



W. R. McCollum, Jr.  
Vice President

**Duke Power**

Oconee Nuclear Site  
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March 16, 2000


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

Subject: Duke Power Company  
Oconee Nuclear Station, Unit 2  
Docket Nos. 50-270  
Third Ten Year Inservice Inspection Interval  
Request for Relief No. 00-01

Pursuant to 10 CFR 50.55a(g)(6)(i), attached is a Request for Relief from the requirement to examine 100% of the volume specified by the ASME Boiler and Pressure Vessel Code, Section XI, 1989 Edition with no Addenda (as modified by Code Case N-460) and ASME Section V, Article 4, T-441.3.2, Scanning Requirements, 1989 Edition with no Addenda. This request is to allow Duke Power to take credit for limited ultrasonic examinations on specific Steam Generator Outlet Nozzle welds described in the attached request, in conjunction with hydrostatic tests and VT-2 visual inspections. During examination of the subject Unit 2 welds, the ultrasonic examination coverages did not meet the 90% examination requirements of Code Case N-460. Achievement of greater than 90% examination coverage for these welds is impractical due to piping/vessel geometry, interferences, and existing examination technology.

If there are any questions or further information is needed you may 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  
March 16, 2000  
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  
Atlanta, GA 30303

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  
Washington, DC 20555-0001

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 Power Company

Station Oconee Unit 2

10-YEAR INTERVAL REQUEST FOR RELIEF NO. 00-01

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

a. Pressurizer Nozzle-to-Vessel Welds:

2-PZR-WP34 Item Number B03.110.002  
2-PZR-WP33-3 Item Number B03.110.003  
2-PZR-WP33-2 Item Number B03.110.004  
2-PZR-WP33-1 Item Number B03.110.005

b. Steam Generator (Primary Side) Nozzle-to-Vessel Weld:

2-SGB-WG25 Item Number B03.130.006

c. Steam Generator (Primary Side) Nozzle Inside Radius Section:

2-SGB-WG25 Item Number B03.140.006

II. Code Requirement:

Figure IWB-2500-7, Examination Category B-D, Full Penetration Welds Of Nozzles In Vessels - Inspection Program B.

III. Code Requirement from which Relief is Requested:

Relief is requested from the requirement of examining essentially 100% of the weld length. The applicable code required is ASME Section V, Article 4, T-441.3.2, Scanning Requirements, 1989 Edition with no Addenda as modified by Code Case N-460. Due to part geometry and actual physical barriers, obtaining greater than 90% coverage of the required volume as outlined in Code Case N-460 is not possible with existing limitations.

The specified Code requirements identified in Section II of this request, require scanning of the examination volume(s) using three angle beams and a straight beam from both sides of the weld. When scanning for reflectors parallel to the weld, the angle beams shall be aimed at right angles to the weld axis, with the search unit(s) manipulated so that the ultrasonic beams pass through the entire volume of weld metal. The adjacent base metal in the examination volume must be completely scanned by both angle beams from both directions (any combination of two angle beams will satisfy the requirement).

When scanning for reflectors transverse to the weld, the angle beam search units shall be aimed parallel to the axis of longitudinal and circumferential welds. The search unit shall be manipulated so that the ultrasonic beams pass through all of the examination volume.

Scanning shall be done in two directions 180 degrees to each other to the extent possible. Areas blocked by geometric conditions shall be examined from at least one direction.

Code Case N-460 allows credit for full volume coverage if it can be shown that more than 90% of the required volume has been examined.

#### IV. Basis for Relief:

Pressurizer Nozzle-to-Vessel Weld 2-PZR-WP34 (Item Number B03.110.002) was examined to the maximum extent practical using ultrasonic techniques in accordance with the requirements of ASME Section XI, Appendix I 1989 Edition, and Appendix VIII of the 1992 Edition with the 1993 Addenda as modified by the Performance Demonstration Initiative (PDI). Reference Attachment A for a drawing of the Pressurizer.

This weld is limited to 36% coverage of the required volume because single sided access of the nozzle configuration. In order to achieve more coverage, the nozzles would have to be re-designed to allow scanning from both sides of the weld.

Pressurizer Nozzle-to-Vessel Welds 2-PZR-WP33-3 2-PZR-WP33-2 and 2-PZR-WP33-1 (Item Numbers B03.110.003 B03.110.004 and B03.110.005 respectively) 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 and Appendix VIII of the 1992 Edition with the 1993 Addenda as modified by the PDI. Reference Attachment A for a drawing of the Pressurizer.

These welds are 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 nozzles would have to be re-designed to allow scanning from both sides of the weld.

Steam Generator Nozzle-to-Vessel Weld 2-SGB-WG25 (Item Number B03.130.006) was examined to the maximum extent practical using ultrasonic techniques in accordance with the requirements of ASME Section V, Article 4, and ASME Section XI, Appendix I, of the 1989 Edition.

This weld is limited to 58% coverage of the required volume because of the nozzle configuration. In order to achieve more coverage, the nozzles would have to be re-designed to allow scanning from both sides of the weld. Reference Attachment B for a drawing of the Steam Generator.

Steam Generator Nozzle-to-Vessel Inside Radius Section for weld 2-SGB-WG25 (Item Number B03.140.006) was examined to the maximum extent practical using ultrasonic techniques in accordance with the requirements of ASME Section V, Article 4, and ASME Section XI, Appendix I, of the 1989 Edition.

The Inside Radius Section is limited to 70.21% coverage of the required volume because of the nozzle configuration. In order to achieve more coverage, the nozzles would have to be re-designed to allow scanning from both sides of the weld. Reference Attachment B for a drawing of the Steam Generator.

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.

Duke Energy proposes to use the 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, leakage is also monitored by a level indicator in the Reactor Building normal sump. 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 modified by the PDI will be used to examine welds within the scope of the PDI Program. This will provide reasonable assurance of weld/component integrity. Thus, an acceptable level of quality and safety will have been achieved, and public health and safety will not be endangered by allowing relief from the aforementioned Code requirements.

VI. Justification for the Granting of Relief:

Duke Power Company will continue to ultrasonically examine the welds, including inside radius, 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 public health and safety will not be endangered by allowing relief from the aforementioned Code requirements.

The Code requires 100% volumetric examination of all Pressurizer Nozzle-to-Vessel Welds, Steam Generator Nozzle-to-Vessel Weld and Steam Generator Nozzle-to-Vessel Inside Radius Section. However, the taper on the nozzle side of the weld restricts scanning and prevents complete volumetric coverage of Pressurizer Nozzle-to-Vessel Welds 2-PZR-WP34, 2-PZR-WP33-3, and 2-PZR-WP33-2 and 2-PZR-WP33-1; and Steam Generator Nozzle-to-Vessel Weld and Inside Radius for weld 2-SGB-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 create a considerable burden on Duke Energy.

Duke Energy obtained 36% coverage of Pressurizer Nozzle-to-Vessel Weld 2-PZR-WP34 and 37.1% coverage of Pressurizer Nozzle-to-Vessel welds 2-PZR-WP33-3, 2-PZR-WP33-2 and 2-PZR-WP33-1; and 58% coverage of the Steam Generator Nozzle-to-Vessel weld and 70.21% coverage of the inside radius of Steam Generator weld 2-SGB-WG25. 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.

Pursuant to 10 CFR 50.55a(g)(6)(i), granting this relief will provide reasonable assurance of weld/component integrity, ... "is authorized by law and will not endanger life or property or the common defense and security and is otherwise in the public interest giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility."

#### VII. Implementation Schedule:

Unit 2, Refueling Outages 17



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

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

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

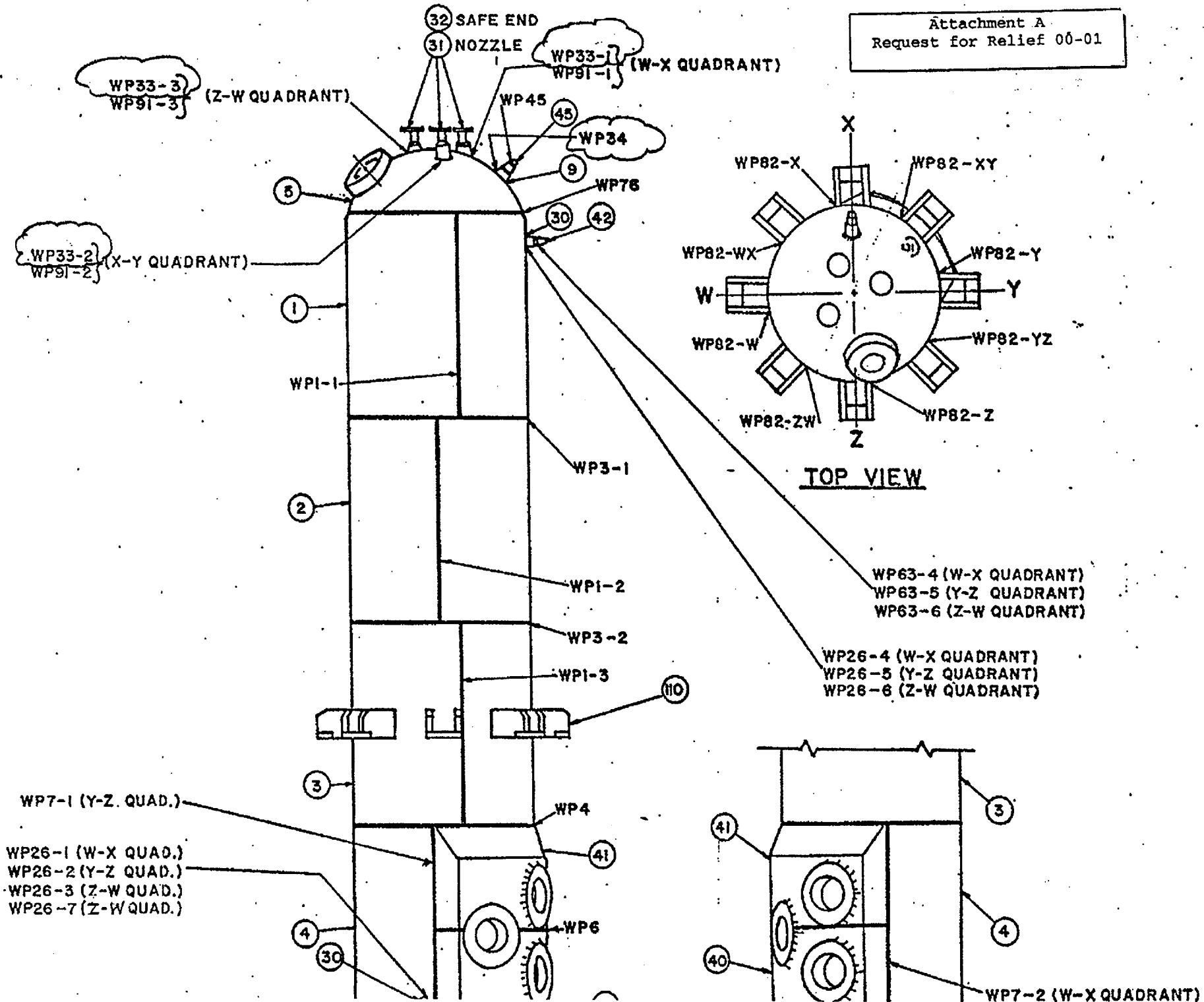
J. J. McArdle III, NDE Level III provided input for Sections III, IV, and V of this request.

R. G. Rouse, Oconee ISI Plan Manager compiled and completed this request.

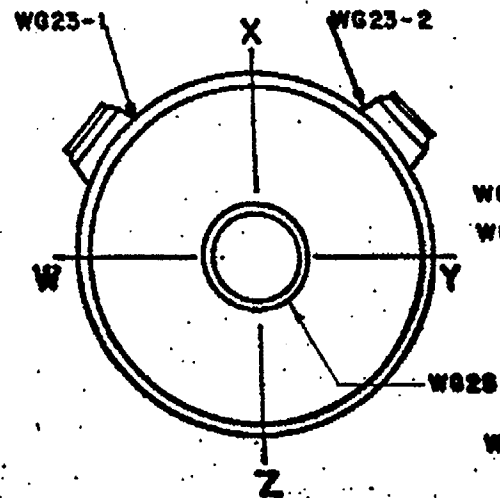
Sponsored By: RC Rouse Date: 2/14/00

Approved By: R. Kevin Rhyme Date: 2/16/00

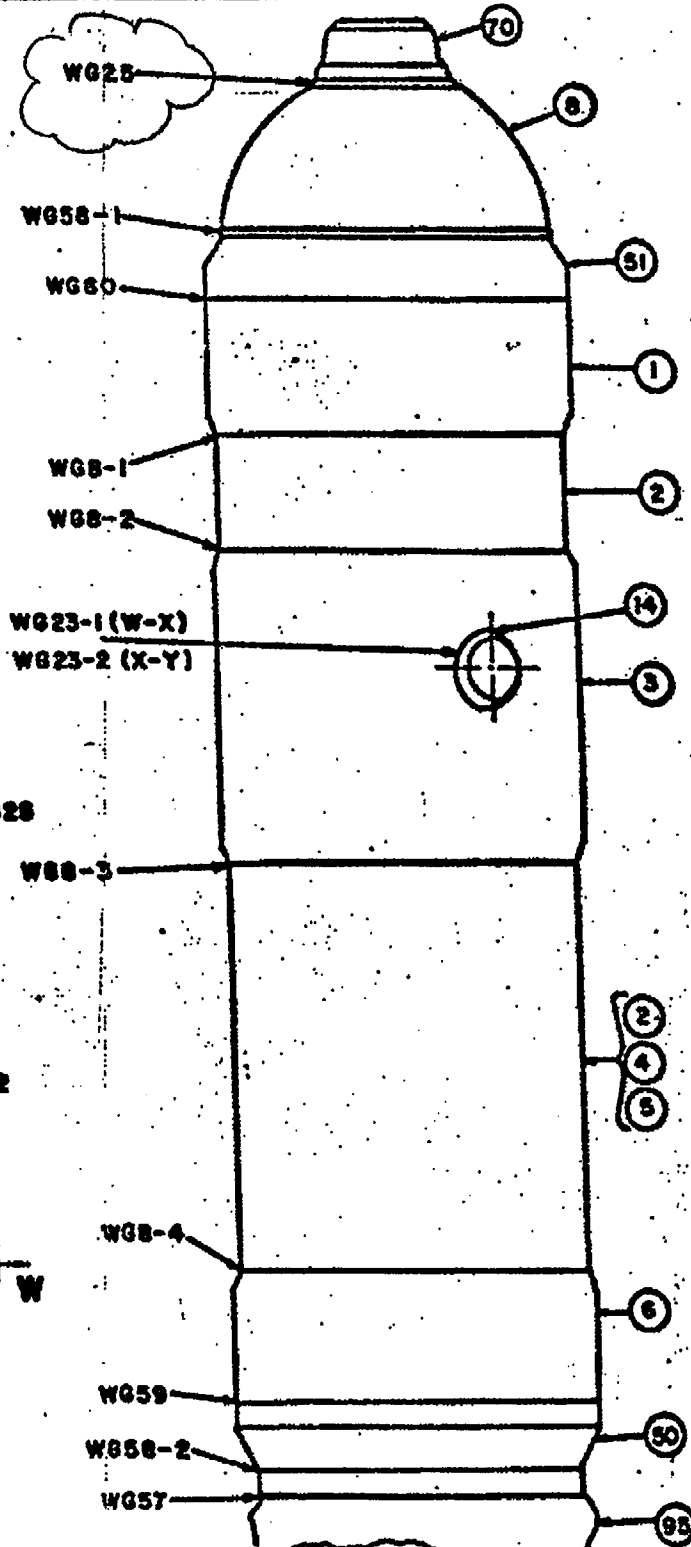
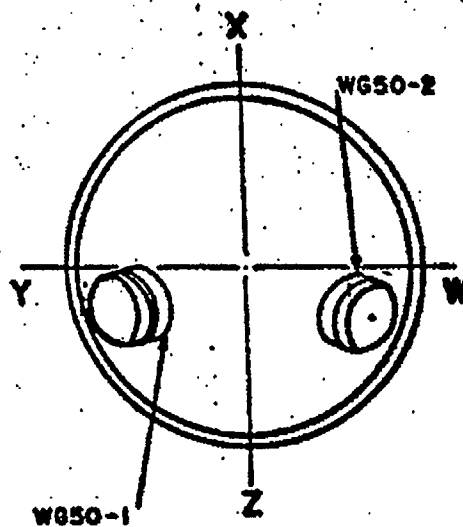
Attachment A  
Request for Relief 00-01



Attachment B  
Request for Relief 00-01



TOP VIEW



## 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>Z-PER-WP34</u>	Date: <u>12/2/99</u>
Weld Length (in.): <u>24.4"</u>	Surface Condition: <u>AS GROUND</u>	Lo <u>9.2.3</u>	Exam Start: <u>1430</u>
			Exam Finish: <u>1530</u>

Procedure No: <u>NDE-620</u>  Revision: <u>8</u>  FC <u>N/A</u>	Scans 70° <u>58</u> dB Zone I    60° <u>80</u> dB Zone II 60° <u>80</u> dB Zone III Axial 60° <u>80</u> dB Zone III Circ.	Configuration <u>NOZZLE TO J. HEAD</u>  Scan Surface: OD	Surface Temp. <u>73 ° F</u> Pyrometer s/n: <u>MCNDE-27010</u> Cal. Due Date: <u>4/27/00</u>	Calibration Sheet No: <u>9902106</u> <u>9902107</u> <u>9902108</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>NRI</u>	<u>70°</u>								

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

Examiner: [Signature] Level: II Date: 12/2/99 Examiner: Jay Moss Level: II Date: 12-3-99 Item No: B03.110.002

Reviewed by: [Signature] Level: II Date: 12/3/99 Authorized Inspector: MBC Date: 12-6-99

Attachment C  
Page 1 of 52  
Request for Relief 00-01

**DUKE POWER COMPANY  
ISI LIMITATION REPORT**

FORM NDE-UT-4

Revision 1

Component/Weld ID: 2-PZR-WP34

Item No: B03.110.002

Remarks:

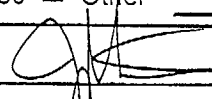
NO SCAN                      SURFACE                      BEAM DIRECTION  
 LIMITED SCAN                       1  2                       1  2  cw  ccw  
 FROM L   N/A   to L   N/A   INCHES FROM WO   C/L   to   Beyond    
 ANGLE:  0  45  60  Other   70°   FROM   0   DEG to   360   DEG

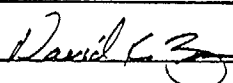

Nozzle Configuration

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: Jay Eaton  Level: II Date: 12/2/99 Sketch(s) attached  yes  no Sheet   2   of   9  

Reviewed By:  Date:   12/3/99   Authorized Inspector:  Date:   12-6-99  

Attachment C  
Page 2 of 52  
Request for Relief 00-01

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

**Examination Volume/Area Defined**

Base Metal    
  Weld    
  Near Surface    
  Bolting    
  Inner Radius

Area Calculation	Volume Calculation

Coverage Calculations							
Scan #	Angle	Beam Direction	Area Examined (sq.in.)	Length Examined (in.)	Volume Examined (cu.in.)	Volume Required (cu.in.)	Percent Coverage
	70				34.1		0.00
	60				37.8		0.00
							0.00

Aggregate %      $71.9 / 2 = 35.95 = 36\%$

	Item No:	B03.110.002
Prepared By: Larry Mauldin <i>Larry Mauldin</i>	Level: III	Date: 12/2/99
Reviewed By: <i>David K. [Signature]</i>	Level: II	Date: 12/3/99

<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>
(See Exam Area Drwg.)  Zone 1                      7.4 sq.in.	7.4 sq.in. X 24.4 in. = 180.56 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	2	3.6	24.4	87.84	180.56	48.65
2	70	1	1.3	24.4	31.72	180.56	17.57
3	70	CW	2.6	24.4	63.44	180.56	35.14
4	70	CCW	2.6	24.4	63.44	180.56	35.14
					246.44	722.24	34.12

34.1%

		Item No: B03.110.002
Prepared By: Larry Mauldin <i>Larry Mauldin</i>	Level: III	Date: 12/2/99
Reviewed By: <i>David K. [Signature]</i>	Level: II	Date: 12/3/99

<b>DUKE POWER COMPANY</b> <b>Limited Examination Coverage Worksheet</b>	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 Exam Area Drwg.)  Zone 2 & 3                      23.2 sq.in.	23.2 sq.in. X 24.4 in. = 566.08 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	2	19.8	24.4	483.12	566.08	85.34
2	60	1	.1	24.4	2.44	566.08	0.43
3	60	CW	7.6	24.4	185.44	566.08	32.76
4	60	CCW	7.6	24.4	185.44	566.08	32.76
					856.44	2264.32	37.82

37.8%

	Item No:	B03.110.002
Prepared By: Larry Mauldin <i>Larry Mauldin</i>	Level: III	Date: 12/2/99
Reviewed By: <i>David K. Z...</i>	Level: II	Date: 12/3/99

5079



# OCONEE PRESSURE SPRAY NOZZLE

## EXAM AREAS:

### ZONE 1:

$$ABHG = 2.9" \times 1.0" = 2.9 \text{ sq. in.}$$

$$HG MN = \pi 4.5^2 - \pi 3.5^2 \times 14.7\% = 3.69 \text{ sq. in.}$$

$$LMNO = \frac{1.0"}{2} (.55 + 1.15) = .85 \text{ sq. in.}$$

$$7.44 = \underline{\underline{7.4 \text{ sq. in.}}}$$

### ZONE 2 & 3:

$$BCJE - DEF = \frac{3.8}{2} (6.0 + 4.0) - \frac{.45 \times .5}{2} = 20.03 \text{ sq. in.}$$

$$IJKL = \frac{.15}{2} (3.0 + 3.2) = .47 \text{ sq. in.}$$

$$GIM = \frac{4.1 \times 1.3}{2} = 2.67 \text{ sq. in.}$$

$$23.17 = \underline{\underline{23.2 \text{ sq. in.}}}$$

Note: AREA HG MN HAS  
A MULTIPLIER OF 14.7%.  
ZONE 1 RADIUS IS  
53° WHICH IS 14.7%  
of 360°.

ITEM # 303.110.002  
I.D.# 2, PCR-W/P34  
34: LAM Mouldki  
DATE: 12-2-99

SCALE = 1.0" = 1.0"

- FULL COVERAGE  
 - PARTIAL COVERAGE  
 - NO COVERAGE

Pg. 6 of Pg. 9

CONE PRESSURE SPRAY NOZZLE

70° ZONE 1 EXAM

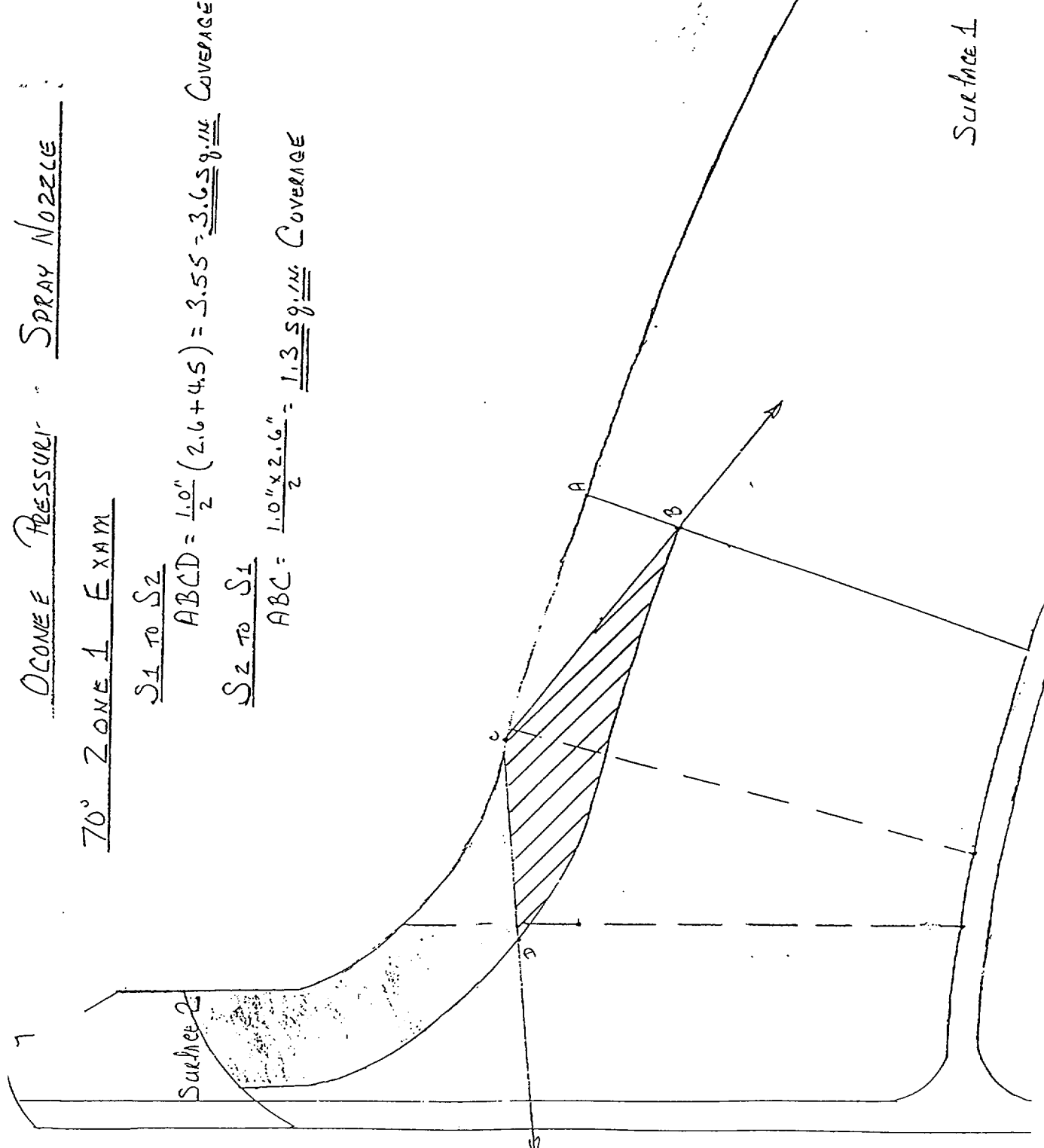
S1 TO S2

$$ABCD = \frac{1.0''}{2} (2.6 + 4.5) = 3.55 = \underline{\underline{3.6 \text{ sq. in. COVERAGE}}}$$

S2 TO S1

$$ABC = \frac{1.0'' \times 2.6''}{2} = \underline{\underline{1.3 \text{ sq. in. COVERAGE}}}$$

...



ITEM # B03.110.002  
 I.D. # 2-P22-KP3P  
 BY: John Novels  
 DATE: 12-2-99

SCALE = 1.0" = 1.0'  
 - FULL COVERAGE  
 - PARTIAL COVERAGE  
 - NO COVERAGE  
 Pg. 7 of Pg. 9

Surface 1

OCONEE PRESSURE SPRAY NOZZLE

60° ZONE 2 & 3 EXAM

S1 TO S2

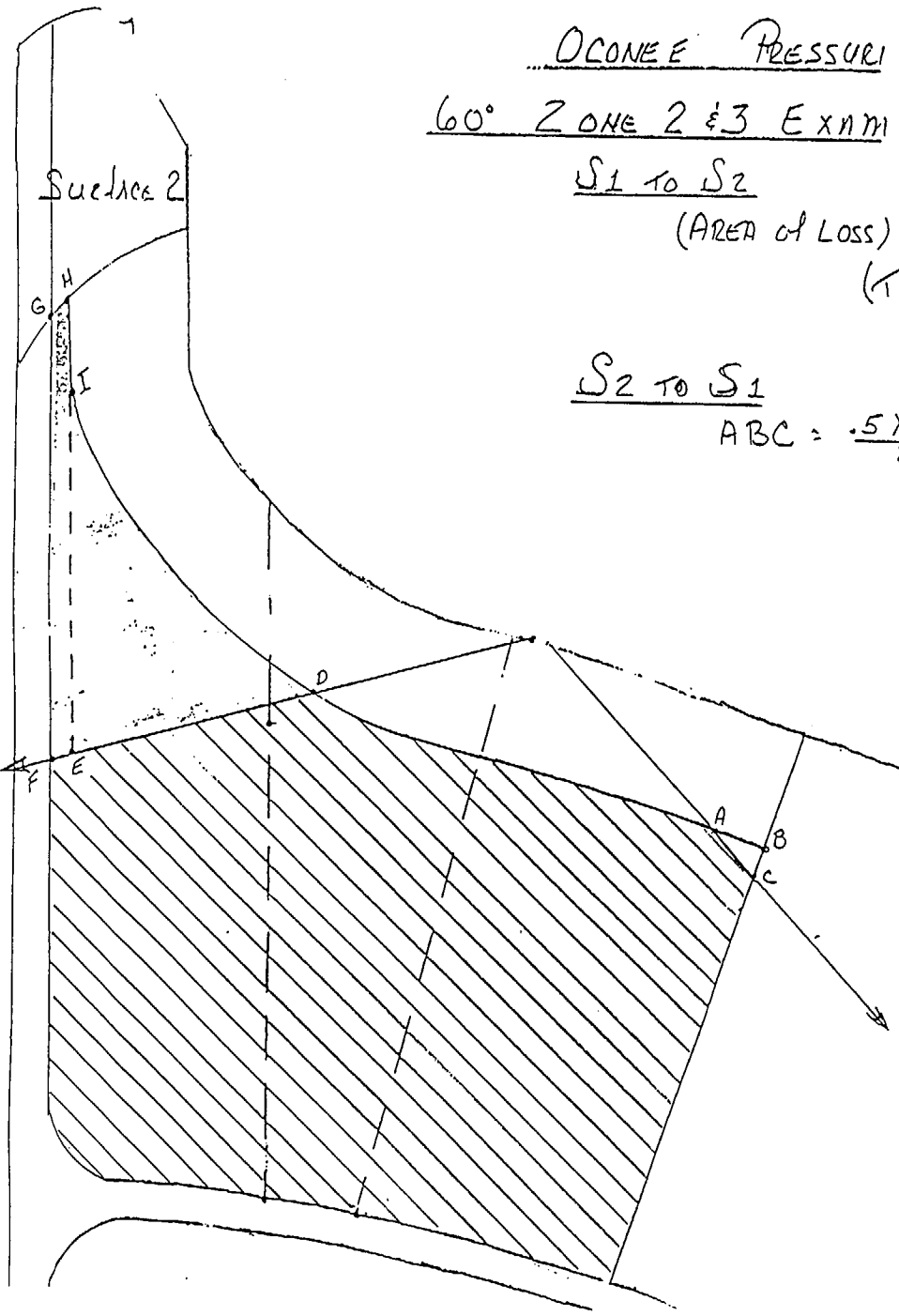
(AREA OF LOSS)  $DEI + EFGH = \frac{2.9" \times 2.0"}{2} + \frac{.15"}{2} (3.5 + 3.6) = 3.43 = 3.4 \text{ sq. in.}$

(TOTAL AREA)  $23.2 \text{ sq. in.} - (\text{LOSS}) 3.4 \text{ sq. in.} =$

COVERAGE 19.8 sq. in.

S2 TO S1

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



ITEM # B03.110.002  
 I.D.# 2-P2R-WP34  
 BY: Low-Maulds  
 DATE: 12-2-99

SCALE = 1.0" = 1.0"  
 □ - FULL COVERAGE  
 ▨ - PARTIAL COVERAGE  
 ▩ - NO COVERAGE  
 Pg. 8 of Pg. 9

SURFACE 1

OCONEE PRESSURE SPRAY NOZZLE

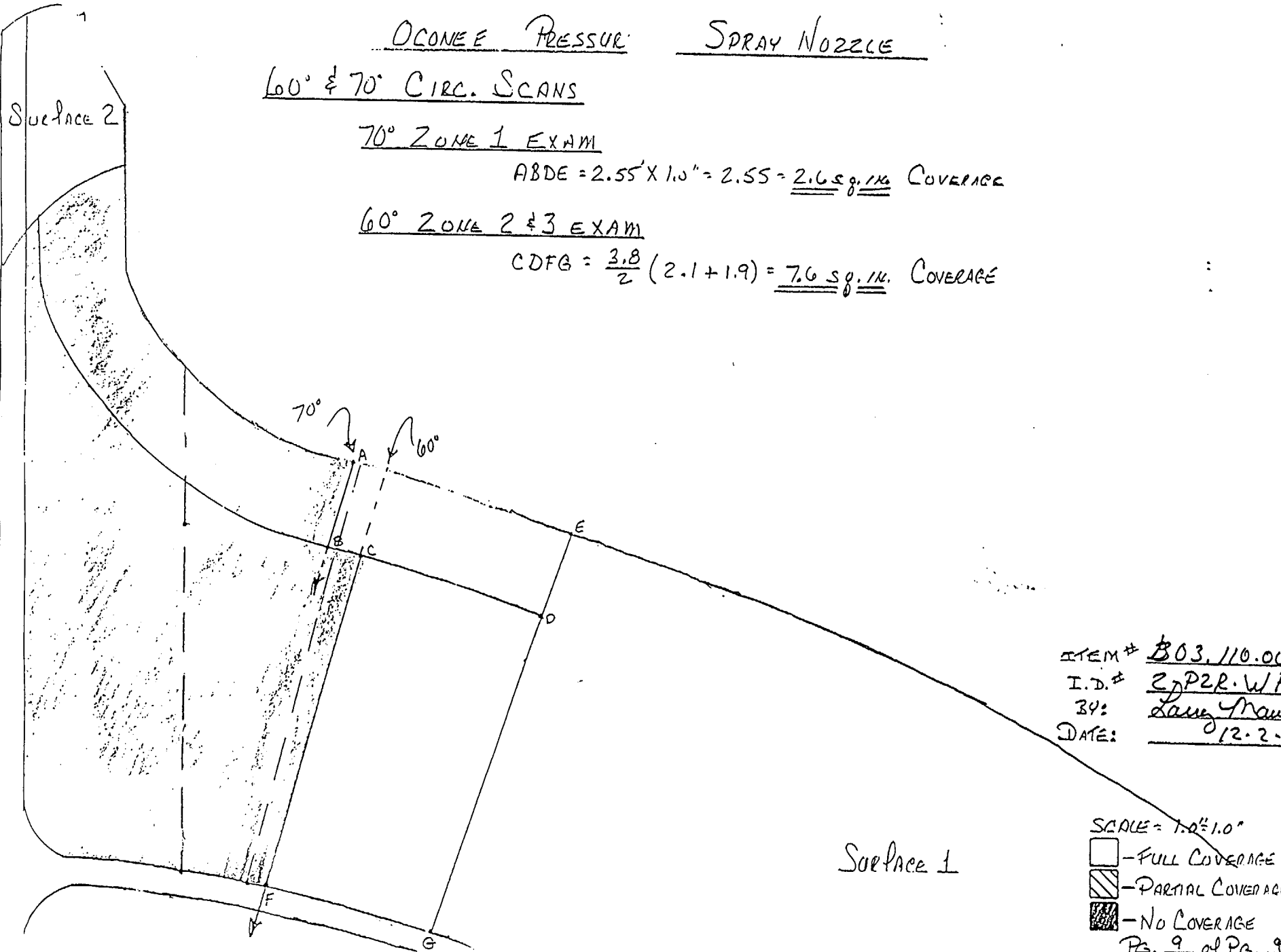
60° & 70° CIRC. SCANS

70° ZONE 1 EXAM

$ABDE = 2.55' \times 1.0" = 2.55 = \underline{\underline{2.6 \text{ sq. ft.}}}$  COVERAGE

60° ZONE 2 & 3 EXAM

$CDFG = \frac{3.8}{2} (2.1 + 1.9) = \underline{\underline{7.6 \text{ sq. ft.}}}$  COVERAGE



ITEM# B03.110.002  
 I.D.# ZPP2R.WP34  
 BY: Larry Mauldin  
 DATE: 12.2.99

Surface 1

- SCALE = 1.0" = 1.0'
- FULL COVERAGE
  - PARTIAL COVERAGE
  - NO COVERAGE
- Pg. 9 of Pg. 9

## DUKE POWER COMPANY

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

Station: OCONEE Unit: Z Component/Weld ID: Z-PER-WP33-3 Date: 12/2/99  
 Weld Length (in.): 21.6" Surface Condition: AS GROUND Lo 9.2.3 Exam Start: 1430 Exam Finish: 1530

Procedure No:  
NDE-620  
Revision: 8  
FC N/A

Scans  
70° 58 dB Zone I 60° 80 dB Zone II  
60° 80 dB Zone III Axial  
60° 80 dB Zone III Circ.

Configuration  
NOZZLE TO J. HEAD  
Scan Surface: OD

Surface Temp. 73 ° F  
Pyrometer s/n: MCNDE-27010  
Cal. Due Date: 4/27/00

Calibration Sheet No:  
9902106  
9902107  
9902108

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>NRI</u>	<u>70°</u>								

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

Examiner: [Signature] Level: II Date: 12/2/99 Examiner: Mary Moss Level: II Date: 12-2-99 Item No: B03.110.003  
 Reviewed by: [Signature] Level: II Date: 12/3/99 Authorized Inspector: [Signature] Date: 12-6-99

Attachment C  
Page 10 of 52  
Request for Relief 00-01

**DUKE POWER COMPANY  
ISI LIMITATION REPORT**

FORM NDE-UT-4

Revision 1

Component/Weld ID: 2-PZR-WP33-3

Item No: B03.110.003

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   C/L   to   Beyond    
 ANGLE:  0  45  60  Other   70°                        FROM   0   DEG to   360   DEG

Nozzle Configuration

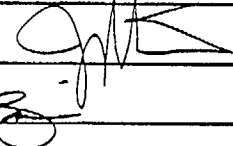
NO SCAN                      SURFACE                      BEAM DIRECTION  
 LIMITED SCAN                       1  2                       1  2  cw  ccw  
 FROM L   N/A   to L   N/A                        INCHES FROM WO   C/L+10"   to   Beyond    
 ANGLE:  0  45  60  Other   70                        FROM   190   DEG to   230   DEG

Lifting Lug

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: Jay Eaton



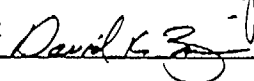
Level: II

Date: 12/2/99

Sketch(s) attached  yes  no

Sheet   2   of   9  

Reviewed By:



Date:   12/3/99  

Authorized Inspector:



Date:   12-6-99  

Attachment C  
 Page 11 of 52  
 Request for Relief 00-01

<b>DUKE POWER COMPANY</b> <b>Limited Examination Coverage Worksheet</b>	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

Coverage Calculations							
Scan #	Angle	Beam Direction	Area Examined (sq.in.)	Length Examined (in.)	Volume Examined (cu.in.)	Volume Required (cu.in.)	Percent Coverage
	60				38.7		0.00
	70				35.5		0.00
					72.2		0.00

Aggregate %      74.2 / 2 = 37.1%

		Item No:	B03.110.003
Prepared By:	Larry Mauldin <i>Larry Mauldin</i>	Level:	III      Date: 12/2/99
Reviewed By:	<i>Daniel C. [Signature]</i>	Level:	II      Date: 12/3/99

3 of 9

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

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 Exam Area Drwg.)  Zone 2 & 3                      23.6 sq.in.	23.6 sq.in. X 21.6 in. = 509.76 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	2	19.2	21.6	414.72	509.76	81.36
2	60	1	.1	21.6	2.16	509.76	0.42
3	60	CW	8.6	21.6	185.76	509.76	36.44
4	60	CCW	8.6	21.6	185.76	509.76	36.44
					788.4	2039.04	38.67

38.7%

		Item No: B03.110.003
Prepared By: Larry Mauldin	<i>Larry Mauldin</i>	Level: III                      Date: 12/2/99
Reviewed By: <i>David K. [Signature]</i>	Level: II	Date: 12/3/99

4 of 9



<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 Exam Area Drwg.)  Zone 1                      7.4 sq.in.	7.4 sq.in. X 21.6 in. = 159.84 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	2	3.7	21.6	79.92	159.84	50.00
2	70	1	1.4	21.6	30.24	159.84	18.92
3	70	CW	2.7	21.6	58.32	159.84	36.49
4	70	CCW	2.7	21.6	58.32	159.84	36.49
					226.8	639.36	35.47

35.5%

		Item No: B03.110.003
Prepared By: Larry Mauldin	<i>Larry Mauldin</i>	Level: III                      Date: 12/2/99
Reviewed By:	<i>David K. Fry</i>	Level: II                      Date: 12/3/99

OZONE SURIZER RELIEF NOZZLE

EXAM AREAS

ZONE 1

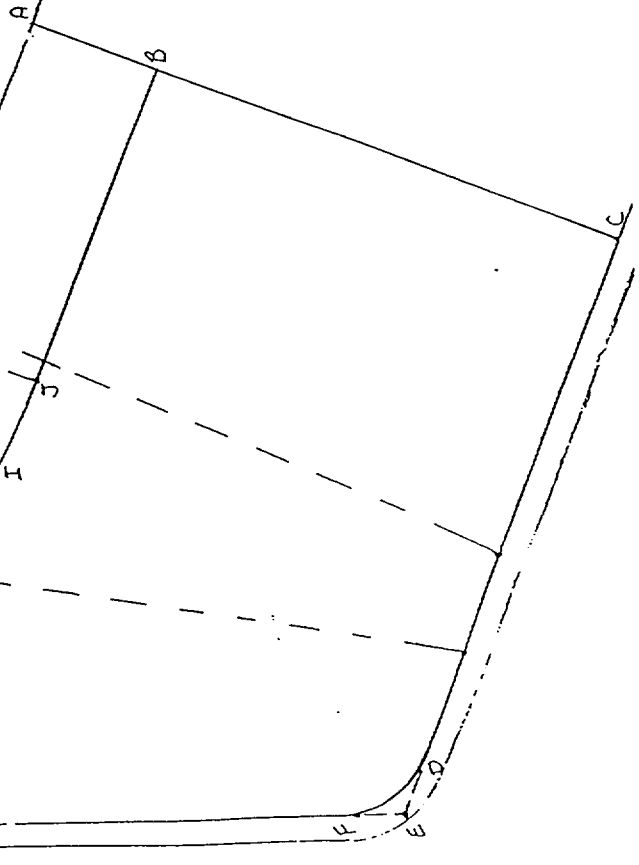
$ABKJ = 2.5'' \times 1.0'' = 2.5 \text{ sq. in.}$   
 $JKLM = \pi \times 3\frac{1}{4}''^2 \times 18.9\% = 3.26 \text{ sq. in.}$   
 $LMOP = \frac{1.0''}{2} (1.5 + 1.75) = 1.63 \text{ sq. in.}$

$7.39 \text{ sq. in.} = \underline{\underline{7.4 \text{ sq. in.}}}$

ZONE 2 & 3

$BLEG - DEF = \frac{3.75}{2} (6.2 + 4.7) - \frac{4 \times 4 \times 4}{2} = 20.35 \text{ sq. in.}$   
 $GHNO = \frac{1.0''}{2} (1.8 + 3.2) = 2.5 \text{ sq. in.}$   
 $HIM = \frac{2.9 \times .55}{2} = .79 \text{ sq. in.}$

$23.64 = \underline{\underline{23.6 \text{ sq. in.}}}$



Note:

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

SCALE 1.0" = 1.0"

- FULL COVERAGE
- PARTIAL COVERAGE
- NO COVERAGE

ITEM # 303-110.003  
 I.D.# PER. WP 33.3  
 BY: Louie Mauldin  
 DATE: 9-2-95

Surface 1

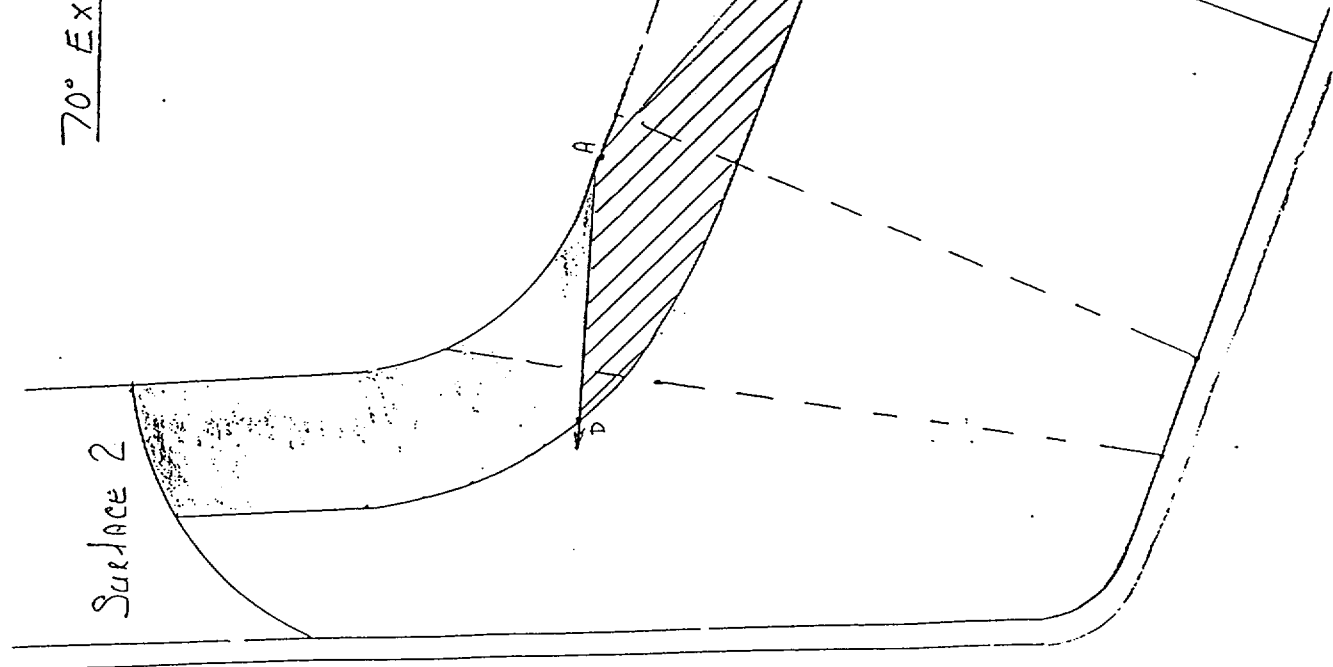
Page 6 of Page 9

UCONEE - SURIZED RELIEF NOZZLE

70° EXAM ZONE 1

S<sub>1</sub> TO S<sub>2</sub>: ABCD =  $\frac{10''}{2} (2.7 + 4.6) = 3.65 = 3.759$  IN

S<sub>2</sub> TO S<sub>1</sub>: ABC =  $\frac{2.7 \times 1.0}{2} = 1.35 = 1.459$  IN



SCALE 1.0" = 1.0"  
- FULL COVERAGE  
- PARTIAL COVERAGE  
- NO COVERAGE

ITEM # B03.116.003  
I.D.# ZPER WP 33.3  
BY: Louis Mandlin  
DATE: 12/2/99

PG. 7 of PG. 9

OCONEE SURIZER RELIEF NOZZLE

60° EXAM ZONE 2 & 3

SURFACE 2

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

$$(AREA OF LOSS) DEHI + EFG = \frac{10}{2} (2.6 + 3.7) + \frac{2.1 \times 1.1}{2} = 4.4 \text{ sq. in.}$$

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

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

$$ABC = \frac{.5 \times .25}{2} \times .06 = \underline{\underline{.159 \text{ in.}}}$$

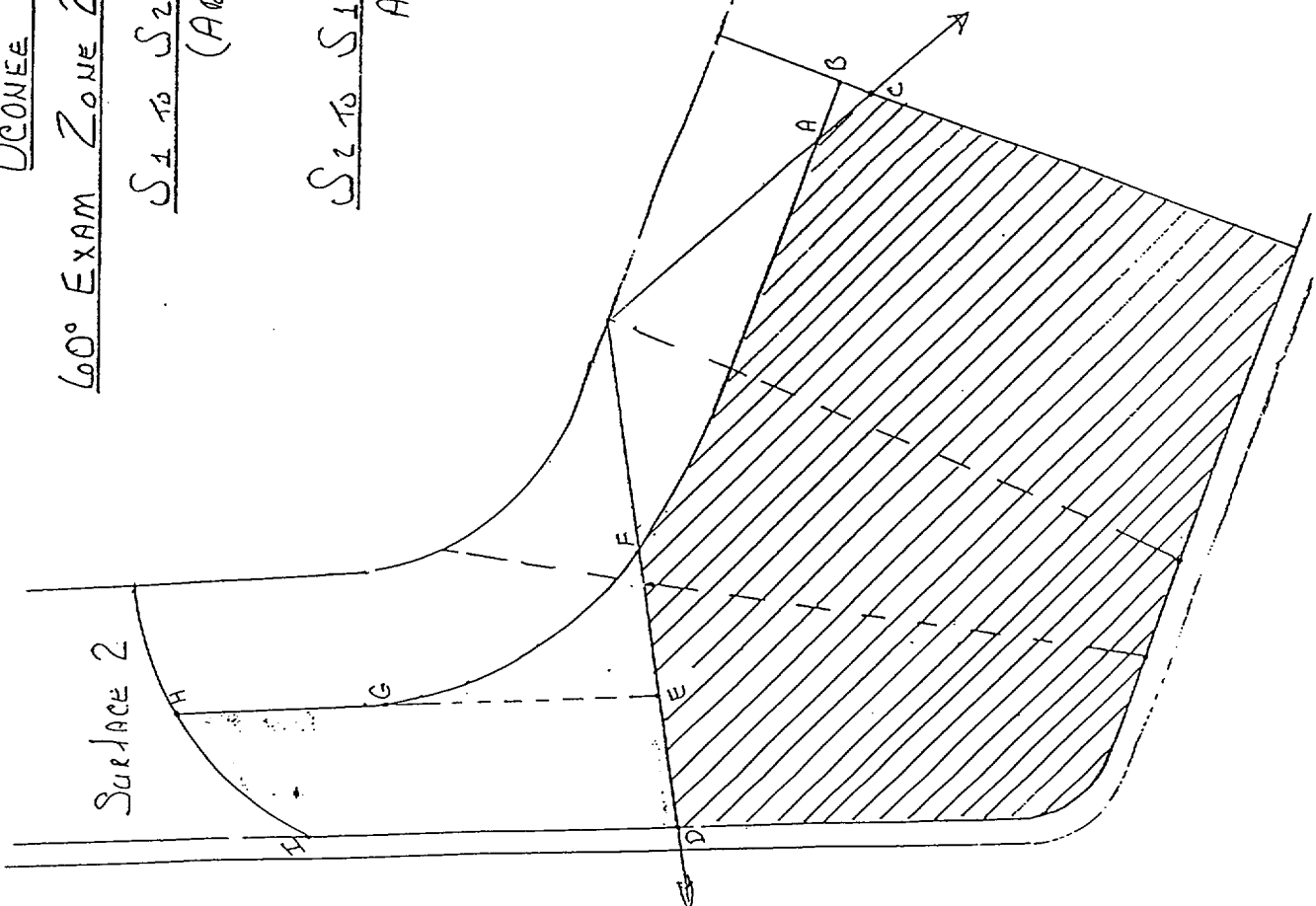
SCALE 1.0" = 1.0"

- FULL COVERAGE  
 - PARTIAL COVERAGE  
 - NO COVERAGE

ITEM # BOB 110.001  
 I.D. # 2 PRR WP. 33-3  
 BY: Raymond  
 DATE: 12-8-99

SURFACE 1

PG. 8 of PG. 9



OCONEE SURFIZER RELIEF NOZZLE

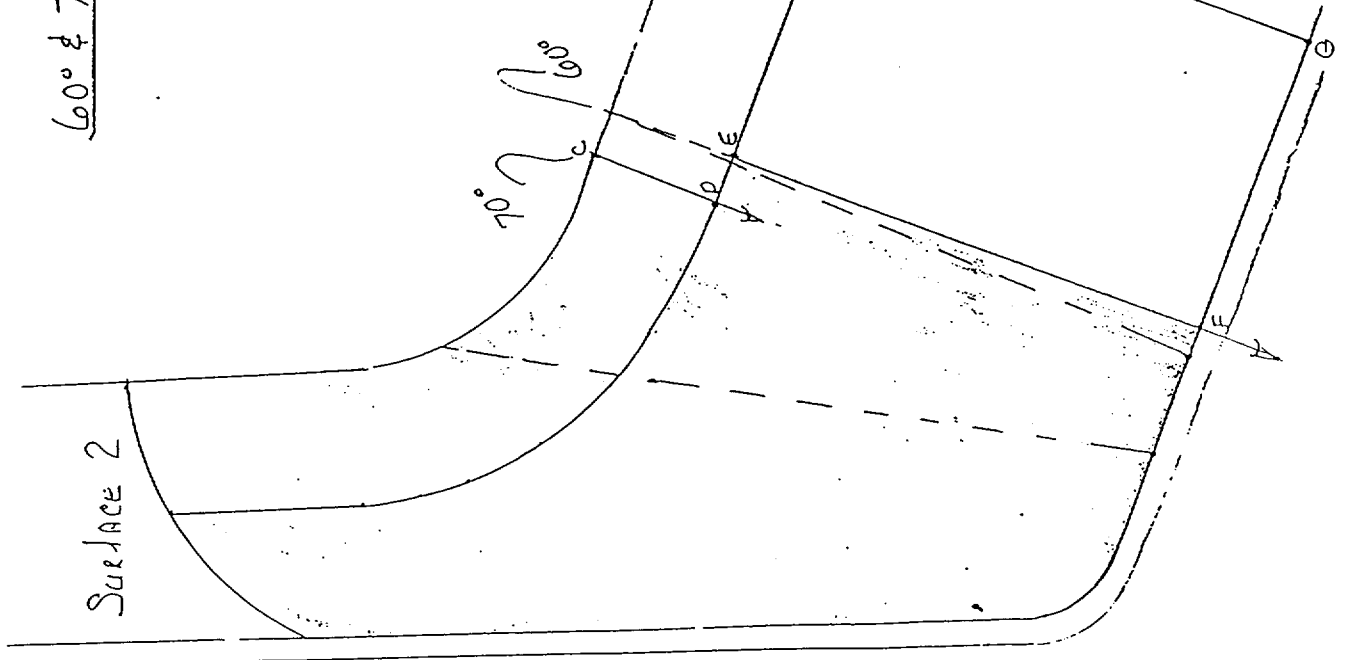
60° & 70° CIRC. SCANS

70° ZONE 1

ABCD 2.7' x 1.0" = 2.7 sq. ft. COVERAGE

60° ZONE 2 & 3

BEFG 2.3' x 3.75" = 8.625 sq. ft. COVERAGE



SCALE 1.0" = 1.0"  
 - FULL COVERAGE  
 - PARTIAL COVERAGE  
 - NO COVERAGE

ITEM # BOJ. 110.003  
 I.D. # ZPER-VP-33.3  
 BY: Levy Howell  
 DATE: 12-2-99

Page 9 of Page 9

## 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>Z-PER-WP33-2</u>	Date: <u>12/2/99</u>
Weld Length (in.): <u>21.6"</u>	Surface Condition: <u>AS GROUND</u>	Lo <u>9.2.3</u>	Exam Start: <u>1430</u>
			Exam Finish: <u>1530</u>

Procedure No: <u>NDE-620</u>  Revision: <u>8</u>  FC <u>N/A</u>	Scans 70° <u>58</u> dB Zone I    60° <u>80</u> dB Zone II 60° <u>80</u> dB Zone III Axial 60° <u>80</u> dB Zone III Circ.	Configuration <u>NOZZLE TO J. HEAD</u>  Scan Surface: OD	Surface Temp. <u>73 ° F</u> Pyrometer s/n: <u>MCJDE-27010</u> Cal. Due Date: <u>4/27/00</u>	Calibration Sheet No: <u>9902106</u> <u>9902107</u> <u>9902108</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>NRI</u>	<u>70°</u>								

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

Examiner: [Signature]    Level: II    Date: 12/2/99    Examiner: [Signature]    Level: II    Date: 12-2-99    Item No: B03.110.064

Reviewed by: [Signature]    Level: II    Date: 12/3/99    Authorized Inspector: [Signature]    Date: 12-6-99

Attachment C  
Page 19 of 52  
Request for Relief 00-01

**DUKE POWER COMPANY  
ISI LIMITATION REPORT**

FORM NDE-UT-4

Revision 1

Component/Weld ID: 2-PZR-WP33-2

Item No: B03.110.004

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   C/L   to   Beyond    
 ANGLE:  0  45  60  Other   70°                        FROM   0   DEG to   360   DEG

Nozzle Configuration

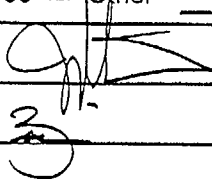
NO SCAN                      SURFACE                      BEAM DIRECTION  
 LIMITED SCAN                       1  2                       1  2  cw  ccw  
 FROM L   N/A   to L   N/A                        INCHES FROM WO   C/L+5"   to   Beyond    
 ANGLE:  0  45  60  Other   70                        FROM   160   DEG to   200   DEG

Lifting Lug

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: Jay Eaton



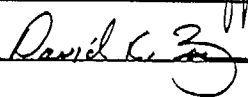
Level: II

Date: 12/2/99

Sketch(s) attached  yes  no

Sheet   2   of   9  

Reviewed By:



Date:   12/3/99  

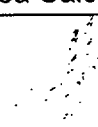
Authorized Inspector:

  MBC  

Date:   12-6-99

<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
	

Coverage Calculations							
Scan #	Angle	Beam Direction	Area Examined (sq.in.)	Length Examined (in.)	Volume Examined (cu.in.)	Volume Required (cu.in.)	Percent Coverage
	60				38.7		0.00
	70				35.5		0.00
					72.2		0.00

Aggregate %      74.2 / 2 = 37.1%

		Item No:	B03.110.004
Prepared By:	<i>Larry Mauldin</i>	Level:	III      Date: 12/2/99
Reviewed By:	<i>David King</i>	Level:	II      Date: 12/3/99



<b>DUKE POWER COMPANY</b> <b>Limited Examination Coverage Worksheet</b>	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 Exam Area Drwg.) Zone 2 & 3      23.6 sq.in.	23.6 sq.in. X 21.6 in. = 509.76 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	2	19.2	21.6	414.72	509.76	81.36
2	60	1	.1	21.6	2.16	509.76	0.42
3	60	CW	8.6	21.6	185.76	509.76	36.44
4	60	CCW	8.6	21.6	185.76	509.76	36.44
					788.4	2039.04	38.67

38.7%

		Item No:	B03.110.004
Prepared By: Larry Mauldin	<i>Larry Mauldin</i>	Level:	III      Date: 12/2/99
Reviewed By:	<i>David K. [Signature]</i>	Level:	II      Date: 12/3/99

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

**Examination Volume/Area Defined**

Base Metal    
  Weld    
  Near Surface    
  Bolting    
  Inner Radius

Area Calculation	Volume Calculation
(See Exam Area Dwg.)  Zone 1     7.4 sq.in.	7.4 sq.in. X 21.6 in. = 159.84 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	2	3.7	21.6	79.92	159.84	50.00
2	70	1	1.4	21.6	30.24	159.84	18.92
3	70	CW	2.7	21.6	58.32	159.84	36.49
4	70	CCW	2.7	21.6	58.32	159.84	36.49
					226.8	639.36	35.47

35.5%

		Item No:	B03.110.004
Prepared By: Larry Mauldin	<i>Larry Mauldin</i>	Level:	III     Date: 12/2/99
Reviewed By:	<i>David K. [Signature]</i>	Level:	II     Date: 12/3/99

OCONEE SURVEYOR RELIEF NOZZLE

EXAM AREAS

ZONE 1

$ABKJ = 2.5" \times 1.0" = 2.5 \text{ sq. in.}$   
 $JKLM = \pi \cdot 3\frac{1}{4}"^2 - \pi \cdot 2\frac{1}{4}"^2 \times 18.9\% = 3.26 \text{ sq. in.}$   
 $LMOP = \frac{1.0"}{2} (1.5 + 1.75) = 1.63 \text{ sq. in.}$

$7.39 \text{ sq. in.} = \underline{\underline{7.4 \text{ sq. in.}}}$

ZONE 2 & 3

$BCEG - DEF = \frac{3.75}{2} (6.2 + 4.7) - \frac{4 \times 4}{2} = 20.35 \text{ sq. in.}$

$GHNO = \frac{1.0"}{2} (1.8 + 3.2) = 2.5 \text{ sq. in.}$

$HIM = \frac{2.9 \times 1.55}{2} = .79 \text{ sq. in.}$

$23.64 = \underline{\underline{23.6 \text{ sq. in.}}}$

Attachment C  
Page 24 of 52  
Request for Relief 00-01

Note:

JKLM HAS A MULTIPLIER OF 18.9%. THE RADIUS OF ZONE IS 68' OR 18.9% OF 360'

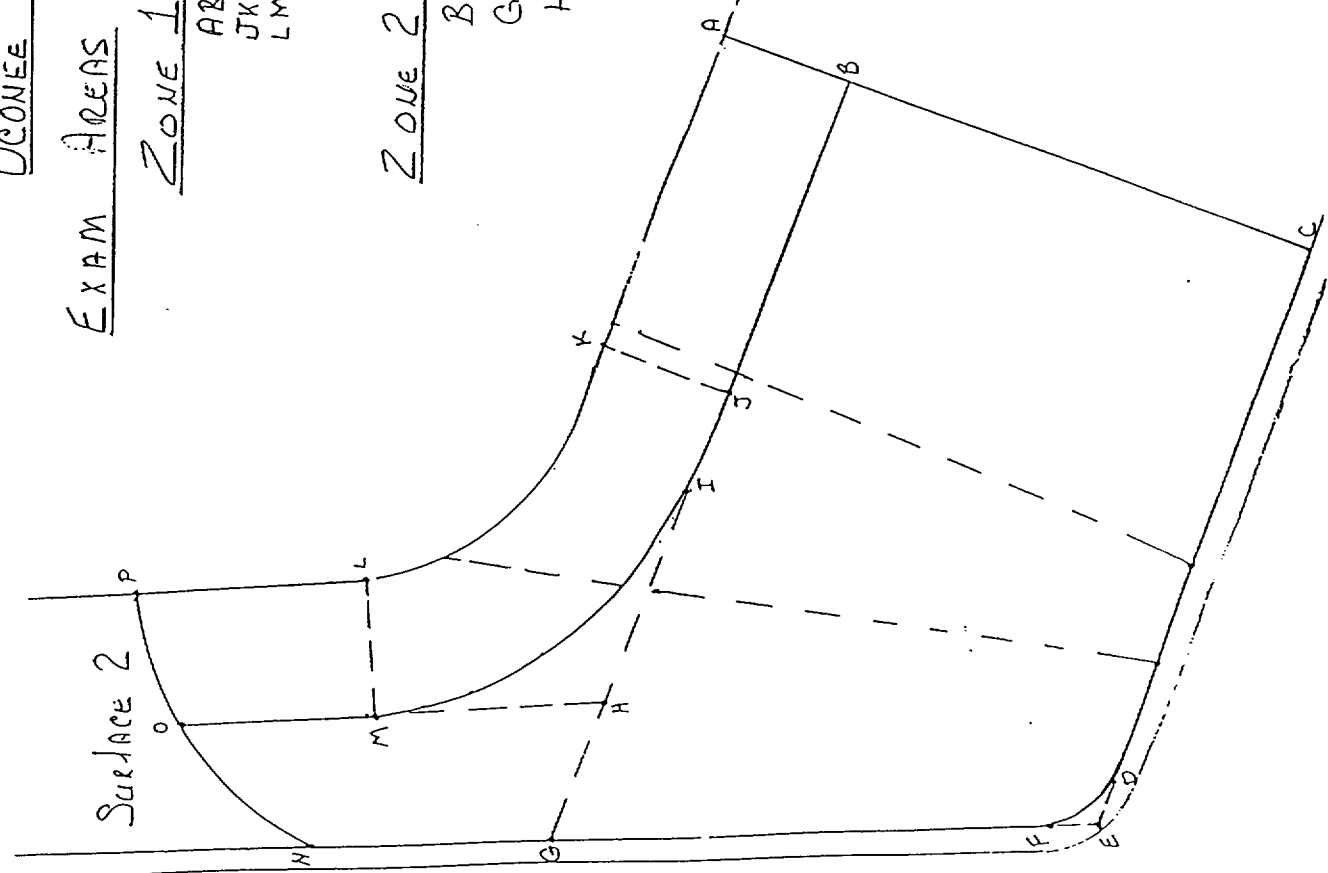
SCALE 1.0" = 1.0"

- FULL COVERAGE
- PARTIAL COVERAGE
- NO COVERAGE

ITEM # 303-110.004  
 I.D. # 2 PR-R-WP 33.2  
 BY: Ross Thacker  
 DATE: 12-2-99

PG. 6 of PG. 9

Surface 1

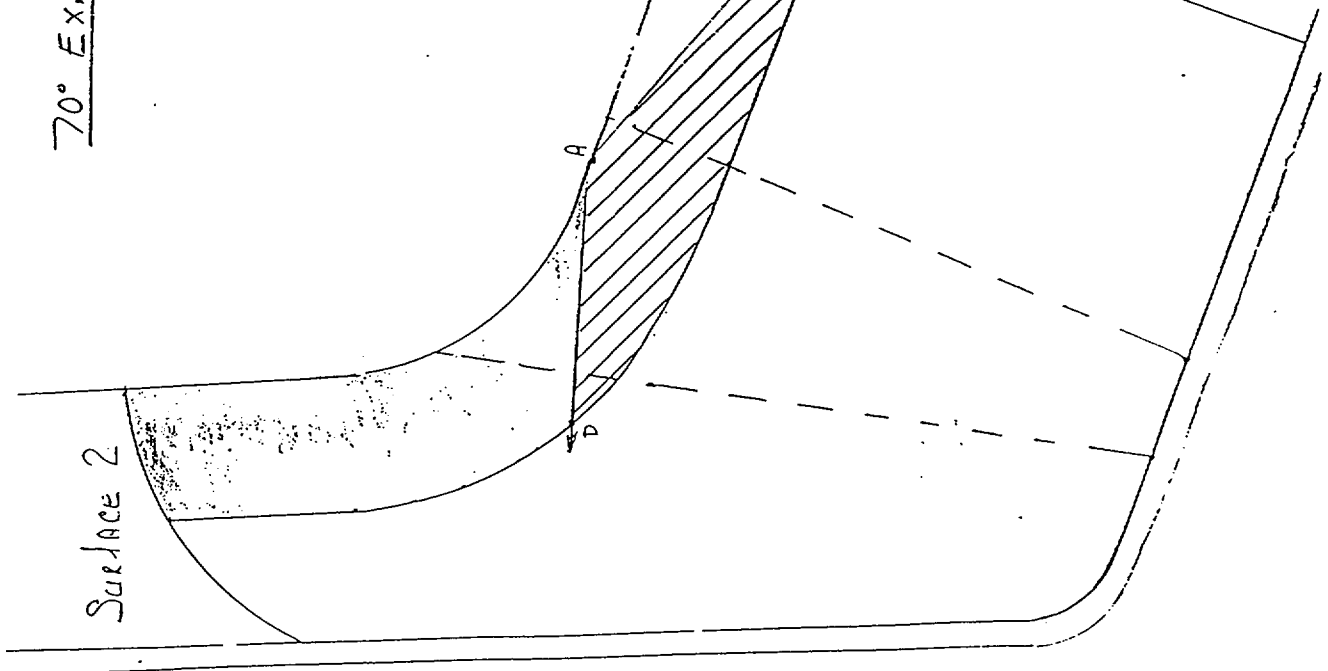


UCONEE SURIZER RELIEF NOZZLE

70° EXAM ZONE 1

$S_1 \text{ TO } S_2: ABCD = \frac{1.0}{2} (2.7 + 4.6) = 3.65 = \underline{\underline{3.759.14}}$

$S_2 \text{ TO } S_1: ABC = \frac{2.7 \times 1.0}{2} = 1.35 = \underline{\underline{1.459.14}}$



SCALE 1.0" = 1.0"

- FULL COVERAGE
- PARTIAL COVERAGE
- NO COVERAGE

ITEM # 303.110.004  
I.D.# 2 PER - WP. 33.2  
BY: RAMY MADDA  
DATE: 12.2.99

SURFACE 1

OCONEE SURVEY RELIEF NOZZLE

60° EXAM ZONE 2 & 3

S1 TO S2

$$(AREA OF LOSS) DEHI + EFG = \frac{10}{2} (2.8 + 3.7) + \frac{2.1 \times 1.1}{2} = 4.4 \text{ SQ. IN.}$$

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

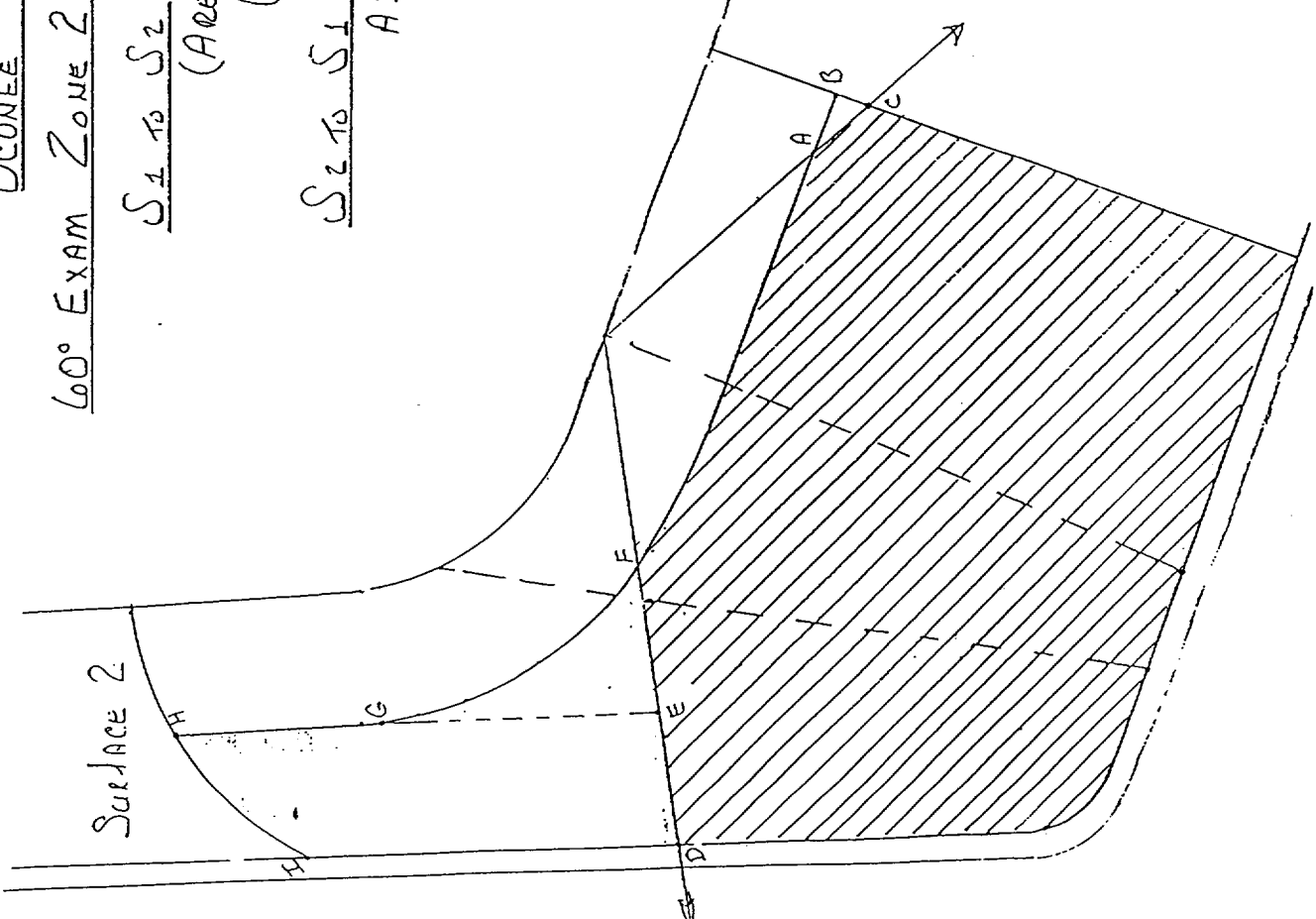
S2 TO S1

$$ABC = \frac{.5 \times 2.5}{2} \times .06 = \underline{.159 \text{ IN.}}$$

SCALE 1.0" = 1.0"  
 - FULL COVERAGE  
 - PARTIAL COVERAGE  
 - NO COVERAGE

ITEM # B03.110.004  
 I.D.# SPER-WP 33.2  
 BY: LOU Moulton  
 DATE: 12.22.99

Page 8 of Pg. 9



Surface 1

OCONEE PRESSURIZER RELIEF NOZZLE

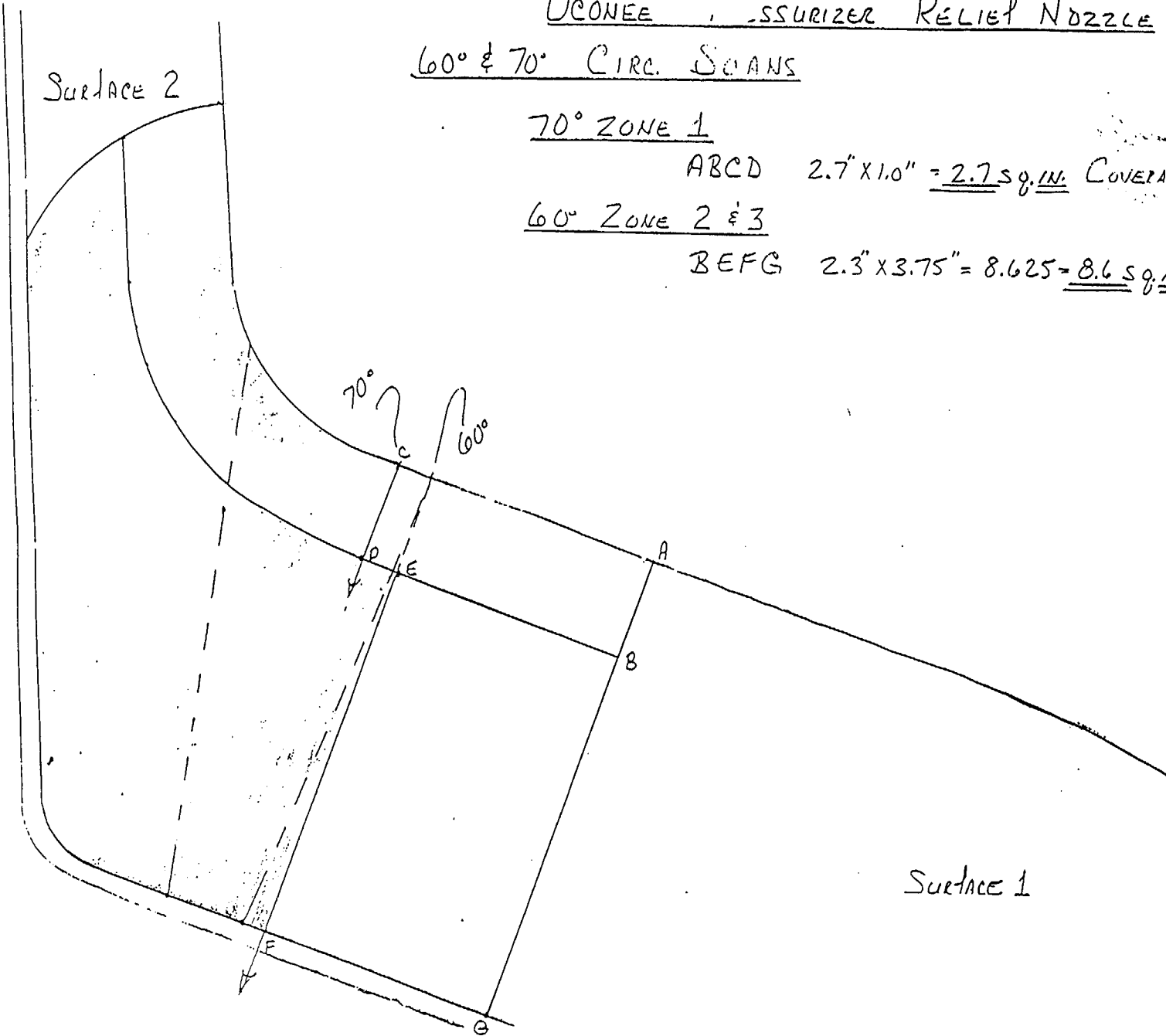
60° & 70° CIRC. SCANS

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



Attachment C  
Page 27 of 52  
Request for Relief 00-01

SCALE 1.0" = 1.0"

- FULL COVERAGE
- PARTIAL COVERAGE
- NO COVERAGE

ITEM# B03.110.004  
I.D.# 2PER-WP 33-2  
BY: Laure Moulder  
DATE: 012-2-99

Pg. 9 of Pg. 9

## 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>Z-PER-WP33-1</u>	Date: <u>12/2/99</u>
Weld Length (in.): <u>21.6"</u>	Surface Condition: <u>AS GROUJD</u>	Lo <u>9.2.3</u>	Exam Start: <u>1430</u>
			Exam Finish: <u>1530</u>

Procedure No:  
NDE-620

Revision: 8

FC N/A

Scans

70° 58 dB Zone I    60° 80 dB Zone II

60° 80 dB Zone III Axial

60° 80 dB Zone III Circ.

Configuration

NOZZLE TO J. HEAD

Scan Surface: OD

Surface Temp. 73 ° F

Pyrometer s/n: MCJDE-27010

Cal. Due Date: 4/27/00

Calibration Sheet No:

9902106

9902107

9902108

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>NRI</u>	<u>70°</u>								

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

Examiner: [Signature]    Level: II    Date: 12/2/99    Examiner: Maya Mero    Level: II    Date: 12.2.99    Item No: B03.110.005

Reviewed by: Daniel C. [Signature]    Level: II    Date: 12/3/99    Authorized Inspector: YABC    Date: 12-6-99

Attachment C  
Page 28 of 52  
Request for Relief 00-01

**DUKE POWER COMPANY  
ISI LIMITATION REPORT**

FORM NDE-UT-4

Revision 1

Component/Weld ID: 2-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   C/L   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: Jay Eaton

Level: II

Date: 12/2/99

Sketch(s) attached  yes  no

Sheet   2   of   9  

Reviewed By: *Randall*

Date:   12/3/99  

Authorized Inspector: *MBC*

Date:   12-6-99



<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

Coverage Calculations							
Scan #	Angle	Beam Direction	Area Examined (sq.in.)	Length Examined (in.)	Volume Examined (cu.in.)	Volume Required (cu.in.)	Percent Coverage
	60				38.7		0.00
	70				35.5		0.00
					72.2		0.00

Aggregate %      74.2 / 2 = 37.1%

		Item No:	B03.110.005
Prepared By: Larry Mauldin	<i>Larry Mauldin</i>	Level:	III      Date: 12/2/99
Reviewed By:	<i>David K. Z...</i>	Level:	II      Date: 12/3/99

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

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 Exam Area Drwg.)  Zone 2 & 3                      23.6 sq.in.	23.6 sq.in. X 21.6 in. = 509.76 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	2	19.2	21.6	414.72	509.76	81.36
2	60	1	.1	21.6	2.16	509.76	0.42
3	60	CW	8.6	21.6	185.76	509.76	36.44
4	60	CCW	8.6	21.6	185.76	509.76	36.44
					788.4	2039.04	38.67

38.7%

		Item No: B03.110.005
Prepared By: Larry Mauldin	<i>Larry Mauldin</i>	Level: III                      Date: 12/2/99
Reviewed By:	<i>David K. [Signature]</i>	Level: II                      Date: 12/3/99

4089

<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 Exam Area Drwg.)  Zone 1                      7.4 sq.in.	7.4 sq.in. X 21.6 in.= 159.84 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	2	3.7	21.6	79.92	159.84	50.00
2	70	1	1.4	21.6	30.24	159.84	18.92
3	70	CW	2.7	21.6	58.32	159.84	36.49
4	70	CCW	2.7	21.6	58.32	159.84	36.49
					226.8	639.36	35.47

35.5%

		Item No:	B03.110.005
Prepared By: Larry Mauldin	<i>Larry Mauldin</i>	Level:	III
Date:	12/2/99		
Reviewed By:	<i>David C. [Signature]</i>	Level:	II
Date:	12/3/99		

OCONEE SURFIZER RELIEF NOZZLE

EXAM AREAS

ZONE 1

$$ABKJ = 2.5" \times 1.0" = 2.5 \text{ sq. in.}$$

$$JKLM = \pi 3\frac{1}{4}''^2 - \pi 2\frac{1}{4}''^2 \times 18.9\% = 3.26 \text{ sq. in.}$$

$$LMOP = \frac{1.0''}{2} (1.5 + 1.75) = 1.63 \text{ sq. in.}$$

$$7.39 \text{ sq. in.} = \underline{\underline{7.4 \text{ sq. in.}}}$$

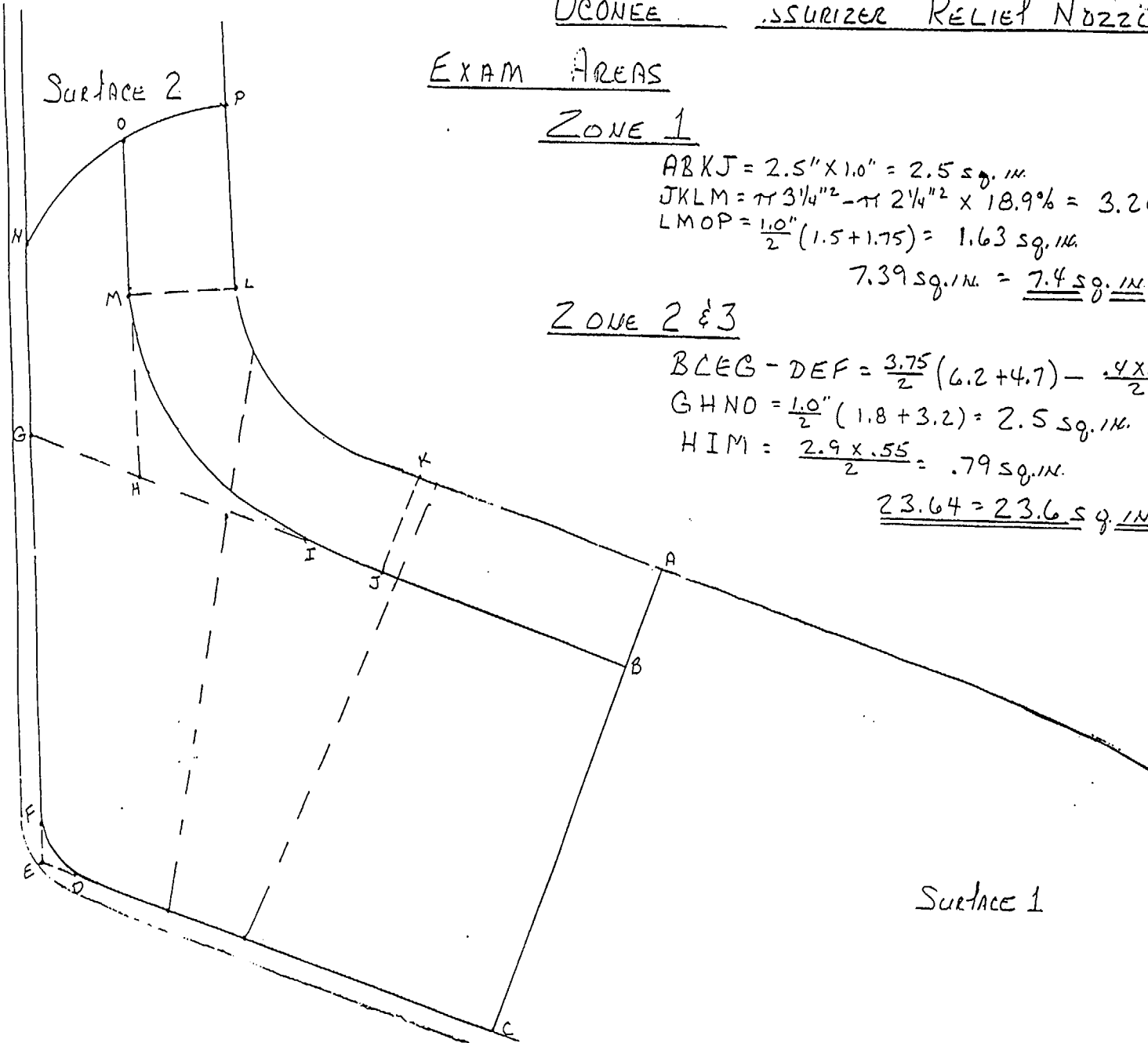
ZONE 2 & 3

$$BCEG - DEF = \frac{3.75}{2} (6.2 + 4.7) - \frac{.4 \times .4}{2} = 20.35 \text{ sq. in.}$$

$$GHNO = \frac{1.0''}{2} (1.8 + 3.2) = 2.5 \text{ sq. in.}$$

$$HIM = \frac{2.9 \times .55}{2} = .79 \text{ sq. in.}$$

$$\underline{\underline{23.64 = 23.6 \text{ sq. in.}}}$$



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 # 305, 110.005  
 I.D. # 2 PER-WP33-1  
 BY: Lane Thacker  
 DATE: 9-2-99

Pa. 6 of Pg. 9

OCONEE SURFACED RELIEF NOZZLE

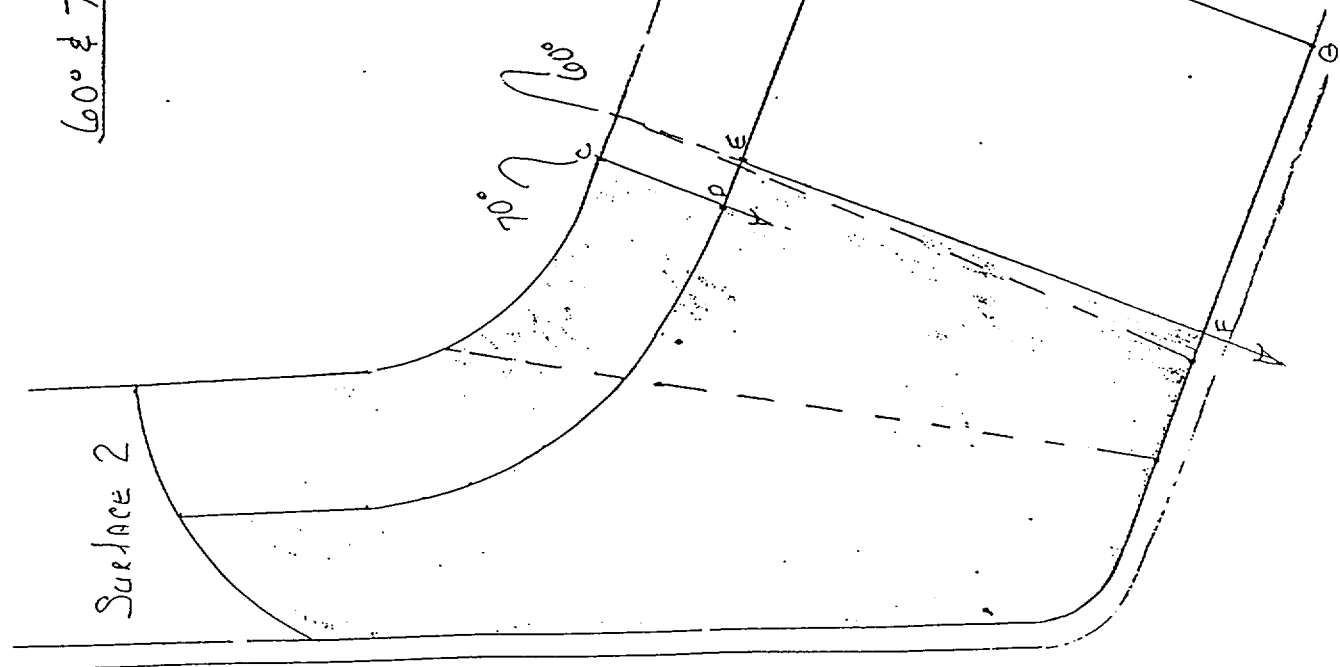
60° & 70° CIRC SCANS

70° ZONE 1

ABCD 2.7' x 1.0" = 2.7 sq. ft. COVERAGE

60° ZONE 2 & 3

BEFG 2.3' x 3.75" = 8.625 = 8.6 sq. ft. COVERAGE



SCALE 1.0" = 1.0"  
 - FULL COVERAGE  
 - PARTIAL COVERAGE  
 - NO COVERAGE

ITEM # 203/10-005  
 I.D. # 2 P.L. W.P. 33-1  
 BY: James N. ...  
 DATE: 12-22-99

Surface 1

PG. 1 of PG. 9

OCONEE SSURIZER RELIEF NOZZLE

60° EXAM ZONE 2 & 3

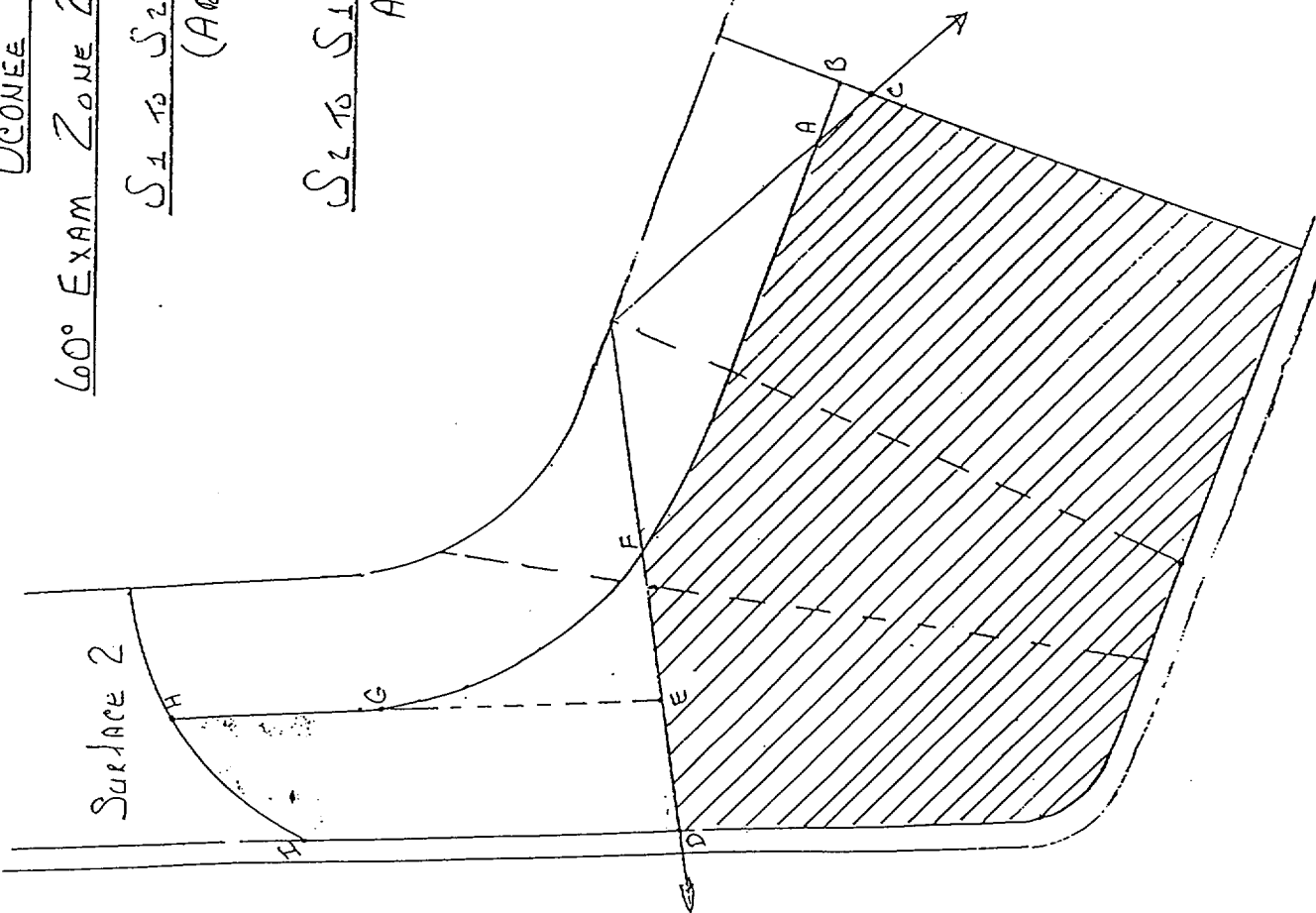
S<sub>2</sub> TO S<sub>2</sub>

$$(AREA OF LOSS) DEHI + EFG = \frac{10}{2} (2.8 + 3.7) + \frac{2.1 \times 1.1}{2} = 4.4 \text{ sq. in.}$$

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

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

$$ABC = \frac{.5 \times .25}{2} = .06 = \underline{.15 \text{ sq. in.}}$$



Surface 1

SCALE 1.0" = 1.0"

□ - FULL COVERAGE

▨ - PARTIAL COVERAGE

■ - NO COVERAGE

ITEM #

I.D. #

BY:

DME:

BUS. INV. 005

SPR-WP 334

Law Moulds

1222-99

PG. 8 of PG. 9

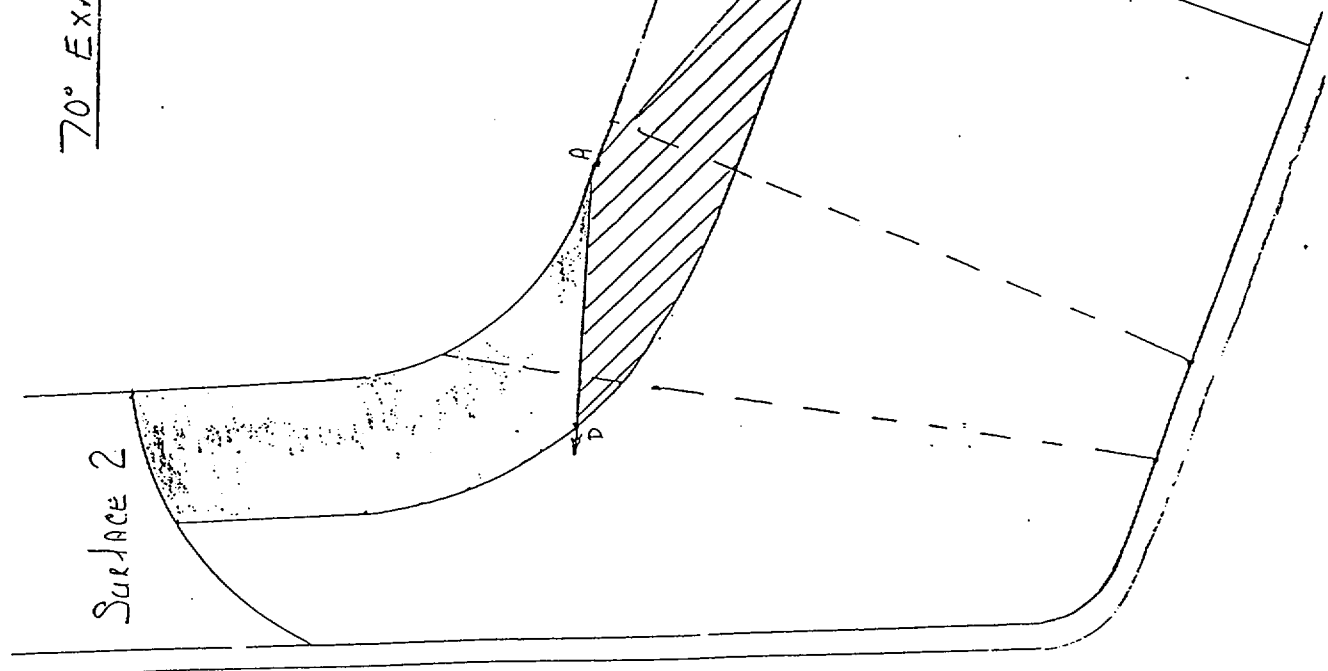
OCONEE enlarged Relief Nozzle

70° EXAM ZONE 1

SURFACE 2

$S_1 \text{ TO } S_2: ABCD = \frac{1.0''}{2} (2.7 + 4.6) = 3.65 = \underline{\underline{3.759''}}$

$S_2 \text{ TO } S_1: ABC = \frac{2.7 \times 1.0}{2} = 1.35 = \underline{\underline{1.459''}}$



SCALE 1.0" = 1.0"  
□ - FULL COVERAGE  
▨ - PARTIAL COVERAGE  
▩ - NO COVERAGE

ITEM # BOB. 110.005  
I.D. # 2222-WP 337  
BY: Larry Mauldin  
DATE: 12-2-99

Surface 1

PG. #9 of PG. 9

# DUKE POWER COMPANY

## ULTRASONIC EXAMINATION DATA SHEET FOR PLANAR REFLECTORS

Exam Start: 0831

Form NDE-UT-2A

Exam Finish: 0903

Revision 4

Station: OCONEE

Unit: 2

Component/Weld ID: 2-SGB-WG25

Date: 12/2/99

Weld Length (in.): 152.8"

Surface Condition: AS GROUND

Lo: 9.2.3

Surface Temperature: 73 ° F

Examiner: David Zimmerman

Level: II

Scans:

Pyrometer S/N: MCNDE 27206

Examiner: Jay A. Eaton

Level: II

 45  51.5 dB 70  \_\_\_\_\_ dB

Cal Due: 1/21/00

Procedure: NDE-970

Rev: 0

FC:

 45T  51.5 dB 70T  \_\_\_\_\_ dB

Configuration: Nozzle to Head

NDE-640

1

NA

 60  \_\_\_\_\_ dB

S2 Flow S1

NOZZLE to HEAD

Calibration Sheet No:

9902101, 9902102

\*

 60T  \_\_\_\_\_ dB

Scan Surface: OD

Applies to NDE-680 only

Other: 0°-22.5 dB 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
		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		DO NOT WRITE IN THIS SPACE	
	0°	NRI													
	45°	NRI													

Remarks: \* 95-18, 95-19

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

Sheet 1 of 13

Reviewed By:

Level:

II

Date:

12.03.99

Authorized Inspector:

Date:

12-6-99

Item No:

B03.130.006



<b>DUKE POWER COMPANY</b>						Exam Start: 0830	Form NDE-UT-2A
<b>ULTRASONIC EXAMINATION DATA SHEET FOR PLANAR REFLECTORS</b>						Exam Finish: 0843	Revision 4
Station: OCONEE	Unit: 2	Component/Weld ID: 2-SGB-WG25				Date: 12/2/99	
Weld Length (in.): 152.8"	Surface Condition: AS GROUND			Lo: 9.2.3	Surface Temperature: <u>73</u> ° <u>F</u>		
Examiner: Larry Mauldin <i>Larry Mauldin</i>	Level: III		Scans: 45 <input type="checkbox"/> _____ dB    70 <input type="checkbox"/> _____ dB 45T <input type="checkbox"/> _____ dB    70T <input type="checkbox"/> _____ dB 60 <input checked="" type="checkbox"/> <u>70</u> dB 60T <input checked="" type="checkbox"/> <u>70</u> dB Other: _____ dB			Pyrometer S/N: <u>MCNDE 27206</u>	
Examiner: James L. Panel <i>James L. Panel</i>	Level: II					Cal Due: <u>1/21/00</u>	
Procedure: NDE-970	Rev: 0	FC: NA				Configuration: <u>Nozzle to Head</u>	
						<u>S2</u> Flow <u>S1</u> <u>NOZZLE</u> to <u>HEAD</u> Scan Surface: <u>OD</u> Applies to NDE-680 only Skew Angle: NA	
Calibration Sheet No: 9902103							

IND #	<del>4</del>	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	20%dac HMA	20%dac HMA	20%dac HMA	20%dac HMA	20%dac HMA	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					
	60°	NRI														

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>Larry Moss</i>	Level: <u>II</u>	Date: <u>12-3-99</u>	Authorized Inspector: <i>MBL</i> Date: <u>12-4-99</u>
			Item No: B03.130.006

Attachment C  
Page 38 of 52  
Request for Relief 00-01

**DUKE POWER COMPANY  
ISI LIMITATION REPORT**

FORM NDE-UT-4

Revision 1

Component/Weld ID: 2-SGB-WG25

Item No: B03.130.006

Remarks:

NO SCAN                      SURFACE                      BEAM DIRECTION  
 LIMITED SCAN                       1    2                       1    2    cw    ccw  
 FROM L    NA    to L    NA                         INCHES FROM WO   2.0" to   BEYOND  
 ANGLE:  0    45    60    Other                         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 *Larry Mauldin* Level: III Date: 12/2/99

Sketch(s) attached  yes    no   Sheet 3 of 13

Reviewed By: *Gary Moss* Date: 12.3.99

Authorized Inspector: *IMBC* Date: 12-6-99

Attachment C  
Page 39 of 52  
Request for Relief 00-01

<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 = 11261.4 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	40.6	152.8	6203.7	11261.4	55.09
2	45°	1 &/or 2	48.9	152.8	7471.9	11261.4	66.35
3	60°	1 &/or 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
					33753.6	56307	59.95

59.95 = 60 %

		Item No:	B03.130.006
Prepared By:	Larry Mauldin <i>Larry Mauldin</i>	Level:	III     Date: 12/2/99
Reviewed By:	<i>Gary Moss</i>	Level:	II     Date: 12-3-99

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

Examination Volume/Area Defined	
<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	2750.4	89.45
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
							53.5%

		Item No: B03.130.006
Prepared By: Larry Mauldin	<i>Larry Mauldin</i>	Level: III     Date: 12/2/99
Reviewed By:	<i>Mary Moss</i>	Level: II     Date: 12-3-99

<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

Coverage Calculations							
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

Aggregate 58%

		Item No:	B03.130.006
Prepared By:	Larry Mauldin <i>Larry Mauldin</i>	Level:	III Date: 12/2/99
Reviewed By:	<i>Harry Moss</i>	Level:	II Date: 12-3-99

6613

CONE NOZZLE TO UPPER T. (GENERATOR)

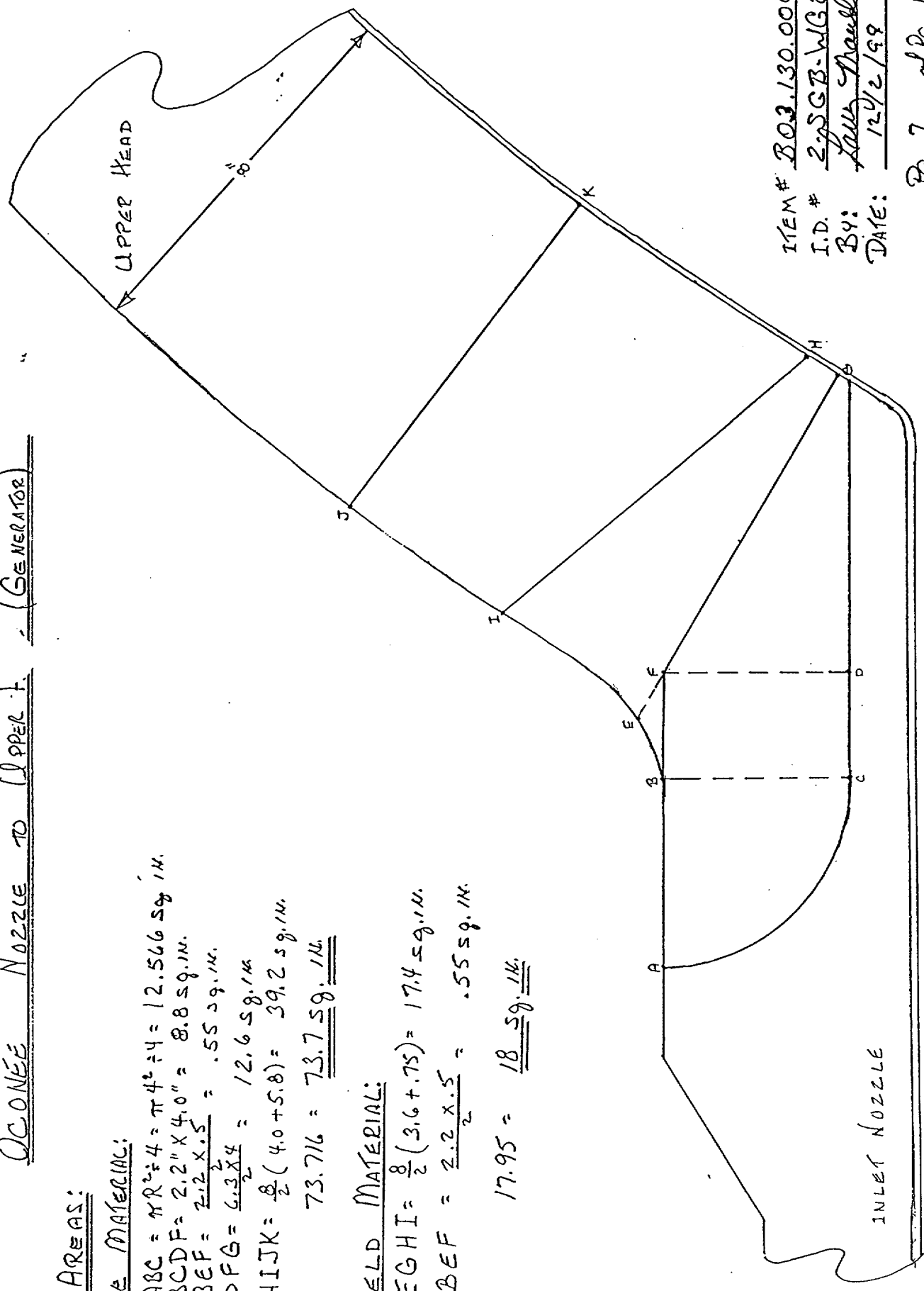
CAM AREAS:

BASE MATERIAL:

$ABC = \pi R^2 \div 4 = \pi 4^2 \div 4 = 12.566 \text{ sq. in.}$   
 $BCDF = 2.2" \times 4.0" = 8.8 \text{ sq. in.}$   
 $BEF = \frac{2.2 \times 2.5}{2} = .55 \text{ sq. in.}$   
 $DFG = \frac{6.3 \times 4}{2} = 12.6 \text{ sq. in.}$   
 $HJK = \frac{8}{2} (4.0 + 5.8) = 39.2 \text{ sq. in.}$   
 $73.716 = \underline{\underline{73.759 \text{ in.}}}$

WELD MATERIAL:

$EGHI = \frac{8}{2} (3.6 + .75) = 17.4 \text{ sq. in.}$   
 $BEF = \frac{2.2 \times 2.5}{2} = .55 \text{ sq. in.}$   
 $17.95 = \underline{\underline{18 \text{ sq. in.}}}$



ITEM # B03.130.006  
 I.D. # 2-SSGB-WG25  
 BY: LAW MANDLER  
 DATE: 12/2/99

Pa. 7 of Pa. 13

OCONEE NOZZLE TO UPPER GENERATOR

0° SCAN COVERAGE

BASE MATERIAL:

$ABCE = \frac{8}{2} (40 + 5.8) = 39.2 \text{ sq. ft.}$

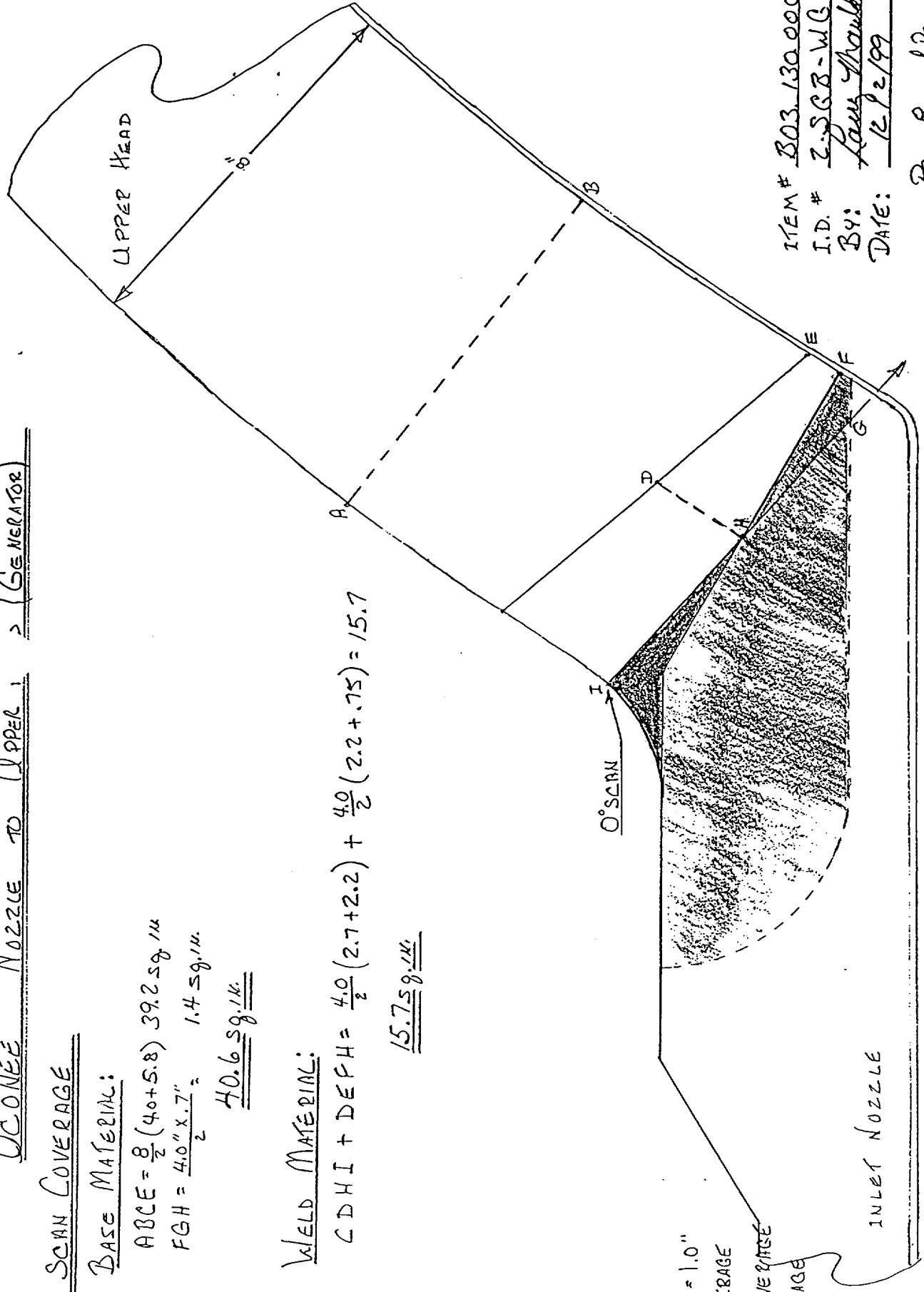
$FGH = \frac{4.0 \times 7.7}{2} = 1.4 \text{ sq. ft.}$

40.6 sq. ft.

WELD MATERIAL:

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

15.7 sq. ft.



ITEM # B03.130.006  
 I.D. # Z-SCB-WG25  
 BY: Larry Shouler  
 DATE: 12/2/99

PG. 8 of PG. 13

$\frac{1}{2}'' = 1.0''$   
 COVERAGE  
 COVERAGE

CONE NOZZLE TO UPPER (GENERATOR)

45° SCANS (AXIAL)

BASE MATERIAL

S1 TO S2

$$ACDF = \frac{\pi}{2} (40 + 5.8) = 39.2 \text{ sq. in.}$$

$$GHI = \frac{4.7 \times 2.9}{2} = 9.715 \text{ sq. in.}$$

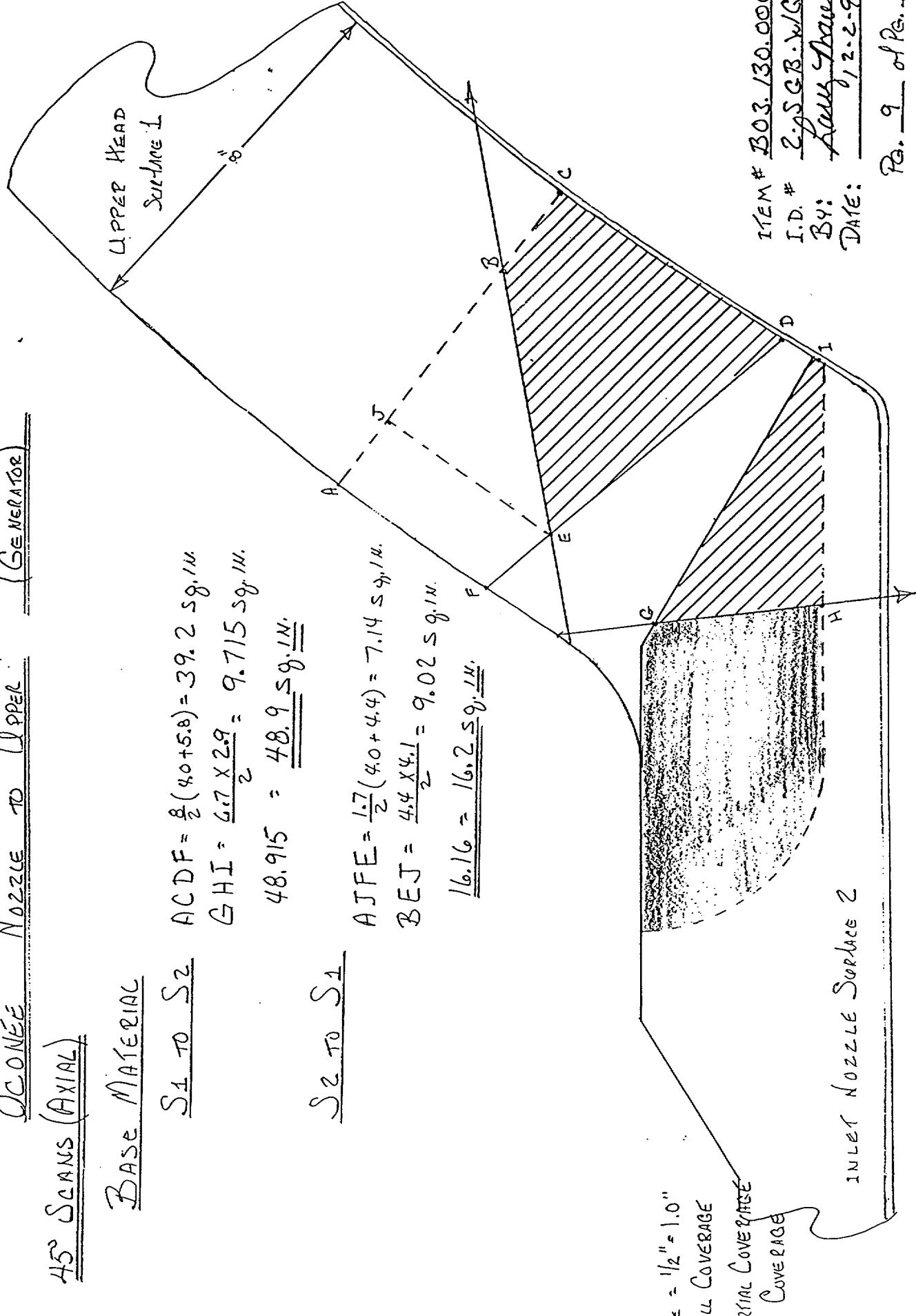
$$48.915 = \underline{\underline{48.9 \text{ sq. in.}}}$$

S2 TO S1

$$AJFE = \frac{1.7}{2} (40 + 4.4) = 7.14 \text{ sq. in.}$$

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

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



ITEM # B03.130.006  
I.D. # 295GB.WIG.25  
BY: Andy Struble  
DATE: 12-2-99

Pa. 9 of Pa. 13

$\frac{1}{2}'' = 1.0''$   
L COVERAGE  
AXIAL COVERAGE  
COVERAGE

INLET NOZZLE SURFACE 2



OCONEE NOZZLE TO UPPER

GENERATOR

NOZZLE TO UPPER

GENERATOR

45° SCANS (AXIAL)

WELD MATERIAL:

S1 TO S2:

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.

S2 TO S1:

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

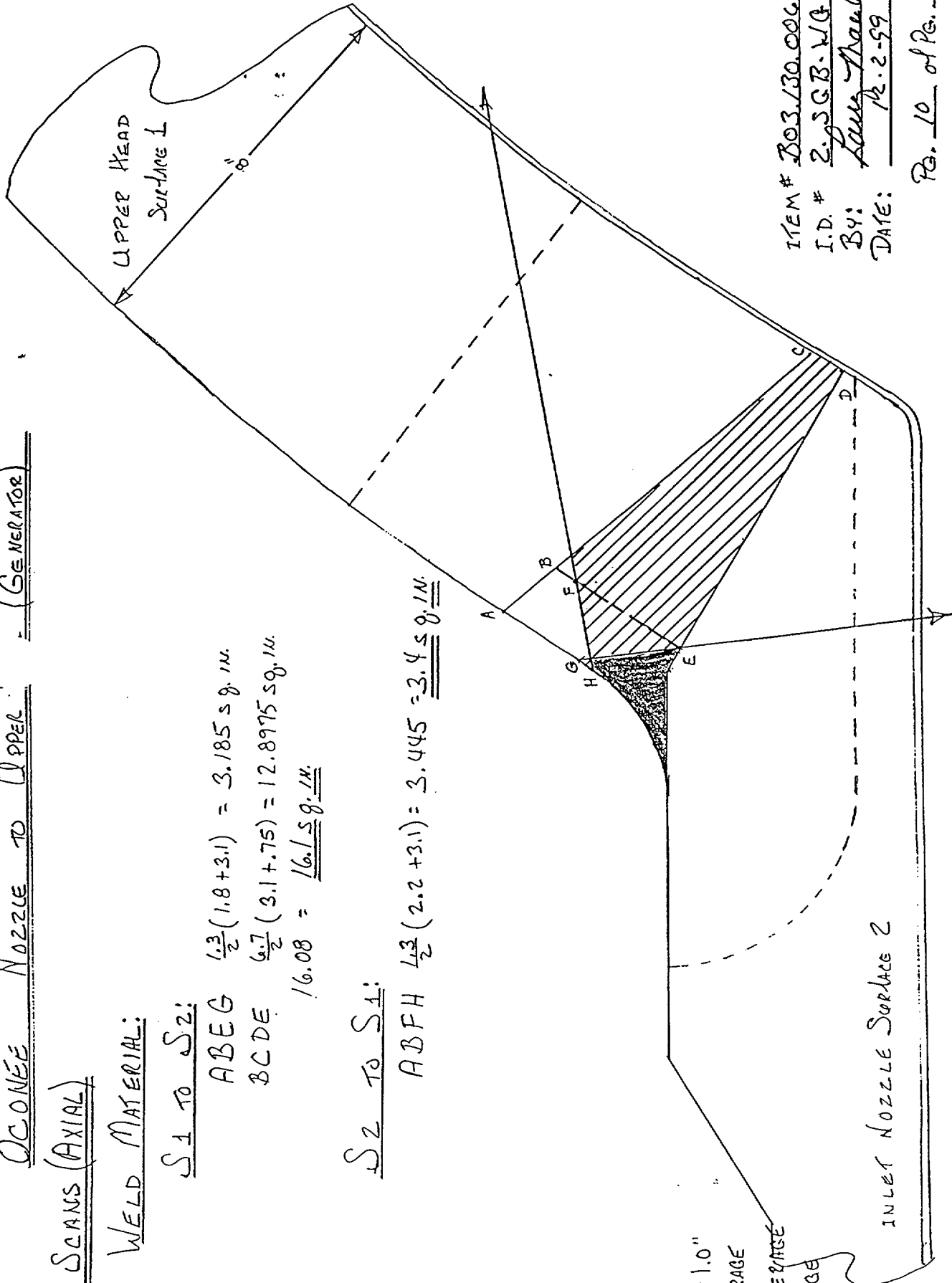
$\approx \frac{1}{2}'' = 1.0''$

ALL COVERAGE

AXIAL COVERAGE

COVERAGE

INLET NOZZLE SURFACE 2



ITEM # BO3.130.006  
 I.D. # 2. J.S.G.B. W.G. 25  
 BY: Steve Handley  
 DATE: 12.2.99

Pg. 10 of Pg. 13

OCONEE NOZZLE TO UPPER (GENERATOR)

60° SCANS (AXIAL)

BASE MATERIAL:

S1 TO S2:

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

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

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

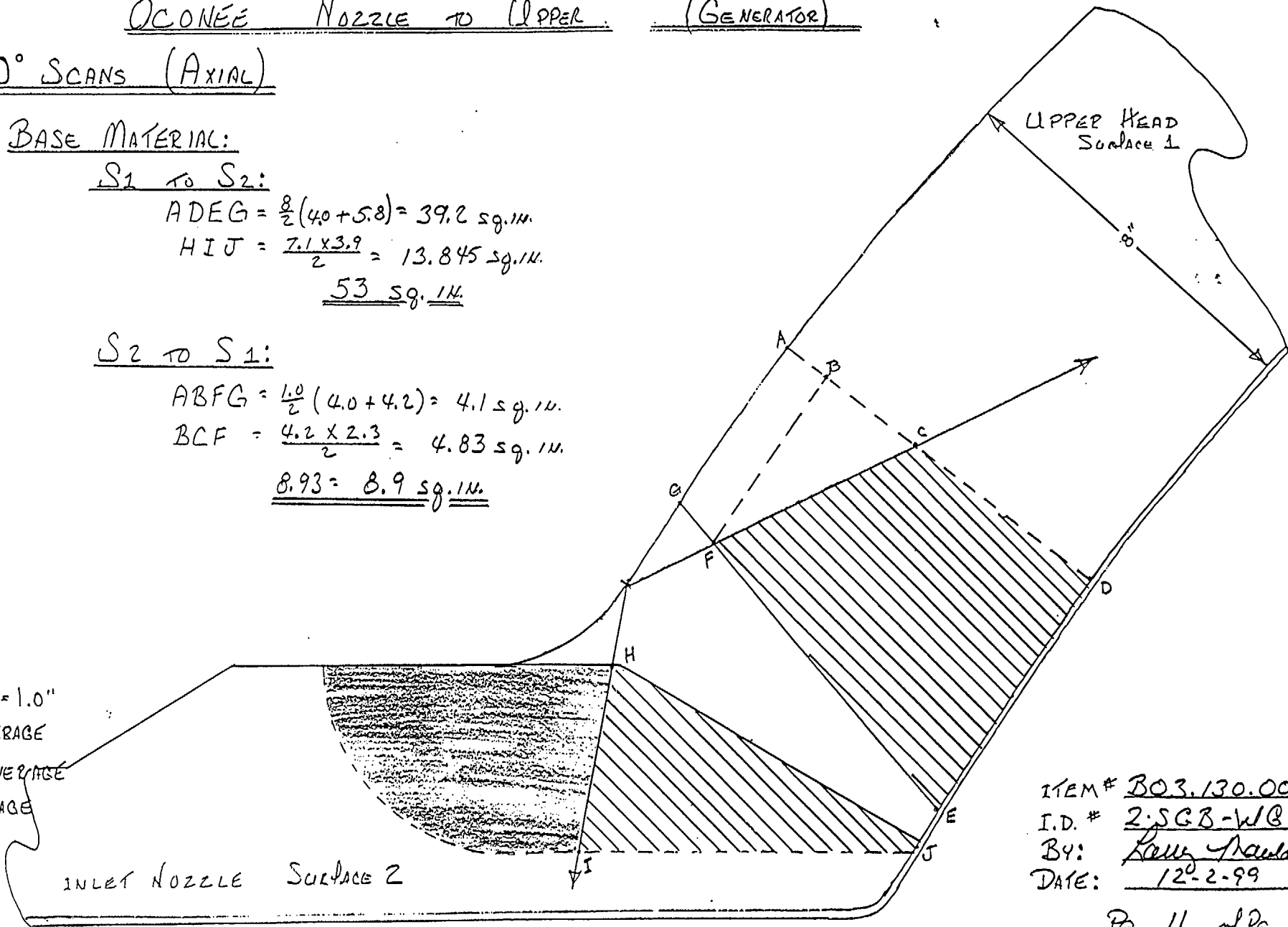
S2 TO S1:

$$ABFG = \frac{1.0}{2}(4.0 + 4.2) = 4.1 \text{ sq. in.}$$

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

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

$e = 1/2" = 1.0"$   
 ALL COVERAGE  
 AXIAL COVERAGE  
 3 COVERAGE



Attachment C  
 Page 47 of 52  
 Request for Relief 00-01

ITEM # BO3.130.006  
 I.D. # 2-SGB-WB25  
 BY: Larry Handley  
 DATE: 12-2-99

Pa. 11 of Pa. 13

OCONEE NOZZLE TO UPPER: (GENERATOR)

60° SCANS (AXIAL)

WELD MATERIAL:

S1 TO S2:

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

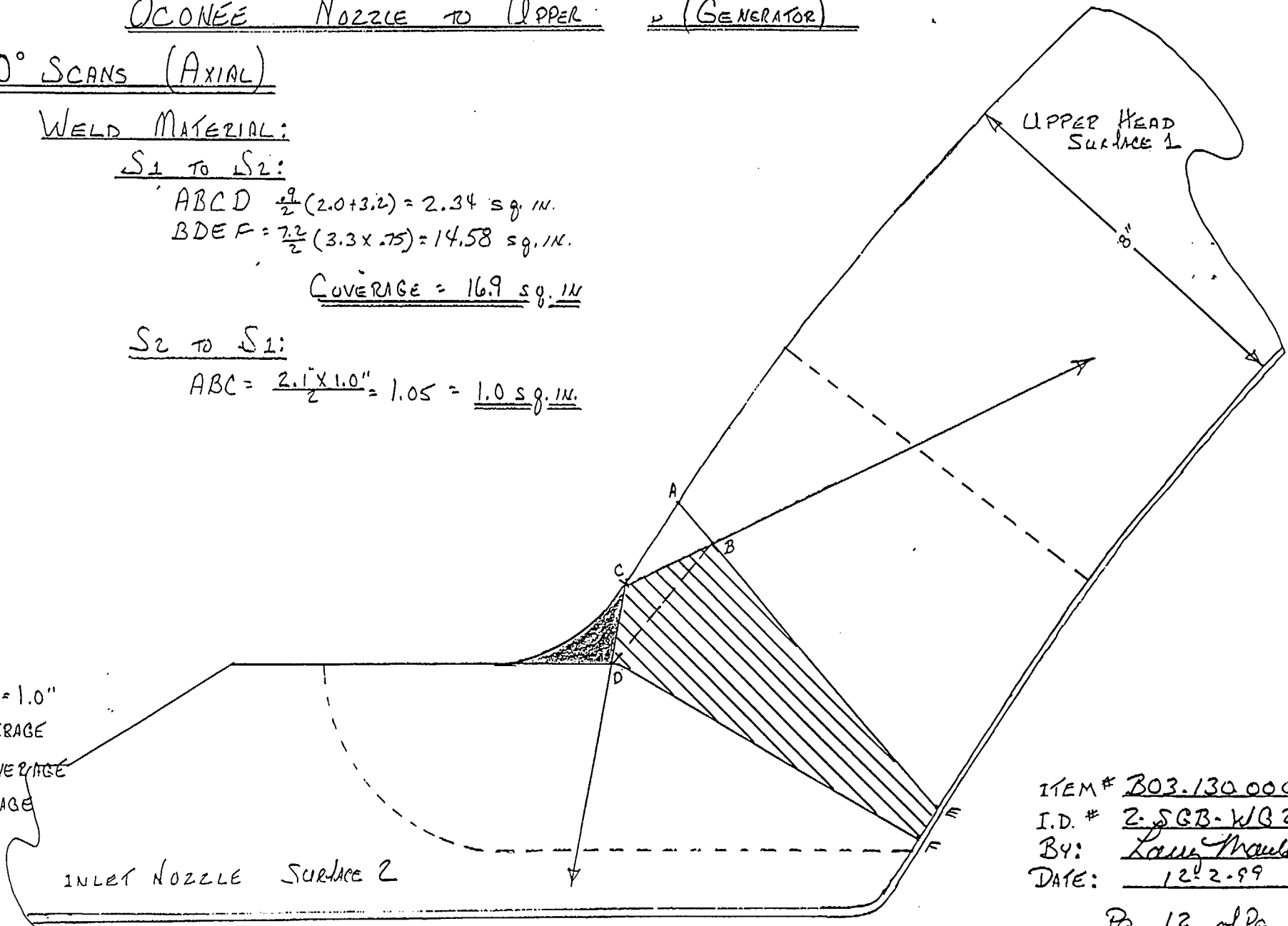
$BDEF = \frac{7.2}{2} (3.3 \times .75) = 14.58 \text{ sq. in.}$

COVERAGE = 16.9 sq. in.

S2 TO S1:

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

$\epsilon = 1/2" = 1.0"$   
 ALL COVERAGE  
 INITIAL COVERAGE  
 NO COVERAGE



Attachment C  
 Page 48 of 52  
 Request for Relief 00-01

ITEM # 303.130.006  
 I.D. # 2-SGB-WG 25  
 BY: Louis Moullet  
 DATE: 12/2/99

O'CONNOR NOZZLE TO UPPER - (GENERATOR)

45° & 60° CIRC. SCANS:

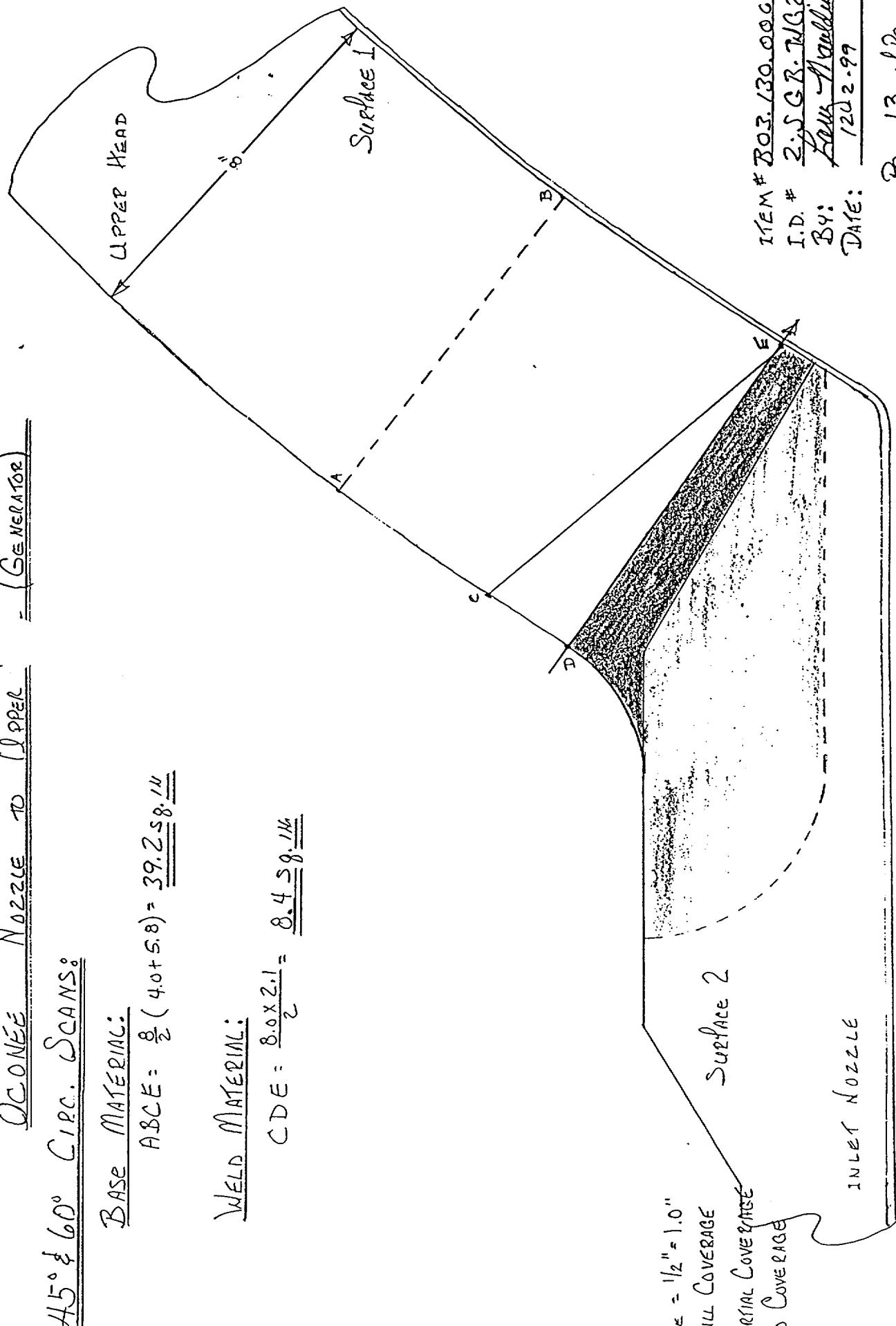
BASE MATERIAL:

$$ABCE = \frac{\pi}{2} (4.0 + 5.8) = \underline{\underline{39.258 \text{ IN}}}$$

WELD MATERIAL:

$$CDE = \frac{8.0 \times 2.1}{2} = \underline{\underline{8.458 \text{ IN}}}$$

Attachment C  
Page 49 of 52  
Request for Relief 00-01



ITEM # BOJ. 130.000  
I.D. # 2-S.G.R. NG25  
BY: Tom Alvarado  
DATE: 1202.99

Pg. 13 of Pg. 13

<b>DUKE POWER COMPANY</b>				Exam Start: 0830	Form NDE-UT-2A
<b>ULTRASONIC EXAMINATION DATA SHEET FOR PLANAR REFLECTORS</b>				Exam Finish: 0901	Revision 4
Station: OCONEE	Unit: 2	Component/Weld ID: 2-SGB-WG25			Date: 12/2/99
Weld Length (in.): NA	Surface Condition: AS GROUND	Lo: 9.2.3	Surface Temperature: <u>73</u> ° <u>F</u>		
Examiner: Larry Mauldin <i>Larry Mauldin</i> Level: III	Scans:		Pyrometer S/N: <u>MCNDE 27206</u>		
Examiner: James L. Panel <i>James L. Panel</i> Level: II	45 <input type="checkbox"/> _____ dB	70 <input checked="" type="checkbox"/> <u>79</u> dB	Cal Due: <u>1/21/00</u>		
Procedure: NDE-680 Rev: 2	45T <input type="checkbox"/> _____ dB	70T <input type="checkbox"/> _____ dB	Configuration: <u>NOZZLE TO UPPER HEAD</u>		
FC: N/A	60 <input checked="" type="checkbox"/> <u>70</u> dB		<u>NA</u> Flow <u>NA</u>		
Calibration Sheet No: 9902104, 9902105	60T <input type="checkbox"/> _____ dB		<u>NA</u> to <u>NA</u>		
	Other: _____ dB		Scan Surface: <u>OD</u>		
			Applies to NDE-680 only		
			Skew Angle: <u>23° &amp; 20.5°</u>		

IND #	<del>4</del>	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	20%dac HMA	20%dac HMA	20%dac HMA	20%dac HMA	20%dac HMA		<b>DO NOT WRITE IN THIS SPACE</b>	<b>DO NOT WRITE IN THIS SPACE</b>	
	60°	NRI				50%dac	50%dac	50%dac	50%dac	50%dac	50%dac				
	70°	NRI				100%dac	100%dac	100%dac	100%dac	100%dac	100%dac				

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>3</u>
Reviewed By: <i>Mary Moss</i>	Level: <u>II</u>	Date: <u>12-3-99</u>	Authorized Inspector: <i>MBC</i> Date: <u>12-6-99</u>
			Item No: B03.140.006

Attachment C  
 Page 50 of 52  
 Request for Relief 00-01

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

Examination Volume/Area Defined	
<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 Attachment)  4.7sq.in.	4.7sq.in. X 152.8 in. = 718.16 cu.in.

Coverage Calculations							
Scan #	Angle	Beam Direction	Area Examined (sq.in.)	Length Examined (in.)	Volume Examined (cu.in.)	Volume Required (cu.in.)	Percent Coverage
1	60°/70°	CW	3.3	152.8	504.24	718.2	70.21
2	60°/70°	CCW	3.3	152.8	504.24	718.2	70.21
					1008.48	1436.4	70.21

70.21%

		Item No:	B03.140.006
Prepared By: Larry Mauldin	<i>Larry Mauldin</i>	Level:	III    Date: 12/2/99
Reviewed By:	<i>Gary Moss</i>	Level:	II    Date: 12-3-99

INLET NOZZLE TO PER HEAD

INNER RADIUS INSPECTION AREA

A.B.C.D + C.D.G.H  $\frac{\pi \times 10^2}{2} - (\pi \times .5^2) \times .18 = .424 \text{ sq. in.}$   
 (65° = 18% OF A CIRCLE)

C.D.G.H  $\frac{.5}{2} (8.4 + 8.6) = 4.25 \text{ sq. in.}$

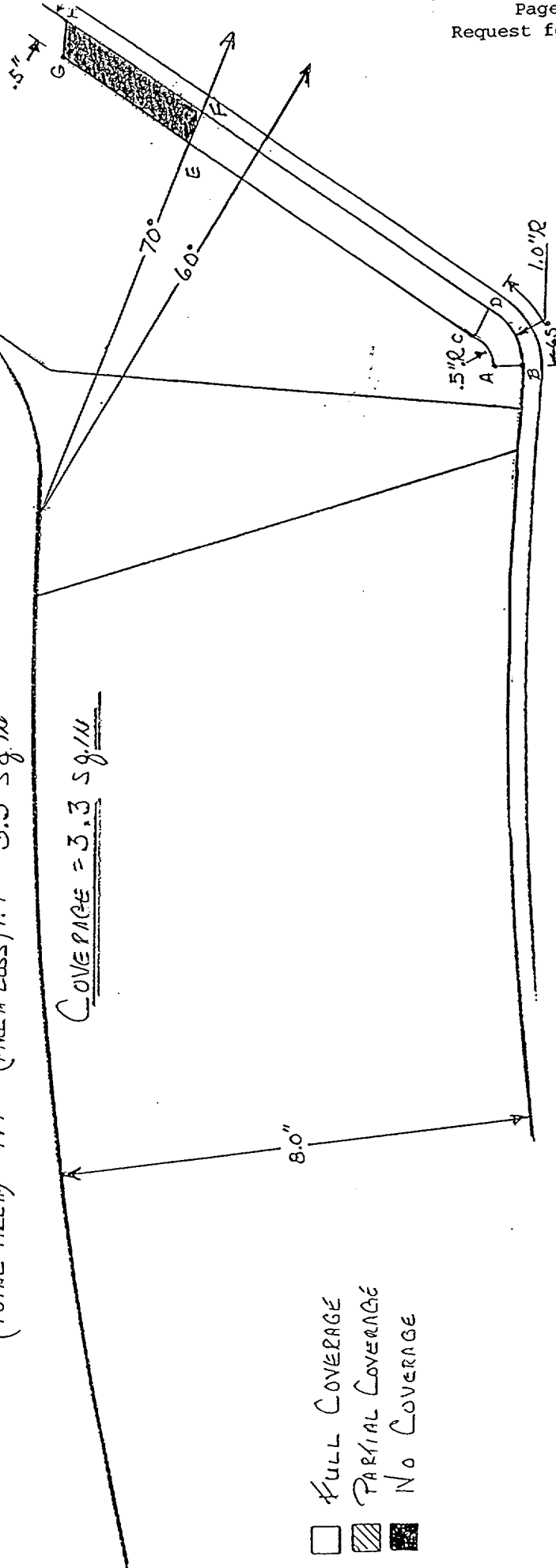
TOTAL AREA = 4.674 = 4.7 sq. in.

INSPECTED AREA

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

(TOTAL AREA) 4.7 - (Area Loss) 1.4 = 3.3 sq. in.

COVERAGE = 3.3 sq. in.



- FULL COVERAGE
- PARTIAL COVERAGE
- NO COVERAGE

I.D.# 2-SGB-WC/25  
 ITEM# B03140.006  
 BY: Louis Moulder  
 DATE: 12-2-99