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September 30, 2008

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

Subject: Duke Energy Carolinas, LLC
Oconee Nuclear Station, Unit 2
Docket Nos. 50-270
Third Ten Year Inservice Inspection Interval
Request for Relief No. 04-ON-009, Revision 1
Request for Additional Information Response

By letter dated February 13, 2008, Duke submitted request for relief No. 04-ON-009 Rev.1 seeking relief, pursuant to 10 CFR 50.55a(g)(iii), 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).

The relief would allow Duke Energy to take credit for ten (10) limited ultrasonic examinations on welds associated with various systems and components described in the request.

On May 22, 2008 Duke received a request for additional information (RAI) via email from the NRC Staff concerning the revision Duke submitted on February 13, 2008. This submittal is to address the staff's questions posed in the RAI. The following enclosure contains the reviewer's questions, and Duke's responses to each.

If there are any questions or further information is needed you may contact Corey Gray at (864) 886-6325.

Very truly yours,

Dave Baxter,
Site Vice President

Enclosure

A047
NRR

xc w/att: Luis Reyes
Region II Administrator
U.S. Nuclear Regulatory Commission
Atlanta Federal Center
61 Forsyth St., SWW, Suite 23T85
Atlanta, GA 30303

Leonard Olshan, Project Manager, Section 1
Project Directorate II
Division of Licensing Project Management
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, DC 20555-0001

xc(w/o attch):

Andy Hutto
Senior NRC Resident Inspector
Oconee Nuclear Station

Susan Jenkins, Section Manager,
Division of Waste Management
Bureau of Land and Waste Management
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DUKE ENERGY CORPORATION
RESPONSE TO NRC REQUEST FOR ADDITIONAL INFORMATION (NRC LETTER DATED MAY 22, 2008 - FOUR ITEMS)
3RD 10-YEAR INSERVICE INSPECTION INTERVAL

1. For welds 2-51A-17-124, 2-51A-17-125, 2-51A-17-20A, 2-51A-17-102, 2HP-227-11, and 2-51A-31-50 in the High Pressure Injection System, supplemental inspections such as 60° refracted longitudinal or 70° shear wave scans were performed. For each of these welds, in Section IV, Impracticality of Compliance of this RR, 100% coverage was claimed for these supplemental inspections. However, upon review of the inspection data sheets, it is clearly noted for each weld that less than 100% coverage was obtained for the supplemental inspections. Please discuss these discrepancies.

Response
Each weld listed was examined to a Performance Demonstration Initiative (PDI) qualified procedure requiring shear waves as the mode for interrogation. The primary shear wave angles used were 45° for circumferential scans (clockwise/counter-clockwise) and 60° for axial scans (upstream/downstream). The aggregate coverage is calculated using coverage obtained by the primary shear waves only. The aggregate percent of coverage is compared to the coverage requirement of >90% to determine any exam limitations.

When axial scan limitations are encountered (e.g. single-sided) on stainless steel pipe components, 60° refracted longitudinal wave or 70° shear waves, depending on component thickness, are used to interrogate the remaining volume for which coverage by the primary shear wave angles 45° and 60° was not achieved. The additional coverage obtained is considered supplemental only and is not included in the aggregate percentage.

See attached tables (6) (separate pdf file) for each of the six questioned welds.

2. Have you considered additional surface preparation to increase the inspection coverage for the ten welds included in RR 04-ON-009, Rev. 1? From a dose standpoint, how much would it take to get additional inspection coverage for these welds?

Response
All limitations are caused by the physical geometry of each component, such as tee or valve configurations, that result in single sided coverage. Additional surface preparation would not remove the scan limitations and therefore would not increase the obtained coverage. Only a change in the component design would permit additional coverage.

3. For all ten welds included in RR 04-ON-009, Rev. 1, in Section VII, Justification for Granting Relief, you use the future tense (i.e., "will use") when discussing pressure and visual testing. Since the request was for the third 10-year inservice inspection interval and that ended on September 9, 2004, these tests should have been completed. Please discuss this discrepancy.

Response
All ten welds were included as part of the pressure retaining components that received pressure testing and a VT-2 visual examination during the third 10-year interval. There was no through wall leakage observed during these pressure tests.

The referenced wording appeared in the original request. The relief applies to work performed during refueling outage 2EOC 20, which occurred during spring of 2004. Even during review of the original submittal, Duke should have identified and corrected this wording. The wording was transferred into the revision and should have been detected and corrected during review of the revision.

4. For welds 2-LDCB-INLET-V1 and 2-LDCB-OUTLET-V2, RR 04-ON-009 states that the Examination Volume is A-B-C-D-E-F-G-H-I-J. However, in Figure IWB-2500-7(a), the examination volume A-B-C-D-E-F-G-H-I is provided. Please correct this inconsistency.

Response
For welds 2-LDCB-INLET-V1 and 2-LDCB-OUTLET-V2, examination data sheets defined the examination volumes as A-B-C-D-E-F-G-H-I-J in accordance with interpretation of the nozzle configuration of the letdown coolers. Review of the Duke component and weld isometric drawings show that the examination volume defined as A-B-C-D-E-F-G-H-I in Figure IWB-2500-7(a) accurately represents the examination volume of welds 2-LDCB-INLET-V1 and 2-LDCB-OUTLET-V2. Recalculation of coverage using the examination volume of Figure IWB-2500-7(a) shows an aggregate coverage of 29.4% for each weld 2-LDCB-INLET-V1 and 2-LDCB-OUTLET-V2.

See attached data sheets 1 through 22 of 22 for re-calculation of percentage of coverage.

Attachment to support question 1. page 1 of 6

2-51A-17-124

Primary Angles	Beam Direction	Weld Length Scanned (in.)	Percent of Volume Covered	Percent of Coverage Claimed
60 shear	Axial pipe side	14.1	38.1	38.1
No scan from valve side				
45° shear	Clockwise pipe side	14.1	50	50
45° shear	Counter clockwise pipe side	14.1	50	50
		Aggregate = 34.52%		

Supplementary Angle	Beam Direction	Weld Length Scanned (in.)	Percent of Volume Covered	Percent of Coverage Claimed	Percent Actual Coverage
60° RL	Axial pipe side	14.1	61.9	0	61.9

Reviewed By: Jackie Smith

Attachment to support question 1. page 2 of 6

2-51A-17-125

Primary Angles	Beam Direction	Weld Length Scanned (in.)	Percent of Volume Covered	Percent of Coverage Claimed
60 shear	Axial elbow side	14.1	38.1	38.1
No scan from valve side				
45° shear	Clockwise elbow side	14.1	50	50
45° shear	Counter clockwise elbow side	14.1	50	50
		Aggregate = 34.52%		

Supplementary Angle	Beam Direction	Weld Length Scanned (in.)	Percent of Volume Covered	Percent of Coverage Claimed	Percent Actual Coverage
60° RL	Axial elbow side	14.1	61.9	0	61.9

Reviewed By: Jack Smith
11/22/08

Attachment to support question 1. page 3 of 6

2-51A-17-20A

Primary Angles	Beam Direction	Weld Length Scanned (in.)	Percent of Volume Covered	Percent of Coverage Claimed
60° shear	Axial pipe side	11.0	40.6	40.6
No scan from valve side				
45° shear	Clockwise pipe side	11.0	50	50
45° shear	Counter clockwise pipe side	11.0	50	50
			Aggregate = 35.15%	

Supplementary Angle	Beam Direction	Weld Length Scanned (in.)	Percent of Volume Covered	Percent of Coverage Claimed	Percent Actual Coverage
70° shear	Axial pipe side	11.0	59.4	0	59.4

REVIEWED BY: Jackie Smith 7/24/08

Attachment to support question 1. page 4 of 6

2-51A-17-102

Primary Angles	Beam Direction	Weld Length Scanned (in.)	Percent of Volume Covered	Percent of Coverage Claimed
60° shear	Axial tee side	7.0	100	63.6
60 shear	Axial pipe side	11.0	63.6+17=80.6	80.6
45° shear	Clockwise pipe side	11.0	100	100
45° shear	Counter clockwise tee side	11.0	100	100
			Aggregate = 86.0%	

Supplementary Angle	Beam Direction	Weld Length Scanned (in.)	Percent of Volume Covered	Percent of Coverage Claimed	Percent Actual Coverage
70° shear	Axial pipe side	4.0	53.3	0	19.4

Note: The calculations on page 3 of 3 in the UT report are incomplete. The percent coverage was re-calculated as follows:

60° axial shear coverage from the pipe side is shown as 46.7%. However, this was along only 4 inches of a weld that is 11 inches long. There is no calculation for the shear wave scan from the tee side. This is simply done by dividing the weld length scanned on the tee side by the total weld length which is:

$$7in/11in = 0.636 \times 100 = 63.6\%$$

The limited coverage on the pipe side was only along 4 inches of the weld. The calculation for that portion is:

$$4in/11in = 0.3636 \times 100 = 36.36\%$$ (rounded to 36.4%)

Multiplying 36.4% by the 46.7% shown on page 3 of 3, results in
$0.364 \times 0.467 = 0.1699 \times 100 = 16.99\%$ (rounded to 17%). This is shown as Scan 1 on page 2 of 3.
In order to arrive at the total coverage for the pipe side the 17% must be added to the 63.6% which yields 80.6%

Reviewed By: Jackie Smith 7/22/08

Attachment to support question 1. page 5 of 6

2HP-227-11

Primary Angles	Beam Direction	Weld Length Scanned (in.)	Percent of Volume Covered	Percent of Coverage Claimed
60° shear	Axial Pipe Side	11.0	42.9	42.9
No axial scan from the valve side				
45° shear	Clockwise elbow side	11.0	50	50
45° shear	Counter clockwise elbow side	11.0	50	50
			Aggregate = 35.7%	

Supplementary Angle	Beam Direction	Weld Length Scanned (in.)	Percent of Volume Covered	Percent of Coverage Claimed	Percent Actual Coverage
70° shear	Axial elbow side	11.0	57.1	0	57.1

Reviewed By [signature] 7/22/08

Attachment to support question 1. page 6 of 6

2-51A-31-50

Primary Angles	Beam Direction	Weld Length Scanned (in.)	Percent of Volume Covered	Percent of Coverage Claimed
60° shear	Axial Pipe Side	11.0	36	36
No axial scan from the valve side				
45° shear	Clockwise both sides	11.0	100	100
45° shear	Counter clockwise both sides	11.0	100	100
			Aggregate = 59%	

Supplementary Angle	Beam Direction	Weld Length Scanned (in.)	Percent of Volume Covered	Percent of Coverage Claimed	Percent Actual Coverage
70° shear	Axial pipe Side	11.0	61.78	0	61.78

Reviewed By: Joshua Jones 1/22/08

Page 1 of 22

Support Question #4

~~Attachment B~~ ~~Page 1 of 75~~ JMB 6/18/08

Duke Energy

UT Vessel Examination

Site/Unit:	Oconee / 2	Procedure:	NDE-630	Outage No:	ONS2EOC20
Summary No.:	B03.150.003	Procedure Rev:	2	Report No.:	UT-04-152
Workscope:	ISI	Work Order No:	98603899	Page:	1 of 2

Code: Asme Section XI 1989 Cat./Item: B-D-/B3.150.3 Location: N/A

Drawing No.: 1-34097-2 Description: Nozzle to Channel Body

System ID: 51A

Component ID: B03.150.003 /2-LDCB-INLET-V1 Size/Length: N/A Thickness/Diameter: 0.875"/3.0"

Limitations: Yes- See attached limitation report. Start Time: 0854 Finish Time: 0950

Examination Surface: Inside ☐ Outside ☑ Surface Condition: AS GROUND

Lo Location: 9.2.2 Wo Location: Centerline of Weld Couplant: ULTRAGEL II Batch No: 03125

Temp. Tool Mfg: FISHER Serial No.: MCNDE32758 Surface Temp: 59 °F

Cal. Report No.: CAL-04-242, CAL-04-243, CAL-04-244, CAL-04-245

Angle Used	0	45	45T	60RL	60T	45RL
Scanning dB		40.5	40.5	63.5		66.5

Indication(s): Yes ☐ No ☑ Scan Coverage: Upstream ☑ Downstream ☐ CW ☑ CCW ☑

Comments:

FC 99-02, 03-17, 03-30

Results: Accept ☑ Reject ☐ Info ☐ Scanning db's less than ref.+14 to obtain 2:1 signal to noise ratio.

Percent Of Coverage Obtained > 90%: No ~~29.26%~~ 29.4% DLC 6/17/08 Reviewed Previous Data: Yes

Examiner Level III Zimmerman, David K.	Signature	Date 4/5/2004	Reviewer JACKIE SMITH III JAM for JCS III	Signature	Date 4/9/04
Examiner Level II Mauldin, Larry E.	Signature	Date 4/5/2004	Site Review	Signature	Date
Other Level	Signature	Date	ANII Review Nancy C Ritchie Slaughter	Signature	Date 4/12/04

David K. Zimmerman for Gary Brouette / ONS ANII 6/18/08 David K Z

2-LDCB-INLET-V1

B03.150.003

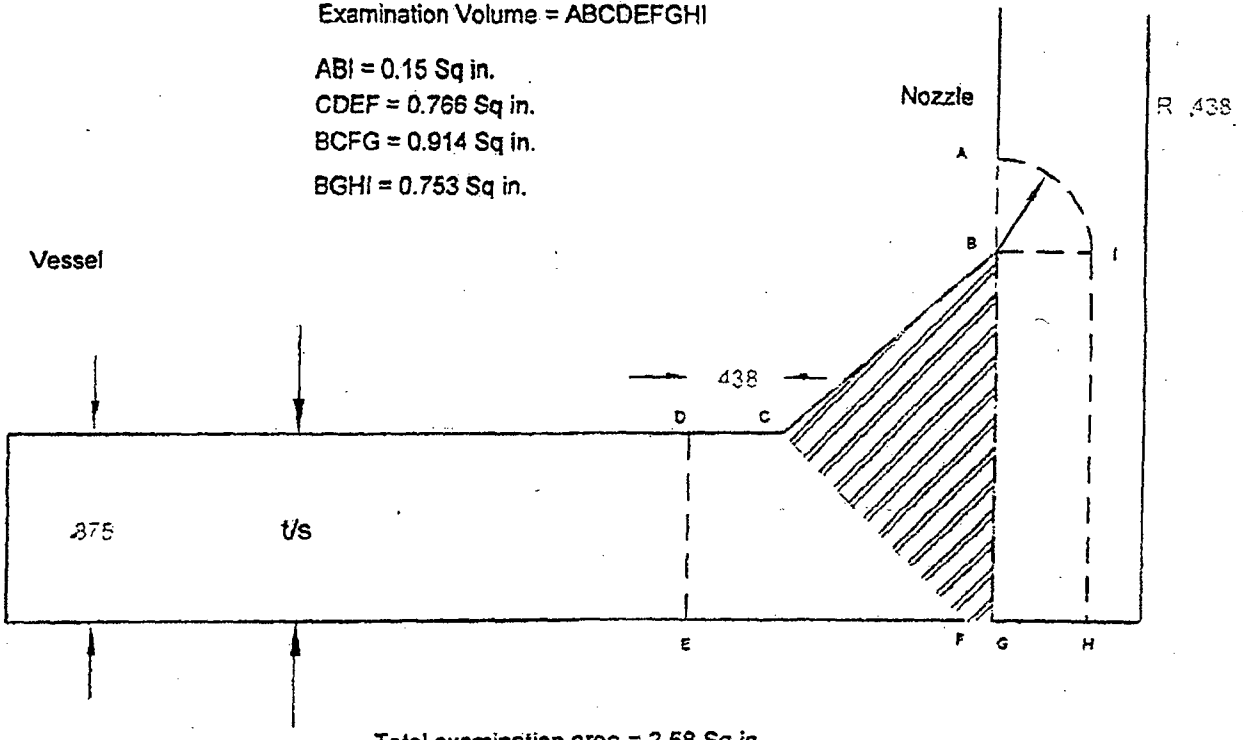
AGGREGATE COVERAGE			
Base Metal			
Scan	**Percentage**	**Aggregate %**	**Total Aggregate%**
45° Axial (Scan 1)	41.9		
60°Axial (Scan 2)	57.1		
45° Circ (CW)	12.6		
45° Circ (CCW)	12.6		
60° Circ (CW)	12.6		
60° Circ (CCW)	12.6		
Total Base	149.4	149.4/6 = 24.9	
Weld Metal			
45° Axial (Scan 1)	21.9		
45° Axial (Scan 2)	35.0		
45° Axial (Scan 1)	13.1		
45° Axial (Scan 2)	21.9		
45° Circ (CW)	44.9		
45° Circ (CCW)	44.9		
60° Circ (CW)	44.9		
60° Circ (CCW)	44.9		
Total Weld	271.5	271.5/8 = 33.9	
			24.9 + 33.9/2 = 29.4

David K. Zimmerman
NDE Level III

06/17/08

Examination Volume = ABCDEFGHI

ABI = 0.15 Sq in.
CDEF = 0.766 Sq in.
BCFG = 0.914 Sq in.
BGHI = 0.753 Sq in.



Total examination area = 2.58 Sq in.

SCALE 1:1

2-1DCB-INLET-V1

AREA OF COVERAGE

45° BASE AXIAL

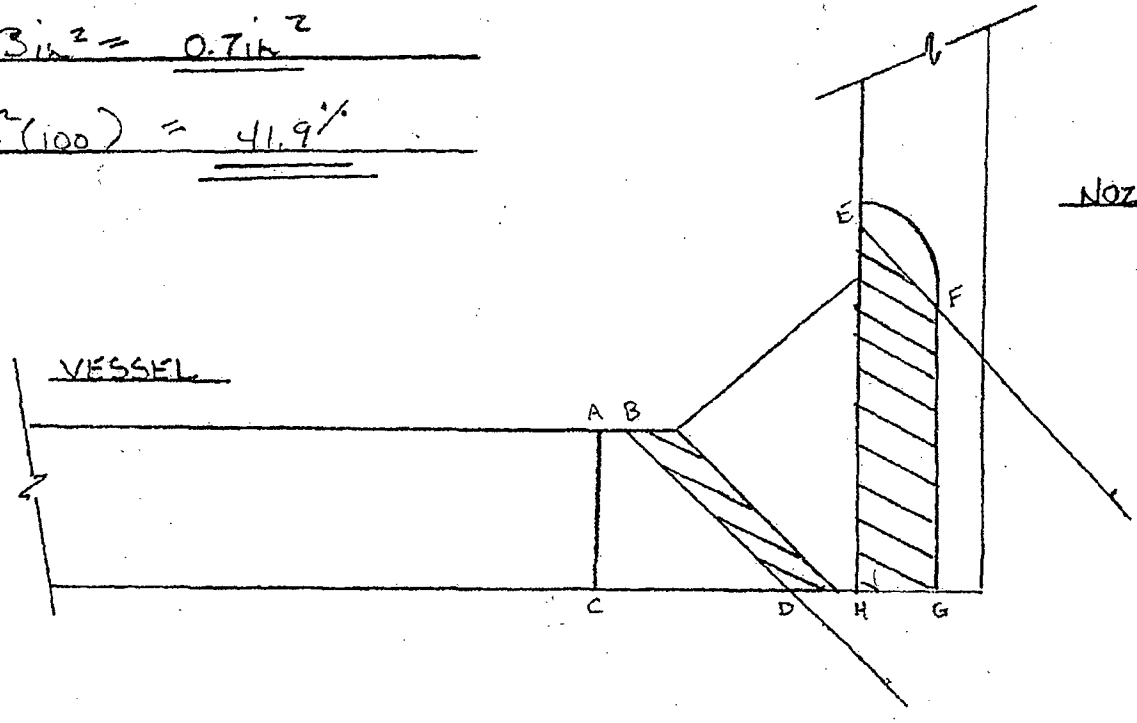
EFGH: $\left(\frac{1.5in+2.0in}{2}\right).438in = 0.77in^2$

$0.903in^2 - 0.77in^2 = 0.13in^2$

ABCD: $\left(\frac{0.2in+1.1in}{2}\right).875in = 0.57in^2$

$0.57in^2 + 0.13in^2 = 0.7in^2$

$0.7in^2/1.67in^2(100) = 41.9\%$



2-LDCB-INLET-V1

SCALE 1:1

AREA OF COVERAGE

60° BASE AXIAL

GHIJ: $\left(\frac{1.25in + 2.01in}{2}\right) .938in = 0.71in^2$

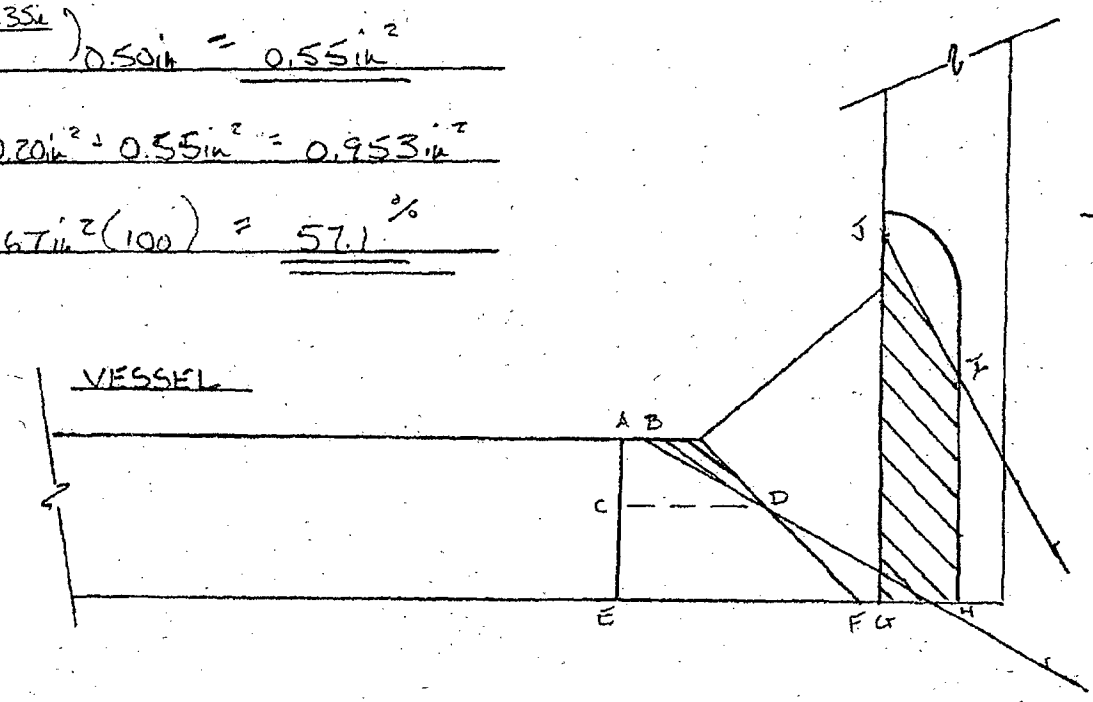
$0.903in^2 - 0.7in^2 = 0.203in^2$

ABCD: $\left(\frac{0.2in + 0.85in}{2}\right) .375in = 0.20in^2$

CDEF: $\left(\frac{0.85in + 1.35in}{2}\right) 0.50in = 0.55in^2$

TOTAL: $0.203in^2 + 0.20in^2 + 0.55in^2 = 0.953in^2$

$0.953in^2 / 1.67in^2 (100) = 57.1\%$



2-LDCB-INLET-V1

SCALE 1:1

AREA OF COVERAGE

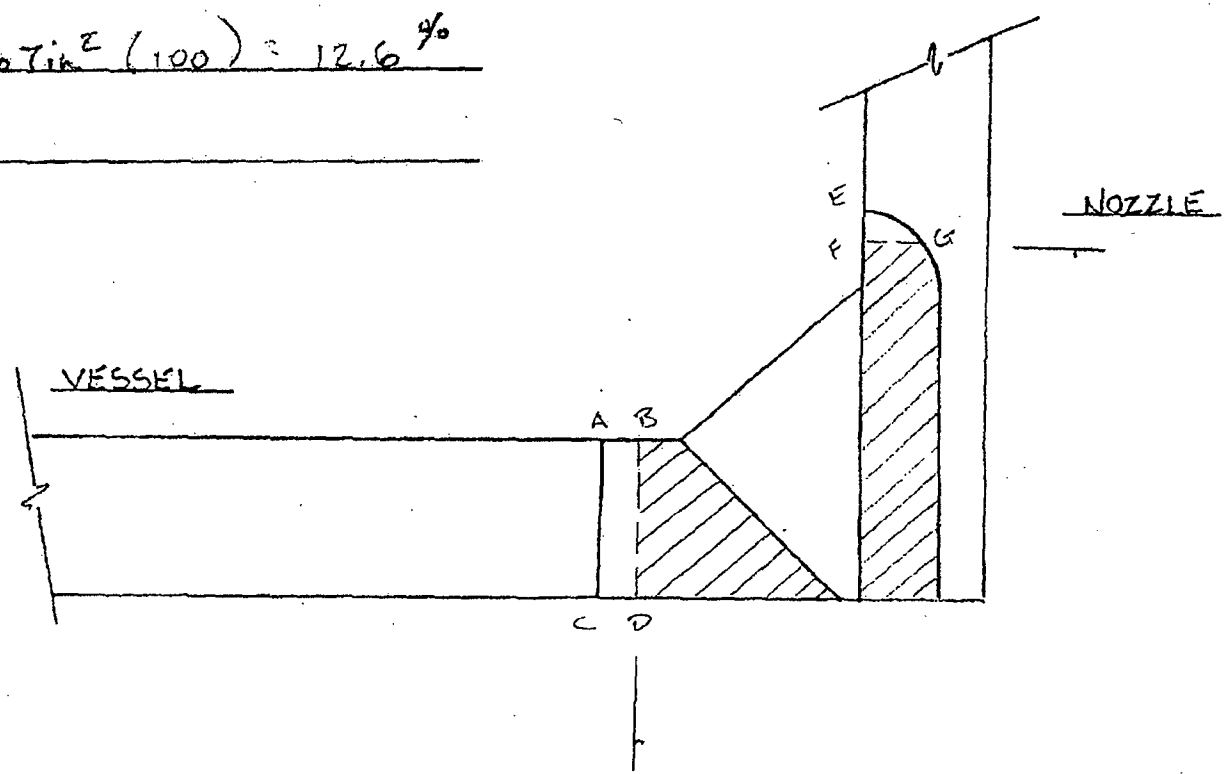
45° & 60° BASE CIRC.

ABCD: $0.2in \times 0.875in = 0.175in^2$

EFG: $\left(\frac{0.15in + 0.3in}{2}\right)\pi = 0.035in^2$

$0.175in^2 + 0.035in^2 = 0.21in^2$

$0.21in^2 / 1.67in^2 (100) = 12.6\%$



2-LDCB-INLET-V1

SCALE 1:1

AREA OF COVERAGE

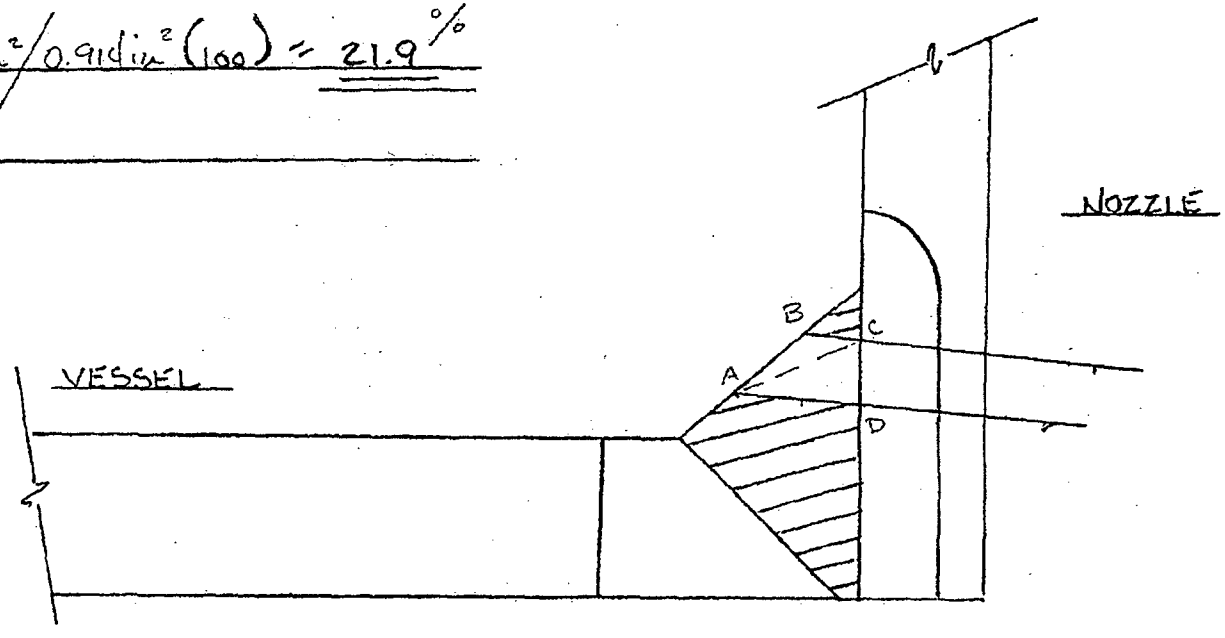
45° WELD AXIAL (1)

ABC: $0.3in \times \frac{1}{2} 0.5in = 0.08in^2$

ACD: $\frac{0.35in}{2} \times 0.7in = 0.12in^2$

$0.08in^2 + 0.12in^2 = 0.20in^2$

TOTAL: $0.20in^2 / 0.914in^2 (100) = 21.9\%$



2-LDCB-INLET-V1

SCALE 1:1

45° WELD AXIAL (2)

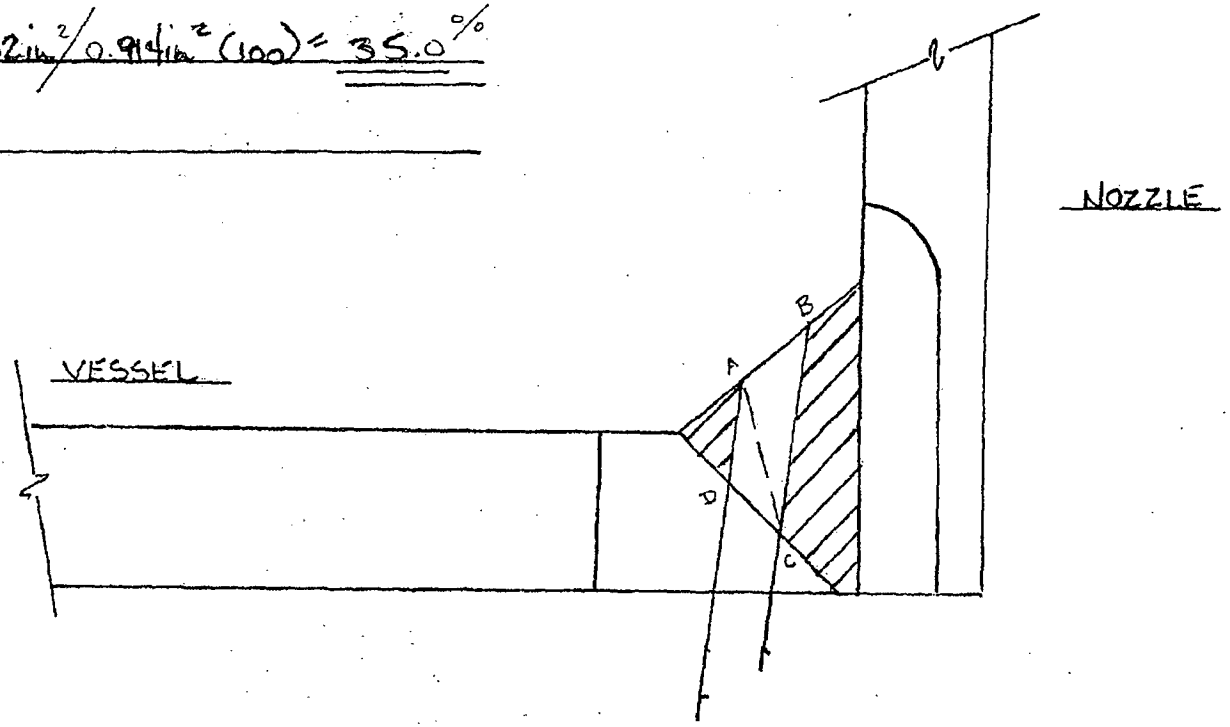
AREA OF COVERAGE

ABC: $\frac{0.5in \times 0.85in}{2} = 0.21in^2$

ACD: $\frac{0.4in \times 0.55in}{2} = 0.11in^2$

$0.21in^2 + 0.11in^2 = 0.32in^2$

TOTAL: $0.32in^2 / 0.914in^2 (100) = 35.0\%$



2-LDCB-INLET-V1

SCALE 1:1

AREA OF COVERAGE

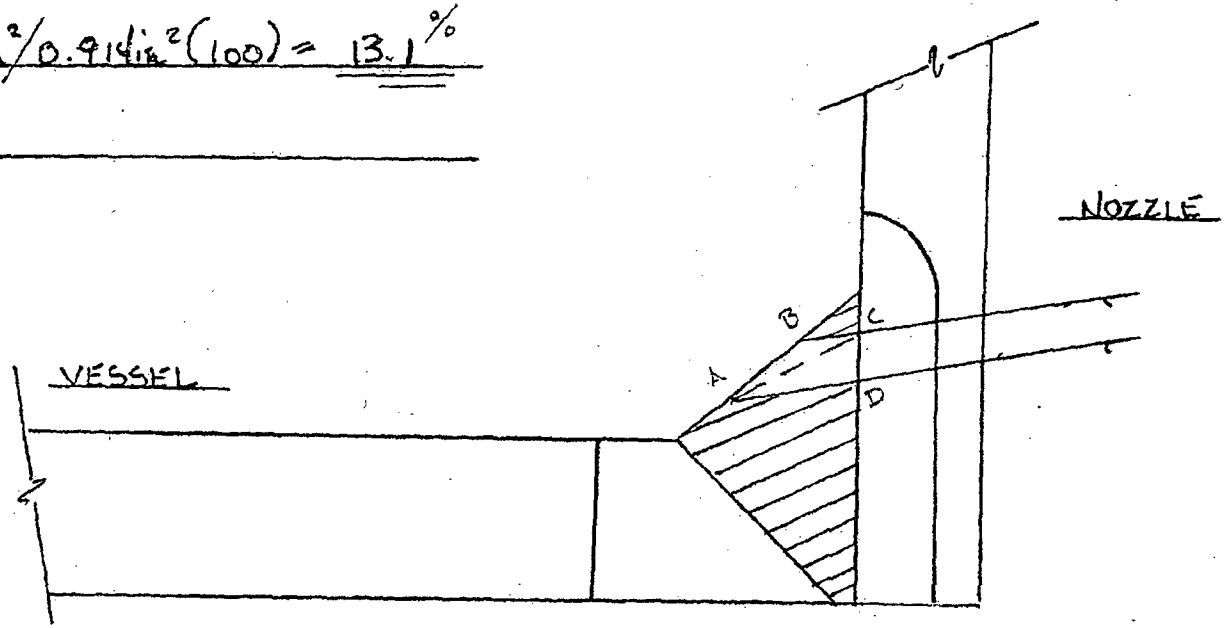
60° WELD AXIAL (1)

ABC: $\frac{0.5in \times 0.3in}{2} = 0.03in^2$

ACD: $\frac{0.7in \times 0.25in}{2} = 0.09in^2$

$0.03in^2 + 0.09in^2 = 0.12in^2$

TOTAL: $0.12in^2 / 0.914in^2 (100) = 13.1\%$



2-LDCB-INLET-V1

SCALE 1:1

60° WELD AXIAL (2)

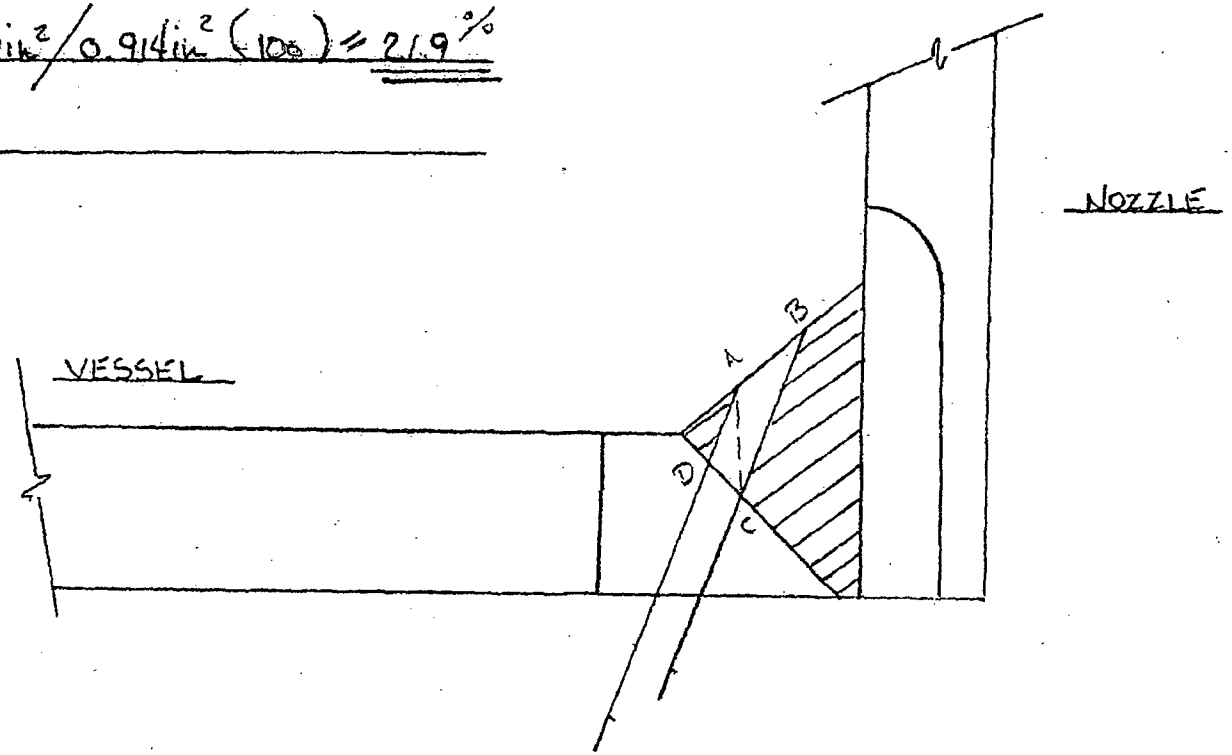
AREA OF COVERAGE

ABC: $\frac{0.5in \times 0.6in}{2} = 0.15in^2$

ACD: $\frac{0.25in \times 0.4in}{2} = 0.05in^2$

$0.15in^2 + 0.05in^2 = 0.20in^2$

TOTAL: $0.20in^2 / 0.914in^2 (100) = 21.9\%$



2-LDCB-INLET-VL

SCALE 1:1

AREA OF COVERAGE

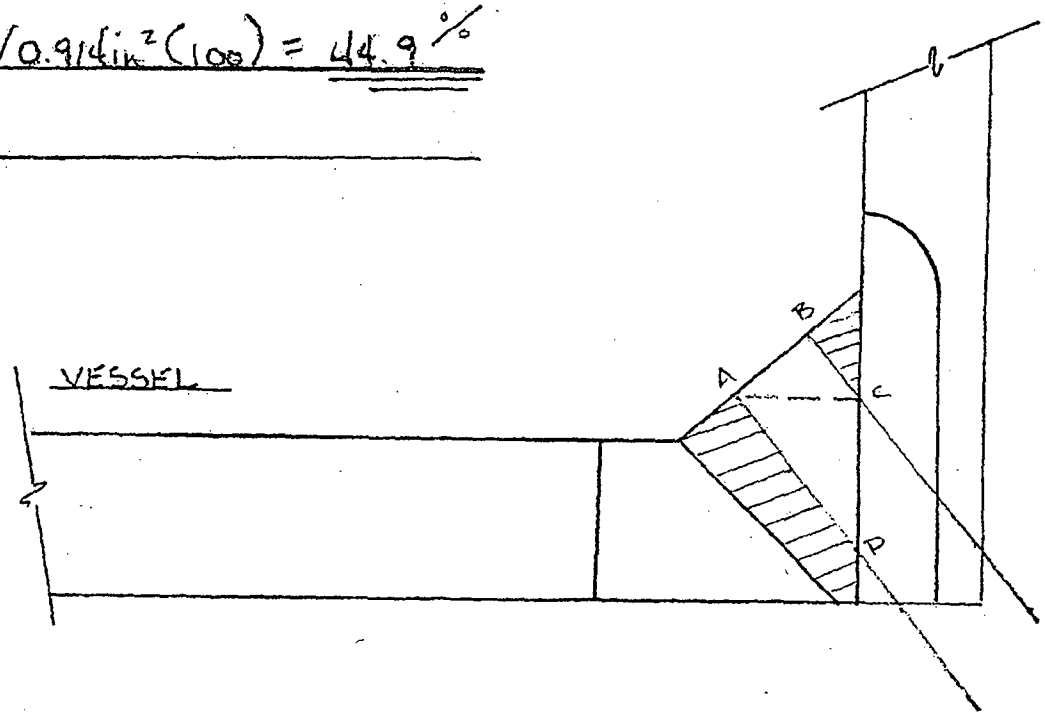
ABC: $\frac{0.45in \times 0.5in}{2} = 0.11in^2$

ACD: $\frac{0.7in \times 0.85in}{2} = 0.30in^2$

$0.11in^2 + 0.30in^2 = 0.41in^2$

TOTAL = $0.41in^2 / 0.914in^2 (100) = 44.9\%$

45° & 60° WELD CHEC



2-LDCB-INLET-V1

SCALE 1:1

JMS 6/18/08 ~~Attachment B~~ ~~Page 17 of 75~~

Duke Energy

UT Vessel Examination

Site/Unit:	Oconee / 2	Procedure:	NDE-630	Outage No.:	ONS2EOC20
Summary No.:	B03.150.004	Procedure Rev.:	2	Report No.:	UT-04-153
Workscope:	ISI	Work Order No.:	98603899	Page:	1 of 2

Code	Asme Section XI 1989	Cat./Item:	B-D- /B3.150.4	Location:	N/A
Drawing No	1-34097-2	Description:	Nozzle to Channel Body		
System ID	51A				
Component ID:	B03.150.004 /2-LDCB-OUTLET-V2	Size/Length:	N/A	Thickness/Diameter:	0.875"/3.0"
Limitations:	Yes- See attached limitation report.	Start Time	0854	Finish Time:	0950

Examination Surface: Inside ☐ Outside ☑ Surface Condition: AS GROUND

Lo Location	9.2.2	Wo Location:	Centerline of Weld	Couplant	ULTRAGEL II	Batch No 03125
Temp Tool Mfg.:	FISHER	Serial No.:	MCNDE32768	Surface Temp	59 °F	

Cal Report No.: CAL-04-242, CAL-04-243, CAL-04-244, CAL-04-245

Angle Used	0	45	45T	60RL	60T	45RL
Scanning dB		40.5	40.5	63.5		66.5

Indication(s): Yes ☐ No ☑ Scan Coverage: Upstream ☑ Downstream ☐ CW ☑ CCW ☑

Comments:

FC 99-02, 03-17, 03-30

Results: Accept ☑ Reject ☐ Info ☐ Scanning db's less than ref.+14 to obtain 2:1 signal to noise ratio.

Percent Of Coverage Obtained > 90%: ~~No 29.26%~~ 29.4% DK2 6/17/08 Reviewed Previous Data: Yes

Examiner Level III Zimmerman, David K.	Signature David K. Zimmerman	Date 4/5/2004	Reviewer JACKIE Smith III ~~JAM EATON JIMS~~	Signature ~~Jackie Smith~~ JMS	Date 6/18/08 4/8/04
Examiner Level II Mauldin, Larry E.	Signature Larry E. Mauldin	Date 4/5/2004	Site Review	Signature	Date
Other Level	Signature	Date	ANII Review Nancy C Ritchie Slaughter	Signature 4/12/04	Date

David K. Zimmerman for Jason Burnette / ONS ANII 6/18/08 DavidKZ

2-LDCB-OULET-V2

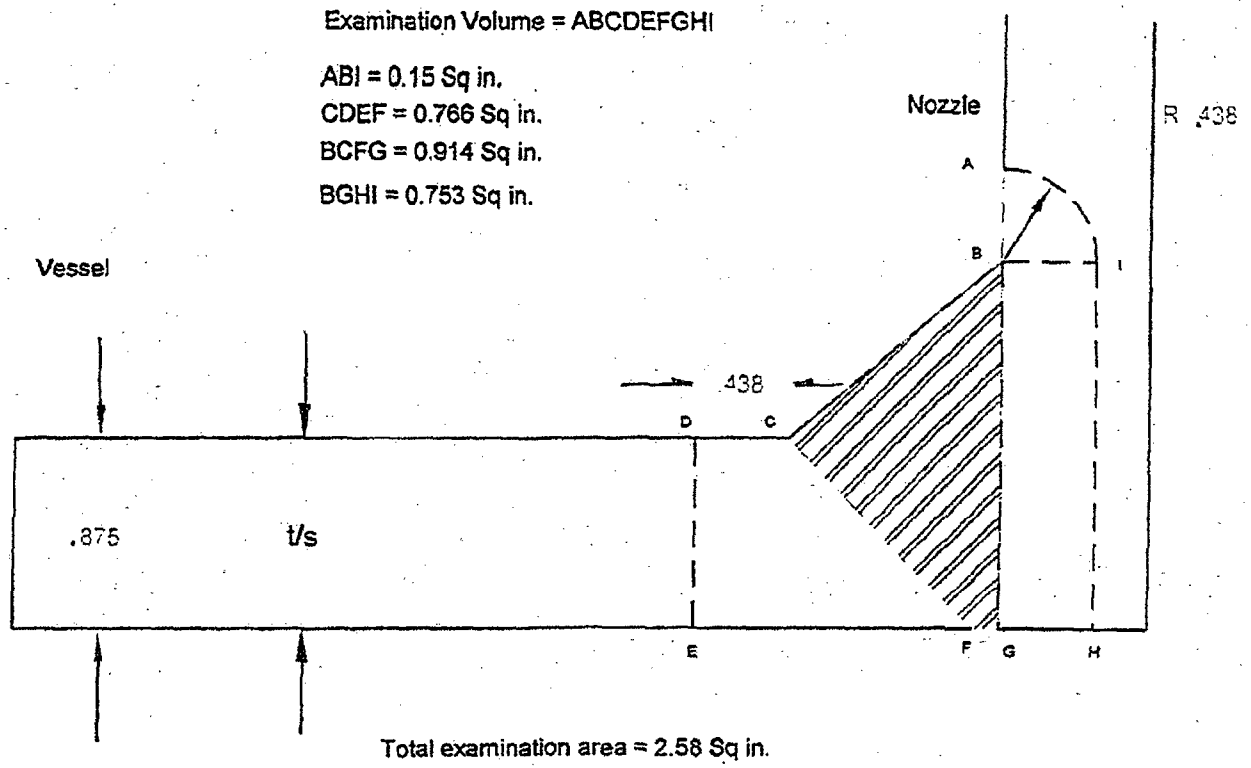
B03.150.004

AGGREGATE COVERAGE			
Base Metal			
Scan	**Percentage**	**Aggregate %**	**Total Aggregate%**
45° Axial (Scan 1)	41.9		
60°Axial (Scan 2)	57.1		
45° Circ (CW)	12.6		
45° Circ (CCW)	12.6		
60° Circ (CW)	12.6		
60° Circ (CCW)	12.6		
Total Base	149.4	149.4/6 = 24.9	
Weld Metal			
45° Axial (Scan 1)	21.9		
45° Axial (Scan 2)	35.0		
45° Axial (Scan 1)	13.1		
45° Axial (Scan 2)	21.9		
45° Circ (CW)	44.9		
45° Circ (CCW)	44.9		
60° Circ (CW)	44.9		
60° Circ (CCW)	44.9		
Total Weld	271.5	271.5/8 = 33.9	
			24.9 + 33.9/2 = 29.4

David K. Zimmerman
NDE Level III

David K. Z

06/17/08



2-LDCB-OUTLET-V2

AREA OF COVERAGE

45° BASE AXIAL

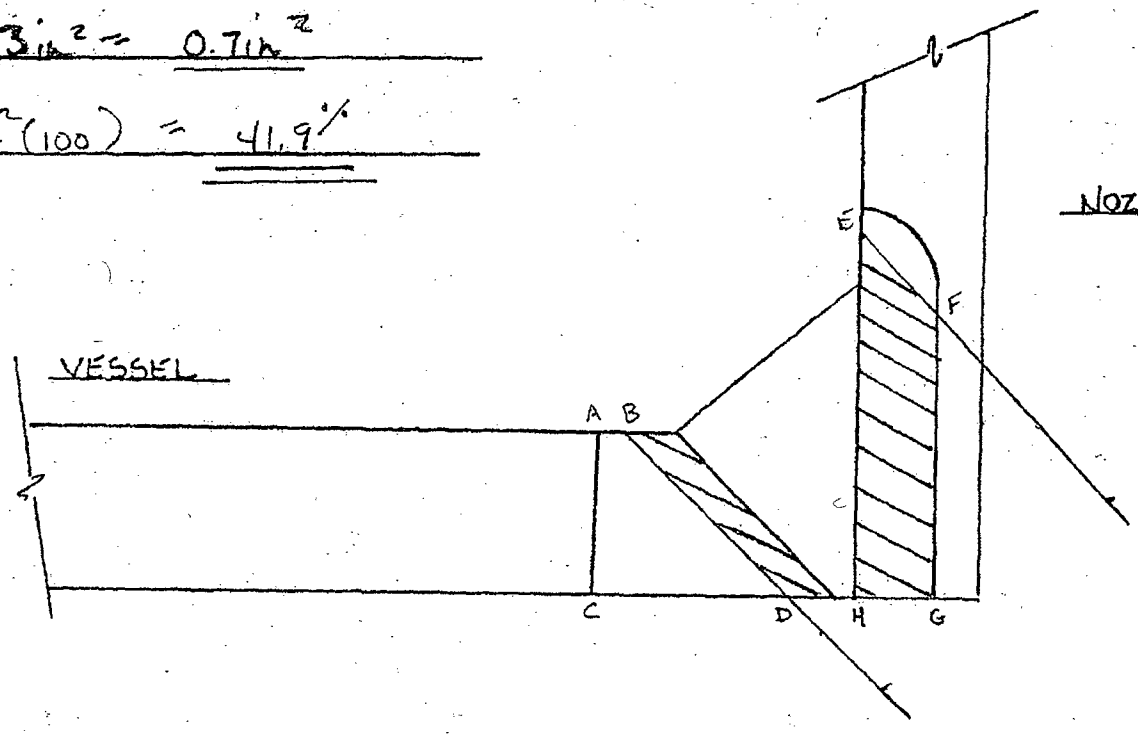
EFGH: $\left(\frac{1.5in + 2.0in}{2}\right).438in = 0.77in^2$

$0.903in^2 - 0.77in^2 = 0.13in^2$

ABCD: $\left(\frac{0.2in + 1.1in}{2}\right).875in = 0.57in^2$

$0.57in^2 + 0.13in^2 = 0.7in^2$

$0.7in^2 / 1.67in^2 (100) = 41.9\%$



2-LDCB-OUTLET-1/2

SCALE 1:1

AREA OF COVERAGE

60° BASE AXIAL

GHIJ: $\left(\frac{1.25in + 2.0in}{2}\right) .438in = 0.7in^2$

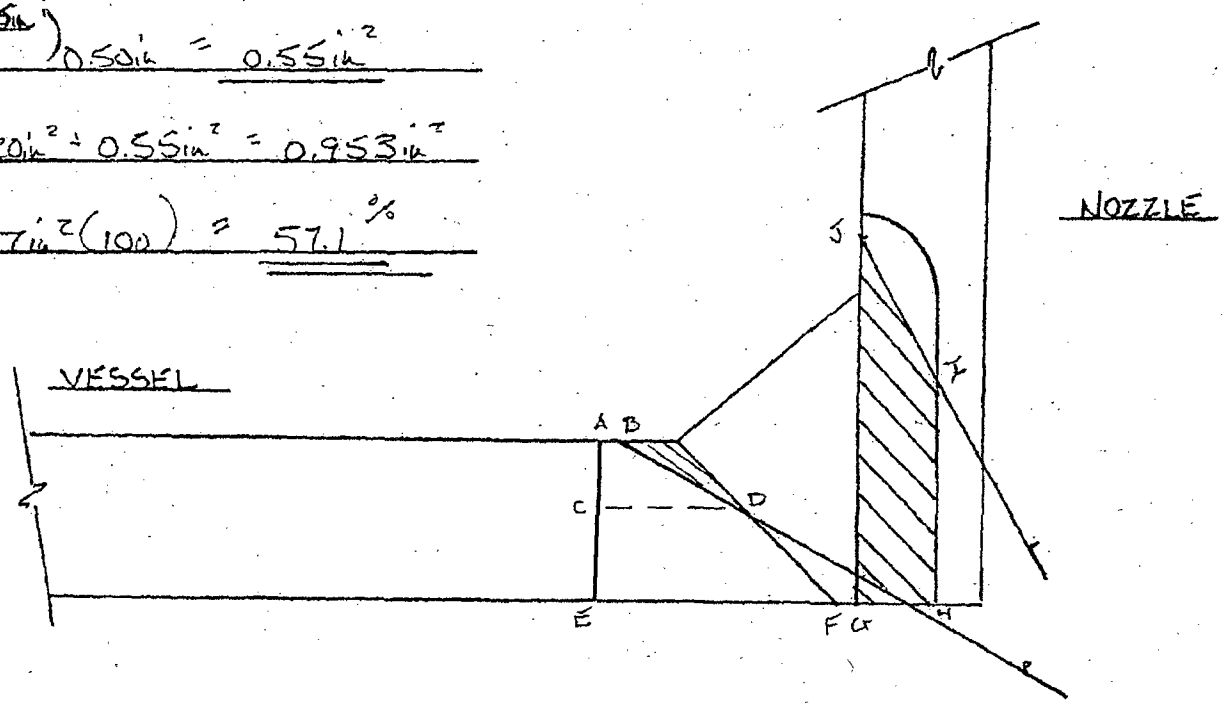
$0.903in^2 - 0.7in^2 = 0.203in^2$

ABCD: $\left(\frac{0.2in + 0.85in}{2}\right) .375in = 0.20in^2$

CDEF: $\left(\frac{0.85in + 1.35in}{2}\right) 0.50in = 0.55in^2$

TOTAL: $0.203in^2 + 0.20in^2 + 0.55in^2 = 0.953in^2$

$0.953in^2 / 1.67in^2 (100) = 57.1\%$



2-LDCB-OUTLET-1/2

SCALE 1:1

AREA OF COVERAGE

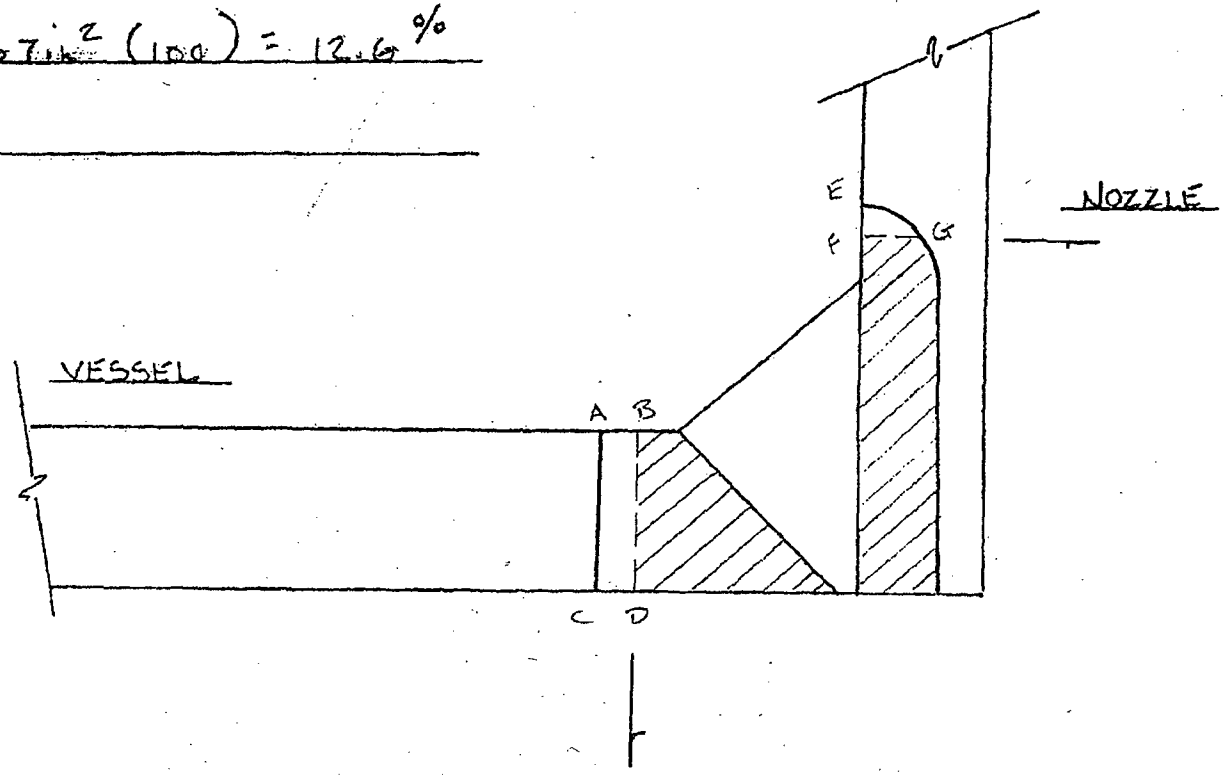
45° & 60° BASE CLIPS

ABCD: $0.2in \times 0.875in = 0.175in^2$

EFG: $\left(\frac{0.15in + 0.3in}{4}\right)\pi = 0.035in^2$

$0.175in^2 + 0.035in^2 = 0.21in^2$

$0.21in^2 / 1.67in^2 (100) = 12.6\%$



2-LDCB-OUTLET-V2

SCALE 1:1

AREA OF COVERAGE

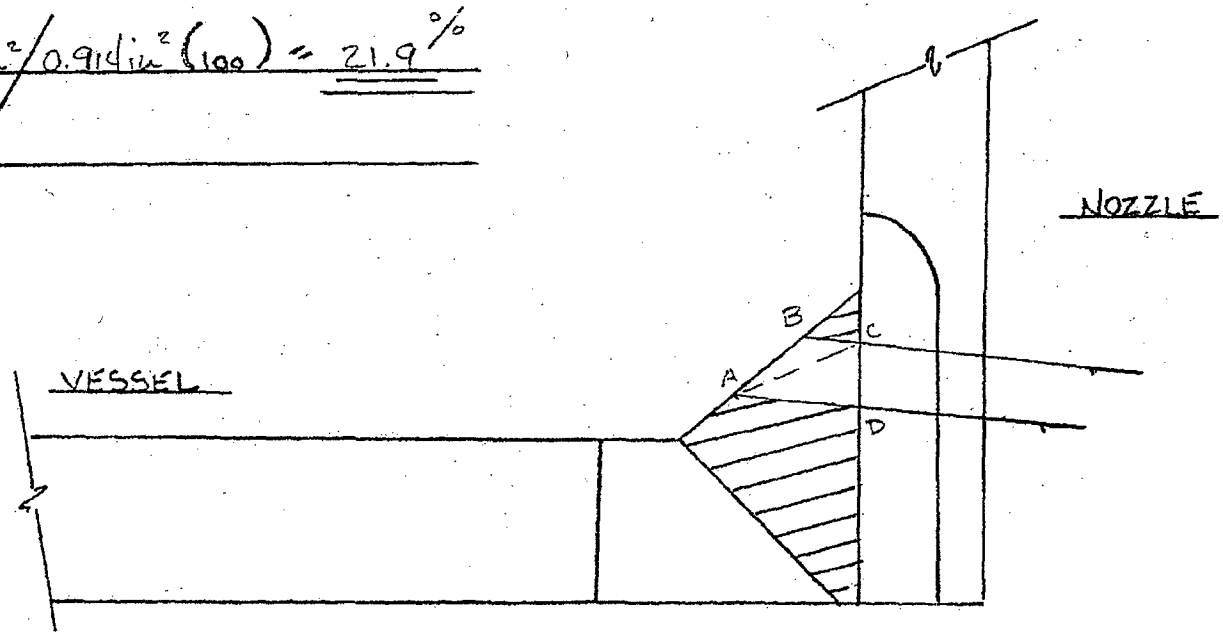
ABC: $\frac{0.3in \times 0.5in}{2} = 0.08in^2$

ACD: $\frac{0.35in \times 0.7in}{2} = 0.12in^2$

$0.08in^2 + 0.12in^2 = 0.20in^2$

TOTAL: $0.20in^2 / 0.914in^2 (100) = 21.9\%$

45° WELD AXIAL (1)



2-LDCB-OUTLET-V2

SCALE 1:1

AREA OF COVERAGE

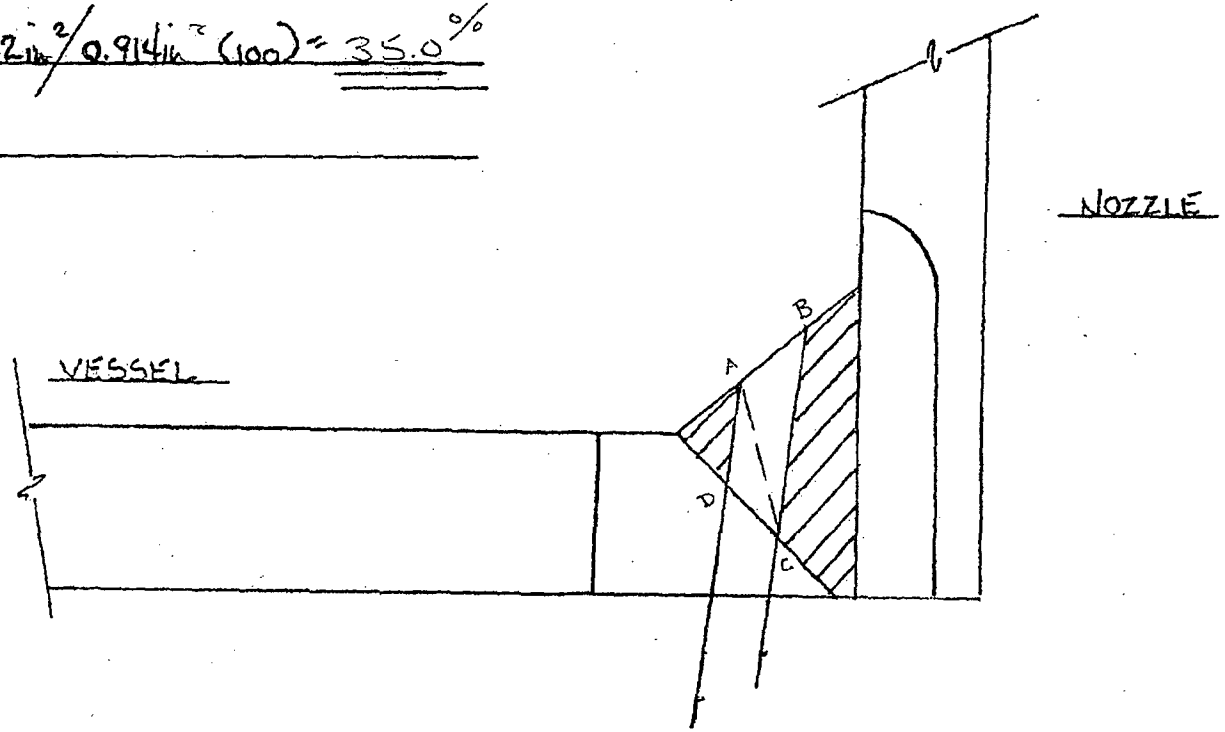
ABC: $\frac{0.5in \times 0.85in}{2} = 0.21in^2$

ACD: $\frac{0.4in \times 0.55in}{2} = 0.11in^2$

$0.21in^2 + 0.11in^2 = 0.32in^2$

TOTAL: $0.32in^2 / 0.914in^2 (100) = 35.0\%$

45° WELD AXIAL (2)



2-LDCB-OUTLET-V2

SCALE 1:1

AREA OF COVERAGE

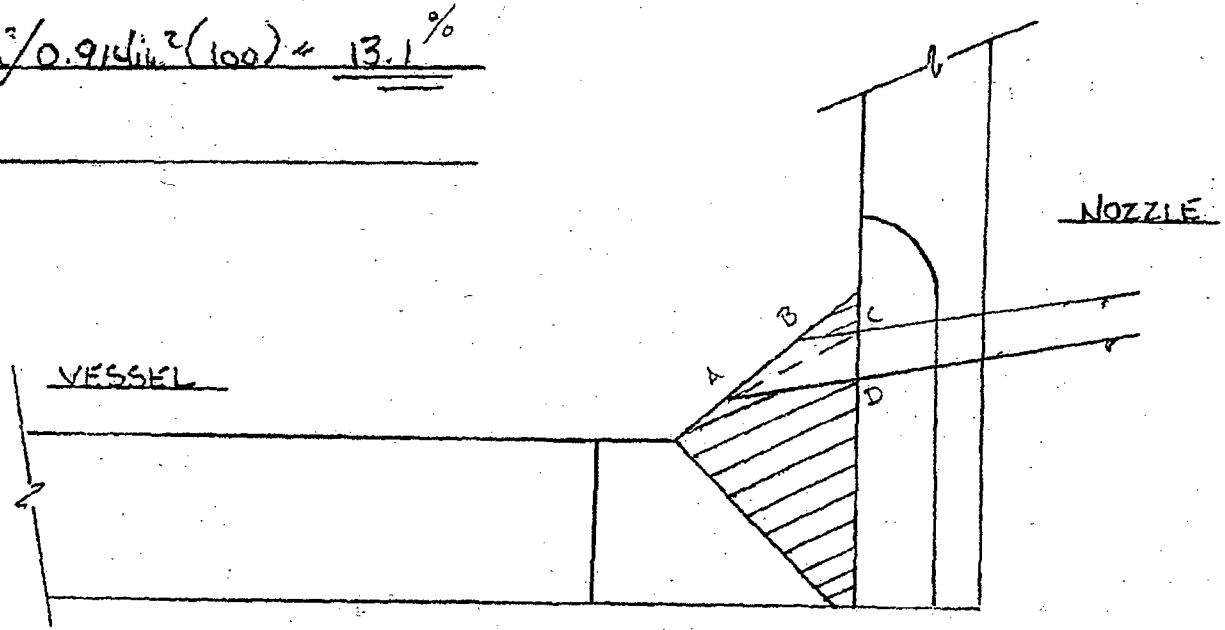
60° WELD AXIAL (1)

ABC: $\frac{0.5in \times 0.3in}{2} = 0.03in^2$

ACD: $\frac{0.7in \times 0.25in}{2} = 0.09in^2$

$0.03in^2 + 0.09in^2 = 0.12in^2$

TOTAL: $0.12in^2 / 0.914in^2 (100) = 13.1\%$



2-LDCB-OUTLET-V2

SCALE 1:1

60° WELD AXIAL (2)

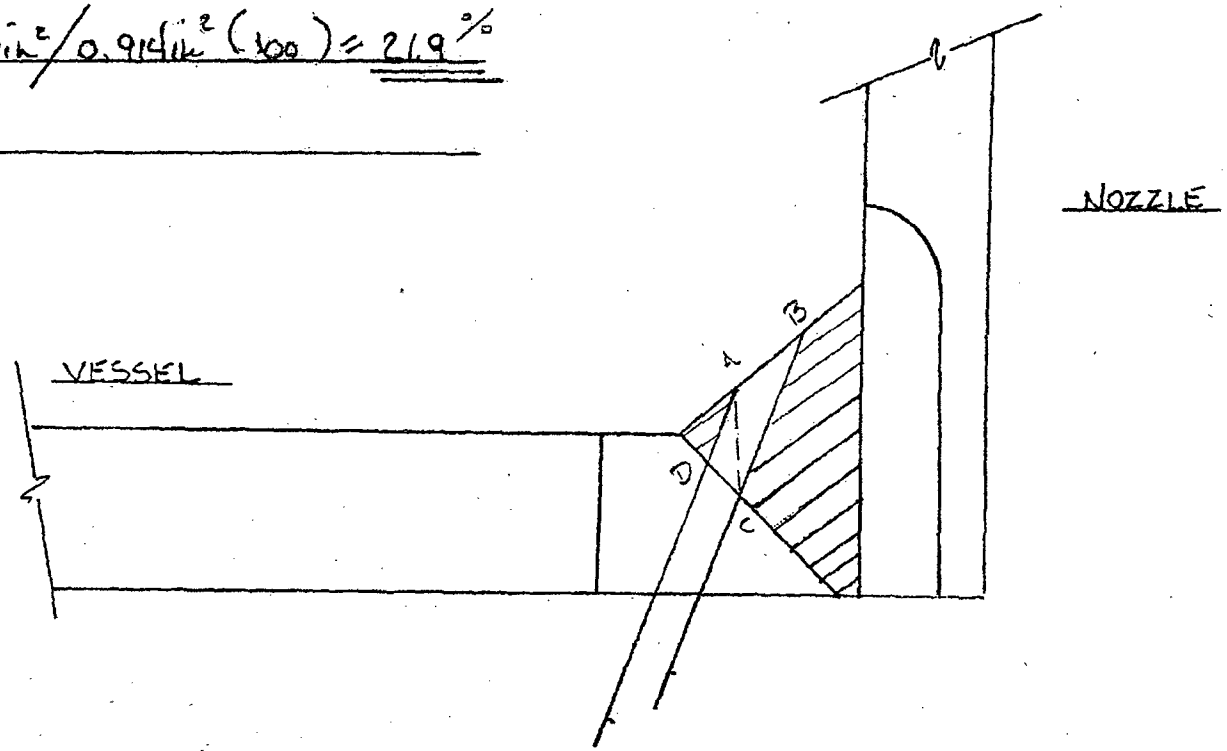
AREA OF COVERAGE

ABC: $\frac{0.5in \times 0.6in}{2} = 0.15in^2$

ACD: $\frac{0.25in \times 0.4in}{2} = 0.05in^2$

$0.15in^2 + 0.05in^2 = 0.20in^2$

TOTAL: $0.20in^2 / 0.914in^2 (100) = 21.9\%$



2-LDCB-OUTLET-VZ

SCALE 1:1

45° 1/4 60° WELD CIRC.

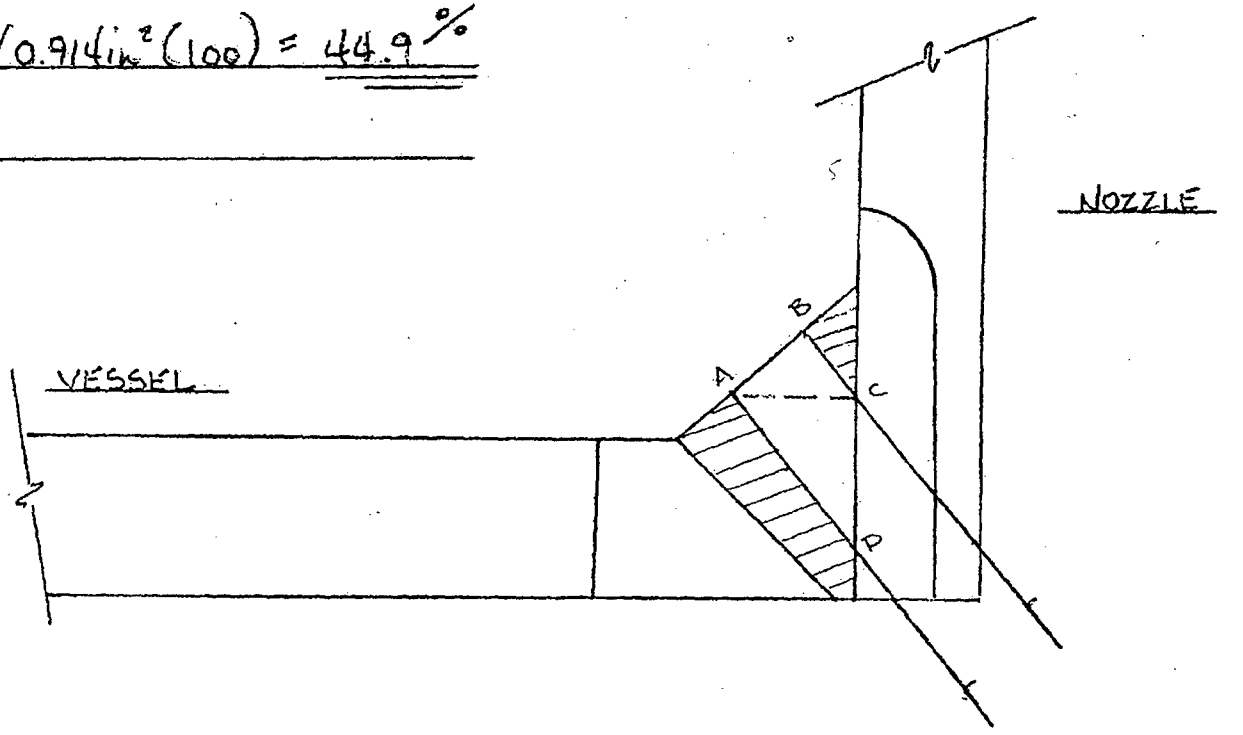
AREA OF COVERAGE

ABC: $\frac{0.45in \times 0.5in}{2} = 0.11in^2$

ACD: $\frac{0.7in \times 0.85in}{2} = 0.30in^2$

$0.11in^2 + 0.30in^2 = 0.41in^2$

TOTAL: $0.41in^2 / 0.914in^2 (100) = 44.9\%$



2-1DCB-OUTLET-V2

SCALE 1:1