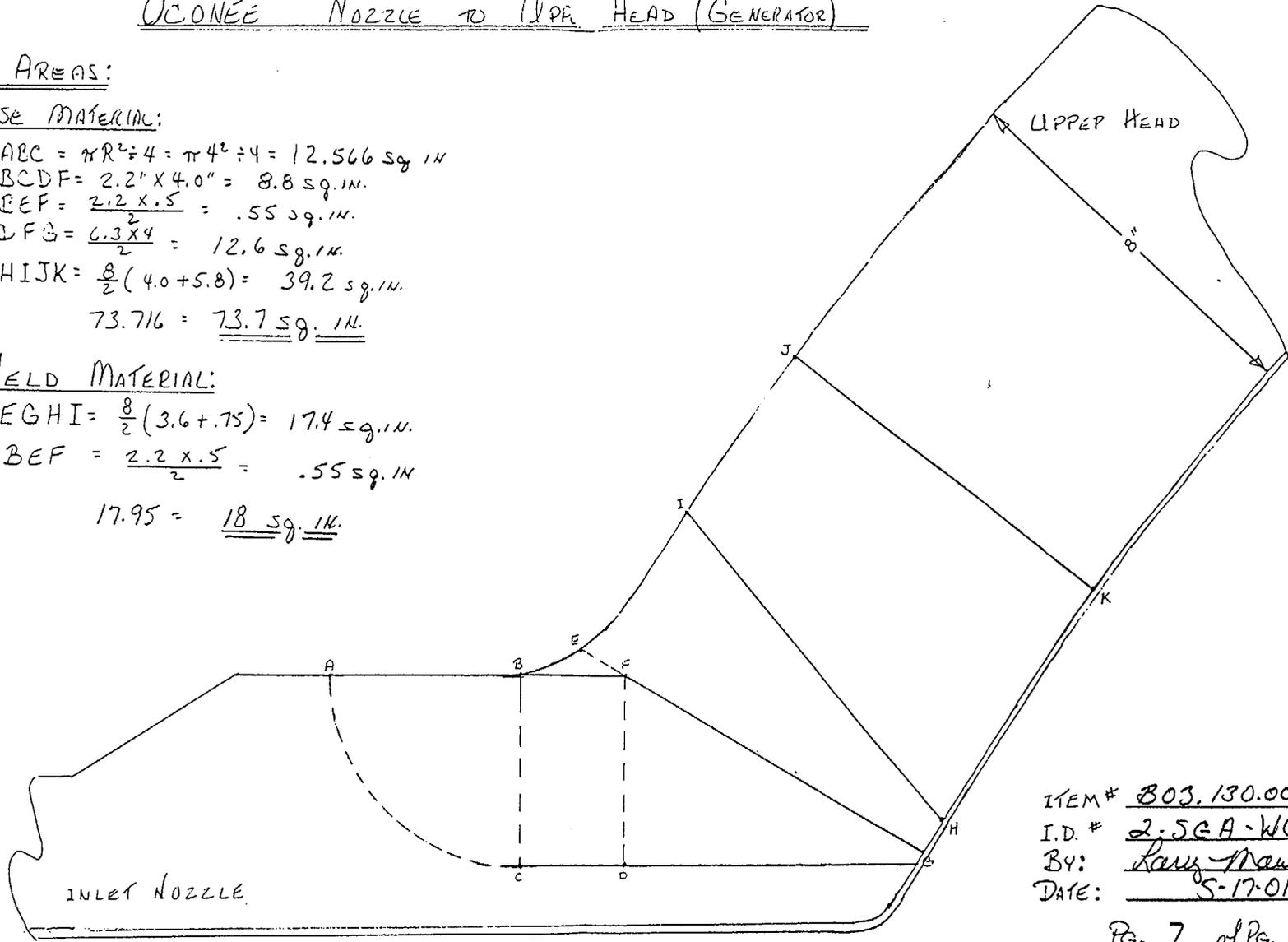
$73.716 = \underline{\underline{73.7 \text{ sq. in.}}}$

WELD MATERIAL:

$EGHI = \frac{8}{2} (3.6 + .75) = 17.4 \text{ sq. in.}$

$BEF = \frac{2.2 \times .5}{2} = .55 \text{ sq. in.}$

$17.95 = \underline{\underline{18 \text{ sq. in.}}}$



ITEM# 803.130.005  
I.D.# 2-JCA-WG25  
BY: Kary Mauldin  
DATE: 5-17-01

Pg. 7 of Pg. 13

ANII  Date 5/24  
HSBI&I Co.

CONE NOZZLE TO WELDED HEAD (GENERATOR)

0° SCAN COVERAGE

BASE MATERIAL:

$ABCE = \frac{8}{2} (4.0 + 5.8) = 39.2 \text{ sq. in.}$

$FGH = \frac{4.0 \times 7.7}{2} = 1.4 \text{ sq. in.}$

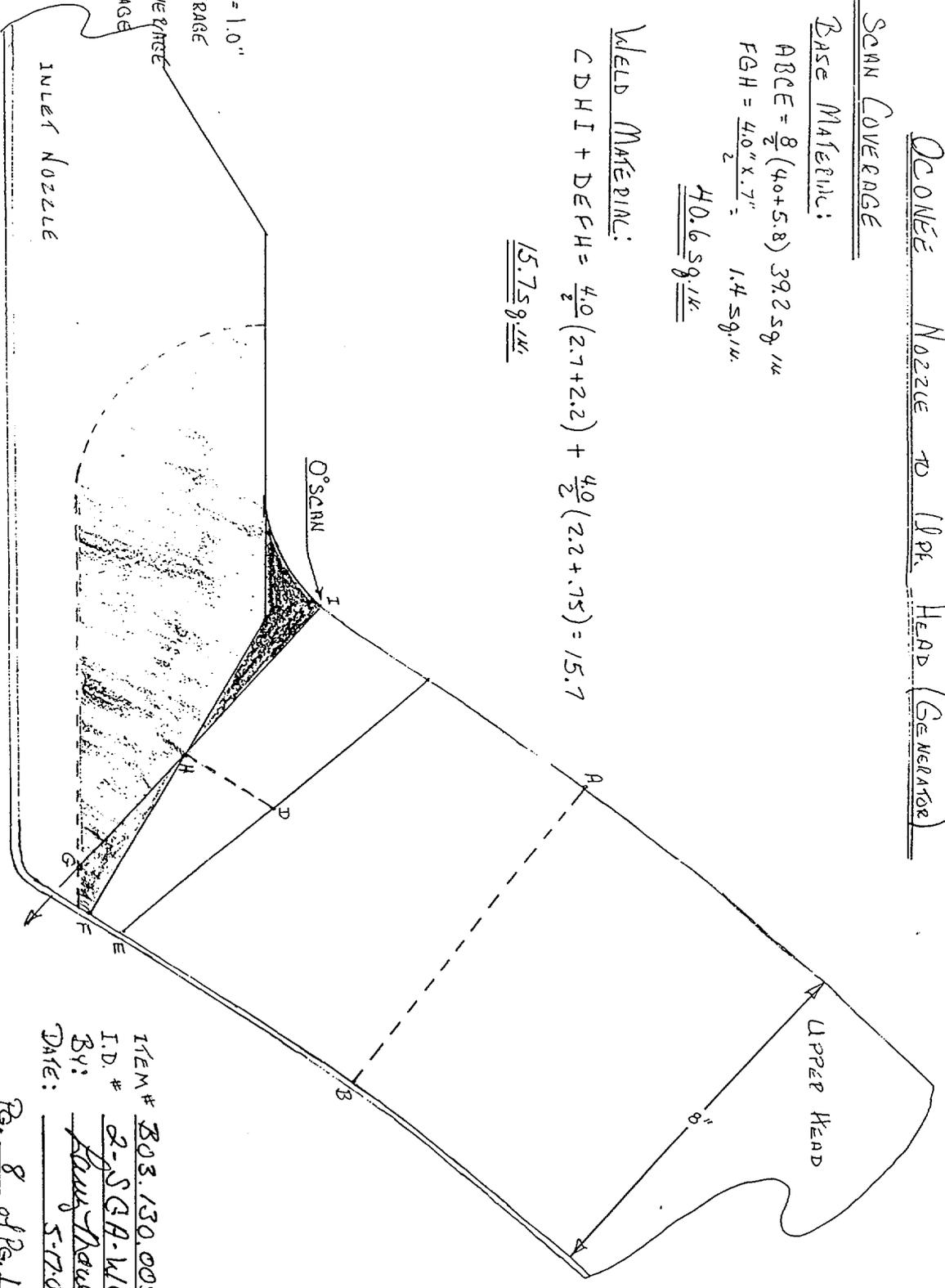
40.6 sq. in.

WELD MATERIAL:

$CDHI + DEFH = \frac{4.0}{2} (2.7 + 2.2) + \frac{4.0}{2} (2.2 + .75) = 15.7$

15.75 sq. in.

- Scale = 1/2" = 1.0"
- = Full Coverage
  - = Partial Coverage
  - = No Coverage



ANII Date 5/14  
HSB&I Co.

ITEM # B03.130.005  
I.D. # 2-SGA-11035  
By: Paul Naudie  
Date: 5-7-01  
Pg. 8 of Pg. 13

45° Scans (Axial)  
CONE Nozzle to Updr. Head (Generator)

BASE MATERIAL

S1 to S2

$$ACDF = \frac{\pi}{2} (4.0 + 5.8) = 39.2 \text{ sq. in.}$$

$$GHI = \frac{6.7 \times 2.9}{2} = 9.715 \text{ sq. in.}$$

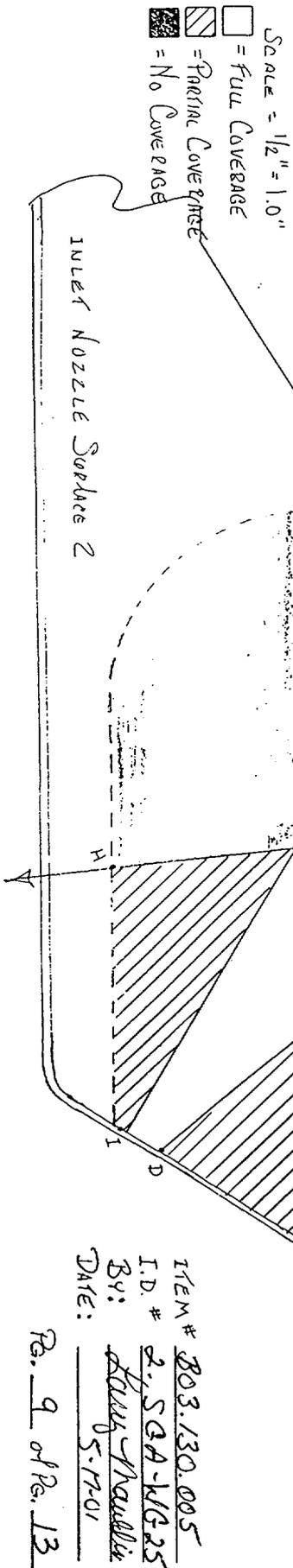
$$48.915 = \underline{\underline{48.9 \text{ sq. in.}}}$$

S2 to S1

$$AJFE = \frac{1.7}{2} (4.0 + 4.4) = 7.14 \text{ sq. in.}$$

$$BEJ = \frac{4.4 \times 4.1}{2} = 9.02 \text{ sq. in.}$$

$$16.16 = \underline{\underline{16.2 \text{ sq. in.}}}$$



ITEM # 803.130.005  
I.D. # 2. SGA-WG25  
BY: Tommy Maddix  
DATE: 5-7-01  
Pg. 9 of Re. 13

ANII Date: 5-24  
HSBI&I Co.

OCONEE NOZZLE TO U.P. HEAD (GENERATOR)

45° SCANS (AXIAL)

WELD MATERIAL:

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

ABEG  $\frac{1.3}{2}(1.8+3.1) = 3.185 \text{ sq. in.}$

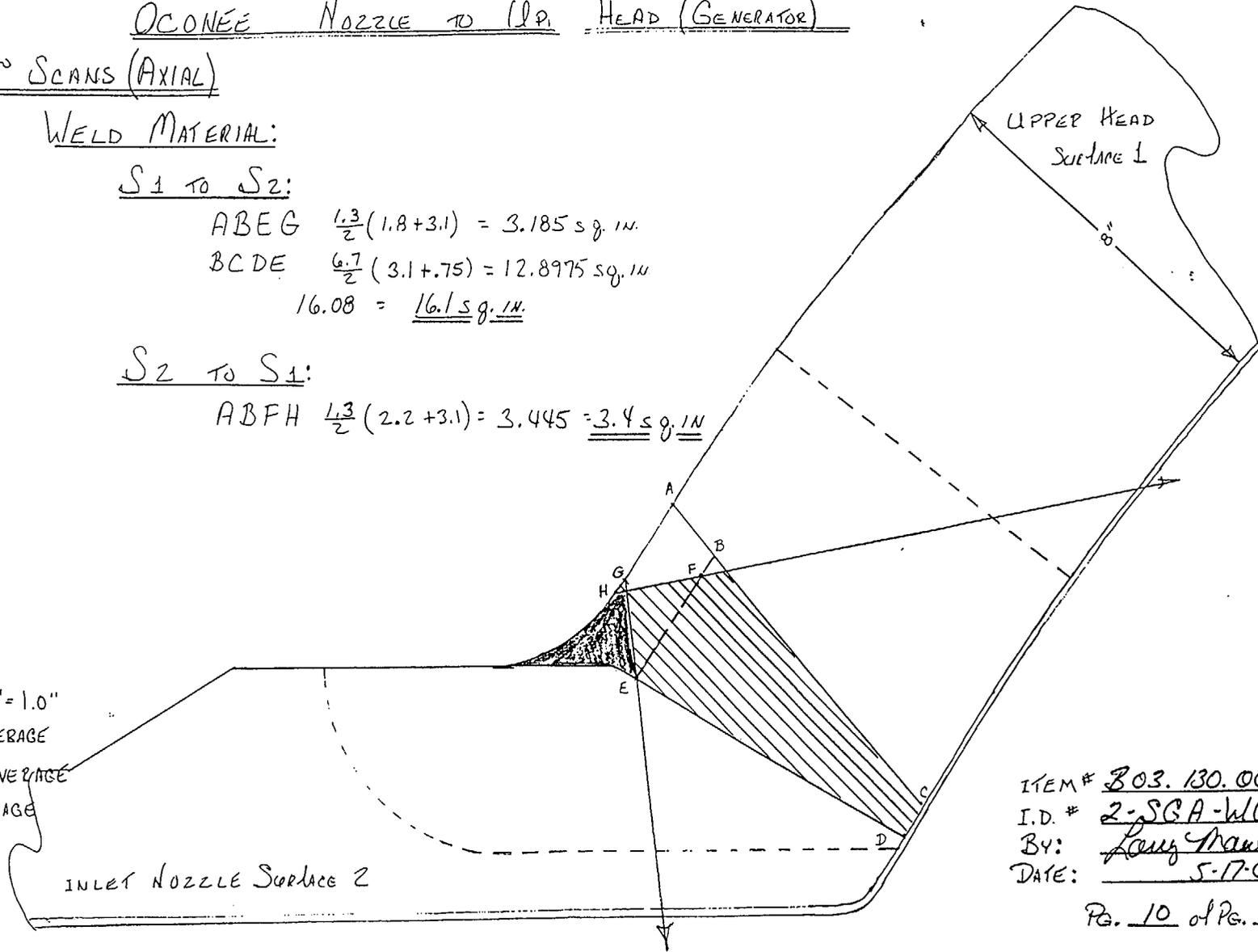
BCDE  $\frac{6.7}{2}(3.1+7.5) = 12.8975 \text{ sq. in.}$

16.08 = 16.1 sq. in.

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

ABFH  $\frac{1.3}{2}(2.2+3.1) = 3.445 = \underline{\underline{3.4 \text{ sq. in.}}}$

- SCALE = 1/2" = 1.0"
- = FULL COVERAGE
  - = PARTIAL COVERAGE
  - = NO COVERAGE



ITEM # 303.130.005  
I.D. # 2-SCA-WB-25  
BY: Larry Mauldin  
DATE: 5-17-01

Pg. 10 of Pg. 13

OCONEE NOZZLE TO UPPER HEAD (GENERATOR)

60° SCANS (AXIAL)

BASE MATERIAL:

S1 TO S2:

$$ADEG = \frac{8}{2}(4.0 + 5.8) = 39.2 \text{ sq. in.}$$

$$HIJ = \frac{7.1 \times 3.9}{2} = 13.845 \text{ sq. in.}$$

$$\underline{\underline{53 \text{ sq. in.}}}$$

S2 TO S1:

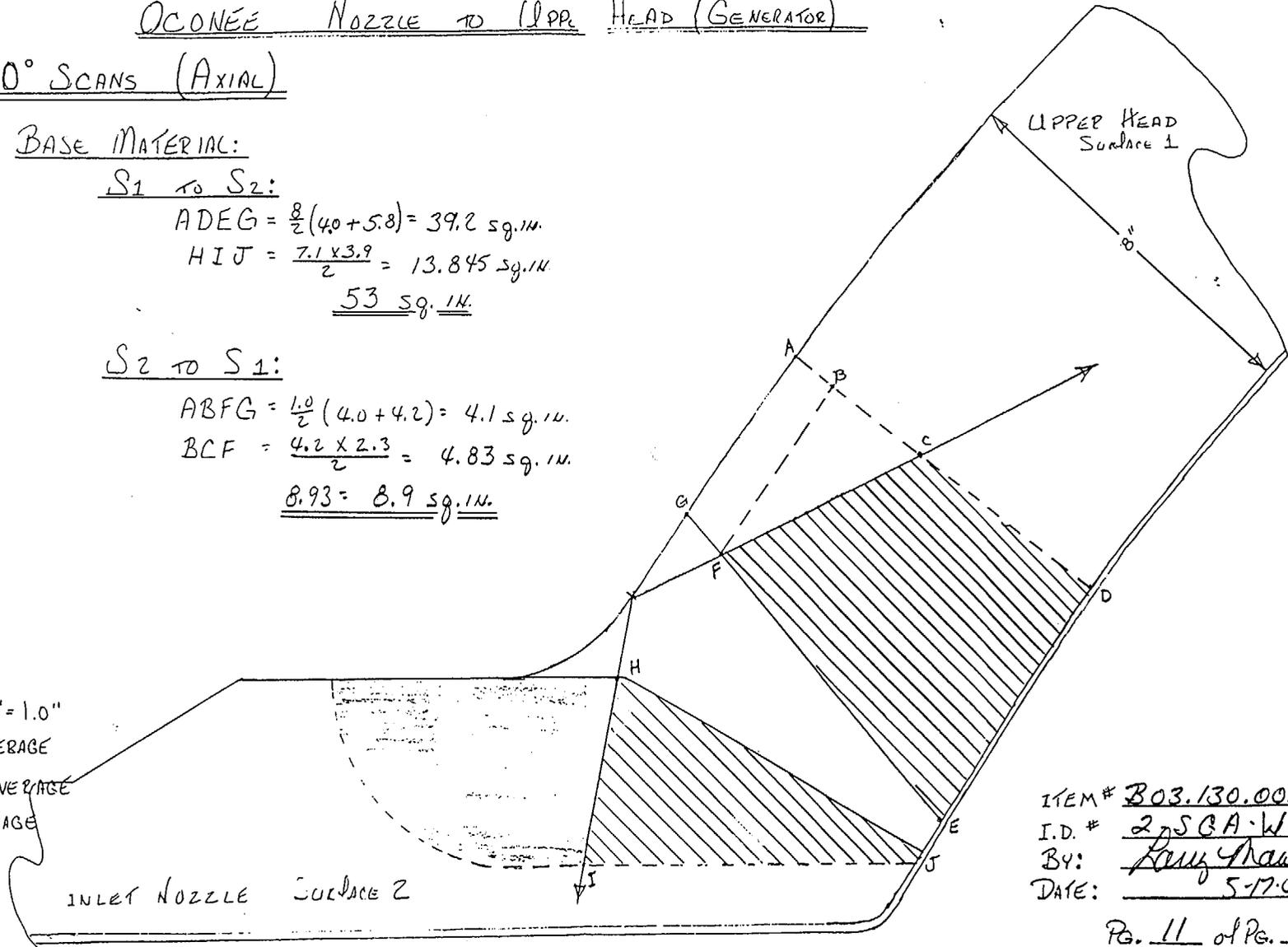
$$ABFG = \frac{4.0}{2}(4.0 + 4.2) = 4.1 \text{ sq. in.}$$

$$BCF = \frac{4.2 \times 2.3}{2} = 4.83 \text{ sq. in.}$$

$$\underline{\underline{8.93 = 8.9 \text{ sq. in.}}}$$

SCALE = 1/2" = 1.0"

-  = FULL COVERAGE
-  = PARTIAL COVERAGE
-  = NO COVERAGE



ITEM # B03.130.005  
I.D. # 275BA-W025  
BY: Ray Madhu  
DATE: 5-17-01

Pg. 11 of Pg. 13

OCONEE NOZZLE TO UPI HEAD (GENERATOR)

6.0° SCANS (AXIAL)

WELD MATERIAL:

S1 TO L2:

$ABCD = \frac{9}{2}(2.0+3.2) = 2.34 \text{ sq. in.}$

$BDEF = \frac{7.2}{2}(3.3+.75) = 14.58 \text{ sq. in.}$

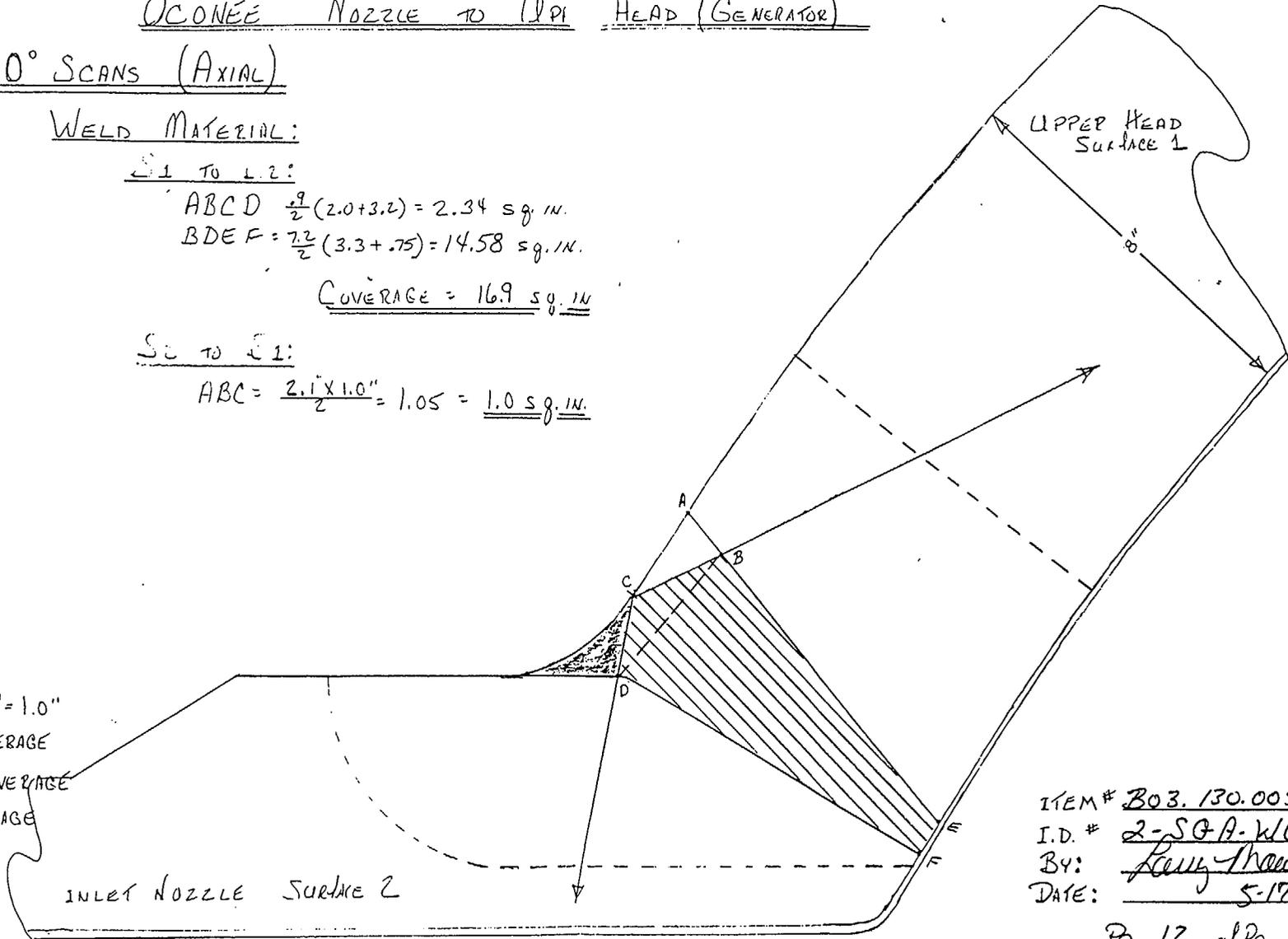
COVERAGE = 16.9 sq. in.

S2 TO S1:

$ABC = \frac{2.1 \times 1.0}{2} = 1.05 = \underline{1.0 \text{ sq. in.}}$

SCALE = 1/2" = 1.0"

- = FULL COVERAGE
- = PARTIAL COVERAGE
- = NO COVERAGE



ITEM# BO3.130.005  
I.D.# 2-SGA-WG25  
BY: Paul Thacker  
DATE: 5-17-01

Pg. 12 of Pg. 13

ANII at Date 5/25  
HSBI&I Co.

OCONEE Nozzle to Upr Head (Generator)

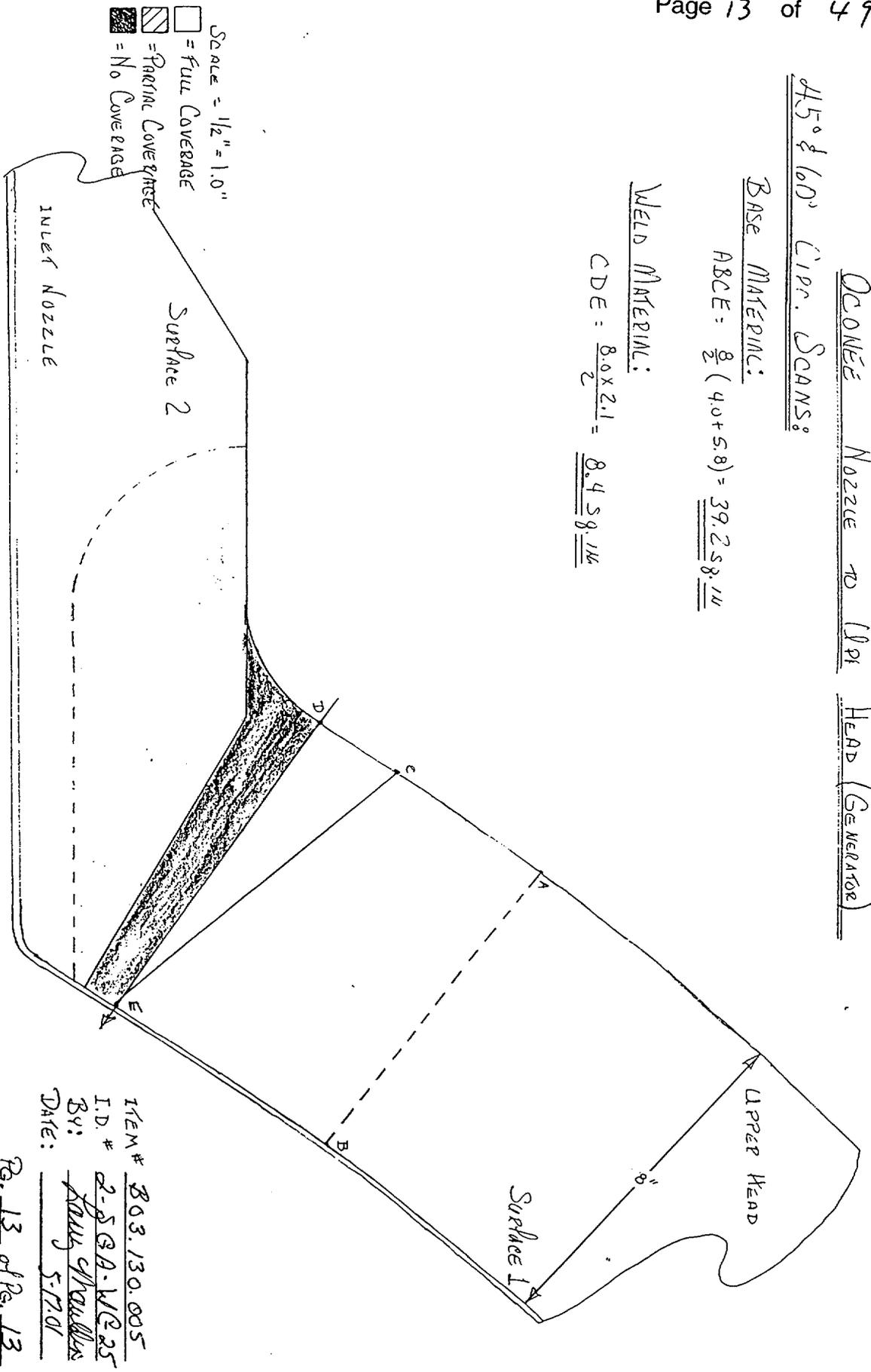
45° & 60° Circ. Scans:

BASE MATERIAL:

$$ABCE = \frac{8}{2} (40 + 58) = \underline{\underline{39.258 \text{ in}}}$$

WELD MATERIAL:

$$CDE = \frac{80 \times 2.1}{2} = \underline{\underline{8.458 \text{ in}}}$$



ANIL [Signature] Date: 5/17/01  
 HSBIRI Co.

<b>DUKE POWER COMPANY</b>										Exam Start: 1110		Form NDE-UT-2A	
<b>ULTRASONIC EXAMINATION DATA SHEET FOR PLANAR REFLECTORS</b>										Exam Finish: 1125		Revision 4	
Station: Oconee			Unit: 2		Component/Weld ID: 2-SGA-WG25					Date: 5/17/01			
Weld Length (in.): 152.8			Surface Condition: AS GROUND			Lo: 9.2.3		Surface Temperature: <u>72</u> ° F					
Examiner: David Zimmerman <i>David Zimmerman</i> Level: II			FC: N/A			Scans:			Pyrometer S/N: <u>MCNDE 27008</u>				
Examiner: Larry Mauldin <i>Larry Mauldin</i> Level: III						45 <input type="checkbox"/> _____ dB 70 <input checked="" type="checkbox"/> <u>70.5</u> dB			Cal Due: <u>8/20/01</u>				
Procedure: NDE-680 Rev: 2						45T <input type="checkbox"/> _____ dB 70T <input type="checkbox"/> _____ dB			Configuration: <u>INNER RADIUS</u>				
Calibration Sheet No: 0102092			60 <input checked="" type="checkbox"/> <u>57</u> dB			60T <input type="checkbox"/> _____ dB			S2 Flow S1				
			Other: _____ dB						NOZZLE to HEAD Scan Surface: OD				
									Applies to NDE-680 only Skew Angle: <u>22.5°</u>				

IND #	Max % Ref	Mp Max	W Max	L Max	L1	L2	W1	Mp1	W2	Mp2	Beam Dir.	Exam Surf.	Scan	Damps
					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°													

Remarks:													
Limitations: (see NDE-UT-4) <input type="checkbox"/> 90% or greater coverage obtained: yes <input checked="" type="checkbox"/> no <input type="checkbox"/>										Sheet <u>1</u> of <u>4</u>			
Reviewed By: <i>Larry Moss</i>			Level: <u>IB</u>		Date: <u>5-19-01</u>		Authorized Inspector: <i>[Signature]</i>			Date: <u>MAY 29 2001</u>		Item No: B03.140.005	

**DUKE POWER COMPANY**

**ULTRASONIC EXAMINATION DATA SHEET FOR PLANAR REFLECTORS**

Exam Start: 1128      Form NDE-UT-2A  
Exam Finish: 1145      Revision 4

Station: Ocone      Unit: 2      Component/Weld ID: 2-SGA-WG25      Date: 5/17/01

Weld Length (in.): 152.8      Surface Condition: AS GROUND      Lo: 9.2.3      Surface Temperature: 72 ° F

Examiner: James L. Panel      Level: II      Scans:      Pyrometer S/N: MCNDE 27008  
Cal Due: 8/20/01

Examiner: Winfred C. Leeper      Level: II      45  \_\_\_\_\_ dB      70  70.5 dB      Configuration: INNER RADIUS

Procedure: NDE-680      Rev: 2      FC:      45T  \_\_\_\_\_ dB      70T  \_\_\_\_\_ dB      S2      Flow      S1

Calibration Sheet No:      60  \_\_\_\_\_ dB      NOZZLE      to      HEAD

0102093      60T  \_\_\_\_\_ dB      Scan Surface: OD

Other: \_\_\_\_\_ dB      **Applies to NDE-680 only**

Skew Angle: \_\_\_\_\_

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	
		<b>DO NOT WRITE IN THIS SPACE</b>				20%dac HMA		<b>DO NOT WRITE IN THIS SPACE</b>								
						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		70°														

Remarks:

Limitations: (see NDE-UT-4)  90% or greater coverage obtained: yes  no       Sheet 2 of 4

Reviewed By: Gay Moss      Level: B      Date: 5-19-01      Authorized Inspector: [Signature]      Date: MAY 29 2001      Item No: B03.140.005

<b>DUKE POWER COMPANY</b>						NDE-91-1	
<b>Limited Examination Coverage Worksheet</b>						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
Area Calculation				Volume Calculation			
SEE DRWG FOR CALCULATIONS 4.7 SQ. IN				4.7 SQ. IN. X 152.8 IN. = 718.16 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	60/70	CW	3.3	152.8	504.24	718.16	70.21
2	60/70	CCW	3.3	152.8	504.24	718.16	70.21
					1008.48	1436.32	70.21

			Item No:	B03.140.005	
Prepared By:	<i>Paula Maddala</i>	Level:	<i>III</i>	Date:	<i>5-17-01</i>
Reviewed By:	<i>Gay Moss</i>	Level:	<i>D</i>	Date:	<i>5-19-01</i>

ANII *10* Date *5/29*  
 HSBI&I Co.

INLET NOZZLE TO UPPER HEAD

INNER RADIUS INSPECTION AREA

A-B-CD+CDGH  $ABCD (\pi \times 1.0^2) - (\pi \times .5^2) \times .18 = .424 \text{ sq. in.}$   
(65° = 18% OF A CIRCLE)

$CDGH \frac{.5}{2} (8.4 + 8.6) = 4.25 \text{ sq. in.}$

TOTAL AREA = 4.674 = 4.7 sq. in.

I.D.# Z.SGA-WG25  
ITEM# B03.140.005  
BY: Larry Moulden  
DATE: 5-17-01

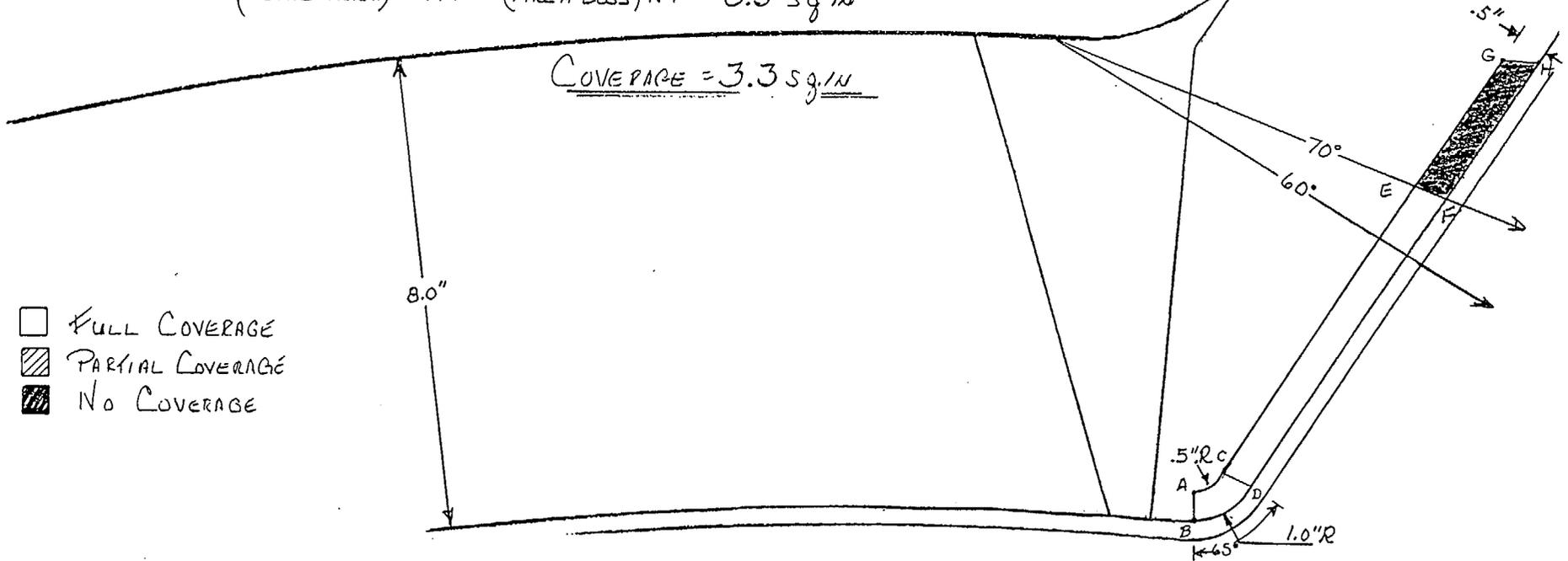
INSPECTED AREA

(Area of Loss)  $EFGH \frac{.5}{2} (2.6 + 2.8) = 1.35 = 1.4 \text{ sq. in.}$

(TOTAL AREA)  $4.7 - (\text{Area Loss}) 1.4 = 3.3 \text{ sq. in.}$

COVERAGE = 3.3 sq. in.

- FULL COVERAGE
- PARTIAL COVERAGE
- NO COVERAGE



ANII ll Date 5/17/01  
HSBI&I Co.

## DUKE POWER COMPANY

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

Station: <u>OCONEE</u>	Unit: <u>Z</u>	Component/Weld ID: <u>256A-WLB-1</u>	Date: <u>5-7-01</u>
Weld Length (in.): <u>433.4</u>	Surface Condition: <u>GROUND</u>	<u>L 9.2.1</u>	Exam Start: <u>0930</u> Exam Finish: <u>1030</u>

Procedure No: <u>NDE-620</u>  Revision: <u>8</u>  FC <u>00-07</u>	Scans 70° ___ dB Zone I    60° <u>75</u> dB Zone II  60° <u>75</u> dB Zone III Axial  60° <u>75</u> dB Zone III Circ.	Configuration  <u>Circ.</u>  Scan Surface: OD	Surface Temp. <u>75 ° F</u>  Pyrometer s/n: <u>MCJDE-27008</u>  Cal. Due Date: <u>8/20/01</u>	Calibration Sheet No: <u>0102064</u> <u>0102065</u>
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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>									

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

Examiner: Sam Mauldin    Level: III    Date: 5-7-01    Examiner: David K. B.    Level: II    Date: 05/07/01    Item No: C01.010.001

Reviewed by: Gay Moss    Level: II    Date: 5-12-01    Authorized Inspector: S. Hester    Date: 5-16-01

## DUKE POWER COMPANY

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

Station: <u>OCOJEE</u>	Unit: <u>Z</u>	Component/Weld ID: <u>Z-SKA-WL8-1</u>	Date: <u>5-7-01</u>
Weld Length (in.): <u>433.4</u>	Surface Condition: <u>GROUND</u>	Lo <u>9.2.1</u>	Exam Start: <u>0930</u> Exam Finish: <u>1030</u>

Procedure No: <u>NDE-620</u>  Revision: <u>8</u>  FC <u>00-07</u>	Scans 70° <u>57</u> dB Zone I 60° ___ dB Zone II  60° ___ dB Zone III Axial  60° ___ dB Zone III Circ.	Configuration  <u>Circ.</u>  Scan Surface: OD	Surface Temp. <u>75 °F</u> Pyrometer s/n: <u>MCJDE-27008</u> Cal. Due Date: <u>8/20/01</u>	Calibration Sheet No: <u>0102066</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>70°</u>									

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

Examiner: James E. Lane Level: II Date: 5/7/01 Examiner: [Signature] Level: II Date: 5/7/01 Item No: COI.010.001

Reviewed by: Ray Moss Level: II Date: 5-12-01 Authorized Inspector: [Signature] Date: 5-16-01

**DUKE POWER COMPANY  
ISI LIMITATION REPORT**

FORM NDE-UT-4

Revision 1

Component/Weld ID: 2-SGA-WG8-1	Item No: C01.010.001	Remarks:
<input type="checkbox"/> NO SCAN                      SURFACE                      BEAM DIRECTION <input checked="" type="checkbox"/> LIMITED SCAN <input checked="" type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> cw <input type="checkbox"/> ccw FROM L <u>  N/A  </u> to L <u>  N/A  </u> INCHES FROM WO <u>  0.0  </u> to <u>  0.7"  </u> ANGLE: <input type="checkbox"/> 0 <input type="checkbox"/> 45 <input type="checkbox"/> 60 <input type="checkbox"/> Other <u>  70°RL  </u> FROM <u>  0  </u> DEG to <u>  360  </u> DEG		DUE TO TAPER CONFIGURATION
<input type="checkbox"/> NO SCAN                      SURFACE                      BEAM DIRECTION <input checked="" type="checkbox"/> LIMITED SCAN <input checked="" type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input checked="" type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> cw <input type="checkbox"/> ccw FROM L <u>  N/A  </u> to L <u>  N/A  </u> INCHES FROM WO <u>  0.0  </u> to <u>  1.0"  </u> ANGLE: <input type="checkbox"/> 0 <input type="checkbox"/> 45 <input type="checkbox"/> 60 <input type="checkbox"/> Other <u>  60°RL  </u> FROM <u>      </u> DEG to <u>  360  </u> DEG		
<input type="checkbox"/> NO SCAN                      SURFACE                      BEAM DIRECTION <input checked="" type="checkbox"/> LIMITED SCAN <input checked="" type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input checked="" type="checkbox"/> cw <input checked="" type="checkbox"/> ccw FROM L <u>  N/A  </u> to L <u>  N/A  </u> INCHES FROM WO <u>  0.0  </u> to <u>  0.75"  </u> ANGLE: <input type="checkbox"/> 0 <input type="checkbox"/> 45 <input type="checkbox"/> 60 <input type="checkbox"/> Other <u>  70°RL  </u> FROM <u>  0  </u> DEG to <u>  360  </u> DEG		
<input type="checkbox"/> NO SCAN                      SURFACE                      BEAM DIRECTION <input checked="" type="checkbox"/> LIMITED SCAN <input checked="" type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input checked="" type="checkbox"/> cw <input checked="" type="checkbox"/> ccw FROM L <u>  N/A  </u> to L <u>  N/A  </u> INCHES FROM WO <u>  0.0  </u> to <u>  1.1"  </u> ANGLE: <input type="checkbox"/> 0 <input type="checkbox"/> 45 <input type="checkbox"/> 60 <input type="checkbox"/> Other <u>  60°RL  </u> FROM <u>  0  </u> DEG to <u>  360  </u> DEG		

Prepared By: <i>Perry Mawdsley</i>	Level: <u>  III  </u>	Date: <u>  5-7-01  </u>	Sketch(s) attached <input checked="" type="checkbox"/> yes <input type="checkbox"/> no	Sheet <u>  3  </u> of <u>  8  </u>
Reviewed By: <i>Gay Moss</i>	Date: <u>  5-12-01  </u>	Authorized Inspector: <i>S. [Signature]</i>	Date: <u>  5-16-01  </u>	

<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	
SEE DRWGS ZONE 1- 2.7 SQ. IN. ZONES 2 & 3 - 8.6 SQ. IN	ZONE 1 2.7 SQ. IN. X 433.5 IN = 1170.5 CU. IN. ZONES 2 & 3 8.6 SQ. IN X 433.5 IN. = 3728.1 CU. IN.	

Coverage Calculations							
Scan #	Angle	Beam Direction	Area Examined (sq.in.)	Length Examined (in.)	Volume Examined (cu.in.)	Volume Required (cu.in.)	Percent Coverage
1	70°	1	2.2	433.5	953.7	1170.5	81.48
2	70°	2	1.6	433.5	693.6	1170.5	59.26
3	70°	CW	1.0	433.5	433.5	1170.5	37.04
4	70°	CCW	1.0	433.5	433.5	1170.5	37.04
5	60°	1	8.3	433.5	3598.1	3728.1	96.51
6	60°	2	7.9	433.5	3424.7	3728.1	91.86
7	60°	CW	.5	433.5	216.8	3728.1	5.82
8	60°	CCW	.5	433.5	216.8	3728.1	5.82
					9970.7	19594.4	50.89

		Item No: C01.010.001
Prepared By: <i>Larry Mauldin</i>	Level: <i>III</i>	Date: <i>5-7-01</i>
Reviewed By: <i>Ray Moss</i>	Level: <i>B</i>	Date: <i>5-12-01</i>

4-05-8

ANII ~~SP~~ Date *5/16*  
 HSBI&I Co.



OCONEE STEAM GENERATOR  
SHELL TO SHELL

COVERAGE

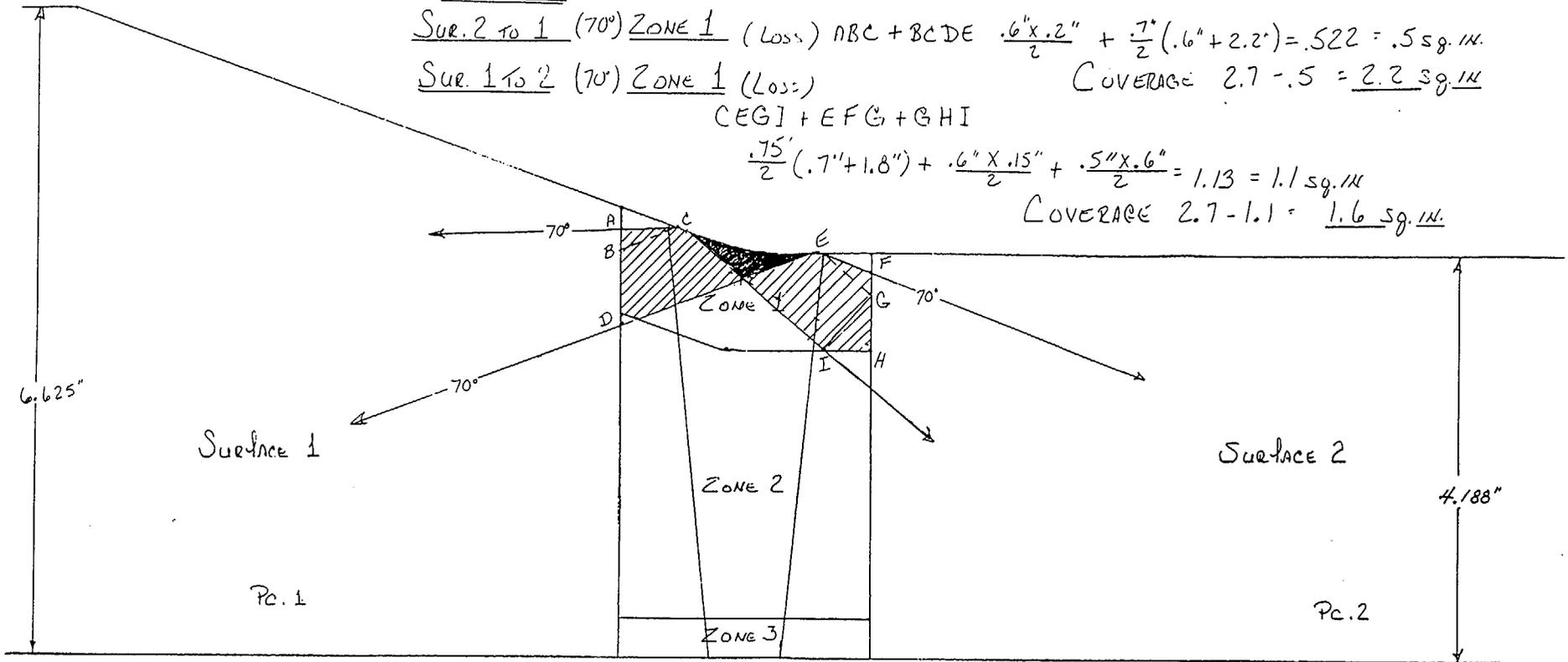
SUR. 2 TO 1 (70°) ZONE 1 (Loss)  $ABC + BCDE = \frac{.6" \times .2"}{2} + \frac{.7"}{2} (.6" + 2.2") = .522 = .5 \text{ sq. in.}$

SUR. 1 TO 2 (70°) ZONE 1 (Loss)  $CEGI + EFG + GHI$  COVERAGE  $2.7 - .5 = 2.2 \text{ sq. in.}$

$CEGI + EFG + GHI$

$\frac{.75'}{2} (.7" + 1.8") + \frac{.6" \times .15"}{2} + \frac{.5" \times .6"}{2} = 1.13 = 1.1 \text{ sq. in.}$

COVERAGE  $2.7 - 1.1 = 1.6 \text{ sq. in.}$



- AREA SCANNED
- AREA NOT SCANNED
- POTENTIAL SCAN

I.D.# 25GA-WG8-1  
ITEM# CO1.010.001  
By: Louis Mauldin  
DATE 5-17-01  
Pg. 6 of 8

ANII ~~5/16~~ Date 5/16  
HSBI&I Co.

OCONEE STEAM GENERATOR  
SHELL TO SHELL

COVERAGE

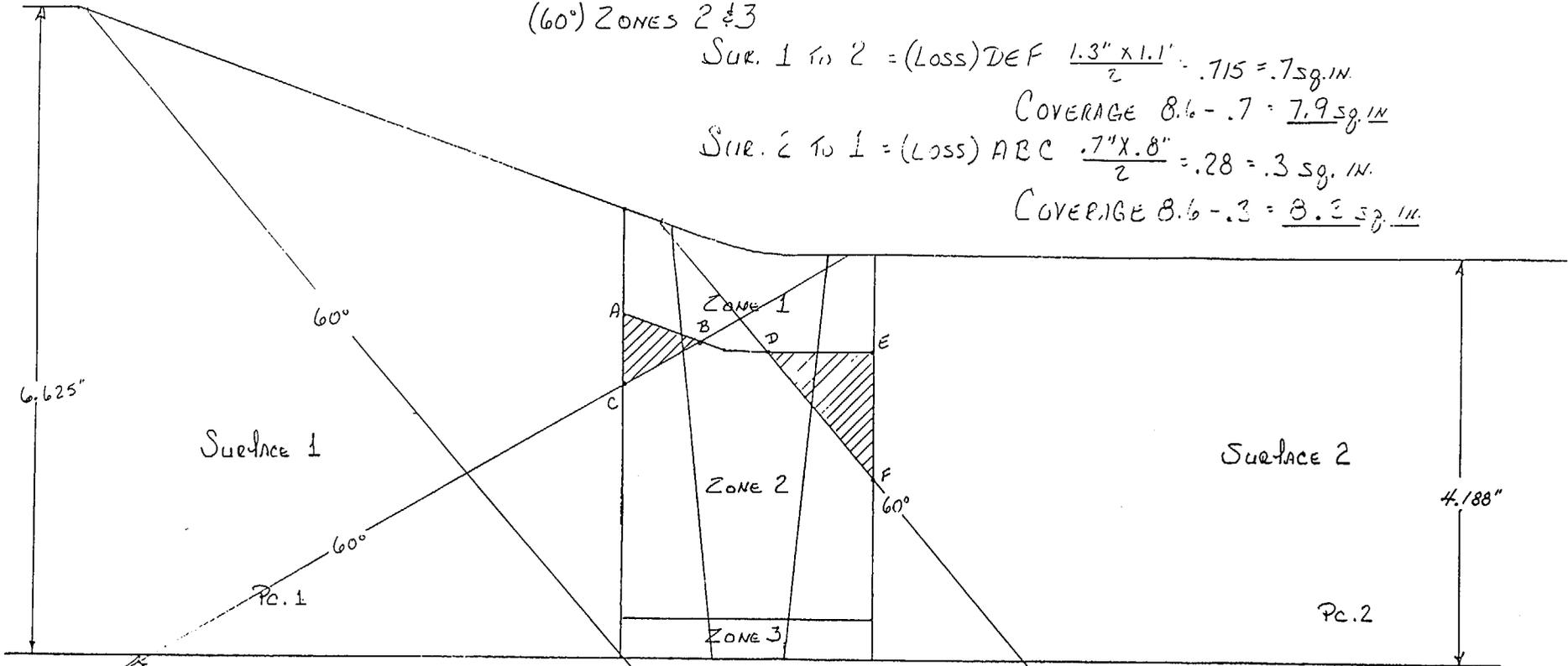
(60°) ZONES 2 & 3

SUR. 1 TO 2 = (LOSS) DEF  $\frac{1.3" \times 1.1"}{2} = .715 = .7 \text{ sq. in.}$

COVERAGE  $8.6 - .7 = 7.9 \text{ sq. in.}$

SUR. 2 TO 1 = (LOSS) ABC  $\frac{.7" \times .8"}{2} = .28 = .3 \text{ sq. in.}$

COVERAGE  $8.6 - .3 = 8.3 \text{ sq. in.}$



- AREA SCANNED
- AREA NOT SCANNED
- PARTIAL SCAN

I.D.# 2-SCA-WG84  
ITEM# COI. 010. 001  
BY: Lane Mauldin  
DATE 05-7-01  
Pg. 7 of 8

ANII ~~1/16~~ Date 5/16  
HSBI&I Co.

OCONEE STEAM GENERATOR  
SHELL TO SHELL

COVERAGE

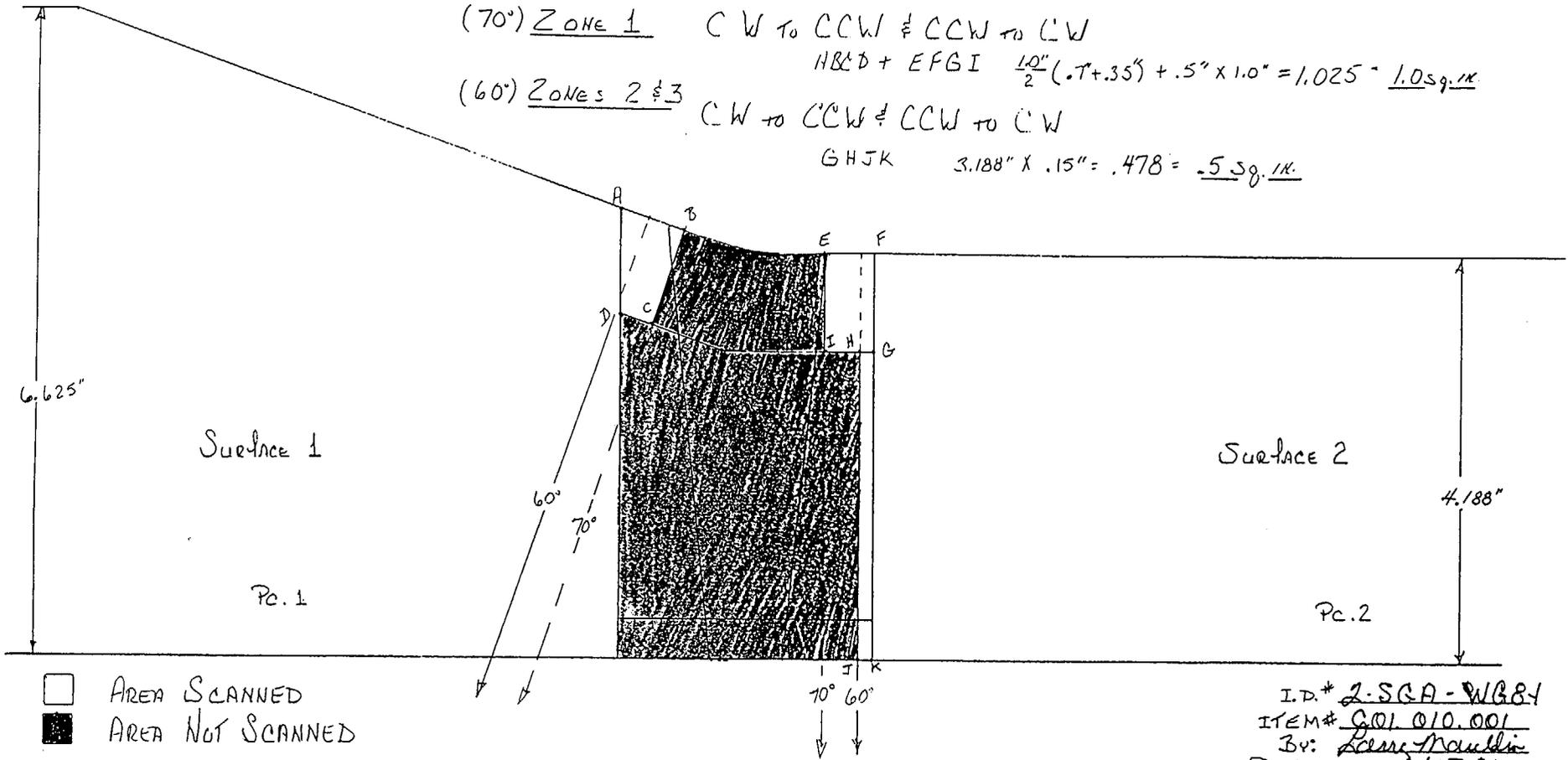
(70°) ZONE 1 CW to CCW & CCW to CW

$HBED + EFGI \frac{10''}{2} (.7 + .35) + .5'' \times 1.0'' = 1.025 = \underline{1.0 \text{ sq. ft.}}$

(60°) ZONES 2 & 3

CW to CCW & CCW to CW

$GHJK \quad 3.188'' \times .15'' = .478 = \underline{.5 \text{ sq. ft.}}$



I.D.# 2-SGA-WGB1  
 ITEM# 001 010 001  
 By: Gene Mauldin  
 DATE 8-5-7-01  
 Pg. 8 of 8

ANII ~~8/5/01~~ Date 5/16  
 HSB&I Co.

## DUKE POWER COMPANY

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

Station: <u>OCONEE</u>	Unit: <u>II</u>	Component/Weld ID: <u>2-SGA-WG60</u>	Date: <u>05/16/01</u>
Weld Length (in.): <u>480.0</u>	Surface Condition: <u>AS GROUP</u>	<u>Lo"x" Axis</u>	Exam Start: <u>0946</u> Exam Finish: <u>1020</u>

Procedure No: <u>NDE-620</u> Revision: <u>8</u> FC <u>00-007</u>	Scans 70° <u>58.0</u> dB Zone I 60° ___ dB Zone II 60° ___ dB Zone III Axial 60° ___ dB Zone III Circ.	Configuration <u>CIRC. WELD</u> Scan Surface: OD	Surface Temp. <u>70</u> ° F Pyrometer s/n: <u>NKND027008</u> Cal. Due Date: <u>8/20/01</u>	Calibration Sheet No:  <u>0102089</u>
---	---	--	--	---

Indication #	∠	MP <sub>max</sub>	% FSH	L <sub>max</sub>	W <sub>max</sub>	SU LOCATION	BEAM DIRECTION	SCAN		REMARKS
								↓	≡	
<u>NRT</u>	<u>70°</u>									

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

Examiner: William T. Wene Level: II Date: 5-16-01 Examiner: [Signature] Item No: C01.030.001  
 Reviewed by: Gay Moss Level: II Date: 5-20-01 Authorized Inspector: [Signature] Date: MAY 29 2001

## DUKE POWER COMPANY

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

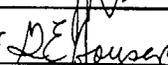
Station: <u>OLNDE</u>	Unit: <u>II</u>	Component/Weld ID: <u>2-SGA-WR60</u>	Date: <u>05/16/01</u>
Weld Length (in.): <u>480.0</u>	Surface Condition: <u>AS GROUND</u>	<u>Lo "X" AXIS</u>	Exam Start: <u>0954</u> Exam Finish: <u>1035</u>

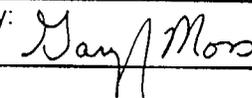
Procedure No: <u>NDE-620</u> Revision: <u>8</u> FC <u>00-007</u>	Scans 70° ___ dB Zone I    60° <u>6.8</u> dB Zone II 60° <u>72.5</u> dB Zone III Axial 60° <u>72.5</u> dB Zone III Circ.	Configuration <u>CIRC. WELD</u> Scan Surface: OD	Surface Temp. <u>70</u> ° F Pyrometer s/n: <u>MCJDE27008</u> Cal. Due Date: <u>8/20/01</u>	Calibration Sheet No: <u>0102090</u> <u>0102091</u>
---	---	--	--	---

Indication #	∠	MP <sub>max</sub>	% FSH	L <sub>max</sub>	W <sub>max</sub>	SU LOCATION	BEAM DIRECTION	SCAN	REMARKS
1	60	6.8	40	34'-8"	7.25"	SZ	S1	AK	

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

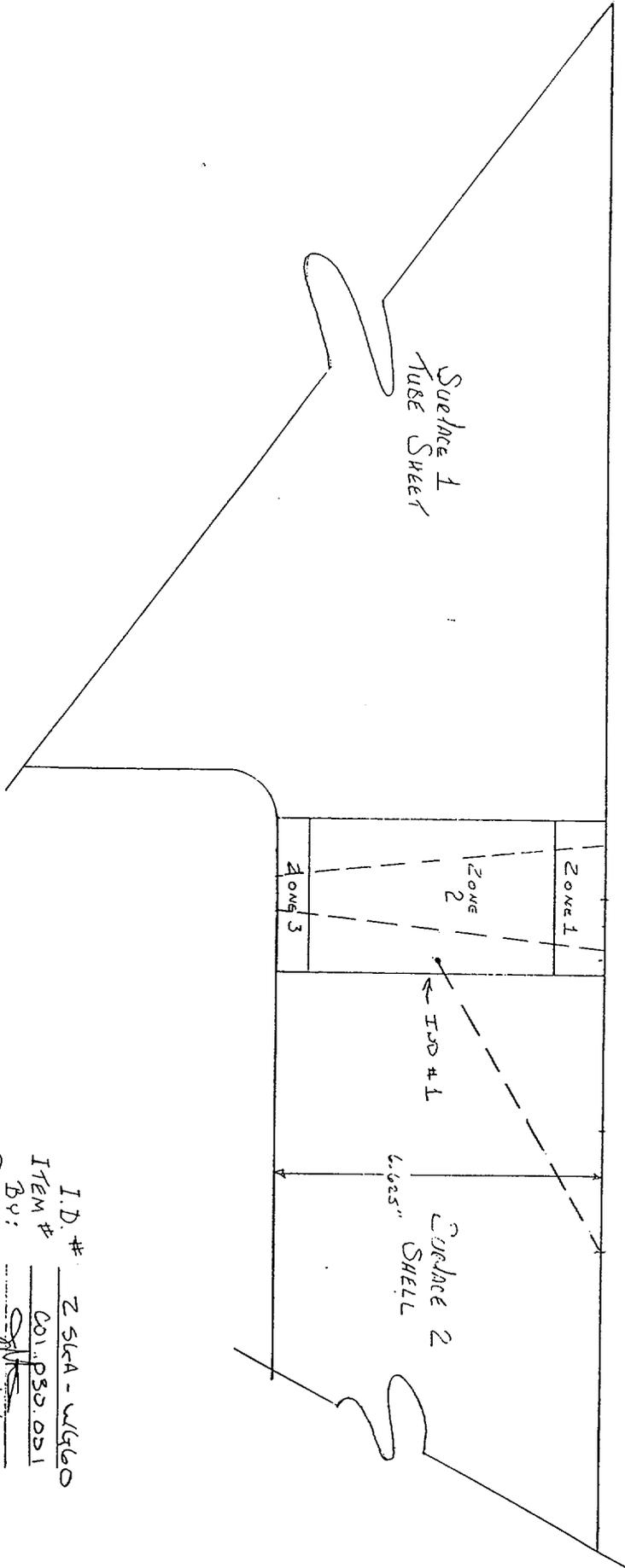
Examiner: William P. Leeper Level: II Date: 5.16.01 Examiner: James Blaine Level: II Date: 5/16/01 Item No: COI.030.001  
 Reviewed by: Gary J. Moss Level: D Date: 5.20.01 Authorized Inspector: P. J. ... Date: MAY 29 2001

DUKE POWER COMPANY					Exam Start: 1430	Form NDE-UT-670B			
Ultrasonic Data Sheet for Planar Flaw Sizing					Exam Finish: 1500	Revision 1			
Station: Oconee	Unit: 2	Date: 5/16/01	Item No: C01.030.001						
Measured Wall Thickness: 6.625 in.	Material Type: CS	Component/Weld ID: 2-SGA-WG60							
Surface Condition: FLUSH	L max: 34' - 8" (from exam data sheet)	Pyrometer S/N: MCNDE 27205							
Examiner: Jay A. Eaton  Level: II	Configuration: Tubesheet to Shell		Cal. Due Date: 7/18/01						
Examiner: Gayle E. Houser  Level: II			Surface Temp: 74 ° F						
Procedure: PDI-UT-7	Rev: D	FC: D/A	Calibration Sheet No: 0102098						
Ind.#		30-70-70	PATT	M-PATT	HALT	Full-V 45°	Reported Thru-Wall	Exam Surface	Beam Direction
1	45°		YES				0.5	S2	S1

Remarks: SEE ATTACHED CALCULATIONS					
					Sheet 3 of 18
Reviewed By: 	Level: 	Date: 5-20-01	Authorized Inspector: 		Date: MAY 29 2001

DUKE POWER COMPANY				FORM NDE-UT-670A			
ULTRASONIC CALIBRATION SHEET FOR PLANAR FLAW SIZING				Revision 3			
Station: Oconee	Unit: 2	Date: 5/16/01	Sheet Number: 0102098				
Procedure: PDI-UT-7	Rev: D	FC: N/A	Couplant: ULTRAGEL II	Batch No: 00325			
Examiner: Jay A. Eaton	Level: II	Calibration Block ID: 50470	Pyrometer S/N: MCNDE 27205				
Examiner: Gayle E. Houser	Level: II	Calibration Block Temp: 72° deg F	Cal. Due Date: 7/18/01				
REFERENCE BLOCK	INSTRUMENT		SEARCH UNIT	SIMULATOR BLOCK			
ID: 97-5589	<input type="checkbox"/> Staveley <input checked="" type="checkbox"/> Krautkramer	Type: Single <input checked="" type="checkbox"/> Dual <input type="checkbox"/>	Type: Single <input checked="" type="checkbox"/> Dual <input type="checkbox"/>	ID: 97-5589			
Type: ROMPAS	Model: USK-7D	Size: .500 Freq: 2.25 Mhz	Size: .500 Freq: 2.25 Mhz	Reflector Type: SDH			
Mat'l: CS	S/N: 32810-4022	Manufacturer: KBA	Manufacturer: KBA	CE-2: N/A Div's			
INSTRUMENT SETTINGS	S/N: 32810-4022		S/N: 0085LN	Depth: .75 in.			
Jack: T <input type="checkbox"/> R <input checked="" type="checkbox"/>	CALIBRATION			CABLES			
Range: 14.1				Wave Mode			
Delay: 5.6				Shear <input checked="" type="checkbox"/>		RG58 <input type="checkbox"/>	
Vel: 128.3				Long. <input type="checkbox"/>		RG174 <input checked="" type="checkbox"/>	
Units: IN				Bi-Modal <input type="checkbox"/>		# of connectors 0	
Gain: 60				<input checked="" type="checkbox"/> PATT		Length: 6'	
Display: FULL				<input type="checkbox"/> M-PATT		INITIAL CAL	
Freq: 1-5				<input type="checkbox"/> HALT		TIME INITIALS	
Rej: OFF				<input type="checkbox"/> 30-70-70 CE-2 Div's		1400 <i>[Signature]</i>	
Pulse: HIGH				<input type="checkbox"/> 45° Full V "Mp		CAL CHECKS	
Damping: N/A						1430 <i>[Signature]</i>	
PRF/PRR: HIGH			1500 <i>[Signature]</i>				
Pulser: HIGH							
Pulse/Echo <input checked="" type="checkbox"/> Dual <input type="checkbox"/>							
Reviewed By: <i>Gayle Moss</i>	Level: <i>SB</i>	Date: 5-20-01	Authorized Inspector: <i>[Signature]</i>		Date: MAY 29 2001		

DOONE TEAM GENERATOR  
UPPER TUBE SHEET TO SHELL

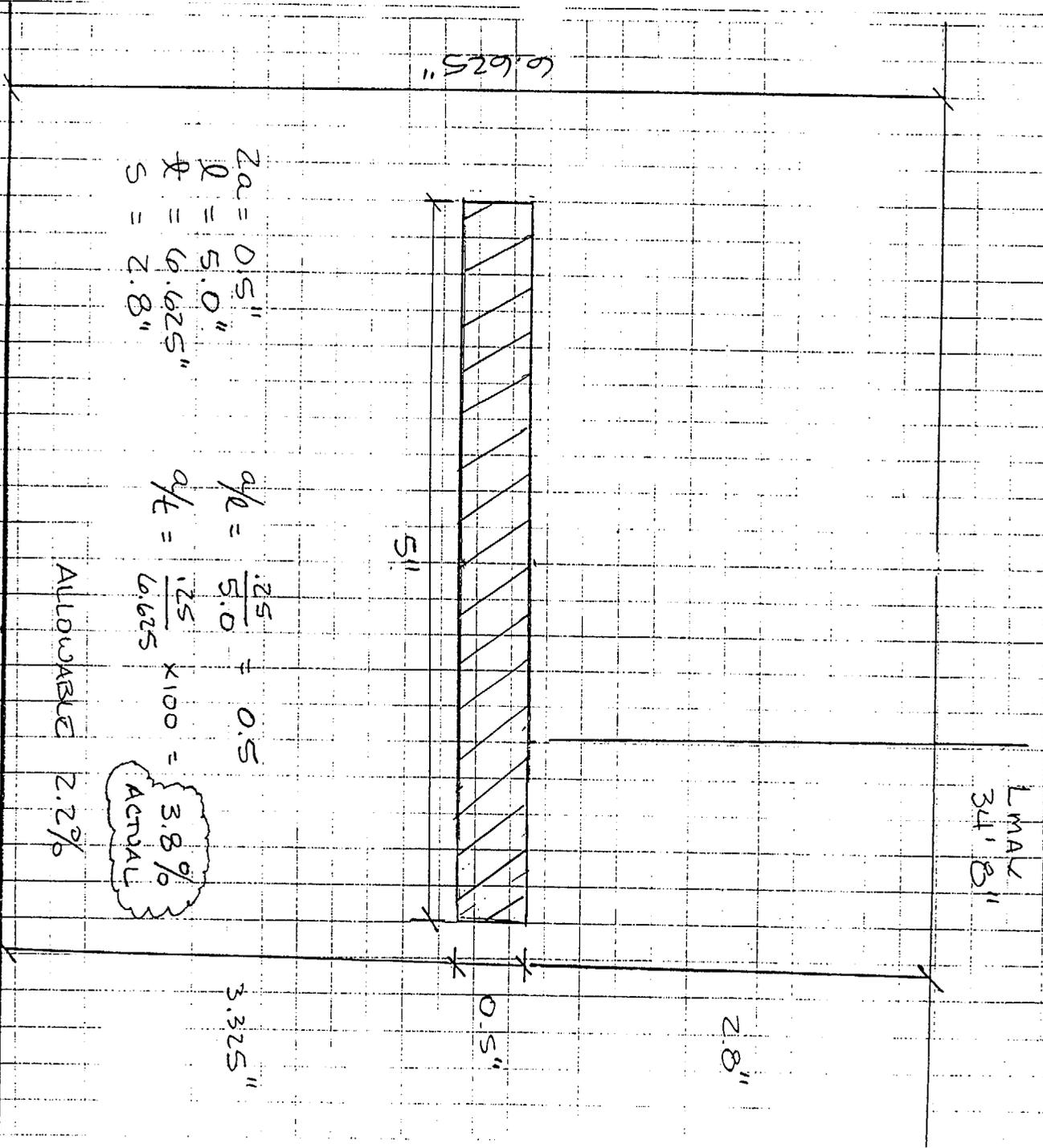


I.D. # 2 SKA - W460  
ITEM # 001.P33.021  
BY: [Signature]  
DATE 3/14/01

Page 5 of 18

ANTI [Signature] Date 3/18  
HSBIRI Co.

Station OCONEE Unit 2 Rev. \_\_\_\_\_ File No. \_\_\_\_\_ Sheet 6 of 18  
 Subject ITEM # 201.030.001  
 WELD # 2-SGA-WK60 By [Signature] Date 5/16/01  
 Prob No. INDICATION # 1 Checked By Randy Maudlin Date 5-16-01



$$Z_a = 0.5''$$

$$Q = 5.0''$$

$$S = 2.8''$$

$$a/Q = \frac{.25}{5.0} = 0.5$$

$$a/L = \frac{.25}{6.625} \times 100 = 3.8\%$$

ACTUAL 3.8%

ALLOWABLE 2.2%

$S < .4d$   
 $2.8 < .4(2.5)$   
 $2.8 > 0.1 \text{ so SUBSOPFALE}$

$$y = \frac{S}{L} = \frac{2.8}{6.625} = 1.2 = 1$$

ANIL [Signature] Date [Signature]  
 HSBI&I Co.

DUKE POWER COMPANY				Form NDE-UT-8	
ULTRASONIC INDICATION RESOLUTION SHEET				Revision 1	
Acceptance Standard: INDICATION #1 - 60° IS A SUBSURFACE INDICATION WITH AN a/t RATIO OF 3.8%. THE CODE ALLOWS 2.2%. THIS INDICATION IS REPORTABLE PER ACCEPTANCE STANDARD: 1WB-3510-1. SEE THE ATTACHED CALCULATION SHEET. FORM QA 516A HAS BEEN ISSUED FOR EVALUATION. SEE PIP 0-01-01857.					
Item No: C01.030.001					
Acceptable Indications: REPORTABLE - IND. #1 - 60°					
Rejectable Indications:					
These indications have been compared with previous ultrasonic data <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No previous data available					
Examiner:	Level:	Date:		Sheet <u>7</u> of <u>18</u>	
Jay A. Eaton	II	5/16/01			
Reviewer:	Level:	Date:	Authorized Inspector:	Date:	
<i>Randy Rauder</i>	III	5-16-01	<i>C. J. ...</i>	MAY 29 2001	

**DUKE POWER COMPANY  
ISI LIMITATION REPORT**

FORM NDE-UT-4

Revision 1

Component/Weld ID: 2-SGA-WG60	Item No: C01.030.001	Remarks:
<input type="checkbox"/> NO SCAN                      SURFACE                      BEAM DIRECTION <input checked="" type="checkbox"/> LIMITED SCAN <input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> cw <input type="checkbox"/> ccw FROM L <u>  36.0"  </u> to L <u>  44.0"  </u> INCHES FROM WO <u>  9.0"  </u> to <u>  16.0"  </u> ANGLE: <input type="checkbox"/> 0 <input type="checkbox"/> 45 <input checked="" type="checkbox"/> 60 <input type="checkbox"/> Other _____                      FROM _____ DEG to _____ DEG		SUPPORT HANGER
<input type="checkbox"/> NO SCAN                      SURFACE                      BEAM DIRECTION <input checked="" type="checkbox"/> LIMITED SCAN <input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> cw <input type="checkbox"/> ccw FROM L <u>  76.0"  </u> to L <u>  84.0"  </u> INCHES FROM WO <u>  9.0"  </u> to <u>  16.0"  </u> ANGLE: <input type="checkbox"/> 0 <input type="checkbox"/> 45 <input checked="" type="checkbox"/> 60 <input type="checkbox"/> Other _____                      FROM _____ DEG to _____ DEG		SUPPORT HANGER
<input type="checkbox"/> NO SCAN                      SURFACE                      BEAM DIRECTION <input checked="" type="checkbox"/> LIMITED SCAN <input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> cw <input type="checkbox"/> ccw FROM L <u> 116.0"  </u> to L <u> 124.0"  </u> INCHES FROM WO <u>  9.0"  </u> to <u>  16.0"  </u> ANGLE: <input type="checkbox"/> 0 <input type="checkbox"/> 45 <input checked="" type="checkbox"/> 60 <input type="checkbox"/> Other _____                      FROM _____ DEG to _____ DEG		SUPPORT HANGER
<input type="checkbox"/> NO SCAN                      SURFACE                      BEAM DIRECTION <input checked="" type="checkbox"/> LIMITED SCAN <input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> cw <input type="checkbox"/> ccw FROM L <u> 144.0"  </u> to L <u> 152.0"  </u> INCHES FROM WO <u>  9.0"  </u> to <u>  16.0"  </u> ANGLE: <input type="checkbox"/> 0 <input type="checkbox"/> 45 <input checked="" type="checkbox"/> 60 <input type="checkbox"/> Other _____                      FROM _____ DEG to _____ DEG		SUPPORT HANGER
Prepared By: <u>Larry Maulder</u>	Level: <u>III</u> Date: <u>5-16-01</u>	Sketch(s) attached <input checked="" type="checkbox"/> yes <input type="checkbox"/> no      Sheet <u>8</u> of <u>18</u>
Reviewed By: <u>Gary Moss</u>	Date: <u>5-20-01</u>	Authorized Inspector: <u>[Signature]</u> Date: <u>MAY 29 2001</u>

**DUKE POWER COMPANY  
ISI LIMITATION REPORT**

FORM NDE-UT-4

Revision 1

Component/Weld ID: 2-SGA-WG60		Item No: C01.030.001		Remarks:
<input type="checkbox"/> NO SCAN	SURFACE	BEAM DIRECTION		SUPPORT HANGER
<input checked="" type="checkbox"/> LIMITED SCAN	<input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2	<input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> cw <input type="checkbox"/> ccw		
FROM L <u>196.0"</u> to L <u>204.0"</u>		INCHES FROM WO <u>9.0"</u> to <u>16.0"</u>		
ANGLE: <input type="checkbox"/> 0 <input type="checkbox"/> 45 <input checked="" type="checkbox"/> 60 <input type="checkbox"/> Other _____		FROM _____ DEG to _____ DEG		
<input type="checkbox"/> NO SCAN	SURFACE	BEAM DIRECTION		SUPPORT HANGER
<input checked="" type="checkbox"/> LIMITED SCAN	<input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2	<input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> cw <input type="checkbox"/> ccw		
FROM L <u>276.0"</u> to L <u>284.0"</u>		INCHES FROM WO <u>9.0"</u> to <u>16.0"</u>		
ANGLE: <input type="checkbox"/> 0 <input type="checkbox"/> 45 <input checked="" type="checkbox"/> 60 <input type="checkbox"/> Other _____		FROM _____ DEG to _____ DEG		
<input type="checkbox"/> NO SCAN	SURFACE	BEAM DIRECTION		SUPPORT HANGER
<input checked="" type="checkbox"/> LIMITED SCAN	<input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2	<input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> cw <input type="checkbox"/> ccw		
FROM L <u>236.0"</u> to L <u>244.0"</u>		INCHES FROM WO <u>9.0"</u> to <u>16.0"</u>		
ANGLE: <input type="checkbox"/> 0 <input type="checkbox"/> 45 <input checked="" type="checkbox"/> 60 <input type="checkbox"/> Other _____		FROM _____ DEG to _____ DEG		
<input type="checkbox"/> NO SCAN	SURFACE	BEAM DIRECTION		SUPPORT HANGER
<input checked="" type="checkbox"/> LIMITED SCAN	<input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2	<input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> cw <input type="checkbox"/> ccw		
FROM L <u>316.0"</u> to L <u>324.0"</u>		INCHES FROM WO <u>9.0"</u> to <u>16.0"</u>		
ANGLE: <input type="checkbox"/> 0 <input type="checkbox"/> 45 <input checked="" type="checkbox"/> 60 <input type="checkbox"/> Other _____		FROM _____ DEG to _____ DEG		
Prepared By: <u>Larry Mauldin</u>	Level: <u>III</u>	Date: <u>5-16-01</u>	Sketch(s) attached <input checked="" type="checkbox"/> yes <input type="checkbox"/> no	Sheet <u>9</u> of <u>18</u>
Reviewed By: <u>Gary Moss</u>	Date: <u>5-20-01</u>	Authorized Inspector: <u>E.A. [Signature]</u>	Date: <u>MAY 29 2001</u>	



**DUKE POWER COMPANY  
ISI LIMITATION REPORT**

FORM NDE-UT-4

Revision 1

Component/Weld ID: 2-SGA-WG60 Item No: C01.030.001 Remarks:

NO SCAN SURFACE BEAM DIRECTION SUPPORT PAD  
 LIMITED SCAN  1  2  1  2  cw  ccw  
 FROM L 54.0" to L 102.0" INCHES FROM WO 9.0" to 16.0"  
 ANGLE:  0  45  60  Other 70° FROM \_\_\_\_\_ DEG to \_\_\_\_\_ DEG

NO SCAN SURFACE BEAM DIRECTION SUPPORT PAD  
 LIMITED SCAN  1  2  1  2  cw  ccw  
 FROM L 166.0" to L 214.0" INCHES FROM WO 9.0" to 16.0"  
 ANGLE:  0  45  60  Other 70° FROM \_\_\_\_\_ DEG to \_\_\_\_\_ DEG

NO SCAN SURFACE BEAM DIRECTION SUPPORT PAD  
 LIMITED SCAN  1  2  1  2  cw  ccw  
 FROM L 261.0" to L 309.0" INCHES FROM WO 9.0" to 16.0"  
 ANGLE:  0  45  60  Other 70° FROM \_\_\_\_\_ DEG to \_\_\_\_\_ DEG

NO SCAN SURFACE BEAM DIRECTION SUPPORT PAD  
 LIMITED SCAN  1  2  1  2  cw  ccw  
 FROM L 356.0" to L 404.0" INCHES FROM WO 9.0" to 16.0"  
 ANGLE:  0  45  60  Other 70° FROM \_\_\_\_\_ DEG to \_\_\_\_\_ DEG

Prepared By: Larry Mauldin Level: III Date: 5-16-01 Sketch(s) attached  yes  no Sheet 11 of 18

Reviewed By: Gary Moss Date: 5-20-01 Authorized Inspector: [Signature] Date MAY 29 2001

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<b>DUKE POWER COMPANY</b> Limited Examination Coverage Worksheet	NDE-91-1
	Revision 0

Examination Volume/Area Defined				
<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 DRWG. ZONES 2 & 3 17.7 SQ. IN.	17.7 SQ. IN. X 433.5 IN. = 7672.95 CU. IN

Coverage Calculations							
Scan #	Angle	Beam Direction	Area Examined (sq.in.)	Length Examined (in.)	Volume Examined (cu.in.)	Volume Required (cu.in.)	Percent Coverage
1	60	1	11.8	88	1038.4	1557.6	66.67
1	60	1	17.5	240	4200	4248	98.87
1	60	1	17.7	105.5	1867.35	1867.35	100.00
2	60	2	17.7	193.5	3424.95	3424.95	100.00
2	60	2	0.0	240	0	4248	0.00
3	60	CW	2.5	433.5	1083.75	7672.95	14.12
3	60	CW	2.5	433.5	1083.75	7672.95	14.12
					12698.2	30731.8	41.32

	Item No: C01.030.001	
Prepared By: <i>Randy Maulder</i>	Level: <i>III</i>	Date: <i>5-16-01</i>
Reviewed By: <i>Mary A Moss</i>	Level: <i>II</i>	Date: <i>5-20-01</i>

ANII *02* Date *5/20/01*  
 HSBI&I Co.

13 of 18

<b>DUKE POWER COMPANY</b>						NDE-91-1			
<b>Limited Examination Coverage Worksheet</b>						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 DRWG. ZONE 1 - 3.2 SQ. IN.				ZONE 1 - 3.2 SQ. IN. X 433.5 IN. = 1387.2 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	1	3.2	193.5	619.2	619.2	100.00		
1	70	1	2.3	240	552	768	71.88		
2	70	2	3.2	193.5	619.2	619.2	100.00		
2	70	2	.1	240	24	768	3.13		
3	70	CW	.9	433.5	390.15	1387.2	28.12		
4	70	CCW	.9	433.5	390.15	1387.2	28.12		
					2594.7	5548.8	46.76		

		Item No: C01.030.001
Prepared By: <i>Larry Maulder</i>	Level: <i>III</i>	Date: <i>5-16-01</i>
Reviewed By: <i>Larry Moss</i>	Level: <i>B</i>	Date: <i>5-20-01</i>

ANII <del>60</del> Date <i>5/29</i> HSBI&I Co.
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14 of 18

<b>DUKE POWER COMPANY</b>						NDE-91-1			
<b>Limited Examination Coverage Worksheet</b>						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		

	70				2594.7	5548.8	46.76
	60				12698.2	30731.8	41.32
					15292.9	36280.6	42.15

Item No: C01.030.001	
Prepared By: <i>Larry Mauldin</i>	Level: <i>III</i> Date: <i>5-16-01</i>
Reviewed By: <i>Gary Moss</i>	Level: <i>II</i> Date: <i>5-20-01</i>

ANII  Date: *5/21/01*  
 HSBI&I Co.

O'DONNEE STEAM GENERATOR  
UPPER TUBE SHEET TO SHELL

Area of Rectangles:

ZONE 1

$ABCD = 3.15' \times 1.0" = 3.15 = 3.2 \text{ sq. in.}$

$3.2 \text{ sq. in.} \times 433.5' = 1387.2 \text{ cu. in.}$

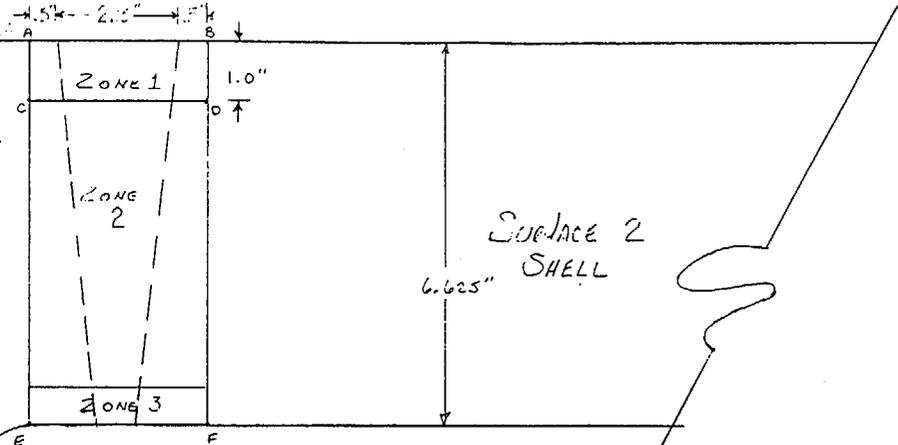
ZONES 2 & 3

$CDEF = 5.625" \times 3.15" = 17.72 = 17.7 \text{ sq. in.}$

$17.7 \text{ sq. in.} \times 433.5' = 7673 \text{ cu. in.}$

SURFACE 1  
TUBE SHEET

SURFACE 2  
SHELL



MANI  
HSBREL Co.  
Date 5/16/01

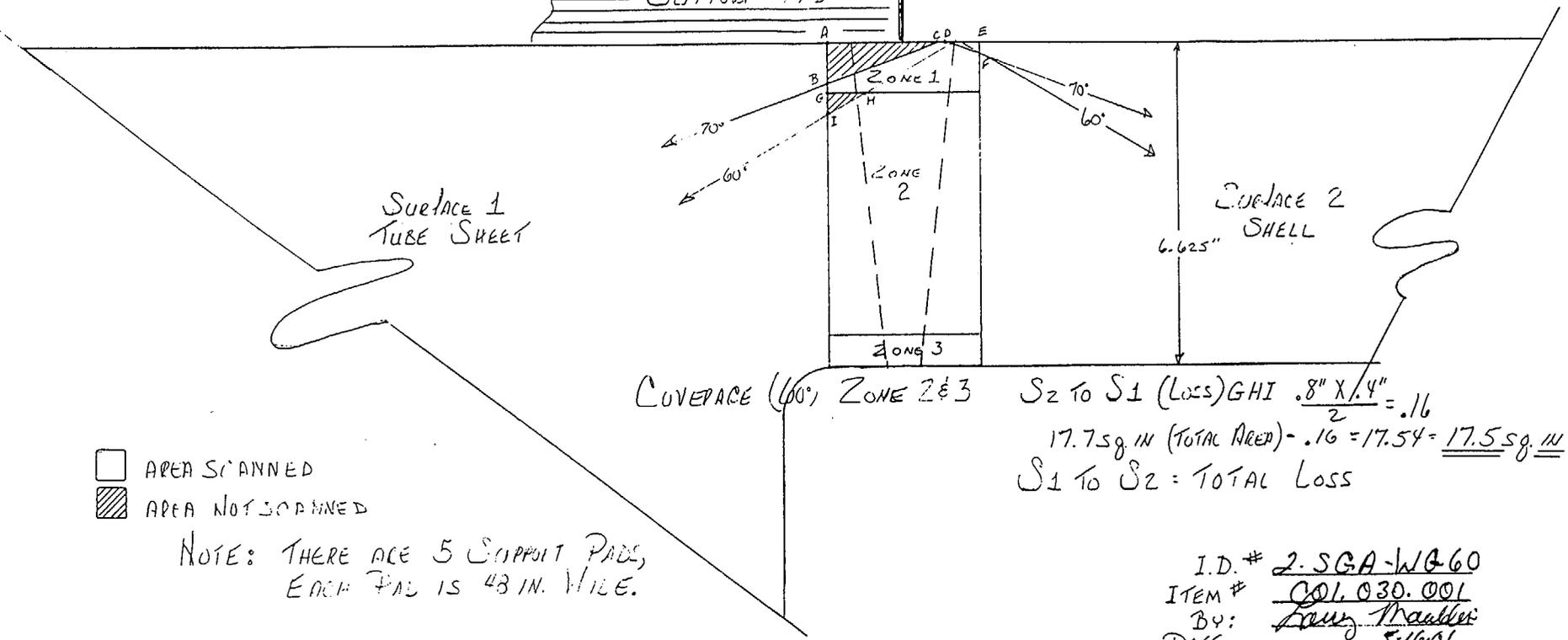
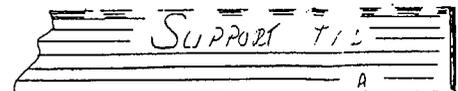
I.D.# 2-SGA-WG60  
ITEM # COI.030.001  
BY: Ray Mauldin  
DATE 5-16-01

Pg. 15 of 18

MCONEE STEAM GENERATOR  
UPPER TUBE SHEET TO SHELL

LIMITED SCAN DUE TO SUPPORT PADS

COVERAGE (70°) ZONE 1:  $S_2 \text{ TO } S_1 \text{ (Loss) } ABC = \frac{2.25" \times .8"}{2} = .9$   $3.2 \text{ sq. in. (TOTAL AREA)} - .9 \text{ sq. in. (Loss)} = \underline{\underline{2.3 \text{ sq. in.}}}$   
 $S_1 \text{ TO } S_2 \text{ DEF} = \frac{.7" \times .2"}{2} = .07 = \underline{\underline{.1 \text{ sq. in.}}}$



COVERAGE (60°) ZONE 2 & 3  $S_2 \text{ TO } S_1 \text{ (Loss) } GHI = \frac{.8" \times .4"}{2} = .16$   
 $17.7 \text{ sq. in. (TOTAL NEED)} - .16 = 17.54 = \underline{\underline{17.5 \text{ sq. in.}}}$   
 $S_1 \text{ TO } S_2 = \text{TOTAL LOSS}$

- AREA SCANNED
- AREA NOT SCANNED

NOTE: THERE ARE 5 SUPPORT PADS,  
EACH PAD IS 48 IN. WIDE.

I.D.# 2-SGA-WA60  
 ITEM# COL 030.001  
 BY: Ray Traylor  
 DATE 5-16-01

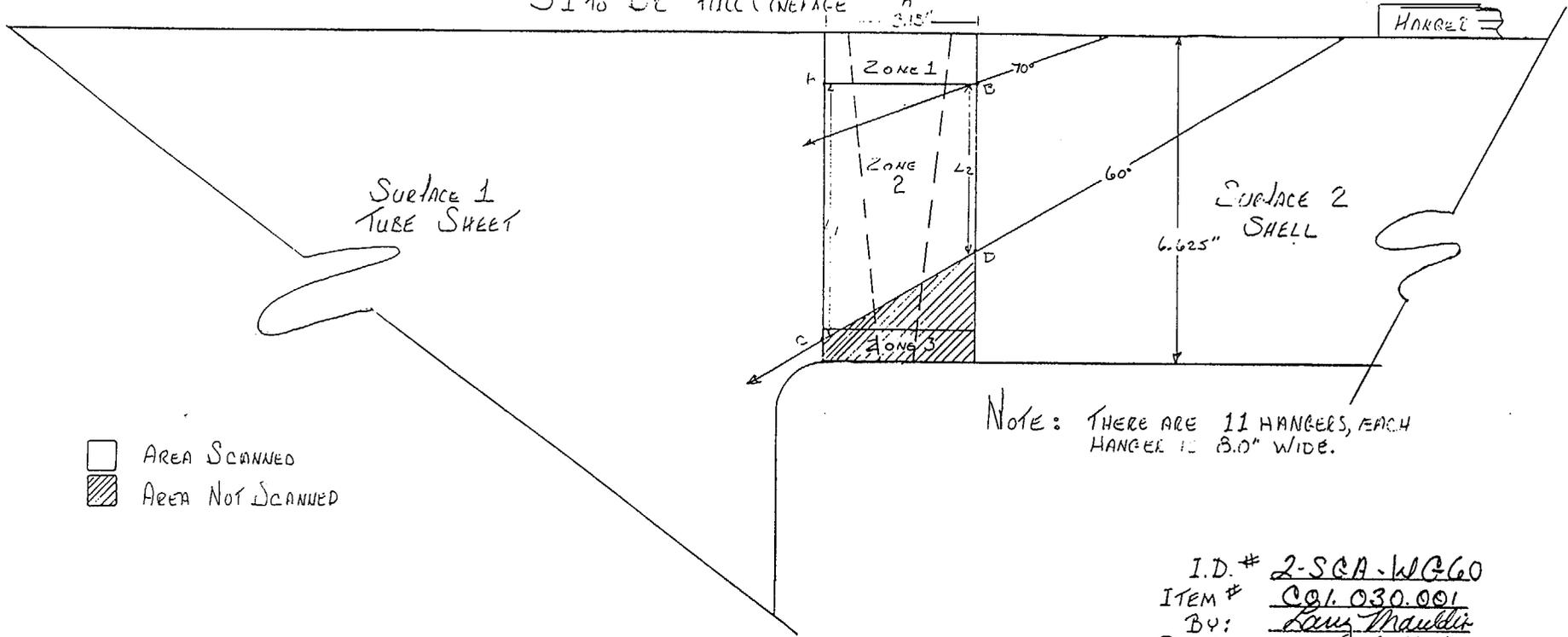


MOONEE STEAM GENERATOR  
UPPER TUBE SHEET TO SHELL

LIMITED COIN DUE TO SUPPORT HANGERS:

COVERAGE (70°) ZONE 1: S<sub>1</sub> to S<sub>2</sub> & S<sub>1</sub> to S<sub>2</sub> FULL COVERAGE

(60°) ZONE 2 & 3: S<sub>1</sub> to S<sub>2</sub>  $ABCD = \frac{h}{2}(L_1 + L_2) = \frac{3.15}{2}(4.1 + 3.4) = 11.8 \text{ sq. in.}$   
S<sub>1</sub> to S<sub>2</sub> FULL COVERAGE



NOTE: THERE ARE 11 HANGERS, EACH HANGER IS 8.0" WIDE.

- AREA SCANNED
- AREA NOT SCANNED

I.D. # 2-SCA-WG60  
ITEM # CGI.030.001  
BY: Larry Mauldin  
DATE 5-16-01

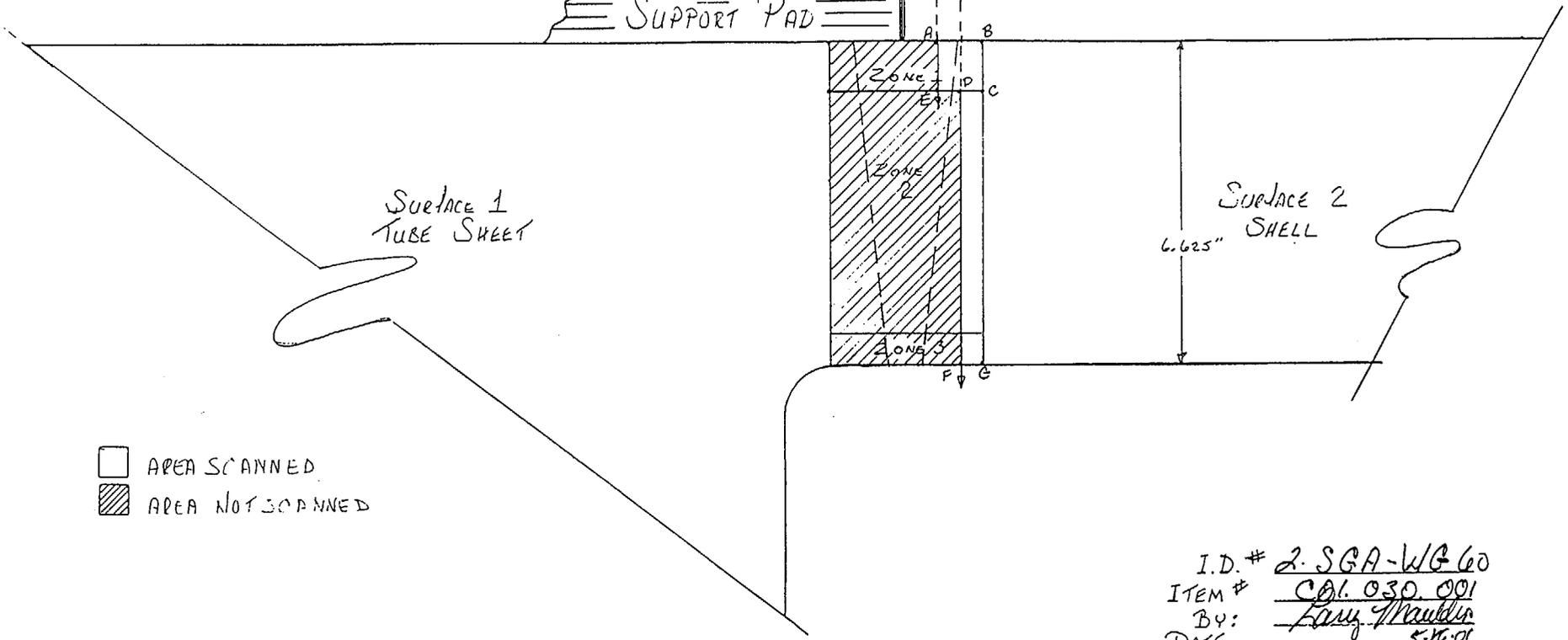
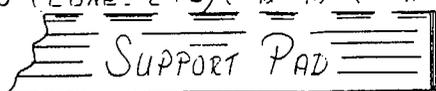
Pg. 17 of 19

ANIL  
HSBRI Co.  
Date  
1/24

MCONEE STEAM GENERATOR  
UPPER TUBE SHEET TO SHELL

LIMITED SCAN DUE TO SUPPORT PAD

COVERAGE 70° (ZONE 1) CW TO CCW & CCW TO CW AREA = .9 IN. x 1.0 IN. = .9 sq in.  
60° (ZONE 2 & 3) CW TO CCW & CCW TO CW (VCEFC) = .45 IN. x 5.625 IN. = 2.5 sq in.



□ AREA SCANNED  
▨ AREA NOT SCANNED

I.D. # 2-SGA-WG 60  
ITEM # COI. 030. 001  
BY: Larry Mauldin  
DATE 5-16-01

Pg. 18 of 18

ANIL  
Date 5-16-01  
HSBIRI Co.

# Oconee Unit #2

## EOC18

### NO DATA

CALIBRATION SHEET # 0102005 - 45° & 60°

# 0102011 - 60°L

# \_\_\_\_\_

COMPONENT I.D.# 2HP-341-VI

ITEM # C05.021.044

ANII ~~SAK~~ Date 5-2  
HSBI&I Co.

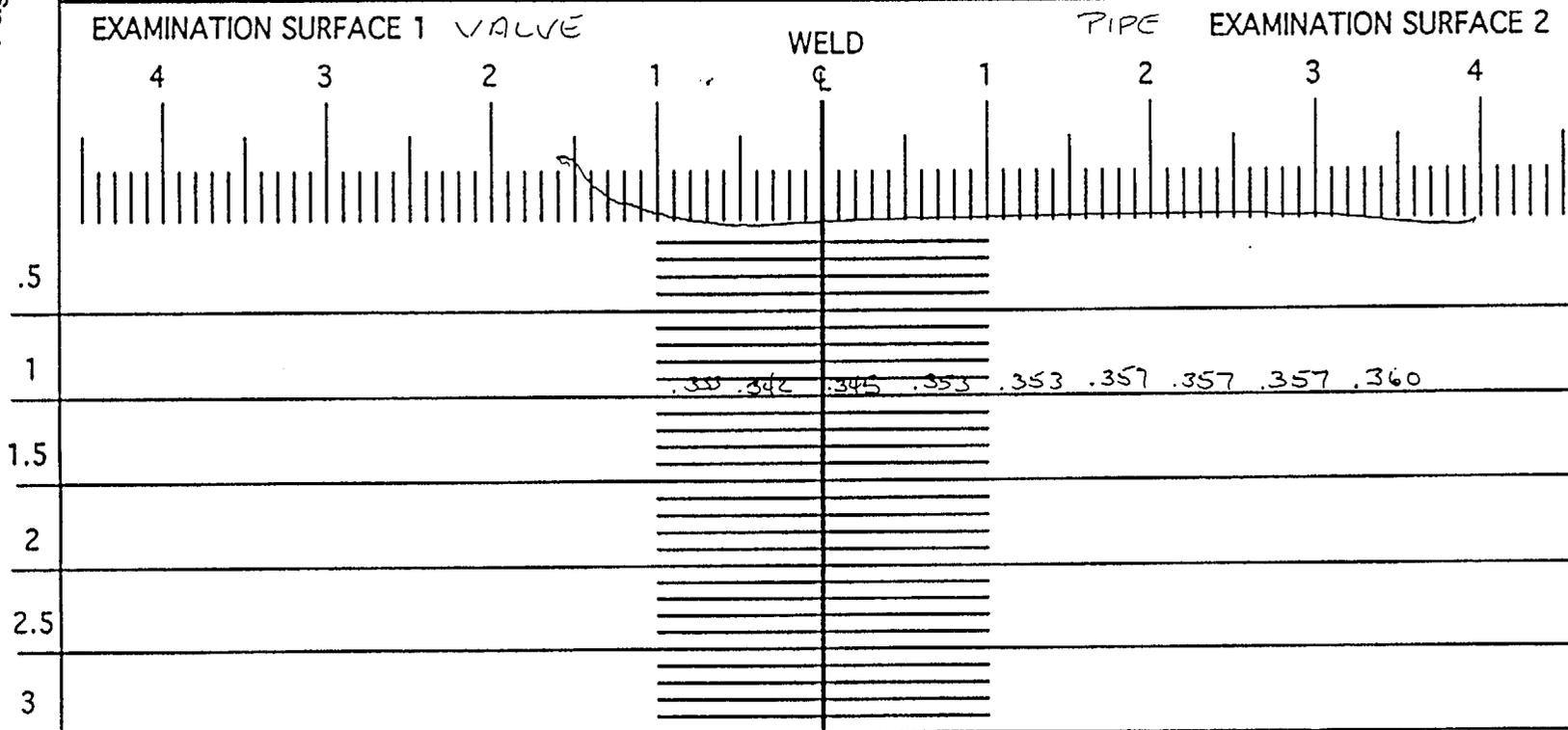
DUKE POWER COMPANY													Exam Start:	1408	NDE-UT-3A
ULTRASONIC EXAMINATION DATA SHEET FOR LAMINAR REFLECTORS													Exam Finish:	1411	Revision 2
Station: Oconee			Unit: 2		Component/Weld ID: 2HP-341-V1						Date: 1/30/01				
Nominal Material Thickness (in): 0.375			Weld Length (in.): 9.03"			Surface Temperature: 82			Deg F						
Measured Material Thickness (in): .323"			Lo: 9.1.1.1			Pyrometer S/N: MCNDE 27008									
Surface Condition: AS GROUND			Calibration Sheet No: 0102006			Cal Due: 3/26/01									
Examiner: James L. Panel <i>James L. Panel</i> Level: II						Configuration: <u>Valve (Valve 2HP-V23) to Reducer</u>									
Examiner: David Zimmerman <i>David Zimmerman</i> Level: II															
Procedure: NDE-640 Rev: <i>1</i> FC: *						PIPE Flow VALVE			S2 to S1						
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	0°														

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: <i>II</i> Date: <i>2-1-01</i>	Authorized Inspector: <i>S. Hansen</i> Date: <i>5-7-01</i>	Item No: C05.021.044

DUKE POWER COMPANY  
UT PROFILE/PLOT SHEET

NDE-UT-5

Revision 1



Component ID/Weld No. 2HP-341-V1

Remarks:

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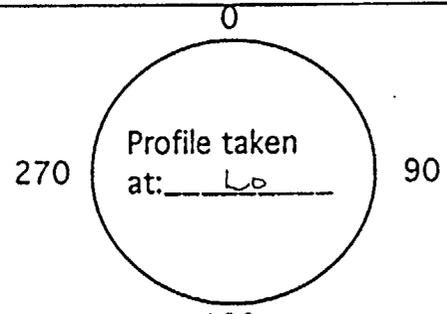
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Item No: 605.021.044

Examiner: <u>David K. [Signature]</u>	Level: <u>II</u>	Date: <u>01/30/01</u>
Reviewed By: <u>Sam Moss</u>	Level: <u>II</u>	Date: <u>2-1-01</u>
Authorized Inspector: <u>[Signature]</u>		Date: <u>5-7-01</u>



## DUKE POWER COMPANY ISI LIMITATION REPORT

FORM NDE-UT-4

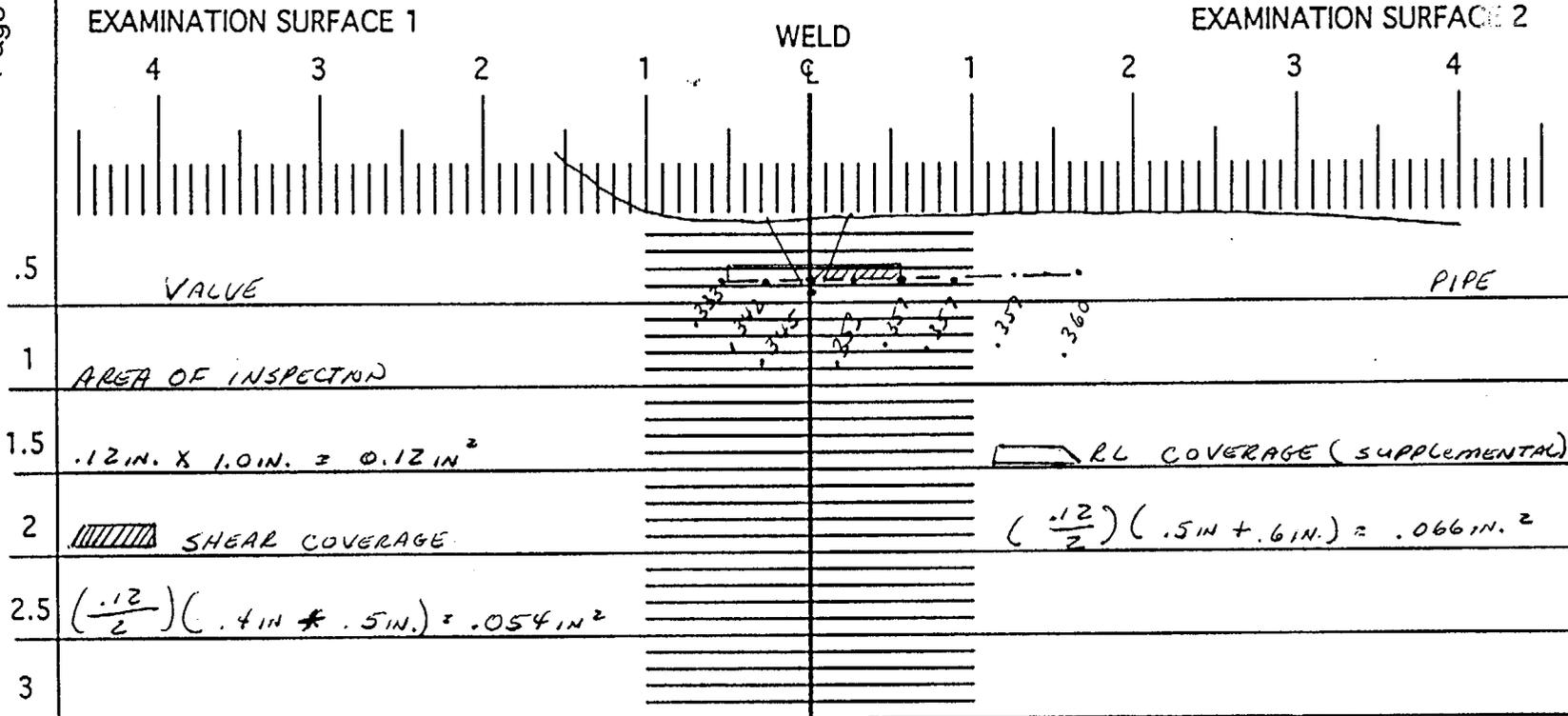
Revision 1

Component/Weld ID: 2HP-341-V1	Item No: C05.021.044	Remarks:		
<input checked="" type="checkbox"/> NO SCAN <input type="checkbox"/> LIMITED SCAN SURFACE <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2 BEAM DIRECTION <input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> cw <input type="checkbox"/> ccw FROM L <u>    </u> N/A <u>    </u> to L <u>    </u> N/A <u>    </u> INCHES FROM WO <u>    </u> CL <u>    </u> to <u>    </u> BEYOND <u>    </u> ANGLE: <input type="checkbox"/> 0 <input type="checkbox"/> 45 <input checked="" type="checkbox"/> 60 <input type="checkbox"/> Other <u>    </u> FROM <u>    </u> 0 <u>    </u> DEG to <u>    </u> 360 <u>    </u> DEG	DUE TO VALVE CONFIGURATIION			
<input type="checkbox"/> NO SCAN <input type="checkbox"/> LIMITED SCAN SURFACE <input type="checkbox"/> 1 <input type="checkbox"/> 2 BEAM DIRECTION <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> cw <input type="checkbox"/> ccw FROM L <u>    </u> to L <u>    </u> INCHES FROM WO <u>    </u> to <u>    </u> ANGLE: <input type="checkbox"/> 0 <input type="checkbox"/> 45 <input type="checkbox"/> 60 <input type="checkbox"/> Other <u>    </u> FROM <u>    </u> DEG to <u>    </u> DEG				
<input type="checkbox"/> NO SCAN <input type="checkbox"/> LIMITED SCAN SURFACE <input type="checkbox"/> 1 <input type="checkbox"/> 2 BEAM DIRECTION <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> cw <input type="checkbox"/> ccw FROM L <u>    </u> to L <u>    </u> INCHES FROM WO <u>    </u> to <u>    </u> ANGLE: <input type="checkbox"/> 0 <input type="checkbox"/> 45 <input type="checkbox"/> 60 <input type="checkbox"/> Other <u>    </u> FROM <u>    </u> DEG to <u>    </u> DEG				
<input type="checkbox"/> NO SCAN <input type="checkbox"/> LIMITED SCAN SURFACE <input type="checkbox"/> 1 <input type="checkbox"/> 2 BEAM DIRECTION <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> cw <input type="checkbox"/> ccw FROM L <u>    </u> to L <u>    </u> INCHES FROM WO <u>    </u> to <u>    </u> ANGLE: <input type="checkbox"/> 0 <input type="checkbox"/> 45 <input type="checkbox"/> 60 <input type="checkbox"/> Other <u>    </u> FROM <u>    </u> DEG to <u>    </u> DEG				
<input type="checkbox"/> NO SCAN <input type="checkbox"/> LIMITED SCAN SURFACE <input type="checkbox"/> 1 <input type="checkbox"/> 2 BEAM DIRECTION <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> cw <input type="checkbox"/> ccw FROM L <u>    </u> to L <u>    </u> INCHES FROM WO <u>    </u> to <u>    </u> ANGLE: <input type="checkbox"/> 0 <input type="checkbox"/> 45 <input type="checkbox"/> 60 <input type="checkbox"/> Other <u>    </u> FROM <u>    </u> DEG to <u>    </u> DEG				
Prepared By: David K. Zimmerman <i>David K. Zimmerman</i>	Level: II	Date: 1/30/01	Sketch(s) attached <input checked="" type="checkbox"/> yes <input type="checkbox"/> no	Sheet <u>4</u> of <u>6</u>
Reviewed By: <i>Gary Moss</i>	Date: <u>2-1-01</u>	Authorized Inspector: <i>S. Fain</i>	Date: <u>5-7-01</u>	

DUKE POWER COMPANY  
UT PROFILE/PLOT SHEET

NDE-UT-5

Revision 1



Component ID/Weld No. ZHP-341-V.1

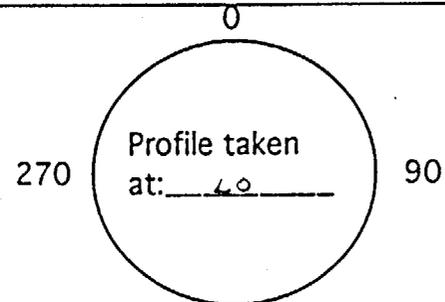
Remarks:

Item No: 005.021.044

Examiner: [Signature] Level: II Date: 1/30/01

Reviewed By: [Signature] Level: III Date: 2-1-01

Authorized Inspector: [Signature] Date: 5-7-01



180 Sheet 5 of 6

SHEET 6 OF 6

<b>DUKE POWER COMPANY</b>						NDE-91-1			
<b>Limited Examination Coverage Worksheet</b>						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					
.12 in. X 1.0 in. = 0.12 sq.in.				0.12 sq.in. X 9.03 in. = 1.08 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°	1	.054	9.03	0.49	1.08			
2	60°	2	0	9.03	0	1.08			
3	45°	CW	.12	9.03	1.08	1.08			
4	45°	CCW	.12	0.03	1.08	1.08			
		Shear Wave	Aggregate	Coverage	2.65	4.32	61.34		
	60°L	Supplemental	Coverage				0.00		
1	60°L	1	.066	9.03	0.6	1.08	55.56		
							0.00		

Shear Wave Aggregate Coverage = 61.34%  
Supplemental Coverage = 55.56% of 1 Scan ( 25%) = 13.89% of Total Weld

			Item No:	C05.021.044	
Prepared By:	David K. Zimmerman <i>David K. Zimmerman</i>	Level:	II	Date:	1/30/01
Reviewed By:	<i>Larry Mauldin</i>	Level:	III	Date:	2-1-01

ANII ~~5-7~~ Date 5-7  
HSBI&I Co.