

# CATEGORY 1

## REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR: 9803310013      DOC. DATE: 98/03/25      NOTARIZED: NO      DOCKET #  
FACIL: 50-269 Oconee Nuclear Station, Unit 1, Duke Power Co.      05000269  
50-270 Oconee Nuclear Station, Unit 2, Duke Power Co.      05000270  
50-287 Oconee Nuclear Station, Unit 3, Duke Power Co.      05000287  
AUTH. NAME      AUTHOR AFFILIATION  
MCCOLLUM, W.R.      Duke Power Co.  
RECIP. NAME      RECIPIENT AFFILIATION  
Document Control Branch (Document Control Desk)

See  
Reports

SUBJECT: Forwards request for relief 98-01 re third ten year ISI interval, per recommendations delineated in insp rept 95-05. Request allows Duke Power to take credit for limited ultrasonic exams on pressurizer-to-head weld.

DISTRIBUTION CODE: A047D      COPIES RECEIVED: LTR 1 ENCL 1      SIZE: 417  
TITLE: OR Submittal: Inservice/Testing/Relief from ASME Code - GL-89-04

### NOTES:

	RECIPIENT ID CODE/NAME	COPIES LTTR ENCL	RECIPIENT ID CODE/NAME	COPIES LTTR ENCL
	PD2-2 LA	1 1	PD2-2 PD	1 1
	LABARGE, D	1 1		
INTERNAL:	ACRS	1 1	AEOD/SPD/RAB	1 1
	FILE CENTER 01	1 1	NRR/DE/EMEB	1 1
	NUDOCS-ABSTRACT	1 1	OGC/HDS2	1 0
	RES/DET/EIB	1 1	RES/DET/EMMEB	1 1
EXTERNAL:	LITCO ANDERSON	1 1	NOAC	1 1
	NRC PDR	1 1		

### NOTE TO ALL "RIDS" RECIPIENTS:

PLEASE HELP US TO REDUCE WASTE. TO HAVE YOUR NAME OR ORGANIZATION REMOVED FROM DISTRIBUTION LISTS OR REDUCE THE NUMBER OF COPIES RECEIVED BY YOU OR YOUR ORGANIZATION, CONTACT THE DOCUMENT CONTROL DESK (DCD) ON EXTENSION 415-2083

TOTAL NUMBER OF COPIES REQUIRED: LTTR 14 ENCL 13

C  
A  
T  
E  
G  
O  
R  
Y  
  
1  
  
D  
O  
C  
U  
M  
E  
N  
T



W. R. McCollum, Jr.  
Vice President

**Duke Power**

Oconee Nuclear Site  
P.O. Box 1439  
Seneca, SC 29679

(864) 885-3107 OFFICE  
(864) 885-3564 FAX

March 25, 1998

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

Subject: Duke Power Company  
Oconee Nuclear Station, Units 1, 2, and 3  
Docket Nos. 50-269, -270, and -287  
Third Ten Year Inservice Inspection Interval  
Request for Relief No. 98-01

Pursuant to 10 CFR 50.55a(g)(5)(iii), attached is a Request for Relief from ASME Section XI, 1989 Edition, with no addenda. This request is to allow Duke Power to take credit for limited ultrasonic examinations on the Pressurizer-to-Head weld and specific Letdown Cooler Heat Exchanger Nozzle to Vessel welds. During examination of the subject Unit 1 welds, the ultrasonic examination coverages did not meet the 90% examination requirements of ASME Section XI. Achievement of greater than 90% examination coverage for these welds is impractical due to piping/vessel geometry, interferences, and existing examination technology. All three Oconee units are addressed by this Request for Relief per recommendations delineated in NRC Inspection Report 95-05, dated May 5, 1995.

If there are any questions or further information is needed you may contact R. P. Todd at (864) 885-3418.

Very truly yours,

*Bentley K Jones for W.R. McCollum Jr.*  
W. R. McCollum, Jr.  
Site Vice President

3000001

A0471

Attachments

9803310013 980325  
PDR ADDCK 05000269  
P PDR

U. S. Nuclear Regulatory Commission  
March 25, 1998  
Page 2

xc (w/attch): Mr. D. E. LaBarge, Project Manager  
Office of Nuclear Reactor Regulation  
U. S. Nuclear Regulatory Commission  
Washington, DC 20555

Mr. L. A. Reyes  
Regional Administrator, Region II  
U. S. Nuclear Regulatory Commission

xc(w/o attch): Mr. M. A. Scott  
Senior NRC Resident Inspector  
Oconee Nuclear Station

Mr. Max Batavia  
Bureau of Radiological Health  
SC Dept. of Health & Environmental Control  
2600 Bull St.  
Columbia, SC 29201

Duke Energy Corporation

Station Oconee Unit 1, 2 & 3  
10-YEAR INTERVAL REQUEST FOR RELIEF NO. 98-01

Pursuant to 10 CFR 50.55a(g)(5)(iii), Duke Energy has determined that compliance with the specified requirements of ASME Boiler and Pressure Vessel Code, Section XI is not practical for Oconee Nuclear Station. Accordingly, information is being submitted in support of our determination and relief is being sought from the applicable ASME Boiler and Pressure Vessel Code, Section XI requirement(s).

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

a. Part 1, Pressurizer Surge Nozzle-to-Lower Head Weld

1-PZR-WP15	Item Number B03.110.001
2-PZR-WP15	Item Number B03.110.001
3-PZR-WP15	Item Number B03.110.001

b. Part 2, Letdown Cooler Heat Exchanger Nozzle-to-Vessel Welds

1-LDCA-IN-V2	Item Number B03.150.001
1-LDCA-OUT-V6	Item Number B03.150.002
3-LDCA-IN-V2	Item Number B03.150.001
3-LDCA-OUT-V5	Item Number B03.150.002

For welds listed in this Request for Relief (both Parts 1 and 2), all configurations, including interferences, are the same for Units 1, 2, and 3. Therefore, all three units are being documented in this Request for Relief as described in NRC Inspection Report No. 50-269/95, 50-270/95, 50-287 dated May 5, 1995.

While the examinations have been completed only for Unit 1 at this time, relief is also being sought for Units 2 and 3 for the same welds. If, for

some reason, the actual examination coverages of the welds referenced in this Request for Relief for Units 2 and 3 are less than those listed for Unit 1 in Section IV of this request, additional Requests for Relief will be submitted on a case by case basis.

## **II. Code Requirement:**

ASME Boiler and Pressure Vessel Code, Section XI, 1989 Edition with no Addenda, Examination Category B-D, Items B3.110 and B3.150 requires 100% volumetric examination of all Pressurizer nozzle-to-vessel welds as defined by Figure IWB-2500-7,

ASME Section XI 1989 Edition with no Addenda, Appendix 1, including Supplement 9 as clarified by Code Inquiry 95-11 requires scanning using two different angles when scanning from the outside surface of the component. 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 at least 90% of the required volume has been examined.

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

Relief is requested from the requirement of examining 100% of the ASME Boiler and Pressure Vessel Code, Section XI, 1989 Edition with no Addenda (Code) required volumetric examinations of the Pressurizer Nozzle-to-Head weld and the Letdown Cooler Heat Exchanger Nozzle to Vessel welds described in Section I above.

Due to part geometry, obtaining at least 90% of the weld length as outlined in Code Case N-460 is not possible with existing ultrasonic techniques.

**IV. Basis for Relief:**

**Request for Relief 98-01, Part 1 Examination Category B-D, Item B3.110, Full Penetration Pressurizer Nozzle-to-Vessel Weld**

Pressurizer Nozzle-to-Head Weld 1-PZR-WP15 (Item Number B03.110.00) 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, 1989 Edition. Reference Attachment A for drawing.

This weld is limited to 68.39% coverage of the required volume because of the nozzle configuration.

**Request for Relief 98-01, Part 2, Examination Category B-D, Item B3.150, Full Penetration Pressurizer Nozzle-to-Vessel Welds**

Letdown Cooler Heat Exchangers (Primary Side) Nozzle-to-Vessel Welds 1-LDCA-IN-V2 and 1-LDCA-IN-V6 (Item Numbers B03.110.001 and B03.110.002 respectively) were examined to the maximum extent practical using ultrasonic techniques in accordance with the requirements of ASME Section V, Article 4, and ASME Section XI Boiler and Pressure Vessel Code, Appendix I, 1989 Edition. Reference Attachment B for drawing.

These welds are limited to 26.73% coverage of the required volume because of branch connection interferences.

**V. Alternate Examinations or Testing:**

**Request for Relief 98-01, Part 1, Examination Category B-D, Item B3.110. Pressurizer Nozzle-to-Vessel Weld**

The use of radiography as an alternate volumetric examination of the Pressurizer weld referenced in this request is not a viable option. Restrictions to performing radiography are primarily due to inability to access the inside of the Pressurizer 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 B15.20) 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 this weld, it would be detected. Specifically, any leakage from this weld 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 required by Technical Specification 3.1.6, "Leakage". The leakage could be detected through several methods. The reactor building air particulate 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 weld 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 identified in Section 1 of this request (for all units) 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, 1989 Edition, and Code Case N-460. 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.

**Request for Relief 98-01, Part 2, Examination Category B-D, Item B3.150.Letdown Cooler Heat Exchanger Nozzle-to-Vessel Welds**

The use of radiography as an alternate volumetric examination of the Letdown Cooler Heat Exchanger Nozzle-to-Vessel welds is not a viable option. Restrictions to performing radiography are primarily due to inability to access the inside of the Letdown Cooler Heat Exchanger 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 B15.40) that a system leakage test be performed after each refueling outage. Additionally a system hydrostatic test (reference Table IWB-2500-1, Item Number B15.41) 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, any 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 required by Technical Specification 3.1.6, "Leakage". The leakage could be detected through several methods. The reactor building air particulate 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. In the unlikely case that a leak did occur, these welds would be isolated from the RCS pressure boundary by remotely-operated valves.

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

### **Request for Relief 98-01, Part 1, Examination Category B-D, Item B3.110. Pressurizer Nozzle-to-Vessel Weld**

---

The Code requires 100% volumetric examination of all Pressurizer Nozzle-to-Vessel welds. However, the taper on the nozzle side of the weld restricts scanning and prevents complete volumetric coverage of Pressurizer Nozzle-to-Vessel weld PZR-WP15. Therefore, the 100% volumetric examination is impractical for this nozzle-to-vessel weld. To meet Code examination requirements, modifications to the nozzle would be necessary to allow complete volumetric coverage. Modification to this portion of the reactor coolant system would create a considerable burden on Duke Energy.

Duke Energy obtained 68.39% coverage of Pressurizer Nozzle-to-Vessel weld 1-PZR-WP15. Based on the significant portion of the required volumetric examination that has been completed, any existing pattern of degradation would have been detected. In addition to the Code required volumetric examination; the Pressurizer will be subjected to 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 nozzle-to-vessel weld.

Pursuant to 10 CFR 50.55a(g)(6)(i), granting this relief for the Pressurizer Nozzle-to-Vessel weld will provide reasonable assurance of weld/component integrity, and 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.

**Request for Relief 98-01, Part 2, Examination Category B-D, Item B3.150.Letdown Cooler Heat Exchanger Nozzle-to-Vessel Welds**

---

The Code requires 100% volumetric examination of all Heat Exchanger Nozzle-to-Vessel welds. However, the location of the Letdown Cooler Heat Exchanger Nozzle-to-Vessel welds prevents obtaining 100% volumetric examination coverage. Therefore, the 100% volumetric examination is impractical. To meet Code examination requirements, modifications to the Letdown Cooler Heat Exchanger Nozzle would be necessary to allow complete volumetric examination coverage. Modifications of this magnitude would create a considerable burden on Duke Energy Corporation.

Duke Energy obtained 26.73% coverage on the Letdown Cooler Heat Exchanger Nozzle-to-Vessel welds, 1LDCA-IN-V2 and 1-LDCA-OUT-V6. 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 nozzle-to-vessel welds. In addition to the above code required examinations, RCS leakage monitoring and the capability of providing remote isolation of these welds from RCS pressure boundary provide assurance that in the unlikely case that a leak from these welds did occur, the welds could be promptly isolated and evaluated for corrective action.

Pursuant to 10 CFR 50.55a(g)(6)(i), granting this relief for the Letdown Cooler Heat Exchanger Nozzle-to-Vessel weld will provide reasonable assurance of weld/component integrity, and is authorized by law and will not endanger life of 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:**

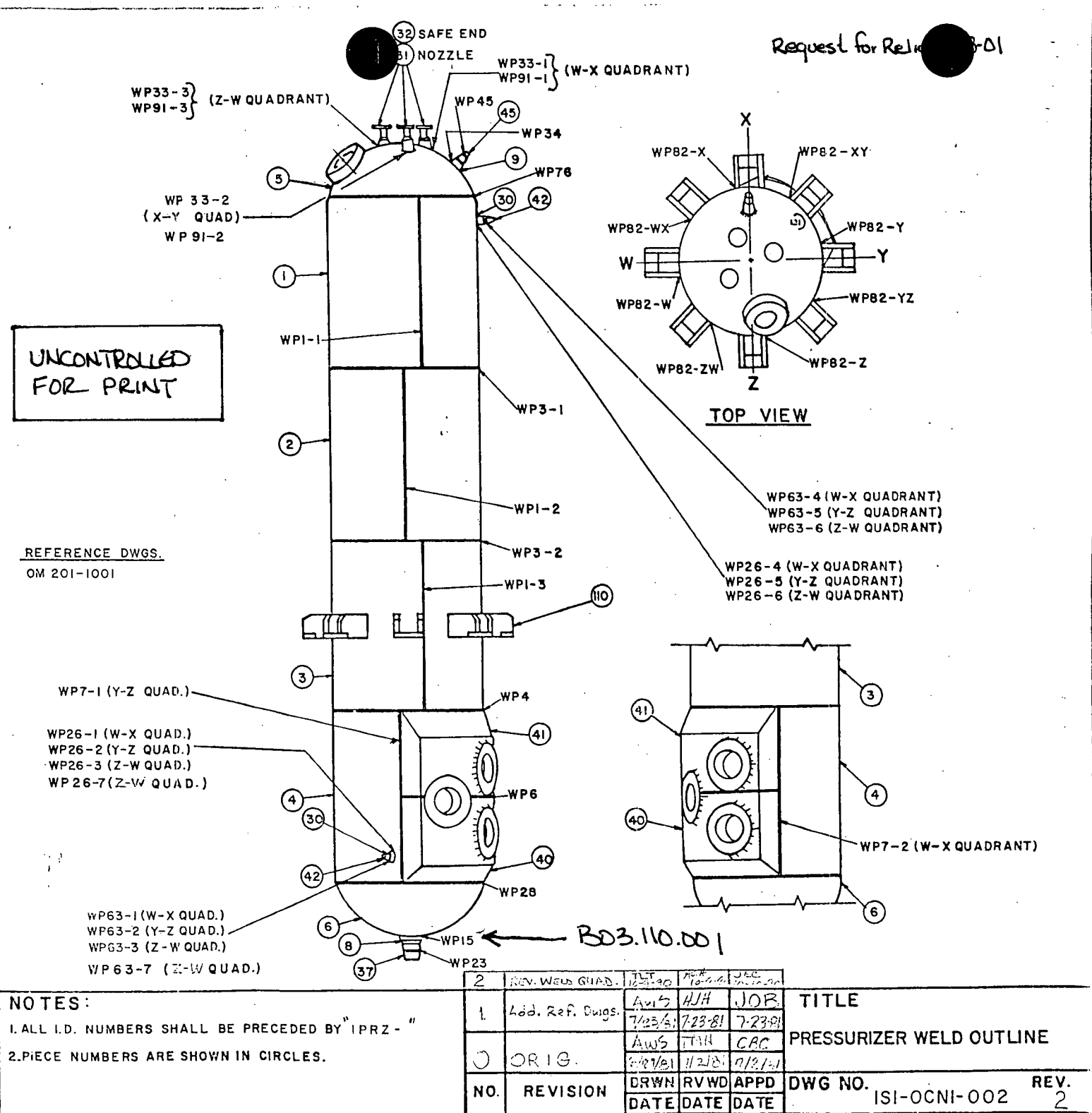
Unit 1, Refueling Outage 17

Unit 2, Refueling Outage 16

Unit 3, Refueling Outage 17

Evaluated By: RC Rouse Date 3/2/98  
Reviewed By: JO Barbour Date 3/5/98

BILL OF MATERIAL				
THICK.	PC. NO.	QTY	DESCRIPTION	MATL.
5.188	1	1	UPPER SHELL COURSE	SA 212 GR. B
5.188	2	1	MIDDLE SHELL COURSE	SA 212 GR. B
5.188	3	1	LOWER SHELL COURSE	SA 212 GR. B
5.188	4	1	HEATER BELT SHELL	SA 212 GR. B
5.188	5	1	UPPER HEAD	SA 212 GR. B
5.188	6	1	LOWER HEAD	SA 212 GR. B
3.563	8	1	PRESSURIZER SURGE NOZZLE	SA 508 CL. I
5.188	9	1	PRESSURIZER SPRAY NOZZLE	SA 508 CL. I
5.188	30	6	SAMPLING NOZZLE	SA 508 GR. B
4.750	31	3	PRESSURIZER RELIEF NOZZLE	SA 508 CL. I
1.063	32	3	PRESSURIZER RELIEF NOZZLE SAFE END	SA 182 F316
5.188	37	1	PRESSURIZER SURGE NOZZLE SAFE END	SA 336 CL. F8M
5.188	40	1	LOWER HEATER BELT FORGING	SA 508 CL. I
5.188	41	1	UPPER HEATER BELT FORGING	SA 508 CL. I
5.188	42	6	SAMPLING NOZZLE SAFE END	SB-166
5.188	45	1	PRESSURIZER SPRAY NOZZLE SAFE END	SB-166
5.188	110	8	PRESSURIZER SUPPORT LUG ASSEMBLY	SA-516 GR. 70
5.188				
4.750				
4.750				
4.750				
4.750				
4.750				
0.750				
1.1875				
1.1875				
1.1875				
1.1875				
1.1875				
4.750				
3.500				
3.500	WELD LIST (CONT.)			
3.500	I.D. NO.	PC. NO.	DIAM.	THICK.
3.500	WP91-1	31 TO 32	2 1/2" NPS	1.000
3.500	WP91-2	31 TO 32	2 1/2" NPS	1.000
3.500	WP91-3	31 TO 32	2 1/2" NPS	1.000
3.500	WP63-7	42 TO 30	SAMPLING	1.1875
3.500				



<b>DUKE POWER COMPANY</b>										Exam Start: 1015		Form NDE-UT-2A	
<b>ULTRASONIC EXAMINATION DATA SHEET FOR PLANAR REFLECTORS</b>										Exam Finish: 1055		Revision 4	
Station: Oconee				Unit: 1		Component/Weld ID: 1-PZR-WP15						Date: 10/24/97	
Weld Length (in.): 58"				Surface Condition: N/A				Lo: 9.2.3		Surface Temperature: 80 ° F			
Examiner: Jay A. Eaton				Level: II		Scans: 45 <input checked="" type="checkbox"/> 56 dB    70 <input type="checkbox"/> _____ dB 45T <input checked="" type="checkbox"/> 56 dB    70T <input type="checkbox"/> _____ dB 60 <input checked="" type="checkbox"/> 63 dB 60T <input checked="" type="checkbox"/> 63 dB Other: 0°-30.5 dB				Pyrometer S/N: MCNDE 27018			
Examiner: James L. Panel				Level: II						Cal Due: 2/14/98			
Procedure: NDE-620    Rev: 5 NDE-640            1				FC: N/A						Configuration: Nozzle to Pzr Head S1                      S2 HEAD            to    NOZZLE Scan Surface: OD			
Calibration Sheet No: 9701091, 9701092, 9701093				95-18&19						<b>Applies to NDE-680 only</b> Skew Angle: N/A			

IND #	<input checked="" type="checkbox"/>	Max % Ref	Mp Max	W Max	L Max	L1	L2	W1	Mp1	W2	Mp2	Beam Dir.	Exam Surf.	Scan	Damps
		DO NOT WRITE IN THIS SPACE				20%dac HMA	20%dac HMA	20%dac HMA	20%dac HMA	20%dac HMA	20%dac HMA		DO NOT WRITE IN THIS SPACE		
						50%dac	50%dac	50%dac	50%dac	50%dac	50%dac				
						100%dac	100%dac	100%dac	100%dac	100%dac	100%dac				
NRI	0°														
NRI	45°														
NRI	60°														

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>13</u>
Reviewed By: G G Bibb <i>GG Bibb</i> Level: III    Date: 10-28-97	Authorized Inspector: <i>Mr. C</i> Date: 11-6-97    Item No: B03.110.001

# DUKE POWER COMPANY ISI LIMITATION REPORT

FORM NDE-UT-4

Revision 1

Component/Weld ID: 1-PZR-WP15

Item No: B03.110.001

Remarks:

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

SURGE LINE NOZZLE

☐ 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: 10/24/97

Sketch(s) attached ☒ yes ☐ no

Sheet 2 of 13

Reviewed By: G G Bibb

Date: 10-28-97

Authorized Inspector: *MBC*

Date: 11-6-97

## DUKE POWER COMPANY

NDE-UT-6

B03.110.001

## Ultrasonic Beam Spread Measurement Sheet

Revision 1

W1 .6 Mp1 1.45

1/4t Wmax 1.1 MpMax 1.85

W2 1.6 Mp2 2.18

W1 2.05 Mp1 3.3

1/2t Wmax 2.45 MpMax 3.71

W2 2.85 Mp2 3.98

45° - 20°

TRANSDUCER: M18425

W1 3.3 Mp1 5.21

3/4t Wmax 3.7 MpMax 5.53

W2 4.25 Mp2 5.86

CAL BLOCK: 40394

Calibration Sheet No: 9701092

Examiner:

Level:

Date:

Reviewed By:

Level:

Date:

Authorized Inspector:

Date:

Gary Moss II 10-24-97

H. Bibb

III 10-28-97

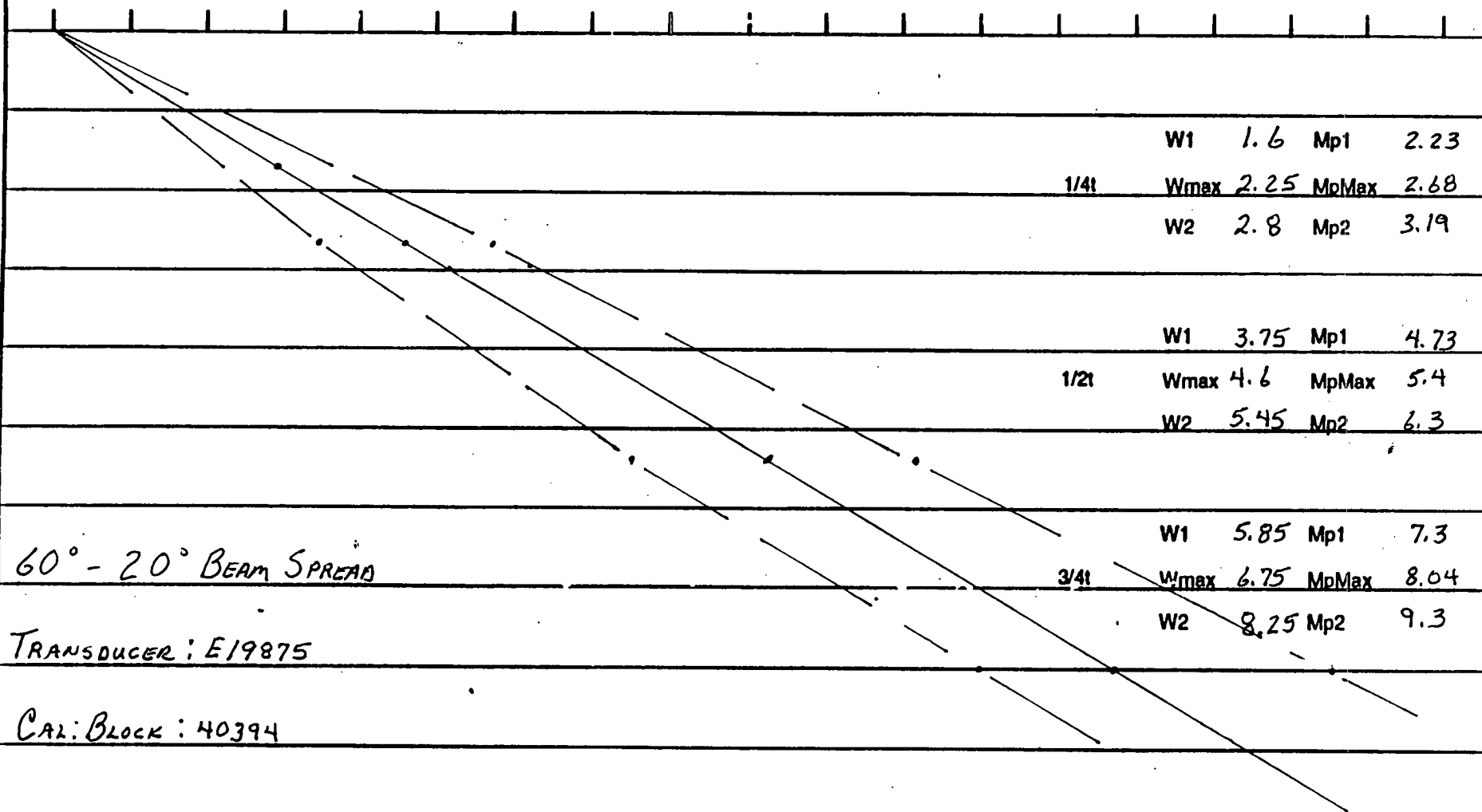
MOC

11-6-97

**DUKE POWER COMPANY**  
**Ultrasonic Beam Spread Measurement Sheet**

**NDE-UT-6**

**Revision 1**



60° - 20° BEAM SPREAD

TRANSDUCER: E19875

CAL: BLOCK: 40394

Calibration Sheet No: 9701090

Examiner:

Level:

Date:

Reviewed By:

Level:

Date:

Authorized Inspector:

Date:

*Say Moss II* 10-24-97

*Adelt*

*III* 10-28-97

*JMBC*

*11-6-97*



**DUKE POWER COMPANY**  
**Limited Examination Coverage Worksheet**

NDE-91-1

Revision 0

**Examination Volume/Area Defined**

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

**Area Calculation**

**Volume Calculation**

**Coverage Calculations**

Scan #	Angle	Beam Direction	Area Examined (sq.in.)	Length Examined (in.)	Volume Examined (cu.in.)	Volume Required (cu.in.)	Percent Coverage
		WELD			2177.4	3689.6	59.01
		BASE METAL			6071.8	8371.8	72.53
		TOTAL	AGGREGATE	COVERAGE	8249.2	12061.4	68.39

Item No: B03.110.001

Prepared By: Jay A Eaton

Level: II

Date: 10/24/97

Reviewed By: G G Bibb

Level: III

Date: 10/24/97

*Sheet 5 of 13*

**DUKE POWER COMPANY**  
**Limited Examination Coverage Worksheet**

NDE-91-1

Revision 0

**Examination Volume/Area Defined**

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

**Area Calculation**

**Volume Calculation**

**Coverage Calculations**

Scan #	Angle	Beam Direction	Area Examined (sq.in.)	Length Examined (in.)	Volume Examined (cu.in.)	Volume Required (cu.in.)	Percent Coverage
B-C-F-G	45	S1	0	54	0	461.2	0.00
B-C-F-G	60	S1	0	54	0	461.2	0.00
B-C-F-G	45	S2	7.34	54	396.4	461.2	85.95
B-C-F-G	60	S2	7.5	54	405	461.2	87.81
B-C-F-G	45	CW	6.37	54	344	461.2	74.59
B-C-F-G	45	CCW	6.37	54	344	461.2	74.59
B-C-F-G	60	CW	6.37	54	344	461.2	74.59
B-C-F-G	60	CCW	6.37	54	344	461.2	74.59
WELD		TOTAL	AGGREGATE	COVERAGE	2177.4	3689.6	59.01

Item No: B03.110.001

Prepared By: Jay A Eaton

Level: II

Date: 10/24/97

Reviewed By: G G Bibb

Level: III

Date: 10/24/97

Sheet 6 of 13

**DUKE POWER COMPANY**  
**Limited Examination Coverage Worksheet**

NDE-91-1

Revision 0

**Examination Volume/Area Defined**

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

**Area Calculation**

**Volume Calculation**

**Coverage Calculations**

Scan #	Angle	Beam Direction	Area Examined (sq.in.)	Length Examined (in.)	Volume Examined (cu.in.)	Volume Required (cu.in.)	Percent Coverage
C-D-E-F	45	S2	15.63	54	844	844	100.00
C-D-E-F	60	S2	15.63	54	844	844	100.00
C-D-E-F	45	CW	15.63	54	844	844	100.00
C-D-E-F	45	CCW	15.63	54	844	844	100.00
C-D-E-F	60	CW	15.63	54	844	844	100.00
C-D-E-F	60	CCW	15.63	54	844	844	100.00
A-B-G-H	45	S2	5.53	54	298.6	551.3	54.16
A-B-G-H	60	S2	6.37	54	344	551.3	62.40
A-B-G-H	45	CW	1.69	54	91.3	551.3	16.56
A-B-G-H	45	CCW	1.69	54	91.3	551.3	16.56

Item No: B03.110.001

Prepared By: Jay A Eaton

Level: II

Date: 10/24/97

Reviewed By: G G Bibb

Level: III

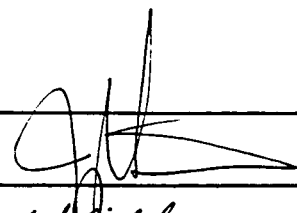

Date: 10/24/97

<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 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
A-B-G-H	60	CW	1.69	54	91.3	551.3	16.56
A-B-G-H	60	CCW	1.69	54	91.3	551.3	16.56
BASE	METAL	TOTAL	AGGREGATE	COVERAGE	6071.8	8371.8	72.53

		Item No:	B03.110.001
Prepared By: Jay A Eaton		Level: II	Date: 10/24/97
Reviewed By: G G Bibb		Level: III	Date: 10/24/97

ITEM# B03.110.001 & B03.120.001

WELD# 1P2E-WP15

BASE METAL A-B-G-H

$$60^\circ = \text{AREA INSPECTED} = 1.3" \times 4.9" = 6.37 \text{ in}^2$$

$$45^\circ = \text{AREA INSPECTED} = 1.3" \times 4.0" = 5.2 \text{ in}^2$$

$$\frac{1.3" \times .5"}{2} = 0.33 \text{ in}^2$$

$$45^\circ \text{ TOTAL} = 5.53 \text{ in}^2$$

45° & 60° CW & CCW

$$\text{AREA INSPECTED} = \frac{2.6" \times 1.3"}{2} = 1.69 \text{ in}^2$$

BASE METAL = CD-E-F

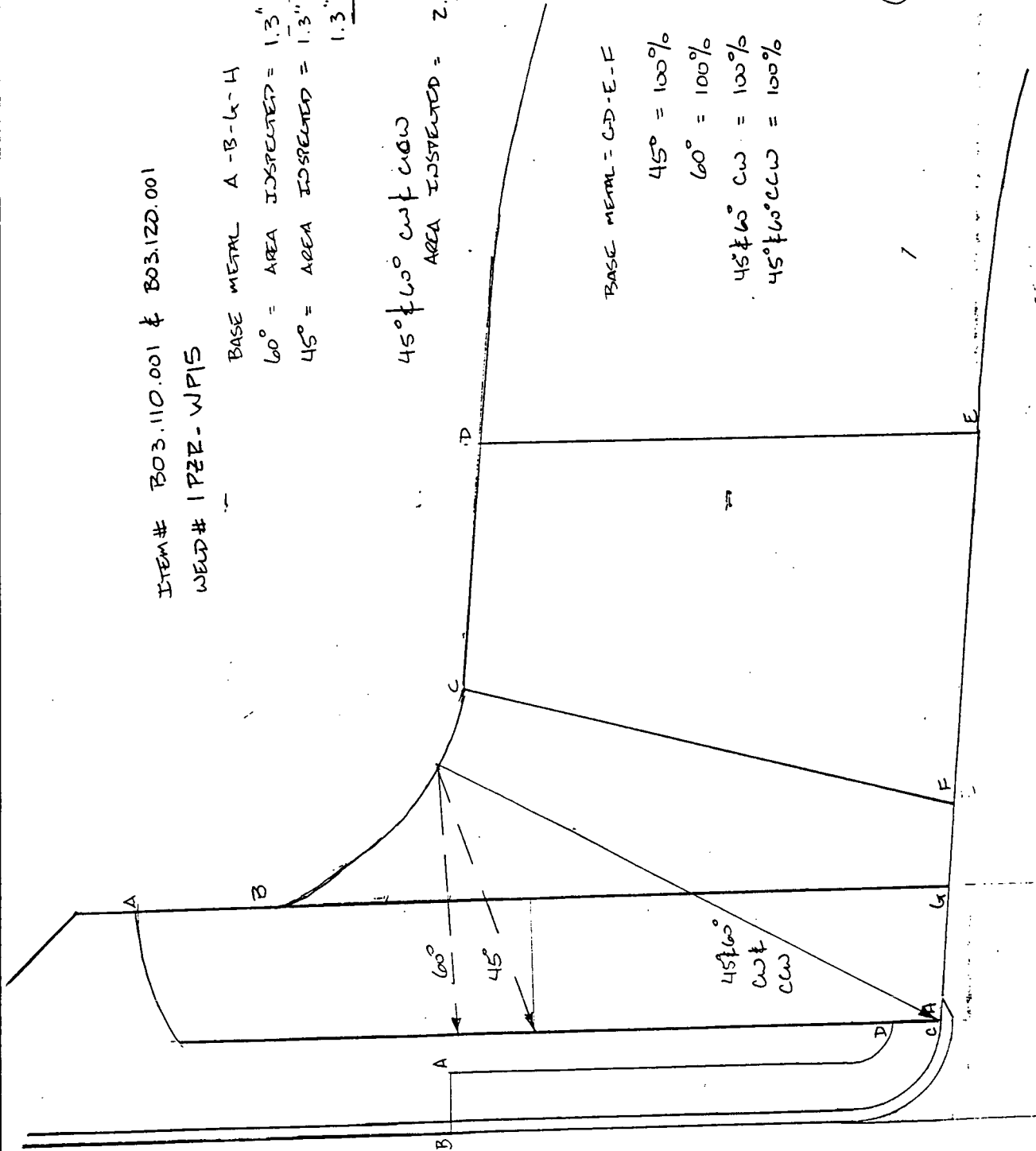
$$45^\circ = 100\%$$

$$60^\circ = 100\%$$

$$45^\circ \& 60^\circ \text{ CW} = 100\%$$

$$45^\circ \& 60^\circ \text{ CCW} = 100\%$$

*[Signature]* II 10/24/97



ITEM# B03.110.001 & B03.120.001  
WELD# 1P2E-WP15

WELD AREA

$$45^\circ \text{ TML} = 8.54$$

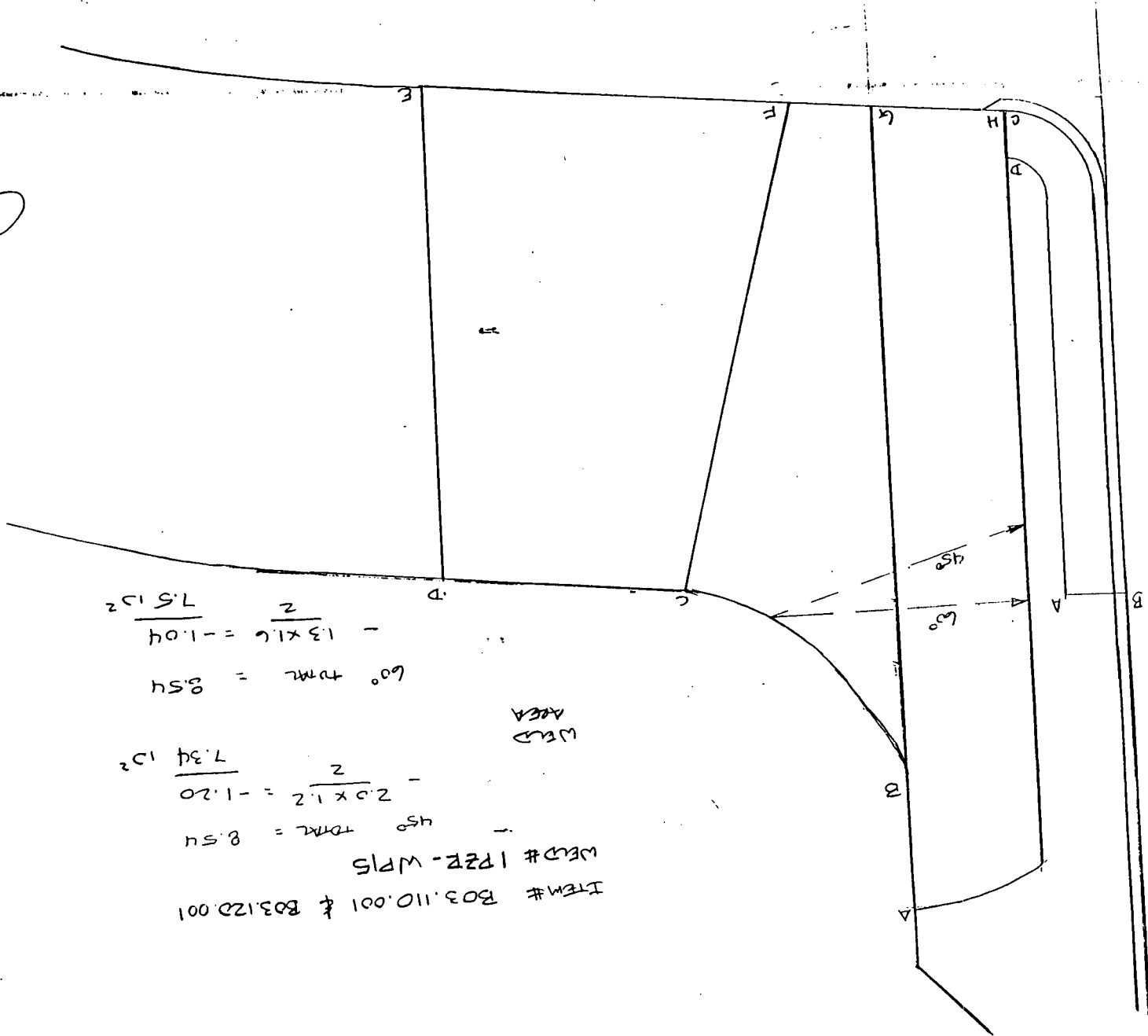
$$- \frac{2.0 \times 1.2}{2} = -1.20$$

$$\frac{7.34}{2} 10^2$$

$$60^\circ \text{ TML} = 8.54$$

$$- \frac{1.3 \times 1.6}{2} = -1.04$$

$$\frac{7.5}{2} 10^2$$



II 10/24/57

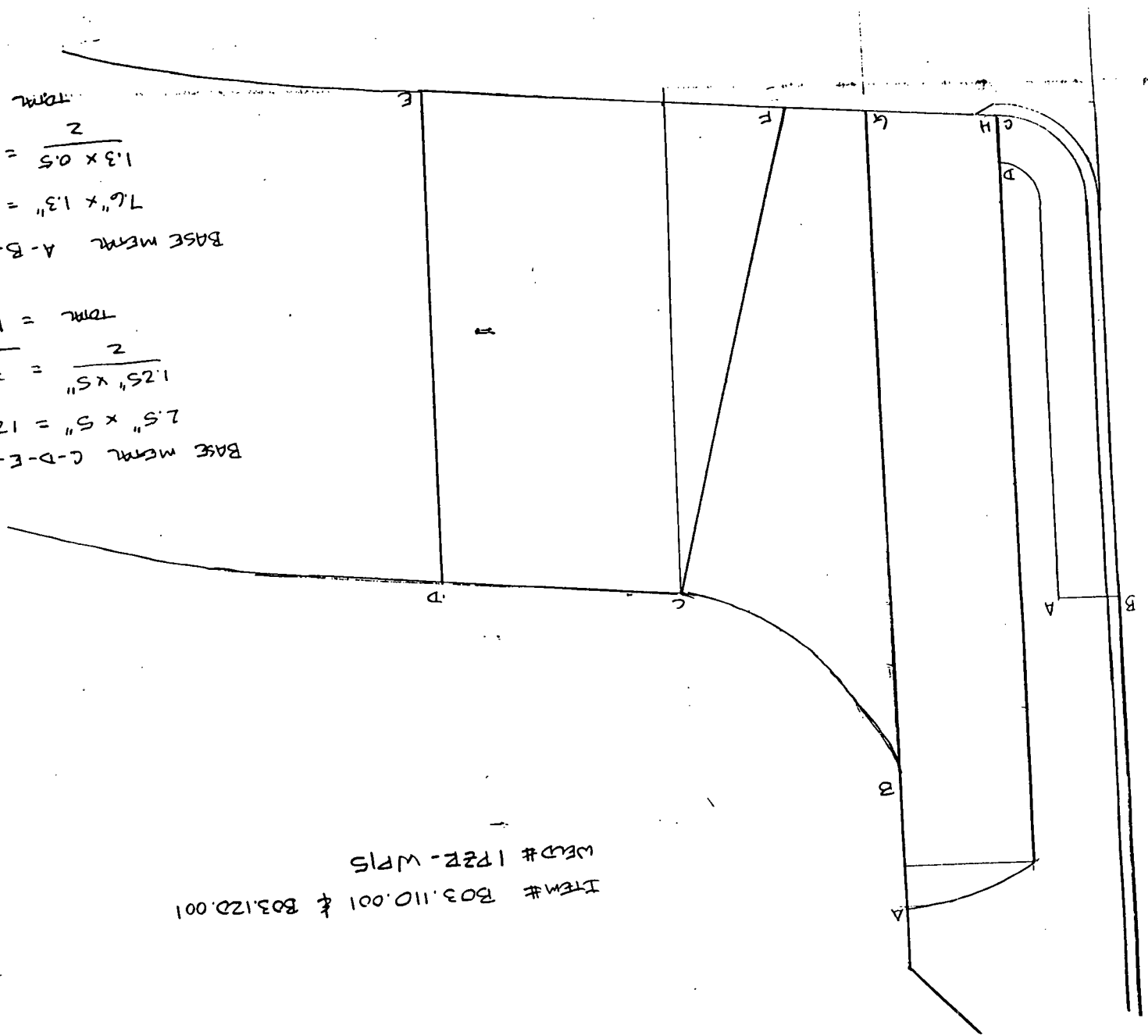
ITEM# B03.110.001 & B03.120.001  
 WELD# 1P2E-WP15

9/17 II 10/24/97

BASE METAL C-D-E-F  
 $2.5" \times 5" = 12.5 \text{ in}^2$   
 $\frac{1.25" \times 5"}{2} = 3.125 \text{ in}^2$   
 $\text{TOTAL} = 15.63 \text{ in}^2$

BASE METAL A-B-G-H  
 $7.6" \times 1.3" = 9.88 \text{ in}^2$   
 $\frac{1.3 \times 0.5}{2} = 0.33 \text{ in}^2$   
 $\text{TOTAL} = 10.21 \text{ in}^2$

Sheet 11 of 13



ITEM# B03.110.001 & B03.120.001  
WEED# 1PZR-WP15

TOTAL WEED

$$\textcircled{1} \frac{1.1 \times 1.4}{2} = 0.77 \text{ } 10^2$$

$$\textcircled{2} 1.9 \times 5.3 = 4.77 \text{ } 10^2$$

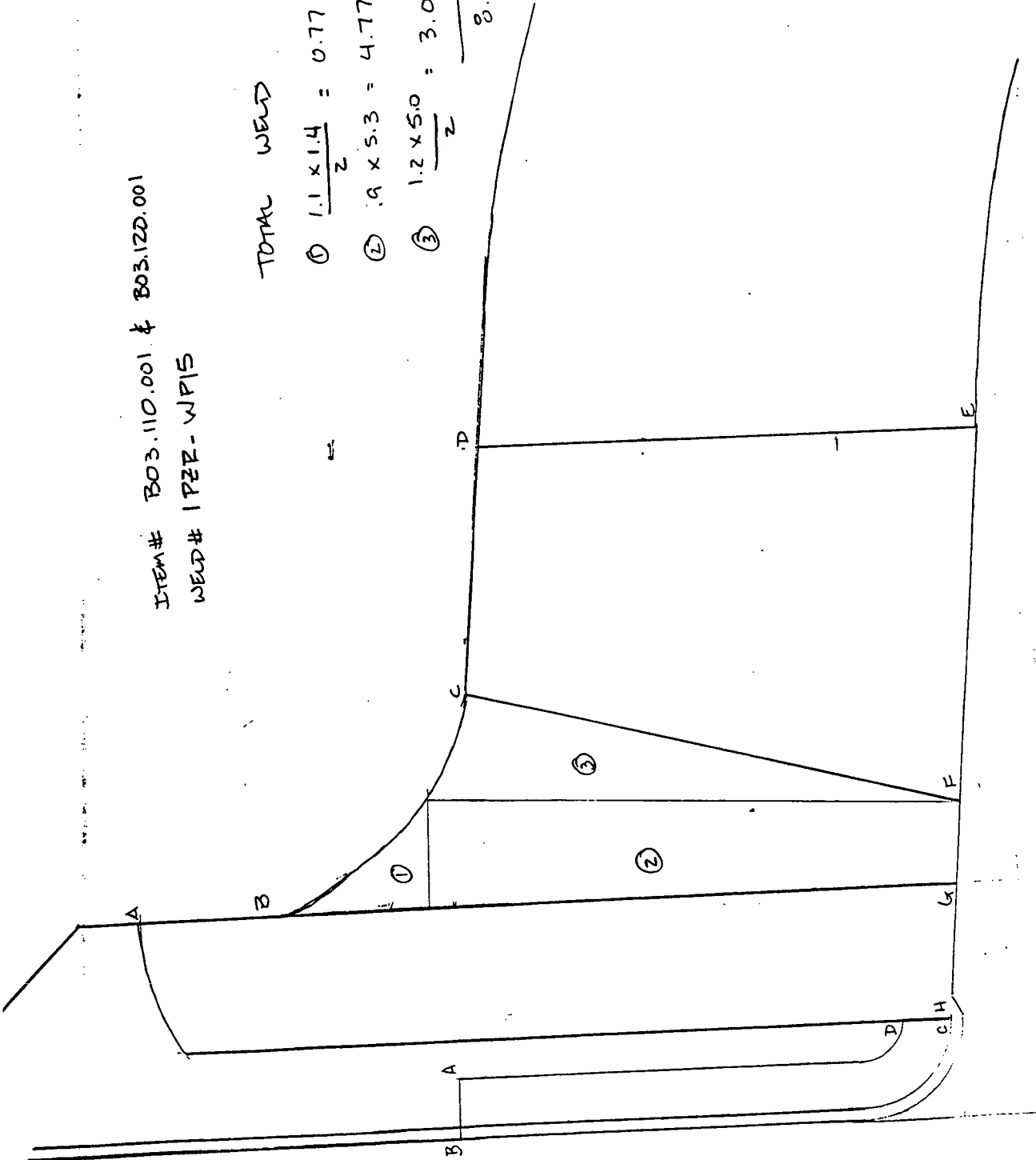
$$\textcircled{3} \frac{1.2 \times 5.0}{2} = 3.0 \text{ } 10^2$$

$$\underline{\hspace{1cm}} 8.54 \text{ } 10^2$$

*[Signature]*

II 10/24/57

Sheet 12 of 13





ITEM# B03.110.001 & B03.120.001  
WELD# 1P2R-WP15

WELD AREA

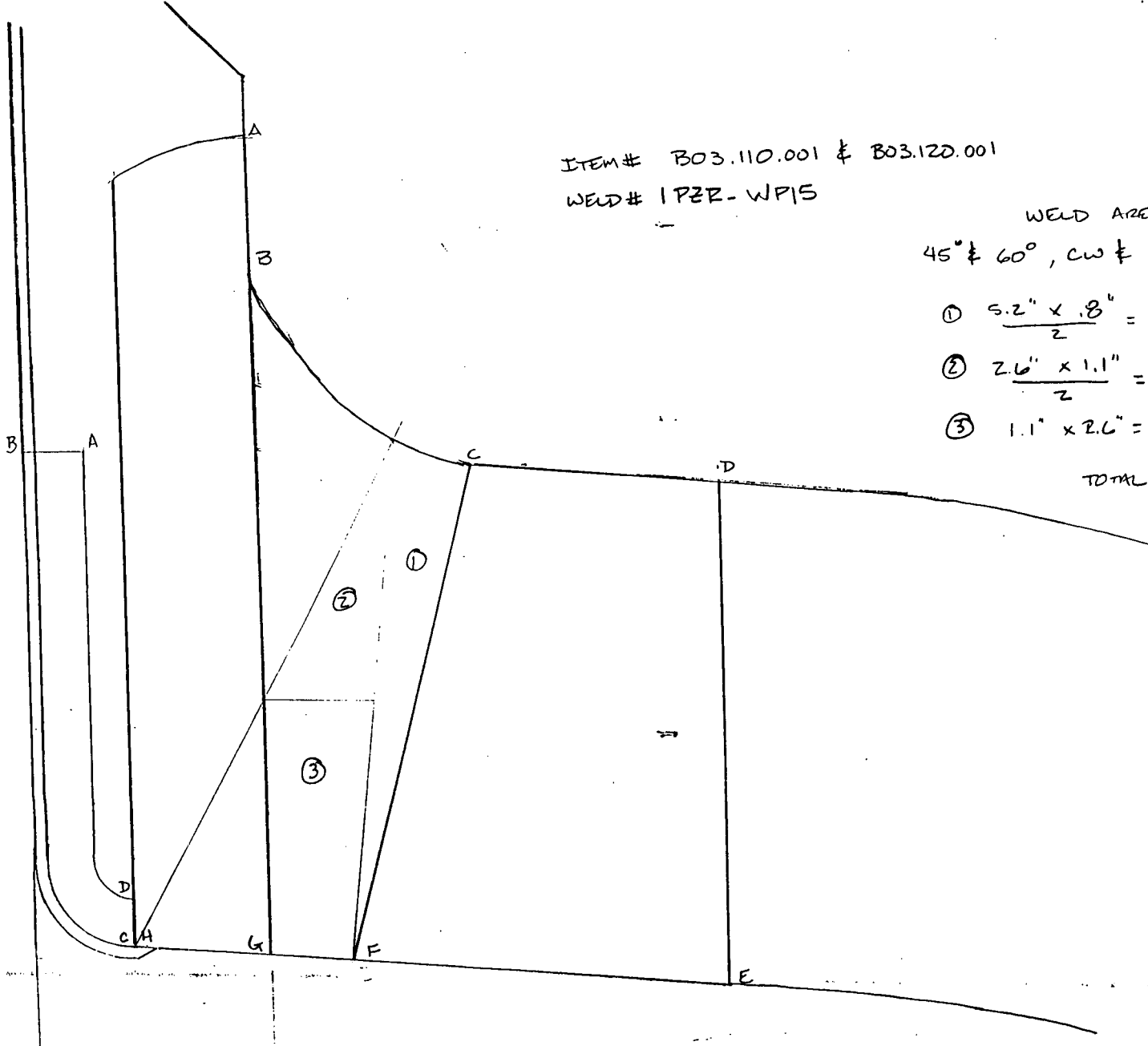
45° & 60°, CW & CCW

$$\textcircled{1} \frac{5.2" \times .8"}{2} = 2.08 \text{ in}^2$$

$$\textcircled{2} \frac{2.6" \times 1.1"}{2} = 1.43 \text{ in}^2$$

$$\textcircled{3} 1.1" \times 2.6" = 2.86 \text{ in}^2$$

$$\text{TOTAL} \quad 6.37 \text{ in}^2$$

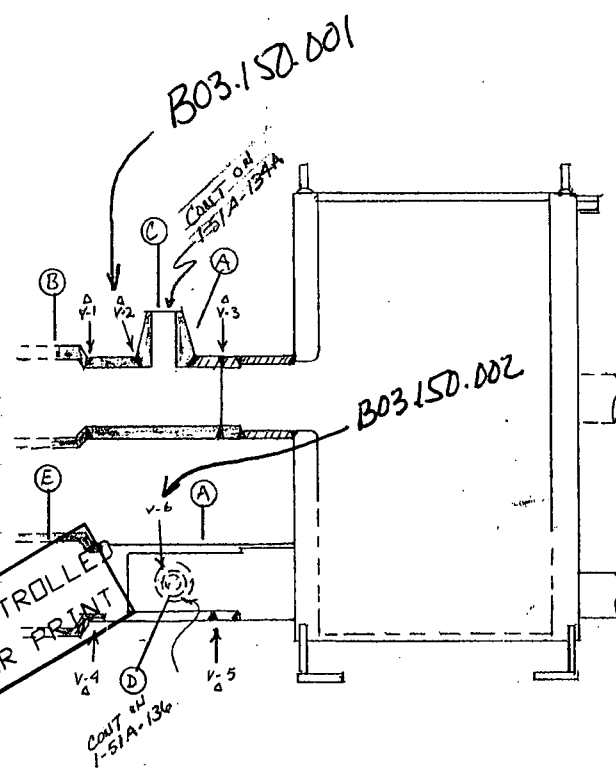


*gfk* II 10/24/97

Request for Relief 98-01

AB1028

BILL OF MATERIAL										
MAT'L I.D.	QUANTITY	MATERIAL		SPECIFICATION		DESCRIPTION	CONST.	SIZE	SCH.	LOT NO.
		CLASS	TYPE	ASME OR ASTM	GRADE					
①		SS	PIPE	316L		Bar (Hanger Nozzle)	—	—	—	
②		SS	PIPE	316L		CHEMICAL CONNECTOR	—	8"	875	E2937-11-2
③		SS	PIPE	316L		PIPE (INLET)	—	3"	1100	
④		SS	PIPE	316L		PIPE (OUTLET)	—	3"	1100	
⑤		SS	PIPE	316L		CHEMICAL CONNECTOR	—	8"	875	E2937-11-1



\*SEE NOTE 3 & SEE NOTE 9

ERN: OXBB 32RH

NOTES:

- ALL WELD NUMBERS SHALL BE PRECEDED BY 151A-18792-1
- LAST WELD NO. V-6
- REF. LAYOUT DWG. 151A-18792-1
- REF. FLOW DWG. 151A-18792-1, 2, 3, 4
- CONSTR. CONSTRUCTION PER ASME SECT III CLASS 3
- DESIGN TEMP. 200° DESIGN PRESS. 2500 PSIG
- THE DRAWING NUMBER WILL BE THE COOLER SERIAL NUMBER. ALL COOLERS WILL BE DESIGNATED AS UNIT 1. PLEASE FILE IN SYSTEM 51A.
- THIS COOLER IS CURRENTLY LET DOWN COOLER 51A

① WELDING WELDS:  
V-1 V-4 - HEAD TO SHELL WELDS  
V-2, V-3, V-6 - NOZZLE TO VESSEL WELDS  
V-5 V-3 - TUBE SHEET TO HEAD WELDS

UNIT 1  
COOLER A

																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					</
--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	----

<b>DUKE POWER COMPANY</b>										Exam Start: 1031		Form NDE-UT-2A	
<b>ULTRASONIC EXAMINATION DATA SHEET FOR PLANAR REFLECTORS</b>										Exam Finish: 1146		Revision 4	
Station: Oconee			Unit: 1		Component/Weld ID: 1-LDCA-IN-V2						Date: 9/29/97		
Weld Length (in.): 14.5			Surface Condition: AS GROUND				Lo: 9.1.1.1		Surface Temperature: 71 ° F				
Examiner: Richard B. Childers <i>Richard B. Childers</i> Level: II			Scans: 45 <input checked="" type="checkbox"/> 47.0 dB    70 <input type="checkbox"/> _____ dB 45T <input checked="" type="checkbox"/> 44.0 dB    70T <input type="checkbox"/> _____ dB 60 <input checked="" type="checkbox"/> 72.0 dB 60T <input type="checkbox"/> _____ dB Other: 45L=75 dB				Pyrometer S/N: MCNDE 27018						
Examiner: James H. Resor <i>James H. Resor</i> Level: II							Cal Due: 2/14/98						
Procedure: NDE-630    Rev: 2    FC: N/A							Configuration: CIRC S1 _____ Flow _____ S2 _____ NOZZLE to C.BODY Scan Surface: OD <b>Applies to NDE-680 only</b> Skew Angle: N/A						
Calibration Sheet No: 9701053, 9701054, 9701056, 9701055													

IND #		Max % Ref	Mp Max	W Max	L Max	L1	L2	W1	Mp1	W2	Mp2	Beam Dir.	Exam Surf.	Scan	Damps
		DO NOT WRITE IN THIS SPACE				20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac	20%dac HMA 50%dac 100%dac		DO NOT WRITE IN THIS SPACE		
1	45L	159	1.55	0.8	12.5	360°	INT					S2	S1	AXIAL	NO
2	60L	159	1.76	1.1	12.5	360°	INT					S2	S1	AXIAL	NO
NRI	45C														

Remarks: SN # 94-18792-1

Limitations: (see NDE-UT-4) <input checked="" type="checkbox"/> 90% or greater coverage obtained: yes <input type="checkbox"/> no <input checked="" type="checkbox"/>										Sheet 1 of 11			
Reviewed By: G G Bibb <i>GG Bibb</i>			Level: III		Date: 10-2-97		Authorized Inspector: <i>MBC</i>			Date: 10-7-97		Item No: B03.150.001	

DUKE POWER COMPANY  
UT PROFILE/PLOT SHEET

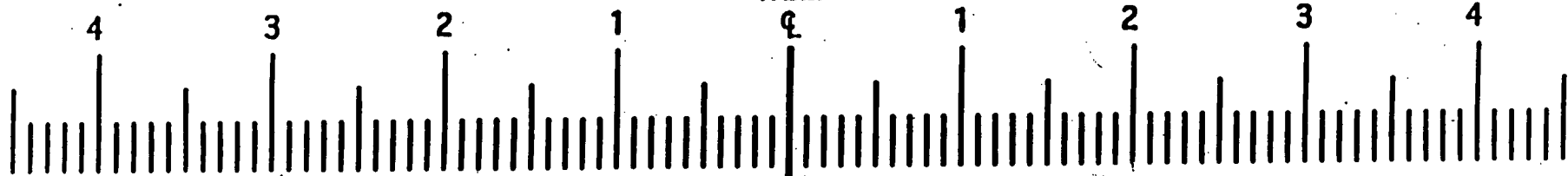
NDE-UT-5

Revision 1

EXAMINATION SURFACE 1

WELD

EXAMINATION SURFACE 2



Component ID/Weld No. 1-LDCA-1N-V2

Remarks: B03.150.001

Item No: B03.150.001

Examiner: Richard B. Chidder

Level: TL

Date: 9-29-97

Reviewed By: SSB,bb

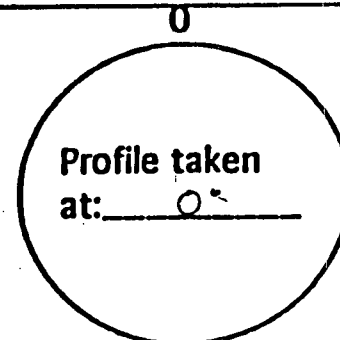
Level: TL

Date: 10-2-97

Authorized Inspector: WBC

Date: 10-9-97

270



90

180 Sheet 2 of 11

# DUKE POWER COMPANY

## ULTRASONIC INDICATION RESOLUTION SHEET

Form NDE-UT-8

Revision 1

Acceptance Standard:

AFTER THE USE OF MULTIPLE ANGLES AND REVIEWING PREVIOUS DATA, INDICATIONS 1&2 WERE DETERMINED TO BE GEOMETRY. THIS WAS DUE TO THE I D RADIUS OF THE BRANCH CONNECTION WELD.

Item No: B03.150.001

Acceptable Indications: 1 -45L& 2-60L

Rejectable Indications:

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

Examiner:	Level:	Date:		Sheet <u>3</u> of <u>11</u>
Richard B. Childers <i>Richard B Childers</i>	II	9/29/97		
Reviewer:	Level:	Date:	Authorized Inspector:	Date:
G.G. BIBB <i>GBB</i>	III	<i>10-2-97</i> 9/29/97 <i>GBB 10-2-97</i>	<i>MBC</i>	<i>10-9-97</i>

**DUKE POWER COMPANY  
UT PROFILE/PLOT SHEET**

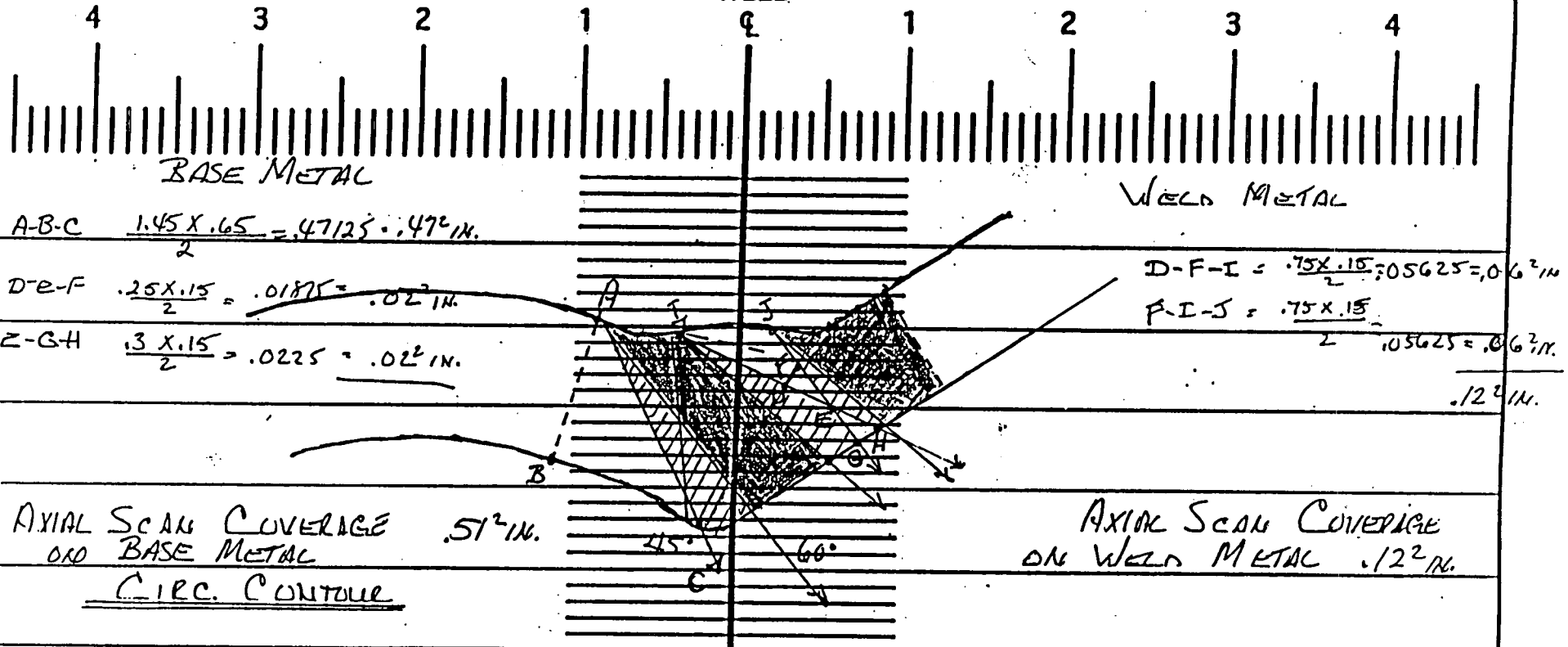
NDE-UT-5

Revision 1

EXAMINATION SURFACE 1

WELD

EXAMINATION SURFACE 2



Component ID/Weld No. 1-LDCA-1N-1/2

Remarks: B03.150.001

Examiner: Richard B. Childers

Reviewed By: ATB

Authorized Inspector: MBC

Item No: B03.150.001

Level: II

Date: 9-29-97

Level: III

Date: 10-2-97

Date: 10-9-97

270

Profile taken  
at: 0°

90

180 Sheet 4 of 11

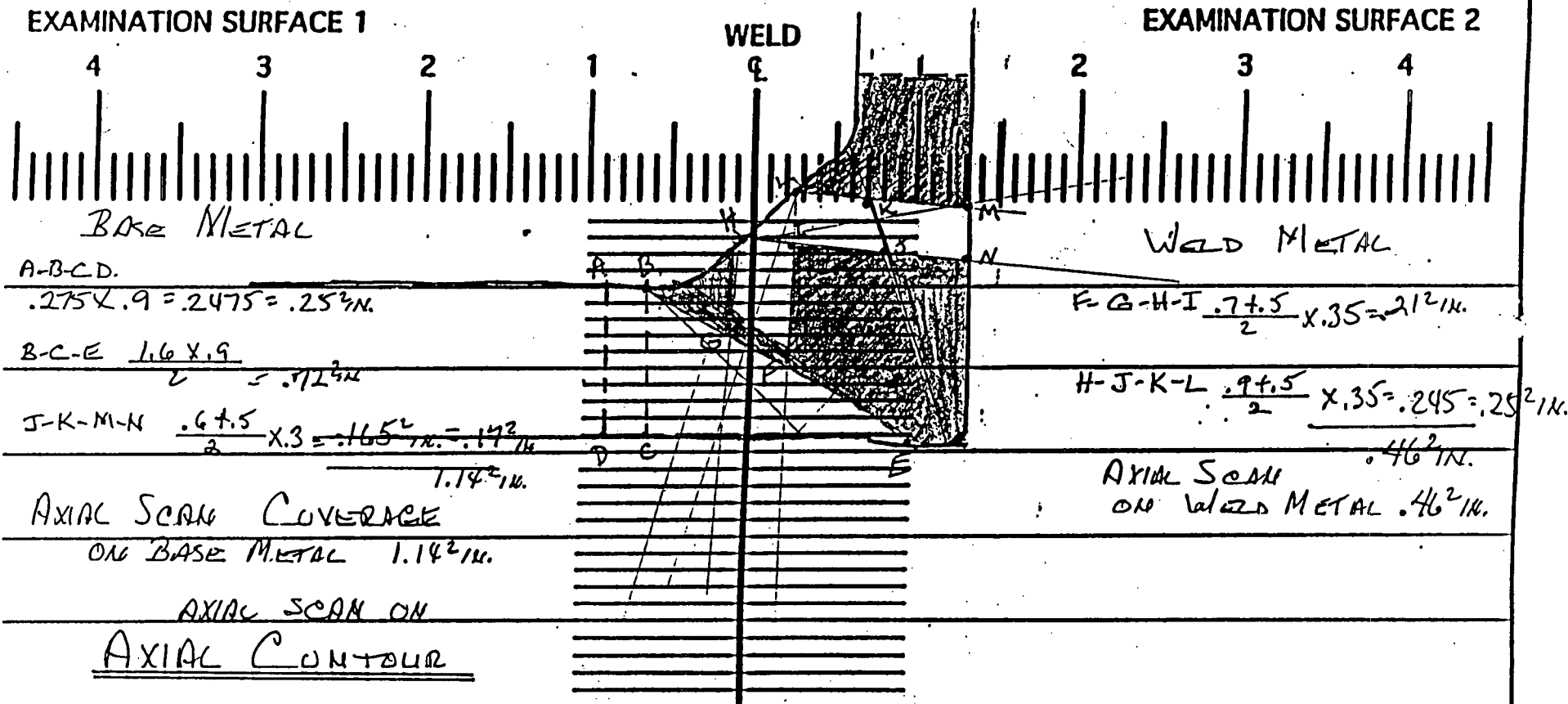
DUKE POWER COMPANY  
UT PROFILE/PLOT SHEET

NDE-UT-5

Revision 1

EXAMINATION SURFACE 1

EXAMINATION SURFACE 2



Component ID/Weld No. 1-LDCA-1N-V2

Remarks: B03:150.001

Item No: B03:150.001

Examiner: Richard B. Childers

Level: II

Date: 9-29-97

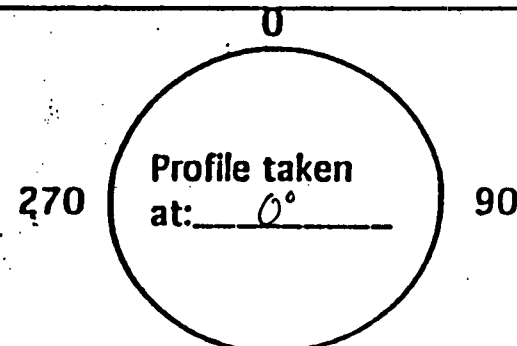
Reviewed By: JSB/bb

Level: III

Date: 10-2-97

Authorized Inspector: M.B.C.

Date: 10-9-97



180 Sheet 5 of 11

**DUKE POWER COMPANY  
UT PROFILE/PLOT SHEET**

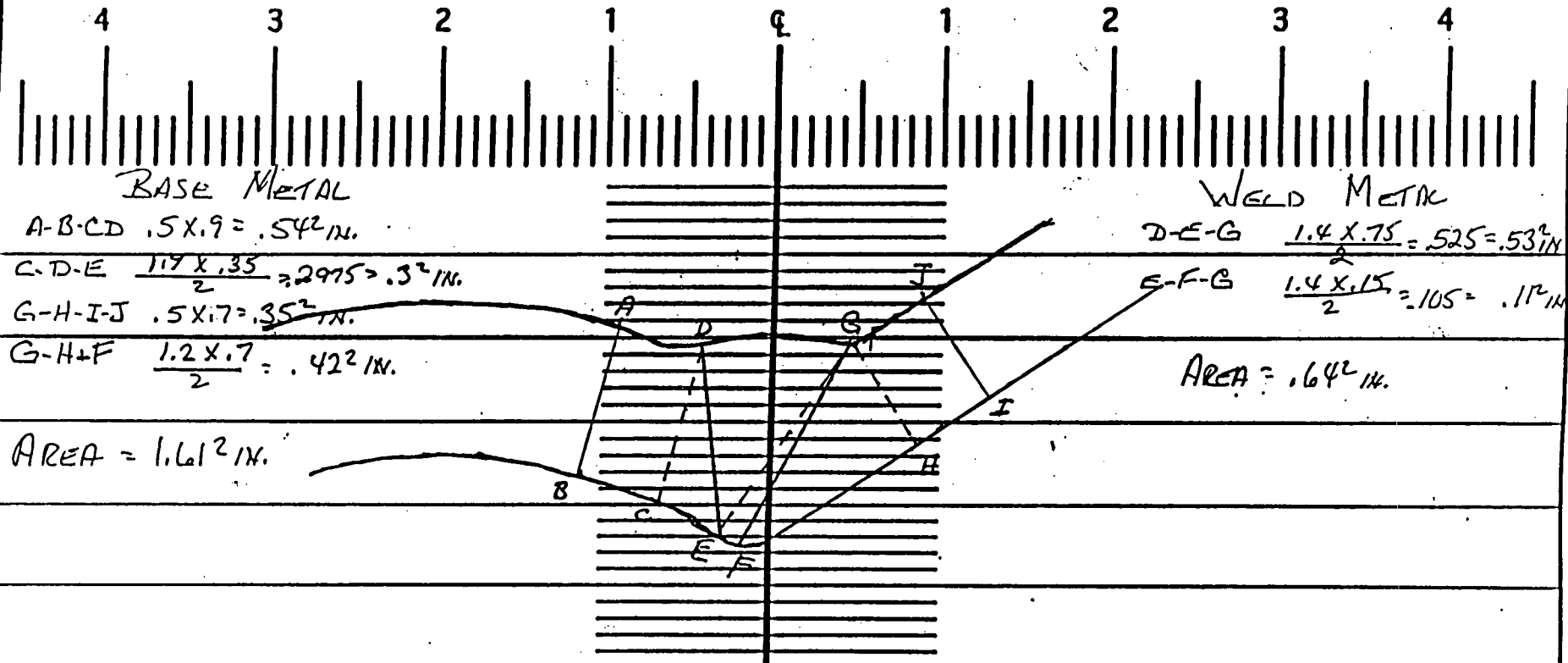
NDE-UT-5

Revision 1

EXAMINATION SURFACE 1

WELD

EXAMINATION SURFACE 2



Component ID/Weld No. 1-LDCA-1N-V2

Remarks: B03.150.001

Examiner: Richard B. Childers

Reviewed By: J.B. Bitt

Authorized Inspector: J.B. Bitt

Item No: B03.150.001

Level: II

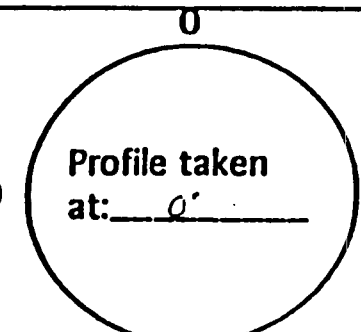
Level: II

Date: 9-29-97

Date: 10-2-97

Date: 10-9-97

270



90

180 Sheet 6 of 11



**DUKE POWER COMPANY**  
**Limited Examination Coverage Worksheet**

NDE-91-1

Revision 0

**Examination Volume/Area Defined**

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

**Area Calculation**

AXIAL CONTOUR 2.13<sup>2</sup> IN.  
 CIRC. CONTOUR 1.61<sup>2</sup> IN.  
 3.74<sup>2</sup> IN.  
 3.74<sup>2</sup> IN. ÷ 2 = 1.87<sup>2</sup> IN. AVERAGE

**Volume Calculation**

LENGTH 14.5"  
 1.87<sup>2</sup> IN. X 14.5" = 27.115 = 27.12 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
			<b>AXIAL CONTOUR</b>				
CIRC.	45	CW/CCW	.26 <sup>2</sup> IN.				
AX	45/60	2	1.14 <sup>2</sup> IN.				
			1.4 <sup>2</sup> IN.				
			<b>CIRC. CONTOUR</b>				
CIRC.	45	CW/CCW	.09 <sup>2</sup> IN.				
AX	45/60	2	.51 <sup>2</sup> IN.				
			.6 <sup>2</sup> IN.				
1.4 + .6 ÷ 4	SCANS		.5 <sup>2</sup> IN.	14.5"	7.25 CU. IN.	27.12	26.73

Item No: B03.150.001

Prepared BY: Richard B. Childers

Level: II

Date: 9-29-97

Reviewed By: JTB

Level: III

Date: 10-2-97

## Revision 0

Inner Radius ☐

LENGTH 14.5"  
 $.95^2 \text{ in.} \times 14.5" = 13.775 = 13.78 \text{ cm. in.}$

8 of 11

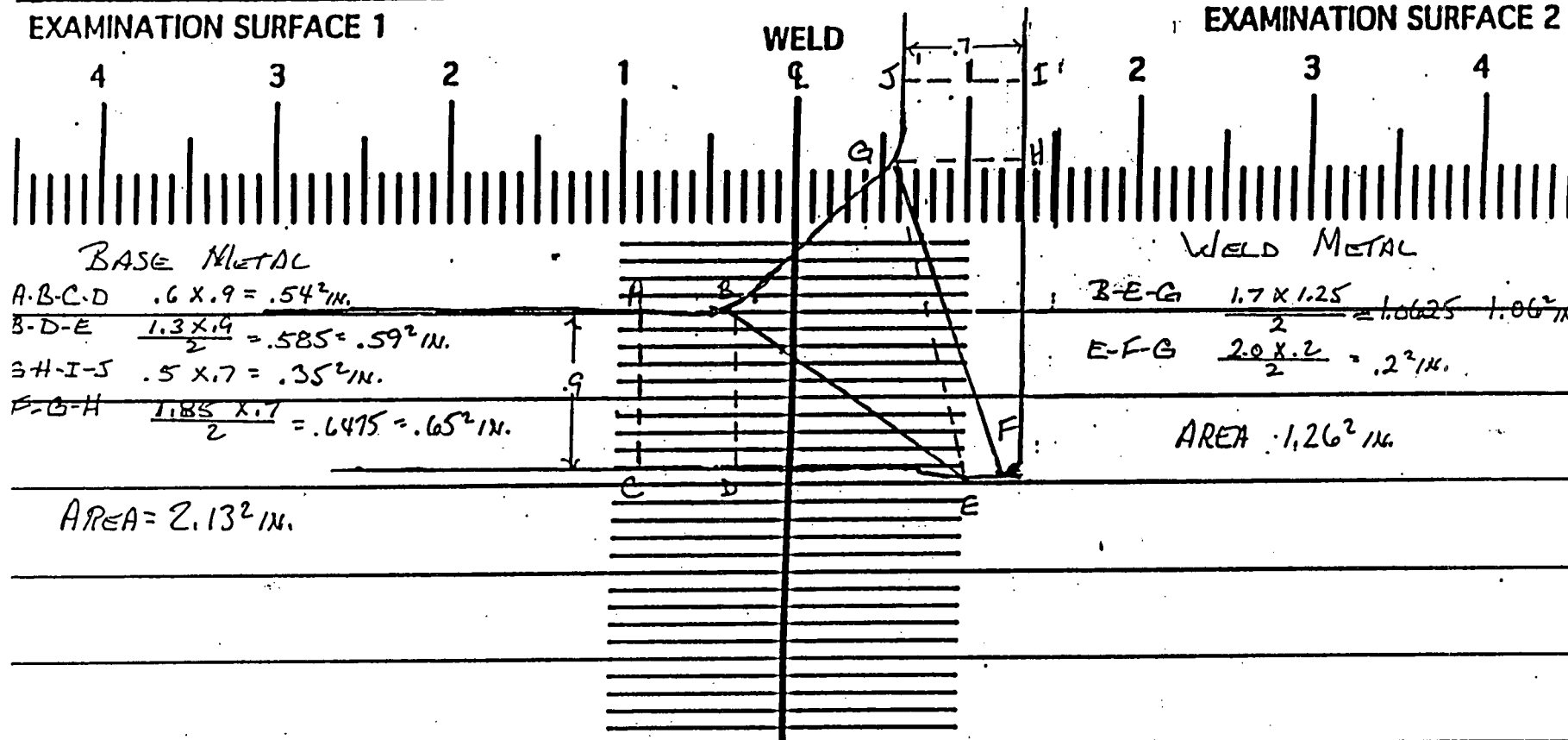
**DUKE POWER COMPANY**  
**UT PROFILE/PLOT SHEET**

NDE-UT-5

Revision 1

EXAMINATION SURFACE 1

EXAMINATION SURFACE 2



Component ID/Weld No. 1-LDCA-IN-V2

Remarks: B03.150.001

Examiner: Richard B. Cholder

Reviewed By: Jim Bibb

Authorized Inspector: MBC

Item No: B03.150.001

Level: II

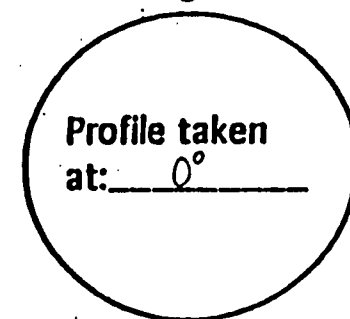
Date: 9-29-97

Level: III

Date: 10-2-97

Date: 10-9-97

270



90

180 Sheet 9 of 11

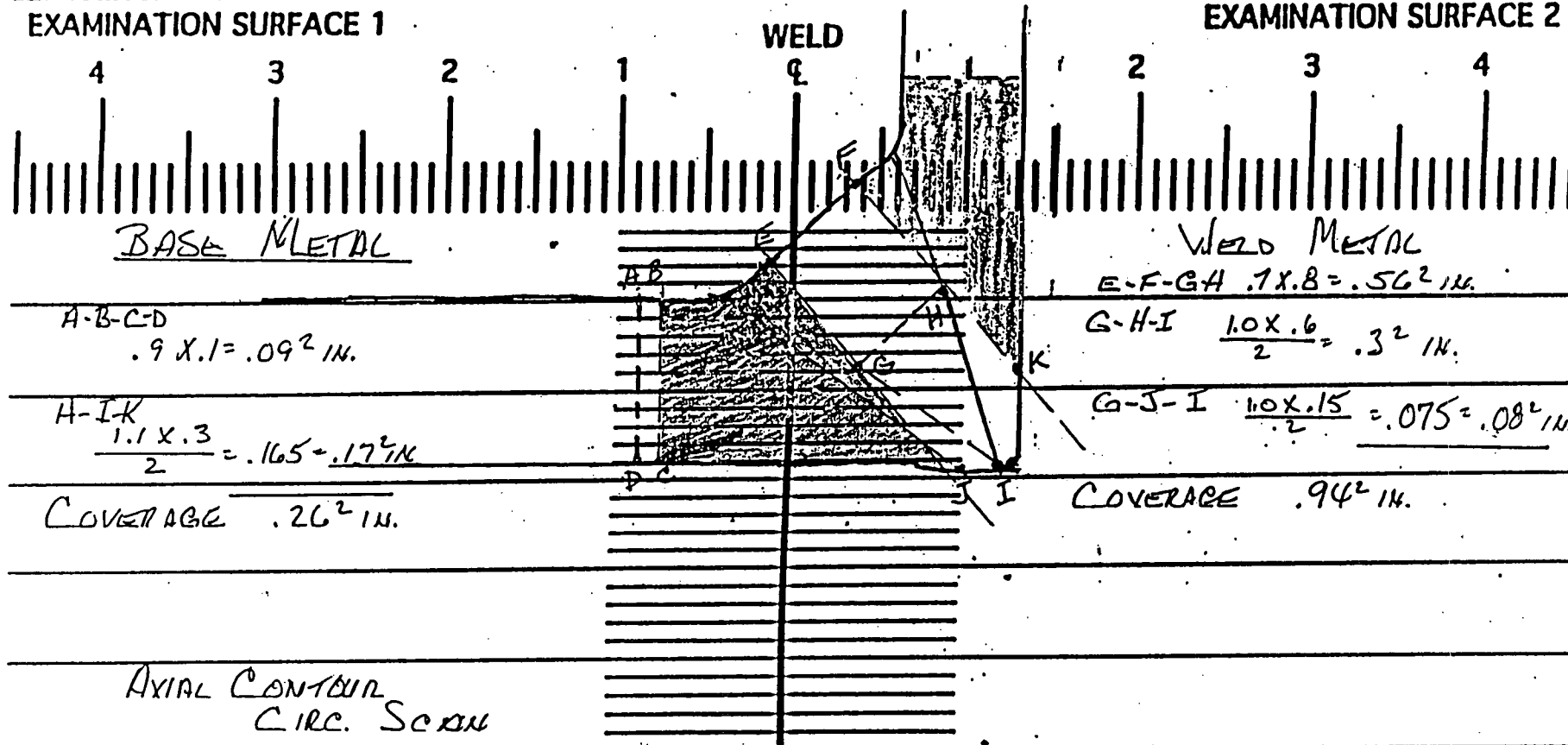
DUKE POWER COMPANY  
UT PROFILE/PLOT SHEET

NDE-UT-5

Revision 1

EXAMINATION SURFACE 1

EXAMINATION SURFACE 2



Component ID/Weld No. 1-LDCA-1N-V2

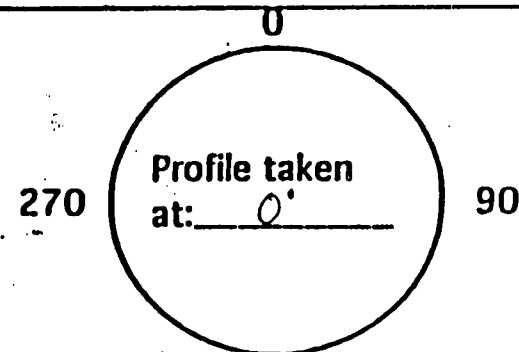
Remarks: B03.150.001

Item No: B03.150.001

Examiner: Richard B. Childers Level: II Date: 9-29-97

Reviewed By: MBH Level: III Date: 10-2-97

Authorized Inspector: MB-C Date: 10-9-97



180 Sheet 10 of 11

**DUKE POWER COMPANY**  
**UT PROFILE/PLOT SHEET**

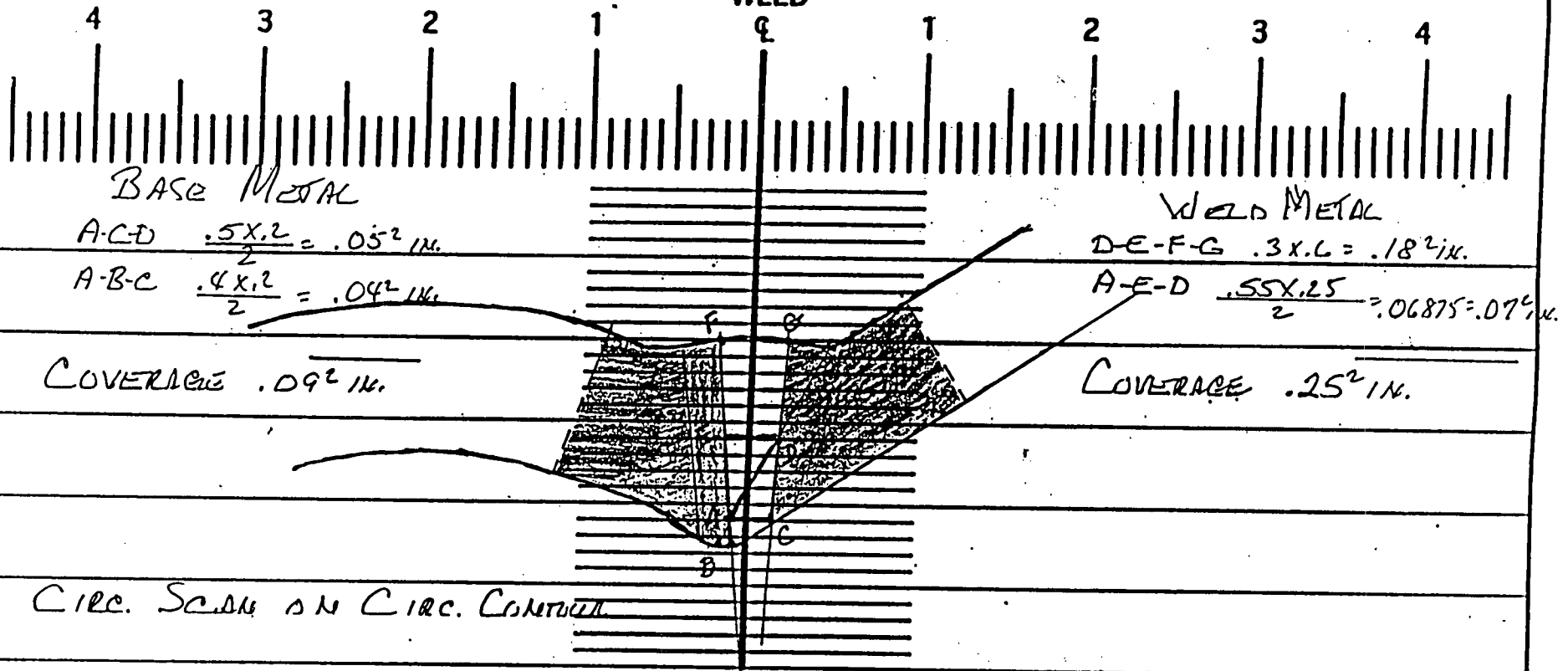
NDE-UT-5

Revision 1

EXAMINATION SURFACE 1

WELD

EXAMINATION SURFACE 2



Component ID/Weld No.

Remarks:

-270

Profile taken  
at: 0°

90

Examiner: <u>Richard B. Childers</u>	Item No: <u>B03.150.001</u>	Level: <u>II</u>	Date: <u>9-29-97</u>
Reviewed By: <u>TTB</u>		Level: <u>IV</u>	Date: <u>10-2-97</u>
Authorized Inspector: <u>YMB</u>			Date: <u>10-9-97</u>

180 Sheet 11 of 11

<b>DUKE POWER COMPANY</b>										Exam Start: 1031		Form NDE-UT-2A	
<b>ULTRASONIC EXAMINATION DATA SHEET FOR PLANAR REFLECTORS</b>										Exam Finish: 1146		Revision 4	
Station: Oconee			Unit: 1		Component/Weld ID: 1-LDCA-OUT-V6						Date: 9/29/97		
Weld Length (in.): 14.5			Surface Condition: AS GROUND				Lo: 9.1.1.1		Surface Temperature: 71 ° F				
Examiner: Richard B. Childers <i>Richard B. Childers</i>			Level: II		Scans: 45 <input checked="" type="checkbox"/> 47.0 dB    70 <input type="checkbox"/> _____ dB 45T <input checked="" type="checkbox"/> 44.0 dB    70T <input type="checkbox"/> _____ dB 60 <input checked="" type="checkbox"/> 72.0 dB 60T <input type="checkbox"/> _____ dB Other: 45L=75 dB				Pyrometer S/N: MCNDE 27018				
Examiner: James H. Resor <i>James H. Resor</i>			Level: II						Cal Due: 2/14/98				
Procedure: NDE-630    Rev: 2			FC: N/A						Configuration: CIRC				
Calibration Sheet No: 9701053, 9701054, 9701056, 9701055									S1    Flow    S2 NOZZLE to C.BODY Scan Surface: OD <b>Applies to NDE-680 only</b> 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
	<i>4</i>														
		DO NOT WRITE IN THIS SPACE				20%dac HMA	20%dac HMA	20%dac HMA	20%dac HMA	20%dac HMA	20%dac HMA	DO NOT WRITE IN THIS SPACE			
						50%dac	50%dac	50%dac	50%dac	50%dac	50%dac				
						100%dac	100%dac	100%dac	100%dac	100%dac	100%dac				
1	60L	159	1.69	1.1	12.5	360	INT					S2	S1	AXIAL	NO
2	45L	159	1.60	0.8	12.5	360	INT					S2	S1	AXIAL	NO
NRI	45C														

Remarks: SN # 94-18792-1	
Limitations: (see NDE-UT-4) <input checked="" type="checkbox"/> 90% or greater coverage obtained: yes <input type="checkbox"/> no <input checked="" type="checkbox"/>	Sheet 1 of 11
Reviewed By: G G Bibb <i>GG Bibb</i>	Level: III    Date: 10-2-97
Authorized Inspector: <i>M.B. Chapman</i>	Date: 10-9-97
Item No: B03.150.002	

**DUKE POWER COMPANY  
UT PROFILE/PLOT SHEET**

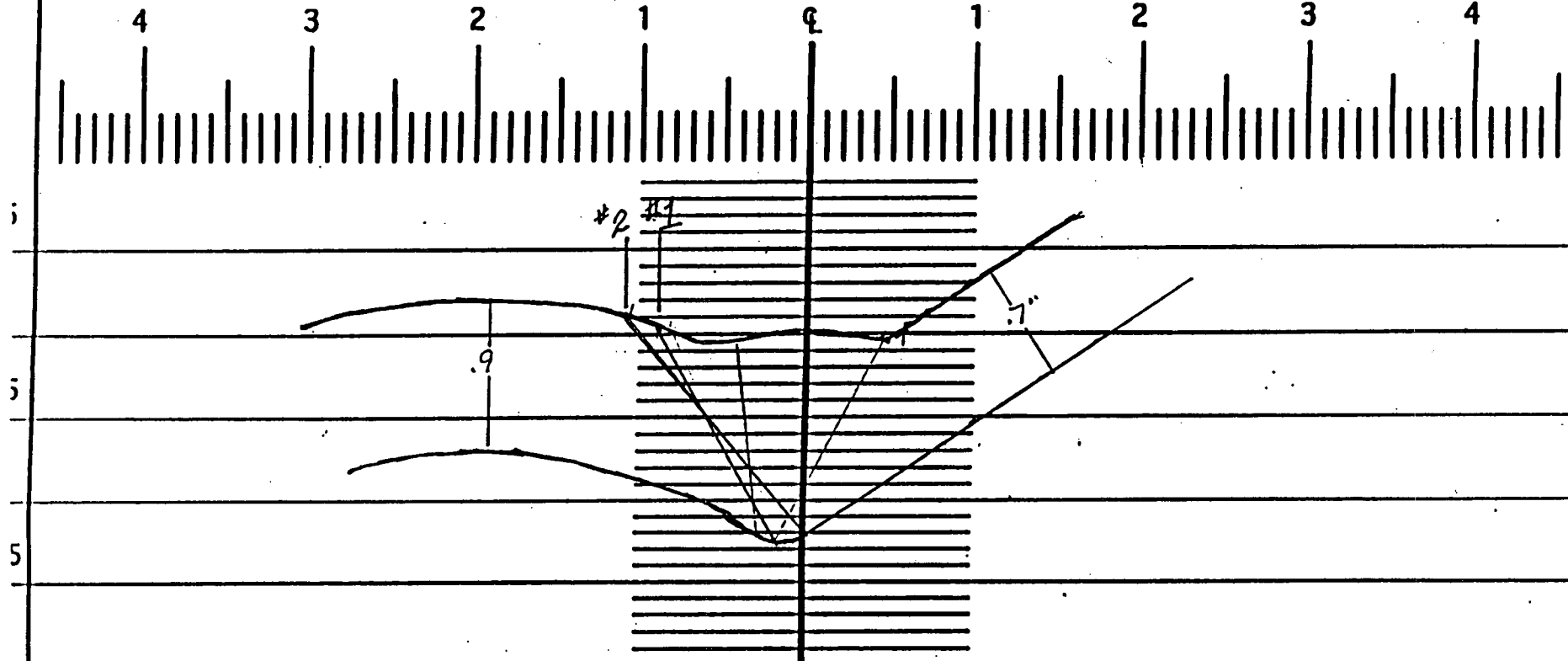
NDE-UT-5

Revision 1

EXAMINATION SURFACE 1

WELD

EXAMINATION SURFACE 2



Component ID/Weld No. 1 LDCA - OUT-V6

Remarks: B03.150.002

Item No: B03.150.002

Examiner: *Richard B. Childers*

Level: *II*

Date: *9-29-97*

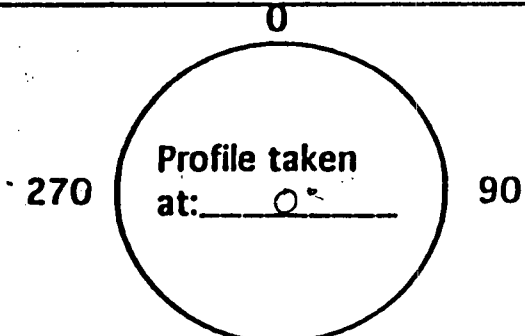
Reviewed By: *SPB*

Level: *IV*

Date: *10-2-97*

Authorized Inspector: *M. B. C.*

Date: *10-9-97*



180 Sheet 2 of 11

# DUKE POWER COMPANY

## ULTRASONIC INDICATION RESOLUTION SHEET

Form NDE-UT-8

Revision 1

Acceptance Standard:

AFTER THE USE OF MULTIPLE ANGLES AND REVIEWING PREVIOUS DATA, INDICATIONS 1&2 WERE DETERMINED TO BE GEOMETRY. THIS WAS DUE TO THE I D RADIUS OF THE BRANCH CONNECTION WELD.

Item No: B03.150.002

Acceptable Indications: 1 -60L& 2-45L

Rejectable Indications:

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

Examiner:

Level:

Date:

Richard B. Childers

*Richard B. Childers*

II

9/29/97

Sheet 3 of 11

Reviewer:

Level:

Date:

G.G. BIBB

*G.G. Bibb*

III

10-2-97  
9/29/97  
10-2-97

Authorized Inspector:

*MSC*

Date:

10-9-97



**DUKE POWER COMPANY  
UT PROFILE/PLOT SHEET**

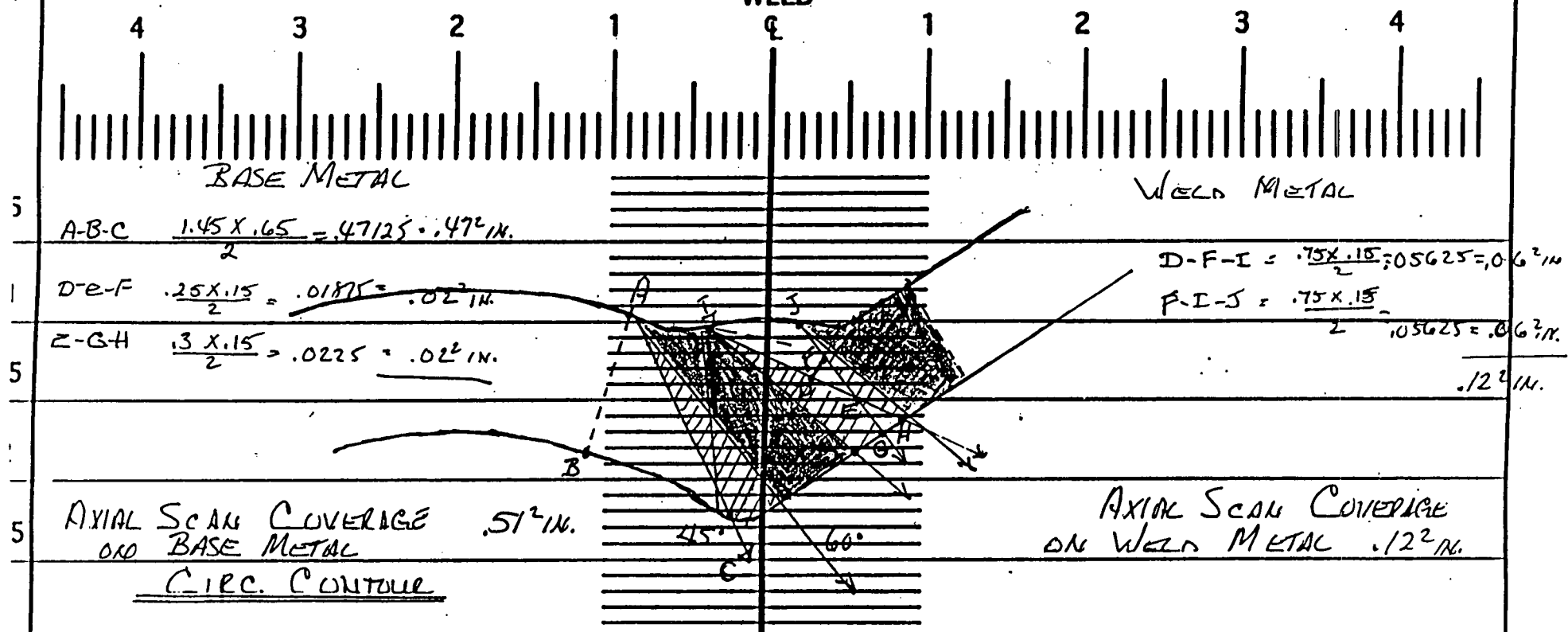
NDE-UT-5

Revision 1

EXAMINATION SURFACE 1

WELD

EXAMINATION SURFACE 2



Component ID/Weld No. 1 LDCA-OUT-V6.

Remarks: B03.150.002

Item No: B03.150.002

Examiner: Richard B. Childers

Level: II

Date: 9-29-97

Reviewed By: J. Bibb

Level: III

Date: 10-2-97

Authorized Inspector: M.B.C.

Date: 10-9-97

270

Profile taken  
at: 0°

90

180 Sheet 4 of 11

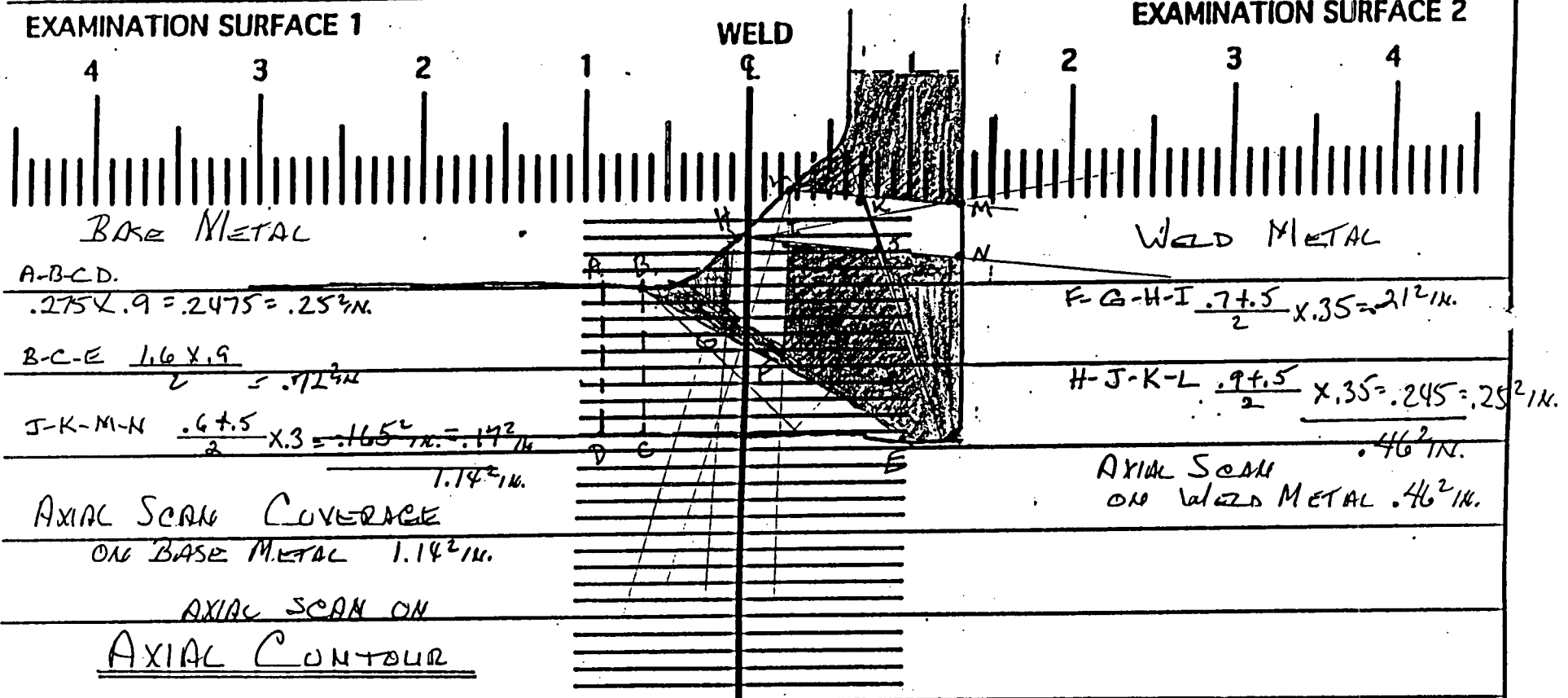
DUKE POWER COMPANY  
UT PROFILE/PLOT SHEET

NDE-UT-5

Revision 1

EXAMINATION SURFACE 1

EXAMINATION SURFACE 2



Component ID/Weld No. 1 LDCA-OUT-V6

Remarks: B03.150.002

Examiner: Richard B. Childers

Reviewed By: J.B.B.

Authorized Inspector: M.B.C.

Item No: B03.150.002

Level: II

Date: 9-29-97

Level: III

Date: 10-2-97

Date: 10-9-97

270

Profile taken

at: 0°

90

180 Sheet 5 of 11

**DUKE POWER COMPANY**  
**UT PROFILE/PLOT SHEET**

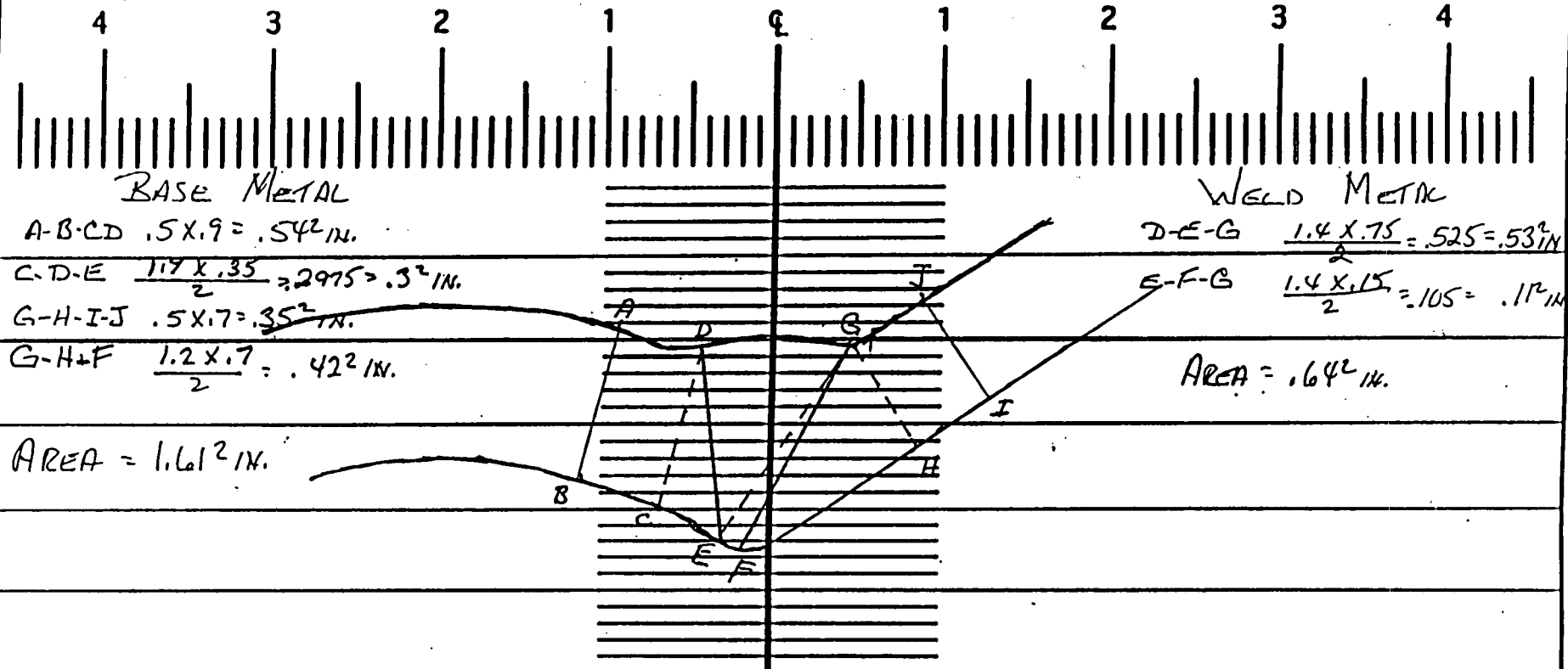
NDE-UT-5

Revision 1

EXAMINATION SURFACE 1

WELD

EXAMINATION SURFACE 2



Component ID/Weld No. 1 LDCA-OUT-V.6

Remarks: B03.150.002

Item No: B03.150.002

Examiner: Richard B. Childers

Level: II

Date: 9-29-97

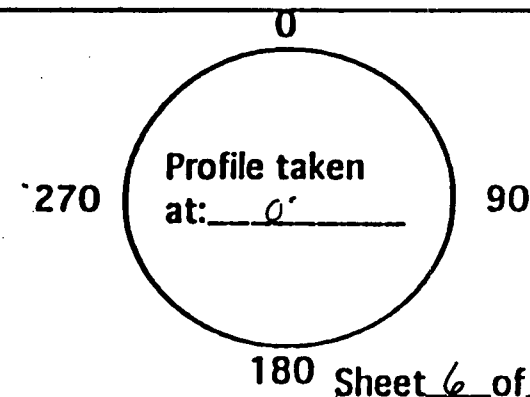
Reviewed By: W. B. B.

Level: III

Date: 10-2-97

Authorized Inspector: W. B. B.

Date: 10-9-97





## DUKE POWER COMPANY

## Limited Examination Coverage Worksheet

NDE-91-1

Revision 0

## Examination Volume/Area Defined

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

## Area Calculation

AXIAL CONTOUR  $.64^2 \text{ in.}$   
 CIRC. CONTOUR  $1.26^2 \text{ in.}$   
 $1.9^2 \text{ in.} \div 2 = .95^2 \text{ in.}$

## Volume Calculation

LENGTH  $14.5''$   
 $.95^2 \text{ in.} \times 14.5'' = 13.775 = 13.78 \text{ cu. in.}$

## Coverage Calculations

Scan #	Angle	Beam Direction	Area Examined (sq.in.)	Length Examined (in)	Volume Examined (cu.in.)	Volume Required (cu.in.)	Percent Coverage
--------	-------	----------------	------------------------	----------------------	--------------------------	--------------------------	------------------

AXIAL CONTOUR

CIRC.	45	CW/CCW	$.94^2 \text{ in.}$				
AX	45/60	2	$.46^2 \text{ in.}$				
			$1.4^2 \text{ in.}$				

CIRC. CONTOUR

CIRC.	45	CW/CCW	$.25^2 \text{ in.}$				
AX	45/60	2	$.12^2 \text{ in.}$				
			$.37^2 \text{ in.}$				

$1.42 \text{ in} + .37 \text{ in.} \div 4 \text{ scans} = .4425 = .44 \text{ in}$   $14.5$   $6.38^3 \text{ in.}$   $13.78^3 \text{ in.}$   $46.3$

Item No: P203.150.002

Prepared BY: Richard B. Childers

Level: II

Date: 9-29-97

Reviewed By: J. Bibb

Level: III

Date: 10-2-97

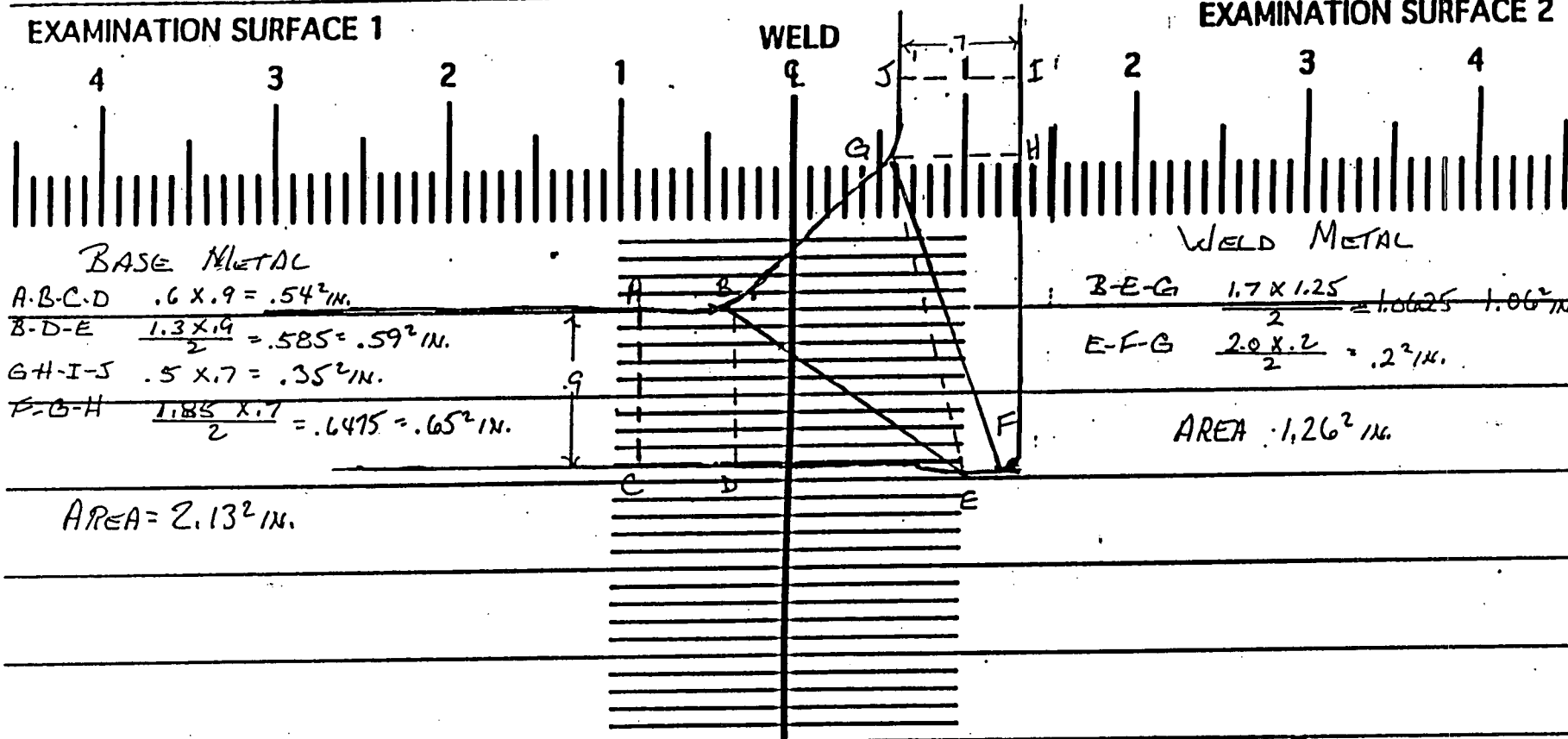
DUKE POWER COMPANY  
UT PROFILE/PLOT SHEET

NDE-UT-5

Revision 1

EXAMINATION SURFACE 1

EXAMINATION SURFACE 2



Component ID/Weld No. 1 LDCA-OUT-V6

Remarks: B03.150.002

Examiner: Richard B. Childers

Reviewed By: JLB

Authorized Inspector: JMB

Item No: B03.150.002

Level: II

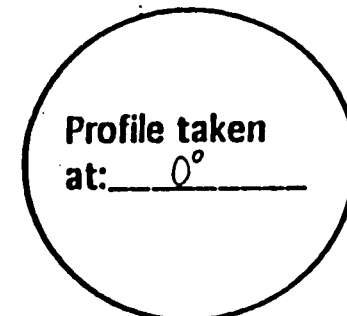
Date: 9-29-97

Level: III

Date: 10-2-97

Date: 10-9-97

270



90

180 Sheet 9 of 11

DUKE POWER COMPANY  
UT PROFILE/PLOT SHEET

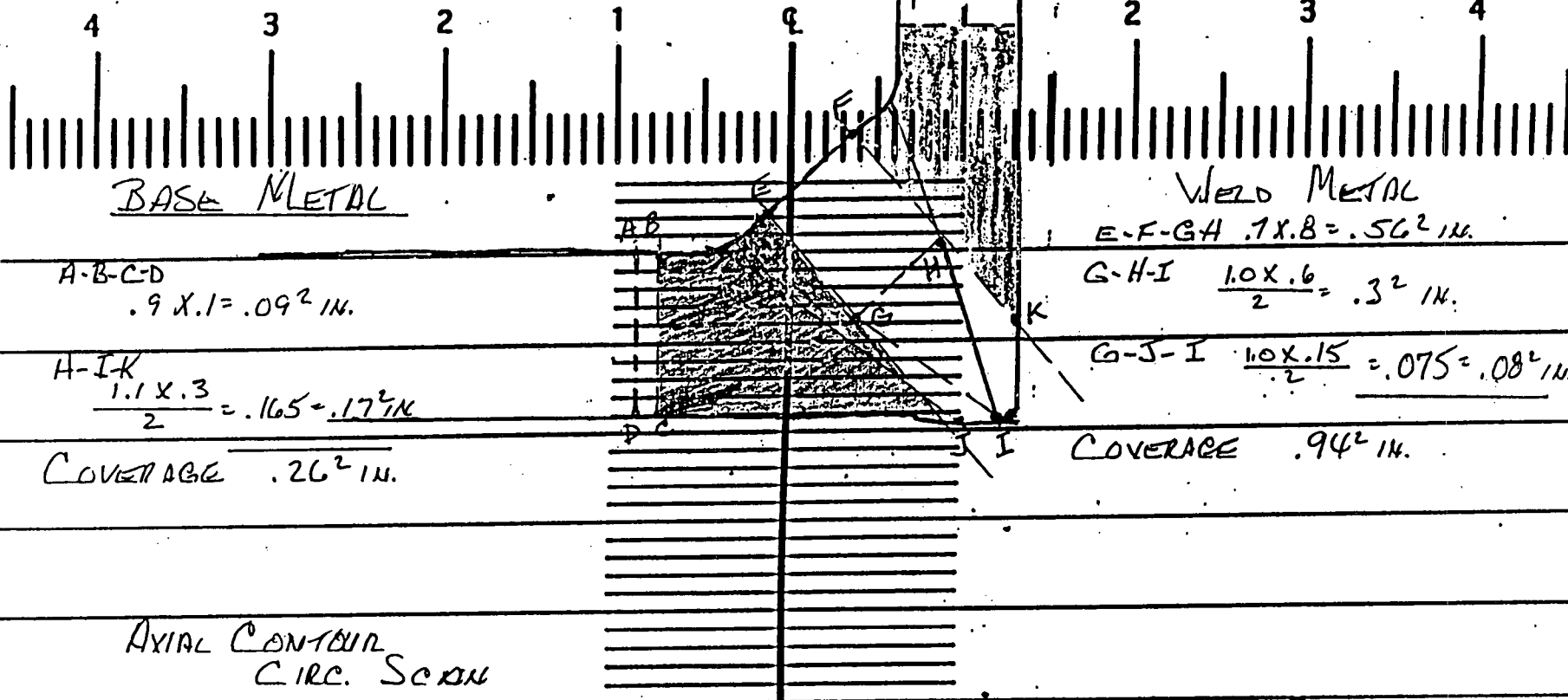
NDE-UT-5

Revision 1

EXAMINATION SURFACE 1

WELD

EXAMINATION SURFACE 2



Component ID/Weld No. 1 LDCA-OUT-V6

Remarks: B03.150.002

Item No: B03.150.002

Examiner: Richard B. Childers

Level: II

Date: 9-29-97

Reviewed By: J. Bibb

Level: III

Date: 10-2-97

Authorized Inspector: J. Bibb

Date: 10-9-97

270

Profile taken

at: 0°

90

180 Sheet 10 of 14

DUKE POWER COMPANY  
UT PROFILE/PLOT SHEET

NDE-UT-5

Revision 1

EXAMINATION SURFACE 1

WELD

EXAMINATION SURFACE 2

4

3

2

1

1

1

2

3

4

BASE METAL

$$A-C-D \frac{.5 \times .2}{2} = .052 \text{ IN.}$$

$$A-B-C \frac{.4 \times .2}{2} = .042 \text{ IN.}$$

COVERAGE .092 IN.

WELD METAL

$$D-E-F-G \frac{.3 \times .6}{2} = .182 \text{ IN.}$$

$$A-E-D \frac{.55 \times .25}{2} = .06875 = .072 \text{ IN.}$$

COVERAGE .252 IN.

CIRC. SCAN ON CIRC. CONTOUR

Component ID/Weld No. LDCA-OUT-V6

Remarks: B03.150.002

Item No: B03.150.002

Examiner: Richard B. Childers

Level: II

Date: 9-29-97

Reviewed By: JLB

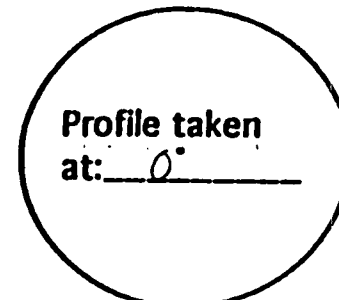
Level: III

Date: 10-2-97

Authorized Inspector: MBO

Date: 10-9-97

270



90

180 Sheet 11 of 11