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June 24, 2005

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

Subject: Duke Energy  
Oconee Nuclear Station, Unit 3  
Docket Nos. 50-270  
Third Ten Year Inservice Inspection Interval  
Requests for Relief No. 05-ON-001 and 002

Pursuant to 10 CFR 50.55a(g) (5)(iii), attached are two Requests 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).

Request for Relief 05-ON-001 is to allow Duke Energy to take credit for eleven (11) limited ultrasonic examinations on welds associated with various systems and components described in the attached request (Attachment A).

Request for Relief 05-ON-002 is a similar request but addresses seven (7) limited ultrasonic examinations on welds specifically associated with the Reactor Vessel as described in the attached request (Attachment B).

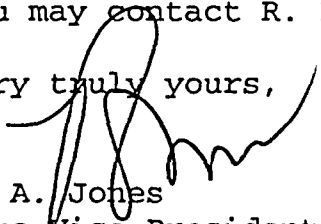
During the recent Unit 3 EOC-21 refueling outage, from 10-9-04 through 1-2-05, numerous ultrasonic examinations were conducted on various welds. The ultrasonic examination coverage of the subject Unit 3 welds did not meet the 90% examination requirements of Code Case N-460. The obtainable volume coverage for each weld examination is indicated on the attached requests. Achievement of greater examination coverage for these welds is impractical due to piping/valve geometry, interferences, and existing examination technology. Therefore, Duke Energy requests that the NRC grant relief as authorized under 10 CFR 50.55a(g)(6)(i).

A047

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

Very truly yours,



R. A. Jones  
Site Vice President

Attachments A and B

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ISI Relief Request File  
NRIA File/ELL EC050  
Document Control



Attachment A

Request for Relief

05-ON-001

Limited Examinations  
Associated With Various  
Systems and Components

3EOC 21

Proposed Relief in Accordance with 10 CFR 50.55a(g)(5)(iii)  
 Inservice Inspection Impracticability  
 Duke Energy Corporation  
 Oconee Nuclear Station – Unit 3 (EOC-21)  
 Third 10-Year Interval – Inservice Inspection Plan  
 Interval Start Date= 12-16-1994 Interval End Date=1-2-2005  
 ASME Section XI Code – 1989 Edition with No Addenda  
 Code Case N-460 is applicable

	I.	II.	III.	IV. & V.	VI.	VII.	VIII.
List Number	Limited Area/Weld I.D. Number	System / Component for Which Relief is Requested: Area or Weld to be Examined	Code Requirement from Which Relief is Requested: 100% Exam Volume Coverage Exam Category Item No. Fig. No. Limitation Percentage	Impracticability/ Burden Caused by Compliance	Proposed Alternate Examinations or Testing	Implementation Schedule and Duration	Justification for Granting Relief
1.	3-PZR-WP26-1	Reactor Coolant System Pressurizer Sensing Sample Nozzle to Heater Belt Weld	Exam Category B-D Item Number B03.110.009 Fig. IWB-2500-7(a) 25.92% Volume Coverage Limited Scan of Examination Volume A-B-C-D-E-F-G-H-I	See Paragraph "A"	See Paragraph "H"	See Paragraph "T"	See Paragraph "J"
2.	3-PZR-WP26-2	Reactor Coolant System Pressurizer Sensing Sample Nozzle to Heater Belt Weld	Exam Category B-D Item Number B03.110.010 Fig. IWB-2500-7(a) 25.92% Volume Coverage Limited Scan of Examination Volume A-B-C-D-E-F-G-H-I	See Paragraph "A"	See Paragraph "H"	See Paragraph "T"	See Paragraph "J"
3.	3-PZR-WP26-3	Reactor Coolant System Pressurizer Sensing Sample Nozzle to Heater Belt Weld	Exam Category B-D Item Number B03.110.011 Fig. IWB-2500-7(a) 25.92% Volume Coverage Limited Scan of Examination Volume A-B-C-D-E-F-G-H-I	See Paragraph "A"	See Paragraph "H"	See Paragraph "T"	See Paragraph "J"

List Number	I. Limited Area/Weld I.D. Number	II. System / Component for Which Relief is Requested: Area or Weld to be Examined	III. Code Requirement from Which Relief is Requested: 100% Exam Volume Coverage Exam Category Item No. Fig. No. Limitation Percentage	IV. & V. Impracticality/ Burden Caused by Compliance	VI. Proposed Alternate Examinations or Testing	VII. Implementation Schedule and Duration	VIII. Justification for Granting Relief
4.	3-PZR-WP26-7	Reactor Coolant System Pressurizer Sensing Sample Nozzle to Heater Belt Weld	Exam Category B-D Item Number B03.110.012 Fig. IWB-2500-7(a) 25.92% Volume Coverage Limited Scan of Examination Volume A-B-C-D-E-F-G-H-I	See Paragraph "A"	See Paragraph "H"	See Paragraph "T"	See Paragraph "J"
5.	3-LDCB-IN-V1	High Pressure Injection System Letdown Cooler 3B Inlet Nozzle to Channel Head Weld	Exam Category B-D Item Number B03.150.003 Fig. IWB-2500-7(a) 29.26% Volume Coverage Limited Scan of Examination Volume A-B-C-D-E-F-G-H-I-J	See Paragraph "B"	See Paragraph "H"	See Paragraph "T"	See Paragraph "J"
6.	3-LDCB-OUT-V2	High Pressure Injection System Letdown Cooler 3B Outlet Nozzle to Channel Head Weld	Exam Category B-D Item Number B03.150.004 Fig. IWB-2500-7(a) 29.26% Volume Coverage Limited Scan of Examination Volume A-B-C-D-E-F-G-H-I-J	See Paragraph "B"	See Paragraph "H"	See Paragraph "T"	See Paragraph "J"
7.	3-14B-H20A	Low Pressure Service Water System Component Support Attachment to Pipe Weld	Exam Category C-C Item Number C03.020.017 Fig. IWC-2500-5(a) 50% Surface Coverage Limited Coverage of Examination Surfaces A-B and C-D	See Paragraph "C"	See Paragraph "H"	See Paragraph "T"	See Paragraph "K"
8.	3-51A-67-3	High Pressure Injection System Pipe to Elbow Weld (circumferential weld)	Exam Category C-F-1 Item Number C05.021.049 Fig. IWC-2500-7(a) 87.38% Volume Coverage Limited Scan of Examination Volume C-D-E-F	See Paragraph "D"	See Paragraph "H"	See Paragraph "T"	See Paragraph "L"

	I.	II.	III.	IV. & V.	VI.	VII.	VIII.
List Number	Limited Area/Weld I.D. Number	System / Component for Which Relief is Requested: Area or Weld to be Examined	Code Requirement from Which Relief is Requested: 100% Exam Volume Coverage Exam Category Item No. Fig. No. Limitation Percentage	Impracticality/ Burden Caused by Compliance	Proposed Alternate Examinations or Testing	Implementation Schedule and Duration	Justification for Granting Relief
9.	3HP-241-2	High Pressure Injection System Pipe to Valve 3HP-194 Weld (circumferential weld)	Exam Category C-F-1 Item Number C05.021.051 Fig. IWC-2500-7(a) 35.55% Volume Coverage Limited Scan of Examination Volume C-D-E-F	See Paragraph "E"	See Paragraph "H"	See Paragraph "I"	See Paragraph "L"
10.	3-51A-119-11	High Pressure Injection System Flange to Pipe Weld (circumferential weld)	Exam Category C-F-1 Item Number C05.021.076 Fig. IWC-2500-7(a) 58% Volume Coverage Limited Scan of Examination Volume C-D-E-F	See Paragraph "F"	See Paragraph "H"	See Paragraph "I"	See Paragraph "L"
11.	3-51A-67-4	High Pressure Injection System Elbow to Pipe Weld (circumferential weld)	Exam Category C-F-1 Item Number C05.021.091 Fig. IWC-2500-7(a) 87.38% Volume Coverage Limited Scan of Examination Volume C-D-E-F	See Paragraph "G"	See Paragraph "H"	See Paragraph "I"	See Paragraph "L"

See Attachment A for B03.110 area/weld locations.

See Attachment B for B03.150 area/weld locations.

See Attachment C for inspection data on all items listed in the above table for this Relief Request.

Note: Items in this relief request were inspected during one of the following months: July, October, or November of 2004.

#### **IV. & V. Impracticity/Burden Caused by Code Compliance**

**Paragraph A:** (The Pressurizer Sensing Sampling Nozzle material is SA508 Grade B and the Pressurizer Heater Belt material is SA516 Grade 70. This weld has a diameter of 5.75 inches and a wall thickness of 6.187 inches.) During the ultrasonic examination of the Sensing Sampling Nozzle to Heater Belt weld, 25% coverage of the required examination volume was obtained for this weld. The percentage of coverage reported represents the aggregate coverage from all scans performed on the weld and adjacent base material. The coverage from each scan was as follows: 45° scan perpendicular and parallel to the weld covered 28% of the weld and base material; 60° scan perpendicular and parallel to the weld covered, 30% of the weld and base material. The weld joint geometry, which is essentially a branch connection arrangement using a set-in nozzle, prevented scanning from both sides of the weld. In order to scan all of the required volume for these welds, the sensing sampling nozzle would have to be redesigned to allow scanning from both sides of the weld, which is impractical. There were no recordable indications found during the inspection of this weld.

**Paragraph B:** (The Letdown Cooler Inlet/Outlet Nozzles and Channel Head material is SA182 Grade T316L. These welds have a diameter of 3.0 inches and a wall thickness of .875 inches.) During the ultrasonic examination of the Inlet/Outlet Nozzles to Channel Head welds, 29% coverage of the required examination volume was obtained for each of the welds. The percentage of coverage reported represents the aggregate coverage from all scans performed on the weld and adjacent base material. The coverage from each scan was as follows: 45° scan perpendicular and parallel to the weld covered 28% of the weld and base material; 60° scan perpendicular and parallel to the weld covered, 29% of the weld and base material. The weld joint geometry, which is essentially a branch connection arrangement using a set-on nozzle, prevented scanning from both sides of the welds. In order to scan all of the required surfaces for the inspection of these welds, the inlet/outlet nozzles would have to be redesigned to allow scanning from both sides of the welds, which is impractical. There were no recordable indications found during the inspection of these welds.

**Paragraph C:** (The Pipe and Lug material is carbon steel. This pipe has a diameter of 8.0 inches and a wall thickness of .500 inches. The four lugs are 1.5 inches thick and the welds are ¼ inch fillet welds.) During the MT examination of the attachment welds on lugs for the component support, 50% coverage of the required examination surfaces was obtained. The percentage of coverage represents the aggregate coverage for all the examinations surfaces required to be examined. The limitations were due to limited access space that would not allow 2 of the attachment lugs to be examined. In order to examine all of the required surfaces for the inspection of these attachment lugs, the support would have to be redesigned to allow access for examining the attachment lugs or the piping rerouted to allow access, which is impractical. There were no recordable indications found during the inspection of the accessible lug welds.

**Paragraph D:** (The pipe and elbow material is stainless steel. This weld has a diameter of 2.5 inches and a wall thickness of .375 inches.) During the ultrasonic examination of this weld, 87% coverage of the required examination volume was obtained. The percentage of coverage represents the aggregate coverage from all scans performed on the weld and adjacent base material. The 45° shear wave circumferential scans, both clockwise and counter-clockwise covered 100% of the examination volume and the 60° shear wave axial scan covered 48% from the pipe side of the weld. A supplemental 70° shear wave scan covered 22% of the examination volume in one axial direction from the pipe side of the weld. Limitations were caused by elbow configuration which prevented scanning from that side. In order to scan all of the required volume for this weld, the elbow would have to be redesigned to allow scanning from both sides of the weld, which is impractical. There were no recordable indications found during the inspection of this weld.

**Paragraph E:** (The valve and pipe material is stainless steel. This weld has a diameter of 4.0 inches and a wall thickness of .674 inches.) During the ultrasonic examination of this weld, 35% coverage of the required examination volume was obtained. The percentage of coverage represents the aggregate coverage from all scans performed on the weld and adjacent base material. The 45° shear wave circumferential scans, both clockwise and counter-clockwise covered 47% of the examination volume and the 60° shear wave axial scan covered 47% of the examination volume from one direction.

A supplemental scan using a 60° refracted longitudinal wave search unit covered 52.6% of the examination volume including 100% of the inside surface within the area of interest. The limitation was caused by the taper on the valve side of the weld which prevented scanning from that side. In order to scan all of the required surfaces for the inspection of this weld, the valve would have to be redesigned to allow scanning from both sides of the weld, which is impractical. There were no recordable indications found during the inspection of this weld.

**Paragraph F:** (The flange and pipe material is stainless steel. This weld has a diameter of 4.0 inches and a wall thickness of .531 inches.)

During the ultrasonic examination of this weld, 58% coverage of the required examination volume was obtained. The percentage of coverage represents the aggregate coverage from all scans performed on the weld and adjacent base material. The 45° shear wave circumferential scans, both clockwise and counter-clockwise covered 100% of the examination volume and the 60° shear wave axial scan covered 32% of the examination volume from the elbow side. The limitation was caused by the taper on the flange side of the weld which prevented scanning from that side. In order to scan all of the required surfaces for the inspection of this weld, the flange would have to be redesigned to allow scanning from both sides of the weld, which is impractical. There were no recordable indications found during the inspection of this weld.

**Paragraph G:** (The pipe and elbow material is stainless steel. This weld has a diameter of 2.5 inches and a wall thickness of .375 inches.)

During the ultrasonic examination of this weld, 87% coverage of the required examination volume was obtained. The percentage of coverage represents the aggregate coverage from all scans performed on the weld and adjacent base material. The 45° shear wave circumferential scans, both clockwise and counter-clockwise covered 100% of the examination volume and the 60° shear wave axial scan covered 48%. A supplemental 70° shear wave scan covered 22% of the examination volume in one axial direction from the pipe side. Limitations were caused by elbow configuration which prevented scanning from that side. In order to scan all of the required surfaces for the inspection of this weld, the elbow would have to be redesigned to allow scanning from both sides of the weld, which is impractical. There were no recordable indications found during the inspection of this weld.

#### **VI. Proposed Alternate Examinations or Testing**

**Paragraph H:**

The scheduled 10-year code examination was performed on the referenced area/weld and it resulted in the noted limited coverage of the required ultrasonic volume. These inspections were performed during the last inspection outage of the interval; no additional examinations are planned for the area/weld during the current inspection interval.

#### **VII. Implementation Schedule and Duration**

**Paragraph I**

The scheduled third 10-year interval plan code examination was performed on the referenced areas/welds resulting in limited scan and volumetric coverage. No additional examinations are planned for the areas/welds during the current inspection interval. The same areas/welds may be examined again as part of the next (fourth) 10-year interval plan, depending on the applicable code year edition and addenda requirements adopted in the future.

#### **VIII. Justification for Granting Relief**

**Paragraph J:**

Ultrasonic examination of areas/welds for item number B03.110 and B03.150 were conducted using personnel, qualified in accordance with ASME Section XI, Appendix VII of the 1995 Edition with the 1996 Addenda. The ultrasonic procedures used complied with the requirements of ASME Section V, Article 4, 1989 Edition with no addenda. Although 100% coverage of the examination volume could not be achieved, the amount of coverage obtained for this examination provides an acceptable level of quality and integrity.

Duke Energy will use Class 1, Examination Category B-P, pressure testing and VT-2 visual examination to compliment the limited scan examinations. The Code requires that a pressure test be performed after each refueling outage for Class 1. These tests require a VT-2 visual examination for evidence of leakage. This testing provides 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 event 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/3/A/0600/10, "RCS Leakage". This RCS leakage monitoring is a requirement of Technical Specification 3.4.13, "Reactor Coolant System Leakage". Any leakage is also evaluated in accordance with this Technical Specification. The leakage could also be detected through several other methods. One method is 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. A second is the level indicator in the Reactor Building normal sump. A third is a loss of level in the Letdown Storage Tank. Based on the results of the required volumetric, surface and VT-2 examinations performed during this outage, it is Duke's belief that this combination of examinations provides a reasonable assurance of component integrity.

**Paragraph K:**

MT examination of the support attachment welds for item number C03.020.017 were conducted using personnel, qualified in accordance with paragraph IWA-2300 of the 1989 Edition with no addenda, ASME Section XI Code. The examination procedure was demonstrated using the remote camera equipment and the 1/32 inch black line on an 18% neutral gray card. Although 100% of the required examination surfaces could not be examined, the amount of surface that was examined provides an acceptable level of quality and integrity. In addition to the MT examinations with limited coverage, Duke Energy performed a supplemental Visual VT-1 examination on the welds of the 2 lugs that were not accessible for MT and achieved 100% coverage. The results from the Visual VT-1 examinations were acceptable. (See Paragraph M for additional justification.)

Duke Energy has examined the support referenced in this request to the maximum extent possible utilizing the latest in examination techniques and equipment. Based on the inspections coverage and results of the required MT exam this outage and the supplemental VT-1 exam on the inaccessible lugs, it is Duke's belief that this examination provides a reasonable assurance of component integrity.

**Paragraph L:**

Ultrasonic examination of areas/welds for the item numbers C05.021 were conducted using personnel, equipment and procedures qualified in accordance with ASME Section XI, Appendix VIII Supplement 2 of the 1995 Edition with the 1996 Addenda as administered by the PDI. Although 100% coverage of the examination volume could not be achieved, the amount of coverage obtained for each of these welds provides an acceptable level of quality and integrity. In addition to the volumetric examinations with limited coverage, Duke Energy performed a surface examination (code required) on each of the C05.021 items and achieved 100% coverage. The results from the surface examinations were acceptable.

(See Paragraph M for additional justification for all C05.021 items except for C05.021.076.)

(For item C05.021.076 see Paragraph N for additional justification)

In addition to the C05.021 welds that relief is being requested for limited scanning, there were 13 additional C05.021 welds that surface and volumetric examinations were performed on. The examinations didn't identify any recordable indications and 100% coverage was obtained on each of the 13 welds. The 13 additional welds were from the same system as the C05.021 welds of this request.

Duke Energy Corporation does not claim credit for coverage of the far side of austenitic welds. The characteristics of austenitic weld metal attenuate and distort the sound beam when shear waves pass through the weld. Refracted longitudinal waves provide better penetration but cannot be used beyond the first path leg. Duke Energy Corporation uses a combination of shear waves and longitudinal waves to examine single sided austenitic welds when the nominal material thickness exceeds 0.5 inch. A 70° shear wave angle beam is used to interrogate the far side of the weld when the nominal material thickness is equal to or less than 0.5 inch and a 60° refracted longitudinal wave is used to interrogate the far side of the weld when the nominal material thickness is greater than 0.5 inch.

**Paragraph M:**

Duke Energy will use Class 2, Examination Category C-H, pressure testing and VT-2 visual examination to compliment the limited examination coverage. The Code requires that a pressure test be performed once each period for Class 2 items. These tests require a VT-2 visual examination for evidence of leakage. This testing provides adequate assurance of pressure boundary integrity.

In addition to the above Code required examinations (volumetric, surface and pressure test), there are other activities which provide a high level of confidence that, in the unlikely event 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/3/A/0600/10, "RCS Leakage". This RCS leakage monitoring is a requirement of Technical Specification 3.4.13, "Reactor Coolant System Leakage". Any leakage is also evaluated in accordance with this Technical Specification. The leakage could also be detected through several other methods. One method is 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. A second is the level indicator in the Reactor Building normal sump. A third is a loss of level in the Letdown Storage Tank. Based on the results of the required volumetric, surface and VT-2 examinations performed during this outage, it is Duke's belief that this combination of examinations provides a reasonable assurance of component integrity.

**Paragraph N:**

Duke Energy will use Class 2, Examination Category C-H, pressure testing and VT-2 visual examination to compliment the limited examination coverage. The Code requires that a pressure test be performed once each period for Class 2 items. These tests require a VT-2 visual examination for evidence of leakage. This testing provides 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 and isolated. One is that leakage from these welds would be detected by Operations personnel during their regular rounds (reference procedure OP/3/A/1102/020A "Primary Rounds"). The Nuclear Equipment Operator has been trained to look for any unusual conditions, such as leaks. In addition, the procedure addresses leaks as being an item to consider during rounds. The C05.021 item in this request is located in an area where operations personnel will be walking through as part of their rounds; therefore, any leak would be identified by visual observation.

Duke Energy has examined the welds/components referenced in this request to the maximum extent possible utilizing the latest in examination techniques and equipment. The welds/components identified in Section II of this request were rigorously inspected by volumetric NDE methods during construction and verified to be free from unacceptable fabrication defects. Based on the coverage and results of the required volumetric exams and surface exams this outage and the pressure testing (VT-2) exams, it is Duke's belief that this combination of examinations provides a reasonable assurance of component integrity.



IX. Other Information

The following individuals contributed to the development of this relief request:

James J. McArdle (Principal UT NDE Level III Examiner) provided Sections III., IV., V., and part of Section VIII.

B. W. Carney, Jr. (Oconee Engineering) provided part of Section VIII.

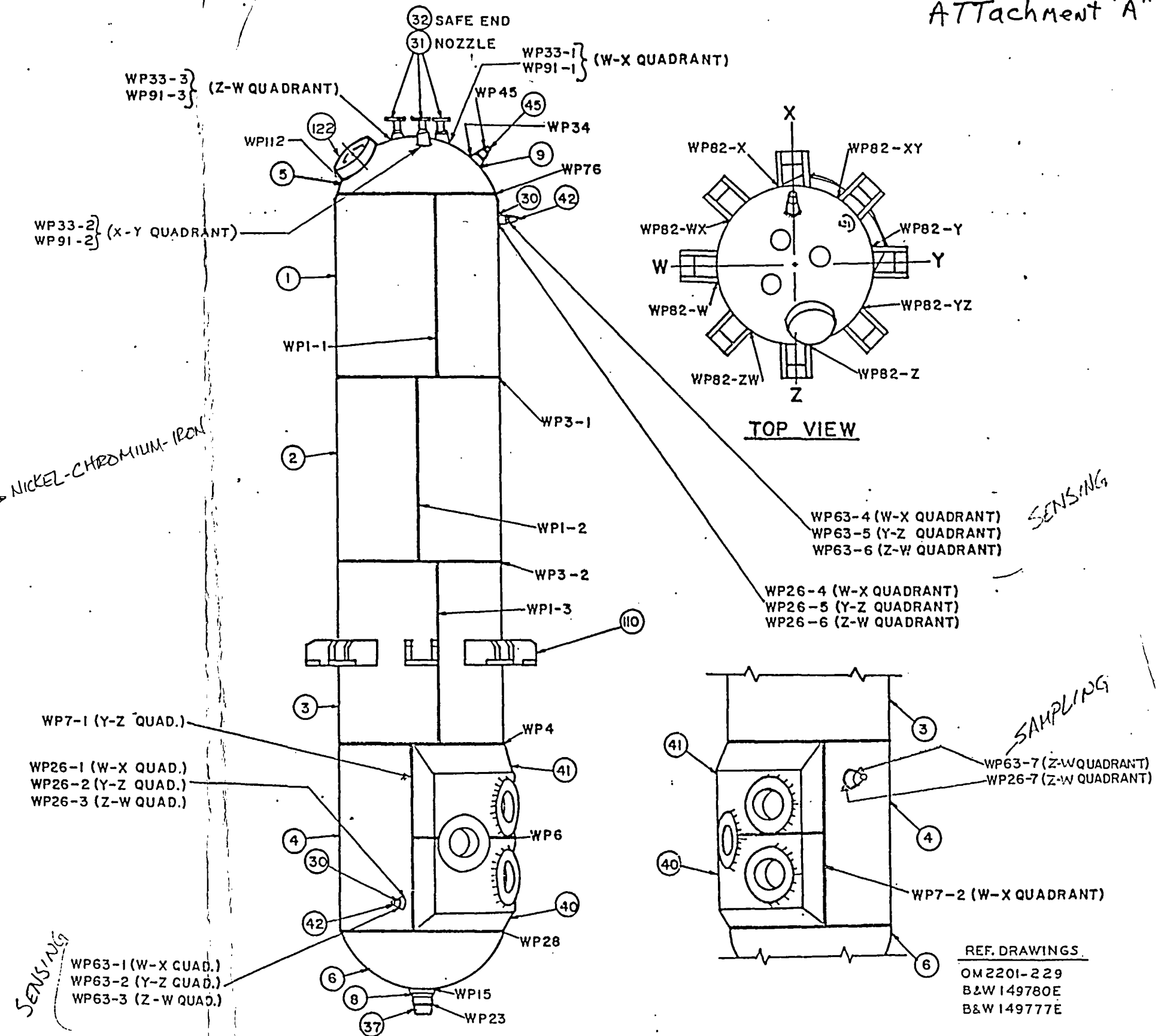
Larry C. Keith (Oconee ISI Plan Manager) compiled the remaining sections.

Sponsored By: Larry C. Keith Date 5-3-2005

Approved By: R. Kevin Rhyme Date 5/3/05

WELD LIST				BILL OF MATERIAL			
IDENT NO.	PIECE NO.	DIAM.	THICK.	PC. NO.	QTY	DESCRIPTION	MATL.
WPI-1	1 TO 1	N/A	6.188	1	1	UPPER SHELL COURSE	SA 516 GR.70
WPI-2	2 TO 2	N/A	6.188	2	1	MIDDLE SHELL COURSE	SA 516 GR.770
WPI-3	3 TO 3	N/A	6.188	3	1	LOWER SHELL COURSE	SA 516 GR.70
WP3-1	1 TO 2	84" I.D.	6.188	4	1	HEATER BELT SHELL	SA 516 GR.70
WP3-2	2 TO 3	84" I.D.	6.188	5	1	UPPER HEAD	SA 516 GR.70
WP4	3 TO 4 & 41	84" I.D.	6.188	6	1	LOWER HEAD	SA 516 GR.70
WP6	40 TO 41	84" I.D.	13.563	8	1	PRESSURIZER SURGE NOZZLE	SA 508 CL.1
WP7-1	4 TO 40 & 41	N/A	6.188	9	1	PRESSURIZER SPRAY NOZZLE	SA 508 CL.1
WP7-2	4 TO 40 & 41	N/A	6.188	30	7	SAMPLING NOZZLE	SA 508 GR.8
WPI5	6 TO 8		4.750	31	3	PRESSURIZER RELIEF NOZZLE	SA 508 CL.1
WP23	8 TO 37	10" NPS	1.063	32	3	PRESSURIZER RELIEF NOZZLE SAFE END	SA 182 F316
WP26-1	30 TO 4		6.188	37	1	PRESSURIZER SURGE NOZZLE SAFE END	SA 336 CL.F8M
WP26-2	30 TO 4		6.188	40	1	LOWER HEATER BELT FORGING	SA 508 CL.1
WP26-3	30 TO 4		6.188	41	1	UPPER HEATER BELT FORGING	SA 508 CL.1
WP26-4	30 TO 1		6.188	42	7	SAMPLING NOZZLE SAFE END	SB-166
WP26-5	30 TO 1		6.188	45	1	PRESSURIZER SPRAY NOZZLE SAFE END	SB-166
WP26-6	30 TO 1		6.188	110	8	PRESSURIZER SUPPORT LUG ASSEMBLY	SA-516 GR.70
WP26-7	30 TO 4		6.188	122	1	UPPER HEAD MANWAY FORGING	SA-508 CL.1
WP28	6 TO 4 & 40	84" I.D.	4.750				
WP33-1	31 TO 5		4.750				
WP33-2	31 TO 5		4.750				
WP33-3	31 TO 5		4.750				
WP34	9 TO 5		4.750				
WP45	45 TO 9	4" NPS	0.750				
WP63-1	42 TO 30		1.1875				
WP63-2	42 TO 30		1.1875				
WP63-3	42 TO 30		1.1875				
WP63-4	42 TO 30		1.1875				
WP63-5	42 TO 30		1.1875				
WP63-6	42 TO 30		1.1875				
WP76	1 TO 5	84" I.D.	4.750				
WP82-X	110 TO 3	N/A	3.500				
WP82-XY	110 TO 3	N/A	3.500				
WP82-Y	110 TO 3	N/A	3.500				
WP82-YZ	110 TO 3	N/A	3.500				
WP82-Z	110 TO 3	N/A	3.500				
WP82-ZW	110 TO 3	N/A	3.500				
WP82-WX	110 TO 3	N/A	3.500				
WP91-1	31 TO 32	2 1/2" NPS	1.000				
WP91-2	31 TO 32	2 1/2" NPS	1.000				
WP91-3	31 TO 32	2 1/2" NPS	1.000				
WP63-7	42 TO 30		1.1875				
WPI12	5 TO 122		4.750				

WELD LIST (CONT.)			
I.D. NO.	PC. NO.	DIAM.	THICK.
WP91-1	31 TO 32	2 1/2" NPS	1.000
WP91-2	31 TO 32	2 1/2" NPS	1.000
WP91-3	31 TO 32	2 1/2" NPS	1.000
WP63-7	42 TO 30		1.1875
WPI12	5 TO 122		4.750



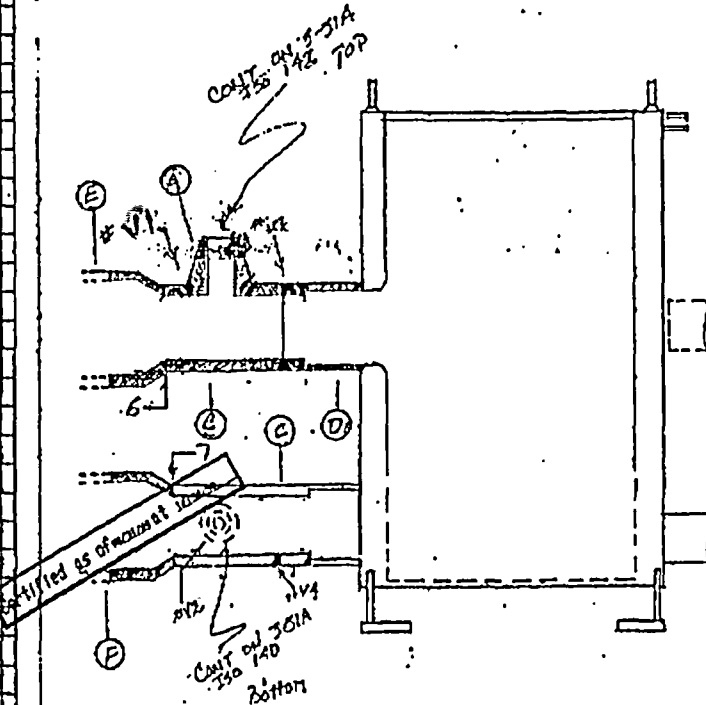
NOTES:		REV. WELD QUAD.		TLT	REV	JEL	TITLE	
1. ALL I.D. NUMBERS SHALL BE PRECEDED BY "3PRZ-"		0 ORIGINAL		10-7-82	10-9-92	10-10-92	PRESSURIZER WELD OUTLINE	
2. PIECE NUMBERS ARE SHOWN IN CIRCLES.		NO. REVISION		W5B	TMH	ICC	DWG NO.	
				1-13-82	2-28-82	2-2-82	REV.	
				DATE	DATE	DATE	1	

REF. DRAWINGS		OM2201-229	
		B&W 149780E	
		B&W 149777E	

ISI-OCN3-002	
--------------	--

AB 5028

BILL OF MATERIAL									
QTY	UNIT	MATERIAL	SPECIFICATION	DESCRIPTION	QTY	SIZE	LEN	LOT NO.	
		CLASS	TYPE	ITEM OR GRADE					
(A)	O	B	SS	SAB2L 316L	BAR	—	—		
(B)	O	B	SS	SAB2L 316L	BAR	—	—		
(C)	O	B	SS	SAB2L 316L	BAR	—	—		
(D)	O	B	CS	SAB2L 316L	PIPE	8"	40'		
(E)	B	SS	SAB2	FLUID CHEMICAL CONNECTOR	—	8"	875	See Note 1 & 2	
(F)	B	SS	SAB2	FLUID CHEMICAL CONNECTOR	—	8"	875	See Note 1 & 2	



NOTES:

- ALL WELD NUMBERS SHALL BE PRECEDED BY 1-51A-44773-3
- LAST WELD NO. 7
- REA LAYOUT DWG. 0M-2201-1419-001
- REA FLOW DWG. 0EP-101A-31
- VENDOR WELDS
- WORK REQUEST NO. \_\_\_\_\_
- DESIGN TEMP: 600° DESIGN PRESS: 2500 PSIG
- CONSTRUCTION PER ASME SECT III, CLASS 3
- THIS IS A WELD ON REMOVED THE WELD NUMBER WILL BE THE SAME SERIAL NUMBER. THIS TWO WAS ORIGINALLY 31A160. THIS COUPLER IS CURRENTLY

Let-down Cooler, 3A, please refer to Unit 1 system 31A (all 7 coolers are designated as Unit 1)

QA CONDITION →				DUKE POWER COMPANY COONEE NUCLEAR STATION UNIT			
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	LEFTDOWN COUPLER			
4	REV. NO. 1	DATE	BY	SERIAL NO. 44773-3			
3	REV. NO. 2	DATE	BY	SYS. 31A, LINE NO. 4			
2	REV. NO. 3	DATE	BY	DUKE CLASS 3			
1	REV. NO. 4	DATE	BY	CODE CLASS III, NO CLASS A			
0	REV. NO. 5	DATE	BY	PIPING SPEC. 1501.2			
NO.	REVISION	DATE	DATE	LOCATION BRACKET B.O. NPI 758'-0"			
				DWG. NO. 1-44773-3			
				REV. NO. 4			



## UT Vessel Examination

ATTACHMENT C  
PAGE 1 OF 96Site/Unit: Oconee / 03  
Summary No.: B03.110.009  
Workscope: ISIProcedure: NDE-640  
Procedure Rev.: 2  
Work Order No.: 98641456Outage No.: ONS3EOC21  
Report No.: UT-04-470  
Page: 1 of 1

Code: Asme Section XI 1989 Cat./Item: B-D- /B3.110.9 Location: N/A  
Drawing No.: ISI-OCN3-002 Description: Nozzle to To Shell  
System ID: 50  
Component ID: B03.110.009 /3-PZR-WP26-1 Size/Length: N/A Thickness/Diameter: 6.187"/5.75"  
Limitations: See limitation calculations on report UT-04-471. Start Time: 1115 Finish Time: 1120

Examination Surface: Inside ☐ Outside ☒ Surface Condition: AS GROUND  
Lo Location: 9.2.3 Wo Location: Centerline of Weld Couplant: ULTRAGEL II Batch No.: 03125  
Temp. Tool Mfg.: FISHER Serial No.: MCNDE32768 Surface Temp.: 72 °F  
Cal. Report No.: CAL-04-735

Angle Used	0	45	45T	60	60T	
Scanning dB	39					

Indication(s): Yes ☐ No ☒ Scan Coverage: Upstream ☒ Downstream ☒ CW ☒ CCW ☒Comments:  
FC 03-20Results: Accept ☒ Reject ☐ Info ☐Percent Of Coverage Obtained > 90%: No - 25.927%Reviewed Previous Data: Yes

Examiner	Level	II-N	Signature	Date	Reviewer	Signature	Date
Mauldin, Larry E.			<i>Larry E. Mauldin</i>	11/1/2004	<i>Sam Moss</i>		11-9-04
Examiner	Level	III	Signature	Date	Site Review	Signature	Date
Eaton, Jay A.			<i>Jay A. Eaton</i>	11/1/2004			
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A					<i>Timothy J. [Signature]</i>		11/12/04



# UT Vessel Examination

Site/Unit: Oconee / O3  
Summary No.: B03.110.009  
Workscope: ISI

Procedure: NDE-820  
Procedure Rev.: 1  
Work Order No.: 98641456

Outage No.: ONS3EOC21  
Report No.: UT-04-471  
Page: 1 of 3

Code: Asme Section XI 1989 Cat./Item: B-D- /B3.110.9 Location: N/A  
Drawing No.: ISI-OCN3-002 Description: Nozzle to To Shell  
System ID: 50  
Component ID: B03.110.009 /3-PZR-WP26-1 Size/Length: N/A Thickness/Diameter: 6.187"/5.75"  
Limitations: See attached limitation report. Start Time: 1121 Finish Time: 1131

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

Lo Location: 9.2.3 Wo Location: Centerline of Weld Couplant: ULTRAGEL II Batch No.: 03125

Temp. Tool Mfg.: FISHER Serial No.: MCNDE32768 Surface Temp.: 72 °F

Cal. Report No.: CAL-04-736, CAL-04-737

Angle Used	0	45	45T	60	60T	
Scanning dB		70.2	70.2	84.6	84.6	

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

Comments:

FC 03-29, 03-31

Results: Accept ☒ Reject ☐ Info ☐

Percent Of Coverage Obtained > 90%: No - 25.927% Reviewed Previous Data: Yes

Examiner	Level	II-N	Signature	Date	Reviewer	Signature	Date
Mauldin, Larry E.			<i>Larry E. Mauldin</i>	11/1/2004	<i>Larry Moss</i>		11-9-04
Examiner	Level	III	Signature	Date	Site Review	Signature	Date
Eaton, Jay A.			<i>Jay A. Eaton</i>	11/1/2004			
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A					<i>[Signature]</i>		11/10/04



## Limitation Record

Site/Unit: Oconee / O3  
Summary No.: B03.110.009  
Workscope: ISI

Procedure: NDE-820  
Procedure Rev.: 1  
Work Order No.: 98641456

Outage No.: ONS3EOC21  
Report No.: UT-04-471  
Page: 2 of 3

## Description of Limitation:

Limited 360° from the weld edge and beyond due to blend radius and nozzle configuration.

## Aggregate Coverage

<u>Angle</u>	<u>Beam Dir.</u>	<u>Base Metal</u>	<u>Weld</u>	<u>Aggregate</u>
0	N/A	37.42%	0%	18.71%
45	S1	61.77%	44.14%	52.96%
45	S2	0%	0%	0%
45	CW	47.28%	13.1%	30.19%
45	CCW	47.28%	13.1%	30.19%
60	S1	72.03%	53.1%	62.57%
60	S2	0%	0%	0%
60	CW	47.28%	13.1%	30.19%
60	CCW	47.28%	13.1%	30.19%

## Limitations removal requirements:

N/A

## Radiation field: N/A

Examiner	Level	II-N	Signature	Date	Reviewed	Signature	Date
Mauldin, Larry E.			<i>Larry E. Mauldin</i>	11/1/2004	<i>Larry E. Mauldin</i>		11-9-04
Examiner	Level	III	Signature	Date	Site Review	Signature	Date
Eaton, Jay A.			<i>Jay A. Eaton</i>	11/1/2004			
Examiner	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A					<i>M. H. H. H.</i>		11/10/04



# Determination of Percent Coverage for UT Examinations - Vessels

ATTACHMENT C  
PAGE 4 OF 96

Site/Unit: <u>Oconee / O3</u>	Procedure: <u>NDE-820</u>	Outage No.: <u>ONS3EOC21</u>
Summary No.: <u>B03.110.009</u>	Procedure Rev.: <u>1</u>	Report No.: <u>UT-04-471</u>
Workscope: <u>ISI</u>	Work Order No.: <u>98641456</u>	Page: <u>3</u> of <u>3</u>

## 0 deg Planar

Scan 100.000 % Length X 18.710 % volume of length / 100 = 18.710 % total for 0 deg

## 45 deg

Scan 1 100.000 % Length X 52.960 % volume of length / 100 = 52.960 % total for Scan 1

Scan 2 100.000 % Length X 0.000 % volume of length / 100 = 0.000 % total for Scan 2

Scan 3 100.000 % Length X 30.190 % volume of length / 100 = 30.190 % total for Scan 3

Scan 4 100.000 % Length X 30.190 % volume of length / 100 = 30.190 % total for Scan 4

Add totals and divide by # scans = 28.335 % total for 45 deg

## Other deg 60

Scan 1 100.000 % Length X 62.570 % volume of length / 100 = 62.570 % total for Scan 1

Scan 2 100.000 % Length X 0.000 % volume of length / 100 = 0.000 % total for Scan 2

Scan 3 100.000 % Length X 30.190 % volume of length / 100 = 30.190 % total for Scan 3

Scan 4 100.000 % Length X 30.190 % volume of length / 100 = 30.190 % total for Scan 4

Add totals and divide by # scans = 30.738 % total for 60 deg

## Percent complete coverage

Add totals for each angle and scan required and divide by # of angles to determine;

25.927 % Total for complete exam

### **Note:**

Supplemental coverage may be achieved by use of other angles / methods. When used, the coverage for volume not obtained with angles as noted above shall be calculated and added to the total to provide the percent total for the complete examination.

Site Field Supervisor: 

Date: 11/1/04

# DCONEE SENSING / SAMPLING NOZZLE

## INSPECTION AREAS

### BASE METAL:

$$ABCD + E G K L + G H I + J K H$$

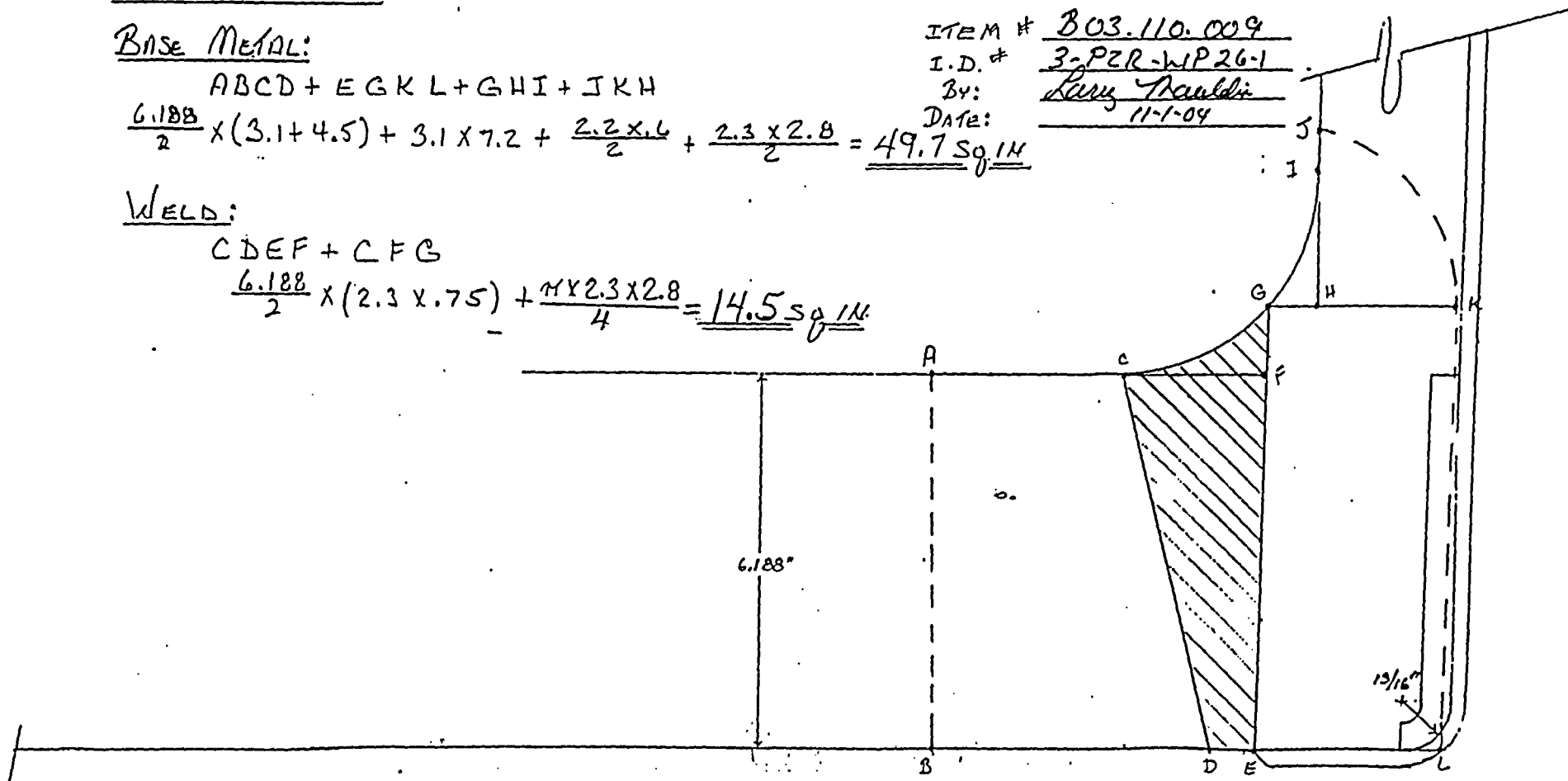
$$\frac{6.188}{2} \times (3.1 + 4.5) + 3.1 \times 7.2 + \frac{2.2 \times 1.6}{2} + \frac{2.3 \times 2.8}{2} = \underline{49.7 \text{ SQ. IN.}}$$

### WELD:

$$C D E F + C F G$$

$$\frac{6.188}{2} \times (2.3 \times 7.5) + \frac{\pi \times 2.3 \times 2.8}{4} = \underline{14.5 \text{ SQ. IN.}}$$

ITEM # B03.110.009  
I.D. # 3-PZR-WP26-1  
By: Rory Pauldi  
DATE: 11-1-04





DCONEE SENSING/SAMPLING NOZZLE

ITEM # B03.110.009  
I.D. # 3-PZR-WP26-1  
BY: Larry Moulden  
DATE: 11-1-04

0° COVERAGE:

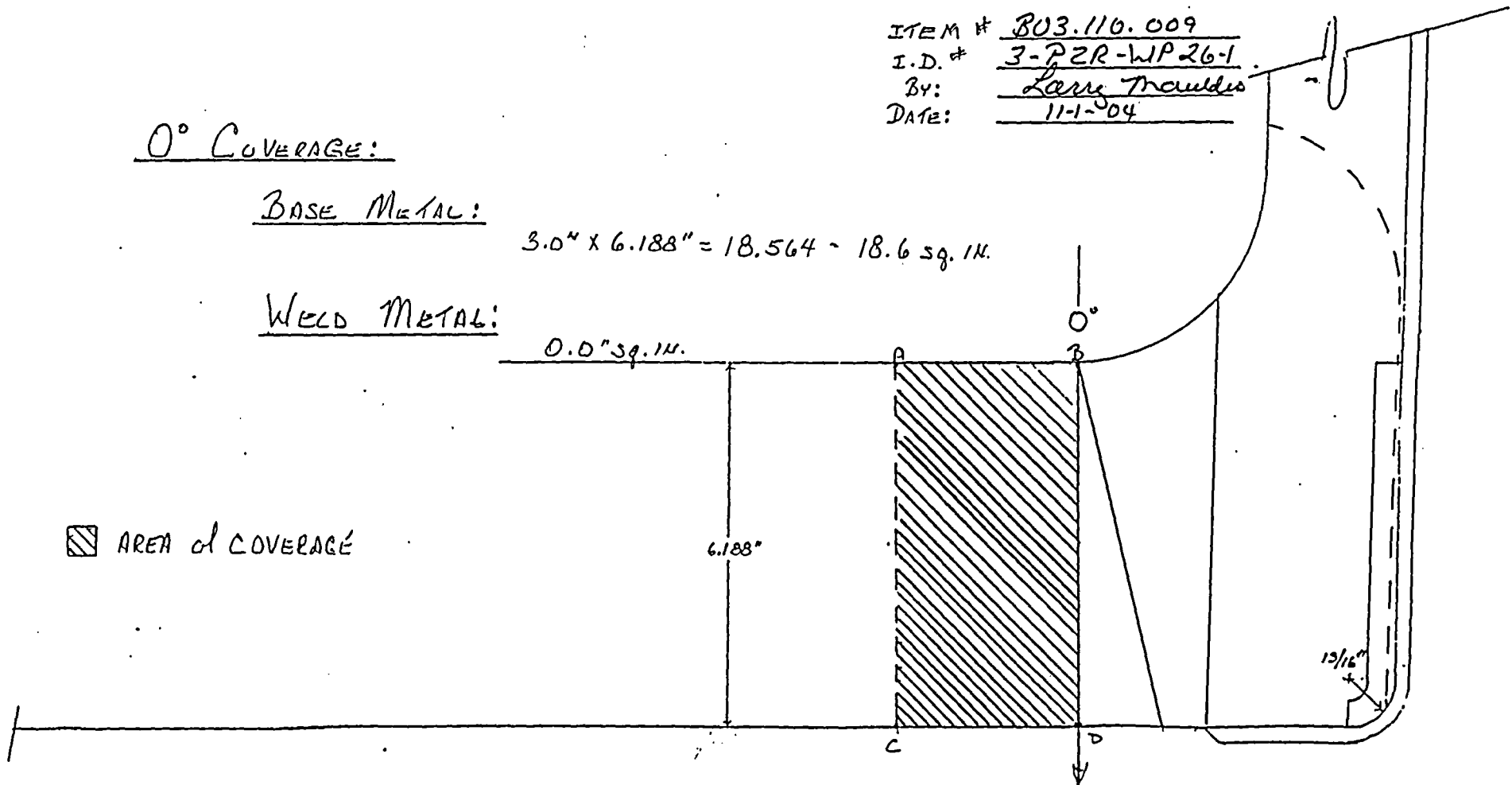
BASE METAL:

$$3.0" \times 6.188" = 18.564 \sim 18.6 \text{ sq. in.}$$

WELD METAL:

0.0" sq. in.

▨ AREA OF COVERAGE



# OCONEE SENSING/SAMPLING NOZZLE

45° COVERAGE



BASE METAL:

S1 TO S2 ABCD + EFGH (N/A S2 TO S1 SCAN)  
 $\frac{6.188}{2} \times (3.1 + 4.5) + \frac{3.8 \times 3.8}{2} = 30.7 \text{ sq. in.}$

WELD

S1 TO S2 BEF + DEFG  
 $\frac{3.2 \times 6.2}{2} + \frac{3.9}{2} (1.8 + 7.5) = 6.4 \text{ sq. in.}$

S2 TO S1: 0.0 sq. in.

 BASE METAL COVERAGE  
 WELD COVERAGE

S1

6.188"

S2

13.15"

# DCONEE SENSING/SAMPLING NOZZLE

60° COVERAGE

BASE METAL:

S1 to S2

ABCD + FGHI

$$\frac{6.188}{2} + (3.1 + 4.5) + \frac{3.2}{2} (3.0 + 4.7) = \underline{35.8 \text{ sq. in.}}$$

N/A - S2 to S1

WELD

S1 to S2

BEF + DEFG

$$\frac{2.6 \times .9}{2} + \frac{4.75}{2} (2.0 + .75) = \underline{7.7 \text{ sq. in.}}$$

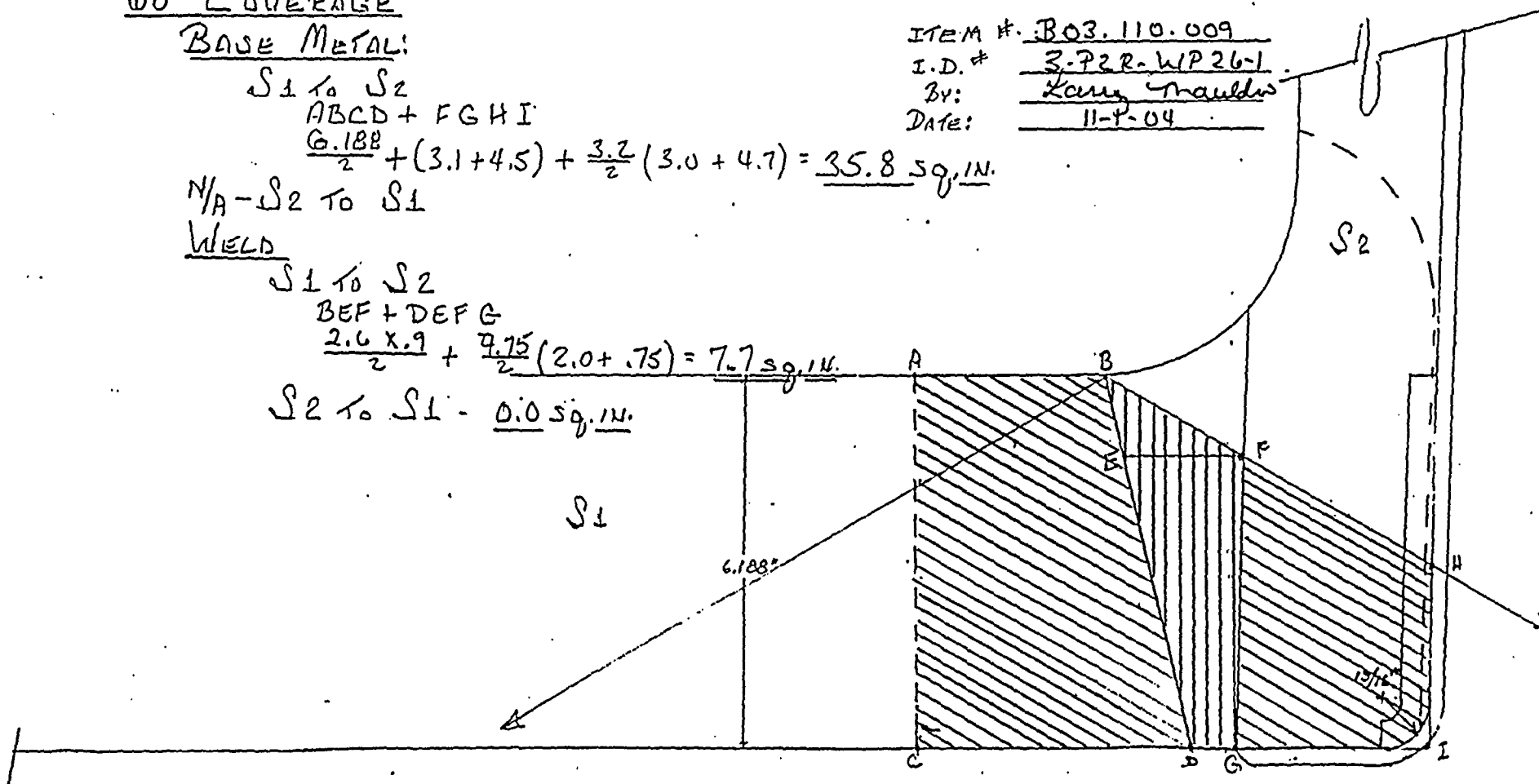
$$S2 \text{ to } S1 - \underline{0.0 \text{ sq. in.}}$$

ITEM #: B03.110.009

I.D. #: 3-P2R-WP26-1

By: Larry Mauldin

DATE: 11-1-04



# OCONEE SENSING / SAMPLING NOZZLE

45° & 60° Circ. SCAN COVERAGE

BASE METAL:

ABCD

$$\frac{6.188}{2} \times (3.1 + 4.5) = \underline{23.5 \text{ sq. in.}}$$

WELD

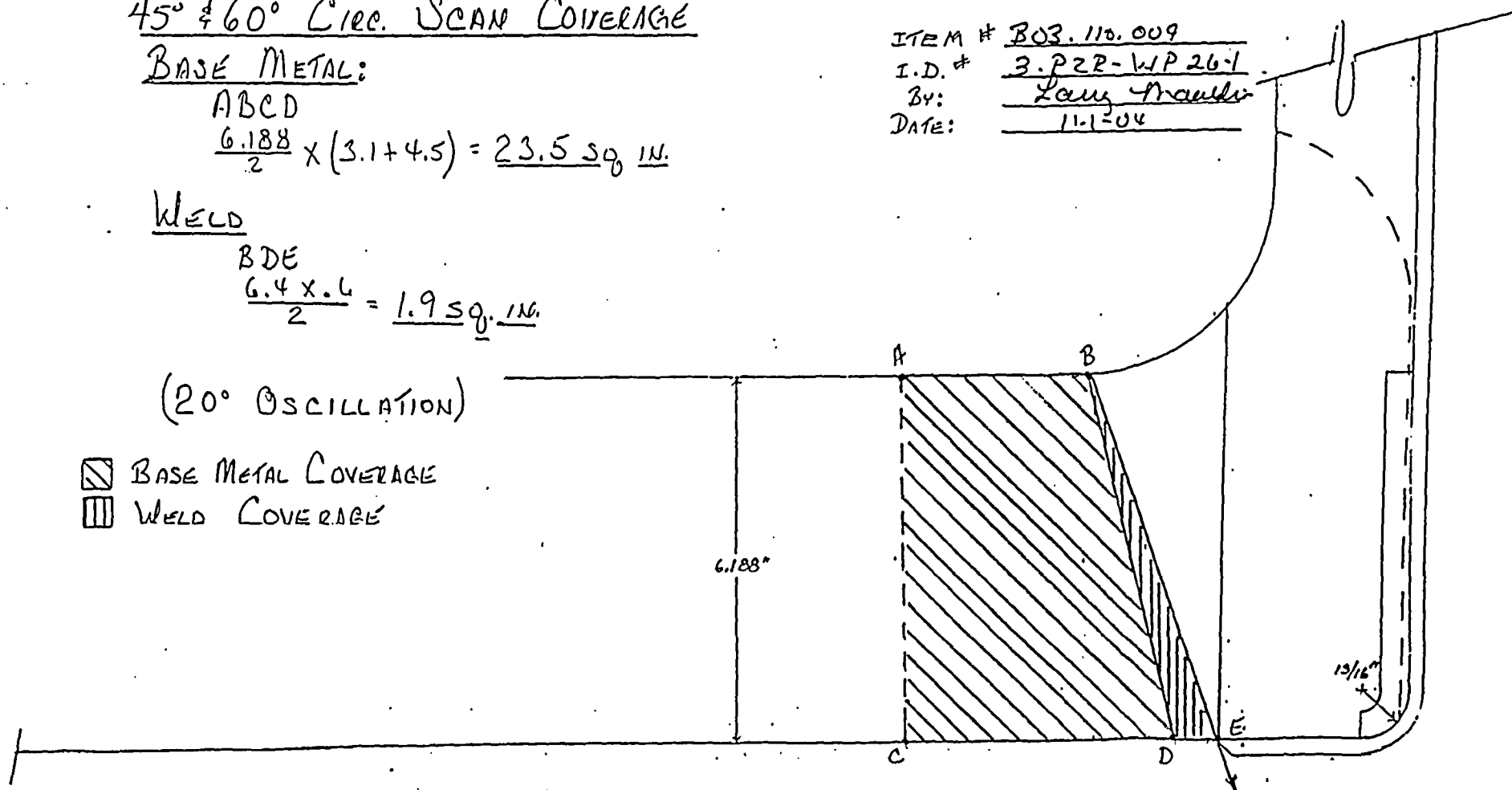
BDE

$$\frac{6.4 \times .6}{2} = \underline{1.9 \text{ sq. in.}}$$

(20° OSCILLATION)

-  BASE METAL COVERAGE
-  WELD COVERAGE

ITEM # B03.110.009  
I.D. # 3.P22-WP 26-1  
BY: Larry Moultrie  
DATE: 11-1-04





## UT Vessel Examination

Site/Unit: Oconee / O3 Procedure: NDE-640 Outage No.: ONS3EOC21  
Summary No.: B03.110.010 Procedure Rev.: 2 Report No.: UT-04-472  
Workscope: ISI Work Order No.: 98641456 Page: 1 of 1

Code: Asme Section XI 1989 Cat./Item: B-D- /B3.110.10 Location: N/A  
Drawing No.: ISI-OCN3-002 Description: Nozzle to To Shell  
System ID: 50  
Component ID: B03.110.010 /3-PZR-WP26-2 Size/Length: N/A Thickness/Diameter: 6.187"/5.75"  
Limitations: See limitation calculations on report UT-04-473. Start Time: 1137 Finish Time: 1142

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

Lo Location: 9.2.3 Wo Location: Centerline of Weld Couplant: ULTRAGEL II Batch No.: 03125

Temp. Tool Mfg.: FISHER Serial No.: MCNDE32768 Surface Temp.: 72 °F

Cal. Report No.: CAL-04-735

Angle Used	0	45	45T	60	60T	
Scanning dB	39					

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

Comments:

FC 03-20

Results: Accept ☒ Reject ☐ Info ☐

Percent Of Coverage Obtained > 90%: No - 25.927% Reviewed Previous Data: Yes

Examiner	Level	II-N	Signature	Date	Reviewer	Signature	Date
Mauldin, Larry E.			<i>Larry E. Mauldin</i>	11/1/2004	<i>Gary Moss</i>		11-9-04
Examiner	Level	III	Signature	Date	Site Review	Signature	Date
Eaton, Jay A.			<i>Jay A. Eaton</i>	11/1/2004			
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A					<i>[Signature]</i>		11/10/04



## UT Vessel Examination

Site/Unit: Oconee / O3  
 Summary No.: B03.110.010  
 Workscope: ISI

Procedure: NDE-820  
 Procedure Rev.: 1  
 Work Order No.: 98641456

Outage No.: ONS3EOC21  
 Report No.: UT-04-473  
 Page: 1 of 3

Code: Asme Section XI 1989 Cat./Item: B-D- /B3.110.10 Location: N/A  
 Drawing No.: ISI-OCN3-002 Description: Nozzle to To Shell  
 System ID: 50  
 Component ID: B03.110.010 /3-PZR-WP26-2 Size/Length: N/A Thickness/Diameter: 3.187"/5.75"  
 Limitations: See attached limitation report. Start Time: 1143 Finish Time: 1154

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

Lo Location: 9.2.3 Wo Location: Centerline of Weld Couplant: ULTRAGEL II Batch No.: 03125

Temp. Tool Mfg.: FISHER Serial No.: MCNDE32768 Surface Temp.: 72 °F

Cal. Report No.: CAL-04-736, CAL-04-737

Angle Used	0	45	45T	60	60T	
Scanning dB		70.2	70.2	84.6	84.6	

Indication(s): Yes ☐ No ☒

Scan Coverage: Upstream ☒ Downstream ☒ CW ☒ CCW ☒

Comments:

FC 03-29, 03-31

Results: Accept ☒ Reject ☐ Info ☐

Percent Of Coverage Obtained > 90%: No - 25.927%

Reviewed Previous Data: Yes

Examiner	Level	II-N	Signature	Date	Reviewer	Signature	Date
Mauldin, Larry E.			<i>Larry E. Mauldin</i>	11/1/2004	<i>Larry Moss</i>		11-9-04
Examiner	Level	III	Signature	Date	Site Review	Signature	Date
Eaton, Jay A.			<i>Jay A. Eaton</i>	11/1/2004			
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A					<i>[Signature]</i>		11/10/04



## Limitation Record

Site/Unit:	Oconee / O3	Procedure:	NDE-820	Outage No.:	ONS3EOC21
Summary No.:	B03.110.010	Procedure Rev.:	1	Report No.:	UT-04-473
Workscope:	ISI	Work Order No.:	98641456	Page:	2 of 3

## Description of Limitation:

Limited 360° from the weld edge and beyond due to blend radius and nozzle configuration.

## Aggregate Coverage

Angle	Beam Dir.	Base Metal	Weld	Aggregate
0	N/A	37.42%	0%	18.71%
45	S1	61.77%	44.14%	52.96%
45	S2	0%	0%	0%
45	CW	47.28%	13.1%	30.19%
45	CCW	47.28%	13.1%	30.19%
60	S1	72.03%	53.1%	62.57%
60	S2	0%	0%	0%
60	CW	47.28%	13.1%	30.19%
60	CCW	47.28%	13.1%	30.19%

## Limitations removal requirements:

N/A

Radiation field: N/A

Examiner	Level	Signature	Date	Reviewer	Signature	Date
Mauldin, Larry E.	II-N	<i>Larry E. Mauldin</i>	11/11/2004	<i>Larry E. Mauldin</i>		11-9-04
Examiner	Level	Signature	Date	Site Review	Signature	Date
Eaton, Jay A.	III	<i>Jay A. Eaton</i>	11/11/2004			
ther	Level	Signature	Date	ANII Review	Signature	Date
N/A	N/A			<i>Mike Peters</i>		11/10/04



# Determination of Percent Coverage for UT Examinations - Vessels

ATTACHMENT C  
PAGE 13 OF 76

Site/Unit:	<u>Oconee / O3</u>	Procedure:	<u>NDE-820</u>	Outage No.:	<u>ONS3EOC21</u>
Summary No.:	<u>B03.110.010</u>	Procedure Rev.:	<u>1</u>	Report No.:	<u>UT-04-473</u>
Workscope:	<u>ISI</u>	Work Order No.:	<u>98641456</u>	Page:	<u>3</u> of <u>3</u>

## 0 deg Planar

Scan 100.000 % Length X 18.710 % volume of length / 100 = 18.710 % total for 0 deg

## 45 deg

Scan 1 100.000 % Length X 52.960 % volume of length / 100 = 52.960 % total for Scan 1

Scan 2 100.000 % Length X 0.000 % volume of length / 100 = 0.000 % total for Scan 2

Scan 3 100.000 % Length X 30.190 % volume of length / 100 = 30.190 % total for Scan 3

Scan 4 100.000 % Length X 30.190 % volume of length / 100 = 30.190 % total for Scan 4

Add totals and divide by # scans = 28.335 % total for 45 deg

## Other deg 60

Scan 1 100.000 % Length X 62.570 % volume of length / 100 = 62.570 % total for Scan 1

Scan 2 100.000 % Length X 0.000 % volume of length / 100 = 0.000 % total for Scan 2

Scan 3 100.000 % Length X 30.190 % volume of length / 100 = 30.190 % total for Scan 3

Scan 4 100.000 % Length X 30.190 % volume of length / 100 = 30.190 % total for Scan 4

Add totals and divide by # scans = 30.738 % total for 60 deg

## Percent complete coverage

Add totals for each angle and scan required and divide by # of angles to determine;

25.927 % Total for complete exam

### **Note:**

Supplemental coverage may be achieved by use of other angles / methods. When used, the coverage for volume not obtained with angles as noted above shall be calculated and added to the total to provide the percent total for the complete examination.

Site Field Supervisor: 

Date: 11/1/04



# OCONEE SENSING / SAMPLING NOZZLE

## INSPECTION AREAS

### BASE METAL:

$$ABCD + EGKL + GHI + JKH$$

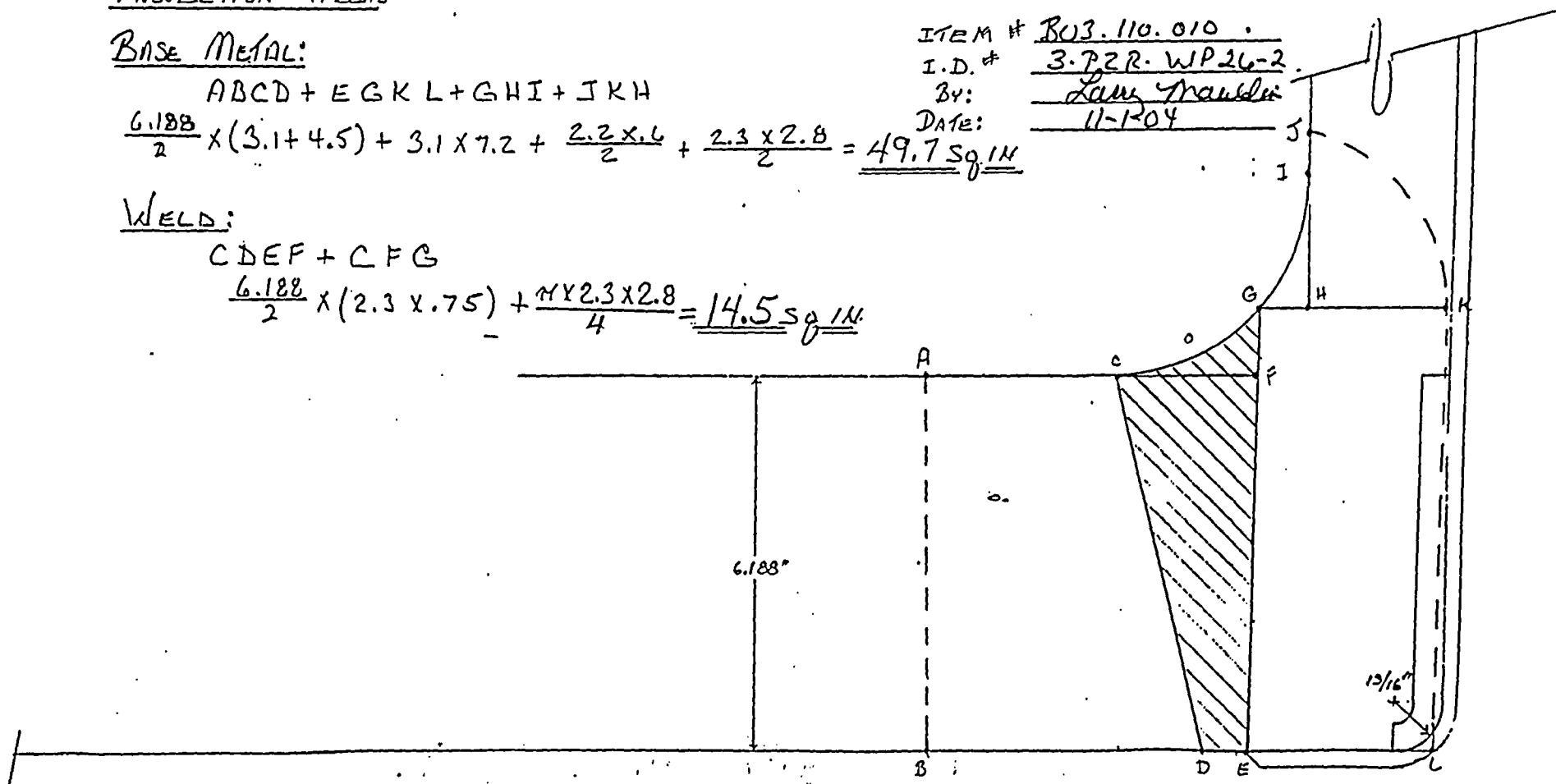
$$\frac{6.188}{2} \times (3.1 + 4.5) + 3.1 \times 7.2 + \frac{2.2 \times 6}{2} + \frac{2.3 \times 2.8}{2} = \underline{49.7 \text{ SQ IN}}$$

### WELD:

$$CDEF + CFG$$

$$\frac{6.188}{2} \times (2.3 \times 7.5) + \frac{\pi \times 2.3 \times 2.8}{4} = \underline{14.5 \text{ SQ IN}}$$

ITEM # BO3.110.010  
I.D. # 3.722 WP 26-2  
BY: Larry Maudlin  
DATE: 11-1-04



OCONEE SENSING/SAMPLING NOZZLE

ITEM # BU3.110.010  
I.D. # 3.P2R-WP26-2  
BY: Larry Thaller  
DATE: 11-1-04

0° COVERAGE:

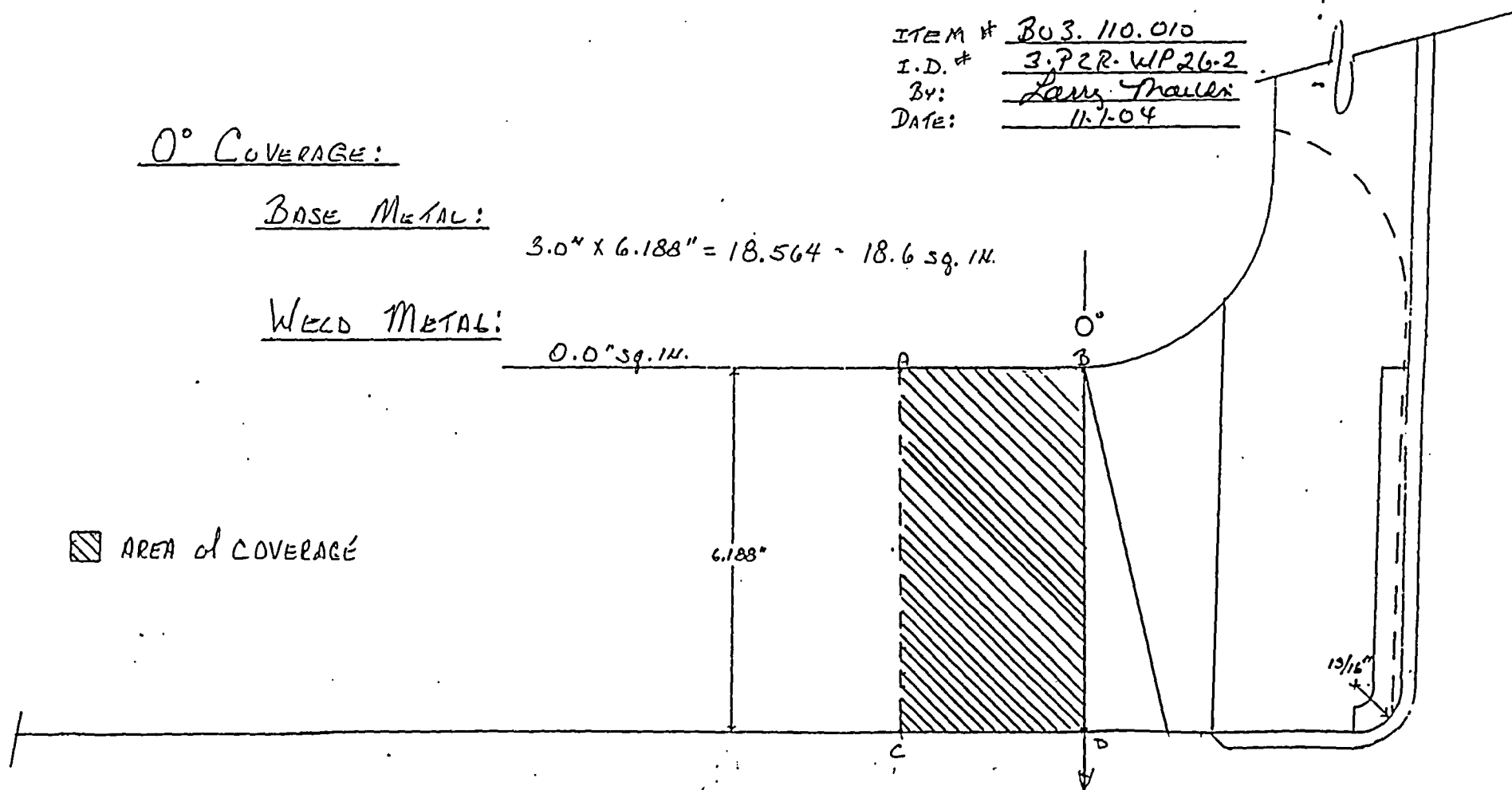
BASE METAL:

$$3.0" \times 6.188" = 18.564 \sim 18.6 \text{ sq. in.}$$

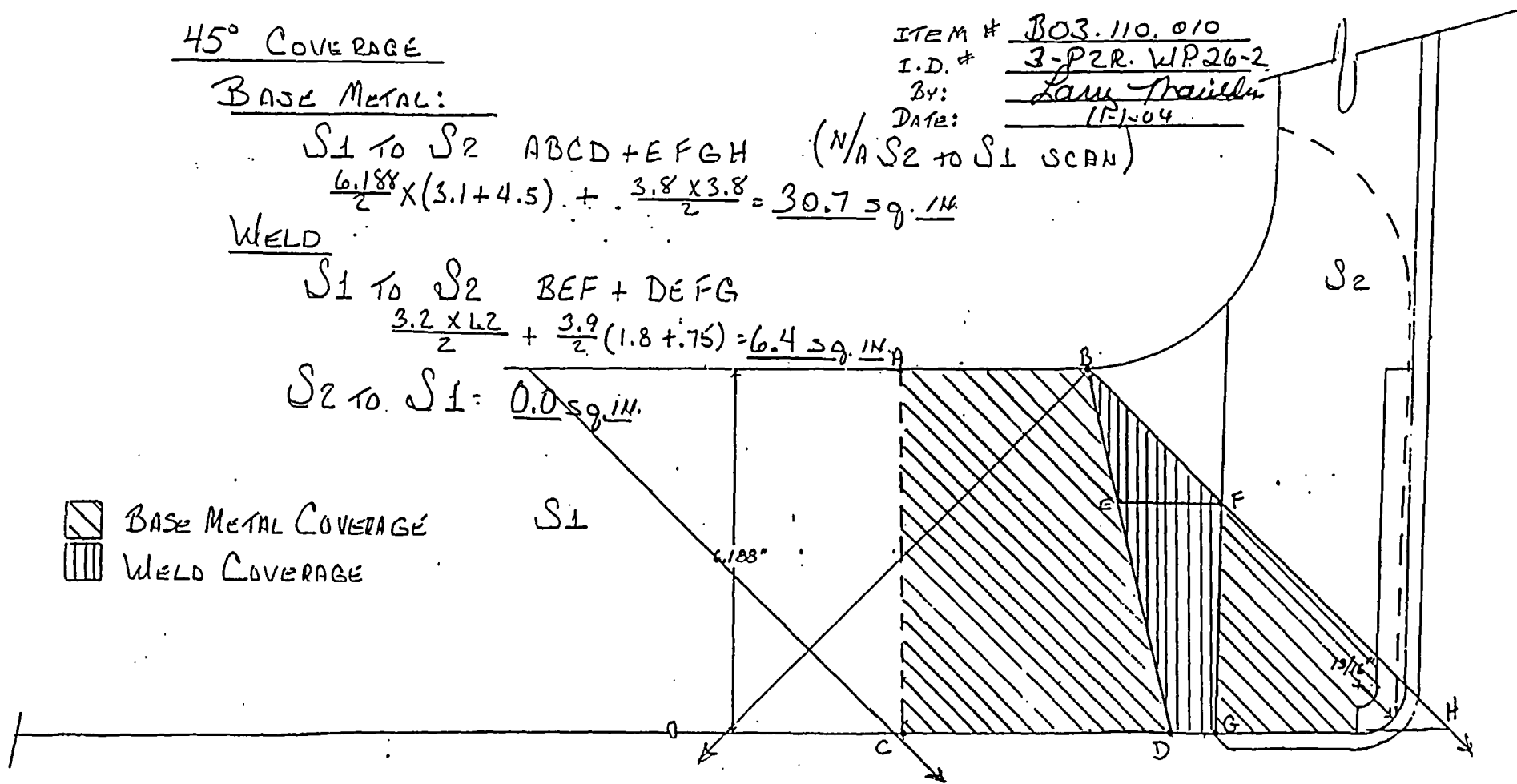
WELD METAL:

0.0" sq. in.

▨ AREA of COVERAGE



ATTACHMENT TO UT-04-473  
PAGE 3 OF 5



# OCONEE SENSING / SAMPLING NOZZLE

60° COVERAGE

BASE METAL:

S1 to S2

ABCD + FGHI

$$\frac{6.188}{2} + (3.1 + 4.5) + \frac{3.2}{2} (3.0 + 4.7) = \underline{35.8 \text{ sq. in.}}$$

N/A - S2 to S1

WELD

S1 to S2

BEF + DEFG

$$\frac{2.6 \times .9}{2} + \frac{4.75}{2} (2.0 + .75) = \underline{7.7 \text{ sq. in.}}$$

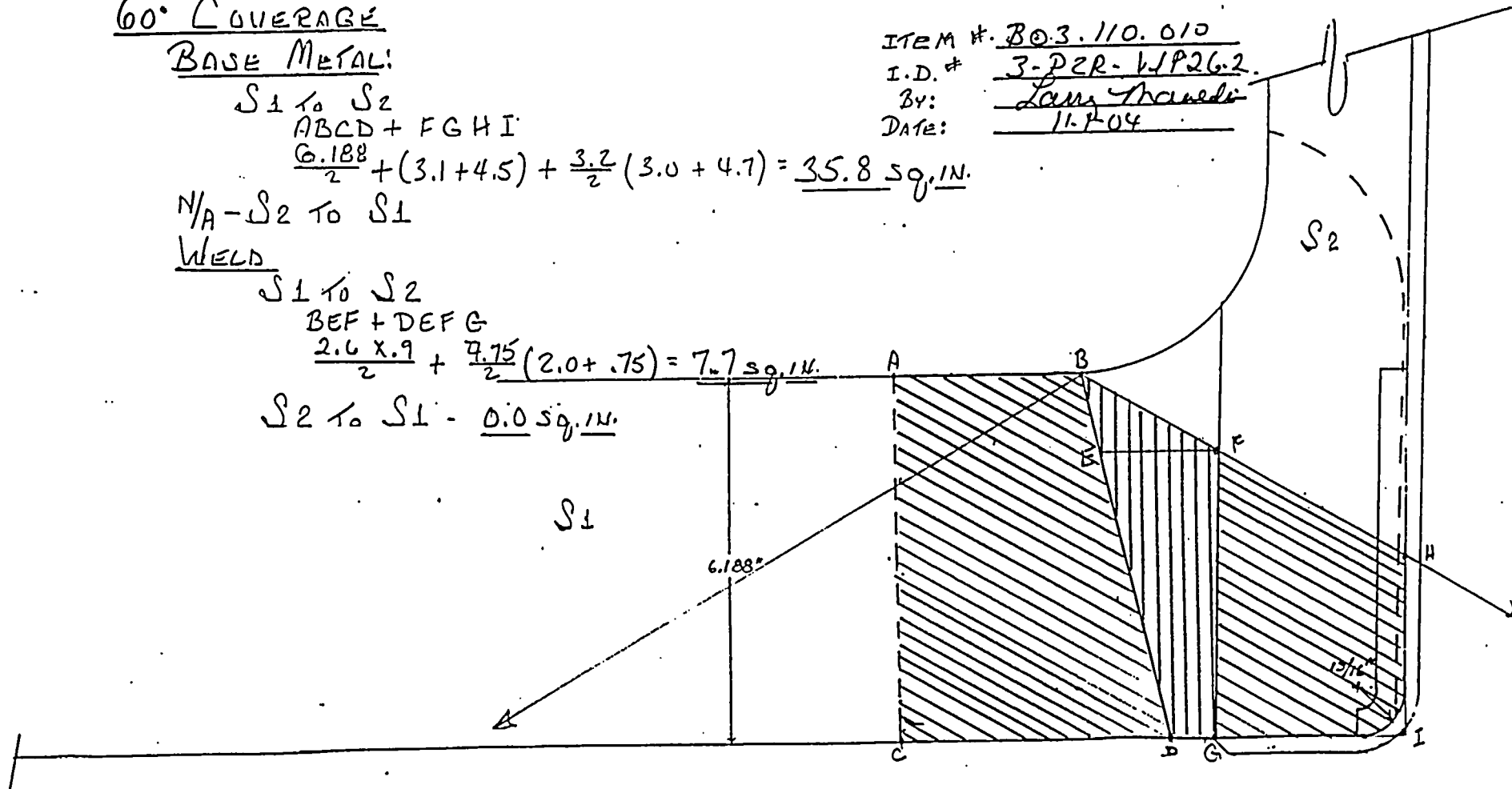
S2 to S1 - 0.0 sq. in.

ITEM #. BO.3.110.010

I.D. # 3-P2R-WP26.2

BY: Lans Thawley

DATE: 11-1-04



ATTACHMENT TO UT-04-473

PAGE 4 OF 5

# DCONEE SENSING / SAMPLING NOZZLE

45° & 60° CIRC. SCAN COVERAGE

BASE METAL:

ABCD

$$\frac{6.188}{2} \times (3.1 + 4.5) = \underline{23.5 \text{ sq. in.}}$$

WELD

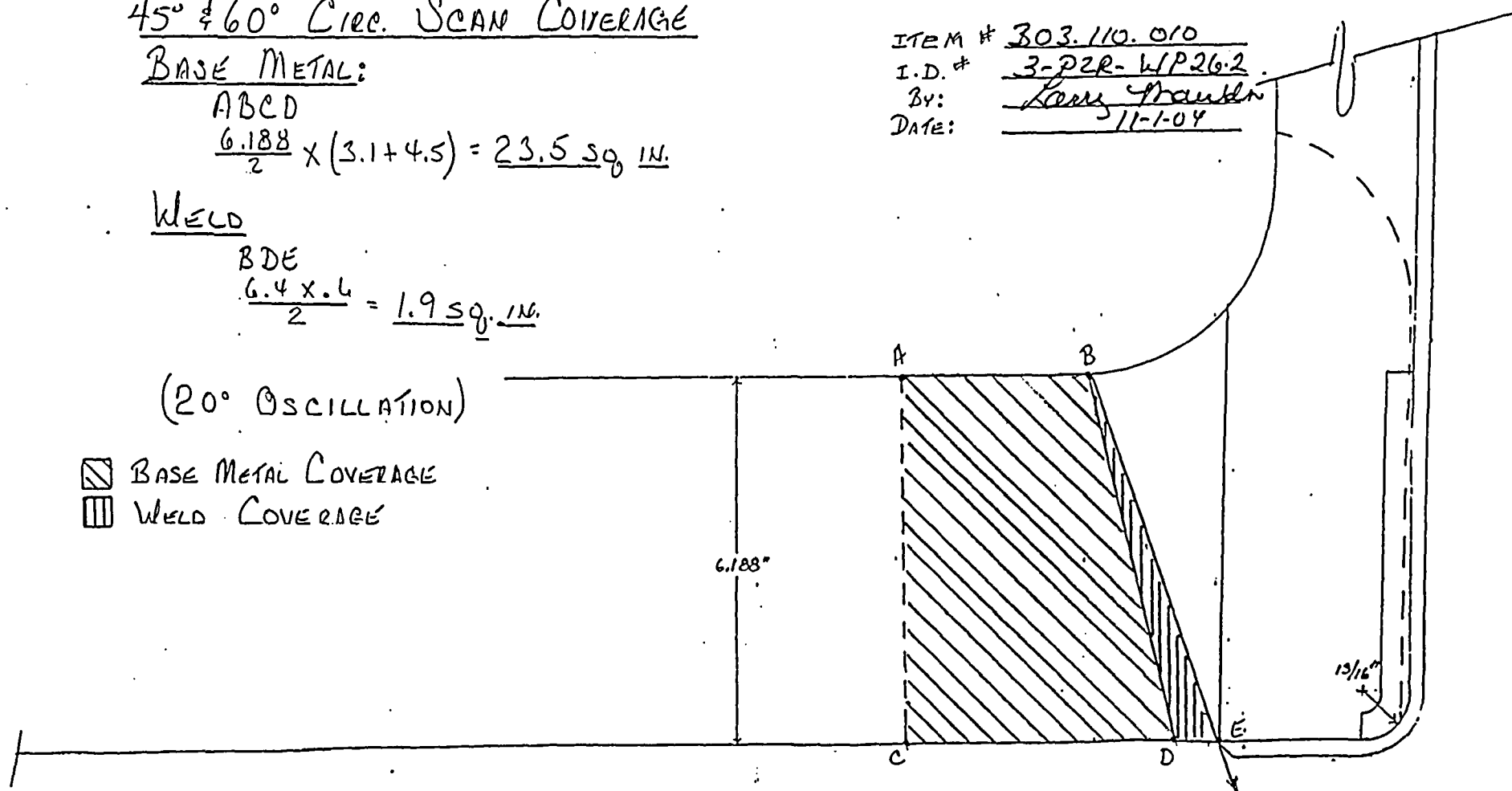
BDE

$$\frac{6.4 \times .4}{2} = \underline{1.9 \text{ sq. in.}}$$

(20° OSCILLATION)

-  BASE METAL COVERAGE
-  WELD COVERAGE

ITEM # 303.110.010  
I.D. # 3-P2R-WP26.2  
BY: Larry Mankin  
DATE: 11-1-04





## UT Vessel Examination

Site/Unit: Oconee / O3 Procedure: NDE-640 Outage No.: ONS3EOC21  
 Summary No.: B03.110.011 Procedure Rev.: 2 Report No.: UT-04-474  
 Workscope: ISI Work Order No.: 98641456 Page: 1 of 1

Code: Asme Section XI 1989 Cat./Item: B-D- /B3.110.11 Location: N/A  
 Drawing No.: ISI-OCN3-002 Description: Nozzle to To Shell  
 System ID: 50  
 Component ID: B03.110.011 /3-PZR-WP26-3 Size/Length: N/A Thickness/Diameter: 6.187"/5.75"  
 Limitations: See limitation calculations on report UT-04-475. Start Time: 1204 Finish Time: 1208

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

Lo Location: 9.2.3 Wo Location: Centerline of Weld Couplant: ULTRAGEL II Batch No.: 03125

Temp. Tool Mfg.: FISHER Serial No.: MCNDE32768 Surface Temp.: 72 °F

Cal. Report No.: CAL-04-735

Angle Used	0	45	45T	60	60T	
Scanning dB	39					

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

Comments:

FC 03-20

Results: Accept ☒ Reject ☐ Info ☐

Percent Of Coverage Obtained > 90%: No - 25.927% Reviewed Previous Data: Yes

Examiner	Level	II-N	Signature	Date	Reviewed	Signature	Date
Mauldin, Larry E.			<i>Larry E. Mauldin</i>	11/11/2004	<i>Larry E. Mauldin</i>		11-9-04
Examiner	Level	III	Signature	Date	Site Review	Signature	Date
Eaton, Jay A.			<i>Jay A. Eaton</i>	11/11/2004			
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A					<i>W. J. J. J.</i>		11/10/04



## UT Vessel Examination

Site/Unit: Oconee / O3  
Summary No.: B03.110.011  
Workscope: ISIProcedure: NDE-820  
Procedure Rev.: 1  
Work Order No.: 98641456Outage No.: ONS3EOC21  
Report No.: UT-04-475  
Page: 1 of 3Code: Asme Section XI 1989 Cat./Item: B-D- /B3.110.11 Location: N/A  
Drawing No.: ISI-OCN3-002 Description: Nozzle to To Shell  
System ID: 50  
Component ID: B03.110.011 /3-PZR-WP26-3 Size/Length: N/A Thickness/Diameter: 6.1887"/5.75"  
Limitations: See attached limitation report. Start Time: 1213 Finish Time: 1233Examination Surface: Inside ☐ Outside ☒ Surface Condition: AS GROUNDLo Location: 9.2.3 Wo Location: Centerline of Weld Couplant: ULTRAGEL II Batch No.: 03125Temp. Tool Mfg.: FISHER Serial No.: MCNDE32768 Surface Temp.: 72 °FCal. Report No.: CAL-04-736, CAL-04-737

Angle Used	0	45	45T	60	60T	
Scanning dB		70.2	70.2	84.6	84.6	

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

Comments:

FC 03-29, 03-31

Results: Accept ☒ Reject ☐ Info ☐Percent Of Coverage Obtained > 90%: No - 25.927%Reviewed Previous Data: Yes

Examiner	Level	II-N	Signature	Date	Reviewed	Signature	Date
Mauldin, Larry E.			<i>Larry E. Mauldin</i>	11/1/2004	<i>Larry E. Mauldin</i>		11-9-04
Examiner	Level	III	Signature	Date	Site Review	Signature	Date
Eaton, Jay A.			<i>Jay A. Eaton</i>	11/1/2004			
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A					<i>Mike Pelt</i>		11/10/04



## Limitation Record

Site/Unit:	Oconee / O3	Procedure:	NDE-820	Outage No.:	ONS3EOC21
Summary No.:	B03.110.011	Procedure Rev.:	1	Report No.:	UT-04-475
Workscope:	ISI	Work Order No.:	98641456	Page:	2 of 3

Description of Limitation:

Limited 360° from the weld edge and beyond due to blend radius and nozzle configuration.

### Aggregate Coverage

Angle	Beam Dir.	Base Metal	Weld	Aggregate
0	N/A	37.42%	0%	18.71%
45	S1	61.77%	44.14%	52.96%
45	S2	0%	0%	0%
45	CW	47.28%	13.1%	30.19%
45	CCW	47.28%	13.1%	30.19%
60	S1	72.03%	53.1%	62.57%
60	S2	0%	0%	0%
60	CW	47.28%	13.1%	30.19%
60	CCW	47.28%	13.1%	30.19%

Limitations removal requirements:

N/A

Radiation field: N/A

Examiner	Level	II-N	Signature	Date	Reviewer	Signature	Date
Mauldin, Larry E.			<i>Larry E. Mauldin</i>	11/1/2004	<i>Jay A. Eaton</i>		11-9-04
Examiner	Level	III	Signature	Date	Site Review	Signature	Date
Eaton, Jay A.			<i>Jay A. Eaton</i>	11/1/2004			
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A					<i>W. V. [Signature]</i>		11/10/04





# Determination of Percent Coverage for UT Examinations - Vessels

ATTACHMENT C  
PAGE 22 OF 76

Site/Unit:	<u>Oconee / O3</u>	Procedure:	<u>NDE-820</u>	Outage No.:	<u>ONS3EOC21</u>
Summary No.:	<u>B03.110.011</u>	Procedure Rev.:	<u>1</u>	Report No.:	<u>UT-04-475</u>
Workscope:	<u>ISI</u>	Work Order No.:	<u>98641456</u>	Page:	<u>3</u> of <u>3</u>

## 0 deg Planar

Scan 100.000 % Length X 18.710 % volume of length / 100 = 18.710 % total for 0 deg

## 45 deg

Scan 1 100.000 % Length X 52.960 % volume of length / 100 = 52.960 % total for Scan 1

Scan 2 100.000 % Length X 0.000 % volume of length / 100 = 0.000 % total for Scan 2

Scan 3 100.000 % Length X 30.190 % volume of length / 100 = 30.190 % total for Scan 3

Scan 4 100.000 % Length X 30.190 % volume of length / 100 = 30.190 % total for Scan 4

Add totals and divide by # scans = 28.335 % total for 45 deg

## Other deg 60

Scan 1 100.000 % Length X 62.570 % volume of length / 100 = 62.570 % total for Scan 1

Scan 2 100.000 % Length X 0.000 % volume of length / 100 = 0.000 % total for Scan 2

Scan 3 100.000 % Length X 30.190 % volume of length / 100 = 30.190 % total for Scan 3

Scan 4 100.000 % Length X 30.190 % volume of length / 100 = 30.190 % total for Scan 4

Add totals and divide by # scans = 30.738 % total for 60 deg

## Percent complete coverage

Add totals for each angle and scan required and divide by # of angles to determine;

25.927 % Total for complete exam

### **Note:**

Supplemental coverage may be achieved by use of other angles / methods. When used, the coverage for volume not obtained with angles as noted above shall be calculated and added to the total to provide the percent total for the complete examination.

Site Field Supervisor: 

Date: 11/1/04

# OCONEE SENSING / SAMPLING NOZZLE

## INSPECTION AREAS

### BASE METAL:

ABCD + E G K L + G H I + J K H

$$\frac{6.188}{2} \times (3.1 + 4.5) + 3.1 \times 7.2 + \frac{2.2 \times 4}{2} + \frac{2.3 \times 2.8}{2} = \underline{49.7 \text{ sq. in.}}$$

### WELD:

C D E F + C F G

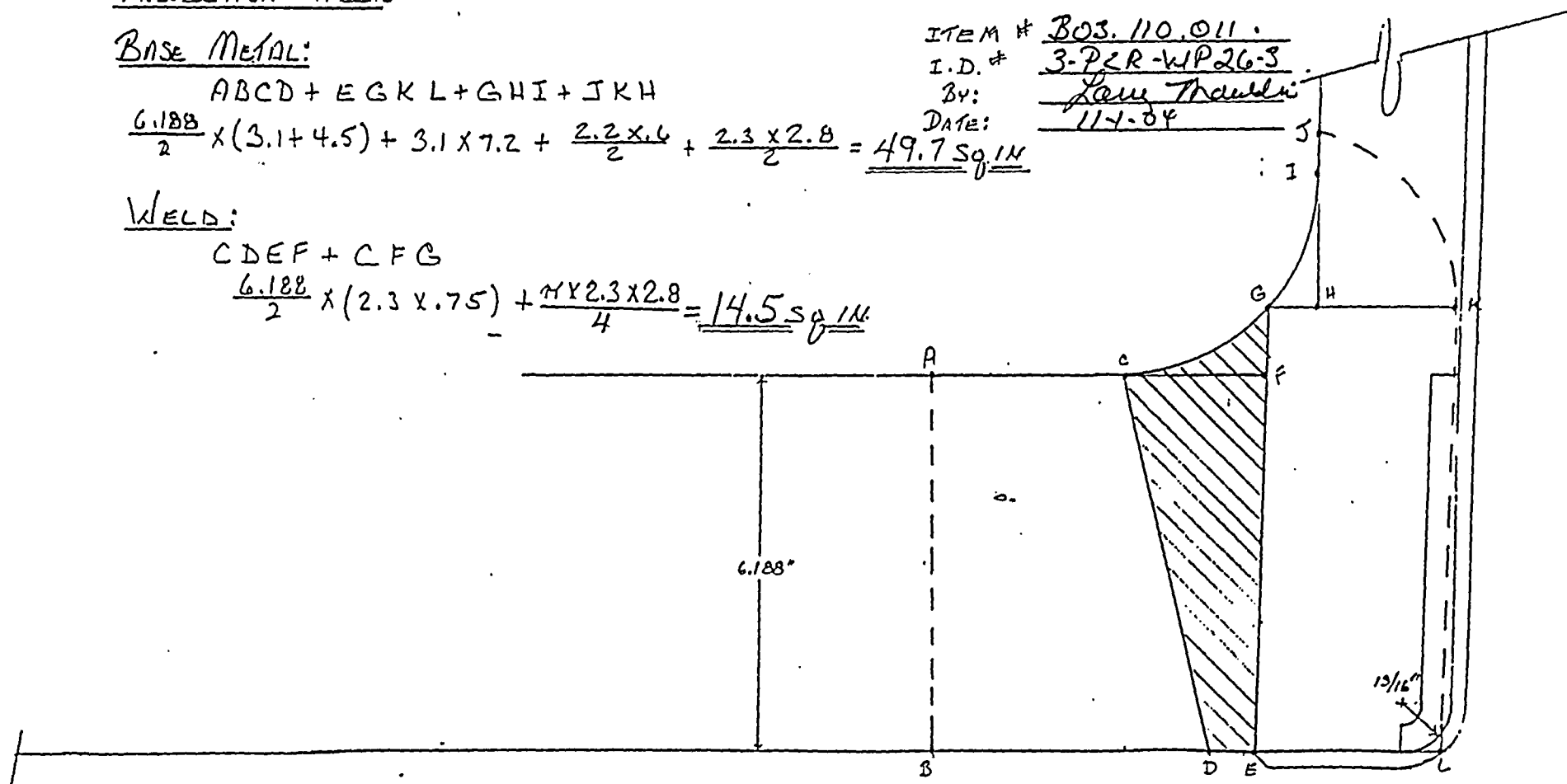
$$\frac{6.188}{2} \times (2.3 \times 7.5) + \frac{\pi \times 2.3 \times 2.8}{4} = \underline{14.5 \text{ sq. in.}}$$

ITEM # BO3.110.011.

I.D. # 3-P&R-WP26-3

BY: Law Thacker

DATE: 11-1-84

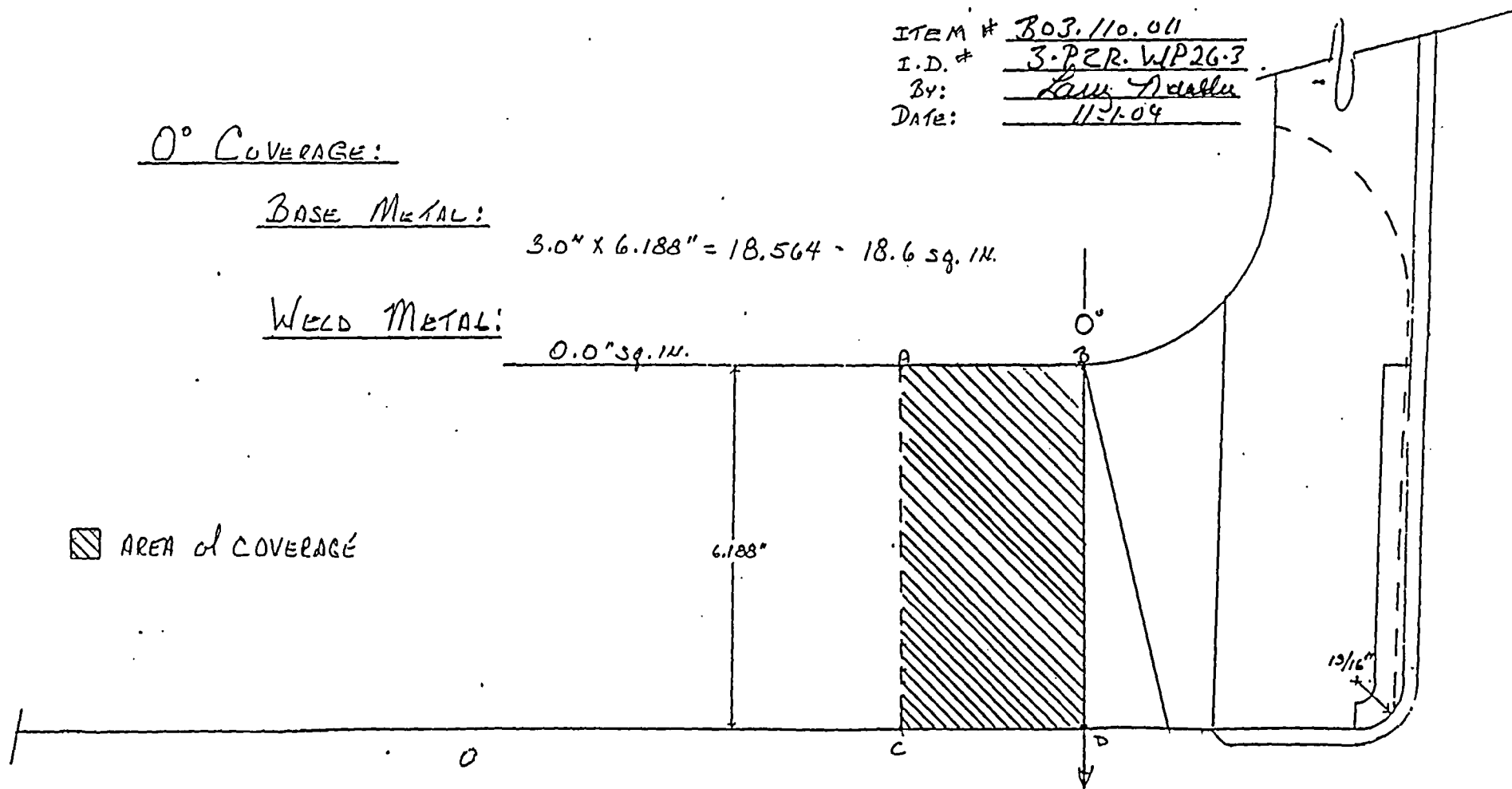


### 0° COVERAGE:

$$3.0'' \times 6.188'' = 18.564 \sim 18.6 \text{ sq. in.}$$

O.O" 39.14.

 AREA of COVERAGE



# O'CONNOR SENSING / SAMPLING NOZZLE

45° COVERAGE

BASE METAL:

S1 TO S2 ABCD + EFGH (N/A S2 TO S1 SCAN)



$$\frac{6.188}{2} \times (3.1 + 4.5) + \frac{3.8 \times 3.8}{2} = 30.7 \text{ sq. in.}$$

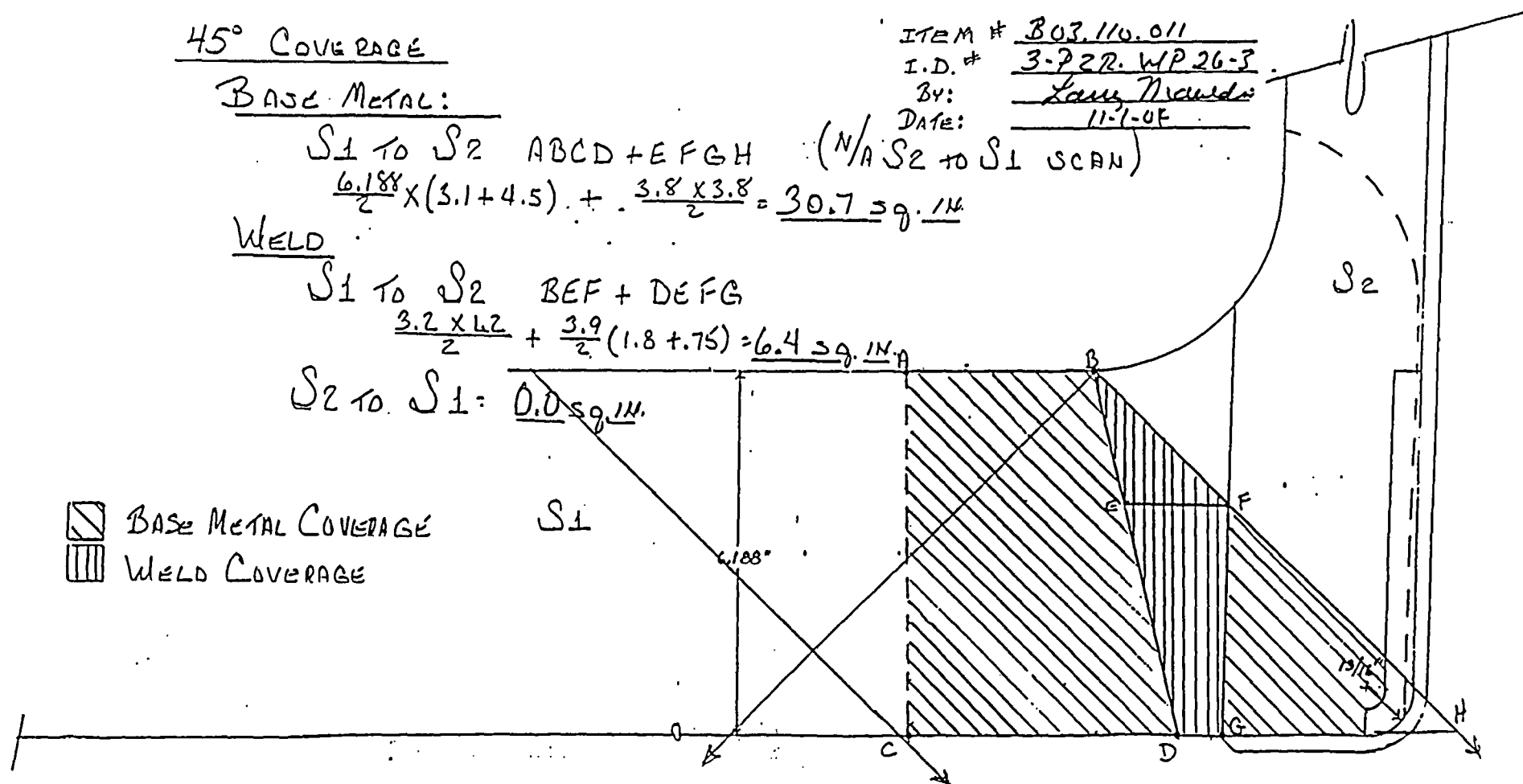
WELD

S1 TO S2 BEF + DEFG

$$\frac{3.2 \times 4.2}{2} + \frac{3.9}{2} (1.8 + 7.5) = 6.4 \text{ sq. in.}$$

S2 TO S1: 0.0 sq. in.

 BASE METAL COVERAGE  
 WELD COVERAGE



ATTACHMENT TO UT-04-475

PAGE 3 OF 5

# OCONEE SENSING/SAMPLING NOZZLE

60° COVERAGE

BASE METAL:

S1 TO S2

ABCD + FGHI

$$\frac{6.188}{2} + (3.1 + 4.5) + \frac{3.2}{2} (3.0 + 4.7) = \underline{35.8 \text{ sq. in.}}$$

N/A - S2 TO S1

WELD

S1 TO S2

BEF + DEFG

$$\frac{2.6 \times .9}{2} + \frac{7.75}{2} (2.0 + .75) = \underline{7.7 \text{ sq. in.}}$$

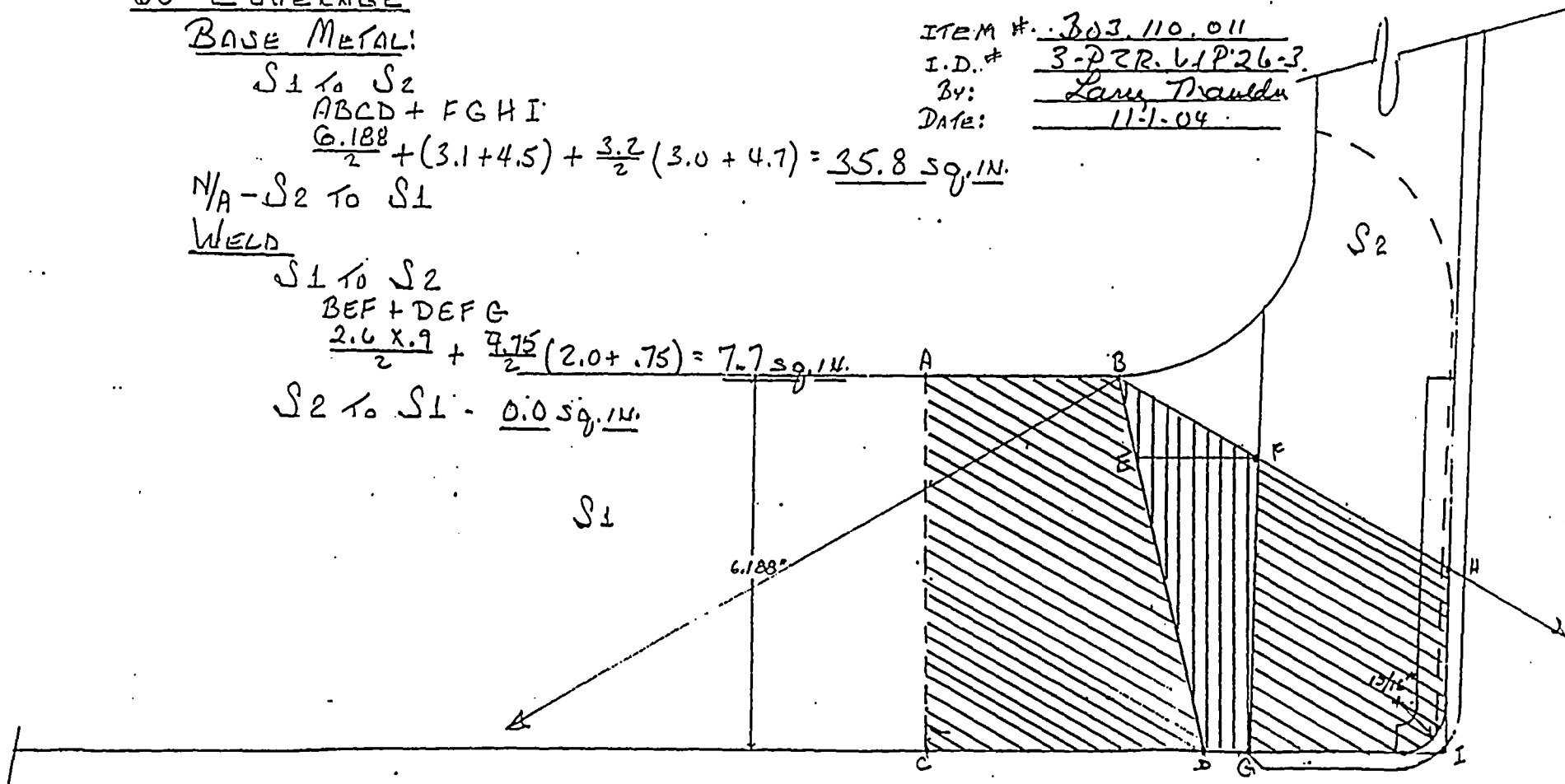
$$S2 \text{ TO } S1 = \underline{0.0 \text{ sq. in.}}$$

ITEM #. 303.110.011

I.D.# 3-PZR. LIP 26-3.

By: Larry Trawler

DATE: 11-1-04



# DCONEE. SENSING / SAMPLING NOZZLE

45° & 60° Circ. SCAN COVERAGE

BASE METAL:

ABCD

$$\frac{6.188}{2} \times (3.1 + 4.5) = \underline{23.5 \text{ sq. in.}}$$

WELD

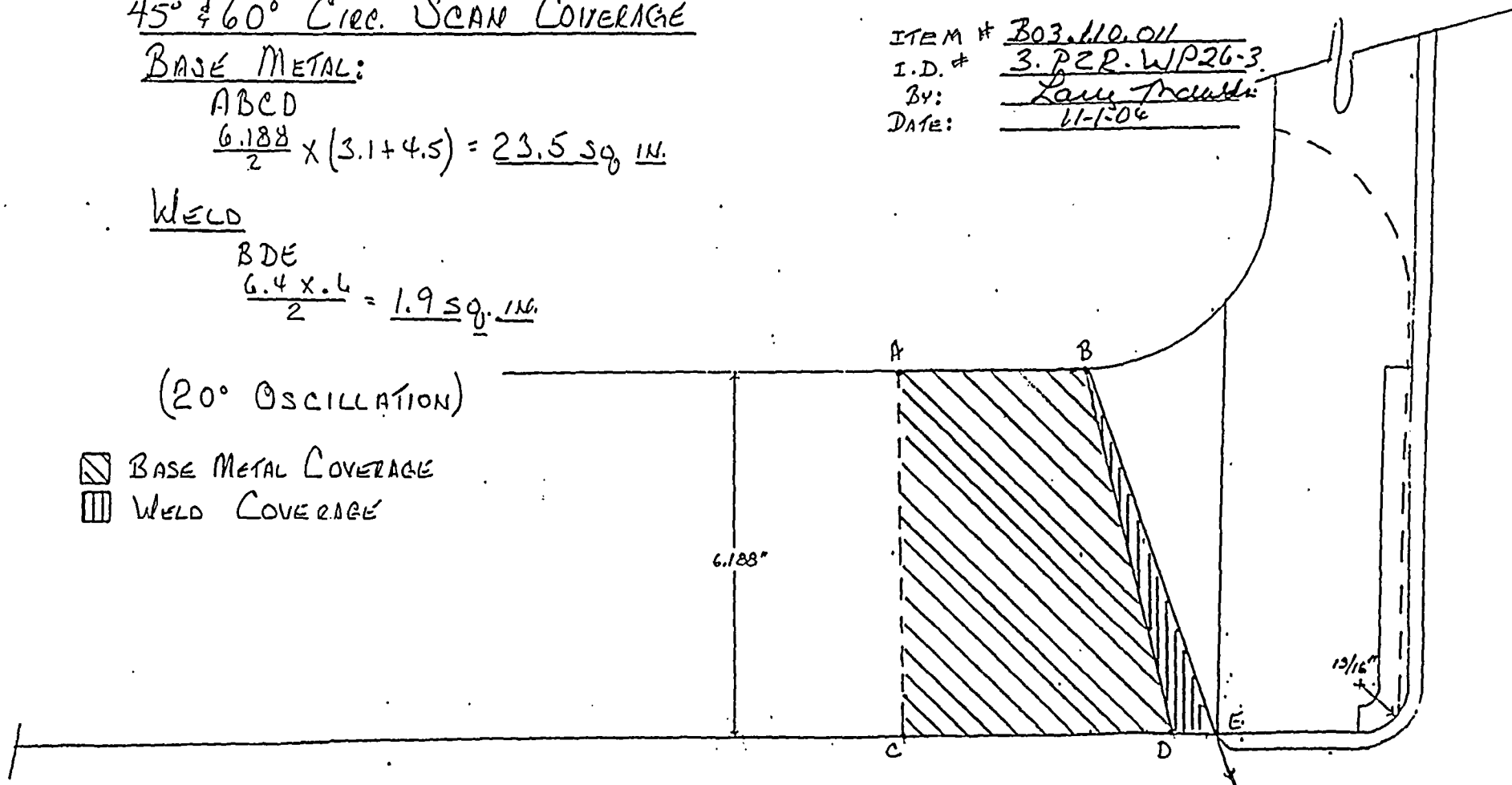
BDE

$$\frac{6.4 \times .4}{2} = \underline{1.9 \text{ sq. in.}}$$

(20° OSCILLATION)

-  BASE METAL COVERAGE
-  WELD COVERAGE

ITEM # 303.110.011  
I.D. # 3.P22.WP26-3.  
BY: Larry Trumble  
DATE: 11-1-06





## UT Vessel Examination

Site/Unit: Oconee / O3  
Summary No.: B03.110.012  
Workscope: ISI

Procedure: NDE-640  
Procedure Rev.: 2  
Work Order No.: 98641456

Outage No.: ONS3EOC21  
Report No.: UT-04-476  
Page: 1 of 1

Code: Asme Section XI 1989 Cat./Item: B-D- /B3.110.12 Location: N/A  
Drawing No.: ISI-OCN3-002 Description: Nozzle to To Shell  
System ID: 50  
Component ID: B03.110.012 /3-PZR-WP26-7 Size/Length: N/A Thickness/Diameter: 6.187"/5.75"  
Limitations: See limitation calculations on report UT-04-477. Start Time: 1209 Finish Time: 1212

Examination Surface: Inside ☐ Outside ☒ Surface Condition: AS GROUND  
Lo Location: 9.2.3 Wo Location: Centerline of Weld Couplant: ULTRAGEL II Batch No.: 03125  
Temp. Tool Mfg.: FISHER Serial No.: MCNDE32768 Surface Temp.: 72 °F  
Cal. Report No.: CAL-04-735

Angle Used	0	45	45T	60	60T	
Scanning dB	39					

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

Comments:  
FC 03-20

Results: Accept ☒ Reject ☐ Info ☐

Percent Of Coverage Obtained > 90%: No - 25.927%

Reviewed Previous Data: Yes

Examiner	Level	II-N	Signature	Date	Reviewer	Signature	Date
Mauldin, Larry E.				11/1/2004			11-9-04
Examiner	Level	III	Signature	Date	Site Review	Signature	Date
Eaton, Jay A.				11/1/2004			
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A							11/19/04



## UT Vessel Examination

Site/Unit: Oconee / O3  
Summary No.: B03.110.012  
Workscope: ISI

Procedure: NDE-820  
Procedure Rev.: 1  
Work Order No.: 98641456

Outage No.: ONS3EOC21  
Report No.: UT-04-477  
Page: 1 of 3

Code: Asme Section XI 1989 Cat./Item: B-D- /B3.110.12 Location: N/A  
Drawing No.: ISI-OCN3-002 Description: Nozzle to To Shell  
System ID: 50  
Component ID: B03.110.012 /3-PZR-WP26-7 Size/Length: N/A Thickness/Diameter: 6.187"/5.75"  
Limitations: See attached limitation report. Start Time: 1219 Finish Time: 1240

Examination Surface: Inside ☐ Outside ☒ Surface Condition: \_\_\_\_\_

Lo Location: 9.2.3 Wo Location: Centerline of Weld Couplant: ULTRAGEL II Batch No.: 03125

Temp. Tool Mfg.: FISHER Serial No.: MCNDE32768 Surface Temp.: 72 °F

Cal. Report No.: CAL-04-736, CAL-04-737

Angle Used	0	45	45T	60	60T	
Scanning dB		70.2	70.2	84.6	84.6	

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

Comments:

FC 03-29, 03-31

Results: Accept ☒ Reject ☐ Info ☐

Percent Of Coverage Obtained > 90%: No - 25.927% Reviewed Previous Data: Yes

Examiner	Level	II-N	Signature	Date	Reviewer	Signature	Date
Mauldin, Larry E.			<i>Larry E. Mauldin</i>	11/1/2004	<i>Larry E. Mauldin</i>		11-10-04
Examiner	Level	III	Signature	Date	Site Review	Signature	Date
Eaton, Jay A.			<i>Jay A. Eaton</i>	11/1/2004			
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A					<i>[Signature]</i>		11/10/04





## Limitation Record

Site/Unit: <u>Oconee / O3</u>	Procedure: <u>NDE-820</u>	Outage No.: <u>ONS3EOC21</u>
Summary No.: <u>B03.110.012</u>	Procedure Rev.: <u>1</u>	Report No.: <u>UT-04-477</u>
Workscope: <u>ISI</u>	Work Order No.: <u>98641456</u>	Page: <u>2</u> of <u>3</u>

## Description of Limitation:

Limited 360° from the weld edge and beyond due to blend radius and nozzle configuration.

## Aggregate Coverage

<u>Angle</u>	<u>Beam Dir.</u>	<u>Base Metal</u>	<u>Weld</u>	<u>Aggregate</u>
0	N/A	37.42%	0%	18.71%
45	S1	61.77%	44.14%	52.96%
45	S2	0%	0%	0%
45	CW	47.28%	13.1%	30.19%
45	CCW	47.28%	13.1%	30.19%
60	S1	72.03%	53.1%	62.57%
60	S2	0%	0%	0%
60	CW	47.28%	13.1%	30.19%
60	CCW	47.28%	13.1%	30.19%

## Limitations removal requirements:

N/A

Radiation field: N/A

Examiner	Level	II-N	Signature	Date	Reviewer	Signature	Date
Mauldin, Larry E.			<i>Larry E. Mauldin</i>	11/1/2004	<i>Gary Moss</i>		11-9-04
Examiner	Level	III	Signature	Date	Site Review	Signature	Date
Eaton, Jay A.			<i>Jay A. Eaton</i>	11/1/2004			
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A					<i>Mike Pelt</i>		11/10/04



# Determination of Percent Coverage for UT Examinations - Vessels

ATTACHMENT C  
PAGE 31 OF 96

Site/Unit:	Oconee / O3	Procedure:	NDE-820	Outage No.:	ONS3EOC21
Summary No.:	B03.110.012	Procedure Rev.:	1	Report No.:	UT-04-477
Workscope:	ISI	Work Order No.:	98641456	Page:	3 of 3

## 0 deg Planar

Scan 100.000 % Length X 18.710 % volume of length / 100 = 18.710 % total for 0 deg

## 45 deg

Scan 1 100.000 % Length X 52.960 % volume of length / 100 = 52.960 % total for Scan 1

Scan 2 100.000 % Length X 0.000 % volume of length / 100 = 0.000 % total for Scan 2

Scan 3 100.000 % Length X 30.190 % volume of length / 100 = 30.190 % total for Scan 3

Scan 4 100.000 % Length X 30.190 % volume of length / 100 = 30.190 % total for Scan 4

Add totals and divide by # scans = 28.335 % total for 45 deg

## Other deg 60

Scan 1 100.000 % Length X 62.570 % volume of length / 100 = 62.570 % total for Scan 1

Scan 2 100.000 % Length X 0.000 % volume of length / 100 = 0.000 % total for Scan 2

Scan 3 100.000 % Length X 30.190 % volume of length / 100 = 30.190 % total for Scan 3

Scan 4 100.000 % Length X 30.190 % volume of length / 100 = 30.190 % total for Scan 4

Add totals and divide by # scans = 30.738 % total for 60 deg

## Percent complete coverage

Add totals for each angle and scan required and divide by # of angles to determine;

25.927 % Total for complete exam

### Note:

Supplemental coverage may be achieved by use of other angles / methods. When used, the coverage for volume not obtained with angles as noted above shall be calculated and added to the total to provide the percent total for the complete examination.

Site Field Supervisor: 

Date: 11/1/04

# DCONEE SENSING/SAMPLING NOZZLE

## INSPECTION AREAS

### BASE METAL:

ABCD + E G K L + G H I + J K H

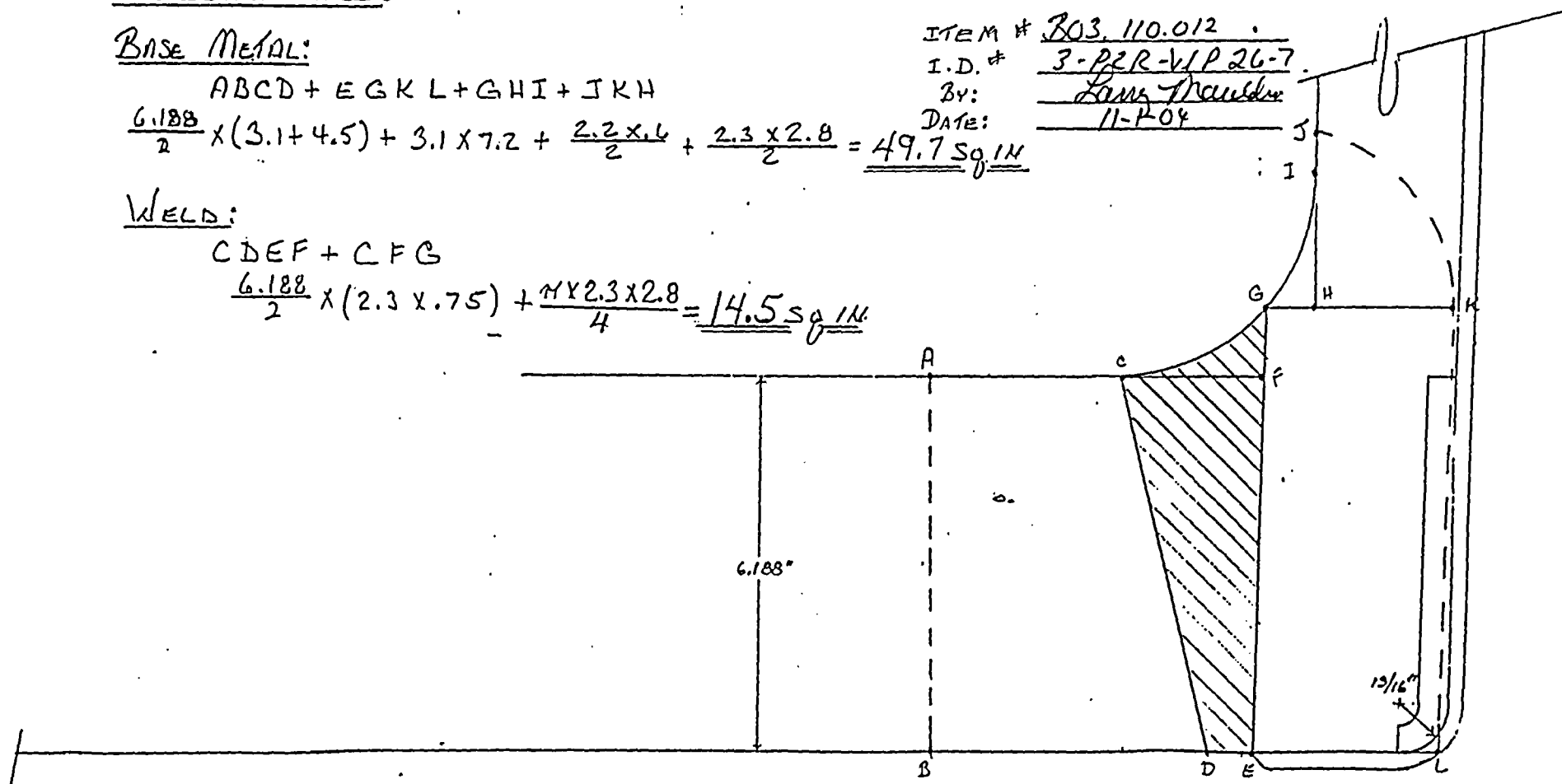
$$\frac{6.188}{2} \times (3.1 + 4.5) + 3.1 \times 7.2 + \frac{2.2 \times 6}{2} + \frac{2.3 \times 2.8}{2} = \underline{\underline{49.7 \text{ SQ. IN.}}}$$

### WELD:

CDEF + CFG

$$\frac{6.188}{2} \times (2.3 \times 7.5) + \frac{\pi \times 2.3 \times 2.8}{4} = \underline{\underline{14.5 \text{ SQ. IN.}}}$$

ITEM # 803.110.012  
I.D. # 3-P2R-VIP26-7  
By: Larry Thacker  
DATE: 11-1-04



OCONEE SENSING/SAMPLING NOZZLE

ITEM # 803.110.012  
I.D. # 3-P2R-4P26-7  
BY: Gene Thawley  
DATE: 11-1-04

0° COVERAGE:

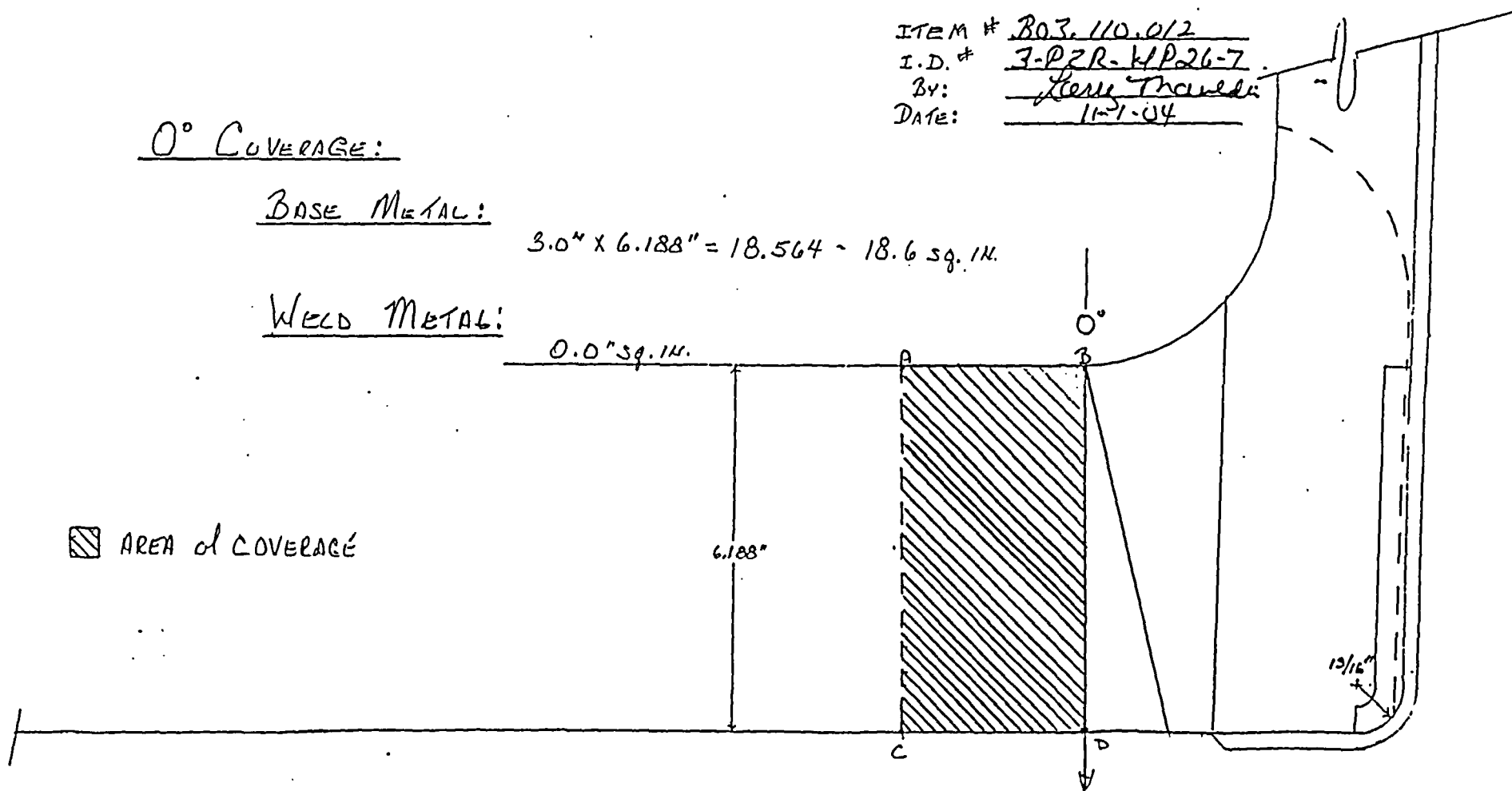
BASE METAL:

$$3.0" \times 6.188" = 18.564 \sim 18.6 \text{ sq. in.}$$

WELD METAL:

$$0.0 \text{ sq. in.}$$

▨ AREA of COVERAGE



ATTACHMENT TO UT-04-477

PAGE 2 OF 5

# OCONEE SENSING/SAMPLING NOZZLE

45° COVERAGE

BASE METAL:

S1 TO S2 ABCD + EFGH (N/A S2 TO S1 SCAN)



$$\frac{6.188}{2} \times (3.1 + 4.5) + \frac{3.8 \times 3.8}{2} = \underline{30.7 \text{ sq. in.}}$$

WELD

S1 TO S2 BEF + DEFG

$$\frac{3.2 \times 6.2}{2} + \frac{3.9}{2} (1.8 + 7.5) = \underline{6.4 \text{ sq. in.}}$$

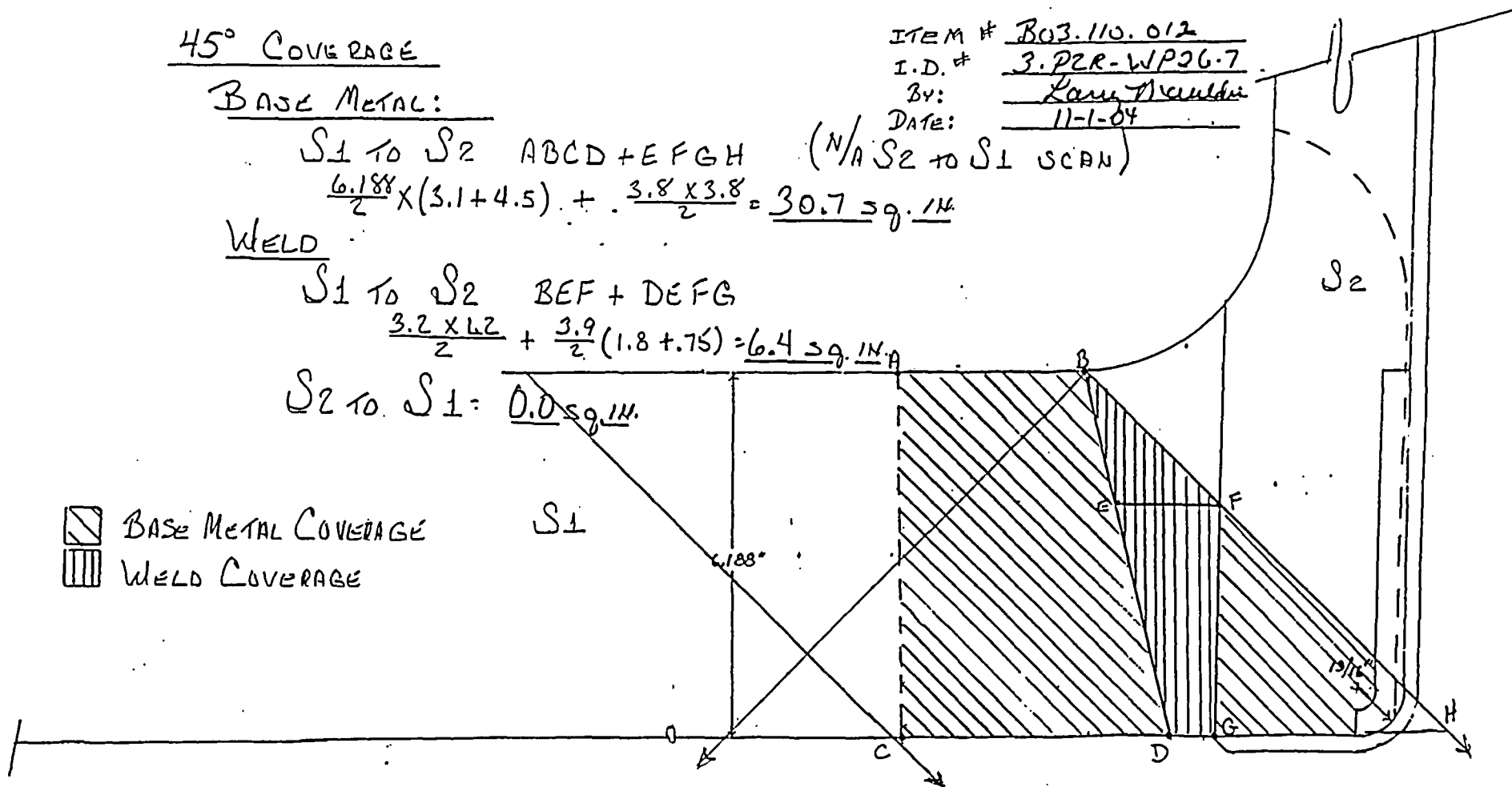
S2 TO S1: 0.0 sq. in.

 BASE METAL COVERAGE  
 WELD COVERAGE

S1

6.188"

S2



ATTACHMENT TO UT-04-477

PAGE 3 OF 5

# OCONEE SENSING / SAMPLING NOZZLE

## 60° COVERAGE

### BASE METAL:

S1 to S2

ABCD + FGHI

$$\frac{6.188}{2} + (3.1 + 4.5) + \frac{3.2}{2} (3.0 + 4.7) = \underline{35.8 \text{ sq. in.}}$$

N/A - S2 to S1

### WELD

S1 to S2

BEF + DEFG

$$\frac{2.6 \times .9}{2} + \frac{7.75}{2} (2.0 + .75) = \underline{7.7 \text{ sq. in.}}$$

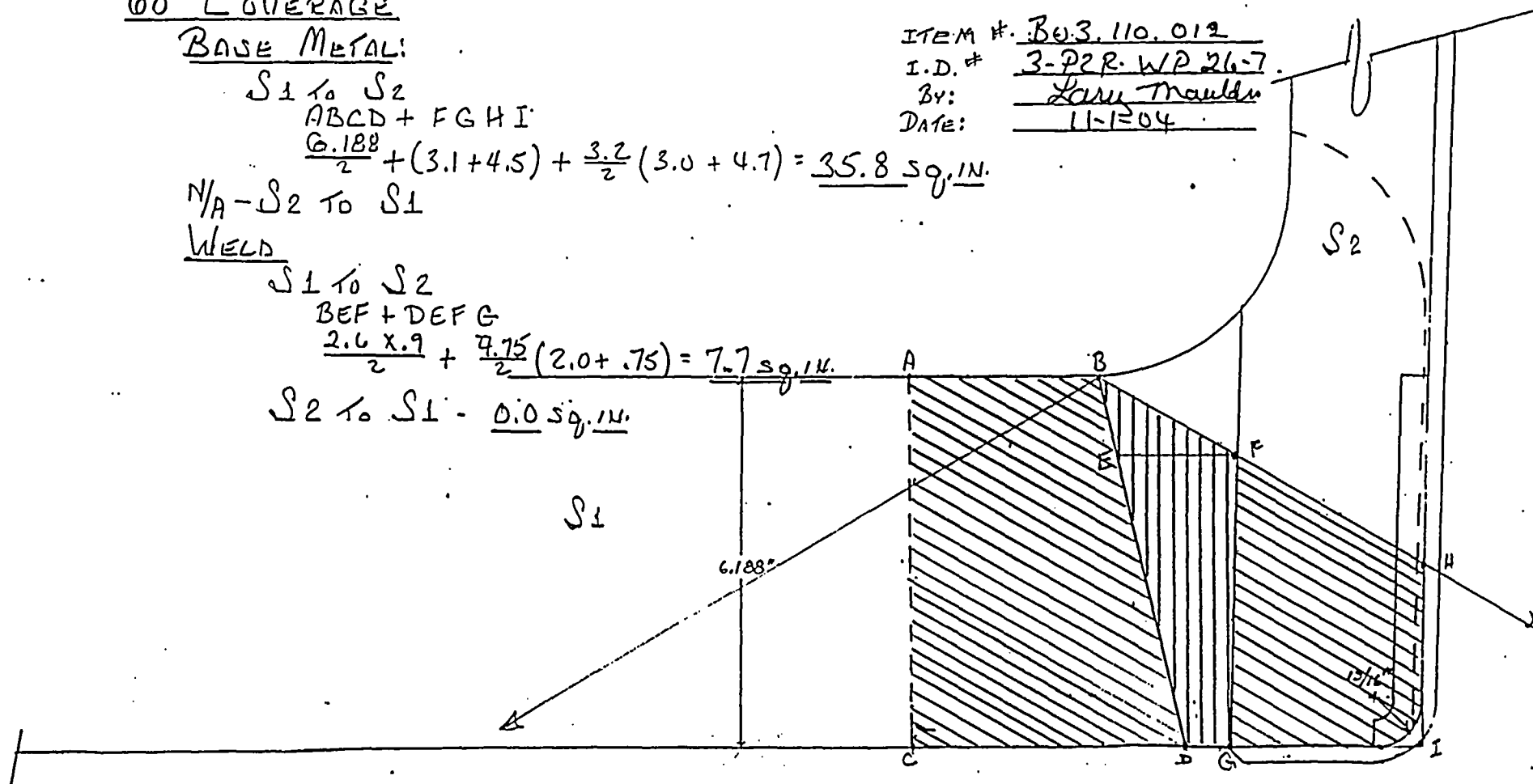
$$S2 \text{ to } S1 = \underline{0.0 \text{ sq. in.}}$$

ITEM #. BO-3.110.012

I.D. # 3-P2R-WP 26-7

BY: Larry Moulden

DATE: 11-1-04



# OCONEE SENSING / SAMPLING NOZZLE

45° & 60° Circ. SCAN COVERAGE

BASE METAL:

ABCD

$$\frac{6.188}{2} \times (3.1 + 4.5) = \underline{23.5 \text{ sq. in.}}$$

WELD

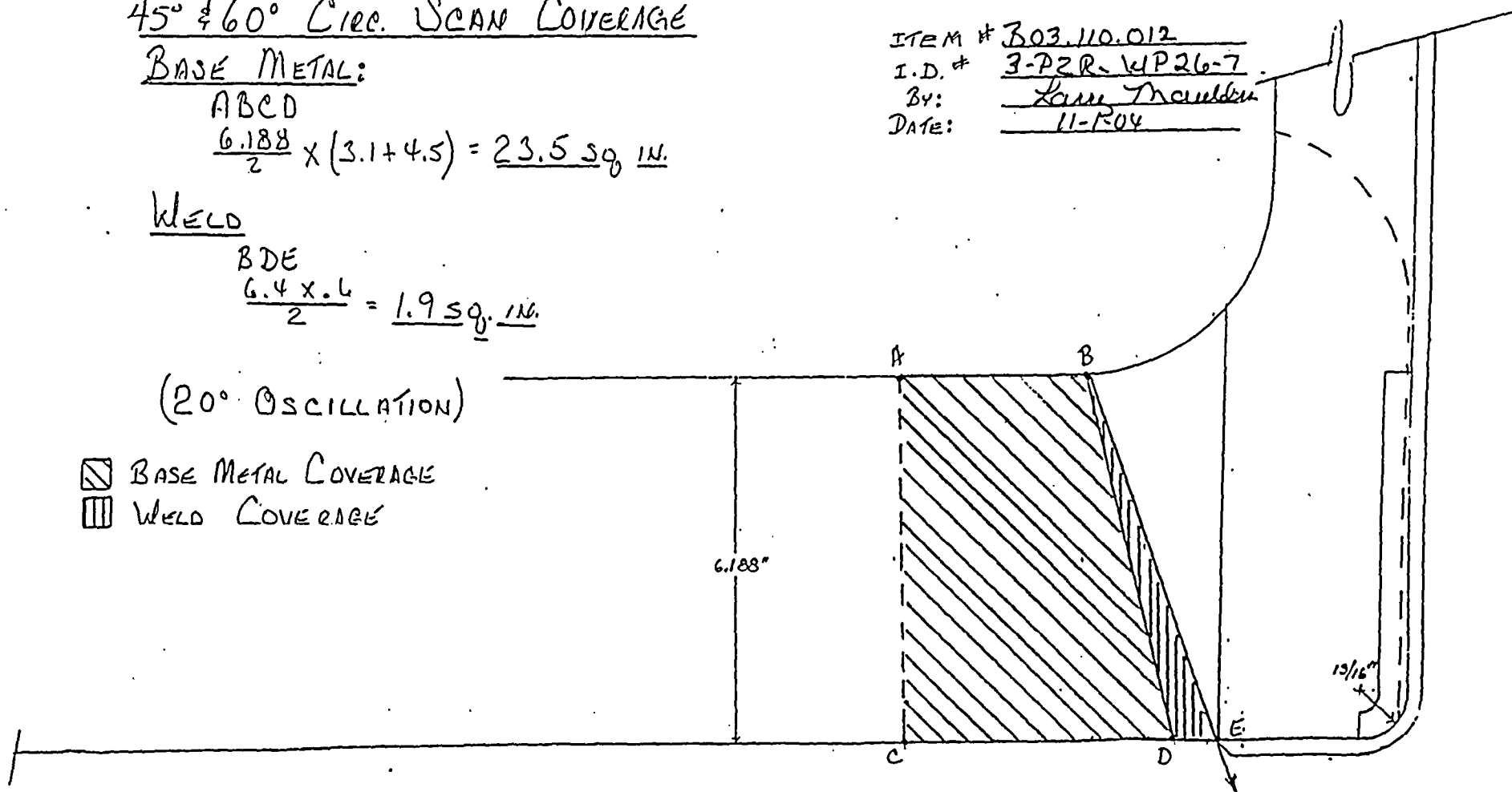
BDE

$$\frac{6.4 \times .6}{2} = \underline{1.9 \text{ sq. in.}}$$

(20° OSCILLATION)

-  BASE METAL COVERAGE
-  WELD COVERAGE

ITEM # B03.110.012  
I.D. # 3-P2R-WP26-7  
BY: Lane Thaulden  
DATE: 11-10-04



ATTACHMENT TO UT-04-477

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## UT Vessel Examination

Site/Unit: Oconee / O3  
 Summary No.: B03.150.003  
 Workscope: ISI

Procedure: NDE-630  
 Procedure Rev.: 2  
 Work Order No.: 98641451

Outage No.: ONS3EOC21  
 Report No.: UT-04-487  
 Page: 1 of 2

Code: Asme Section XI 1989 Cat./Item: B-D- /B3.150.3 Location: N/A  
 Drawing No.: I-44773-1 Description: Nozzle to Channel Body  
 System ID: 51A  
 Component ID: B03.150.003 /3-LDCB-IN-V1 Size/Length: N/A Thickness/Diameter: .875" / 8.62" <sup>3.0"</sup> <sub>1.71-0.4</sub>  
 Limitations: None Start Time: 0815 Finish Time: 0847

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.: MCNDE 27220 Surface Temp.: 74 °F

Cal. Report No.: CAL-04-741, CAL-04-742, CAL-04-743

Angle Used

0	45	45T	60	60T	45 RL
	45.0	45.0	70.5		66.5

Scanning dB

Indication(s): Yes ☐ No ☒

Scan Coverage: Upstream ☒ Downstream ☐ CW ☒ CCW ☒

Comments:

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 - 29.263%

Reviewed Previous Data: Yes

Examiner Level II Resor, James H.	Signature <i>James H. Resor</i>	Date 11/4/2004	Reviewer <i>Don Moss</i>	Signature <i>Don Moss</i>	Date 11-10-04
Examiner Level II-N Jones, Russel	Signature <i>Russel Jones</i>	Date 11/4/2004	Site Review	Signature	Date
Other Level N/A N/A	Signature	Date	ANII Review <i>Nancy C. Ritchie Shugart</i>	Signature	Date 11/11/04





# Determination of Percent Coverage for UT Examinations - Vessels

ATTACHMENT C  
PAGE 38 OF 96

Site/Unit:	<u>Oconee / O3</u>	Procedure:	<u>NDE-630</u>	Outage No.:	<u>ONS3EOC21</u>
Summary No.:	<u>B03.150.003</u>	Procedure Rev.:	<u>2</u>	Report No.:	<u>UT-04-487</u>
Workscope:	<u>ISI</u>	Work Order No.:	<u>98641451</u>	Page:	<u>2</u> of <u>2</u>

## 0 deg Planar

Scan \_\_\_\_\_ % Length X \_\_\_\_\_ % volume of length / 100 = \_\_\_\_\_ % total for 0 deg

## 45 deg

Scan 1 100.000 % Length X 35.900 % volume of length / 100 = 35.900 % total for Scan 1

Scan 2 100.000 % Length X 15.600 % volume of length / 100 = 15.600 % total for Scan 2

Scan 3 100.000 % Length X 31.400 % volume of length / 100 = 31.400 % total for Scan 3

Scan 4 100.000 % Length X 31.400 % volume of length / 100 = 31.400 % total for Scan 4

Add totals and divide by # scans = 28.575 % total for 45 deg

## Other deg 60

Scan 1 100.000 % Length X 46.600 % volume of length / 100 = 46.600 % total for Scan 1

Scan 2 100.000 % Length X 10.400 % volume of length / 100 = 10.400 % total for Scan 2

Scan 3 100.000 % Length X 31.400 % volume of length / 100 = 31.400 % total for Scan 3

Scan 4 100.000 % Length X 31.400 % volume of length / 100 = 31.400 % total for Scan 4

Add totals and divide by # scans = 29.950 % total for 60 deg

## Percent complete coverage

Add totals for each angle and scan required and divide by # of angles to determine;

29.263 % Total for complete exam

### **Note:**

Supplemental coverage may be achieved by use of other angles / methods. When used, the coverage for volume not obtained with angles as noted above shall be calculated and added to the total to provide the percent total for the complete examination.

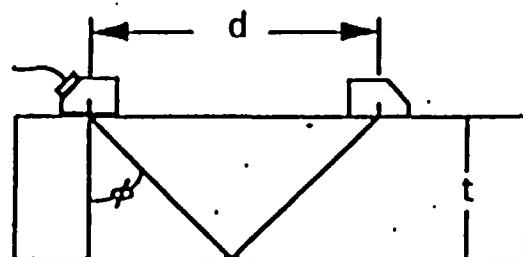
Site Field Supervisor:

Date: 11/10/04

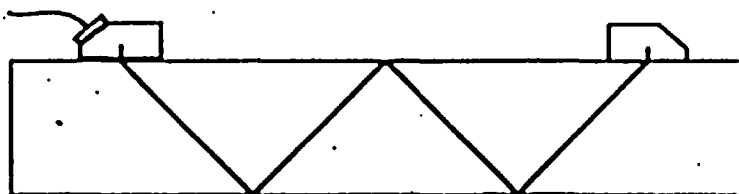
# DUKE POWER COMPANY

## ULTRASONIC BEAM ANGLE MEASUREMENT RECORD

P03.150.003



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



For thin wall pipe use 2nd Vee path

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

Nominal 45 deg: d= 1.70"; t= .875; measured angle= 44.14 degNominal 60 deg: d= 3.0"; t= .875; measured angle= 59.74 degNominal 70 deg: d=       ; t=       ; measured angle=        deg

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

Pipe size: 8.62" (Custom Nozz)Pipe Schedule: N/A

Examiner <i>James H. Boser</i>	Level <i>II</i>	Date <i>11-4-04</i>	Examiner	Level	Date
Reviewed By <i>Gary J. Moss</i>	Level <i>II</i>	Date <i>11-10-04</i>	Authorized Inspector <i>Nancy C. Richter</i>		Date <i>11/11/04</i>

## DUKE POWER COMPANY

## ISI LIMITATION REPORT

Component/Weld ID: <u>3-LDCB-INLET-VI</u> Item No: <u>B03.150.003</u>		remarks:
<input type="checkbox"/> NO SCAN SURFACE BEAM DIRECTION <input checked="" type="checkbox"/> LIMITED SCAN <input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2 <input checked="" type="checkbox"/> cw <input checked="" type="checkbox"/> ccw FROM L <u>N/A</u> to L <u>N/A</u> INCHES FROM W0 <u>.5"</u> to <u>Beyond</u> ANGLE: <input type="checkbox"/> 0 <input checked="" type="checkbox"/> 45 <input type="checkbox"/> 60 other _____ FROM <u>0</u> DEG to <u>360</u> DEG		Due to branch conn. config.
<input checked="" type="checkbox"/> NO SCAN SURFACE BEAM DIRECTION <input type="checkbox"/> LIMITED SCAN <input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> cw <input type="checkbox"/> ccw FROM L _____ to L _____ INCHES FROM W0 <u>.5"</u> to <u>Beyond</u> ANGLE: <input type="checkbox"/> 0 <input type="checkbox"/> 45 <input checked="" type="checkbox"/> 60 other _____ FROM <u>0</u> DEG to <u>360</u> DEG		Due to branch conn. config.
<input type="checkbox"/> NO SCAN SURFACE BEAM DIRECTION <input type="checkbox"/> LIMITED SCAN <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> cw <input type="checkbox"/> ccw FROM L _____ to L _____ INCHES FROM W0 _____ to _____ ANGLE: <input type="checkbox"/> 0 <input type="checkbox"/> 45 <input type="checkbox"/> 60 other _____ FROM _____ DEG to _____ DEG		
<input type="checkbox"/> NO SCAN SURFACE BEAM DIRECTION <input type="checkbox"/> LIMITED SCAN <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> cw <input type="checkbox"/> ccw FROM L _____ to L _____ INCHES FROM W0 _____ to _____ ANGLE: <input type="checkbox"/> 0 <input type="checkbox"/> 45 <input type="checkbox"/> 60 other _____ FROM _____ DEG to _____ DEG		Sketch(s) attached <input checked="" type="checkbox"/> yes <input type="checkbox"/> No
Prepared By: <u>James H. Resor</u> <i>James H. Resor</i> Level: <u>II</u> Date: <u>11/04/2004</u>	Sheet <u>1</u> of <u>14</u>	
Reviewed By: <u>Nancy Moore</u> <i>Nancy Moore</i> Date: <u>11-10-04</u>	Authorized Inspector: <u>Nancy C. Ritchie Slaughter</u> <i>Nancy C. Ritchie Slaughter</i> Date: <u>11/11/04</u>	



## Supplemental Report

Report No.: \_\_\_\_\_

Page: 2 of 14Summary No.: B03.150.003Examiner: Jonathan B. Bess

Examiner: \_\_\_\_\_

Other: \_\_\_\_\_

Level: II

Level: \_\_\_\_\_

Level: \_\_\_\_\_

Reviewer: JTB III

Site Review: \_\_\_\_\_

ANII Review: Nancy C. Ritchie-SlaughterDate: 11/10/04

Date: \_\_\_\_\_

Date: 11/11/04

Comments:

AVERAGE OF EXAM AREAS OF AXIAL/CIRC. CONTOURS USED TO DETERMINE  
ACTUAL EXAM AREA.

Sketch or Photo:

$$\text{ACTUAL EXAM AREA} = (Ax) 3.43 \text{ in}^2 + (C) 2.077 \text{ in}^2 = 5.507 \text{ in}^2 / 2 = 2.754 \text{ in}^2$$

3-LDCB-INLET-VI

SCAN	AXIAL AREA	CIRC. AREA	AVERAGE	PERCENT (AVE/ACT) * 100
45° - 1	1.124 in <sup>2</sup>	.856 in <sup>2</sup>	.99 in <sup>2</sup>	35.9%
- 2	.473 in <sup>2</sup>	.385 in <sup>2</sup>	.429 in <sup>2</sup>	15.6%
- 3	1.29 in <sup>2</sup>	.44 in <sup>2</sup>	.865 in <sup>2</sup>	31.4%
- 4	1.29 in <sup>2</sup>	.44 in <sup>2</sup>	.865 in <sup>2</sup>	31.4%
60° - 1	1.455 in <sup>2</sup>	1.111 in <sup>2</sup>	1.283 in <sup>2</sup>	46.6%
- 2	.356 in <sup>2</sup>	.219 in <sup>2</sup>	.288 in <sup>2</sup>	10.4%
- 3	1.29 in <sup>2</sup>	.44 in <sup>2</sup>	.865 in <sup>2</sup>	31.4%
- 4	1.29 in <sup>2</sup>	.44 in <sup>2</sup>	.865 in <sup>2</sup>	31.4%



# Supplemental Report

ATTACHMENT C  
PAGE 42 OF 96

Report No.: \_\_\_\_\_

Page: 3 of 14

Summary No.: B03.150.003

Examiner: [Signature]

Examiner: \_\_\_\_\_

Other: \_\_\_\_\_

Level: II

Level: \_\_\_\_\_

Level: \_\_\_\_\_

Reviewer: [Signature] III

Site Review: \_\_\_\_\_

ANII Review: Nancy C. Rittenbach Slaughter

Date: 11/10/04

Date: \_\_\_\_\_

Date: 11/11/04

Comments:

Exam Area:

$$ABCD = .5' \times .875' = .4375'^2$$

$$CDE = \frac{.875 \times 1.4}{2} = .6125'^2$$

$$CEG = \frac{1.75' \times 1.25}{2} = 1.0938'^2$$

$$EFG = \frac{2.0' \times .2'}{2} = .2'^2$$

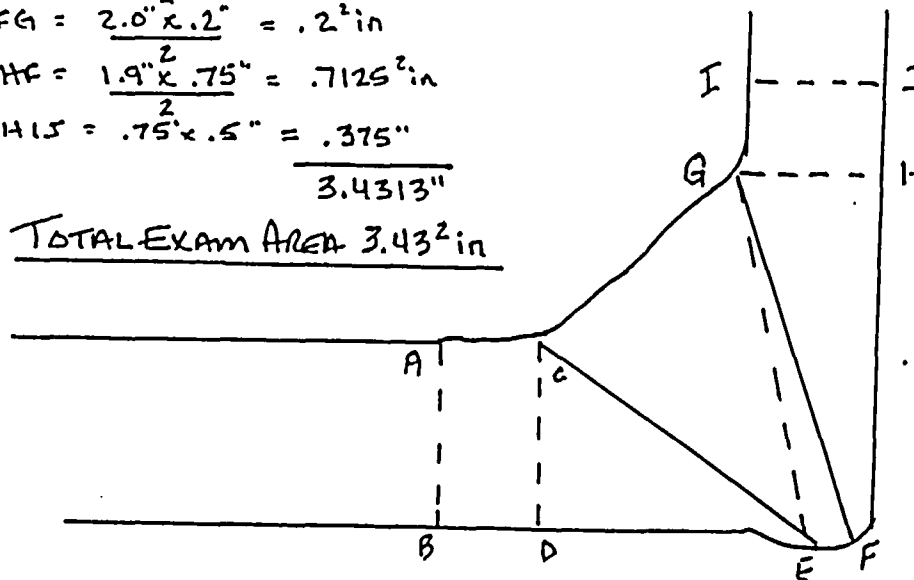
$$GHF = \frac{1.9' \times .75'}{2} = .7125'^2$$

$$GHIS = \frac{.75' \times .5'}{2} = .375'$$

$$\underline{3.4313''}$$

TOTAL EXAM AREA 3.43<sup>2</sup> in

Sketch or Photo:



3-LDCB-INLET-V1



# Supplemental Report

ATTACHMENT C  
PAGE 430F 76

Report No.:

Page: 4 of 14

Summary No.: BD3.15D.003

Examiner: James H. Bess

Examiner: \_\_\_\_\_

Other: \_\_\_\_\_

Level: II

Level: \_\_\_\_\_

Level: \_\_\_\_\_

Reviewer: John K. III

Site Review: \_\_\_\_\_

ANII Review: Nancy C. Ritchie Slaughter

Date: 11/10/04

Date: \_\_\_\_\_

Date: 11/11/04

Comments:

3-LDCB - INLET - VI

45° AXIAL SCAN 1

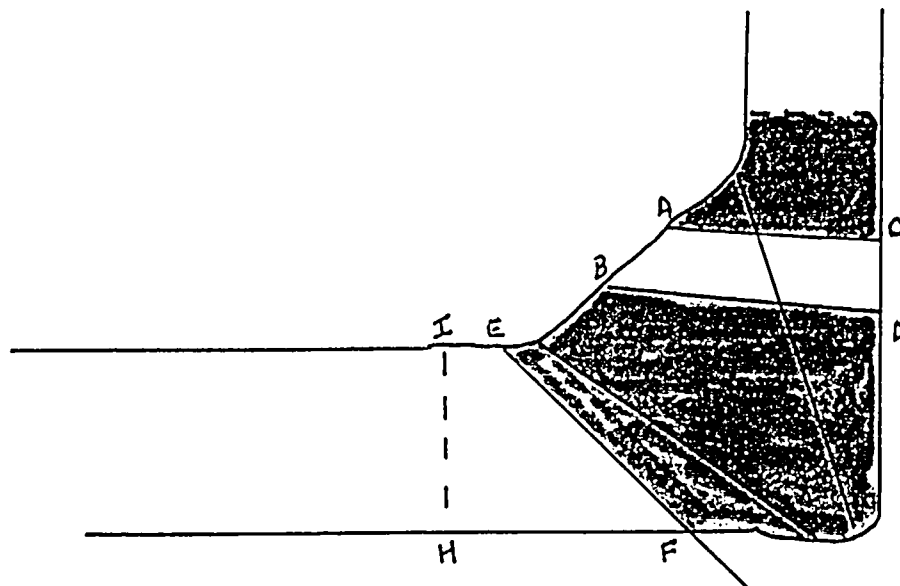
AREA OF COVERAGE

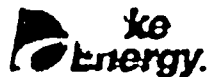
$$ABCD: \left( \frac{1.1 + 1.45}{2} \right) \cdot 35 \text{ in} = .446 \text{ in}^2$$

$$EFHI: \left( \frac{.3 \text{ in} + 1.25 \text{ in}}{2} \right) \cdot 875 \text{ in} = 6.78 \text{ in}^2$$

$$\text{TOTAL AREA} = 1.124 \text{ in}^2$$

Sketch or Photo:





# Supplemental Report

ATTACHMENT C  
PAGE 44 OF 96

Report No.:

Page: 5 of 14

Summary No.: B03.150.003

Examiner: James H. Genn

Examiner: \_\_\_\_\_

Other: \_\_\_\_\_

Level: II

Level: \_\_\_\_\_

Level: \_\_\_\_\_

Reviewer: John J. III

Site Review: \_\_\_\_\_

ANII Review: Nancy C. Ritchie Slaughter

Date: 11/10/04

Date: \_\_\_\_\_

Date: 11/11/04

Comments:

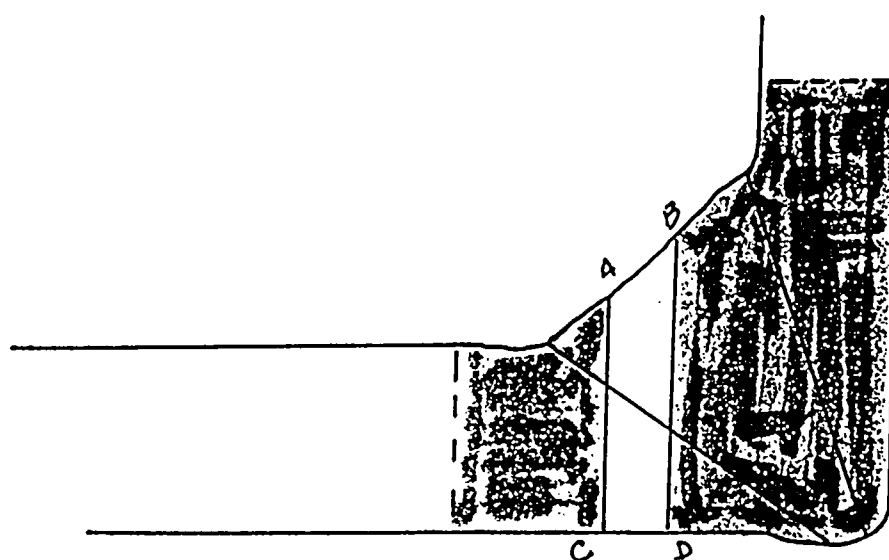
3 - LDCB - INLET - V1

45° AXIAL SCAN 2

Sketch or Photo:

AREA OF COVERAGE

$$ABCD: \left( \frac{1.5^2 + 1.2^2}{2} \right) .35 \text{ in} \\ = .473^2 \text{ in}$$





# Supplemental Report

ATTACHMENT C  
PAGE 45 OF 96

Report No.:

Page: 6 of 14

Summary No.: B03.150.003

Examiner: James H. Bean

Examiner: \_\_\_\_\_

Other: \_\_\_\_\_

Level: II

Level: \_\_\_\_\_

Level: \_\_\_\_\_

Reviewer: [Signature] III

Site Review: \_\_\_\_\_

ANII Review: Nancy C. Ritchel-Slaughter

Date: 11/10/04

Date: \_\_\_\_\_

Date: 11/11/04

Comments:

3 - LDCB - INLET - VI

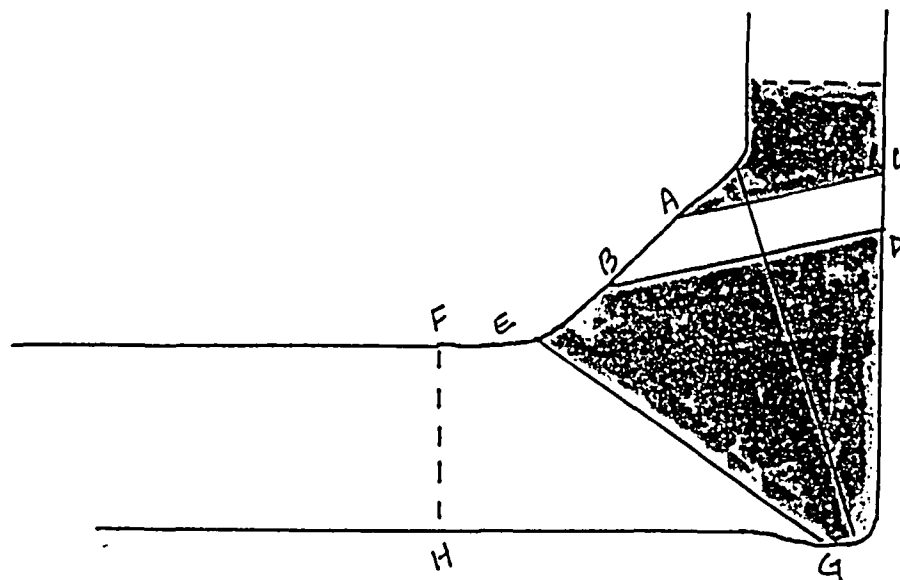
60° AXIAL SCAN 1

AREA OF COVERAGE

$$ABCD: \left( \frac{1.45\text{in} + 1.11\text{in}}{2} \right) \cdot 3" = .383\text{in}^2$$

$$EFGH: \left( \frac{.35\text{in} + 2.1\text{in}}{2} \right) \cdot .875\text{in} = 1.455\text{in}^2$$

Sketch or Photo:







# Supplemental Report

Report No.: \_\_\_\_\_

Page: 7 of 14

Summary No.: B03.15D.DD.3

Examiner: [Signature]

Examiner: \_\_\_\_\_

Other: \_\_\_\_\_

Level: II

Level: \_\_\_\_\_

Level: \_\_\_\_\_

Reviewer: [Signature] III

Site Review: \_\_\_\_\_

ANII Review: Nancy Cretcher-Slaughter

Date: 11/10/04

Date: \_\_\_\_\_

Date: 11/11/04

Comments:

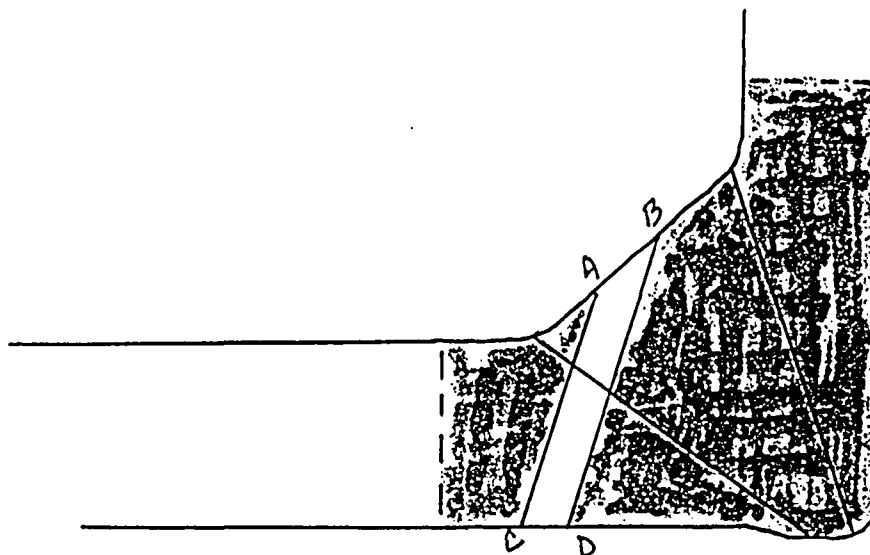
3-LDCB-INLET-VI

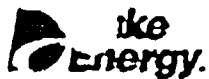
60° AXIAL SCAN 2

Sketch or Photo:

AREA OF COVERAGE

$$ABCD: \left( \frac{1.25'' + 1.6''}{2} \right) \cdot 25\text{in} = .356^2 \text{ in}$$





# Supplemental Report

ATTACHMENT C  
PAGE 47 OF 96

Report No.: \_\_\_\_\_

Page: 8 of 14

Summary No.: B03.15D.003

Examiner: [Signature]

Examiner: \_\_\_\_\_

Other: \_\_\_\_\_

Level: II

Level: \_\_\_\_\_

Level: \_\_\_\_\_

Reviewer: [Signature]

Site Review: \_\_\_\_\_

ANII Review: Nancy Chittell Shryver

Date: 11/10/04

Date: \_\_\_\_\_

Date: 11/11/04

Comments:

3 - LDCB - INLET - VI

CIRC SCAN COVERAGE

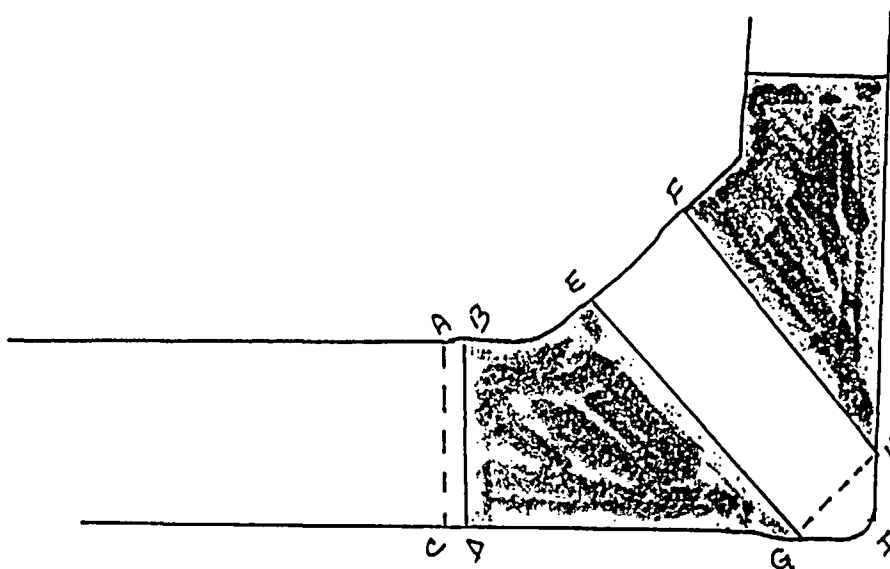
$$ABCD = .875 \times .1 = .0875^2 \text{ in}$$

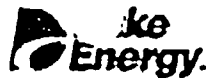
$$EFGH = 1.6 \times .7 = 1.12^2 \text{ in}$$

$$GHI = \frac{.4 \times .4}{2} = .08^2 \text{ in}$$

$$\underline{1.29^2 \text{ in}} = \text{CIRC SCAN COVERAGE}$$

Sketch or Photo:





## Supplemental Report

Report No.: \_\_\_\_\_

Page: 9 of 14Summary No.: B03.15b.003Examiner: [Signature]Level: IIReviewer: [Signature]Date: 11/10/04

Examiner: \_\_\_\_\_

Level: \_\_\_\_\_

Site Review: \_\_\_\_\_

Date: \_\_\_\_\_

Other: \_\_\_\_\_

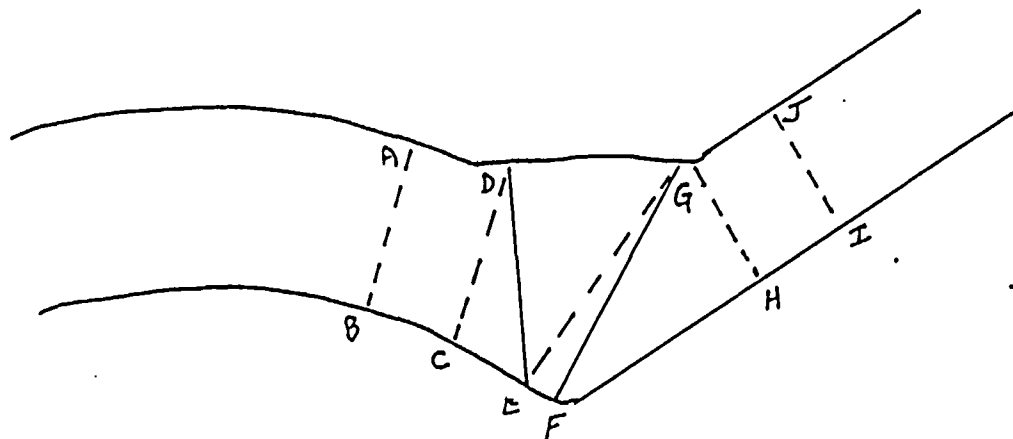
Level: \_\_\_\_\_

ANII Review: Nancy CRitchel ShogrenDate: 11/11/04

Comments:

3-LDCB-INLET-V1

Sketch or Photo:

TOTAL EXAM AREA

$$ABCD = .5 \times .875 = .4375^2 \text{ in}$$

$$CDE = \frac{1.15 \times .35}{2} = .2013^2 \text{ in}$$

$$DEG = \frac{1.4 \times .7}{2} = .49^2 \text{ in}$$

$$EFG = \frac{1.4 \times .2}{2} = .14^2 \text{ in}$$

$$FGH = \frac{1.3 \times .7}{2} = .455^2 \text{ in}$$

$$GHIT = \frac{.5 \times .7}{2} = .35^2 \text{ in}$$

$$\text{TOTAL EXAM AREA} = \underline{2.07^2 \text{ in}}$$



# Supplemental Report

ATTACHMENT C  
PAGE 49 OF 96

Report No.: \_\_\_\_\_

Page: 10 of 14

Summary No.: B03.150.003

Examiner: James L. Berra

Level: II

Reviewer: [Signature]

Date: 11/10/04

Examiner: \_\_\_\_\_

Level: \_\_\_\_\_

Site Review: \_\_\_\_\_

Date: \_\_\_\_\_

Other: \_\_\_\_\_

Level: \_\_\_\_\_

ANII Review: Nancy C. Bittner-Shepherd

Date: 11/11/04

Comments:

3-LDCB-INLET-VI

45° AXIAL SCAN 1

Sketch or Photo:

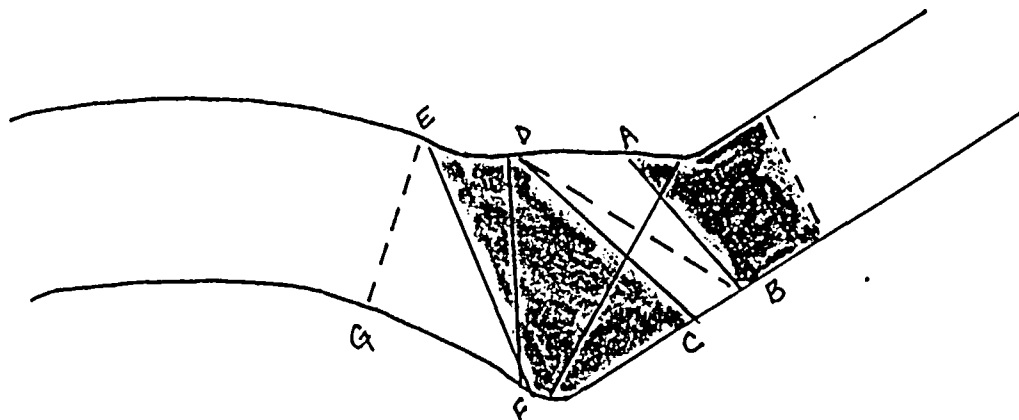
AREA OF COVERAGE

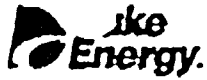
$$ABD: \frac{.9 \times .6}{2} = .27 \text{ in}^2$$

$$BCD: \frac{1.2 \times .25}{2} = .15 \text{ in}^2$$

$$EGF: \frac{1.0 \times .875}{2} = .436 \text{ in}^2$$

$$\text{TOTAL EXAM AREA} = \underline{.856 \text{ in}^2}$$





# Supplemental Report

ATTACHMENT C  
PAGE 58 OF 96

Report No.: \_\_\_\_\_

Page: 11 of 14

Summary No.: B03.150.003

Examiner: [Signature]

Examiner: \_\_\_\_\_

Other: \_\_\_\_\_

Level: II

Level: \_\_\_\_\_

Level: \_\_\_\_\_

Reviewer: [Signature] III

Site Review: \_\_\_\_\_

ANII Review: Nancy C. Pritchard Shugart

Date: 11/10/04

Date: \_\_\_\_\_

Date: 11/11/04

Comments:

3-LDCB-INLET-V1

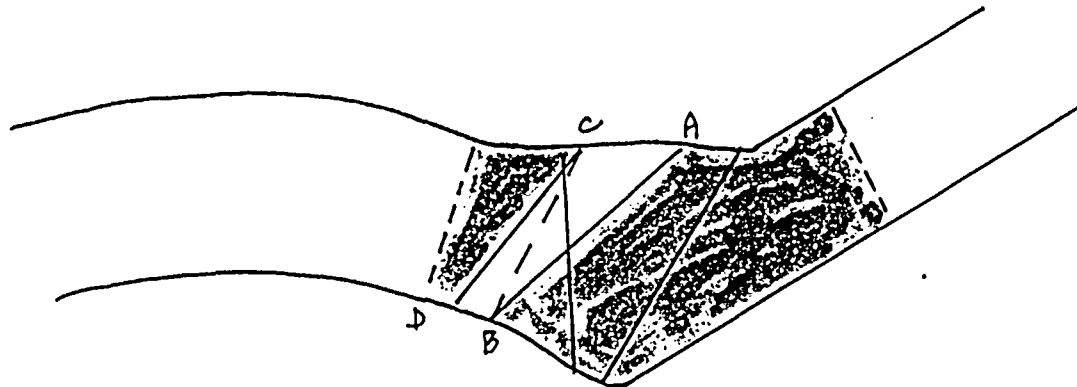
45° AXIAL SCAN 2

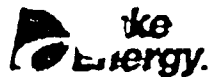
Sketch or Photo:

$$ABC: \frac{1.1 \times .5}{2} = .275^2 \text{ in}$$

$$BCD: \frac{.2 \times 1.1}{2} = .11^2 \text{ in}$$

$$\text{Total Area} = \underline{.385^2 \text{ in}}$$





# Supplemental Report

ATTACHMENT C  
PAGE 51 OF 96

Report No.:

Page: 12 of 14

Summary No.: B03.150.003

Examiner: James H. Brown

Examiner: \_\_\_\_\_

Other: \_\_\_\_\_

Level: II

Level: \_\_\_\_\_

Level: \_\_\_\_\_

Reviewer: John E. III

Site Review: \_\_\_\_\_

ANII Review: Wendy C. Bittler-Slaughter

Date: 11/10/04

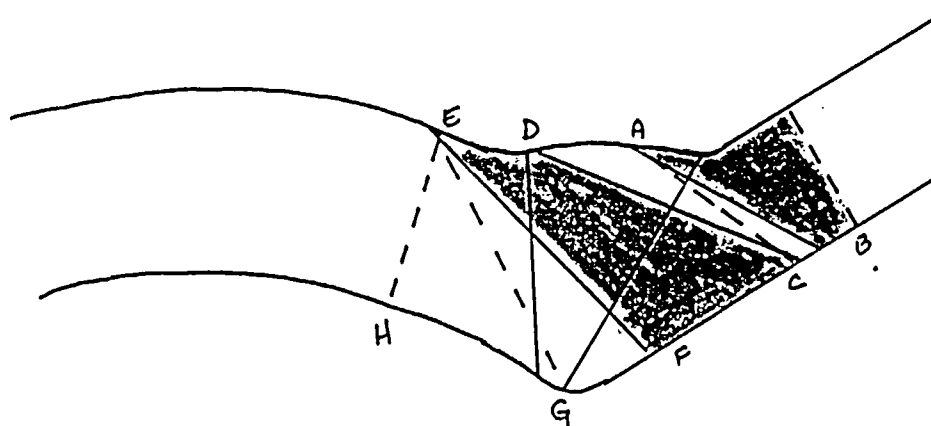
Date: \_\_\_\_\_

Date: 11/11/04

Comments:

3 - LDCB - INLET - VI

Sketch or Photo:



60° AXIAL SCAN 1

$$ABC: \frac{1.0 \times .1}{2} = .05^2 \text{ in}$$

$$ACD: \frac{1.0 \times .55}{2} = .275^2 \text{ in}$$

$$EFG: \frac{1.4 \times .5}{2} = .35^2 \text{ in}$$

$$EGH: \frac{1.0 \times .875}{2} = .4375^2 \text{ in}$$

$$\text{TOTAL AREA} = \underline{1.111^2 \text{ in}}$$



# Supplemental Report

ATTACHMENT C  
PAGE 52 OF 96

Report No.: \_\_\_\_\_

Page: 13 of 14

Summary No.: B03.15D.003

Examiner: [Signature]

Examiner: \_\_\_\_\_

Other: \_\_\_\_\_

Level: II

Level: \_\_\_\_\_

Level: \_\_\_\_\_

Reviewer: [Signature] III

Site Review: \_\_\_\_\_

ANII Review: Nancy Critchfield

Date: 11/10/04

Date: \_\_\_\_\_

Date: 11/11/04

Comments:

3-LDCB-INLET-VI

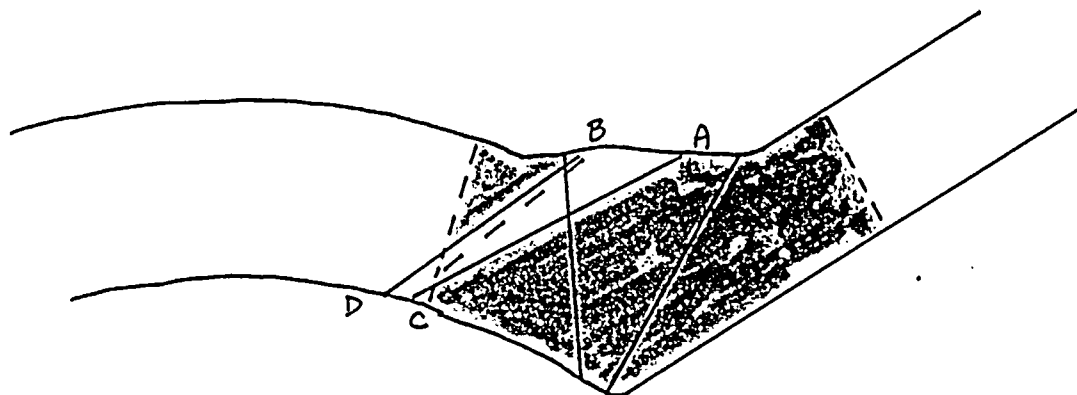
60° AXIAL SCAN 2

$$ABC: \frac{1.25 \times .25}{2} = .156^2$$

$$BCD: \frac{.1 \times 1.25}{2} = .063^2 \text{ in}$$

$$\text{TOTAL SCAN AREA} = .219^2 \text{ in}$$

Sketch or Photo:





# Supplemental Report

ATTACHMENT C  
PAGE 53 OF 96

Report No.:

Page: 14 of 14

Summary No.: B03.150.003

Examiner: [Signature]

Examiner: \_\_\_\_\_

Other: \_\_\_\_\_

Level: II

Level: \_\_\_\_\_

Level: \_\_\_\_\_

Reviewer: [Signature] III

Site Review: \_\_\_\_\_

ANII Review: Nancy C. Ritchie-Slaughter

Date: 11/10/04

Date: \_\_\_\_\_

Date: 11/11/04

Comments:

3-LDCB - INLET - V.1

45° & 60° CircScan Coverage

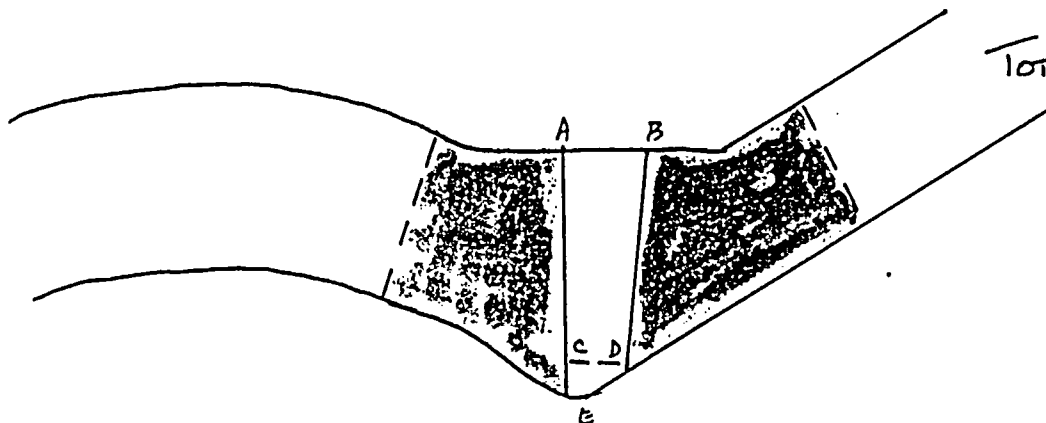
Sketch or Photo:

$$ABCD = \frac{1.1}{2} (.45 + .3) = .4125^2 \text{ in}$$

$$CDE = \frac{.3 \times .15}{2} = .0225^2 \text{ in}$$

.435^2 in

$$\text{Total } 45^\circ \& 60^\circ \text{ Coverage} = \underline{.44^2 \text{ in}}$$







# UT Vessel Examination

ATTACHMENT C  
PAGE 54 OF 96

Site/Unit: Oconee / O3  
Summary No.: B03.150.004  
Workscope: ISI

Procedure: NDE-630  
Procedure Rev.: 2  
Work Order No.: 98641451

Outage No.: ONS3EOC21  
Report No.: UT-04-486  
Page: 1 of 2

Code: Asme Section XI 1989 Cat./Item: B-D- /B3.150.4 Location: N/A  
Drawing No.: 1-44773-1 Description: Nozzle to Channel Body  
System ID: 51A  
Component ID: B03.150.004 /3-LDCB-OUT-V2 Size/Length: N/A Thickness/Diameter: .875" 3.0"  
Limitations: See attached documents. Start Time: 0815 Finish Time: 0847

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.: MCNDE 27220 Surface Temp.: 74 °F

Cal. Report No.: CAL-04-741, CAL-04-742, CAL-04-743

Angle Used	0	45	45T	60	60T	45 RL
Scanning dB		45.0	45.0	70.5		66.5

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

Comments:

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 - 29.263% Reviewed Previous Data: Yes

Examiner	Level	Signature	Date	Reviewer	Signature	Date
Resor, James H.	II		11/4/2004			11-10-04
Examiner	Level	Signature	Date	Site Review	Signature	Date
Jones, Russel	II-N		11/4/2004			
Other	Level	Signature	Date	ANII Review	Signature	Date
N/A	N/A					11/11/04



# Determination of Percent Coverage for UT Examinations - Vessels

ATTACHMENT C  
PAGE 55 OF 96

Site/Unit:	<u>Oconee / O3</u>	Procedure:	<u>NDE-630</u>	Outage No.:	<u>ONS3EOC21</u>
Summary No.:	<u>B03.150.004</u>	Procedure Rev.:	<u>2</u>	Report No.:	<u>UT-04-486</u>
Workscope:	<u>ISI</u>	Work Order No.:	<u>98641451</u>	Page:	<u>2</u> of <u>2</u>

## 0 deg Planar

Scan \_\_\_\_\_ % Length X \_\_\_\_\_ % volume of length / 100 = \_\_\_\_\_ % total for 0 deg

## 45 deg

Scan 1 100.000 % Length X 35.900 % volume of length / 100 = 35.900 % total for Scan 1

Scan 2 100.000 % Length X 15.600 % volume of length / 100 = 15.600 % total for Scan 2

Scan 3 100.000 % Length X 31.400 % volume of length / 100 = 31.400 % total for Scan 3

Scan 4 100.000 % Length X 31.400 % volume of length / 100 = 31.400 % total for Scan 4

Add totals and divide by # scans = 28.575 % total for 45 deg

## Other deg 60

Scan 1 100.000 % Length X 46.600 % volume of length / 100 = 46.600 % total for Scan 1

Scan 2 100.000 % Length X 10.400 % volume of length / 100 = 10.400 % total for Scan 2

Scan 3 100.000 % Length X 31.400 % volume of length / 100 = 31.400 % total for Scan 3

Scan 4 100.000 % Length X 31.400 % volume of length / 100 = 31.400 % total for Scan 4

Add totals and divide by # scans = 29.950 % total for 60 deg

## Percent complete coverage

Add totals for each angle and scan required and divide by # of angles to determine;

29.263 % Total for complete exam

### **Note:**

Supplemental coverage may be achieved by use of other angles / methods. When used, the coverage for volume not obtained with angles as noted above shall be calculated and added to the total to provide the percent total for the complete examination.

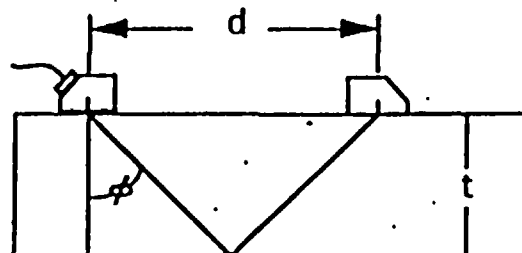
Site Field Supervisor: \_\_\_\_\_

Date: 11/10/04

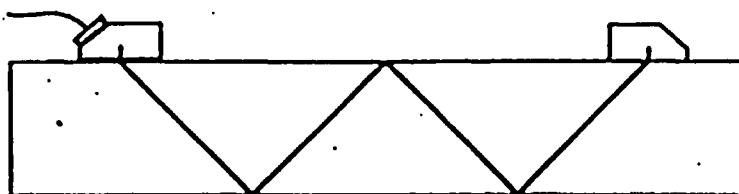
# DUKE POWER COMPANY

## ULTRASONIC BEAM ANGLE MEASUREMENT RECORD

B03.150.004



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



For thin wall pipe use 2nd Vee path

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

Nominal 45 deg: d= 1.70"; t= .875; measured angle= 44.14 degNominal 60 deg: d= 3.0"; t= .875; measured angle= 59.74 degNominal 70 deg: d=       ; t=       ; measured angle=        deg

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

Pipe size: 8.62" (Custom Nozz)Pipe Schedule: N/A

Examiner

*James H. Ben*

Level

*SE*

Date

*11/4/04*

Examiner

Level

Date

Reviewed By

*Gary J. Moss*

Level

*SE*

Date

*11-10-04*

Authorized Inspector

*Nancy C. Ritchie Slaughter*

Date

*11/11/04*

# DUKE POWER COMPANY

## ISI LIMITATION REPORT

<b>DUKE POWER COMPANY</b> <b>ISI LIMITATION REPORT</b>		
Component/Weld ID: <u>3-LDCB-OUTLET-V2</u> Item No: <u>B03.150.004</u>		remarks:
<input type="checkbox"/> NO SCAN                      SURFACE                      BEAM DIRECTION <input checked="" type="checkbox"/> LIMITED SCAN <input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2 <input checked="" type="checkbox"/> cw <input checked="" type="checkbox"/> ccw FROM L <u>N/A</u> to L <u>N/A</u> INCHES FROM W0 <u>.5"</u> to <u>Beyond</u> ANGLE: <input type="checkbox"/> 0 <input checked="" type="checkbox"/> 45 <input type="checkbox"/> 60    other _____                      FROM <u>0</u> DEG to <u>360</u> DEG		Due to branch conn. config.    
<input checked="" type="checkbox"/> NO SCAN                      SURFACE                      BEAM DIRECTION <input type="checkbox"/> LIMITED SCAN <input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> cw <input type="checkbox"/> ccw FROM L <u>N/A</u> to L <u>N/A</u> INCHES FROM W0 <u>.5"</u> to <u>Beyond</u> ANGLE: <input type="checkbox"/> 0 <input type="checkbox"/> 45 <input checked="" type="checkbox"/> 60    other _____                      FROM <u>0</u> DEG to <u>360</u> DEG		Due to branch conn. config.    
<input type="checkbox"/> NO SCAN                      SURFACE                      BEAM DIRECTION <input type="checkbox"/> LIMITED SCAN <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> cw <input type="checkbox"/> ccw FROM L _____ to L _____                      INCHES FROM W0 _____ to _____ ANGLE: <input type="checkbox"/> 0 <input type="checkbox"/> 45 <input type="checkbox"/> 60    other _____                      FROM _____ DEG to _____ DEG		    
<input type="checkbox"/> NO SCAN                      SURFACE                      BEAM DIRECTION <input type="checkbox"/> LIMITED SCAN <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> cw <input type="checkbox"/> ccw FROM L _____ to L _____                      INCHES FROM W0 _____ to _____ ANGLE: <input type="checkbox"/> 0 <input type="checkbox"/> 45 <input type="checkbox"/> 60    other _____                      FROM _____ DEG to _____ DEG		Sketch(s) attached <input checked="" type="checkbox"/> yes <input type="checkbox"/> No
Prepared By: <u>James H. Resor</u> Level: <u>II</u> Date: <u>11/04/2004</u> Sheet <u>1</u> of <u>14</u>		
Reviewed By: <u>Gary Moss</u> Date: <u>11-10-04</u> Authorized Inspector: <u>Nancy C. Britton-Slaughter</u> Date: <u>11/11/04</u>		



## Supplier Initial Report

Report No.:

Page: 2 of 14

Summary No.:

B03.150.004

Examiner:

James H. Bann

Level:

II

Reviewer:

gll IIIDate: 11/10/04

Examiner:

Level:

Site Review:

Date:

Other:

Level:

ANII Review:

Nancy C. Ritchie-SlaughterDate: 11/11/04

Comments:

AVERAGE OF EXAM AREAS OF AXIAL/CIRC. CONTOURS USED TO DETERMINE  
ACTUAL EXAM AREA.

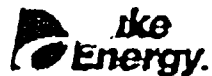
Sketch or Photo:

$$\text{ACTUAL EXAM AREA} = (AX) 3.43 \text{ in}^2 + (C) 2.077 \text{ in}^2 = 5.507 \text{ in}^2 / 2 = 2.754 \text{ in}^2$$

3-LDCB - OUTLET - V2

SCAN	AXIAL AREA	CIRC. AREA	AVERAGE	PERCENT (AVE/ACT) * 100
45° - 1	1.124 in <sup>2</sup>	.856 in <sup>2</sup>	.99 in <sup>2</sup>	35.9%
- 2	.473 in <sup>2</sup>	.385 in <sup>2</sup>	.429 in <sup>2</sup>	15.6%
- 3	1.29 in <sup>2</sup>	.44 in <sup>2</sup>	.865 in <sup>2</sup>	31.4%
- 4	1.29 in <sup>2</sup>	.44 in <sup>2</sup>	.865 in <sup>2</sup>	31.4%
60° - 1	1.455 in <sup>2</sup>	1.111 in <sup>2</sup>	1.283 in <sup>2</sup>	46.6%
- 2	.356 in <sup>2</sup>	.219 in <sup>2</sup>	.288 in <sup>2</sup>	10.4%
- 3	1.29 in <sup>2</sup>	.44 in <sup>2</sup>	.865 in <sup>2</sup>	31.4%
- 4	1.29 in <sup>2</sup>	.44 in <sup>2</sup>	.865 in <sup>2</sup>	31.4%





# Supplemental Report

ATTACHMENT C  
PAGE 60 OF 96

Report No.: \_\_\_\_\_

Page: 4 of 14

Summary No.: BD3.15D.004

Examiner: [Signature]

Examiner: \_\_\_\_\_

Other: \_\_\_\_\_

Level: II

Level: \_\_\_\_\_

Level: \_\_\_\_\_

Reviewer: [Signature]

Site Review: \_\_\_\_\_

ANII Review: Nancy Chittenden Slaughter

Date: 11/10/04

Date: \_\_\_\_\_

Date: 11/11/04

Comments:

3- LDCB - OUTLET - V2

45° AXIAL SCAN 1

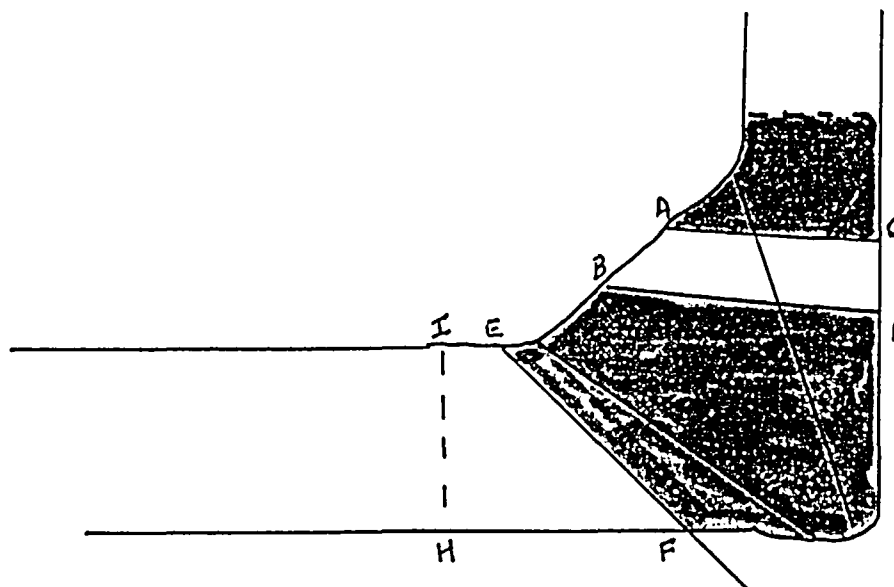
AREA OF COVERAGE

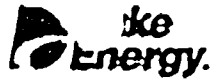
$$ABCD: \left( \frac{1.1 + 1.45}{2} \right) \cdot 35 \text{ in} = .446^2 \text{ in}$$

$$EFHI: \left( \frac{.3 \text{ in} + 1.25 \text{ in}}{2} \right) \cdot 875 \text{ in} = 6.78^2 \text{ in}$$

$$\text{TOTAL AREA} = 1.124 \text{ in}^2$$

Sketch or Photo:





# Supplemental Report

ATTACHMENT C

Report No.: PAGE 61 OF 96

Page: 5 of 14

Summary No.: B03.450.004

Examiner: [Signature]

Examiner: \_\_\_\_\_

Other: \_\_\_\_\_

Level: II

Level: \_\_\_\_\_

Level: \_\_\_\_\_

Reviewer: [Signature] TII

Site Review: \_\_\_\_\_

ANII Review: Nancy C. Ritchie Slaughter

Date: 11/10/04

Date: \_\_\_\_\_

Date: 11/11/04

Comments:

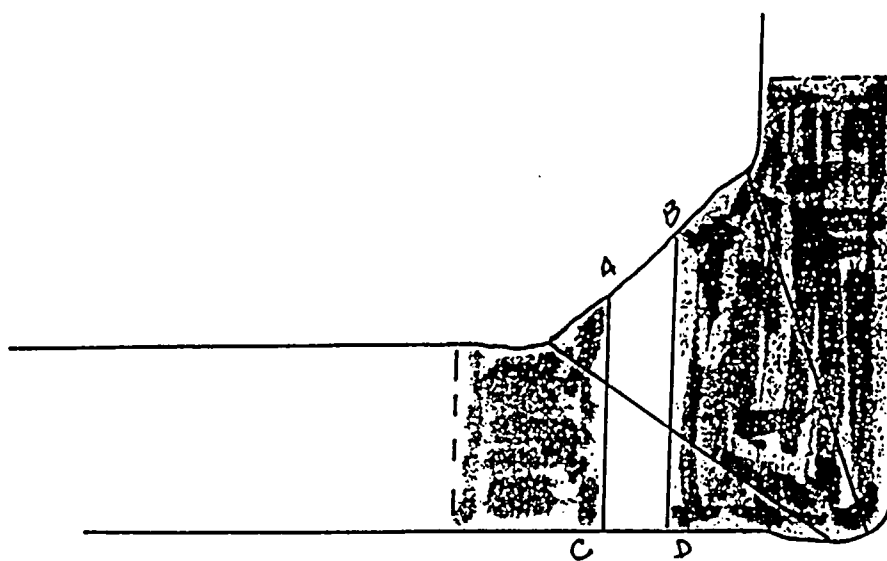
3-LDCB - OUTLET - V2

45° AXIAL SCAN 2

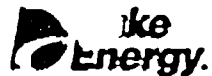
AREA OF COVERAGE

$$ABCD: \left( \frac{1.5^2 + 1.2^2}{2} \right) \cdot 35 \text{ in} \\ = .473^2 \text{ in}$$

Sketch or Photo:







# Supplemental Report

Report No.: ATTACHMENT C  
PAGE 62 OF 96  
Page: 6 of 14

Summary No.: B03.150.00.4  
Examiner: James H. Bern  
Examiner: \_\_\_\_\_  
Other: \_\_\_\_\_

Level: II  
Level: \_\_\_\_\_  
Level: \_\_\_\_\_

Reviewer: QMS III  
Site Review: \_\_\_\_\_  
ANII Review: Wendy C. Ritchie-Slaughter

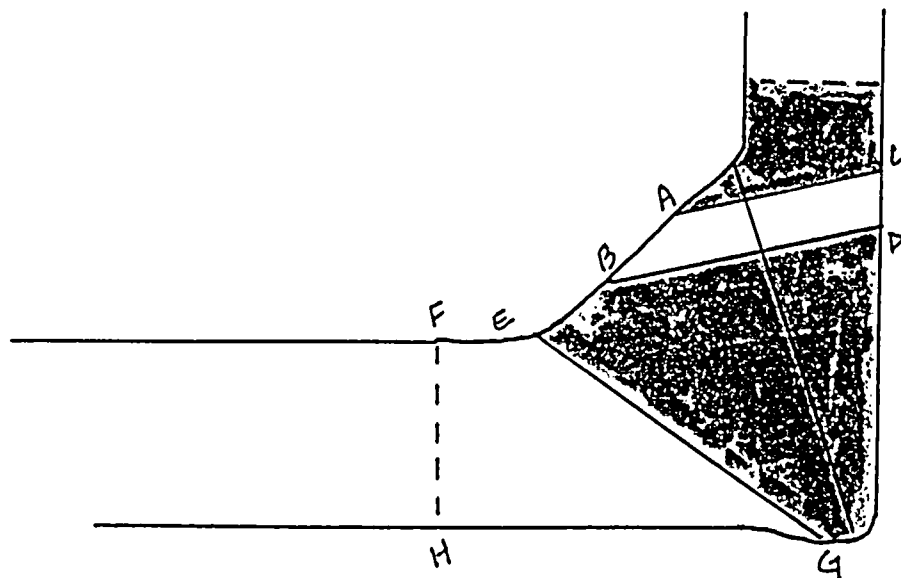
Date: 11/10/04  
Date: \_\_\_\_\_  
Date: 11/11/04

Comments:

3 - LDCB - OUTLET - V2

60° AXIAL SCAN 1

Sketch or Photo:



AREA OF COVERAGE

$$ABCD: \left( \frac{1.45\text{in} + 1.1\text{in}}{2} \right) .3" = .383\text{in}^2$$

$$EFGH: \left( \frac{.35\text{in} + 2.1\text{in}}{2} \right) .875\text{in}^2 = 1.455\text{in}^2$$



# Supplemental Report

Report No.: ATTACHMENT C  
PAGE 63 OF 96  
Page: 7 of 14

Summary No.: B03.150.00.4  
Examiner: [Signature]  
Examiner: \_\_\_\_\_  
Other: \_\_\_\_\_

Level: II  
Level: \_\_\_\_\_  
Level: \_\_\_\_\_

Reviewer: [Signature] III  
Site Review: \_\_\_\_\_  
ANII Review: Nancy C. Ritchie, Draught

Date: 11/10/04  
Date: \_\_\_\_\_  
Date: 11/11/04

Comments:

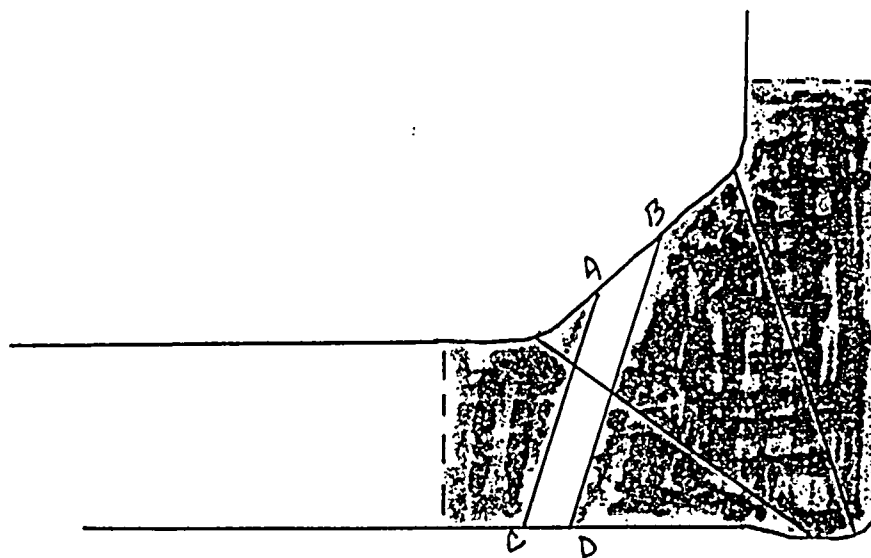
3- LDCB-OUTLET-V2

60° AXIAL SCAN 2

Sketch or Photo:

Area of Coverage

$$ABCD: \left( \frac{1.25" + 1.6"}{2} \right) \cdot 25\sin = .356^2 \text{ in}$$





# Supplemental Report

ATTACHMENT C  
PAGE 64 OF 96

Report No.:

Page: 8 of 14

Summary No.: B03.150.004

Examiner: James H. Byn

Examiner: \_\_\_\_\_

Other: \_\_\_\_\_

Level: II

Level: \_\_\_\_\_

Level: \_\_\_\_\_

Reviewer: John K. III

Site Review: \_\_\_\_\_

ANII Review: Nancy C. Ritchie-Slaughter

Date: 11/10/04

Date: \_\_\_\_\_

Date: 11/11/04

Comments:

3-LDCB - OUTLET - V2

## CIRC SCAN COVERAGE

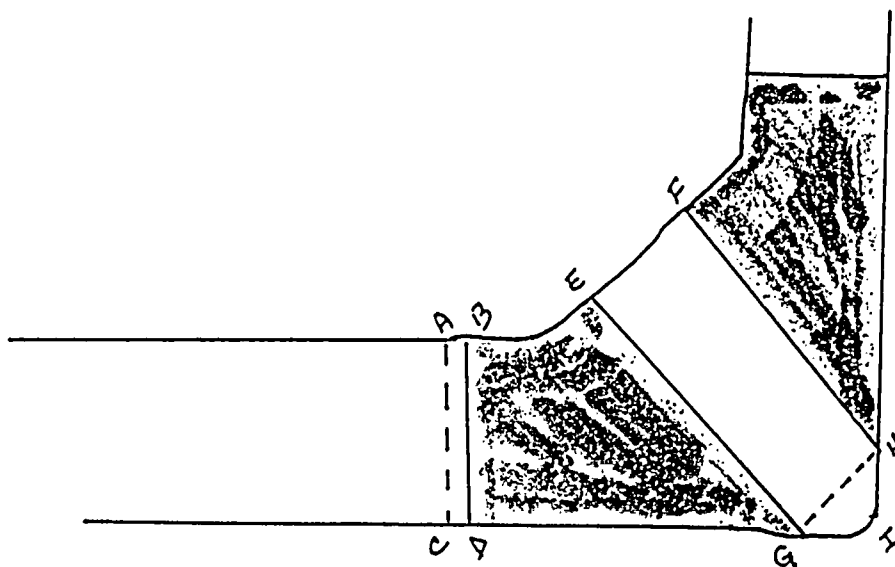
$$ABCD = .875 \times .1 = .0875^2 \text{ in}$$

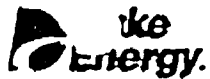
$$EFGH = 1.6 \times .7 = 1.12^2 \text{ in}$$

$$GHI = \frac{.4 \times .4}{2} = .08^2 \text{ in}$$

$$\underline{1.29^2 \text{ in} = \text{CIRC SCAN COVERAGE}}$$

Sketch or Photo:





# Supplemental Report

ATTACHMENT C  
PAGE 65 OF 96  
Report No.:  
Page: 9 of 14

Summary No.: B03.150.004

Examiner: [Signature]

Level: II

Reviewer: [Signature] III

Date: 11/10/04

Examiner: \_\_\_\_\_

Level: \_\_\_\_\_

Site Review: \_\_\_\_\_

Date: \_\_\_\_\_

Other: \_\_\_\_\_

Level: \_\_\_\_\_

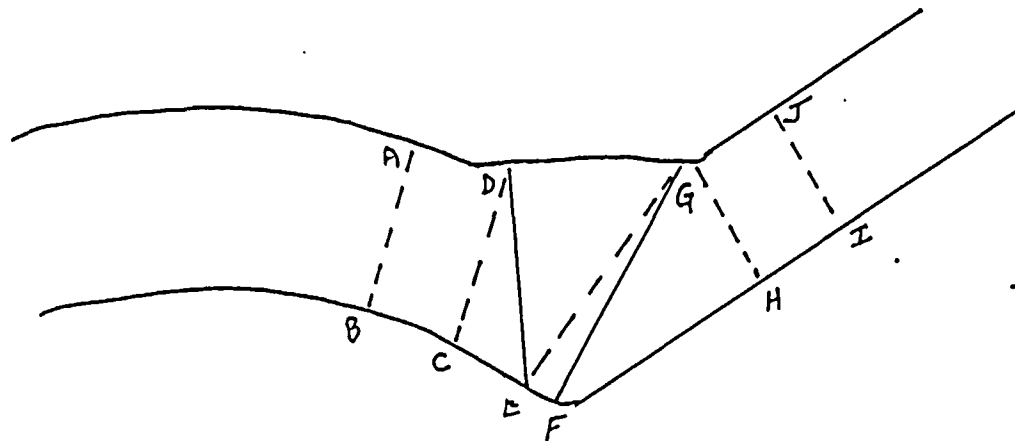
ANII Review: Nancy Critchley Slaughter

Date: 11/11/04

Comments:

3-LDCB-OUTLET-V2

Sketch or Photo:



TOTAL EXAM AREA

$$ABCD = .5 \times .875 = .4375^2 \text{ in}$$

$$CDE = \frac{1.15 \times .35}{2} = .2013^2 \text{ in}$$

$$DEG = \frac{1.4 \times .7}{2} = .49^2 \text{ in}$$

$$EFG = \frac{1.4 \times .2}{2} = .14^2 \text{ in}$$

$$FGH = \frac{1.3 \times .7}{2} = .455^2 \text{ in}$$

$$GHI = \frac{.5 \times .7}{2} = .35^2 \text{ in}$$

$$\text{TOTAL EXAM AREA} = \underline{2.07^2 \text{ in}}$$



# Supplemental Report

ATTACHMENT C

Report No.: PAGE 66 OF 96

Page: 10 of 14

Summary No.: B03.150.004

Examiner: [Signature]

Level: II

Reviewer: [Signature] III

Date: 11/10/04

Examiner: \_\_\_\_\_

Level: \_\_\_\_\_

Site Review: \_\_\_\_\_

Date: \_\_\_\_\_

Other: \_\_\_\_\_

Level: \_\_\_\_\_

ANII Review: Noney C Ritchie Slaughter

Date: 11/11/04

Comments:

3 - LDCB - OUTLET - V2

45° AXIAL SCAN 1

Sketch or Photo:

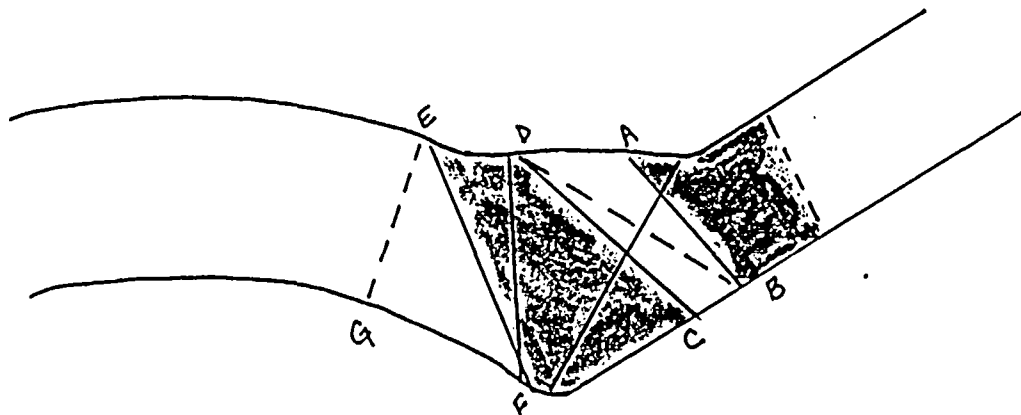
AREA OF COVERAGE

$$ABD : \frac{.9 \times .6}{2} = .27^2 \text{ in}$$

$$BCD : \frac{1.2 \times .25}{2} = .15^2 \text{ in}$$

$$EGF : \frac{1.0 \times .875}{2} = .436^2 \text{ in}$$

$$\text{TOTAL EXAM AREA} = \underline{.856^2 \text{ in}}$$





# Supplemental Report

ATTACHMENT C  
Report No.: PAGE 67 OF 96  
Page: 11 of 14

Summary No.: 303.150.024  
Examiner: [Signature]  
Examiner: \_\_\_\_\_  
Other: \_\_\_\_\_

Level: II  
Level: \_\_\_\_\_  
Level: \_\_\_\_\_

Reviewer: [Signature] III  
Site Review: \_\_\_\_\_  
ANII Review: Nancy C. Rettiler-Schuyler

Date: 11/10/04  
Date: \_\_\_\_\_  
Date: 11/11/04

Comments:

3-LDCB-OUTLET - V2

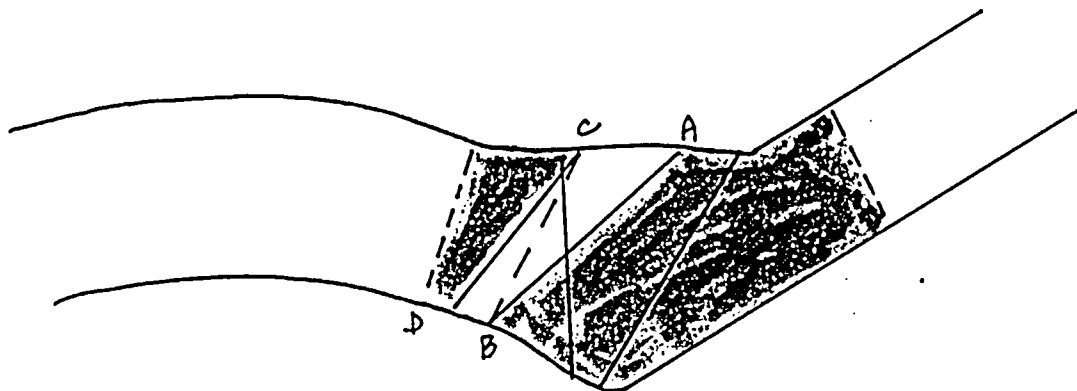
45° AXIAL SCAN 2

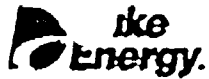
Sketch or Photo:

$$ABC: \frac{1.1 \times .5}{2} = .275^2 \text{ in}$$

$$BCD: \frac{.2 \times 1.1}{2} = .11^2 \text{ in}$$

$$\text{Total Area} = .385^2 \text{ in}$$





# Supplemental Report

ATTACHMENT C  
Report No.: PAGE 68 OF 96  
Page: 12 of 14

Summary No.: B03.150.004  
Examiner: [Signature]  
Examiner: \_\_\_\_\_  
Other: \_\_\_\_\_

Level: II  
Level: \_\_\_\_\_  
Level: \_\_\_\_\_

Reviewer: [Signature] III  
Site Review: \_\_\_\_\_  
ANII Review: Nancy C. Petrie, Shogren

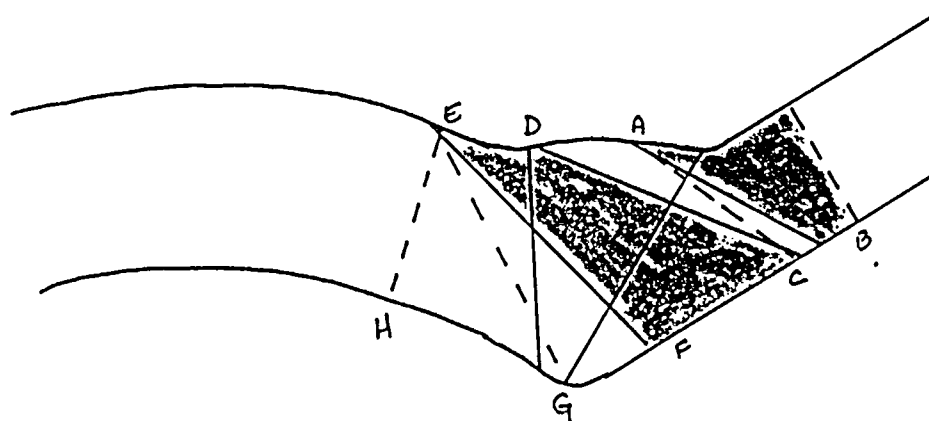
Date: 11/10/04  
Date: \_\_\_\_\_  
Date: 11/11/04

Comments:

3-LDCB-OUTLET-V2

60° AXIAL SCAN 1

Sketch or Photo:



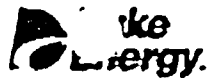
$$ABC: \frac{1.0 \times .1}{2} = .05^2 \text{ in}$$

$$ACD: \frac{1.0 \times .55}{2} = .275^2 \text{ in}$$

$$EFG: \frac{1.4 \times .5}{2} = .35^2 \text{ in}$$

$$EGH: \frac{1.0 \times .875}{2} = .4375^2 \text{ in}$$

$$\text{TOTAL AREA} = 1.111^2 \text{ in}$$



# Supplemental Report

Report No.: ATTACHMENT C  
PAGE 69 OF 96  
Page: 13 of 14

Summary No.: B03.150.004  
Examiner: [Signature]  
Examiner: \_\_\_\_\_  
Other: \_\_\_\_\_

Level: II  
Level: \_\_\_\_\_  
Level: \_\_\_\_\_

Reviewer: [Signature]  
Site Review: \_\_\_\_\_  
ANII Review: Nancy Critchley-Slaughter

Date: 11/10/04  
Date: \_\_\_\_\_  
Date: 11/11/04

Comments:

3-LDCB-OUTLET-V2

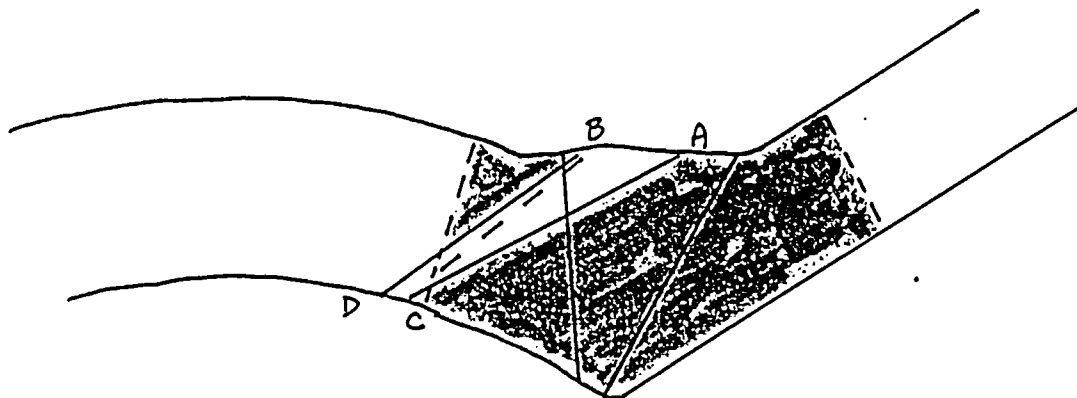
60° AXIAL SCAN 2

$$ABC: \frac{1.25 \times .25}{2} = .156^2$$

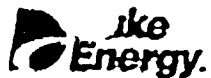
$$BCD: \frac{.1 \times 1.25}{2} = .063^2 \text{ in}$$

$$\text{TOTAL SCAN AREA} = .219^2 \text{ in}$$

Sketch or Photo:







# Supplemental Report

ATTACHMENT C  
PAGE 70 OF 96

Report No.:

Page: 14 of 14

Summary No.: B03.150.004

Examiner: James H. Buser

Examiner: \_\_\_\_\_

Other: \_\_\_\_\_

Level: II

Level: \_\_\_\_\_

Level: \_\_\_\_\_

Reviewer: JHK III

Site Review: \_\_\_\_\_

ANII Review: Nancy C. Rutter-Slaughter

Date: 11/10/04

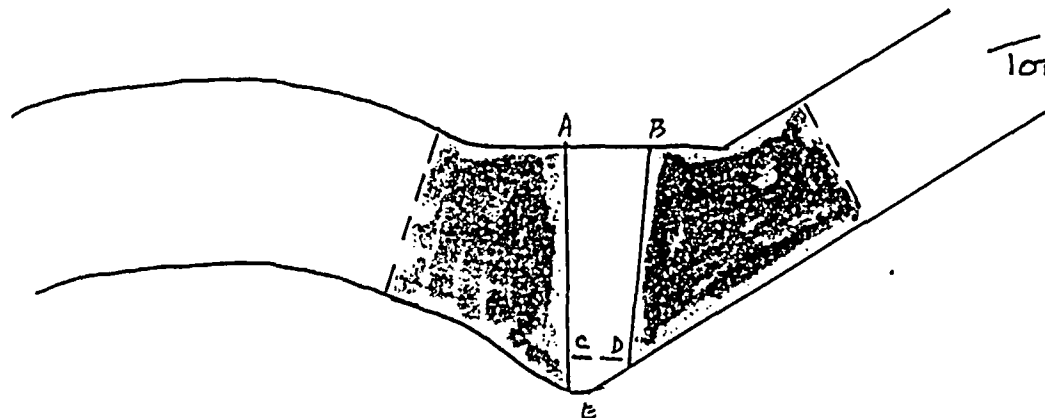
Date: \_\_\_\_\_

Date: 11/11/04

Comments:

3-LACB - OUTLET - V2

Sketch or Photo:



45° & 60° CircScan Coverage

$$ABCD = \frac{1.1}{2} (.45 + .3) = .4125^2 \text{ in}$$

$$CDE = \frac{.3 \times .15}{2} = .0225^2 \text{ in}$$
$$.435^2 \text{ in}$$

$$\text{TOTAL } 45^\circ \& 60^\circ \text{ COVERAGE} = .44^2 \text{ in}$$



# Magnetic Particle Examination

ATTACHMENT C  
PAGE 71 OF 96

Site/Unit: Oconee / O3 Procedure: NDE-25 Outage No.: ONS3EOC21  
Summary No.: C03.020.017 Procedure Rev.: 21 Report No.: MT-04-094  
Workscope: ISI Work Order No.: 98642593 Page: 1 of 3

Code: Asme Section XI 1989 Cat./Item: C-C- /C3.20.17 Location: N/A  
Drawing No.: 0-2479A Description: Rigid Restraint  
System ID: 14B  
Component ID: C03.020.017 /3-14B-H20A Size/Length: 8.0"/1.5"  
Limitations: Yes - see attached limitation reports.

Light Meter Mfg.: N/A Serial No.: N/A Illumination: N/A  
Temp. Tool Mfg.: N/A Serial No.: N/A Surface Temp.: N/A °F  
Resolution: N/A  
Lift Block Serial No.: N/A Surface Condition: As Welded  
Lo/Wo Location: N/A Field Orientation: Two Perpendicular

## Magnetic Particle Material

Brand: OCTAGON Wet ☐ Mixed: Yes ☐ Applied By: Dusting ☒  
Type: ND8-YELLOW Dry ☒ No ☒ Spraying ☐  
Batch No.: F-21011 Fluorescent ☐ With:                      Flooding ☐

Equipment: MAGNAFLUX Serial No.: NDE-UT-3  
Head Shot ☐ N/A Amperes Fixed Spacing ☐ AC ☒ DC ☐  
Adj. Spacing ☒ 3-6 inches Encircling Coils ☐ N/A Turns  
Prods. Spacing ☐ N/A inches Current (machine setting) ☐ N/A Amperes

Indication No.	Loc L	Loc W	Diameter	Length	Type R/L	Remarks
NRI						

## Comments:

Technique B, Acceptance Standard J, PIP 0-04-07725, VT-1 performed on limited area.

Results: Accept ☒ Reject ☐ Info ☐ Initial Section XI Examination

Percent Of Coverage Obtained > 90%: No - 50% Reviewed Previous Data: No

Examiner	Level	II	Signature	Date	Reviewer	Signature	Date
Eaton, Jay A.				11/8/2004			11-14-04
Examiner	Level	N/A	Signature	Date	Site Review	Signature	Date
N/A							11-16-04
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A							11/17/04



# Limitation Record

ATTACHMENT C  
PAGE 72 OF 96

Site/Unit: Oconee / O3  
Summary No.: C03.020.017  
Workscope: ISI

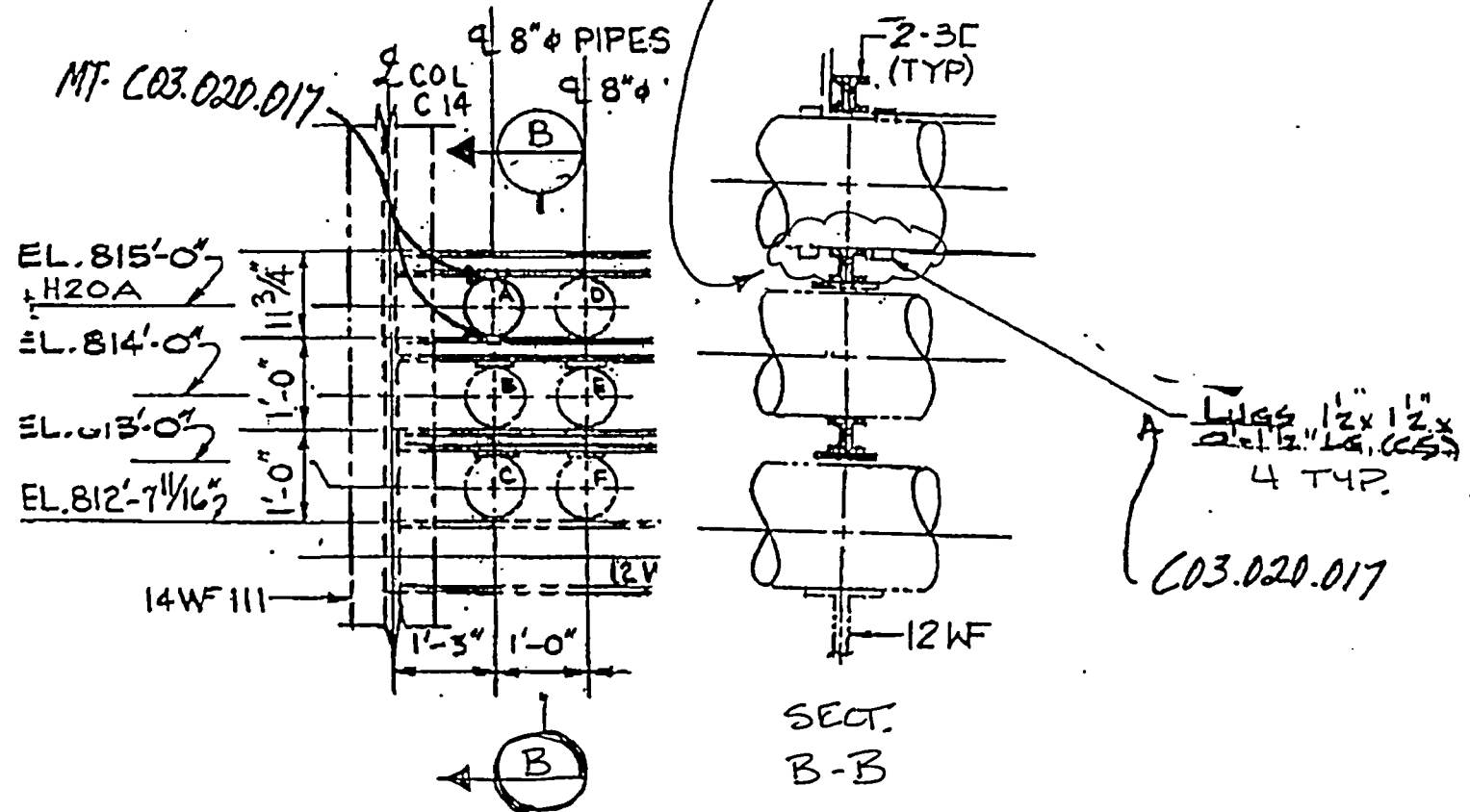
Procedure: NDE-25  
Procedure Rev.: 21  
Work Order No.: 98642593

Outage No.: ONS3EOC21  
Report No.: MT-04-094  
Page: 2 of 3

## Description of Limitation:

Bottom 2 lugs not examined due to limited access.

## Sketch of Limitation:



## Limitations removal requirements:

## Radiation field:

Examiner	Level	Signature	Date	Reviewer	Signature	Date
JAY EATON	II	[Signature]	11/8/04	[Signature]	[Signature]	11-14-04
Examiner	Level	Signature	Date	Site Review	Signature	Date
				[Signature]	[Signature]	11-16-04
her	Level	Signature	Date	ANII Review	Signature	Date
				[Signature]	[Signature]	11/17/04



# Determination of Percent Coverage for Surface Examinations

ATTACHMENT C  
PAGE 73 OF 96

Site/Unit: Oconee / O3 Procedure: NDE-25 Outage No.: ONS3EOC21  
Summary No.: C03.020.017 Procedure Rev.: 21 Report No.: MT-04-094  
Workscope: ISI Work Order No.: 98642593 Page: 3 of 3

Area Required (as shown in applicable code reference drawing)

Length 18.000 \* Width 1.250  
= Total Area required 22.500 square inches

## Coverage Achieved

Area examined 11.250 sq. in. / Total area required (100%) 22.500 sq. in.  
= Percent coverage 50.000 % (area required - area of limitations = area examined)

## To determine length of a circumferential weld

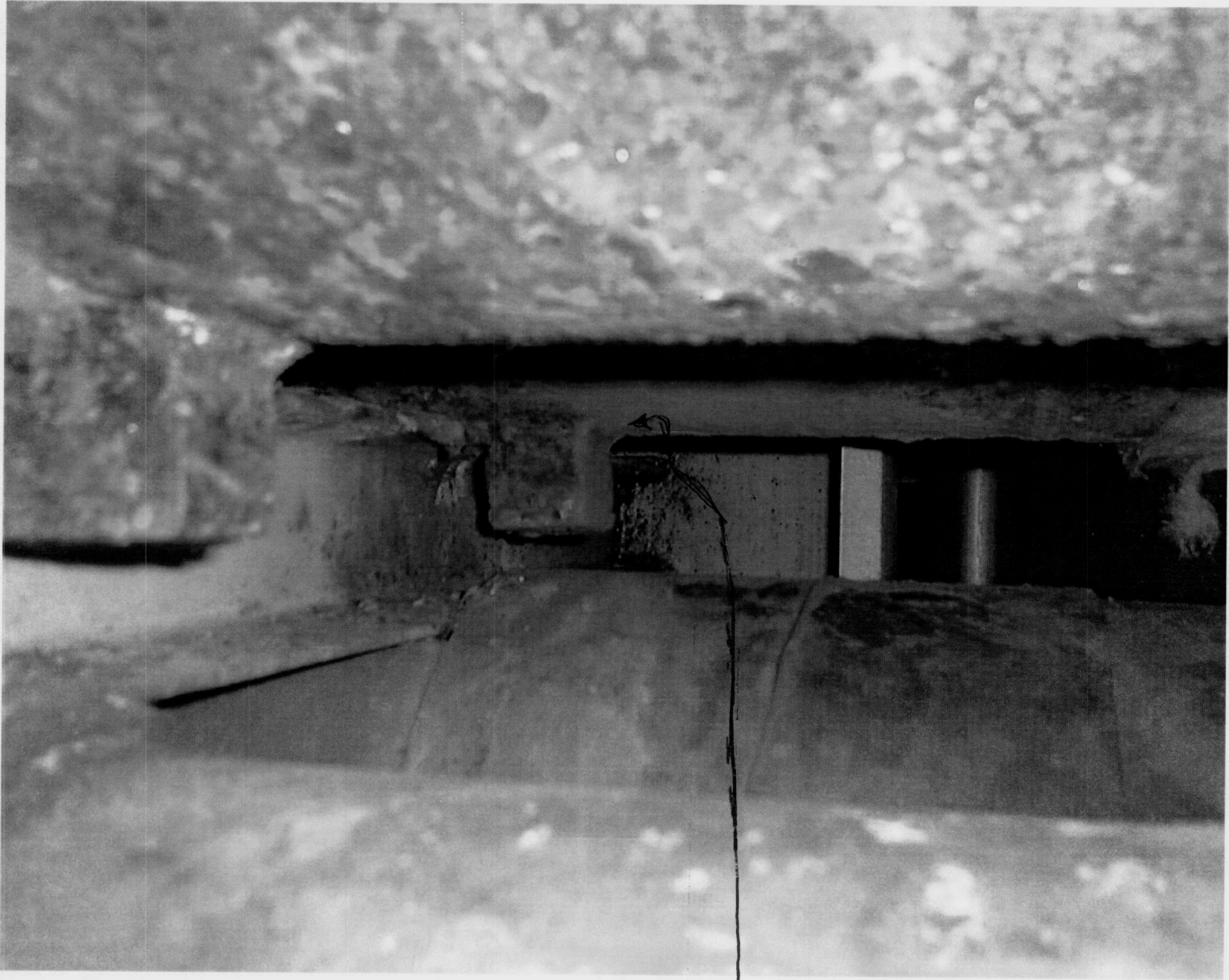
Note - Diameter refers to actual external diameter not pipe size (see table below)

Diameter \_\_\_\_\_ \* (Pi) 3.1416  
= Length \_\_\_\_\_ inches

Pipe Size	Actual Diameter	(Length) Circumference		Pipe Size	Actual Diameter	(Length) Circumference
2	2.375	7.46		12	12.75	40.06
2.5	2.875	9.03		14	14.0	43.98
3	3.5	11.0		16	16.0	50.27
3.5	4.0	12.57		18	18.0	56.55
4	4.5	14.14		20	20.0	62.83
5	5.563	17.48		22	22.0	69.12
6	6.625	20.81		24	24.0	75.40
8	8.625	27.10		30	30.0	94.25
10	10.75	33.77				

Site Field Supervisor: Day Moss

Date: 11-14-04



Lug not accessible

(Note: There is a Lug on  
the opposite side of "I" Beam  
that could not be examined  
also.



## UT Base N Lamination

ATTACHMENT C  
PAGE 75 OF 96Site/Unit: Oconee / O3  
Summary No.: C05.021.049  
Workscope: ISIProcedure: NDE-640  
Procedure Rev.: 2  
Work Order No.: 98643243Outage No.: ONS3EOC21  
Report No.: UT-04-488  
Page: 1 of 2Code: Asme Section XI 1989 Cat./Item: C-F-1/C5.21.49 Location: N/A  
Drawing No.: 3-51A-67 Description: Elbow to Pipe  
System ID: 51A  
Component ID: C05.021.049 /3-51A-67-3 Size/Length: N/A Thickness/Diameter: .375"/2.5"  
Limitations: None Start Time: 0954 Finish Time: 0958Examination Surface: Inside ☐ Outside ☒ Surface Condition: AS GROUND  
Lo Location: 9.1.1.2 Wo Location: Centerline of Weld Couplant: ULTRAGEL II Batch No.: 03125  
Temp. Tool Mfg.: FISHER Serial No.: MCNDE32768 Surface Temp.: 62 °F Scanning dB: 66  
Cal. Report No.: CAL-04-744

Ind. No.	% Loss Back Wall	Amplitude % Full Screen	Position One				Position Max				Position Two				Remarks
			L1	W1	W2	MP	LM	W1	W2	MP	L2	W1	W2	MP	
NRI															

Comments: FC 03-20

Results: Accept ☒ Reject ☐ Info ☐ Initial Section XI ExaminationPercent Of Coverage Obtained > 90%: Yes / 100%Reviewed Previous Data: No

Examiner	Level	II-N	Signature	Date	Reviewer	Signature	Date
Tucker, David K.				11/5/2004			11/12/04
Examiner	Level	II	Signature	Date	Site Review	Signature	Date
Jordan, Joey				11/5/2004			
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A							11/23/04



# Supplemental Report

Report No.: UT-04-488

Page: 2 of 2

Summary No.: C05.021.049

Examiner: Tucker, David K.

Level: II-N

Reviewer: [Signature]

Date: 11/12/04

Examiner: Jordan, Joey

Level: II

Site Review: [Signature]

Date: 11/22/04

Other: N/A

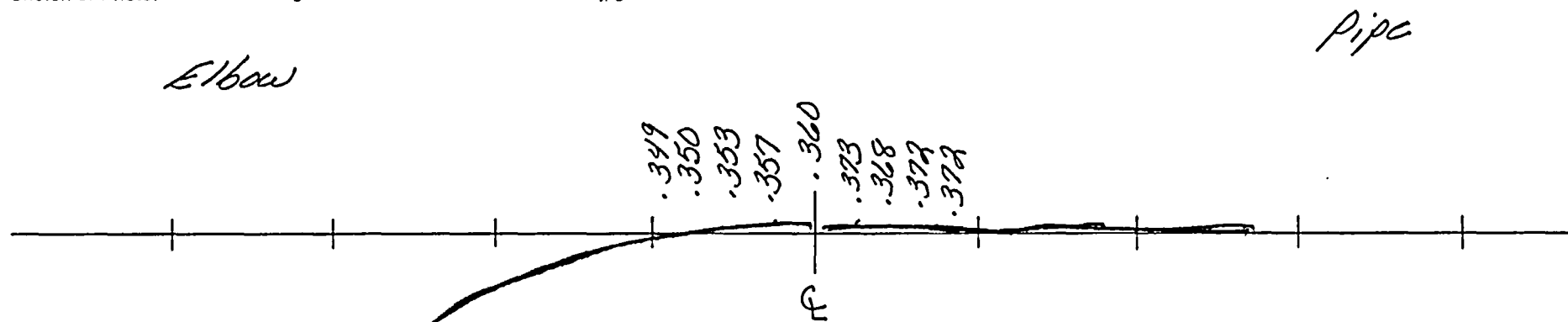
Level: N/A

ANII Review: [Signature]

Comments:

Sketch or Photo:

\\Ngofst1\ndeeess\UT\IDDEAL\ProfileLine2.jpg





# UT Pipe Weld Examination

ATTACHMENT C  
PAGE 77 OF 96

Site/Unit: Oconee / 03

Procedure: NDE-600

Outage No.: ONS3EOC21

Summary No.: C05.021.049

Procedure Rev.: 15

Report No.: UT-04-490

Workscope: ISI

Work Order No.: 98643243

Page: 1 of 3

Code: Asme Section XI 1989 Cat./Item: C-F-1/C5.21.49 Location: N/A

Drawing No.: 3-51A-67 Description: Elbow to Pipe

System ID: 51A

Component ID: C05.021.049 /3-51A-67-3 Size/Length: N/A Thickness/Diameter: .375"/2.5"

Limitations: Yes - see attached limitation report. Start Time: 1005 Finish Time: 1026

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

Lo Location: 9.1.1.2 Wo Location: Centerline of Weld Couplant: ULTRAGEL II Batch No.: 03125

Temp. Tool Mfg.: FISHER Serial No.: MCNDE32768 Surface Temp.: 62 °F

Cal. Report No.: CAL-04-745, CAL-04-746, CAL-04-747

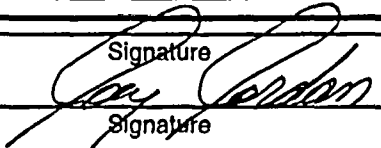
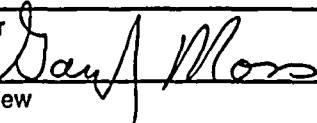

Angle Used	0	45	45T	60	70	
Scanning dB			45.0	48.0	55	

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

Comments:

Results: Accept ☒ Reject ☐ Info ☐ Initial Section XI Examination

Percent Of Coverage Obtained > 90%: No / 87.388% Reviewed Previous Data: No

Examiner	Level II	Signature	Date	Reviewer	Signature	Date
Jordan, Joey			11/5/2004			11-16-04
Examiner	Level N/A	Signature	Date	Site Review	Signature	Date
N/A						
Other	Level N/A	Signature	Date	ANII Review	Signature	Date
N/A						1-10-05





## Limitation Record

Site/Unit: Oconee / O3  
 Summary No.: C05.021.049  
 Workscope: ISI

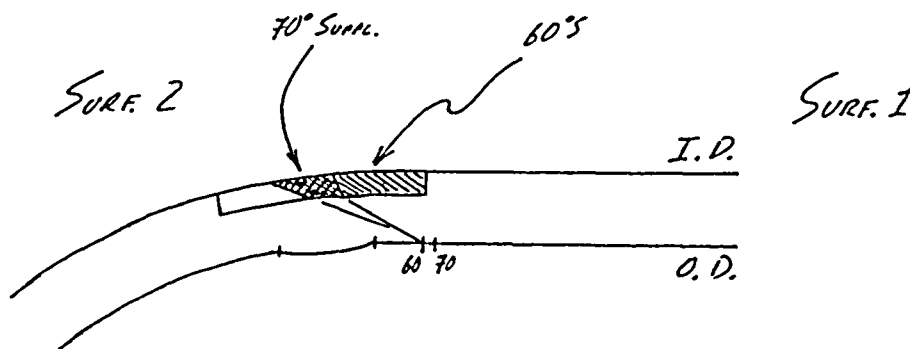
Procedure: NDE-600  
 Procedure Rev.: 15  
 Work Order No.: 98643243

Outage No.: ONS3EOC21  
 Report No.: UT-04-490  
 Page: 2 of 3

## Description of Limitation:

Limited at the intrados on the elbow side of the weld. Limitation dimension is the inner third of the elbow (Lo + 3.0" to Lo + 6.0").

## Sketch of Limitation:



$$\text{TOTAL EXAM AREA} = 1.0\text{in} \times 0.125\text{in} = 0.125\text{in}^2$$

$$60^\circ \text{ SHEAR COVERAGE} = \left( \frac{.45\text{in} + .52\text{in}}{2} \right) \times .125\text{in} = .0606\text{in}^2 / .125\text{in}^2 = 48.5\%$$

$$70^\circ \text{ SHEAR SUPPL. CVG.} = \left( \frac{.15\text{in} + .30\text{in}}{2} \right) \times .125\text{in} = .0281\text{in}^2 / .125\text{in}^2 = 22.5\%$$

## Limitations removal requirements:

## Radiation field:

Examiner	Level	II-N	Signature	Date	Reviewer	Signature	Date
Tucker, David K.			<i>David K. Tucker</i>	11/5/2004	<i>David K. Tucker</i>		11/22/04
Examiner	Level	II	Signature	Date	Site Review	Signature	Date
Jordan, Joey			<i>Joey Jordan</i>	11/5/2004			
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
NA					<i>Mark P. P.</i>		11/22/04



# Determination of Percent Coverage for UT Examinations - Pipe

ATTACHMENT C  
PAGE 79 OF 96

Site/Unit:	Oconee / O3	Procedure:	NDE-600	Outage No.:	ONS3EOC21
Summary No.:	C05.021.049	Procedure Rev.:	15	Report No.:	UT-04-490
Workscope:	ISI	Work Order No.:	98643243	Page:	3 of 3

## 45 deg

Scan 1		% Length X		% volume of length / 100 =		% total for Scan 1
Scan 2		% Length X		% volume of length / 100 =		% total for Scan 2
Scan 3	100.000	% Length X	100.000	% volume of length / 100 =	100.000	% total for Scan 3
Scan 4	100.000	% Length X	100.000	% volume of length / 100 =	100.000	% total for Scan 4

Add totals and divide by # scans = 100.000 % total for 45 deg

## Other deg - 60 (to be used for supplemental scans)

The data to be listed below is for coverage that was not obtained with the 45 deg scans.

Scan 1	66.700	% Length X	100.000	% volume of length / 100 =	66.700	% total for Scan 1
Scan 2	66.700	% Length X	100.000	% volume of length / 100 =	66.700	% total for Scan 2
Scan <del>3</del> 1	33.300	% Length X	48.500	% volume of length / 100 =	16.150	% total for Scan 3
Scan <del>4</del> 2	33.300	% Length X	0.000	% volume of length / 100 =	0.000	% total for Scan 4

## Percent complete coverage

Add totals for each scan required and divide by # of scans to determine;

87.388 % Total for complete exam

Site Field Supervisor:

Daniel J. [Signature]

Date: 11/22/04

NOTE: 70° SHEAR SCAN NOT INCLUDED IN PERCENT COVERAGE DUE TO REQUIREMENTS OF 10CFR50.55a(h)(2)(XV)(A)(2). BEST EFFORT SCAN WITH 70° SHEAR OBTAINED AN ADDITIONAL 22.5% COVERAGE IN ONE AXIAL DIRECTION.



## UT Base Metal Lamination

Site/Unit: Oconee / O3  
 Summary No.: C05.021.051  
 Workscope: ISI

Procedure: NDE-640  
 Procedure Rev.: 2  
 Work Order No.: 98642953

Outage No.: ONS3EOC21  
 Report No.: UT-04-393  
 Page: 1 of 2

Code: Asme Section XI 1989 Cat./Item: C-F-1/C5.21.51 Location: N/A  
 Drawing No.: 3HP-241 Description: Pipe to Valve (3HP-194)  
 System ID: 51A  
 Component ID: C05.021.051 /3HP-241-2 Size/Length: N/A Thickness/Diameter: 0.674"/4.0"  
 Limitations: None Start Time: 1102 Finish Time: 1105

Examination Surface: Inside ☐ Outside ☒ Surface Condition: AS GROUND  
 Lo Location: 9.1.1.1 Wo Location: Centerline of Weld Couplant: ULTRAGEL II Batch No.: 03125  
 Temp. Tool Mfg.: FISHER Serial No.: MCNDE 27220 Surface Temp.: 74 °F Scanning dB: 65.6  
 Cal. Report No.: CAL-04-643

Ind. No.	% Loss Back Wall	Amplitude % Full Screen	Position One				Position Max				Position Two				Remarks
			L1	W1	W2	MP	LM	W1	W2	MP	L2	W1	W2	MP	
NRI															

Comments: FC 03-20

Results: Accept ☒ Reject ☐ Info ☐

Initial Section XI Examination

Percent Of Coverage Obtained > 90%: Yes / 100%

Reviewed Previous Data: No

Examiner Level III Zimmerman, David K.	Signature <i>David K. Zimmerman</i>	Date 10/20/2004	Reviewer <i>Harry Moss</i>	Signature <i>Harry Moss</i>	Date 10-22-04
Examiner Level II-N Jones, Russel	Signature <i>Russel Jones</i>	Date 10/20/2004	Site Review	Signature	Date
Other Level N/A N/A	Signature	Date	ANII Review <i>Tim H. [Signature]</i>	Signature	Date 10/24/04



# Supplemental Report

Report No.: UT-04-393  
Page: 2 of 2

Summary No.: C05.021.051

Examiner: Zimmerman, David K. *David K. Zimmerman*

Examiner: Jones, Russel *Russel Jones* 10/20/04

Other: N/A

Level: III

Level: II-N

Level: N/A

Reviewer: Gary Moss *Gary Moss*

Site Review: *[Signature]*

ANII Review: *[Signature]*

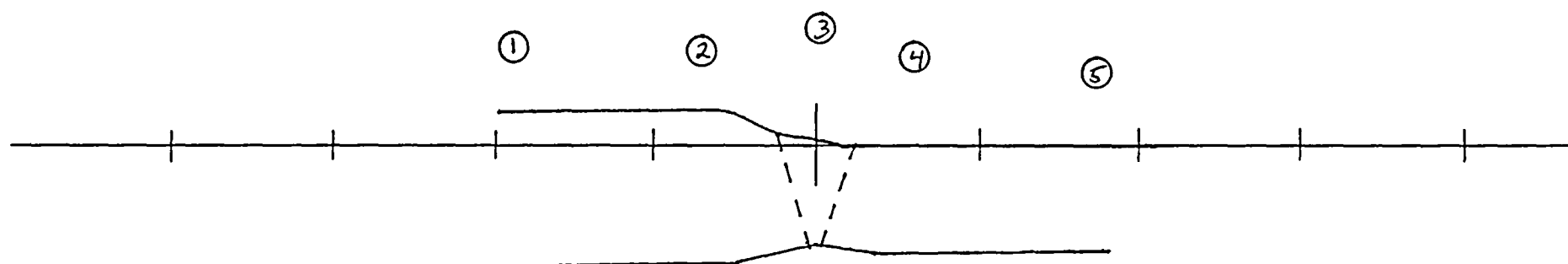
Date: 10.23.04

Date: *[Signature]*

Date: 10/21/04

Comments: Thickness/Profile sheet.

Sketch or Photo: \\ngofsf1\ndeess\UT\IDDEAL\ProfileLine2.jpg



- ① .977"
- ② .977"
- ③ .654"
- ④ .635"
- ⑤ .668"



# UT Pipe Weld Examination

ATTACHMENT C  
PAGE 82 OF 96

Site/Unit: Oconee / 03  
Summary No.: C05.021.051  
Workscope: ISI

Procedure: NDE-600  
Procedure Rev.: 15  
Work Order No.: 98642953

Outage No.: ONS3EOC21  
Report No.: UT-04-394  
Page: 1 of 3

Code: Asme Section XI 1989 Cat./Item: C-F-1/C5.21.51 Location: N/A  
Drawing No.: 3HP-241 Description: Pipe to Valve (3HP-194)  
System ID: 51A  
Component ID: C05.021.051 /3HP-241-2 Size/Length: N/A Thickness/Diameter: 0.674" / 4"  
Limitations: Yes - See ISI Limitation Report Attachment Start Time: 1107 Finish Time: 1125

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

Lo Location: N/A Wo Location: Centerline of Weld Couplant: ULTRAGEL II Batch No.: 03125

Temp. Tool Mfg.: FISHER Serial No.: MCNDE 27220 Surface Temp.: 74 °F

Cal. Report No.: CAL-04-644, CAL-04-645, CAL-04-646

Angle Used	0	45	45T	60	38°	60RL
Scanning dB				49.6	49.6	54.1

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

Comments:

None

Results: Accept ☒ Reject ☐ Info ☐

Initial Section XI Exam

Percent Of Coverage Obtained > 90%: No / 35.55%

Reviewed Previous Data: No

Examiner	Level	III	Signature	Date	Reviewer	Signature	Date
Zimmerman, David K.				10/20/2004			10/22/04
Examiner	Level	II-N	Signature	Date	Site Review	Signature	Date
Jones, Russel				10/20/2004			
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A							10/22/04



# Determination of Percent Coverage for UT Examinations - Pipe

ATTACHMENT C  
PAGE 83 OF 96

Site/Unit:	<u>Oconee / O3</u>	Procedure:	<u>NDE-600</u>	Outage No.:	<u>ONS3EOC21</u>
Summary No.:	<u>C05.021.051</u>	Procedure Rev.:	<u>15</u>	Report No.:	<u>UT-04-394</u>
Workscope:	<u>ISI</u>	Work Order No.:	<u>98642953</u>	Page:	<u>2</u> of <u>3</u>

## 45 deg

Scan 1	<u>                    </u>	% Length X	<u>                    </u>	% volume of length / 100 =	<u>                    </u>	% total for Scan 1
Scan 2	<u>                    </u>	% Length X	<u>                    </u>	% volume of length / 100 =	<u>                    </u>	% total for Scan 2
Scan 3	<u>100.000</u>	% Length X	<u>47.400</u>	% volume of length / 100 =	<u>47.400</u>	% total for Scan 3
Scan 4	<u>100.000</u>	% Length X	<u>47.400</u>	% volume of length / 100 =	<u>47.400</u>	% total for Scan 4

Add totals and divide by # scans = 47.400 % total for 45 deg

Other deg - 60 (to be used for supplemental scans)

The data to be listed below is for coverage that was not obtained with the 45 deg scans.

Scan 1	<u>100.000</u>	% Length X	<u>0.000</u>	% volume of length / 100 =	<u>0.000</u>	% total for Scan 1
Scan 2	<u>100.000</u>	% Length X	<u>47.400</u>	% volume of length / 100 =	<u>47.400</u>	% total for Scan 2
Scan 3	<u>                    </u>	% Length X	<u>                    </u>	% volume of length / 100 =	<u>                    </u>	% total for Scan 3
Scan 4	<u>                    </u>	% Length X	<u>                    </u>	% volume of length / 100 =	<u>                    </u>	% total for Scan 4

## Percent complete coverage

Add totals for each scan required and divide by # of scans to determine;

35.550 % Total for complete exam

Site Field Supervisor:



Date: 10/20/04

NOTE: 60°RL SCAN NOT INCLUDED IN PERCENT COVERAGE DUE TO REQUIREMENTS OF 10CFR50.55a(b)(2)(xv)(A)(2). BEST EFFORT SCAN WITH 60°RL OBTAINED 52.6% COVERAGE IN ONE AXIAL SCAN.



# Supplemental Report

ATTACHMENT C  
PAGE 84 OF 96

Report No.: UT-04-394  
Page: 3 of 3

Summary No.: C05.021.051

Examiner: Zimmerman, David K.

Level: III

Reviewer: Jan Mon

Date: 10/22/04

Examiner: Jones, Russel

Level: II-N

Site Review: Jan Mon

Date: 10/22/04

Other: N/A

Level: N/A

ANII Review: Jan Mon

Date: 10/22/04

Comments: Scan 2, 3, 4 coverage.

Sketch or Photo:

TOTAL AREA OF INSPECTION

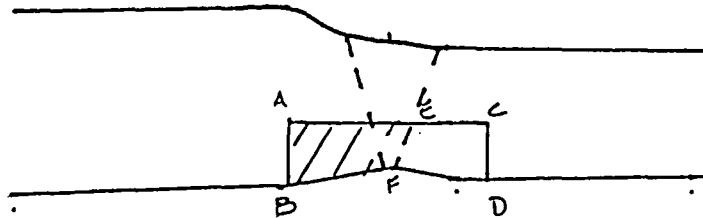
$$ABCD: .225in \times .95in = .213in^2$$

TOTAL AREA OF COVERAGE

$$ECPD: \left( \frac{.4in + .5in}{2} \right) .225in = .101in^2$$

TOTAL SUPPLEMENTAL COVERAGE

$$.213in^2 - .101in^2 = .112in^2$$



PERCENT OF COVERAGE

$$\frac{.101in^2}{.213in^2} = .474 \times 100 = 47.4\%$$

PERCENT OF SUPPLEMENTAL

$$\frac{.112in^2}{.213in^2} = .526 \times 100 = 52.6\%$$

## DUKE POWER COMPANY

## ISI LIMITATION REPORT

UT-04-394

Attachment

Component/Weld ID: <u>C05.021.051</u> Item No: <u>3HP-241-2</u>		remarks:	
<input checked="" type="checkbox"/> NO SCAN	SURFACE	BEAM DIRECTION	Valve Conf.
<input type="checkbox"/> LIMITED SCAN	<input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> cw <input type="checkbox"/> ccw		
FROM L <u>N/A</u> to L <u>N/A</u> INCHES FROM W0 <u>C/L</u> to <u>Beyond</u>			
ANGLE: <input type="checkbox"/> 0 <input type="checkbox"/> 45 <input checked="" type="checkbox"/> 60 other _____ FROM <u>0</u> DEG to <u>360</u> DEG			
<input type="checkbox"/> NO SCAN	SURFACE	BEAM DIRECTION	Valve Conf.
<input checked="" type="checkbox"/> LIMITED SCAN	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input checked="" type="checkbox"/> cw <input checked="" type="checkbox"/> ccw		
FROM L <u>N/A</u> to L <u>N/A</u> INCHES FROM W0 <u>C/L</u> to <u>Beyond</u>			
ANGLE: <input type="checkbox"/> 0 <input checked="" type="checkbox"/> 45 <input type="checkbox"/> 60 other _____ FROM <u>0</u> DEG to <u>360</u> DEG			
<input type="checkbox"/> NO SCAN	SURFACE	BEAM DIRECTION	
<input type="checkbox"/> LIMITED SCAN	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> cw <input type="checkbox"/> ccw		
FROM L _____ to L _____ INCHES FROM W0 _____ to _____			
ANGLE: <input type="checkbox"/> 0 <input type="checkbox"/> 45 <input type="checkbox"/> 60 other _____ FROM _____ DEG to _____ DEG			
<input type="checkbox"/> NO SCAN	SURFACE	BEAM DIRECTION	
<input type="checkbox"/> LIMITED SCAN	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> cw <input type="checkbox"/> ccw		
FROM L _____ to L _____ INCHES FROM W0 _____ to _____			
ANGLE: <input type="checkbox"/> 0 <input type="checkbox"/> 45 <input type="checkbox"/> 60 other _____ FROM _____ DEG to _____ DEG			
		Sketch(s) attached	
		<input type="checkbox"/> yes <input checked="" type="checkbox"/> No	
Prepared By: <u>David Zimmerman</u> <i>David Zimmerman</i> Level: <u>III</u> Date: <u>10/20/2004</u>		Attachment <u>1</u> of <u>1</u>	
Reviewed By: <u>Jan M</u> <i>Jan M</i> Date: <u>10/22/04</u>		Authorized Inspector: <u>[Signature]</u> Date: <u>10/22/04</u>	





## UT Base Metal Examination

ATTACHMENT C  
PAGE 86 OF 96Site/Unit: Oconee / O3  
Summary No.: C05.021.076  
Workscope: ISIProcedure: NDE-640  
Procedure Rev.: 2  
Work Order No.: 98645068Outage No.: ONS3EOC21  
Report No.: UT-04-181  
Page: 1 of 2Code: Asme Section XI 1989 Cat./Item: C-F-1/C5.21.76 Location: N/A  
Drawing No.: 3-51A-119 Description: Flange to Pipe  
System ID: 51A  
Component ID: C05.021.076 /3-51A-119-11 Size/Length: N/A Thickness/Diameter: 4.0" / .531  
Limitations: None Start Time: 1109 Finish Time: 1113Examination Surface: Inside ☐ Outside ☒ Surface Condition: AS GROUND  
Lo Location: 9.1.1.1 Wo Location: Centerline of Weld Couplant: ULTRAGEL II Batch No.: 03125  
Temp. Tool Mfg.: FISHER Serial No.: MCNDE32768 Surface Temp.: 88 °F Scanning dB: 50  
Cal. Report No.: CAL-04-433

Ind. No.	% Loss Back Wall	Amplitude % Full Screen	Position One				Position Max				Position Two				Remarks
			L1	W1	W2	MP	LM	W1	W2	MP	L2	W1	W2	MP	
NRI															

Comments: FC 03-20Results: Accept ☒ Reject ☐ Info ☐ Initial Section XI Inspection  
Percent Of Coverage Obtained > 90%: Yes-100% Reviewed Previous Data: No

Examiner Level II Resor, James H.	Signature 	Date 7/12/2004	Reviewer 	Signature	Date 7-14-04
Examiner Level II Jordan, Joey	Signature 	Date 7/12/2004	Site Review	Signature	Date
Other Level N/A N/A	Signature	Date	ANII Review 	Signature	Date 7/14/04



# Supplemental Report

Report No.: UT-04-181

Page: 2 of 2

Summary No.: C05.021.076

Examiner: Resor, James H. *James H. Resor*

Level: II

Reviewer: *Garth Moss*

Date: 4-14-04

Examiner: Jordan, Joey *Joey Jordan*

Level: II

Site Review:

Date:

Other: N/A

Level: N/A

ANII Review: *Garth Moss*

Date: 7/16/04

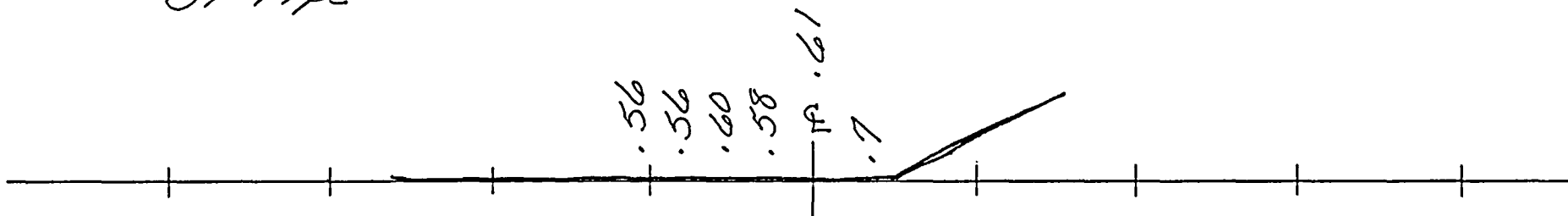
Comments:

Sketch or Photo:

Z:\UT\IDDEAL\ProfileLine2.jpg

*51 Pipe*

*52 Flange*





## UT Pipe Weld Examination

Site/Unit: Oconee / O3 Procedure: NDE-600 Outage No.: ONS3EOC21  
 Summary No.: C05.021.076 Procedure Rev.: 15 Report No.: UT-04-182  
 Workscope: ISI Work Order No.: 98645068 Page: 1 of 3

---

Code: Asme Section XI 1989 Cat./Item: C-F-1/C5.21.76 Location: N/A  
 Drawing No.: 3-51A-119 Description: Flange to Pipe  
 System ID: 51A  
 Component ID: C05.021.076 /3-51A-119-11 Size/Length: N/A Thickness/Diameter: 4.0" / .531  
 Limitations: Yes - See Attached Limitation Report Start Time: 1116 Finish Time: 1131

Examination Surface: Inside ☐ Outside ☒ Surface Condition: AS GROUND  
 Lo Location: 9.1.1.1 Wo Location: Centerline of Weld Couplant: ULTRAGEL II Batch No.: 03125  
 Temp. Tool Mfg.: FISHER Serial No.: MCNDE32768 Surface Temp.: 88 °F

Cal. Report No.: CAL-04-434, CAL-04-435, CAL-04-436

Angle Used	0	45	45T	60	60L	
Scanning dB			42	45	60	

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

Comments:

See attached calculation sheets

Results: Accept ☒ Reject ☐ Info ☐ Initial Section XI Inspection  
 Percent Of Coverage Obtained > 90%: No Reviewed Previous Data: No

Examiner Level II Resor, James H.	Signature <i>James H. Resor</i>	Date 7/12/2004	Reviewer <i>Man / Mor</i>	Signature	Date 7-14-04
Examiner Level II Jordan, Joey	Signature <i>Joey Jordan</i>	Date 7/12/2004	Site Review	Signature	Date
Other Level N/A N/A	Signature	Date	ANII Review <i>[Signature]</i>	Signature	Date 7/14/04



## Limitation Record

Site/Unit: <u>Oconee / O3</u>	Procedure: <u>NDE-600</u>	Outage No.: <u>ONS3EOC21</u>
Summary No.: <u>C05.021.076</u>	Procedure Rev.: <u>15</u>	Report No.: <u>UT-04-182</u>
Workscope: <u>ISI</u>	Work Order No.: <u>98645068</u>	Page: <u>3</u> of <u>3</u>

**Description of Limitation:**

See attached sketch for calculations of aggregate coverage.

**Sketch of Limitation:**

**Limitations removal requirements:**

**Radiation field:**

Examiner	Level	Signature	Date	Reviewer	Signature	Date
Resor, James H.	II		7/12/2004			7-14-04
Examiner	Level	Signature	Date	Site Review	Signature	Date
Jordan, Joey	II		7/12/2004			
Other	Level	Signature	Date	ANII Review	Signature	Date
N/A	N/A					7/14/04



# Determination of Percent Coverage for UT Examinations - Pipe

ATTACHMENT C  
PAGE 90 OF 96

Site/Unit:	<u>Oconee / O3</u>	Procedure:	<u>NDE-600</u>	Outage No.:	<u>ONS3EOC21</u>
Summary No.:	<u>C05.021.076</u>	Procedure Rev.:	<u>15</u>	Report No.:	<u>UT-04-182</u>
Workscope:	<u>ISI</u>	Work Order No.:	<u>98645068</u>	Page:	<u>2</u> of <u>3</u>

## 45 deg

Scan 1	<u>                    </u>	% Length X	<u>                    </u>	% volume of length / 100 =	<u>                    </u>	% total for Scan 1
Scan 2	<u>                    </u>	% Length X	<u>                    </u>	% volume of length / 100 =	<u>                    </u>	% total for Scan 2
Scan 3	<u>100.000</u>	% Length X	<u>100.000</u>	% volume of length / 100 =	<u>100.000</u>	% total for Scan 3
Scan 4	<u>100.000</u>	% Length X	<u>100.000</u>	% volume of length / 100 =	<u>100.000</u>	% total for Scan 4

Add totals and divide by # scans = 100.000 % total for 45 deg

## Other deg - 60 (to be used for supplemental scans)

The data to be listed below is for coverage that was not obtained with the 45 deg scans.

Scan 1	<u>100.000</u>	% Length X	<u>32.000</u>	% volume of length / 100 =	<u>32.000</u>	% total for Scan 1
Scan 2	<u>0.000</u>	% Length X	<u>0.000</u>	% volume of length / 100 =	<u>0.000</u>	% total for Scan 2
Scan 3	<u>                    </u>	% Length X	<u>                    </u>	% volume of length / 100 =	<u>                    </u>	% total for Scan 3
Scan 4	<u>                    </u>	% Length X	<u>                    </u>	% volume of length / 100 =	<u>                    </u>	% total for Scan 4

## Percent complete coverage

Add totals for each scan required and divide by # of scans to determine;

58.000 % Total for complete exam

Site Field Supervisor:

DE Housen

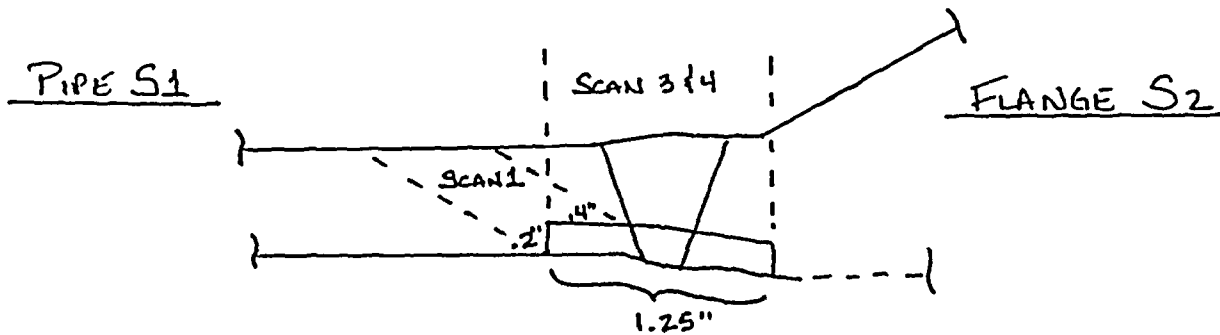
Date:

7.13.04

NOTE: 60° RL SCAN NOT INCLUDED IN PERCENT COVERAGE  
BECAUSE OF THE REQUIREMENTS OF 10CFR50.55a(b)(2)(xv)(A)(2).  
BEST EFFORT SCAN WITH 60° RL OBTAINED 56%  
COVERAGE IN ONE AXIAL DIRECTION.

CD5.021.076

3-51A-119-11



SCAN INFO.

SCAN 1 (60°)  $.2 \times .4 \times 14.14 = 1.131^3 \text{ in}$   
 SCAN 2 (60°) = 0"  
 SCAN 3 (45°)  $.25 \times 14.14 = 3.535^3 \text{ in}$   
 SCAN 4 (45°)  $.25 \times 14.14 = 3.535^3 \text{ in}$

TOTAL VOL. SCANNED =  $8.20^3 \text{ in}$

SCAN 1 = 32%  
 SCAN 2 = 0%  
 SCAN 3 = 100%  
 SCAN 4 = 100%

[(SUPPLEMENTAL "L" WAVE)  
= 56%]

$232\% \div 4(\text{SCANS}) = 58\%$

TOTAL AGGREGATE SHEARWAVE  
 COVERAGE (AXIAL & CIRCUMFENCIAL)

= 58%

WELD DIMS

4" x .531" (4.5" x .531")

CIRCUMFERENCE = 14.14"

AREA OF INTEREST =

$.2" \times 1.25" = .25^3 \text{ in}$

WELD AREA OF INTEREST X CIRC  
 = TOTAL REQ'D VOLUME

$.25^2 \times 14.14 = 3.535^3 \text{ in}$

3.535<sup>3</sup> in

3.535 X TOTAL SCANS (4)  
 = TOTAL REQ'D SCAN AREA  
= 14.14<sup>3</sup> in

CALC. BY JAMIE RESOR II 7-13-04

REVIEW BY DE HOUWER 7.13.04



# UT Base Metal Lamination

Site/Unit: Oconee / O3  
Summary No.: C05.021.091  
Workscope: ISI

Procedure: NDE-640  
Procedure Rev.: 2  
Work Order No.: 98643243

Outage No.: ONS3EOC21  
Report No.: UT-04-489  
Page: 1 of 2

Code: Asme Section XI 1989 Cat./Item: C-F-1/C5.21.91 Location: N/A  
Drawing No.: 3-51A-67 Description: Pipe to Elbow  
System ID: 51A  
Component ID: C05.021.091 / 3-51A-67-4 Size/Length: N/A Thickness/Diameter: .375"/2.5"  
Limitations: None Start Time: 0958 Finish Time: 1002

Examination Surface: Inside ☐ Outside ☒ Surface Condition: AS GROUND  
Lo Location: 9.1.1.2 Wo Location: Centerline of Weld Couplant: ULTRAGEL II Batch No.: 03125  
Temp. Tool Mfg.: FISHER Serial No.: MCNDE32768 Surface Temp.: 62 °F Scanning dB: 66  
Cal. Report No.: CAL-04-744

Ind. No.	% Loss Back Wall	Amplitude % Full Screen	Position One				Position Max				Position Two				Remarks
			L1	W1	W2	MP	LM	W1	W2	MP	L2	W1	W2	MP	
NRI															

Comments: FC 03-20

Results: Accept ☒ Reject ☐ Info ☐ Initial Section XI Examination

Percent Of Coverage Obtained > 90%: Yes / 100% Reviewed Previous Data: No

Examiner	Level	II-N	Signature	Date	Reviewer	Signature	Date
Tucker, David K.				11/5/2004			11/12/04
Examiner	Level	II	Signature	Date	Site Review	Signature	Date
Jordan, Joey				11/5/2004			
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A							11/22/04



# Supplemental Report

ATTACHMENT C  
PAGE 93 OF 96

Report No.: UT-04-489

Page: 2 of 2

Summary No.: C05.021.091

Examiner: Tucker, David K.

Level: II-N

Reviewer: [Signature]

Date: 11/12/04

Examiner: Jordan, Joey

Level: II

Site Review: [Signature]

Date: 11/22/04

Other: N/A

Level: N/A

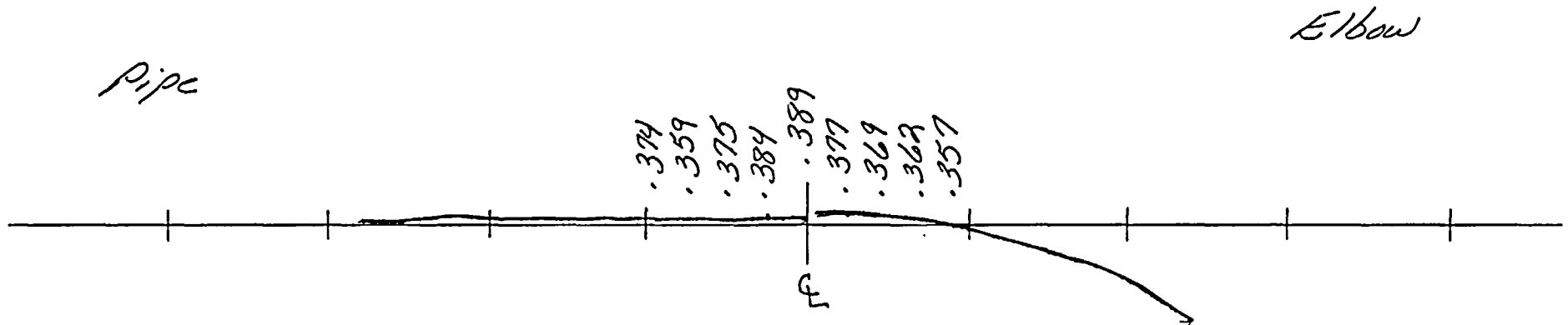
ANII Review: [Signature]

Date: 11/22/04

Comments:

Sketch or Photo:

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# UT Pipe Weld Examination

ATTACHMENT C  
PAGE 94 OF 96

Site/Unit: Ocone / O3  
Summary No.: C05.021.091  
Workscope: ISI

Procedure: NDE-600  
Procedure Rev.: 15  
Work Order No.: 98643243

Outage No.: ONS3EOC21  
Report No.: UT-04-491  
Page: 1 of 3

Code: Asme Section XI 1989 Cat./Item: C-F-1/C5.21.91 Location: N/A  
Drawing No.: 3-51A-67 Description: Pipe to Elbow  
System ID: 51A  
Component ID: C05.021.091 /3-51A-67-4 Size/Length: N/A Thickness/Diameter: .375"/2.5"  
Limitations: Yes - see attached limitation report. Start Time: 1009 Finish Time: 1030

Examination Surface: Inside ☐ Outside ☒ Surface Condition: AS GROUND  
Lo Location: 9.1.1.1 Wo Location: Centerline of Weld Couplant: ULTRAGEL II Batch No.: 03125  
Temp. Tool Mfg.: FISHER Serial No.: MCNDE32768 Surface Temp.: 62 °F

Cal. Report No.: CAL-04-745, CAL-04-746, CAL-04-747

Angle Used	0	45	45T	60	70	
Scanning dB			45	48	55	

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

Comments:

Results: Accept ☒ Reject ☐ Info ☐

Initial Section XI Examination

Percent Of Coverage Obtained > 90%: No / 87.388%

Reviewed Previous Data: No

Examiner	Level	II-N	Signature	Date	Reviewer	Signature	Date
Tucker, David K.				11/5/2004			11-16-04
Examiner	Level	II	Signature	Date	Site Review	Signature	Date
Jordan, Joey				11/5/2004			
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A							11/22/04



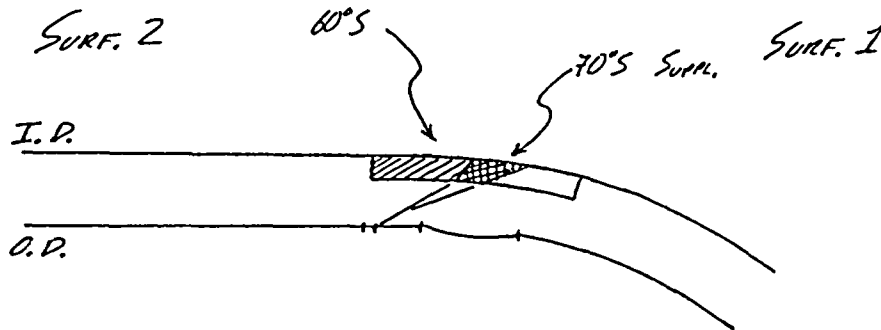
# Limitation Record

Site/Unit: <u>Oconee / O3</u>	Procedure: <u>NDE-600</u>	Outage No.: <u>ONS3EOC21</u>
Summary No.: <u>C05.021.091</u>	Procedure Rev.: <u>15</u>	Report No.: <u>UT-04-491</u>
Workscope: <u>ISI</u>	Work Order No.: <u>98643243</u>	Page: <u>2</u> of <u>3</u>

## Description of Limitation:

Limited at the Intrados on the elbow side of the weld. Limitation dimension is the inner third of the elbow (Lo + 3.0" to Lo + 6.0").

## Sketch of Limitation:



$$\text{TOTAL EXAM AREA} = 1.0\text{in} \times 0.125\text{in} = 0.125\text{in}^2$$

$$60^\circ \text{ SHEAR COVERAGE} = \left( \frac{.45\text{in} + .52\text{in}}{2} \right) \times .125\text{in} = .0606\text{in}^2 / .125\text{in}^2 = 48.5\%$$

$$70^\circ \text{ SHEAR SUPPL. CVG.} = \left( \frac{.15\text{in} + .30\text{in}}{2} \right) \times .125\text{in} = .0281\text{in}^2 / .125\text{in}^2 = 22.5\%$$

## Limitations removal requirements:

## Radiation field:

Examiner	Level	II-N	Signature	Date	Reviewer	Signature	Date
Tucker, David K.			<i>[Signature]</i>	11/5/2004	<i>[Signature]</i>		11/22/04
Examiner	Level	II	Signature	Date	Site Review	Signature	Date
Jordan, Joey			<i>[Signature]</i>	11/5/2004			
Other	Level	N/A	Signature	Date	ANII Review	Signature	Date
N/A					<i>[Signature]</i>		11/22/04



# Determination of Percent Coverage for UT Examinations - Pipe

ATTACHMENT C  
PAGE 96 OF 96

Site/Unit:	<u>Oconee / O3</u>	Procedure:	<u>NDE-600</u>	Outage No.:	<u>ONS3EOC21</u>
Summary No.:	<u>C05.021.091</u>	Procedure Rev.:	<u>15</u>	Report No.:	<u>UT-04-491</u>
Workscope:	<u>ISI</u>	Work Order No.:	<u>98643243</u>	Page:	<u>3</u> of <u>3</u>

## 45 deg

Scan 1	<u>                    </u>	% Length X	<u>                    </u>	% volume of length / 100 =	<u>                    </u>	% total for Scan 1
Scan 2	<u>                    </u>	% Length X	<u>                    </u>	% volume of length / 100 =	<u>                    </u>	% total for Scan 2
Scan 3	<u>100.000</u>	% Length X	<u>100.000</u>	% volume of length / 100 =	<u>100.000</u>	% total for Scan 3
Scan 4	<u>100.000</u>	% Length X	<u>100.000</u>	% volume of length / 100 =	<u>100.000</u>	% total for Scan 4

Add totals and divide by # scans = 100.000 % total for 45 deg

## Other deg - 60 (to be used for supplemental scans)

The data to be listed below is for coverage that was not obtained with the 45 deg scans.

Scan 1	<u>66.700</u>	% Length X	<u>100.000</u>	% volume of length / 100 =	<u>66.700</u>	% total for Scan 1
Scan 2	<u>66.700</u>	% Length X	<u>100.000</u>	% volume of length / 100 =	<u>66.700</u>	% total for Scan 2
Scan <del>3</del> 1	<u>33.300</u>	% Length X	<u>48.500</u>	% volume of length / 100 =	<u>16.150</u>	% total for Scan 3
Scan <del>4</del> 2	<u>33.300</u>	% Length X	<u>0.000</u>	% volume of length / 100 =	<u>0.000</u>	% total for Scan 4

## Percent complete coverage

Add totals for each scan required and divide by # of scans to determine;

87.388 % Total for complete exam

Site Field Supervisor:

*David K. B.*

Date:

11/22/04

NOTE: 70° SHEAR SCAN NOT INCLUDED IN PERCENT COVERAGE DUE TO REQUIREMENTS OF 10CFR50.55a(b)(2)(XV)(A)(2). BEST EFFORT SCAN WITH 70'S OBTAINED AN ADDITIONAL 22.5% COVERAGE IN ONE AXIAL DIRECTION.

Attachment B

Request for Relief

05-ON-002

Limited Examinations  
on Reactor Vessel

3EOC 21

**Proposed Relief in Accordance with 10 CFR 50.55a(g)(5)(iii)**  
**Inservice Inspection Impracticability**  
**Duke Energy Corporation**  
**Oconee Nuclear Station – Unit 3 (EOC-21)**  
**Third 10-Year Interval – Inservice Inspection Plan**  
**Interval Start Date = 12-16-1994    Interval End Date = 1-2-2005**  
**ASME Section XI Code – 1989 Edition with No Addenda**  
**Code Case N-460 is applicable**

<b>List Number</b>	<b>I. Limited Area/Weld I.D. Number</b>	<b>II. System / Component for Which Relief is Requested: Area or Weld to be Examined</b>	<b>III. Code Requirement from Which Relief is Requested: 100% Exam Volume Coverage Exam Category Item No. Fig. No. Limitation Percentage</b>	<b>IV. &amp; V. Impracticability/ Burden Caused by Compliance</b>	<b>VI. Proposed Alternate Examinations or Testing</b>	<b>VII. Implementation Schedule and Duration</b>	<b>VIII. Justification for Granting Relief</b>
1.	3-RPV-WR34	NC System Reactor Vessel Lower Shell to Lower Head Ring Circumferential Weld	Exam Category B-A Item No. B01.011.004 Fig. IWB-2500-1 44.5% Volume Coverage	See Paragraph "A"	See Paragraph "E"	See Paragraph "F"	See Paragraph "G"
2.	3-RPV-WR35	NC System Reactor Vessel Lower Head Cap to Lower Head Ring Circumferential Weld	Exam Category B-A Item No. B01.021.003 Fig. IWB-2500-3 50% Volume Coverage	See Paragraph "B"	See Paragraph "E"	See Paragraph "F"	See Paragraph "G"
3	3-RPV-WR19	NC System Reactor Vessel Upper Shell to Flange Circumferential Weld	Exam Category B-A Item No. B01.030.001 Fig. IWB-2500-4 85.8% Volume Coverage	See Paragraph "C"	See Paragraph "E"	See Paragraph "F"	See Paragraph "G"
4.	3-RPV-WR54	NC System Reactor Vessel Core Flood Nozzle-to-Vessel Weld @ 0°	Exam Category B-D Item No. B03.090.007 (UT from vessel I.D.) Fig. IWB-2500-7(a) 84.2% Volume Coverage	See Paragraph "D"	See Paragraph "E"	See Paragraph "F"	See Paragraph "H"

List Number	I. Limited Area/Weld I.D. Number	II. System / Component for Which Relief is Requested: Area or Weld to be Examined	III. Code Requirement from Which Relief is Requested: 100% Exam Volume Coverage Exam Category Item No. Fig. No. Limitation Percentage	IV. & V. Impracticality/ Burden Caused by Compliance	VI. Proposed Alternate Examinations or Testing	VII. Implementation Schedule and Duration	VIII. Justification for Granting Relief
5.	3-RPV-WR54	NC System Reactor Vessel Core Flood Nozzle-to-Vessel Weld @ 0°	Exam Category B-D Item No. B03.090.007A (UT from nozzle bore.) Fig. IWB-2500-7(a) 84.2% Volume Coverage	See Paragraph "D"	See Paragraph "E"	See Paragraph "F"	See Paragraph "H"
6.	3-RPV-WR54A	NC System Reactor Vessel Core Flood Nozzle-to-Vessel Weld @ 180°	Exam Category B-D Item No. B03.090.008 (UT from vessel ID) Fig. IWB-2500-7(a) 84.2% Volume Coverage	See Paragraph "D"	See Paragraph "E"	See Paragraph "F"	See Paragraph "H"
7.	3-RPV-WR54A	NC System Reactor Vessel Core Flood Nozzle-to-Vessel Weld @ 180°	Exam Category B-D Item No. B03.090.008A (UT from nozzle bore) Fig. IWB-2500-7(a) 84.2% Volume Coverage	See Paragraph "D"	See Paragraph "E"	See Paragraph "F"	See Paragraph "H"

See Attachment A for area/weld locations.

Note: The welds listed in the table above were inspected in December of 2004.

#### **IV. & V. Impracticality/ Burden Caused by Code Compliance**

**Paragraph A:** (The Lower Shell and Lower Head Ring material is SA508 CL2. This weld has a diameter of 170.250 inches and a wall thickness of 5.5 inches.)

During ultrasonic examination, 100% coverage of the required examination volume could not be obtained. Twelve core guide lugs restrict the scanning surface, as shown on the Attachment B drawing, causing limitations that resulted in 44.5% coverage. The percentage of coverage reported represents the aggregate coverage from all scans parallel and perpendicular to the weld. The weld and adjacent base material were examined using 45° refracted shear waves and 45° refracted longitudinal waves. Examination volumes directly below the core guide lugs received no coverage when scanned parallel to the weld. Additionally no scans were performed perpendicular to the weld directly below the core guide lugs. Scans parallel to the weld were restricted to 7.6 inches on either side of each core guide lug and scans perpendicular to the weld were restricted to 4.7 inches on either side of each core guide lug. In order to achieve more coverage, the core guide lugs would have to be moved to allow greater access, which is impractical. There were no recordable indications found in the areas that were examined.

54% of the weld and base material volume received coverage in two directions perpendicular to the weld.

35% of the weld and base material volume received coverage in two directions parallel to the weld.

55.50% of the weld and base material volume received no coverage.

(See Attachment B for exam information)

**Paragraph B:** (The Lower Head Cap material is SA533 CL1 GRB and Lower Head Ring material is SA508 CL2. This weld has a diameter of 143.00 inches and a wall thickness of 5.375 inches.)

During ultrasonic examination, 100% coverage of the required examination volume could not be obtained. The examination coverage was limited to 50%. The percentage of coverage reported represents the aggregate coverage from all scans parallel and perpendicular to the weld. The flow stabilizers, core guide lugs and in-core nozzles that restrict the scanning surface, as shown on the Attachment C drawing, caused the limitations. The weld and adjacent base material were examined using 45° refracted shear waves and 45° refracted longitudinal waves. There were no recordable indications found in the areas that were examined. In order to achieve more coverage the flow stabilizers, core guide lugs and in-core nozzles would have to be moved to allow greater access for scanning, which is impractical.

53.33% of the weld and base material volume received coverage in two directions perpendicular to the weld.

46.66% of the weld and base material volume received coverage in two directions parallel to the weld.

50% of the weld and base material received no coverage.

(See Attachment C for exam information)

**Paragraph C:** (The Upper Shell and Flange material is SA508 CL2. This weld has a diameter of 167.630 inches and a wall thickness of 12.00 inches.)

During ultrasonic examination, 100% coverage of the required examination volume could not be obtained. The examination coverage was limited to 85.8%. The percentage of coverage reported represents the aggregate coverage from all scans parallel and perpendicular to the weld. Limitations were caused by inside surface taper and the ledge shown in Attachment D. The percentage of coverage reported represents the aggregate coverage from all scans. The weld and adjacent base material were examined using 45° refracted shear waves and 45° refracted longitudinal waves. There were no recordable indications found in the areas that were examined. In order to achieve more coverage, the weld would have to be redesigned which is impractical.

(See Attachment D for exam information)

**Paragraph D:** (The Upper Shell and Core Flood Nozzle material is SA508 CL2. This weld has a diameter of 25.00 inches and a wall thickness of 12.00 inches.)

During ultrasonic examination, 100% coverage of the required examination volume could not be obtained. The examination coverage was limited to 84.2% of the required volume. The Core Flood Nozzles of a B&W 177 plant have several obstructions which limit ultrasonic examination coverage. In order of significance these are:

- The flow restrictor which is welded to the inner bore of the nozzle;
- The inlet nozzles located 30° on either side of each core flood nozzle;
- The taper above the core flood nozzles associated with the Core Support Ledge.

The percentage of exam volume coverage reported represents the aggregate coverage as follows:

Weld and adjacent base material = 87.6% scanned parallel to the weld in two opposite directions and 72.9% scanned perpendicular to the weld centerline from the nozzle bore and the vessel inside surface.

There were no recordable indications found in the areas that were examined for either of these welds. In order to achieve more coverage, the inlet nozzles would have to be moved, and the taper on the flange would have to be redesigned to allow greater access for scanning, which is impractical. In addition, because of the proximity of the flow restrictors limited scanning was performed from the nozzle I.D as shown in Attachment E. In order to achieve more coverage, the flow restrictor would have to be moved to allow access for scanning, which is impractical.

(See Attachment E for exam information)

#### **VI. Proposed Alternate Examinations or Testing**

##### **Paragraph E:**

The scheduled 10-year code examination was performed on the referenced area/weld and it resulted in the noted limited scanning and coverage of the required ultrasonic volume. No additional examinations are planned for the area/weld during the current inspection interval.

#### **VII. Implementation Schedule and Duration**

##### **Paragraph F**

The scheduled third 10-year interval plan code examination was performed on the referenced area/weld resulting in limited scanning and volumetric coverage. No additional examinations are planned for the area/weld during the current inspection interval. The same area/weld may be examined again as part of the next (fourth) 10-year interval plan, depending on the applicable code year edition and addenda requirements adopted in the future.

#### **VIII. Justification for Granting Relief**

##### **Paragraph G:**

Ultrasonic examination of welds for item numbers B01.011, B01.021 and B01.30 were conducted using personnel, equipment and procedures qualified in accordance with ASME Section XI, Appendix VIII, Supplements 4 and 6, 1995 Edition with the 1996 Addenda as administered through the Performance Demonstration Initiative (PDI) Program. Although limited scanning prevented 100% coverage of the examination volume, the amount of coverage obtained for these examinations along with the additional volumetric and visual examinations (listed in the next paragraph) provides an acceptable level of quality and integrity. (See Paragraph I for additional justification.)



In addition to the Category B-A welds that relief is being sought for, there were 3 circumferential Category B-A welds that were inspected and all obtained greater than 90 % coverage and there were no reportable indications found during the inspections. Visual examinations were also performed as part of the reactor vessel inspections (item number B13.010.001 and B13.050.001) and were found to be without any reportable indications.

**Paragraph H:**

Ultrasonic examination of areas/welds for item numbers B03.090 were conducted using personnel, equipment and procedures qualified in accordance with ASME Section XI, Appendix I, 1989 Edition with no Addenda. Although limited scanning prevented 100% coverage of the examination volume, the amount of coverage obtained for these examinations provides an acceptable level of quality and integrity. (See Paragraph I for additional justification.)

**Paragraph I:**

Duke Energy will use the Code required pressure testing and VT-2 visual examination to compliment the limited examination coverage. The Code requires (reference Table IWB-2500-1, item numbers B15.010 and B15.050) that a system leakage test be performed after each refueling outage for Class 1. Additionally a system hydrostatic test (reference Table IWB-2500-1, item numbers B15.011 and B15.051) is required once during each 10-year inspection interval; however, Code Case N-498-1 was invoked in lieu of performing the hydrostatic test. These tests require a VT-2 visual examination for evidence of leakage. This testing provides adequate additional assurance of pressure boundary integrity.

Duke Energy will use VT-3 visual examination to compliment the limited examination coverage. The Code requires (reference Table IWB-2500-1, item number B13.010) that a VT-3 examination be performed after the first refueling outage and subsequent refueling outages at approximately 3 year periods. During the first and second periods of an interval a VT-3 examination is performed on areas above and below the reactor core that are made accessible for examination by removal of components during normal refueling outages. During the third period of an interval the VT-3 examination is performed on all of the reactor vessel interior surfaces at the same time that the automated UT exams are performed on the reactor vessel welds. These examinations provide adequate additional assurance of pressure boundary integrity.

In addition to the above Code required examinations (volumetric, pressure test, and VT-3), 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 Technical Specification 3.4.13, "Reactor Coolant System Leakage". Leakage is also evaluated in accordance with this Technical Specification. The leakage could also be detected through several other methods. One is 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 be activated by coolant leakage. A second is the level indicator in the Reactor Building normal sump. A third is a loss of level in the Letdown Storage Tank.

Duke Energy Corporation has examined the welds/components referenced in this request to the maximum extent possible utilizing the latest in examination techniques and equipment. These welds were rigorously inspected by volumetric NDE methods during construction and verified to be free from unacceptable fabrication defects. Based on the coverage and results of the required volumetric and visual examinations performed during this outage, it is Duke's belief that this combination of elements provides a reasonable assurance of component integrity.

IX. Other Information

The following individuals contributed to the development of this relief request:

James J. McArdle (Principal NDE Level III Inspector) provided Sections III through V and part of Section VIII.

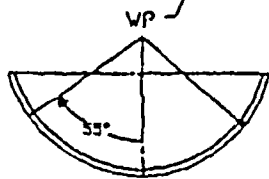
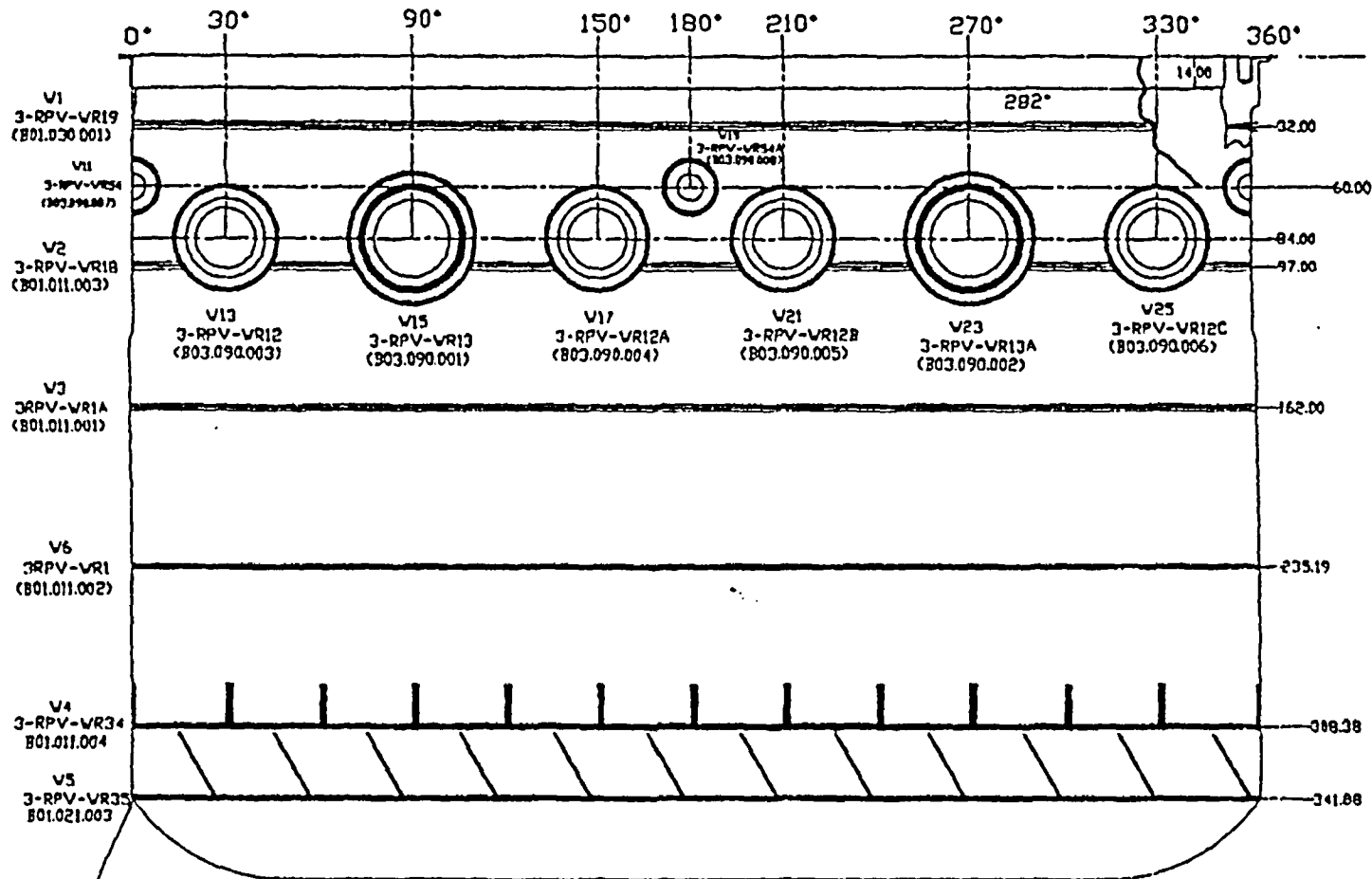
B. W. Carney, Jr. (Oconee Engineering) provided part of Section VIII.

Larry C. Keith (Oconee ISI Plan Manager) compiled the remaining sections.

Sponsored By: Larry C. Keith Date 5-26-05

Approved By: R. Kevin Rhyme Date 5/26/05

## Westinghouse Proprietary Class 2C



SCALED TO THE ID SURFACE

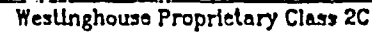
OCONEE 3 BOC03

WesDyne International  
Vessel RolloutSHEET  
TITLE

EXAMINATION PROGRAM PLAN 2004

ALL DIMENSIONS IN INCHES  
UNLESS OTHERWISE NOTED

SHEET 1 OF 22



## R.V. COVERAGE ESTIMATE BREAKDOWNS

PLANT NAME Oconee**WesDyne**WELD NO. W4 (3-RPV-WR34)**International**COMPONENT Transition to Lower Shell Circ. Weld

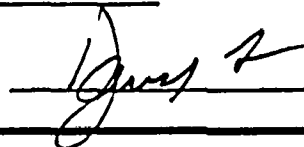
## BEAM ANGLE BREAK DOWN

BEAM DIRECTION	45 Shear		45 L Single		45 L Dual			
	WELD	VOLUME	WELD	VOLUME	WELD	VOLUME	WELD	VOLUME
Perpendicular	54.00	54.00	54.00	54.00	54.00	54.00		
Parallel	35.00	35.00	35.00	35.00	35.00	35.00		
AVERAGE	44.50		44.50		44.50			

Comments: \_\_\_\_\_

Combined Perp. 54.00 Combined Para. 35.00 Combined Average 44.50

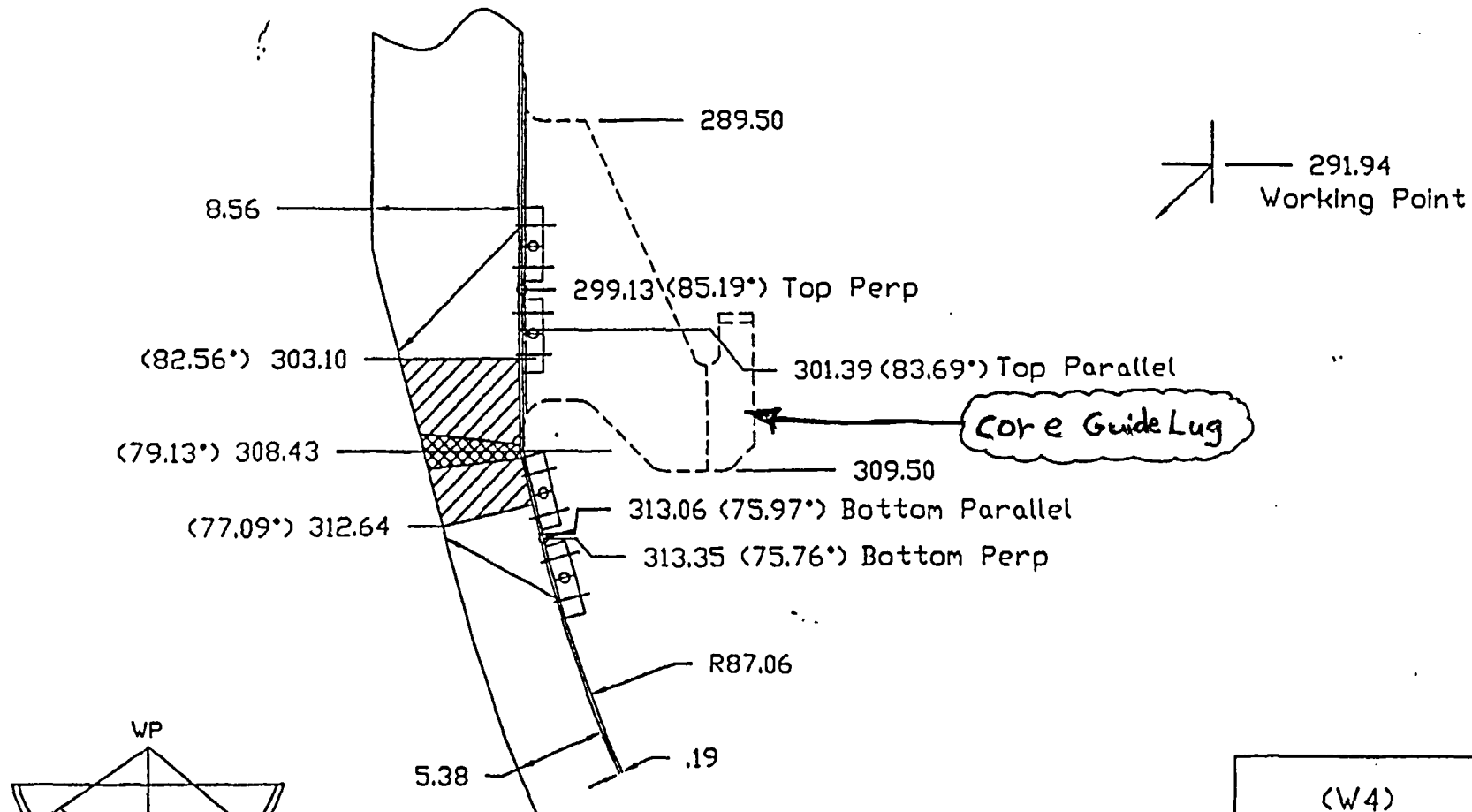
Analyst



Date

12/4/04

Weslinghouse Proprietary Class 2C



Scan Increment = 0.329° (0.5') for Parallel Scans  
 = 0.329° (0.50') for Perp Scans

Verify robot sequence list for Perp sled rotation

Parallel Scan Limits +/- 5.0° Either Side of Core Guide Lugs  
 Perp Scan Limits +/- 3.1° Either Side of Core Guide Lugs  
 No Scans Performed Below Core Guide Lugs

(W4)  
 3-RPV-WR34  
 B01.011.004

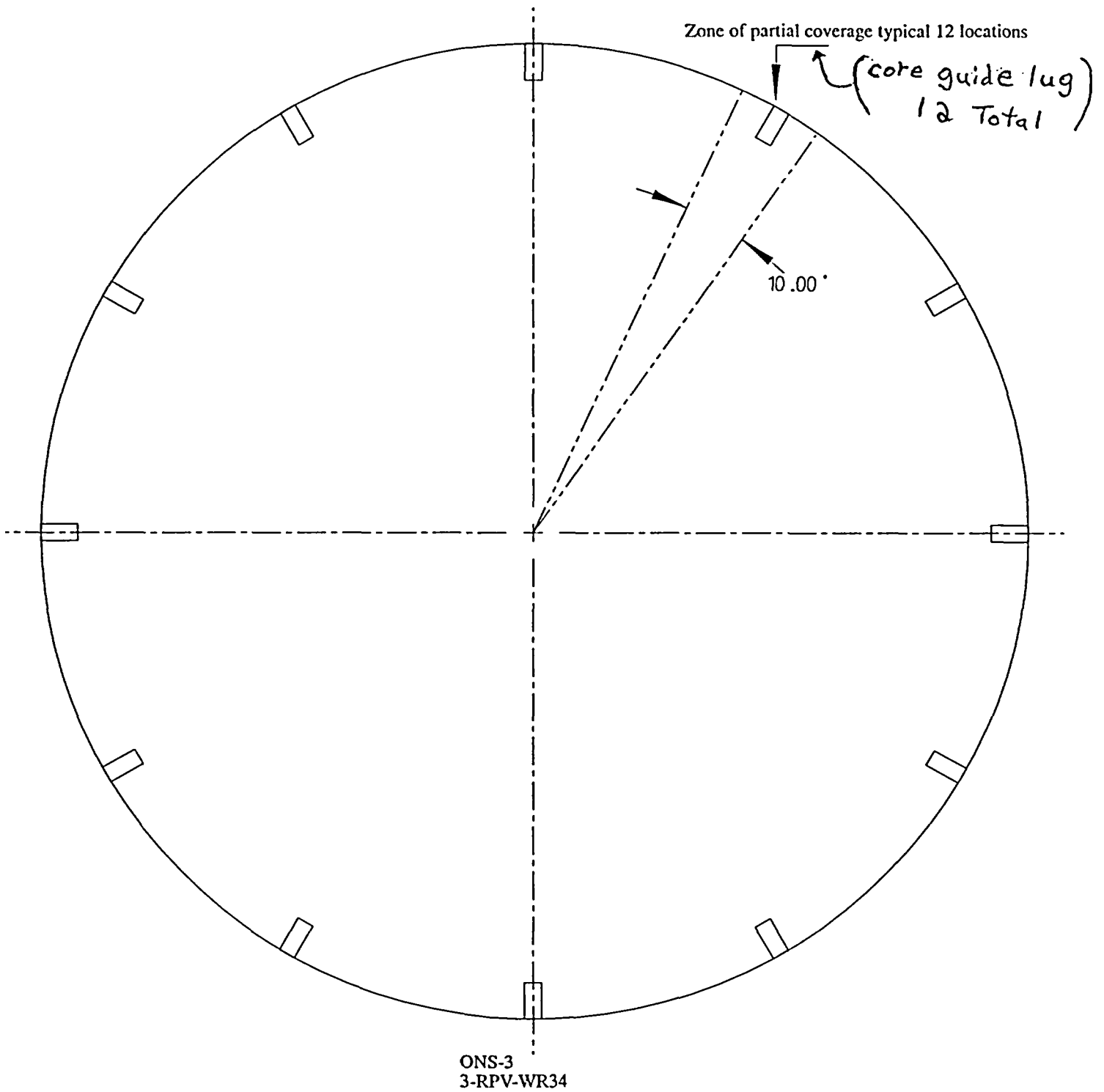
OCONEE 3 BOC03

WesDyne International

WESDYNE  
 TITLE Transition to Lower Shell Circ Weld

EXAMINATION PROGRAM PLAN 2004

ALL DIMENSIONS IN INCHES  
 UNLESS OTHERWISE NOTED SHEET 8 OF 22



## R.V. COVERAGE ESTIMATE BREAKDOWNS

PLANT NAME Oconee**WesDyne**WELD NO. W5 (3-RPV-WR35)**International**COMPONENT Lower Head to Transition Circ. Weld

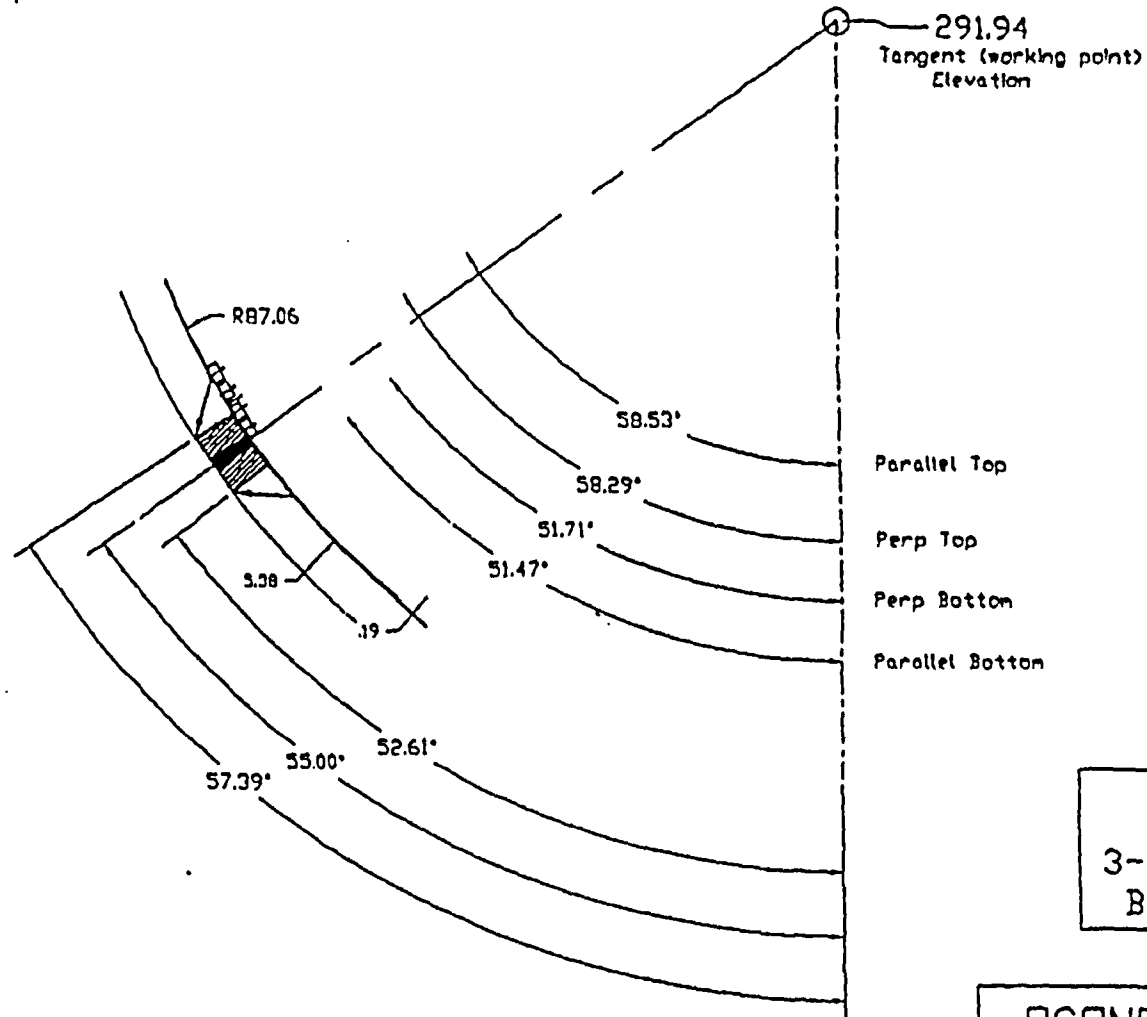
## BEAM ANGLE BREAK DOWN

BEAM DIRECTION	45 Shear		45 L Single		45 L Dual			
	WELD	VOLUME	WELD	VOLUME	WELD	VOLUME	WELD	VOLUME
Perpendicular	53.33	53.33	53.33	53.33	53.33	53.33		
Parallel	46.66	46.66	46.66	46.66	46.66	46.66		
AVERAGE	50.00		50.00		50.00			

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_COMBINED AVERAGE 50.00Analyst *James R*Date 12/4/04



Westinghouse Proprietary Class 2C



(W5)

3-RPV-WR35

B01.021.003

Scan Increment = 0.329° (0.5') for Parallel Scans  
 = 0.329° (0.50') for Perp Scans

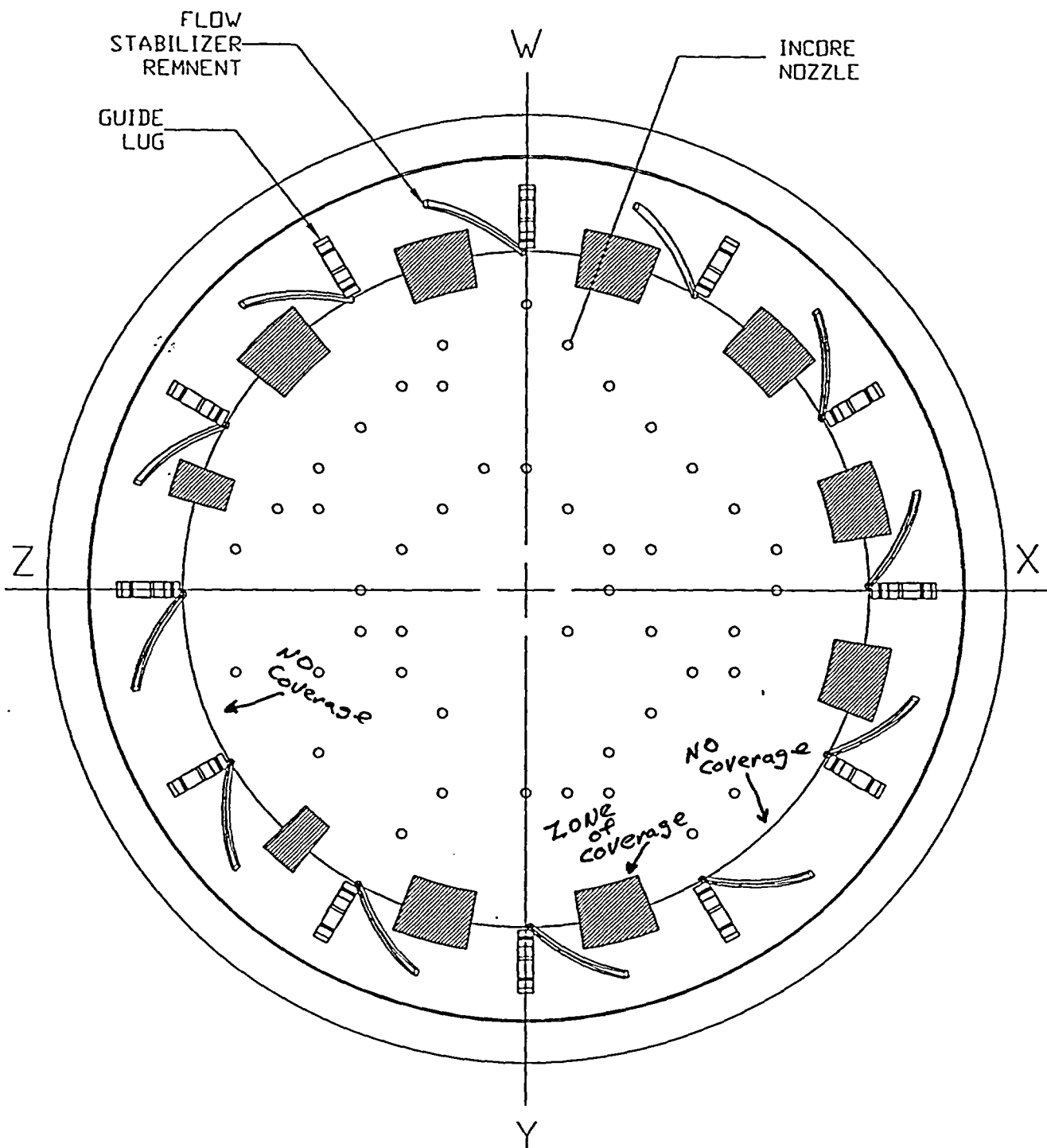
OCONEE 3 BOC03

WesDyne International

Lower Head to Transition Circ Weld

EXAMINATION PROGRAM PLAN 2004

ALL DIMENSIONS IN INCHES  
UNLESS OTHERWISE NOTED SHEET 9 OF 22



DCONEE-3  
3-RPV-WR35  
B01.021.003

# R.V. COVERAGE ESTIMATE BREAKDOWNS

PLANT NAME OCONEE

**WesDyne**

WELD NO. W1 (3-RPV-WR19)

**International**

COMPONENT Shell to Flange Weld

## BEAM ANGLE BREAK DOWN

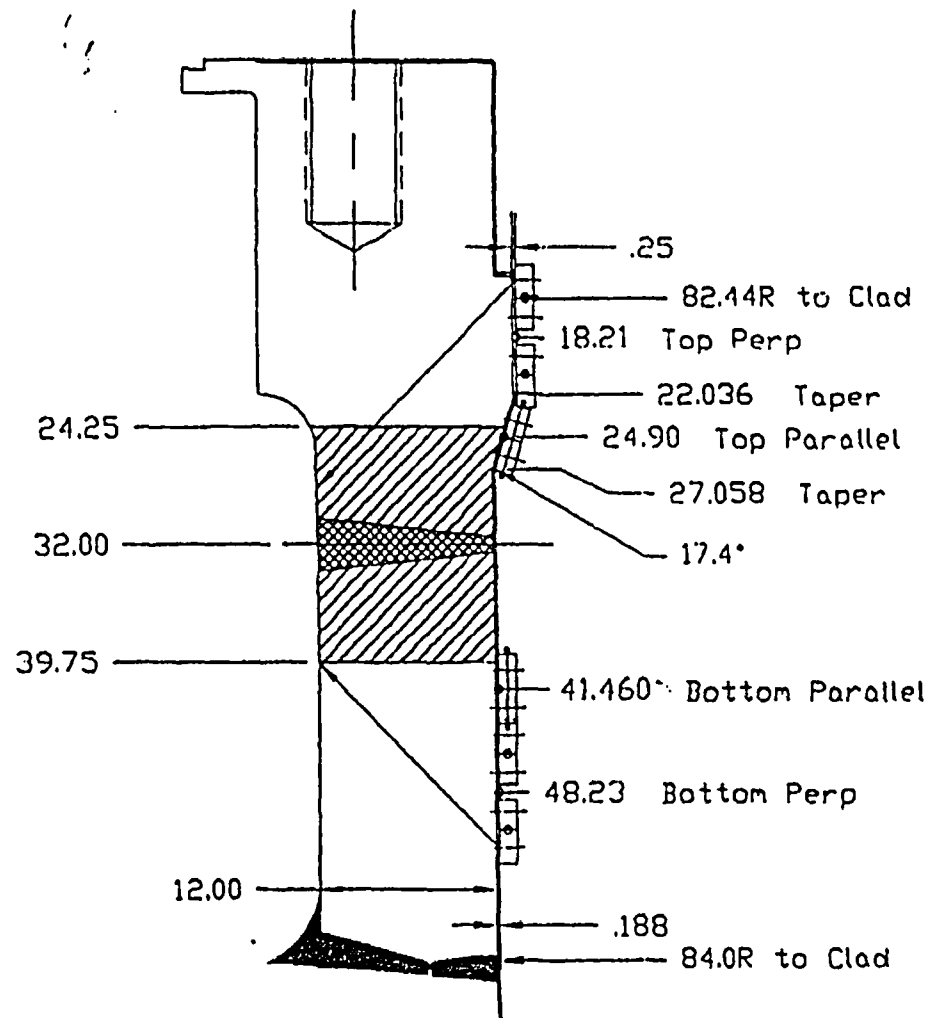
BEAM DIRECTION	45 Shear		45 L Single		45 L Dual			
	WELD	VOLUME	WELD	VOLUME	WELD	VOLUME	WELD	VOLUME
Perpendicular	86.66	86.66	86.66	86.66	86.66	86.66		
Parallel	85.00	85.00	85.00	85.00	85.00	85.00		
AVERAGE	85.83		85.83		85.83			

Comments: \_\_\_\_\_

Combined Perp. 86.66 Combined Para. 85.00 Combined Average 85.83

Analyst *[Signature]* Date 12/4/04

Westinghouse Proprietary Class 2C



Scan Increment = 0.5' for Parallel Scans  
= 0.341' for Perp Scans

(W1)  
3-RPV-WR19  
B01.030.001

OCONEE 3 BOCB3

WesDyne International

SHEET TITLE Upper Shell to Flange

EXAMINATION PROGRAM PLAN 2004

ALL DIMENSIONS IN INCHES  
UNLESS OTHERWISE NOTED SHEET 4 OF 22

## R.V. COVERAGE ESTIMATE BREAKDOWNS

PLANT NAME Oconee**WesDyne**WELD NO. W11 (3-RPV-WR54)**International**COMPONENT Core Flood Nozzle to Shell @ 0°

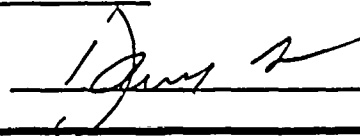
## BEAM ANGLE BREAK DOWN

BEAM DIRECTION	45 Shear °		45 L Single		45 L Dual		Combined Bore/Star	
	WELD	VOLUME	WELD	VOLUME	WELD	VOLUME	WELD	VOLUME
<b>TAN Scan</b>								
Parallel	94.22	80.95	100.00	98.71	100.00	100.00		
<b>Combined Bore&amp;Star</b>								
Perpendicular							74.75	71.01
<b>AVERAGE</b>		87.59		99.35		100.00		72.88

Comments: Coverage calculation is based on the Bore and Star scan (combined) as perpendicular, and the Tan Scan (parallel). Limitation is due to vessel saddle effect at 90° & 270° and the flow restrictor located in the inside of the nozzle.

Combined Perp. 72.88 Combined Para. 95.65 Combined Average 84.26

Analyst



Date

12/4/04

## R.V. COVERAGE ESTIMATE BREAKDOWNS

PLANT NAME Oconee

**WesDyne**

WELD NO. W19 (3-RPV-WR54A)

**International**

COMPONENT Core Flood Nozzle to Shell @ 180°

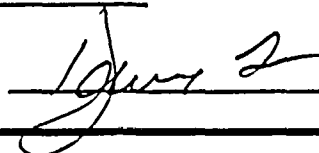
### BEAM ANGLE BREAK DOWN

BEAM DIRECTION	45 Shear		45 L Single		45 L Dual		Combined Bore/Star	
	WELD	VOLUME	WELD	VOLUME	WELD	VOLUME	WELD	VOLUME
<b>TAN Scan</b>								
Parallel	94.22	80.95	100.00	98.71	100.00	100.00		
<b>Combined Bore&amp;Star</b>								
Perpendicular							74.75	71.01
<b>AVERAGE</b>	87.59		99.35		100.00		72.88	

Comments: Coverage calculation is based on the Bore and Star scan (combined) as perpendicular, and the Tan Scan (parallel). Limitation is due to vessel saddle effect at 90° & 270° and the flow restrictor located in the inside of the nozzle.

Combined Perp. 72.88 Combined Para. 95.65 Combined Average 84.26

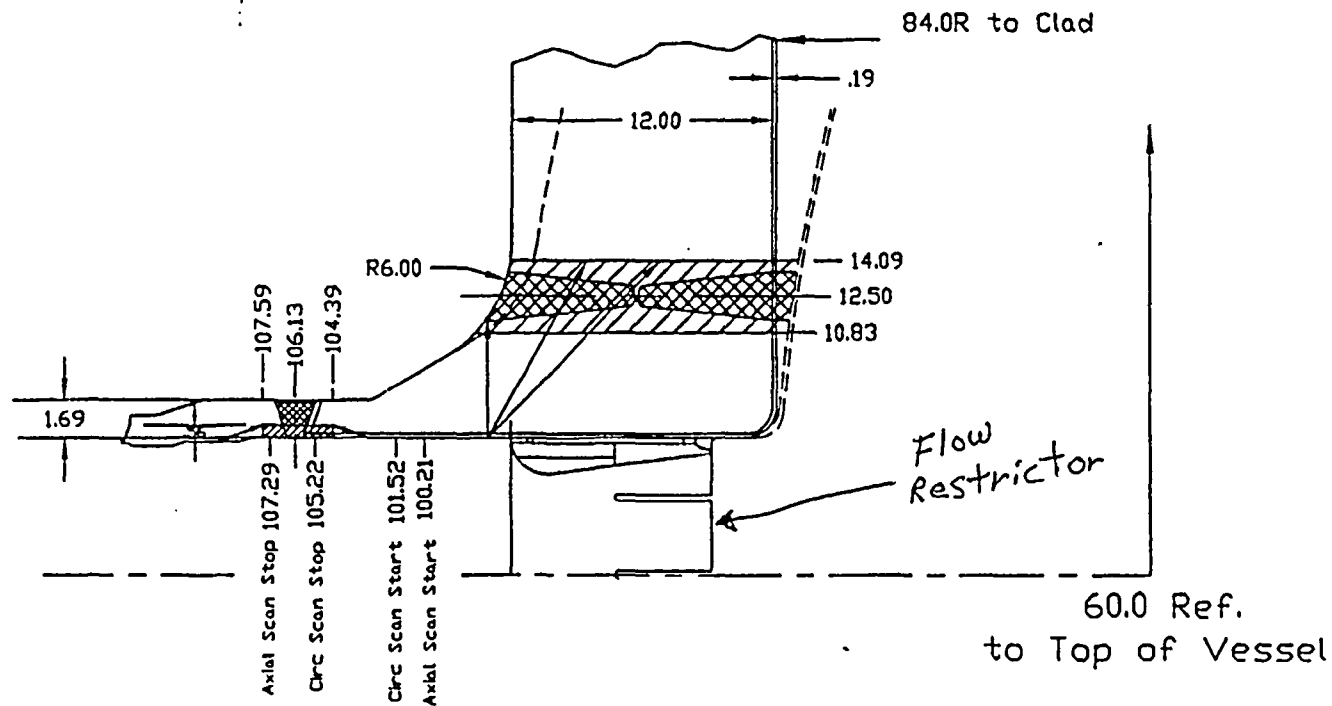
Analyst



Date

12/4/21

Westinghouse Proprietary Class 2C



Core Flood Nozzle to Shell @ 0° - 3RPV-WR54 (B03.090.007A)

Core Flood Nozzle to Shell @ 180° - 3RPV-WR54A (B03.090.008A)

Core Flood Nozzle Safe End @ 0° - 3RPV-WR53 (B05.010.001A, B05.010.001B)

Core Flood Nozzle Safe End @ 180° - 3RPV-WR53A (B05.010.002A, B05.010.002B)

Scan Increment: Axial Scans 1.15°  
Circ. Scans 0.080°

OCONEE 3 BOC03

WesDyne International

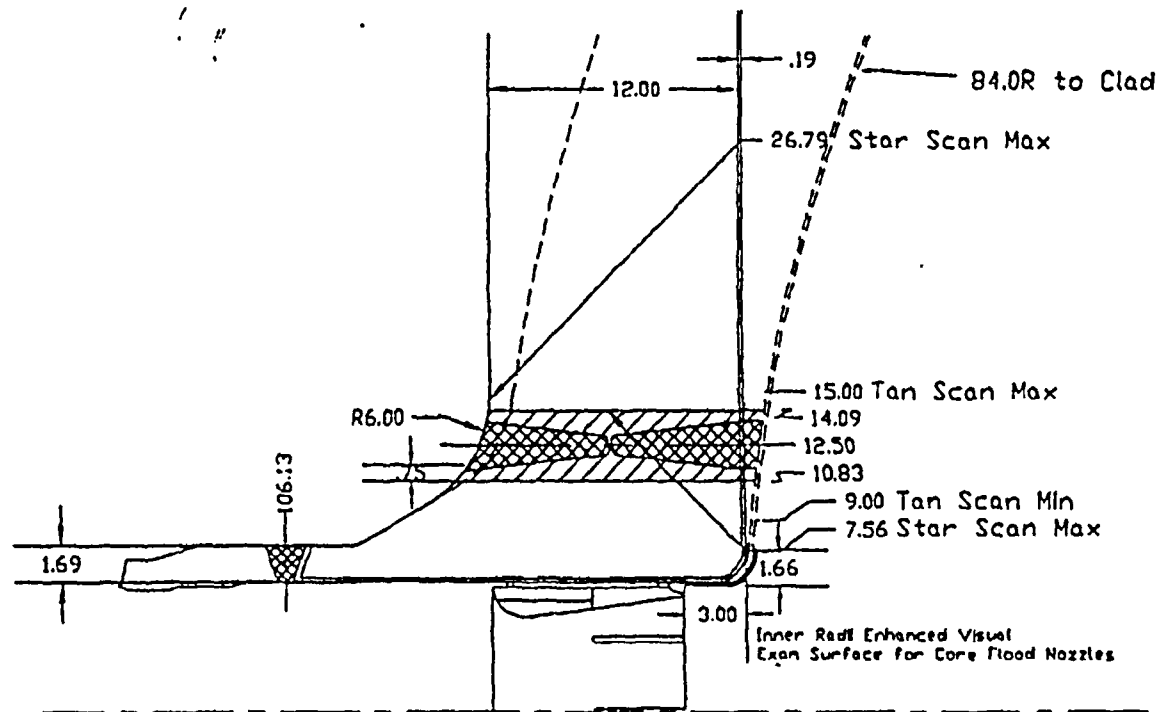
SHEET TITLE Core Flood Nozzle to Shell &amp; Safe End Welds

EXAMINATION PROGRAM PLAN 2004

ALL DIMENSIONS IN INCHES  
UNLESS OTHERWISE NOTED

SHEET 19 OF 22

## Westinghouse Proprietary Class 2C



Core Flood Nozzle to Shell @ 0° Inner Radius VT-- 3RPV-WR54 (B03.100.007)

Core Flood Nozzle to Shell @ 180° Inner Radius VT- 3RPV-WR54A (B03.100.008)

Core Flood Nozzle to Shell @ 0° - 3RPV-WR54 (B03.090.007)

Core Flood Nozzle to Shell @ 180° - 3RPV-WR54A (B03.090.008)

Scan Increment: Star Scans = 2.29° (0.50° @ Nozzle to Shell Weld @  
Tan Scans = 0.50°

OCONEE 3 BOC03

WesDyne International

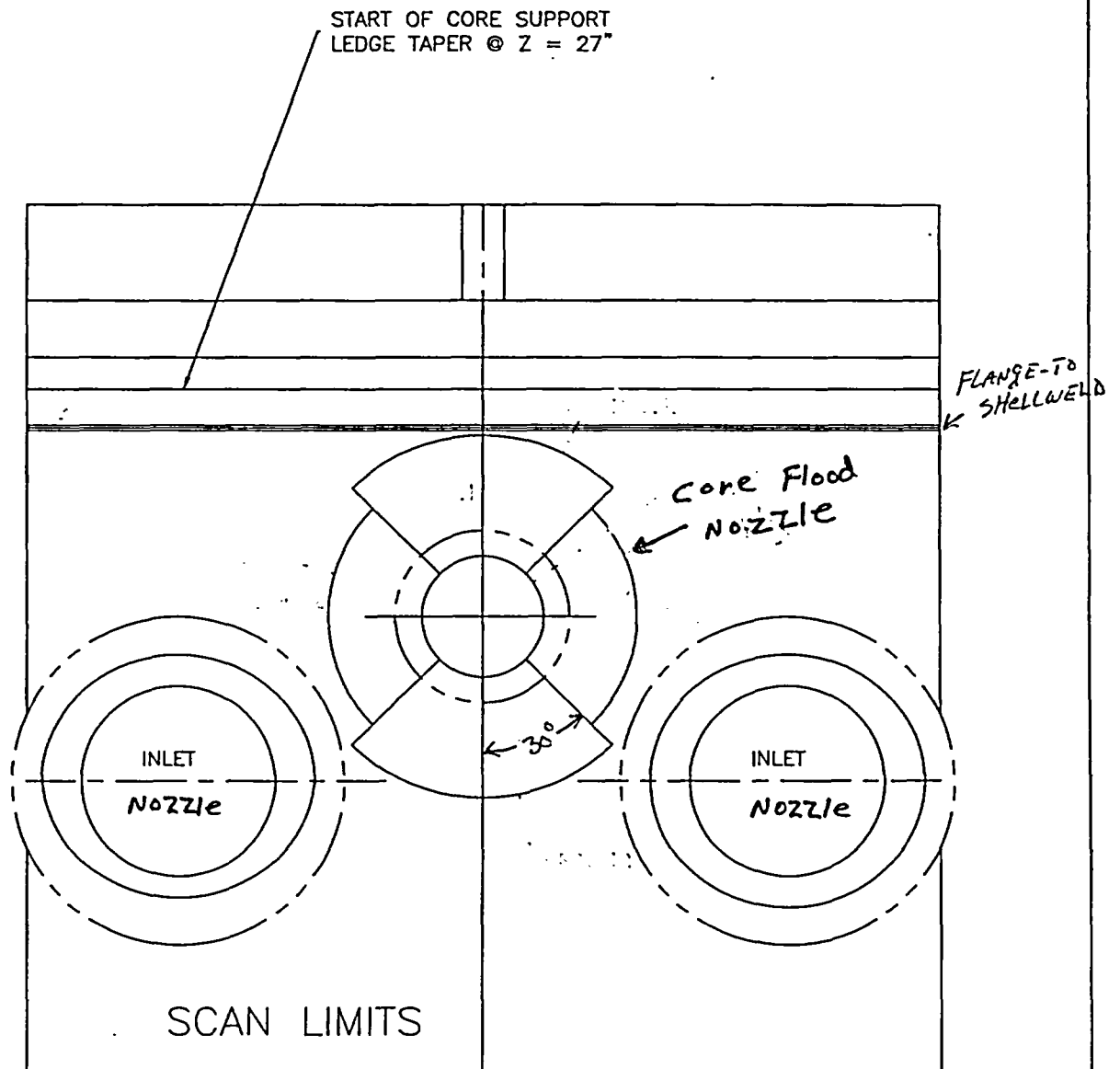
Core Flood Nozzle to Shell TAN, Star IR Exams

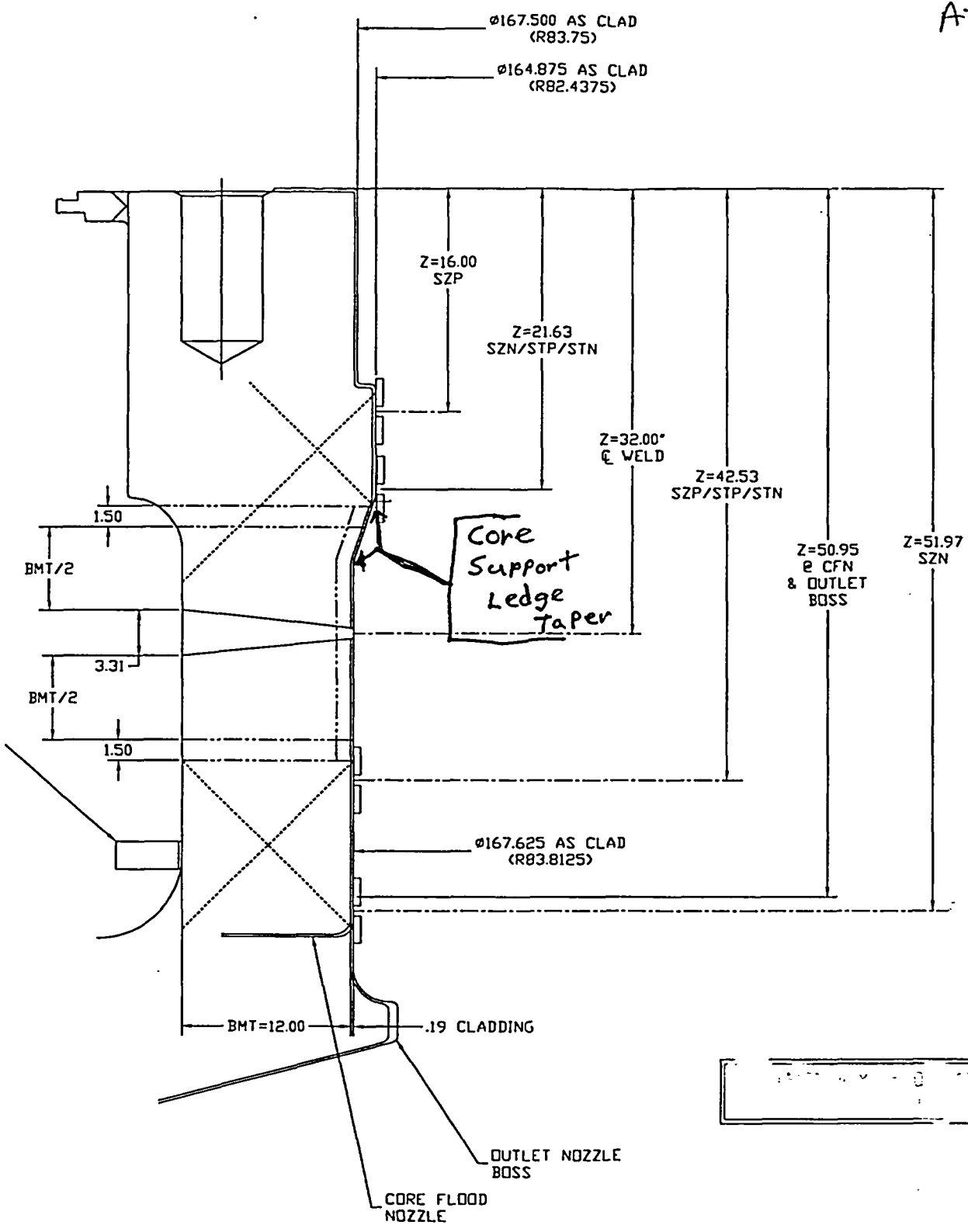
EXAMINATION PROGRAM PLAN 2004

ALL DIMENSIONS IN INCHES  
UNLESS OTHERWISE NOTED

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REVISION 1