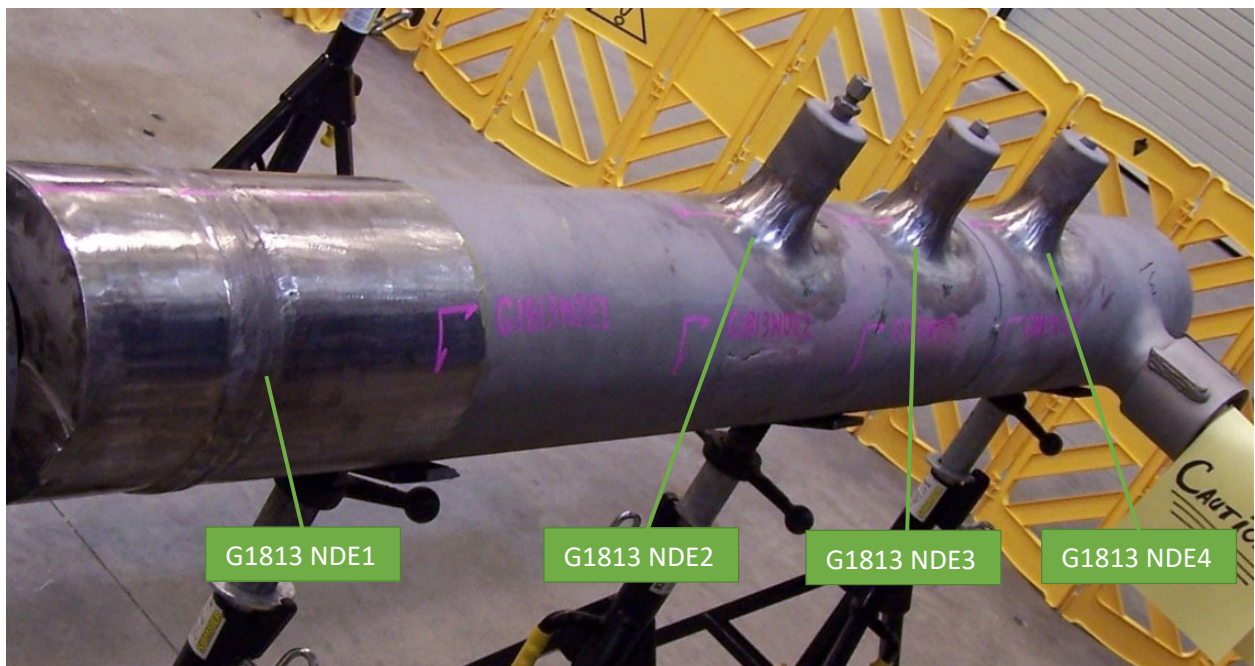


DOE EEM - NDE

Eddystone G1813 - Fingerprint Package

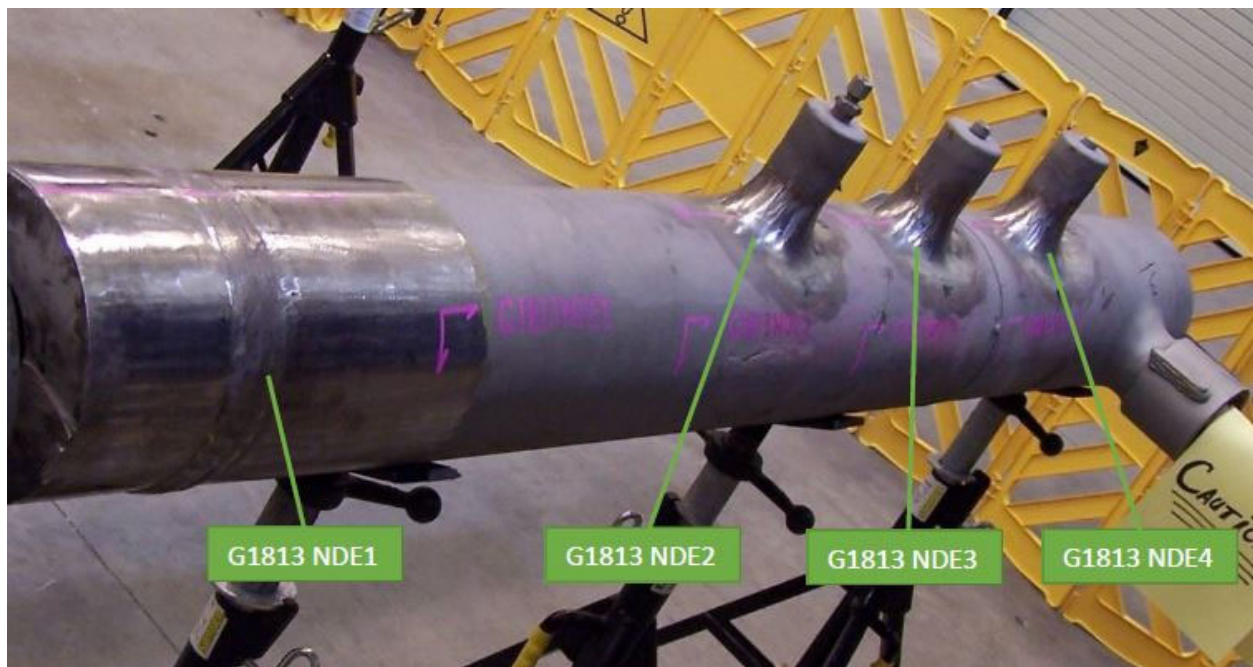


G1813-NDE1-4

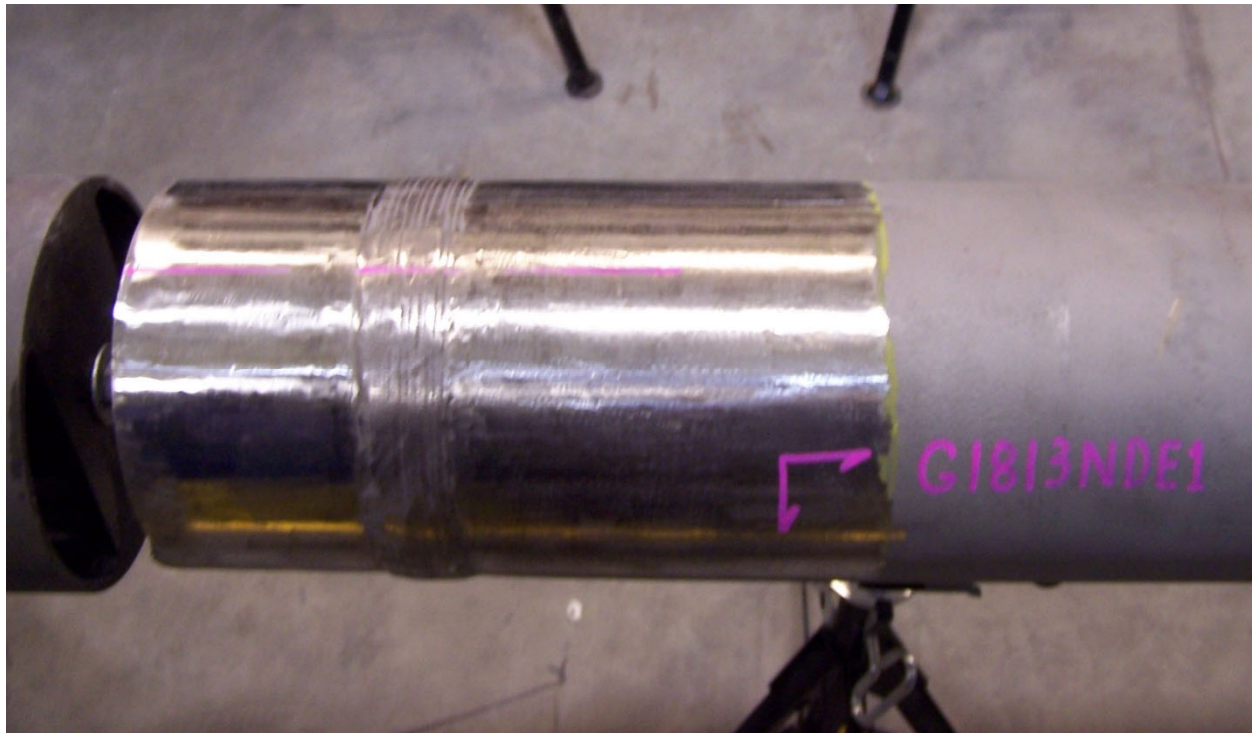
Inspection Summary

DOE EEM Eddystone Project

G1813-NDE1-4 Inspection Summary



Weld G1813-NDE1



G1813-NDE1 is a ~2.65" (67 mm) thick weld (SS to SS) of component G1813, at the time of the examination actual weld joint design information was not available.


Color contrast solvent removable dye penetrant surface examinations were performed on the weld and adjacent base material. No relevant indications were observed.

G1813-NDE1 was examined with encoded ultrasonic testing utilizing phased array ultrasonic techniques employing longitudinal wave modes looking for potential service induced discontinuities along with any potential embedded or fabrication related defects that may be identifiable.

Two circumferentially oriented indications were identified in the data from weld G1813-NDE1. Both indications appear to be embedded located in the mid-wall area of the weld material and did not display evidence of inside or outside surface connection (i.e. the indication was embedded in nature).

Specific recommendations for destructive analysis based on the NDE results of the component G1813-NDE1 are as follows:

G1813-NDE1					
Indication #	Indication Orientation	Cut Location Identifier	Cut Direction	Cut Positional Information	
				Circumferential	Axial
1	Circumferential	1	Axial cut	19" (483 mm)	Thru the weld
2	Circumferential	2a	Axial cut	31.3" (795 mm)	Thru the weld
		2b	Axial cut	31.3" (795 mm)	Thru the weld



Eddystone Fingerprint Data Sheet

G1813 - NDE1


OD @ CL: 9.40

ID @ CL: 4.20

Sample ID: 29.53

OD Circ. @ CL: 13.195

Nom "T" @ CL: 2.600



Fingerprint Information:											
Indication	1	2	3	4	5						
Start(X1)	1.101	13.112									
Stop(X2)	3.303	28.527									
Y Start	-0.501	-0.354									
Y Stop	-0.501	-0.354									
Length	2.202	15.415									
Upper R.L	0.835	0.975									
Lower R.L	1.636	1.531									
Flaw H	0.801	0.556									

Recommended Cut Locations:											
Location	1	2a	2b								
Start(X1)	1.900	17.700	22.700								
Stop(X2)	1.900	17.700	22.700								
Y Start	-1.000	-1.000	-1.000								
Y Stop	0.250	0.250	0.250								

Image 1 (G1813-NDE1 Circumferential Indications 1 and 2)



Page 3 of 6

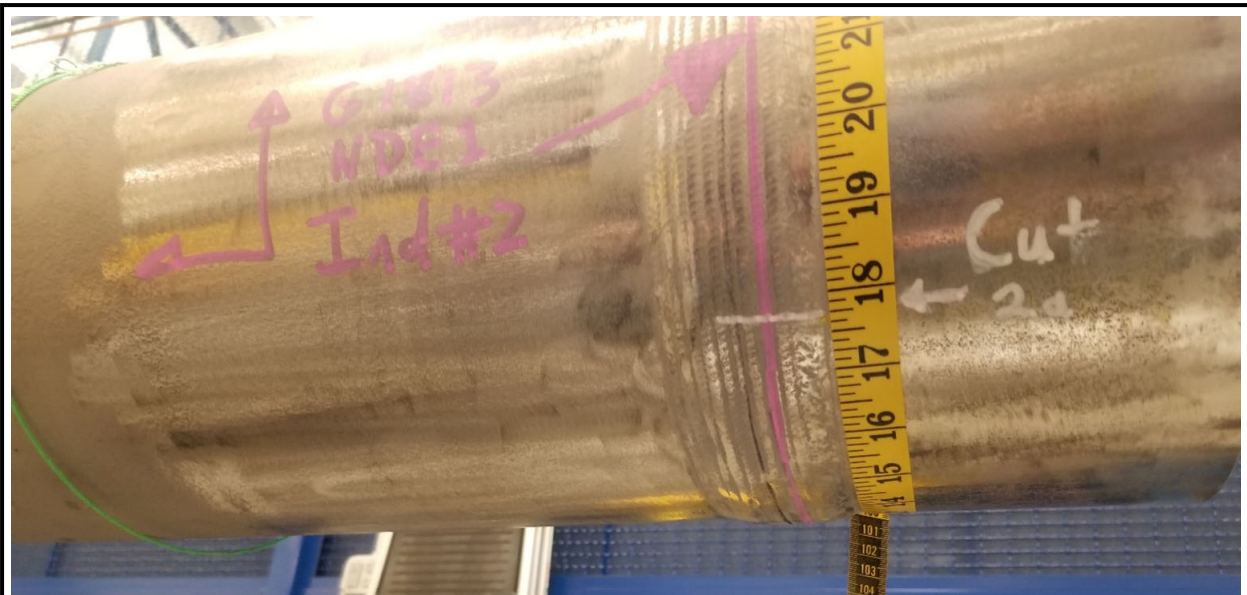
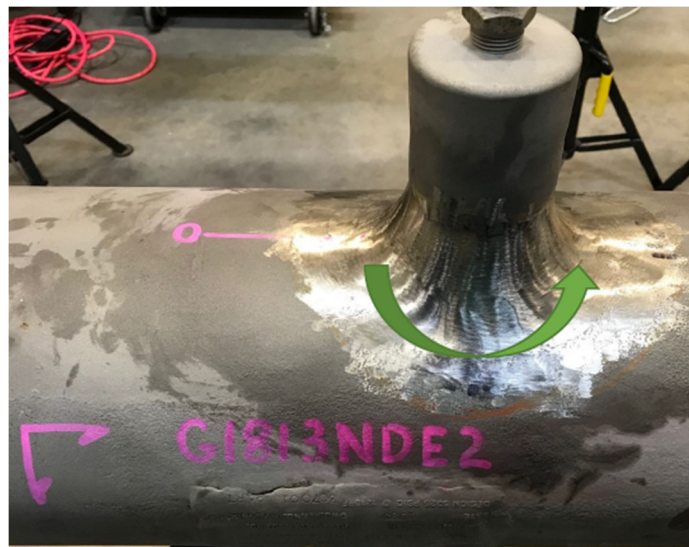


Image 3 (G1813-NDE1 Circumferential Indication 2 - Cut Location 2a)



Image 4 (G1813-NDE1 Circumferential Indication 2 - Cut Location 2b)

Welds G1813-NDE2, G1813-NDE3 and G1813-NDE4



G1813-NDE1, G1813-NDE2 and G1813-NDE3 are set-on branch connection configuration welds of ~0.85" (22 mm) thick branch pipe to ~2.60" (66 mm) thick main run pipe (SS to SS) of component G1813, at the time of the examination actual weld joint design information was not available.

Color contrast solvent removable dye penetrant surface examinations were performed on the welds and adjacent base material. No relevant indications were observed.

G1813-NDE2, G1813-NDE3 and G1813-NDE4 were examined with non-encoded (manual) ultrasonic testing utilizing conventional ultrasonic techniques employing shear (transverse) wave modes looking for potential service induced discontinuities along with any potential embedded or fabrication related defects that may be identifiable.

No responses from service induced or embedded discontinuities were visible in the collected data for these inspection areas.

Specific recommendations for destructive analysis cut locations were not identified in the collected data for G1813-NDE2, G1813-NDE3 or G1813-NDE4.

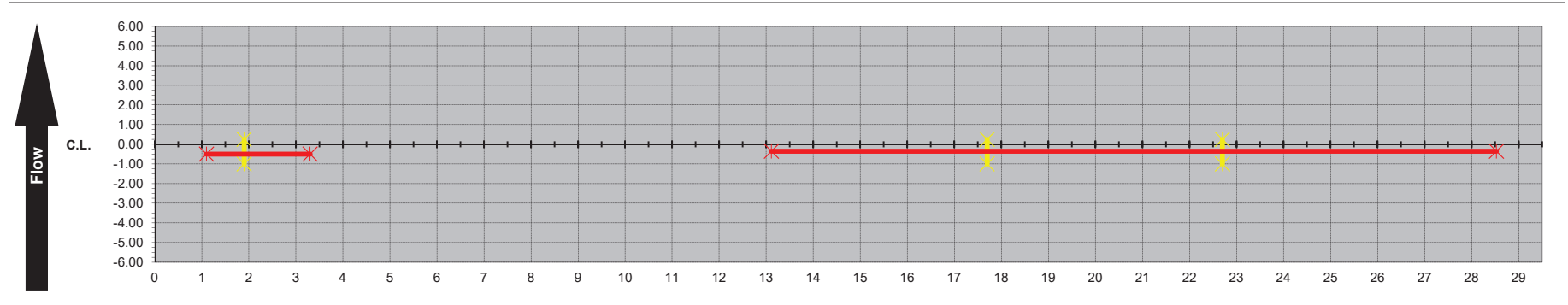
Fingerprint Sheet

G1813-NDE1



Eddystone Fingerprint Data Sheet

Sample ID: **G1813 - NDE1**
OD @ CL: 9.40 ID @ CL: 4.20 OD Circ. @ CL: 29.53 ID Circ. @ CL: 13.195 Nom "T" @ CL: 2.600



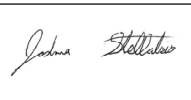
Fingerprint Information:

Indication	1	2	3	4	5								
Start(X1)	1.101	13.112											
Stop(X2)	3.303	28.527											
Y Start	-0.501	-0.354											
Y Stop	-0.501	-0.354											
Length	2.202	15.415											
Upper R.L.	0.835	0.975											
Lower R.L.	1.636	1.531											
Flaw H	0.801	0.556											

Recommended Cut Locations:

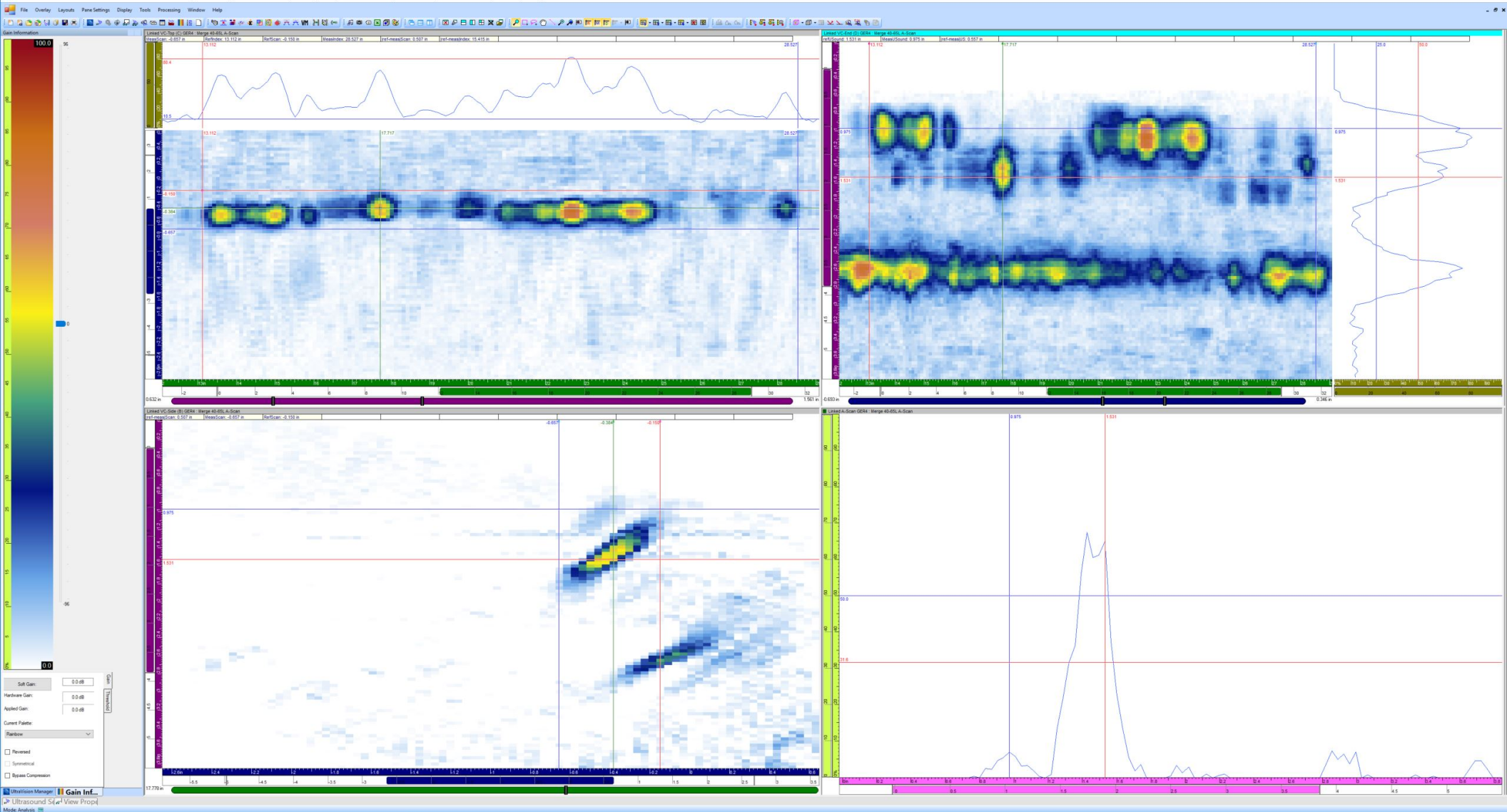
Location	1	2a	2b										
Start(X1)	1.900	17.700	22.700										
Stop(X2)	1.900	17.700	22.700										
Y Start	-1.000	-1.000	-1.000										
Y Stop	0.250	0.250	0.250										

Notes: This component had multiple embedded defects located mid-wall in the weld material, that do not connect to either surface. The recommended cut locations for the two indications noted on this data sheet were the most pronounced areas, with confirmation from multiple beam angles and/or directions.

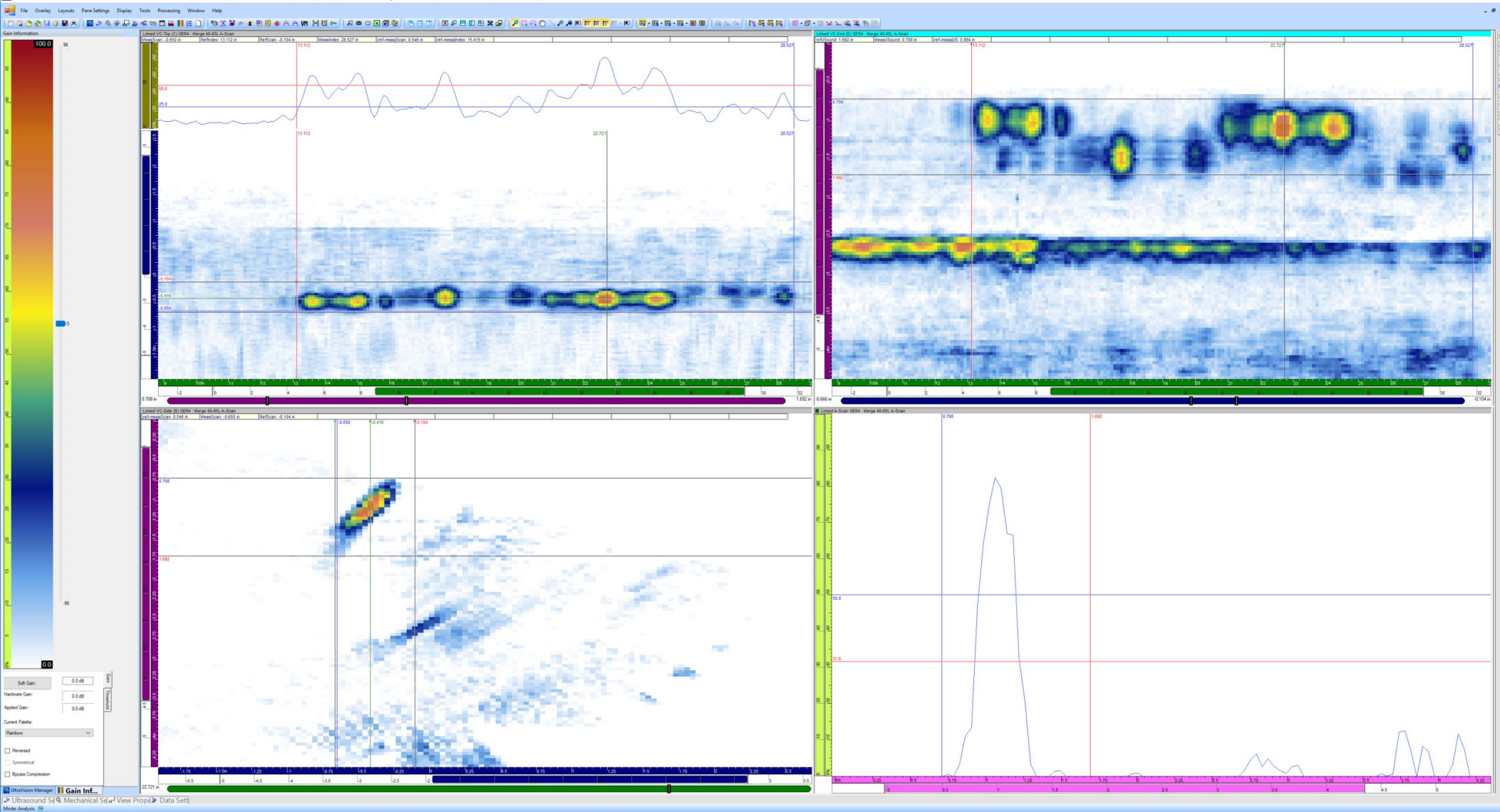
ANALYSIS PERFORMED BY:  Digitally signed by Josh Stellakis
DN: cn=Josh Stellakis,
email=jstellakis@epri.com, c=US
Date: 2019.05.09 09:55:20 -04'00'

DATE: _____

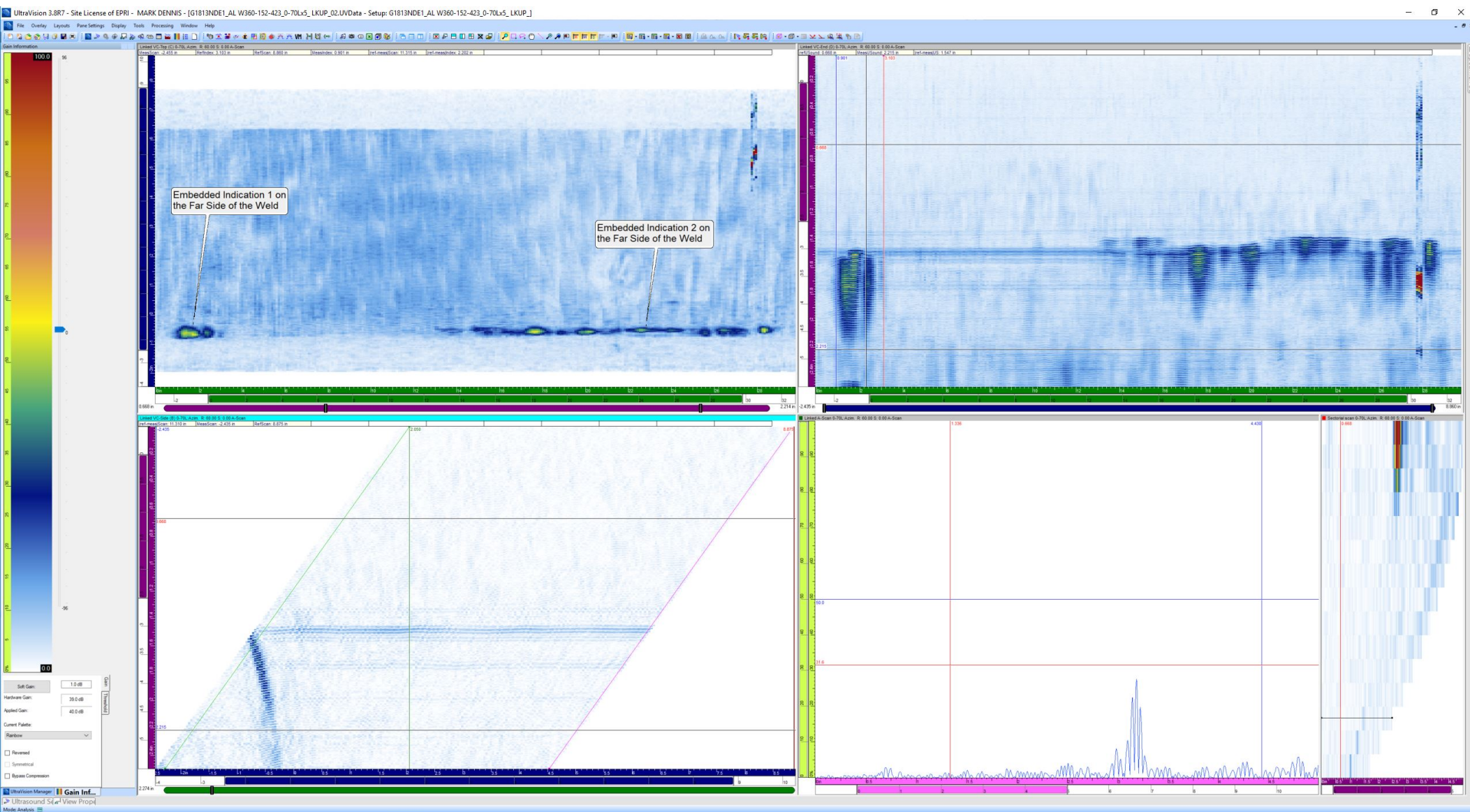
Analysis Screen Captures G1813-NDE1



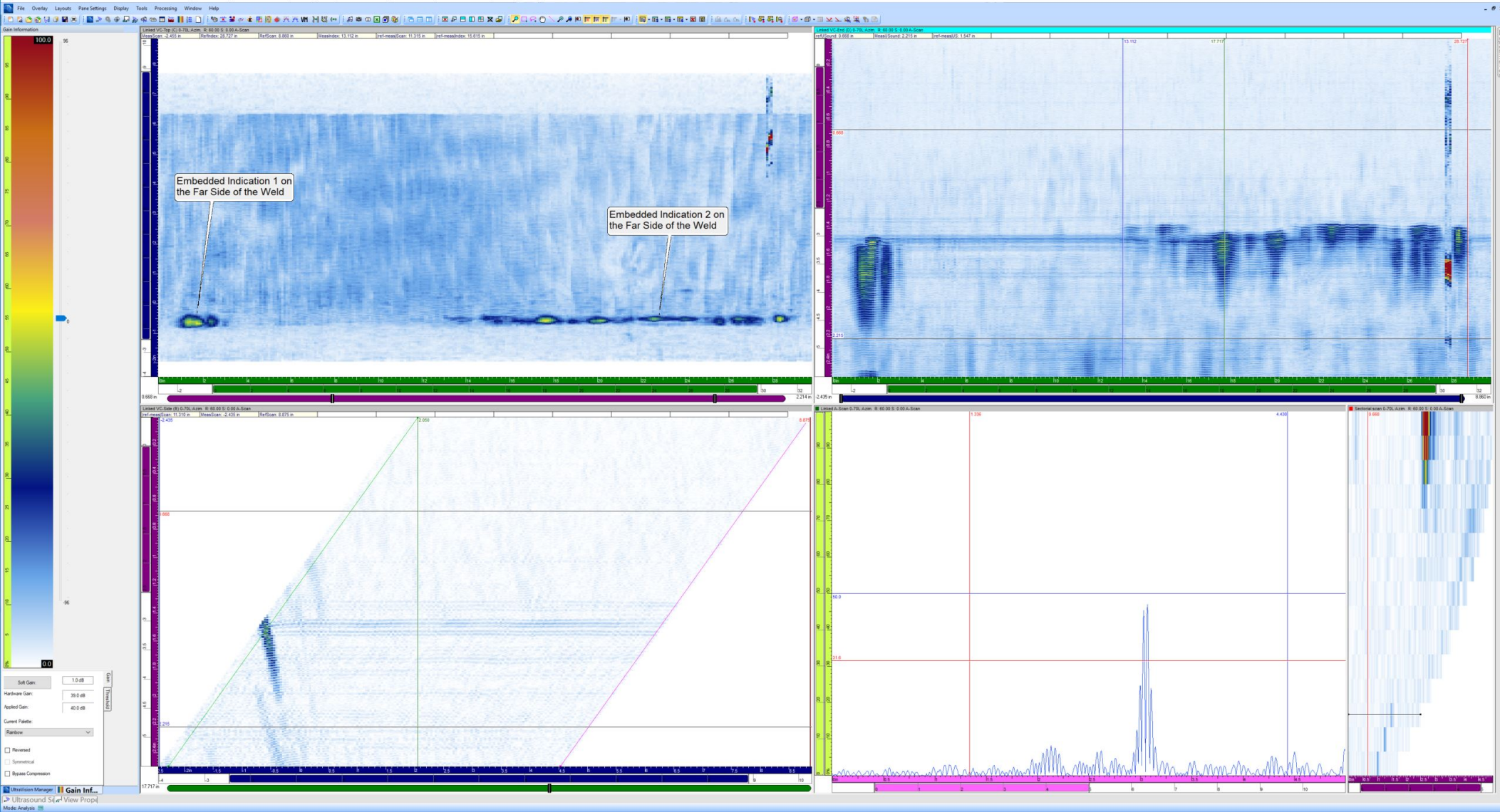
G1813NDE1 40-65L Merge LKDN Indication 2 (Cut Location 2a)



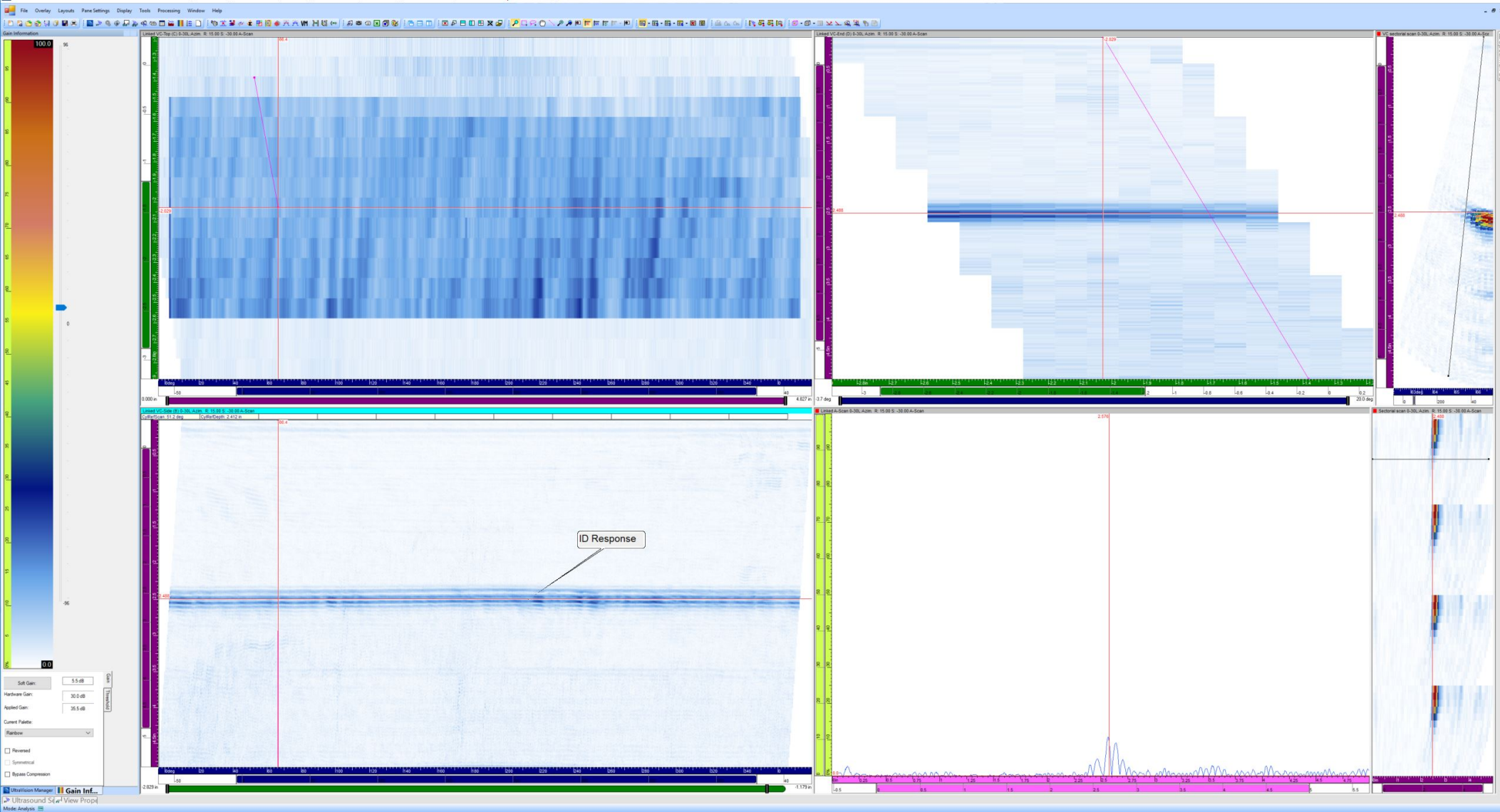
G1813NDE1 40-65L Merge LKDN Indication 2 (Cut Location 2b)

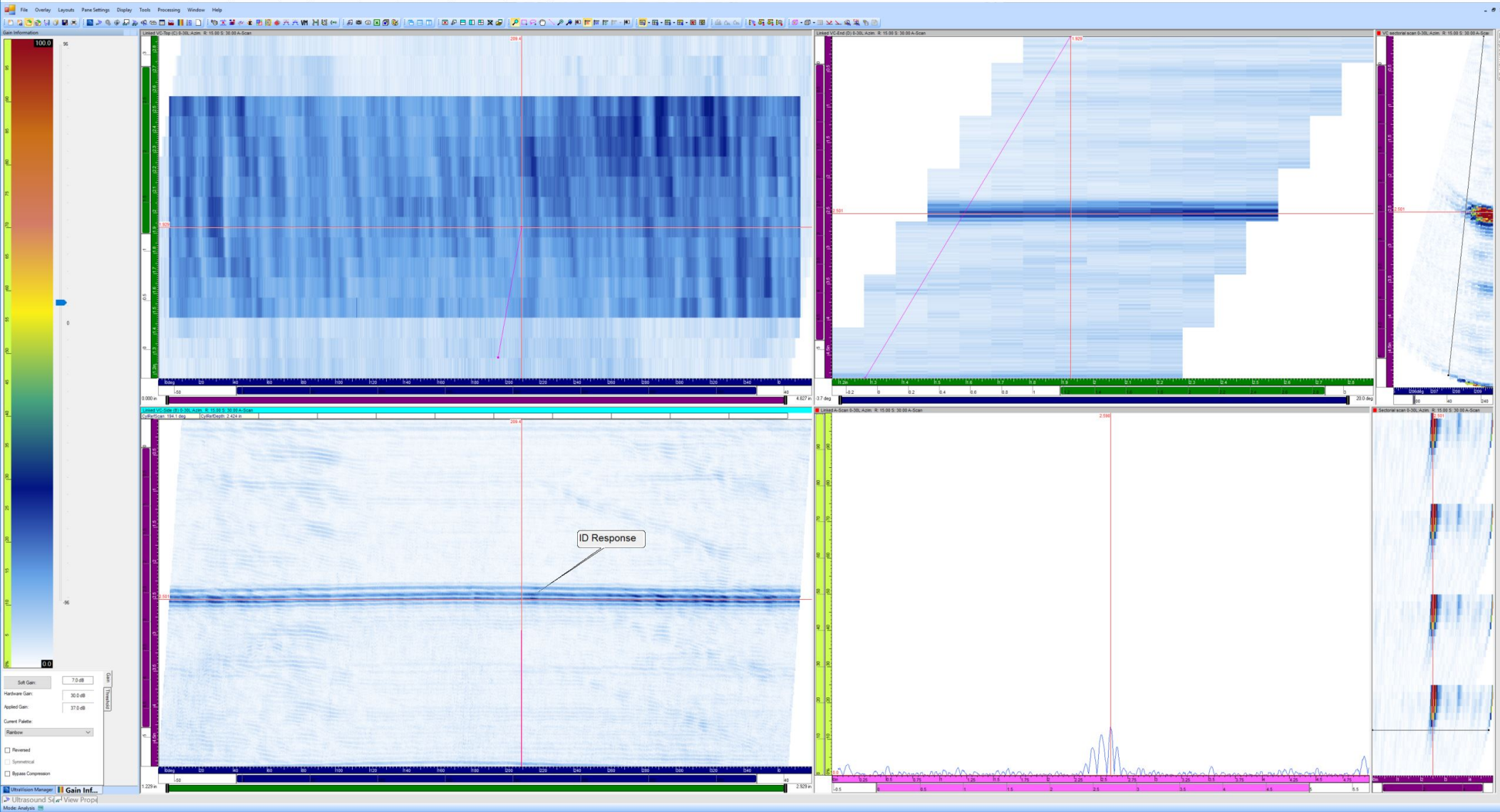


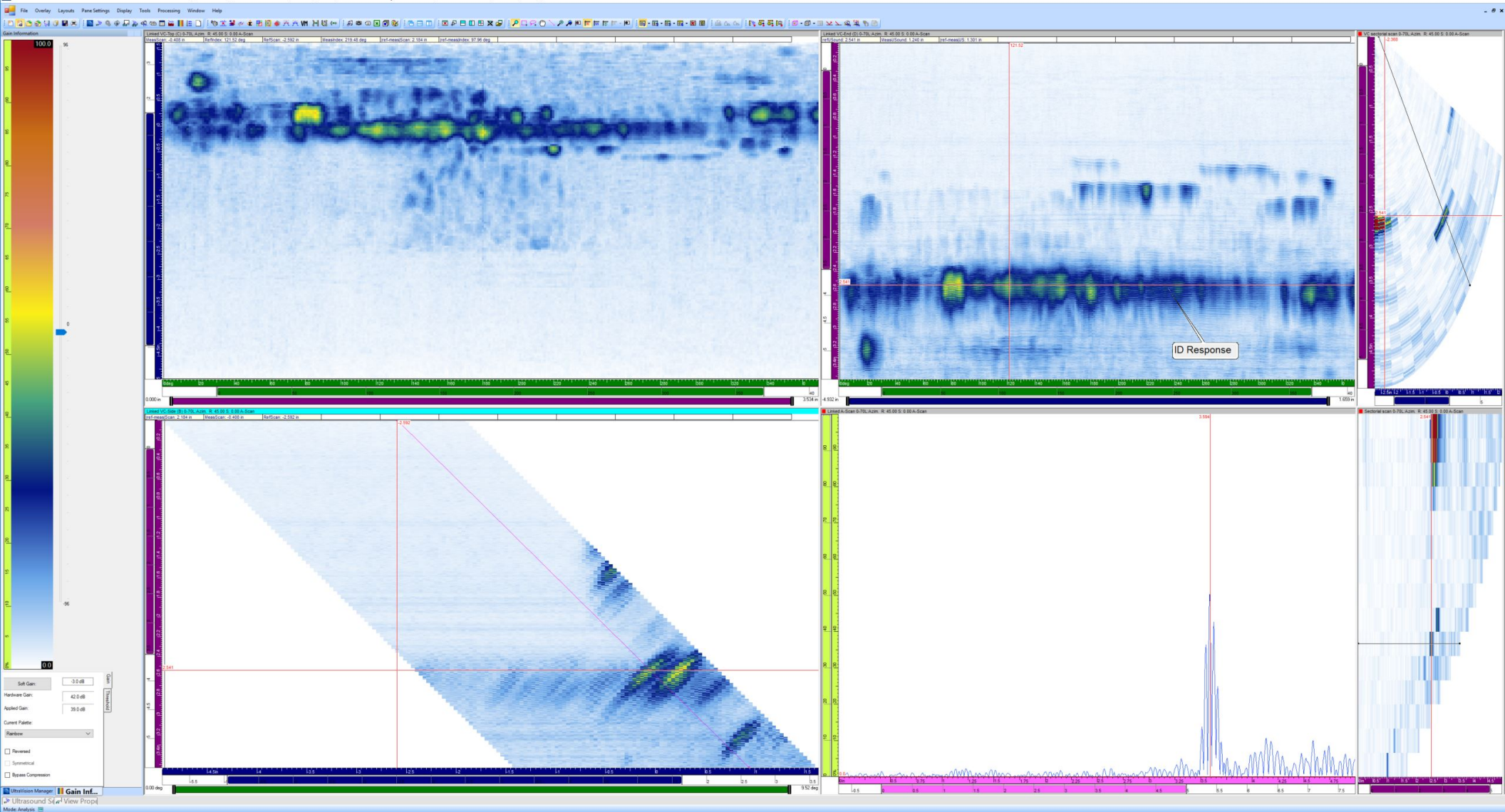
G1813NDE1 60L LKUP Indication 1 (Far Side)



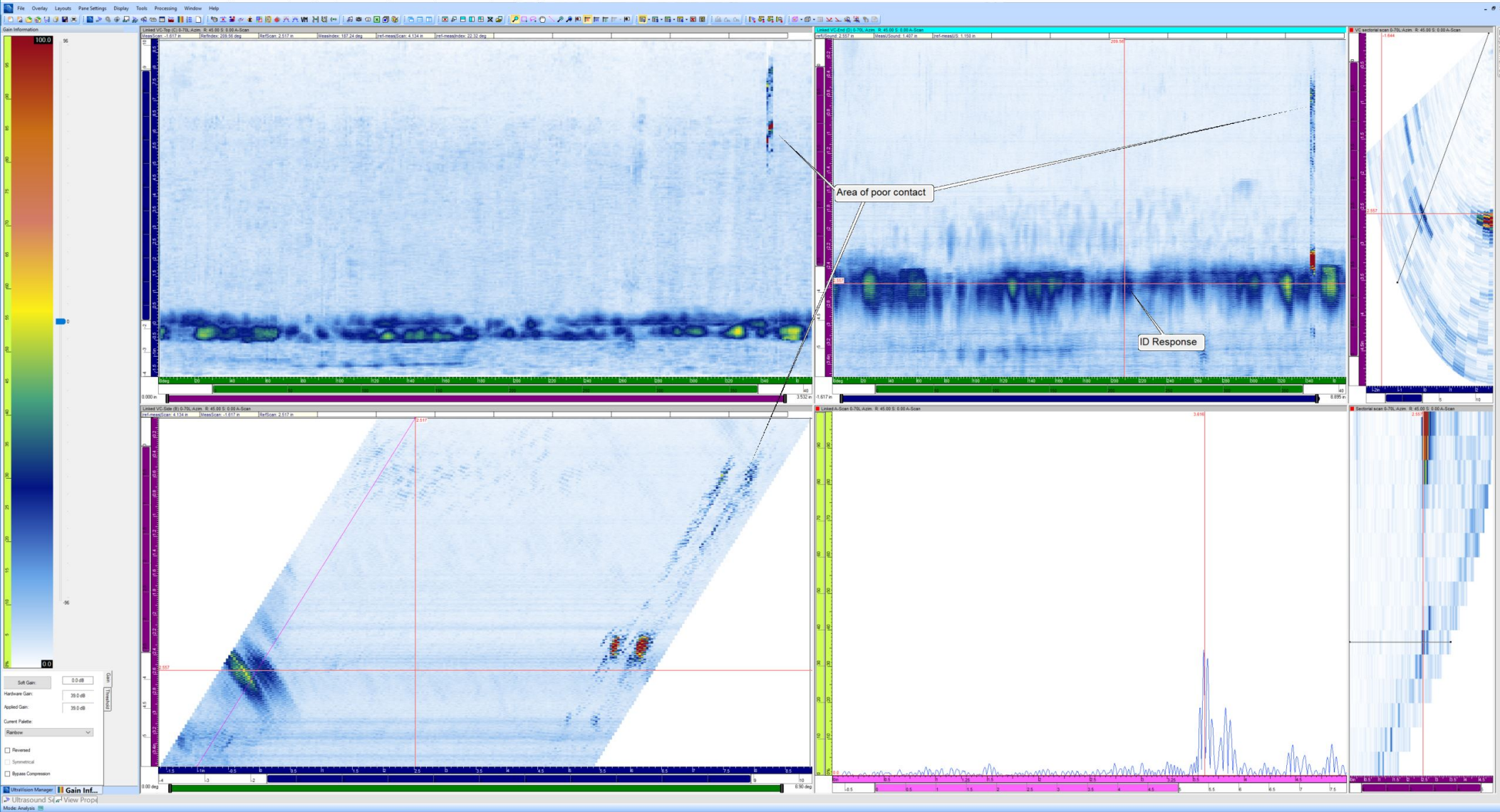
G1813NDE1 60L LKUP Indication 2 (Far Side)

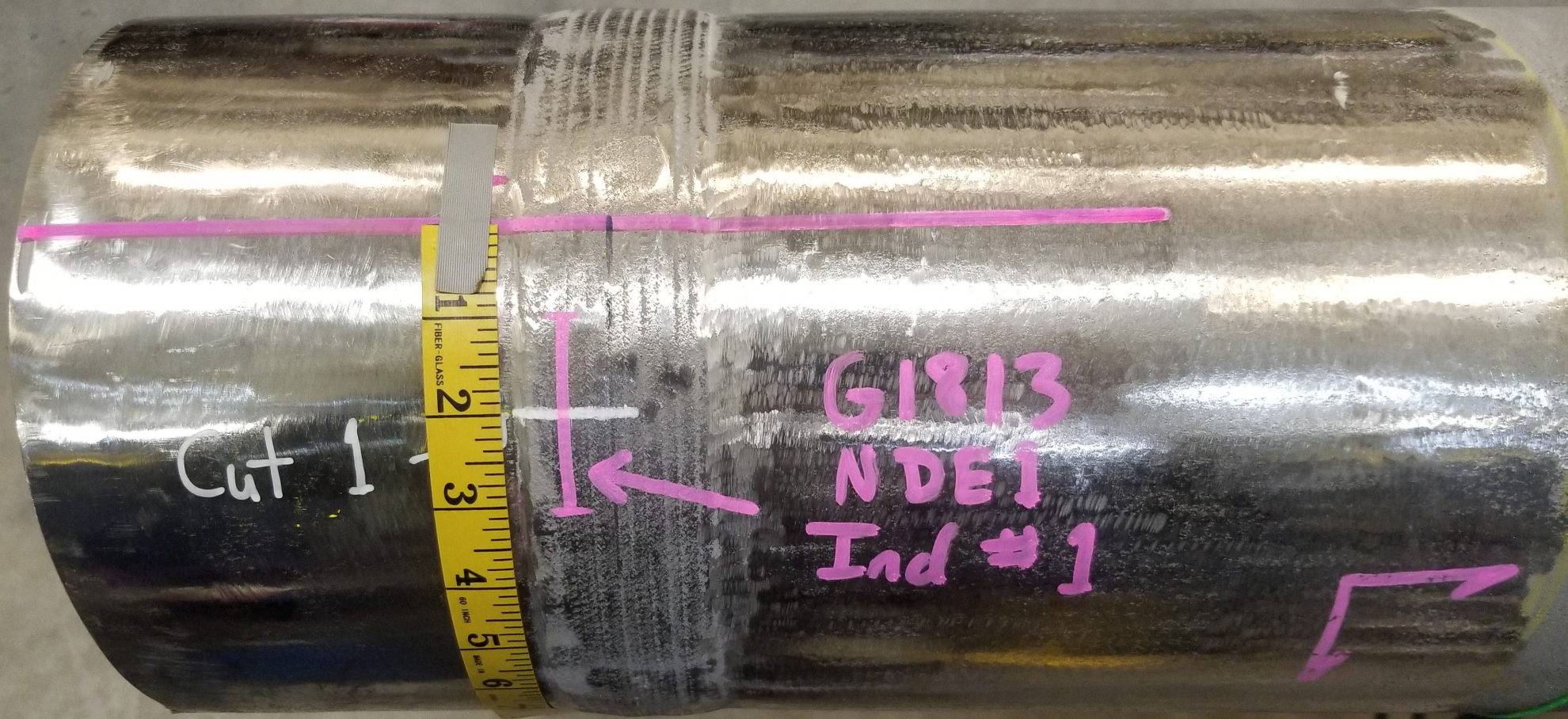






G1813NDE1 45L LKDN OVERVIEW





G1813-NDE1 Indication 1



G1813-NDE1 Indication 2_1



G1813-NDE1 Indication 2_2

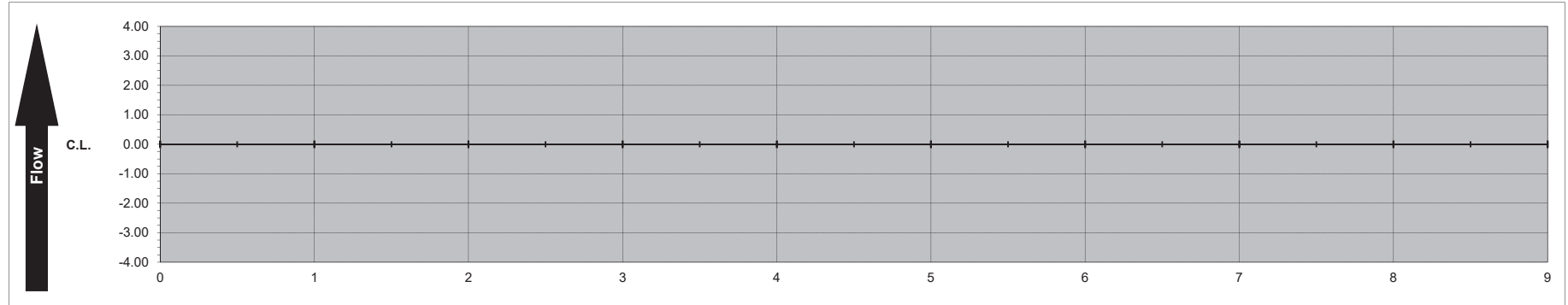
Fingerprint Sheet

G1813-NDE2



Fingerprint Data Sheet

Sample ID: **G1813 - NDE2**
OD @ CL: 2.75 ID @ CL: 1.07 OD Circ. @ CL: 8.639 ID Circ. @ CL: 3.362 Nom "T" @ CL: 0.840



Fingerprint Information:

Indication	1	2	3	4	5								
Start(X1)	NRI												
Stop(X2)													
Y Start													
Y Stop													
Length													
Upper R.L.													
Lower R.L.													
Flaw H													

Recommended Cut Locations:

Location	1												
Start(X1)	None												
Stop(X2)													
Y Start													
Y Stop													

Fingerprint Notes: No indications were observed in this examination area, there are no recommendations for cutting this component.

William Ratliff

Digitally signed by William Ratliff
Date: 2019.05.07 11:37:51
-04'00'

ANALYSIS PERFORMED BY: _____ DATE: _____

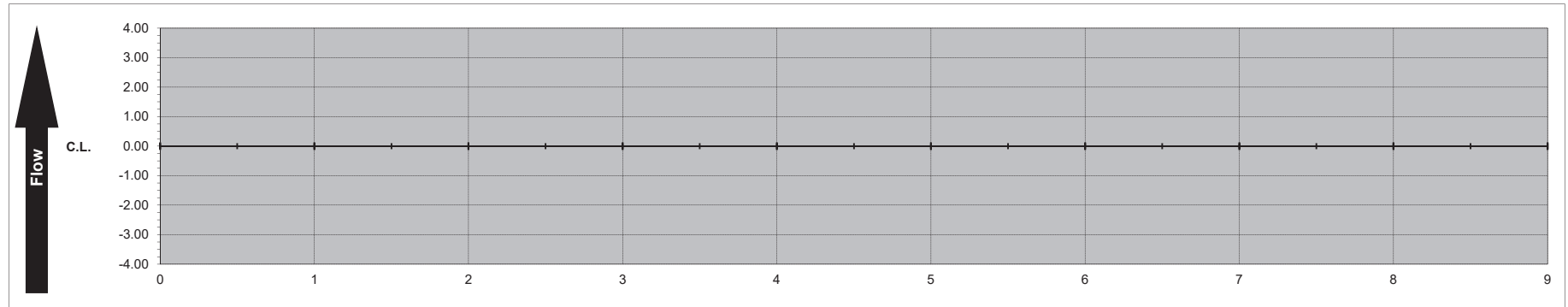
Fingerprint Sheet

G1813-NDE3



Fingerprint Data Sheet

Sample ID: **G1813 - NDE3**
OD @ CL: 2.75 ID @ CL: 1.07 OD Circ. @ CL: 8.639 ID Circ. @ CL: 3.362 Nom "T" @ CL: 0.840



Fingerprint Information:

Indication	1	2	3	4	5								
Start(X1)	NRI												
Stop(X2)													
Y Start													
Y Stop													
Length													
Upper R.L.													
Lower R.L.													
Flaw H													

Recommended Cut Locations:

Location	1												
Start(X1)	None												
Stop(X2)													
Y Start													
Y Stop													

Fingerprint Notes: No indications were observed in this examination area, there are no recommendations for cutting this component.

William Ratliff
Digitally signed by William Ratliff
Date: 2019.05.07 11:35:31
-04'00'

ANALYSIS PERFORMED BY: _____ DATE: _____

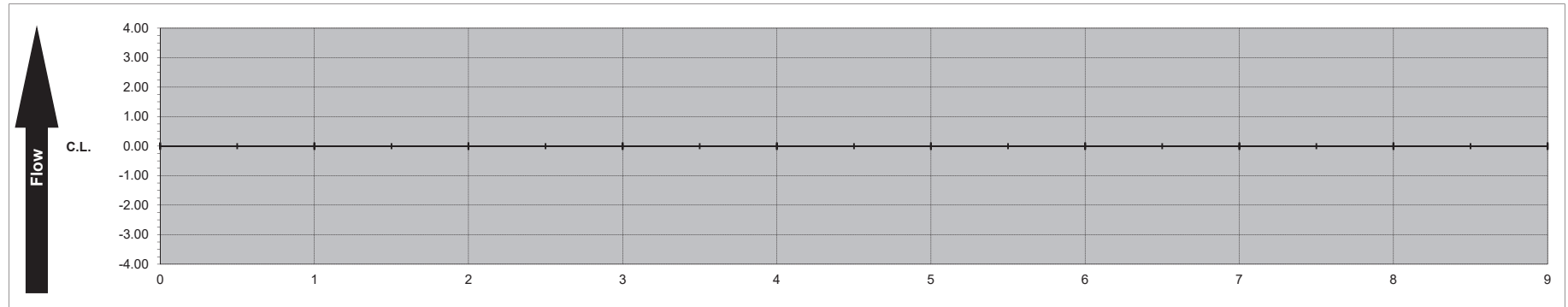
Fingerprint Sheet

G1813-NDE4



Fingerprint Data Sheet

Sample ID: **G1813 - NDE4**
OD @ CL: 2.75 ID @ CL: 1.07 OD Circ. @ CL: 8.639 ID Circ. @ CL: 3.362 Nom "T" @ CL: 0.840



Fingerprint Information:

Indication	1	2	3	4	5								
Start(X1)	NRI												
Stop(X2)													
Y Start													
Y Stop													
Length													
Upper R.L.													
Lower R.L.													
Flaw H													

Recommended Cut Locations:

Location	1												
Start(X1)	None												
Stop(X2)													
Y Start													
Y Stop													

Fingerprint Notes: No indications were observed in this examination area, there are no recommendations for cutting this component.

William Ratliff Digitally signed by William Ratliff
Date: 2019.05.07 11:35:52 -04'00'

ANALYSIS PERFORMED BY: _____ DATE: _____

PD PIPING EQUIPMENT INVENTORY LIST

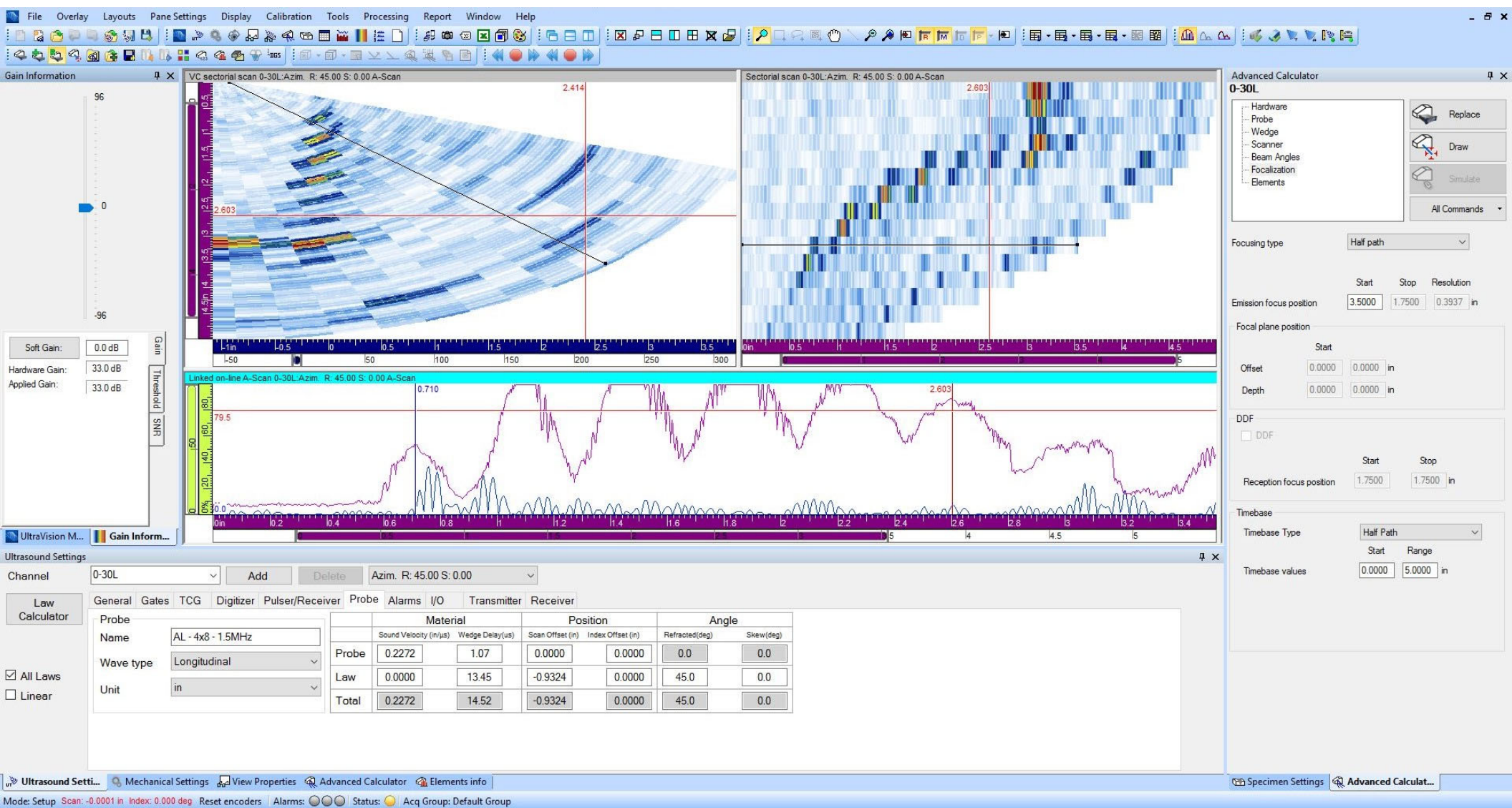
Candidate's Name: _____ CID #: _____ Session #: _____ Date: _____

Test Set # Eddy Stone Procedure _____ Rev. _____

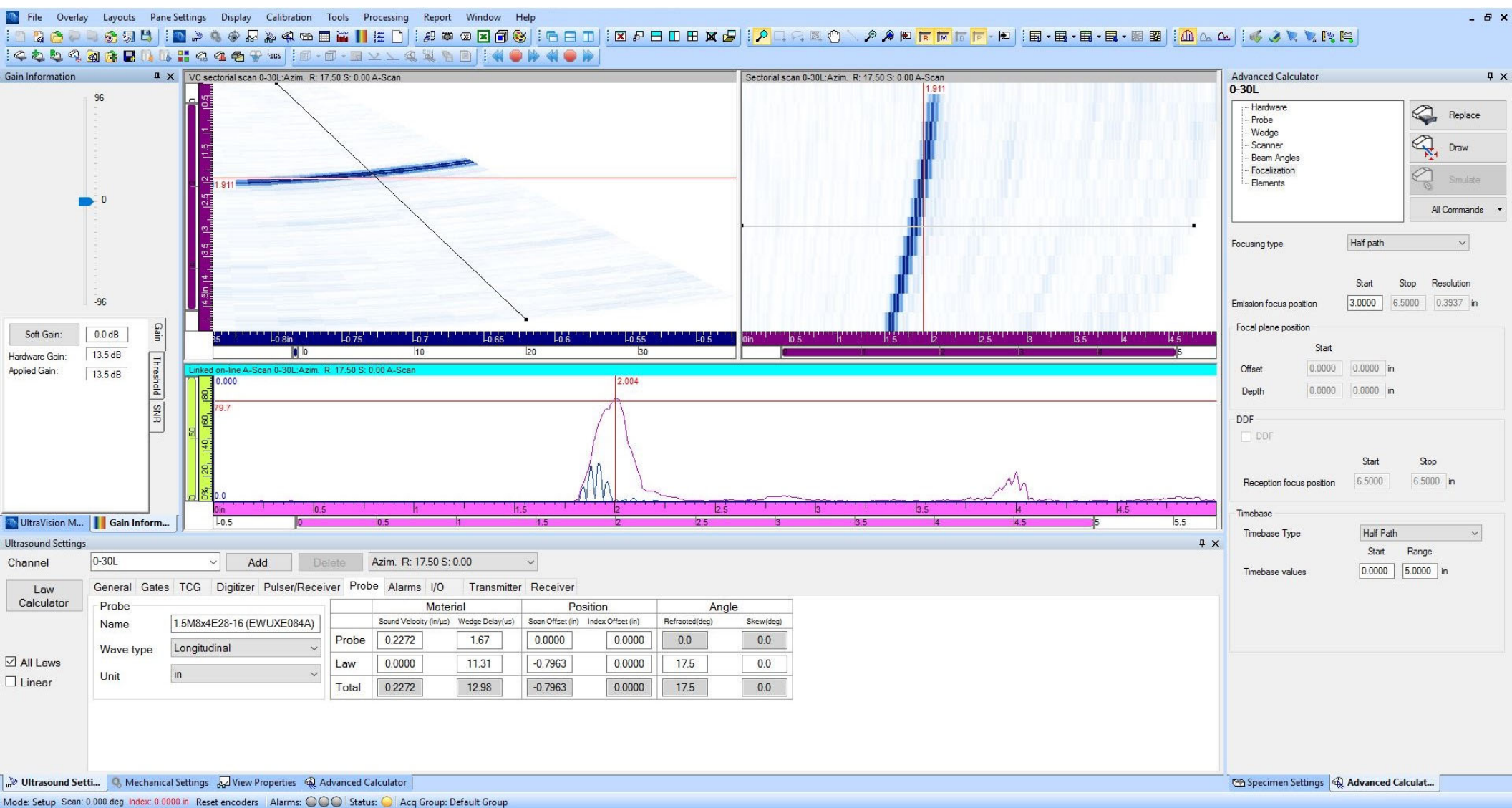
Instrument Manufacturer: Zetec Model: Omniscan MX 32-128

SEARCH UNIT PARAMETERS								SEARCH UNIT CABLES			PDA USE ONLY									
No.	MFG./MDL.	FREQ.	SIZE	ANGLE	FOCUS FD/FS	CONTOUR Diameter	S/N	TYPE	LENGTH	INT. CONN.	Verified	Sample ID	Ferr/Aust (circle one)			<input type="checkbox"/> IGSCC <input type="checkbox"/> WOR <input type="checkbox"/> DM				
														DT	LN	TW	DT	LN	TW	
Ex.	RTD/TRL-2	2.0	2(10x18mm)1/4λ	60°	FS 35mm	12" Ax or Circ	98-012	RG-174	12'	0				DS			DS			
														SS			SS			
1	GEIT Comp G	2.25	0.25"	45°	NA	Flat	SB1241	RG-174	6'	1				DS			DS			
														SS			SS			
2	GEIT Comp G	2.25	0.25"	60°	NA	Flat	SB1241	RG-174	6'	1				DS			DS			
														SS			SS			
3														DS			DS			
														SS			SS			
4														DS			DS			
														SS			SS			
5														DS			DS			
														SS			SS			
6														DS			DS			
														SS			SS			
7														DS			DS			
														SS			SS			
8														DS			DS			
														SS			SS			
9														DS			DS			
														SS			SS			
10														DS			DS			
														SS			SS			

Calibrations



AL Probe W360-152-423_1.5MHz_45°L_0-70L_3.5in FP_2.6in SDH Delay Cal_10-AX-04



AL Probe W10027111_1.5MHz_17.5°L_0-30L_3.0in FP_2.0in Radius Delay Cal_10-CIRC-01

Report Date	Report Version	Setup File name	Date of Inspection	Inspection Version	Save Mode
2019 / 05 / 07	1.4R3	45deg Shear 0.25in 2.25MHz.sps	2019 / 05 / 07	1.4R3	A Scan
OmniScan Type	OmniScan Serial #	Module Type	Module Serial #	Calibration Due	Data File name
OmniScan NX	030N1-Z-000036	030N1-M-PA32112SPR	030N1-Z-6053	2013 / 03 / 07	Data####

Group 1

Setup

A:45.0 Sk:000 L:001					
Beam Delay	Start (Half Path)	Range (Half Path)	PRF	Type	Averaging Factor
4.200 us	0.000 in	6.054 in	60	PA	1
Scale Type	Scale Factor	Video Filter	Pretrig	Rectification	Band Pass Filter
Compression	31	Off	0.00 us	FW	None (0.52 - 19 MHz)
Voltage	Gain	Mode	Wave Type	Sound Velocity	Pulse Width
High	36.50 dB	PE (Pulse Echo)	Shear	0.122 in/us	220.00 ns
Scan Offset	Index Offset	Skew			
0.000 in	0.000 in	0.0°			
Gate	Start	Width	Threshold	Synchro	
I	0.000 in	0.138 in	20.00 %	Pulse	
A	0.401 in	0.492 in	25.00 %	Pulse	
B	0.095 in	0.138 in	30.00 %	Pulse	

Calculator

Used Element Qty	First Element	Last Element	Resolution	Wave Type	Material Velocity
1	1	1	1.0	Shear	0.122 in/us
Start Angle	Stop Angle	Angle Resolution	Focus Depth	Scan Type	
45.0°	60.0°	1.0°	1.000 in	Linear Angle	

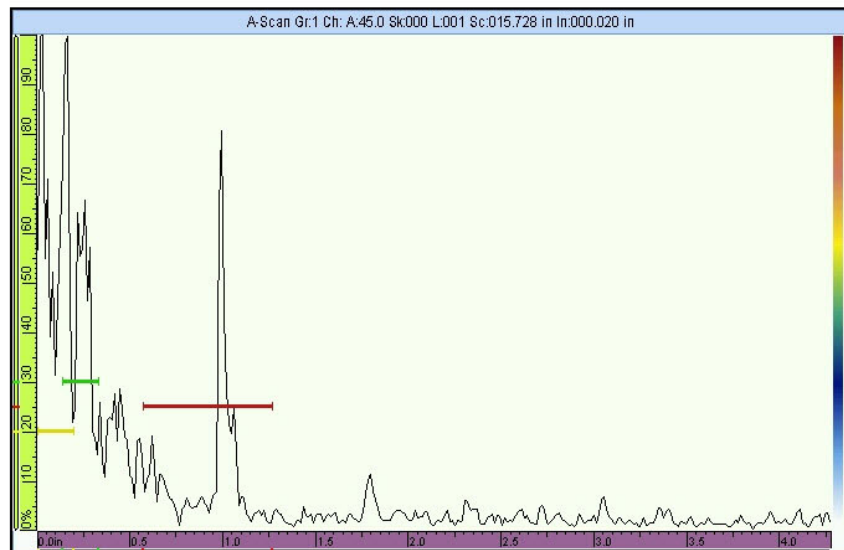
Part

Material	Geometry	Thickness
STEEL STNLS	Plate	4.000 in

Scan Area

Scan Start	Scan Length	Scan Resolution	Index Start	Index Length	Index Resolution
0.000 in	15.748 in	0.039 in	0.000 in	0.039 in	0.039 in
Synchro	Max Scan Speed				
Clock	N/A				
Axis	Encoder	Encoder Type	Encoder Resolution	Polarity	
Scan	Off	Off	Off	Off	
Index	Off	Off	Off	Off	

A%	A"	B%	B"	None	None	None	None
81.0 %	1.000 in	104.5 %	0.161 in				



Report Date	Report Version	Setup File name	Date of Inspection	Inspection Version	Save Mode
2019 / 05 / 07	1.4R3	60deg Shear 0.25in 2.25MHz ops	2019 / 05 / 07	1.4R3	Screen
OmniScan Type	OmniScan Serial #	Module Type	Module Serial #	Calibration Due	Data File name
OmniScan MX	OMNI-Z-000036	OMNI-M-PA32118PR	OMNI-Z-6053	2019 / 03 / 07	60Shear Cal_0.8inSDH delay Cal

Group 1

Setup

A:60.0 Sk:000 L:001					
Beam Delay	Start (Half Path)	Range (Half Path)	PRF	Type	Averaging Factor
5.400 us	0.000 in	6.054 in	60	PA	1
Scale Type	Scale Factor	Video Filter	Pretrig	Rectification	Band Pass Filter
Compression	31	Off	0.00 us	FW	None (0.52 - 19 MHz)
Voltage	Gain	Mode	Wave Type	Sound Velocity	Pulse Width
High	41.50 dB	PE (Pulse Echo)	Shear	0.122 in/us	220.00 ns
Scan Offset	Index Offset	Skew			
0.000 in	0.000 in	0.0°			
Gate	Start	Width	Threshold	Synchro	
I	0.000 in	0.098 in	20.00 %	Pulse	
A	0.283 in	0.348 in	25.00 %	Pulse	
B	0.067 in	0.098 in	30.00 %	Pulse	

Calculator

Used Element Qty	First Element	Last Element	Resolution	Wave Type	Material Velocity
1	1	1	1.0	Shear	0.122 in/us
Start Angle	Stop Angle	Angle Resolution	Focus Depth	Scan Type	
60.0°	60.0°	1.0°	1.000 in	Linear Angle	

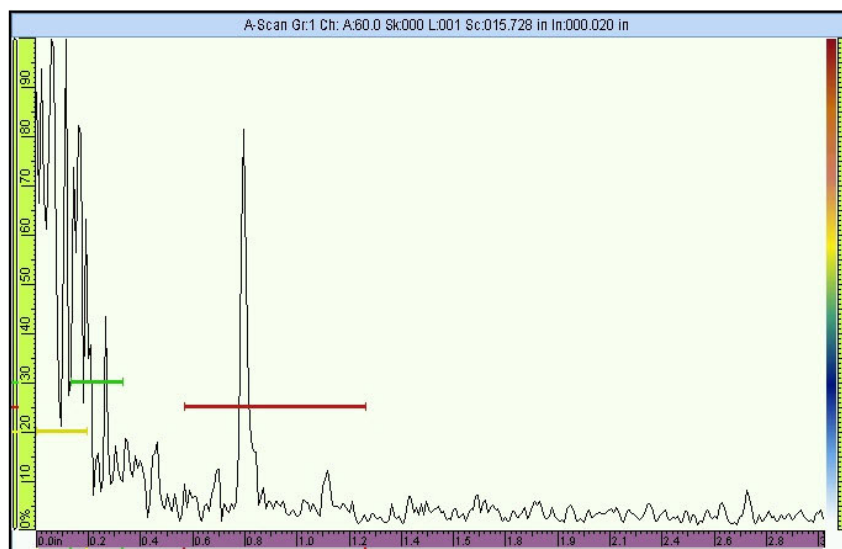
Part

Material	Geometry	Thickness
STEEL STNLS	Plate	4.000 in

Scan Area

Scan Start	Scan Length	Scan Resolution	Index Start	Index Length	Index Resolution
0.000 in	15.748 in	0.039 in	0.000 in	0.039 in	0.039 in
Synchro	Max Scan Speed				
Clock	N/A				
Axis	Encoder	Encoder Type	Encoder Resolution	Polarity	
Scan	Off	Off	Off	Off	
Index	Off	Off	Off	Off	

A%	A^	B%	B^	None	None	None	None
81.8 %	0.800 in	82.6 %	0.170 in				



Technique Sheets

TECHNIQUE SHEET FOR ULTRASONIC FINGERPRINTING OF PERFORMANCE DEMONSTRATION SAMPLES

Project Information

Project Identification:	Eddystone EEM Project (DOE)
Project Supervisor:	Josh Stellakis
Project Description:	Collection of UT data to detect and length size flaws in field removed piping.
Security Requirements:	N/A
Miscellaneous Info:	N/A

Component Information

Sample Description:	G1813 pipe sections labeled NDE 1
Material Type(s):	Stainless Steel
Thickness/Diameter:	2.75" / 9.25"
Examination Volume:	1/4" past Weld Toes
Reference System:	Weld centerline (Wo) and downstream mid-point extension of set-on branch connection stub row (Lo)
Flaw Mechanism's	Unknown
Sample numbers:	G1813 NDE 1
Miscellaneous Info:	N/A

APPROVED BY: _____

Josh Stellakis

Digitally signed by Josh Stellakis
DN: cn=Josh Stellakis,
email=jstellakis@epri.com, c=US
Date: 2019.05.09 11:31:06 -04'00'

DATE: _____

Technique Information

Examination Method:	Contact testing
Examination Surface:	Outside diameter surface
Miscellaneous Info:	N/A

Equipment Requirements

UT System:	Zetec Dynaray			
Pulser Type:	Unipolar Square			
Amplifier Type:	Linear			
Software Version:	Ultravision 3.8 R7 or later			
Specific Hardware:	None			
Essential Variables:	None			
Misc.:	None			
Search Unit:	#1 Zetec AL Probe 51561004	#2 Zetec AL Probe 51561004		
Mode:	Longitudinal	Longitudinal		
Frequency:	1.5 MHz	1.5 MHz		
Element Size:	8 x 4 3.5mm x 4.0mm	8 x 4 3.5mm x 4.0mm		
Element Shape:	Rectangular	Rectangular		
Examination Angles:	0° - 70°	0° - 30° 0° - 30° Skew towards weld		
Wedges:	GEIT 360-152-423 LKUP / LKDN	10027111-R01 LKCW / LKCCW		
Focusing: (Half Path)	3.5" Half Path	3.0" Half Path		
Misc.:	N/A			
Scanner:	ATCO GPS-1000			
Motion Controller:	MCDU or Zetec ZMC ²			
Axis Requirements:	X and Y movement			
Gimble Requirements:	N/A			
Misc.:	N/A			
Cabling Requirements:				
Cable Type:	RG-174 Integrated			
Min/Max Length:	6'			
Int. Connectors:	0			
Misc.:	N/A			

Calibration Information

Calibration Type:	Depth calibration performed on appropriate reference block side drilled holes for axial scans. Metal path calibration performed on a radius for circumferential scans.
Time base Info:	Time base shall be sufficient to encompass component thickness at a minimum
Calibration Blocks:	EPRI-REF-10-AX-04 / 10-CIRC-01
Temp. Requirements:	Ambient
Miscellaneous Info:	N/A

Examination Requirements

Scan Surface(s) :	OD
Scan Directions:	Axial and circumferential to pipe axis
Scan Pattern:	Unidirectional Raster
Scan Dimensions:	As necessary to cover examination volume from OD surfaces
Scan Speeds:	Not to exceed 3" per sec. either axis
Data Resolutions:	≤ 0.040" for scan resolution / ≤ 0.100" for index resolution
Examination Sensitivity:	Gain set at 80% SDH at max depth
Misc.:	N/A

Data Recording

Storage Media:	Local hard drive and external hard drive
Maximum File Size:	Not Applicable
File Nomenclature :	Sample ID_Probe Model _Wedge Model_Scan Angles_Scan Direction_Scan Number
Misc.:	N/A

Data Analysis Information

Software Version:	Ultravision 3.X or later
Documentation Required:	Calibration screen prints, Overview screen prints, Technique sheet, Equipment settings
Misc.:	N/A

Additional Requirements/Notes

Values for time base range, scan and index axis (start / stop) will be adjusted and input for each sample.
Weld crown was intact so circumferential scans were performed with skew looking towards the weld.
Scanning on upstream side of weld was conducted as far back from weld toe as possible given limitations of pipe geometry.

TECHNIQUE SHEET FOR ULTRASONIC FINGERPRINTING OF PERFORMANCE DEMONSTRATION SAMPLES

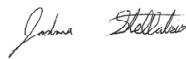
Project Information

Project Identification:	Eddystone EEM Project (DOE)
Project Supervisor:	Josh Stellakis
Project Description:	Collection of UT data to detect and length size flaws in field removed piping.
Security Requirements:	N/A
Miscellaneous Info:	N/A

Component Information

Sample Description:	G1813 pipe sections labeled NDE 2, 3, and 4
Material Type(s):	Stainless Steel
Thickness/Diameter:	0.84" / 2.75"
Examination Volume:	Weld Volume
Reference System:	Weld Toe on Branch Connection (Wo) and towards the upstream cut end of main run (Lo)
Flaw Mechanism's	Unknown
Sample numbers:	G1813 NDE 2, 3, and 4
Miscellaneous Info:	N/A

APPROVED BY: _____



Digitally signed by Josh Stellakis
DN: cn=Josh Stellakis,
email=jstellakis@epri.com, c=US
Date: 2019.05.09 11:37:56 -04'00'

DATE: _____

Technique Information

Examination Method:	Contact testing
Examination Surface:	Outside diameter surface
Miscellaneous Info:	N/A

Equipment Requirements

UT System:	Omniscan 32-128			
Pulser Type:	Unipolar Square			
Amplifier Type:	Linear			
Software Version:	1.4R3			
Specific Hardware:	None			
Essential Variables:	None			
Misc.:	None			
Search Unit:	#1 GEITCompG SB1241	#2 GEITCompG SB1241		
Mode:	Shear	Shear		
Frequency:	2.25 MHz	2.25 MHz		
Element Size:	0.25"	0.25"		
Element Shape:	Circular	Circular		
Examination Angles:	45°	60°		
Wedges:	SNI 45° Shear	SNI 60° Shear		
Focusing: (Half Path)	NA	NA		
Misc.:	N/A			
Scanner:	N/A			
Motion Controller:	N/A			
Axis Requirements:	N/A			
Gimble Requirements:	N/A			
Misc.:	N/A			
Cabling Requirements:				
Cable Type:	RG-174			
Min/Max Length:	6'			
Int. Connectors:	0			
Misc.:	N/A			

Calibration Information

Calibration Type:	Depth calibration performed on appropriate reference block side drilled holes for axial scans and circumferential scans.
Time base Info:	Time base shall be sufficient to encompass component thickness at a minimum
Calibration Blocks:	N DEC-3
Temp. Requirements:	Ambient
Miscellaneous Info:	N/A

Examination Requirements

Scan Surface(s) :	OD
Scan Directions:	Axial and circumferential to pipe axis
Scan Pattern:	Unidirectional Raster
Scan Dimensions:	As necessary to cover examination volume from OD surfaces
Scan Speeds:	Not to exceed 3" per sec. either axis
Data Resolutions:	50% Overlap
Examination Sensitivity:	Gain set at 80% SDH at max depth
Misc.:	N/A

Data Recording

Storage Media:	Local hard drive and external hard drive
Maximum File Size:	Not Applicable
File Nomenclature :	N/A
Misc.:	N/A

Data Analysis Information

Software Version:	N/A
Documentation Required:	N/A
Misc.:	N/A

Additional Requirements/Notes

UT System Setting Reports

Detailed Report



Acquisition Date 4/8/2019 3:03:55 PM **Analysis Date** 5/9/2019 12:11:12 PM
Setup File C:\Users\BWRVIP - EPRI\Desktop\Eddystone\G1813\NDE1\Setup\G1813NDE1_AL
W360-152-423_0-70Lx5_LKDN_01.UVSetup
Data File C:\Users\pjst011\Desktop\2019 DOE EEM\Priority 6
(G1813)_NDE1-4\Scanning\Data\G1813NDE1_AL W360-152-423_0-70Lx5_LKDN_01.UVData

Instrument and Software

Manufacturer	Zetec	Online Software	UltraVision: 3.9R9
Model	DYNARAY Lite	Online License	Site License: EPRI
Serial Number	DYN-0122	Reporting Software	UltraVision: 3.8R7
Calibration Date	5/15/2018	Reporting License	Site License: EPRI

Custom Fields

Default

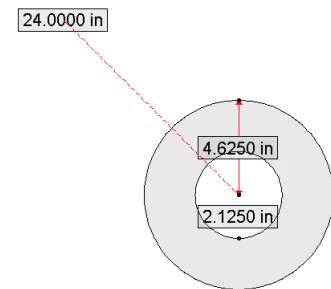
Contractor
Customer
Site
Procedure

Technician
Project
Part Number

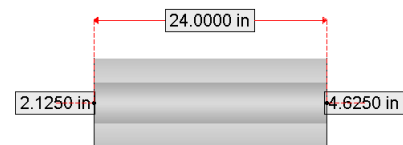
Specimen

Material **Steel**
Shear Velocity 0.1272 in/ μ s
Longitudinal Velocity 0.2272 in/ μ s

Shape **Pipe**
Inside Diameter 4.2500 in
Outside Diameter 9.2500 in
Length 24.0000 in



Scan Orientation **Axial**



UT Settings - 0-70L

Configuration Pitch & Catch

Probe	AL - 4x8 - 1.5MHz	Scan Reference	0.000 in	Pulser Connection	1
Wedge	360-152-423	Index Reference	0.000 in	Receiver Connection	1
Skew	0.0 deg	Probe Reverse	No	Separation	1.3084 in
Channel Wedge Delay	1.07 μ s				

Beams Sector

Wave Type	Longitudinal	Refracted Start Angle	0.0 deg	Skew Start Angle	0.0 deg
Focusing Type	Half Path	Refracted Stop Angle	70.0 deg	Skew Stop Angle	0.0 deg
Focusing Depth	3.5000 in	Refracted Resolution	5.0 deg	Skew Resolution Angle	1.0 deg
Primary First Element	1	Primary Aperture	8	Secondary Aperture	4

General

Gain	42.0 dB	Reference Gain	0.0 dB	Amplitude Range	100%
Timebase Start	0.000 in	Timebase Range	4.998 in		
Timebase Mode	True Depth				

Pulse & Receiver

Voltage	200 V	Pulse Width	330 ns	Rectification	Bipolar
Filter	None	Smoothing	No smoothing		

Digitizer

Acquisition Rate	133.3 Hz	Recurrence	2000 Hz	Averaging Type	None
Compression	1	Digitizing Frequency	25.0 MHz	Produce A-Scan	Yes

Gates

Name	Start(in)	Width(in)	Threshold(%)	Trigger	State	Sync
Synchro	0.103	0.206	25.0	Crossing	Off	None

Probes

Channel	Manufacturer	Model	Serial	Skew	Reversed
0-70L		- 4x8 - 1.5MHz		0.0 deg	No

Wedges

Channel	Manufacturer	Model	Serial	Velocity(in/μs)
0-70L		360-152-423		0.0921

Mechanical Settings**Sequence Type : Unidirectional**

Name	Start	Stop	Resolution	Unit
Scan Axis	-4.0000	-0.9970	0.0390	in
Index Axis	0.0	369.5	1.2	deg

Encoders

Action on Inspection Start : None

	Name	Type	Resolution	Unit	Inverted	Preset
Scan Axis	Encoder 2	Quadrature	23.2423	steps/in	No	-1.0000
Index Axis	Encoder 1	Quadrature	4802.0	steps/deg	No	0.0

Signature

Examiner

Reviewer

Customer

Date 5/9/2019 12:11:12 PM

Detailed Report



Acquisition Date 4/8/2019 11:03:31 AM **Analysis Date** 5/9/2019 12:12:54 PM
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W360-152-423_0-70Lx5_LKUP_01.UVSetup
Data File C:\Users\pjst011\Desktop\2019 DOE EEM\Priority 6
(G1813)_NDE1-4\Scanning\Data\G1813NDE1_AL W360-152-423_0-70Lx5_LKUP_02.UVData

Instrument and Software

Manufacturer	Zetec	Online Software	UltraVision: 3.9R9
Model	DYNARAY Lite	Online License	Site License: EPRI
Serial Number	DYN-0122	Reporting Software	UltraVision: 3.8R7
Calibration Date	5/15/2018	Reporting License	Site License: EPRI

Custom Fields

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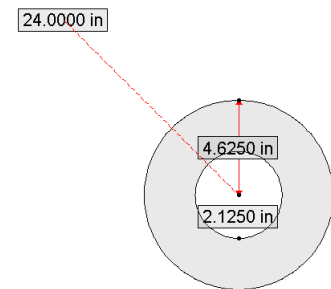
Contractor
Customer
Site
Procedure

Technician
Project
Part Number

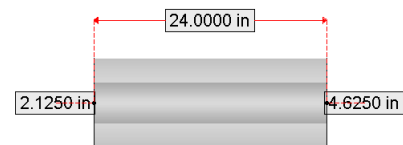
Specimen

Material Steel
Shear Velocity 0.1272 in/μs
Longitudinal Velocity 0.2272 in/μs

Shape Pipe
Inside Diameter 4.2500 in
Outside Diameter 9.2500 in
Length 24.0000 in



Scan Orientation Axial



UT Settings - 0-70L

Configuration Pitch & Catch

Probe	AL - 4x8 - 1.5MHz	Scan Reference	0.000 in	Pulser Connection	1
Wedge	360-152-423	Index Reference	0.000 in	Receiver Connection	1
Skew	180.0 deg	Probe Reverse	No	Separation	1.3084 in
Channel Wedge Delay	1.07 μs				

Beams Sector

Wave Type	Longitudinal	Refracted Start Angle	0.0 deg	Skew Start Angle	0.0 deg
Focusing Type	Half Path	Refracted Stop Angle	70.0 deg	Skew Stop Angle	0.0 deg
Focusing Depth	3.5000 in	Refracted Resolution	5.0 deg	Skew Resolution Angle	1.0 deg
Primary First Element	1	Primary Aperture	8	Secondary Aperture	4

General

Gain	39.0 dB	Reference Gain	0.0 dB	Amplitude Range	100%
Timebase Start	0.000 in	Timebase Range	4.998 in		
Timebase Mode	True Depth				

Pulse & Receiver

Voltage	200 V	Pulse Width	330 ns	Rectification	Bipolar
Filter	None	Smoothing	No smoothing		

Digitizer

Acquisition Rate	133.3 Hz	Recurrence	2000 Hz	Averaging Type	None
Compression	1	Digitizing Frequency	25.0 MHz	Produce A-Scan	Yes

Gates

Name	Start(in)	Width(in)	Threshold(%)	Trigger	State	Sync
Synchro	0.103	0.206	25.0	Crossing	Off	None

Probes

Channel	Manufacturer	Model	Serial	Skew	Reversed
0-70L		- 4x8 - 1.5MHz		180.0 deg	No

Wedges

Channel	Manufacturer	Model	Serial	Velocity(in/μs)
0-70L		360-152-423		0.0921

Mechanical Settings**Sequence Type : Unidirectional**

Name	Start	Stop	Resolution	Unit
Scan Axis	1.0000	7.9810	0.0390	in
Index Axis	0.0	369.5	1.2	deg

Encoders

Action on Inspection Start : None

	Name	Type	Resolution	Unit	Inverted	Preset
Scan Axis	Encoder 2	Quadrature	23.2423	steps/in	No	1.0000
Index Axis	Encoder 1	Quadrature	4802.0	steps/deg	No	0.0

Signature

Examiner

Reviewer

Customer

Date 5/9/2019 12:12:54 PM

Detailed Report



Acquisition Date 4/9/2019 10:36:15 AM **Analysis Date** 5/9/2019 12:19:42 PM
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Data File C:\Users\pjst011\Desktop\2019 DOE EEM\Priority 6
(G1813)_NDE1-4\Scanning\Data\G1813NDE1_AL W10027111_0-30Lx2.5_0-30 NEG
Skew_DN-LKCCW_FLOW REVERSED_01.UVData

Instrument and Software

Manufacturer	Zetec	Online Software	UltraVision: 3.9R9
Model	DYNARAY Lite	Online License	Site License: EPRI
Serial Number	DYN-0122	Reporting Software	UltraVision: 3.8R7
Calibration Date	5/15/2018	Reporting License	Site License: EPRI

Custom Fields

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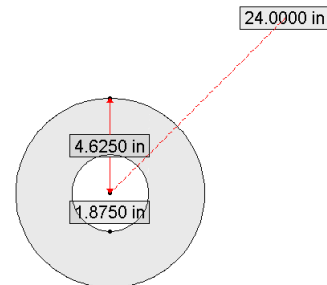
Contractor
Customer
Site
Procedure

Technician
Project
Part Number

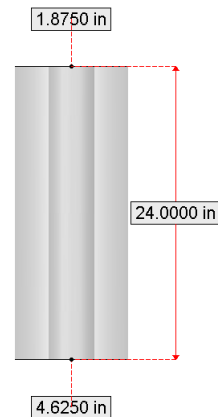
Specimen

Material Steel(stainless)
Shear Velocity 0.1240 in/μs
Longitudinal Velocity 0.2272 in/μs

Shape Pipe
Inside Diameter 3.7500 in
Outside Diameter 9.2500 in
Length 24.0000 in



Scan Orientation Circular



UT Settings - 0-30L

Configuration Pitch & Catch

Probe	3x4E28-16 (EWUXE084A)	Scan Reference	0.000 in	Pulser Connection	1
Wedge	10027111	Index Reference	0.000 in	Receiver Connection	1
Skew	180.0 deg	Probe Reverse	No	Separation	1.3780 in
Channel Wedge Delay	1.67 μs				

Beams Sector

Wave Type	Longitudinal	Refracted Start Angle	0.0 deg	Skew Start Angle	-30.0 deg
Focusing Type	Half Path	Refracted Stop Angle	30.0 deg	Skew Stop Angle	0.0 deg
Focusing Depth	3.0000 in	Refracted Resolution	2.5 deg	Skew Resolution Angle	10.0 deg
Primary First Element	1	Primary Aperture	8	Secondary Aperture	4

General

Gain	30.0 dB	Reference Gain	0.0 dB	Amplitude Range	100%
Timebase Start	0.000 in	Timebase Range	4.998 in		
Timebase Mode	True Depth				

Pulse & Receiver

Voltage	200 V	Pulse Width	330 ns	Rectification	Bipolar
Filter	None	Smoothing	No smoothing		

Digitizer

Acquisition Rate	38.4 Hz	Recurrence	2000 Hz	Averaging Type	None
Compression	1	Digitizing Frequency	25.0 MHz	Produce A-Scan	Yes

Gates

Name	Start(in)	Width(in)	Threshold(%)	Trigger	State	Sync
Synchro	0.103	0.206	25.0	Crossing	Off	None

Probes

Channel	Manufacturer	Model	Serial	Skew	Reversed
0-30L		(EWUXE084A)		180.0 deg	No

Wedges

Channel	Manufacturer	Model	Serial	Velocity(in/μs)
0-30L		10027111		0.0917

Mechanical Settings**Sequence Type : Unidirectional**

Name	Start	Stop	Resolution	Unit
Scan Axis	0.0	370.0	0.5	deg
Index Axis	-1.8500	-2.8500	0.1000	in

Encoders

Action on Inspection Start : None

	Name	Type	Resolution	Unit	Inverted	Preset
Scan Axis	Encoder 1	Quadrature	4802.0	steps/deg	No	0.0
Index Axis	Encoder 2	Quadrature	23.2423	steps/in	Yes	-1.8500

Signature

Examiner

Reviewer

Customer

Date 5/9/2019 12:19:42 PM

Detailed Report



Acquisition Date 4/9/2019 8:51:35 AM **Analysis Date** 5/9/2019 12:18:48 PM
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Data File C:\Users\pjst011\Desktop\2019 DOE EEM\Priority 6
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Skew_DN-LKCW_FLOW REVERSED_01.UVData

Instrument and Software

Manufacturer	Zetec	Online Software	UltraVision: 3.9R9
Model	DYNARAY Lite	Online License	Site License: EPRI
Serial Number	DYN-0122	Reporting Software	UltraVision: 3.8R7
Calibration Date	5/15/2018	Reporting License	Site License: EPRI

Custom Fields

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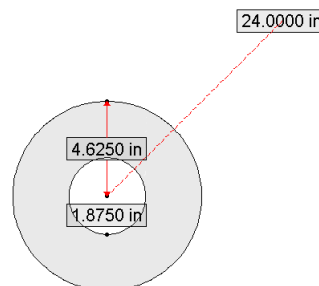
Contractor
Customer
Site
Procedure

Technician
Project
Part Number

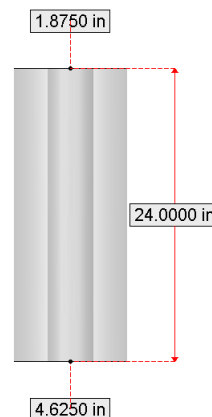
Specimen

Material Steel(stainless)
Shear Velocity 0.1240 in/ μ s
Longitudinal Velocity 0.2272 in/ μ s

Shape Pipe
Inside Diameter 3.7500 in
Outside Diameter 9.2500 in
Length 24.0000 in



Scan Orientation Circular



UT Settings - 0-30L

Configuration Pitch & Catch

Probe	\x4E28-16 (EWUXE084A)	Scan Reference	0.000 in	Pulser Connection	1
Wedge	10027111	Index Reference	0.000 in	Receiver Connection	1
Skew	0.0 deg	Probe Reverse	No	Separation	1.3780 in
Channel Wedge Delay	1.67 μ s				

Beams Sector

Wave Type	Longitudinal	Refracted Start Angle	0.0 deg	Skew Start Angle	0.0 deg
Focusing Type	Half Path	Refracted Stop Angle	30.0 deg	Skew Stop Angle	30.0 deg
Focusing Depth	3.0000 in	Refracted Resolution	2.5 deg	Skew Resolution Angle	10.0 deg
Primary First Element	1	Primary Aperture	8	Secondary Aperture	4

General

Gain	30.0 dB	Reference Gain	0.0 dB	Amplitude Range	100%
Timebase Start	0.000 in	Timebase Range	4.998 in		
Timebase Mode	True Depth				

Pulse & Receiver

Voltage	200 V	Pulse Width	330 ns	Rectification	Bipolar
Filter	None	Smoothing	No smoothing		

Digitizer

Acquisition Rate	38.4 Hz	Recurrence	2000 Hz	Averaging Type	None
Compression	1	Digitizing Frequency	25.0 MHz	Produce A-Scan	Yes

Gates

Name	Start(in)	Width(in)	Threshold(%)	Trigger	State	Sync
Synchro	0.103	0.206	25.0	Crossing	Off	None

Probes

Channel	Manufacturer	Model	Serial	Skew	Reversed
0-30L		(EWUXE084A)		0.0 deg	No

Wedges

Channel	Manufacturer	Model	Serial	Velocity(in/μs)
0-30L		10027111		0.0917

Mechanical Settings**Sequence Type : Unidirectional**

Name	Start	Stop	Resolution	Unit
Scan Axis	0.0	370.0	0.5	deg
Index Axis	-1.8500	-2.8500	0.1000	in

Encoders

Action on Inspection Start : None

	Name	Type	Resolution	Unit	Inverted	Preset
Scan Axis	Encoder 1	Quadrature	4802.0	steps/deg	No	0.0
Index Axis	Encoder 2	Quadrature	23.2423	steps/in	Yes	-1.8500

Signature

Examiner

Reviewer

Customer

Date 5/9/2019 12:18:48 PM

Detailed Report



Acquisition Date 4/9/2019 11:04:02 AM **Analysis Date** 5/9/2019 12:16:15 PM
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Data File C:\Users\pjst011\Desktop\2019 DOE EEM\Priority 6
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Skew_UP-LKCCW_FLOW REVERSED_01.UVData

Instrument and Software

Manufacturer	Zetec	Online Software	UltraVision: 3.9R9
Model	DYNARAY Lite	Online License	Site License: EPRI
Serial Number	DYN-0122	Reporting Software	UltraVision: 3.8R7
Calibration Date	5/15/2018	Reporting License	Site License: EPRI

Custom Fields

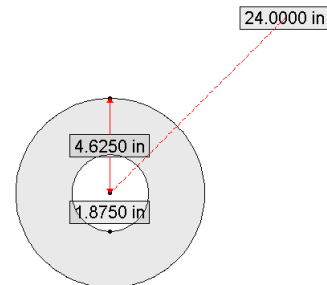
Default

Contractor	Technician
Customer	Project
Site	Part Number
Procedure	

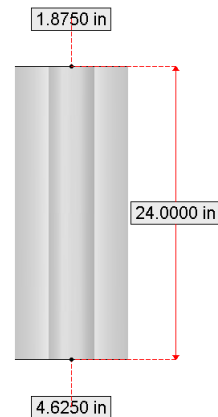
Specimen

Material Steel(stainless)
Shear Velocity 0.1240 in/ μ s
Longitudinal Velocity 0.2272 in/ μ s

Shape Pipe
Inside Diameter 3.7500 in
Outside Diameter 9.2500 in
Length 24.0000 in



Scan Orientation Circular



UT Settings - 0-30L

Configuration	Pitch & Catch			
Probe	3x4E28-16 (EWUXE084A)	Scan Reference	0.000 in	Pulser Connection 1
Wedge	10027111	Index Reference	0.000 in	Receiver Connection 1
Skew	180.0 deg	Probe Reverse	No	Separation 1.3780 in
Channel Wedge Delay	1.67 μ s			

Beams Sector

Wave Type	Longitudinal	Refracted Start Angle	0.0 deg	Skew Start Angle	0.0 deg
Focusing Type	Half Path	Refracted Stop Angle	30.0 deg	Skew Stop Angle	30.0 deg
Focusing Depth	3.0000 in	Refracted Resolution	2.5 deg	Skew Resolution Angle	10.0 deg
Primary First Element	1	Primary Aperture	8	Secondary Aperture	4

General

Gain	30.0 dB	Reference Gain	0.0 dB	Amplitude Range	100%
Timebase Start	0.000 in	Timebase Range	4.998 in		
Timebase Mode	True Depth				

Pulse & Receiver

Voltage	200 V	Pulse Width	330 ns	Rectification	Bipolar
Filter	None	Smoothing	No smoothing		

Digitizer

Acquisition Rate	38.4 Hz	Recurrence	2000 Hz	Averaging Type	None
Compression	1	Digitizing Frequency	25.0 MHz	Produce A-Scan	Yes

Gates

Name	Start(in)	Width(in)	Threshold(%)	Trigger	State	Sync
Synchro	0.103	0.206	25.0	Crossing	Off	None

Probes

Channel	Manufacturer	Model	Serial	Skew	Reversed
0-30L		(EWUXE084A)		180.0 deg	No

Wedges

Channel	Manufacturer	Model	Serial	Velocity(in/μs)
0-30L		10027111		0.0917

Mechanical Settings**Sequence Type : Unidirectional**

Name	Start	Stop	Resolution	Unit
Scan Axis	0.0	370.0	0.5	deg
Index Axis	1.8500	2.8500	0.1000	in

Encoders

Action on Inspection Start : None

	Name	Type	Resolution	Unit	Inverted	Preset
Scan Axis	Encoder 1	Quadrature	4802.0	steps/deg	No	0.0
Index Axis	Encoder 2	Quadrature	23.2423	steps/in	Yes	1.8500

Signature

Examiner

Reviewer

Customer

Date 5/9/2019 12:16:15 PM

Detailed Report



Acquisition Date 4/9/2019 8:19:16 AM **Analysis Date** 5/9/2019 12:17:56 PM
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Data File C:\Users\pjst011\Desktop\2019 DOE EEM\Priority 6
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Skew_UP-LKCW_FLOW REVERSED_01.UVData

Instrument and Software

Manufacturer	Zetec	Online Software	UltraVision: 3.9R9
Model	DYNARAY Lite	Online License	Site License: EPRI
Serial Number	DYN-0122	Reporting Software	UltraVision: 3.8R7
Calibration Date	5/15/2018	Reporting License	Site License: EPRI

Custom Fields

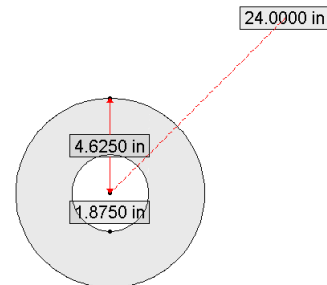
Default

Contractor	Technician
Customer	Project
Site	Part Number
Procedure	

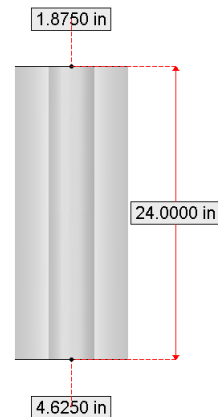
Specimen

Material Steel(stainless)
Shear Velocity 0.1240 in/μs
Longitudinal Velocity 0.2272 in/μs

Shape Pipe
Inside Diameter 3.7500 in
Outside Diameter 9.2500 in
Length 24.0000 in



Scan Orientation Circular



UT Settings - 0-30L

Configuration	Pitch & Catch			
Probe	3x4E28-16 (EWUXE084A)	Scan Reference	0.000 in	Pulser Connection 1
Wedge	10027111	Index Reference	0.000 in	Receiver Connection 1
Skew	0.0 deg	Probe Reverse	No	Separation 1.3780 in
Channel Wedge Delay	1.67 μs			

Beams Sector

Wave Type	Longitudinal	Refracted Start Angle	0.0 deg	Skew Start Angle	-30.0 deg
Focusing Type	Half Path	Refracted Stop Angle	30.0 deg	Skew Stop Angle	0.0 deg
Focusing Depth	3.0000 in	Refracted Resolution	2.5 deg	Skew Resolution Angle	10.0 deg
Primary First Element	1	Primary Aperture	8	Secondary Aperture	4

General

Gain	30.0 dB	Reference Gain	0.0 dB	Amplitude Range	100%
Timebase Start	0.000 in	Timebase Range	4.998 in		
Timebase Mode	True Depth				

Pulse & Receiver

Voltage	200 V	Pulse Width	330 ns	Rectification	Bipolar
Filter	None	Smoothing	No smoothing		

Digitizer

Acquisition Rate	38.4 Hz	Recurrence	2000 Hz	Averaging Type	None
Compression	1	Digitizing Frequency	25.0 MHz	Produce A-Scan	Yes

Gates

Name	Start(in)	Width(in)	Threshold(%)	Trigger	State	Sync
Synchro	0.103	0.206	25.0	Crossing	Off	None

Probes

Channel	Manufacturer	Model	Serial	Skew	Reversed
0-30L		(EWUXE084A)		0.0 deg	No

Wedges

Channel	Manufacturer	Model	Serial	Velocity(in/μs)
0-30L		10027111		0.0917

Mechanical Settings**Sequence Type : Unidirectional**

Name	Start	Stop	Resolution	Unit
Scan Axis	0.0	370.0	0.5	deg
Index Axis	1.8500	2.8500	0.1000	in

Encoders

Action on Inspection Start : None

	Name	Type	Resolution	Unit	Inverted	Preset
Scan Axis	Encoder 1	Quadrature	4802.0	steps/deg	No	0.0
Index Axis	Encoder 2	Quadrature	23.2423	steps/in	Yes	1.8500

Signature

Examiner

Reviewer

Customer

Date 5/9/2019 12:17:56 PM

Report Date	Report Version	Setup File name	Date of Inspection	Inspection Version	Save Mode
2019 / 05 / 07	1.4R3	45deg Shear 0.25in 2.25MHz ops	2019 / 05 / 07	1.4R3	A Scan
OmniScan Type	OmniScan Serial #	Module Type	Module Serial #	Calibration Due	Data File name
OmniScan NX	03DNZ-Z-000036	OMNI-M-PA32112SPR	03DNZ-Z-6053	2013 / 03 / 07	Data####

Group 1

Setup

A:45.0 Sk:000 L:001					
Beam Delay	Start (Half Path)	Range (Half Path)	PRF	Type	Averaging Factor
4.200 us	0.000 in	6.054 in	60	PA	1
Scale Type	Scale Factor	Video Filter	Pretrig	Rectification	Band Pass Filter
Compression	31	Off	0.00 us	FW	None (0.52 - 19 MHz)
Voltage	Gain	Mode	Wave Type	Sound Velocity	Pulse Width
High	36.50 dB	PE (Pulse Echo)	Shear	0.122 in/us	220.00 ns
Scan Offset	Index Offset	Skew			
0.000 in	0.000 in	0.0°			
Gate	Start	Width	Threshold	Synchro	
I	0.000 in	0.138 in	20.00 %	Pulse	
A	0.401 in	0.492 in	25.00 %	Pulse	
B	0.095 in	0.138 in	30.00 %	Pulse	

Calculator

Used Element Qty	First Element	Last Element	Resolution	Wave Type	Material Velocity
1	1	1	1.0	Shear	0.122 in/us
Start Angle	Stop Angle	Angle Resolution	Focus Depth	Scan Type	
45.0°	60.0°	1.0°	1.000 in	Linear Angle	

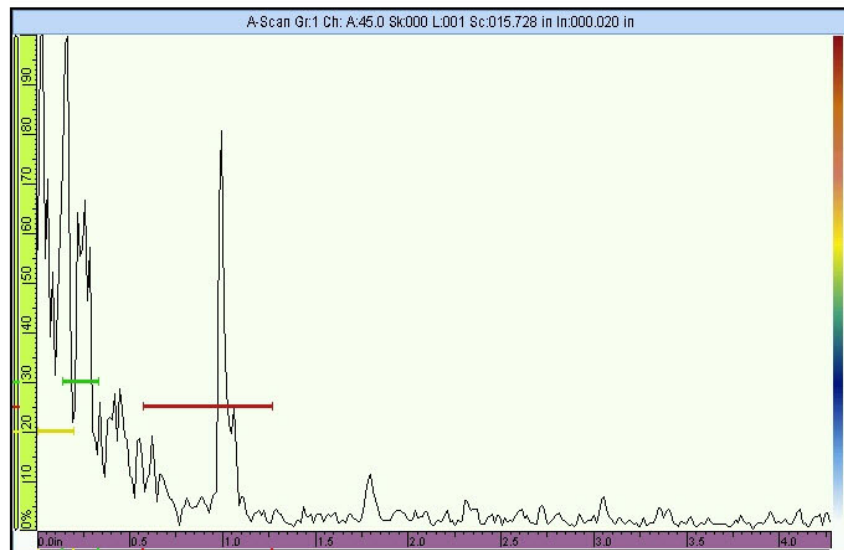
Part

Material	Geometry	Thickness
STEEL STNLS	Plate	4.000 in

Scan Area

Scan Start	Scan Length	Scan Resolution	Index Start	Index Length	Index Resolution
0.000 in	15.748 in	0.039 in	0.000 in	0.039 in	0.039 in
Synchro	Max Scan Speed				
Clock	N/A				
Axis	Encoder	Encoder Type	Encoder Resolution	Polarity	
Scan	Off	Off	Off	Off	
Index	Off	Off	Off	Off	

A%	A"	B%	B"	None	None	None	None
81.0 %	1.000 in	104.5 %	0.161 in				



Report Date	Report Version	Setup File name	Date of Inspection	Inspection Version	Save Mode
2019 / 05 / 07	1.4R3	60deg Shear 0.25in 2.25MHz.sps	2019 / 05 / 07	1.4R3	Screen
OmniScan Type	OmniScan Serial #	Module Type	Module Serial #	Calibration Due	Data File name
OmniScan MX	OMNI-Z-000036	OMNI-M-PA32112PR	OMNI-Z-6053	2019 / 03 / 07	60Shear Cal_0.3inSDH delay Cal1

Group 1

Setup

A:60.0 Sk:000 L:001					
Beam Delay	Start (Half Path)	Range (Half Path)	PRF	Type	Averaging Factor
5.400 us	0.000 in	6.054 in	60	PA	1
Scale Type	Scale Factor	Video Filter	Pretrig	Rectification	Band Pass Filter
Compression	31	Off	0.00 us	FW	None (0.52 - 19 MHz)
Voltage	Gain	Mode	Wave Type	Sound Velocity	Pulse Width
High	41.50 dB	PE (Pulse Echo)	Shear	0.122 in/us	220.00 ns
Scan Offset	Index Offset	Skew			
0.000 in	0.000 in	0.0°			
Gate	Start	Width	Threshold	Synchro	
I	0.000 in	0.098 in	20.00 %	Pulse	
A	0.283 in	0.348 in	25.00 %	Pulse	
B	0.067 in	0.098 in	30.00 %	Pulse	

Calculator

Used Element Qty	First Element	Last Element	Resolution	Wave Type	Material Velocity
1	1	1	1.0	Shear	0.122 in/us
Start Angle	Stop Angle	Angle Resolution	Focus Depth	Scan Type	
60.0°	60.0°	1.0°	1.000 in	Linear Angle	

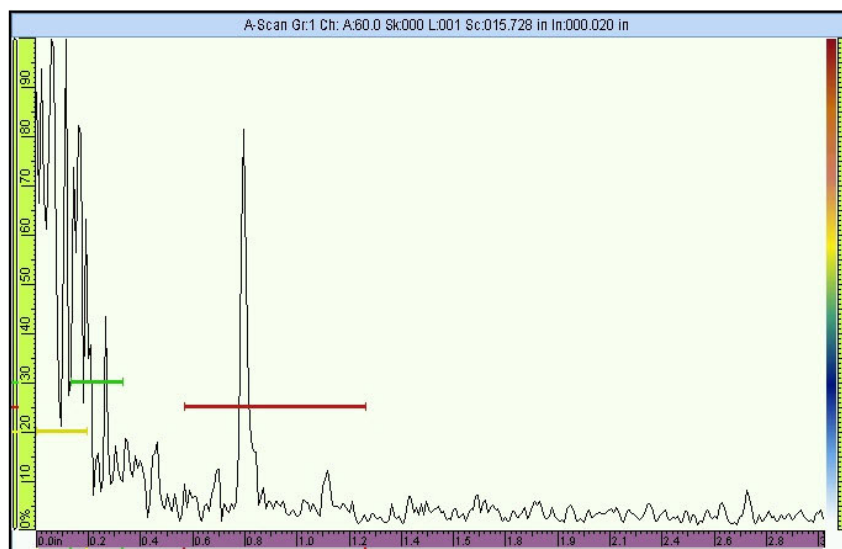
Part

Material	Geometry	Thickness
STEEL STNLS	Plate	4.000 in

Scan Area

Scan Start	Scan Length	Scan Resolution	Index Start	Index Length	Index Resolution
0.000 in	15.748 in	0.039 in	0.000 in	0.039 in	0.039 in
Synchro	Max Scan Speed				
Clock	N/A				
Axis	Encoder	Encoder Type	Encoder Resolution	Polarity	
Scan	Off	Off	Off	Off	
Index	Off	Off	Off	Off	

A%	A^	B%	B^	None	None	None	None
81.8 %	0.800 in	82.6 %	0.170 in				



Penetrant Examination Results

Liquid Penetrant Examination Report

Exam Item: G1813-NDE1 Material: SS Thickness: ~2.70" Date: 3/21/2019
 Procedure: (Note 1) Rev: N/A
 Surface Condition: (Note 2) Surface Temp: Room Temp

	Brand	Type	Batch #	Drying/Dwell Time
Cleaner:	<u>Spotcheck</u>	<u>SKC-S</u>	<u>16E18K</u>	<u>10</u> minutes
Penetrant:	<u>Spotcheck</u>	<u>SKL-SP</u>	<u>96G11K</u>	<u>10</u> minutes
Developer:	<u>Spotcheck</u>	<u>SKD-S2</u>	<u>13C14K</u>	<u>20</u> minutes

Datum Point Reference

Lo = (Note 3)

Wo = Weld Center Line

L1 = Distance from Lo to the start/center of indication.

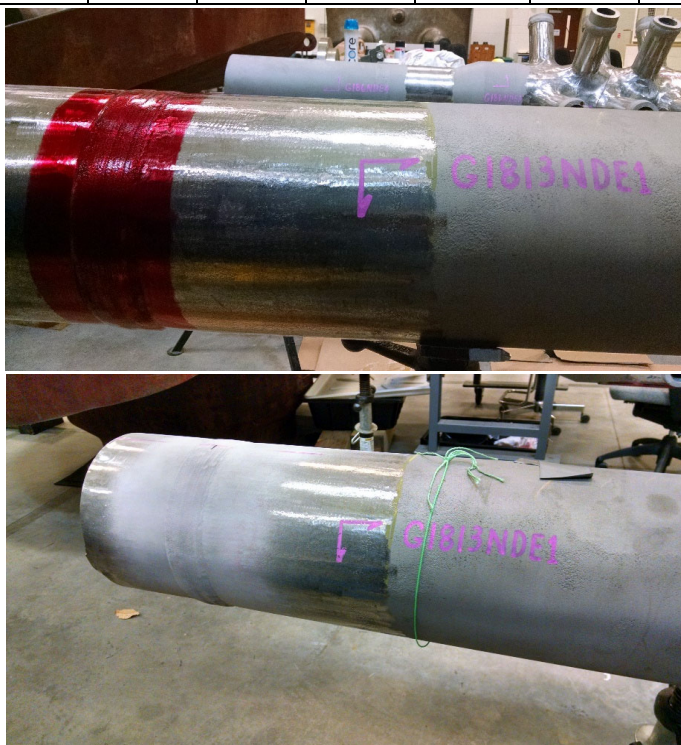
L2 = Distance from Lo to the end of indication.

W1 = Distance from Wo to the start/center if indication.

W2 = Distance from Wo to the end of the indication

IND #	Descript.	L1	L2	W1	W2	Length	Width	Linear / Rounded	Proximity	Accept / Reject

NRI



Comments:

Note 1 - Generic PT method used for information only. No procedure to be referenced. All applicable PT information is documented on this form.

Note 2 - Component was media blasted and buffed smooth to remove surface scale.

Note 3 - DnStream mid-point extension of set-on branch connection stub row.

Examine Markis Lee

Level: N/A

Date: 3/21/2019

Liquid Penetrant Examination Report

Exam Item: G1813-NDE2 Material: SS Thickness: (Note 3) Date: 3/21/2019
 Procedure: (Note 1) Rev: N/A
 Surface Condition: (Note 2) Surface Temp: Room Temp

	Brand	Type	Batch #	Drying/Dwell Time
Cleaner:	<u>Spotcheck</u>	<u>SKC-S</u>	<u>16E18K</u>	<u>10</u> minutes
Penetrant:	<u>Spotcheck</u>	<u>SKL-SP</u>	<u>96G11K</u>	<u>10</u> minutes
Developer:	<u>Spotcheck</u>	<u>SKD-S2</u>	<u>13C14K</u>	<u>20</u> minutes

Datum Point Reference

Lo = (Note 4)

Wo = (Note 4)

L1 = Distance from Lo to the start/center of indication.

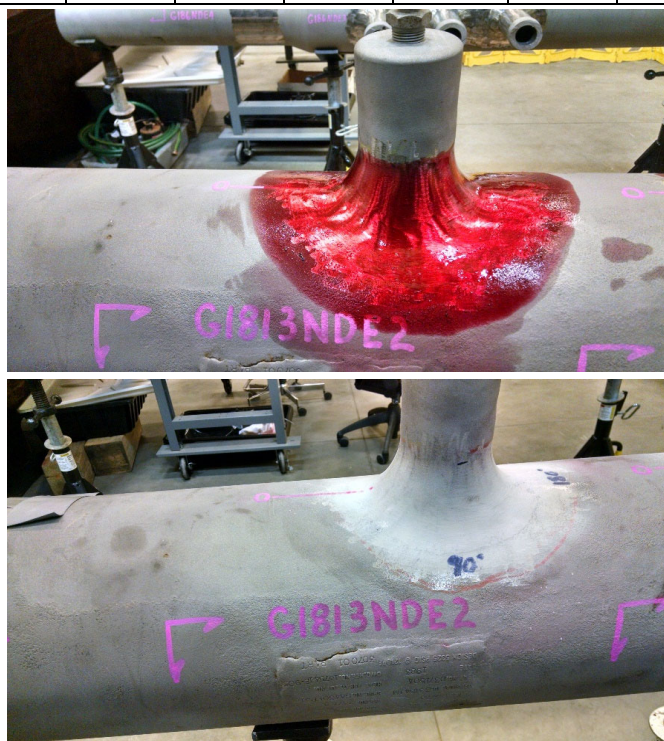
L2 = Distance from Lo to the end of indication.

W1 = Distance from Wo to the start/center of indication.

W2 = Distance from Wo to the end of the indication

IND #	Descript.	L1	L2	W1	W2	Length	Width	Linear / Rounded	Proximity	Accept / Reject

NRI



Comments:

Note 1 - Generic PT method used for information only. No procedure to be referenced. All applicable PT information is documented on this form.

Note 2 - Component was media blasted and buffed smooth to remove surface scale.

Note 3 - ~0.85" (branch pipe) and ~2.60" (main run).

Note 4 - Towards the upstream cut end of main run for Lo and dnstream weld toe (set-on connection side) for Wo.

Examine Markis Lee

Level: N/A

Date: 3/21/2019

Liquid Penetrant Examination Report

Exam Item: G1813-NDE3 Material: SS Thickness: (Note 3) Date: 3/21/2019
 Procedure: (Note 1) Rev: N/A
 Surface Condition: (Note 2) Surface Temp: Room Temp

	Brand	Type	Batch #	Drying/Dwell Time
Cleaner:	<u>Spotcheck</u>	<u>SKC-S</u>	<u>16E18K</u>	<u>10</u> minutes
Penetrant:	<u>Spotcheck</u>	<u>SKL-SP</u>	<u>96G11K</u>	<u>10</u> minutes
Developer:	<u>Spotcheck</u>	<u>SKD-S2</u>	<u>13C14K</u>	<u>20</u> minutes

Datum Point Reference

Lo = (Note 4)

Wo = (Note 4)

L1 = Distance from Lo to the start/center of indication.

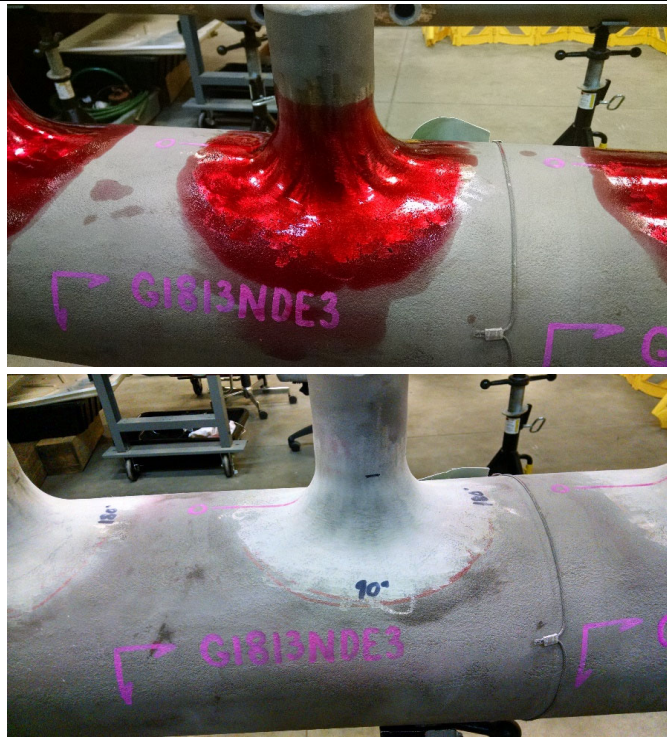
L2 = Distance from Lo to the end of indication.

W1 = Distance from Wo to the start/center of indication.

W2 = Distance from Wo to the end of the indication

IND #	Descript.	L1	L2	W1	W2	Length	Width	Linear / Rounded	Proximity	Accept / Reject

NRI



Comments:

Note 1 - Generic PT method used for information only. No procedure to be referenced. All applicable PT information is documented on this form.

Note 2 - Component was media blasted and buffed smooth to remove surface scale.

Note 3 - ~0.85" (branch pipe) and ~2.60" (main run).

Note 4 - Towards the upstream cut end of main run for Lo and dnstream weld toe (set-on connection side) for Wo.

Examine Markis Lee

Level: N/A

Date: 3/21/2019

Liquid Penetrant Examination Report

Exam Item: G1813-NDE4 Material: SS Thickness: (Note 3) Date: 3/21/2019
 Procedure: (Note 1) Rev: N/A
 Surface Condition: (Note 2) Surface Temp: Room Temp

	Brand	Type	Batch #	Drying/Dwell Time
Cleaner:	<u>Spotcheck</u>	<u>SKC-S</u>	<u>16E18K</u>	<u>10</u> minutes
Penetrant:	<u>Spotcheck</u>	<u>SKL-SP</u>	<u>96G11K</u>	<u>10</u> minutes
Developer:	<u>Spotcheck</u>	<u>SKD-S2</u>	<u>13C14K</u>	<u>20</u> minutes

Datum Point Reference

Lo = (Note 4)

Wo = (Note 4)

L1 = Distance from Lo to the start/center of indication.

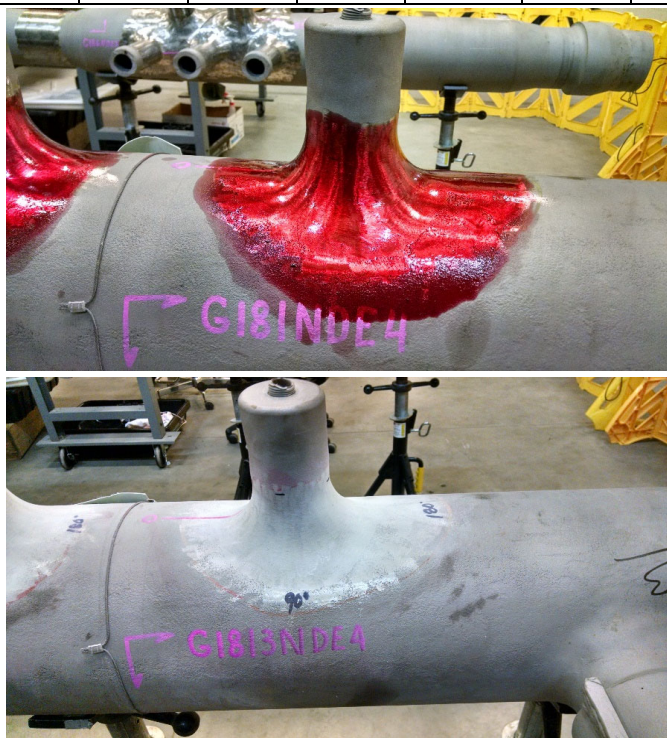
L2 = Distance from Lo to the end of indication.

W1 = Distance from Wo to the start/center of indication.

W2 = Distance from Wo to the end of the indication

IND #	Descript.	L1	L2	W1	W2	Length	Width	Linear / Rounded	Proximity	Accept / Reject

NRI



Comments:

Note 1 - Generic PT method used for information only. No procedure to be referenced. All applicable PT information is documented on this form.

Note 2 - Component was media blasted and buffed smooth to remove surface scale.

Note 3 - ~0.85" (branch pipe) and ~2.60" (main run).

Note 4 - Towards the upstream cut end of main run for Lo and dnstream weld toe (set-on connection side) for Wo.

Examine Markis Lee

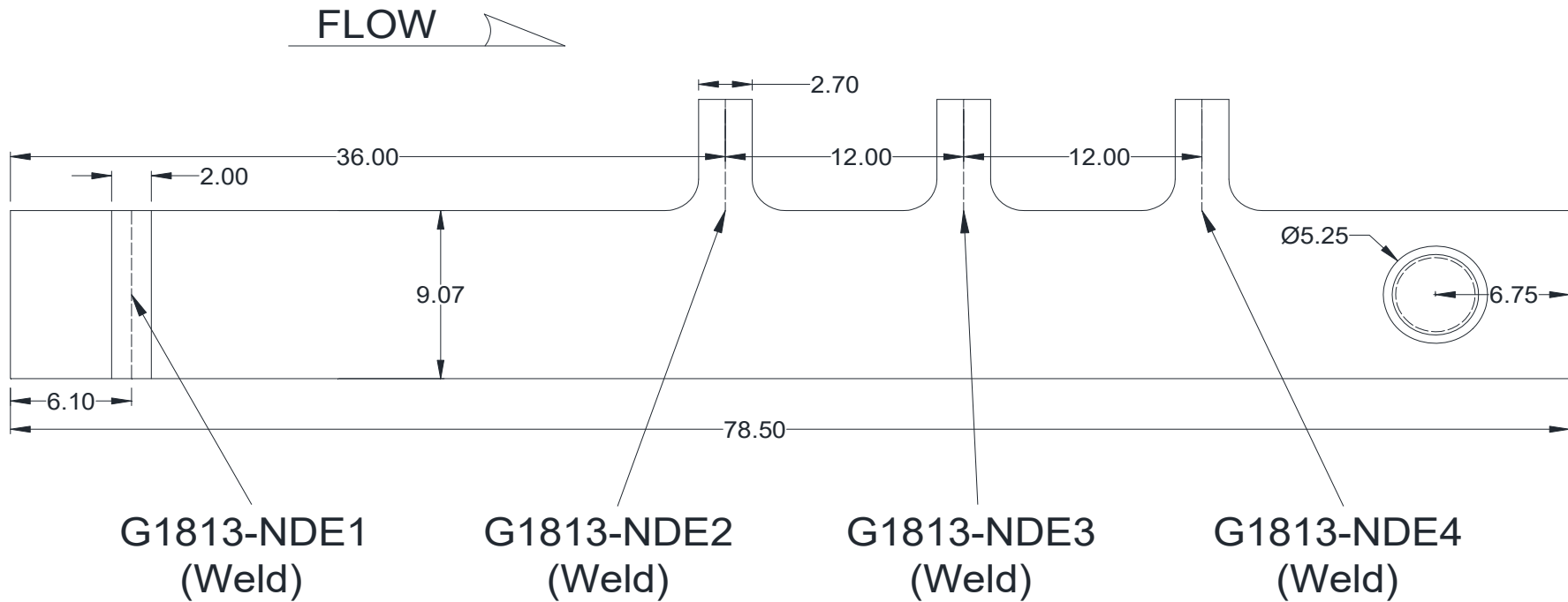
Level: N/A

Date: 3/21/2019

Thickness and Profile Sheets

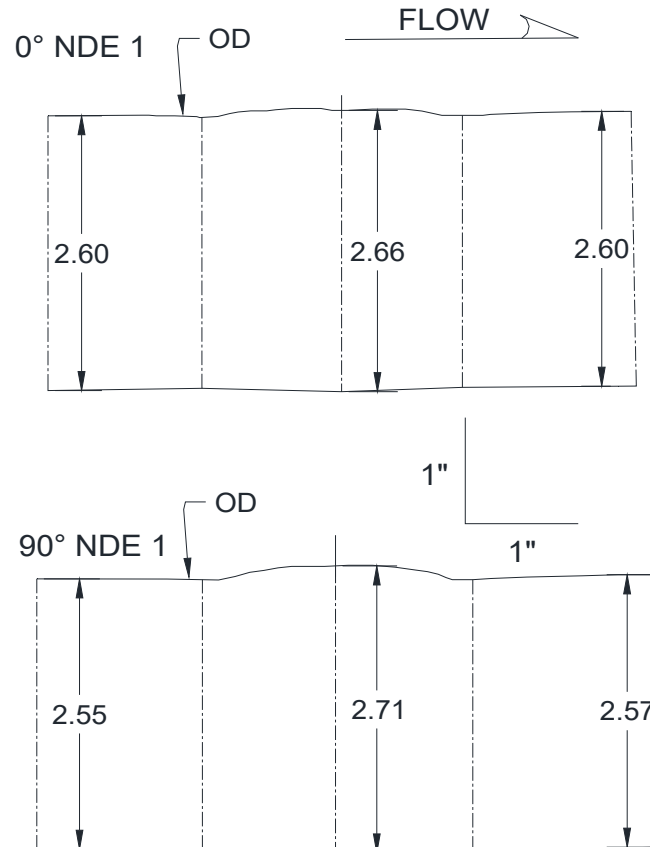
Wall Thickness Profile Sheet

Project: 1-110520 EddyStone						Component Layout G1813
Component: G1813 NDE-1 - 4						
Position	1	2	3	4	5	
0°						
90°						
180°						
270°						
Crown Height: N/A			Diameter: N/A			Comments: This is a component layout designating the inspection areas. All dimensions are in inches unless otherwise noted.
Crown Width: N/A			Weld Length: N/A			

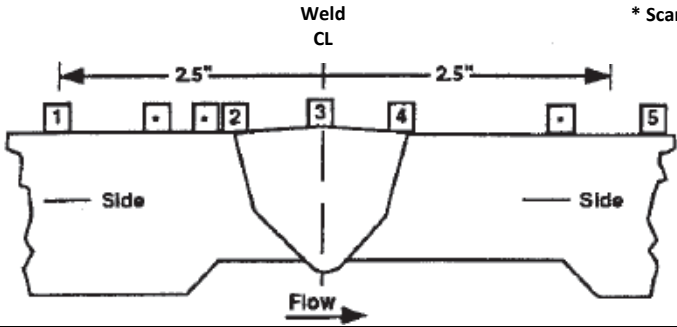


Wall Thickness Profile Sheet

Project: 1-110520 EddyStone						
Component: G1813 NDE-1						
Position	1	2	3	4	5	
0°	2.60	2.56	2.66	2.59	2.60	
90°	2.55	2.54	2.71	2.56	2.57	
180°						Note: Positions 2 & 4 are taken on the weld toe locations or 1.5" if no weld is present
270°						
Crown Height: 0.125				Diameter: 9.4		Comments: All dimensions are in inches unless otherwise noted.
Crown Width: 2.00				Weld Length: 29.5		

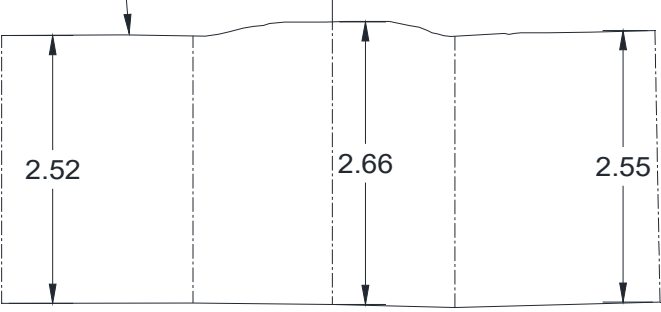


Wall Thickness Profile Sheet

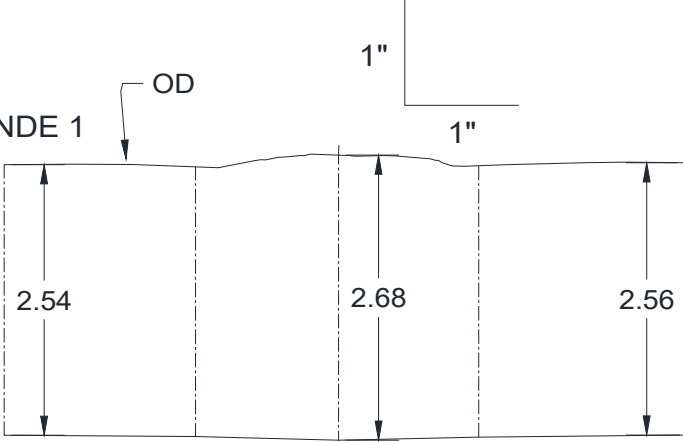
Project: 1-110520 EddyStone						 <p style="text-align: right;">* Scan from CL out if counterbore is present and depict on sketch</p> <p style="text-align: right;">Note: Positions 2 & 4 are taken on the weld toe locations or 1.5" if no weld is present</p>
Component: G1813 NDE-1						
Position	1	2	3	4	5	
0°						
90°						
180°	2.52	2.51	2.66	2.55	2.55	
270°	2.54	2.54	2.68	2.55	2.56	

Crown Height: 0.125	Diameter: 9.4	Comments: All dimensions are in inches unless otherwise noted.
Crown Width: 2.00	Weld Length: 29.5	

180° NDE 1

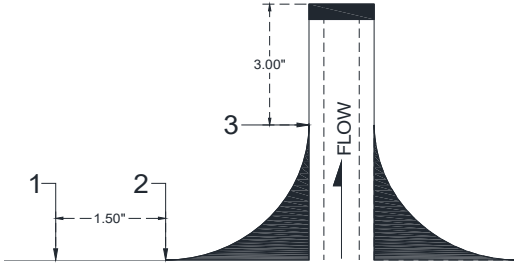


270° NDE 1



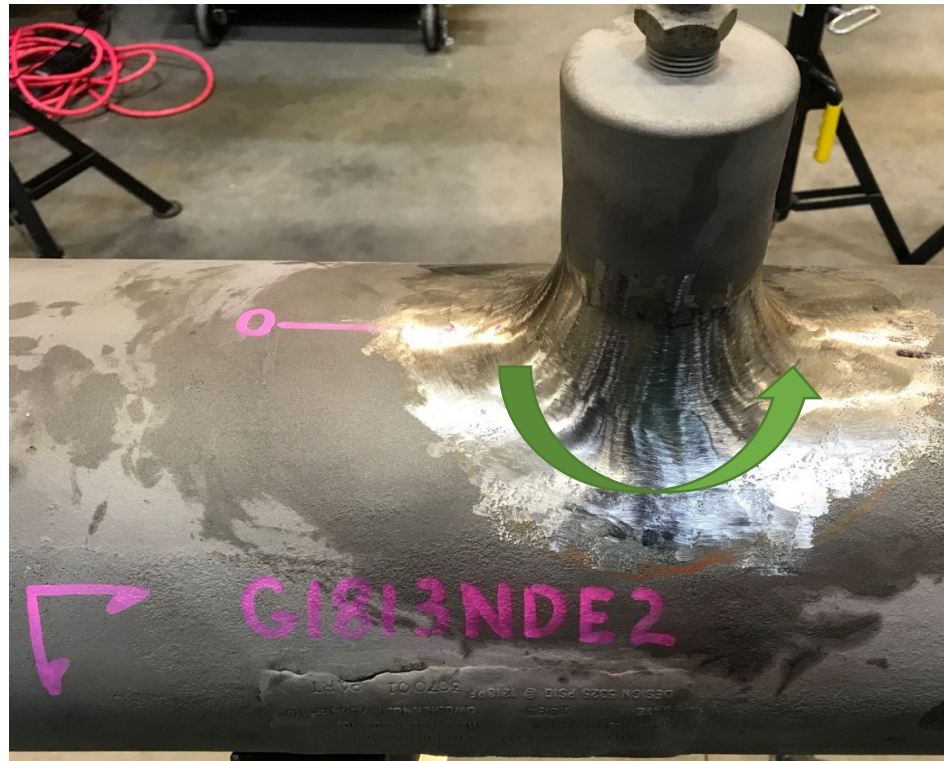
Wall Thickness Profile Sheet

Project: 1-110520 EddyStone					
Component: G1813 NDE-2					
Position	1	2	3	4	5
0°	2.56	2.58	0.87	N/A	N/A
90°	2.58	2.60	0.84	N/A	N/A
180°	2.57	2.61	0.84	N/A	N/A
270°	2.58	2.58	0.82	N/A	N/A
Crown Height: N/A				Diameter: N/A	
Crown Width: N/A				Weld Length: N/A	



The diagram shows a bell-shaped profile on a horizontal base. The profile is divided into three sections labeled 1, 2, and 3. Section 1 is the leftmost part, section 2 is the middle part, and section 3 is the rightmost part. The total width of the profile is 1.50 inches. The height of the profile is 3.00 inches. A vertical arrow labeled 'FLOW' points upwards through the center of the profile.

Comments: All dimensions are in inches unless otherwise noted.



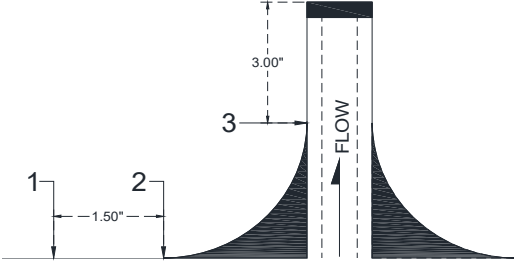

Wall Thickness Profile Sheet

Project: 1-110520 EddyStone					
Component: G1813 NDE-3					
Position	1	2	3	4	5
0°	2.59	2.59	0.85	N/A	N/A
90°	2.59	2.59	0.83	N/A	N/A
180°	2.57	2.58	0.85	N/A	N/A
270°	2.57	2.59	0.82	N/A	N/A
Crown Height: N/A				Diameter: N/A	
Crown Width: N/A				Weld Length: N/A	

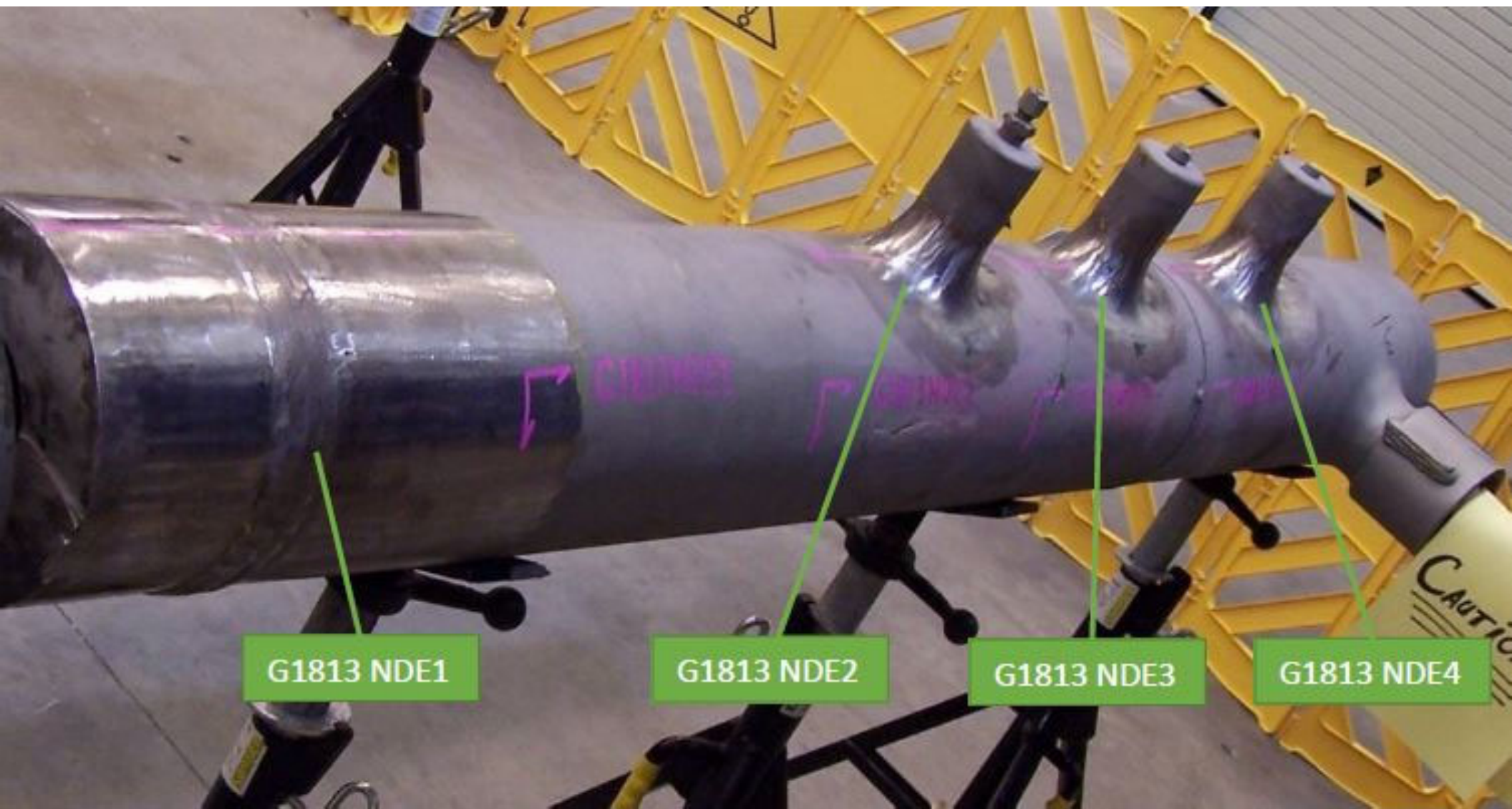
Comments: All dimensions are in inches unless otherwise noted.



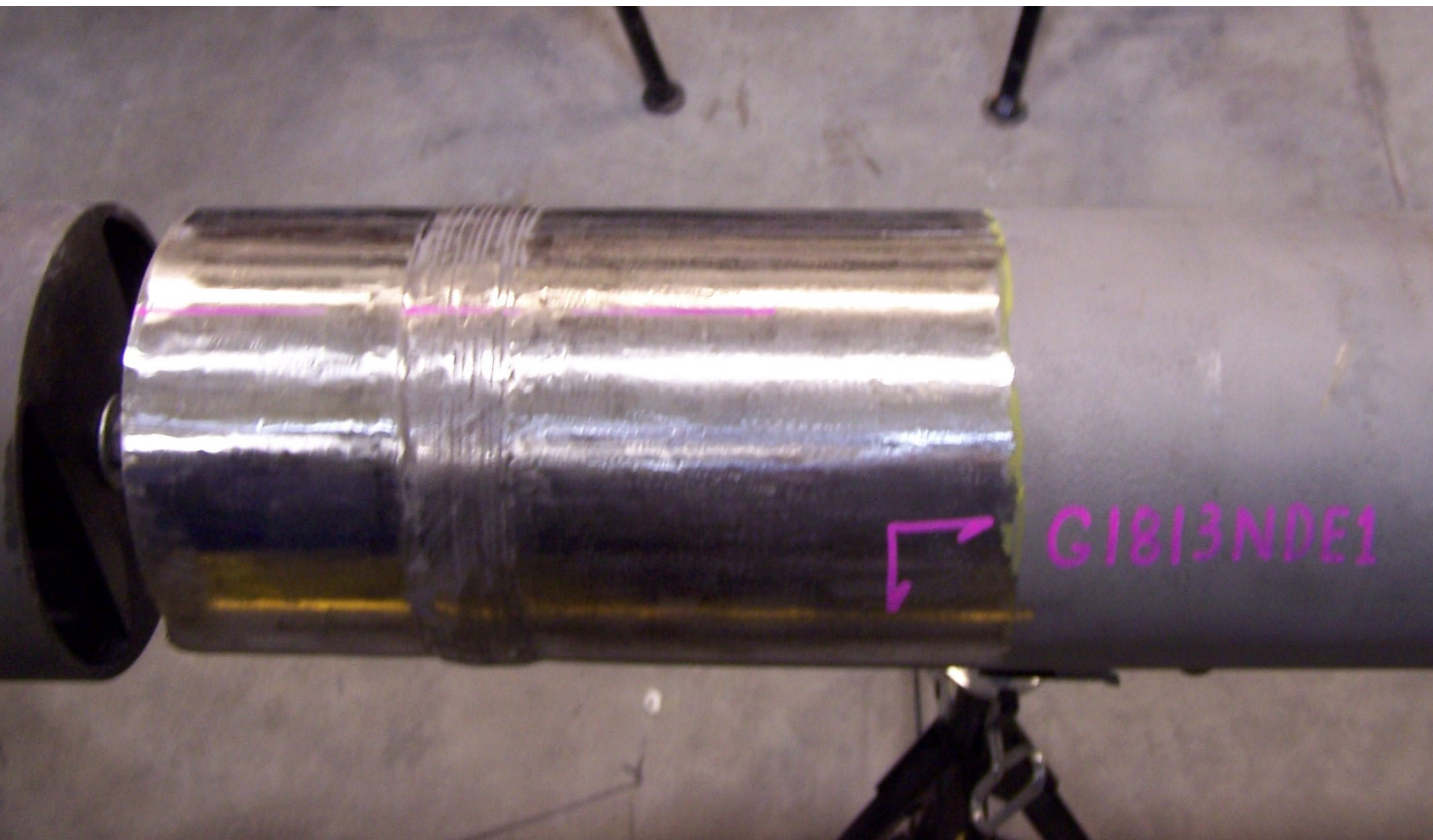
Wall Thickness Profile Sheet

Project: 1-110520 EddyStone						
Component: G1813 NDE-4						
Position	1	2	3	4	5	
0°	2.57	2.59	0.81	N/A	N/A	
90°	2.59	2.69	0.88	N/A	N/A	
180°	2.59	2.61	0.85	N/A	N/A	
270°	2.57	2.63	0.88	N/A	N/A	
Crown Height: N/A			Diameter: N/A			Comments: All dimensions are in inches unless otherwise noted.
Crown Width: N/A			Weld Length: N/A			
						

Setup Configuration Images



G1813 Setup Overview



G1813 Setup Overview NDE1



G1813 Setup Overview NDE2



G1813 Setup Overview NDE3



G1813 Setup Overview NDE4