


INSPECTION METHODS, EQUIPMENT AND SOFTWARE NEEDED TO REACH DEEP ENERGY RESERVES - VisonArraySM 3D

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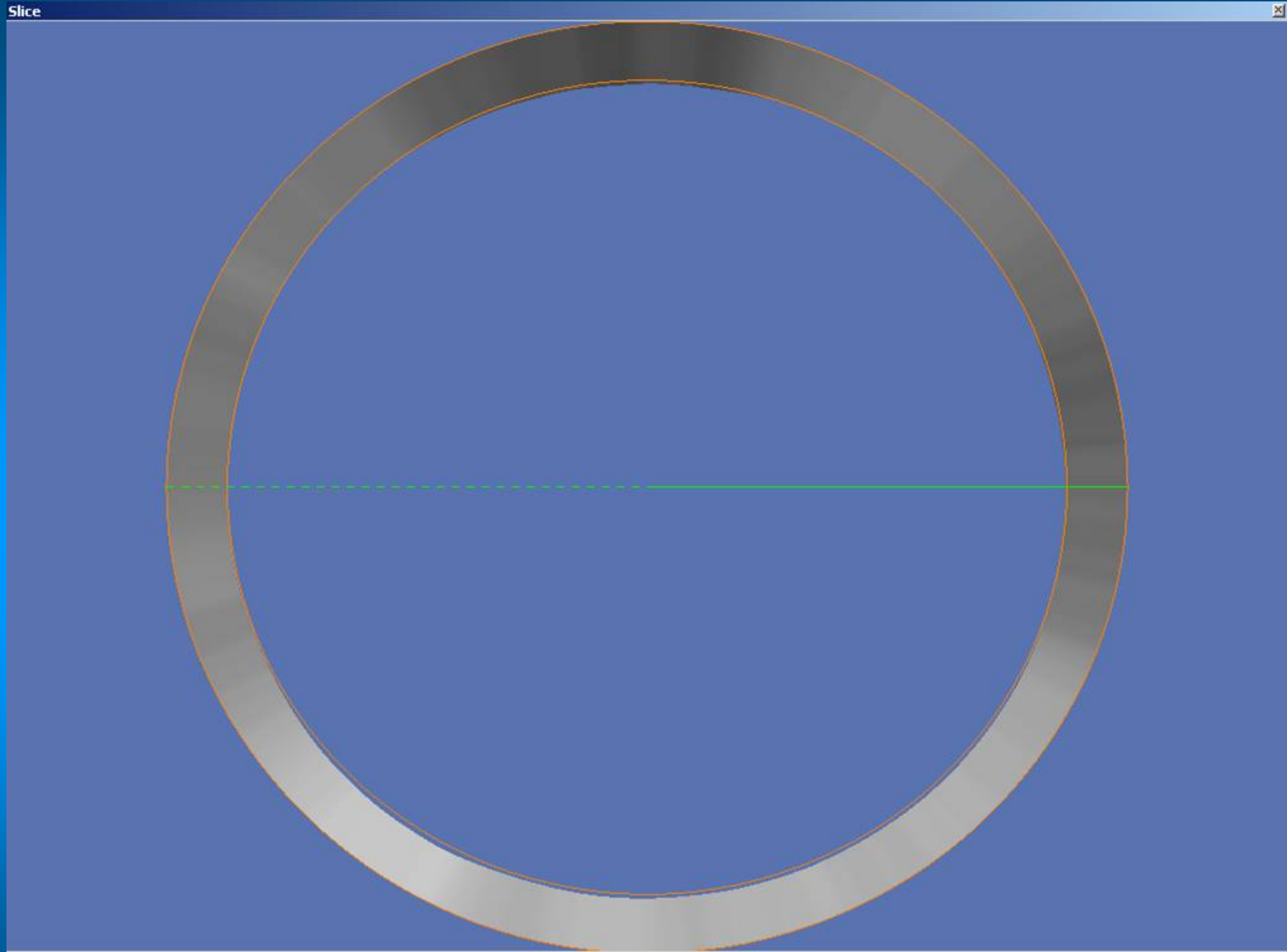
- WHY and HOW We Inspect Pipe
- How the VisonArray 3D Imaging System Works, and Help Customer Drill Deeper By Using Existing Pipes And Save Money
- Advantages to Working With Technical Industries
- How We Have Helped Others Achieve Success



Mill Inspected Seamless Pipe

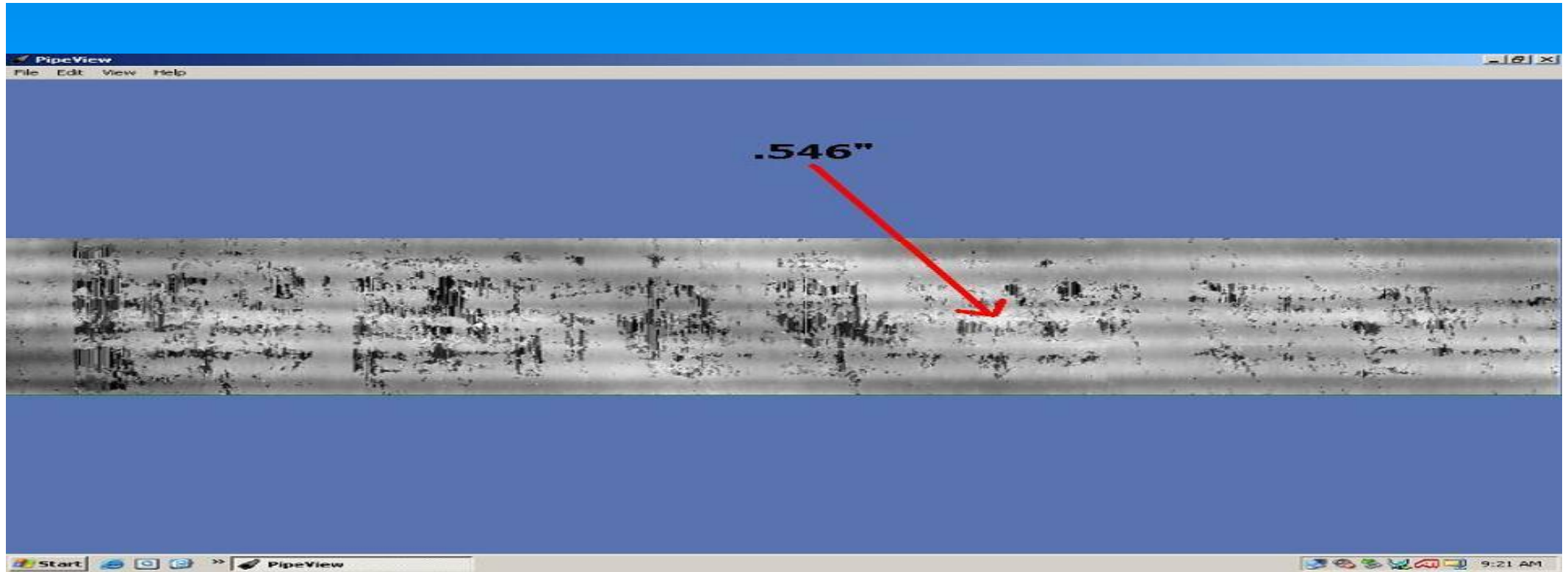
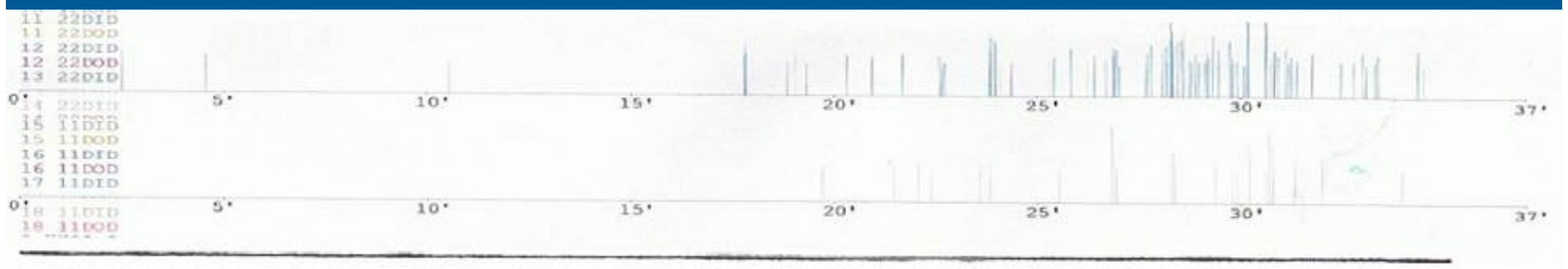


Mill Inspected Seamless Pipe

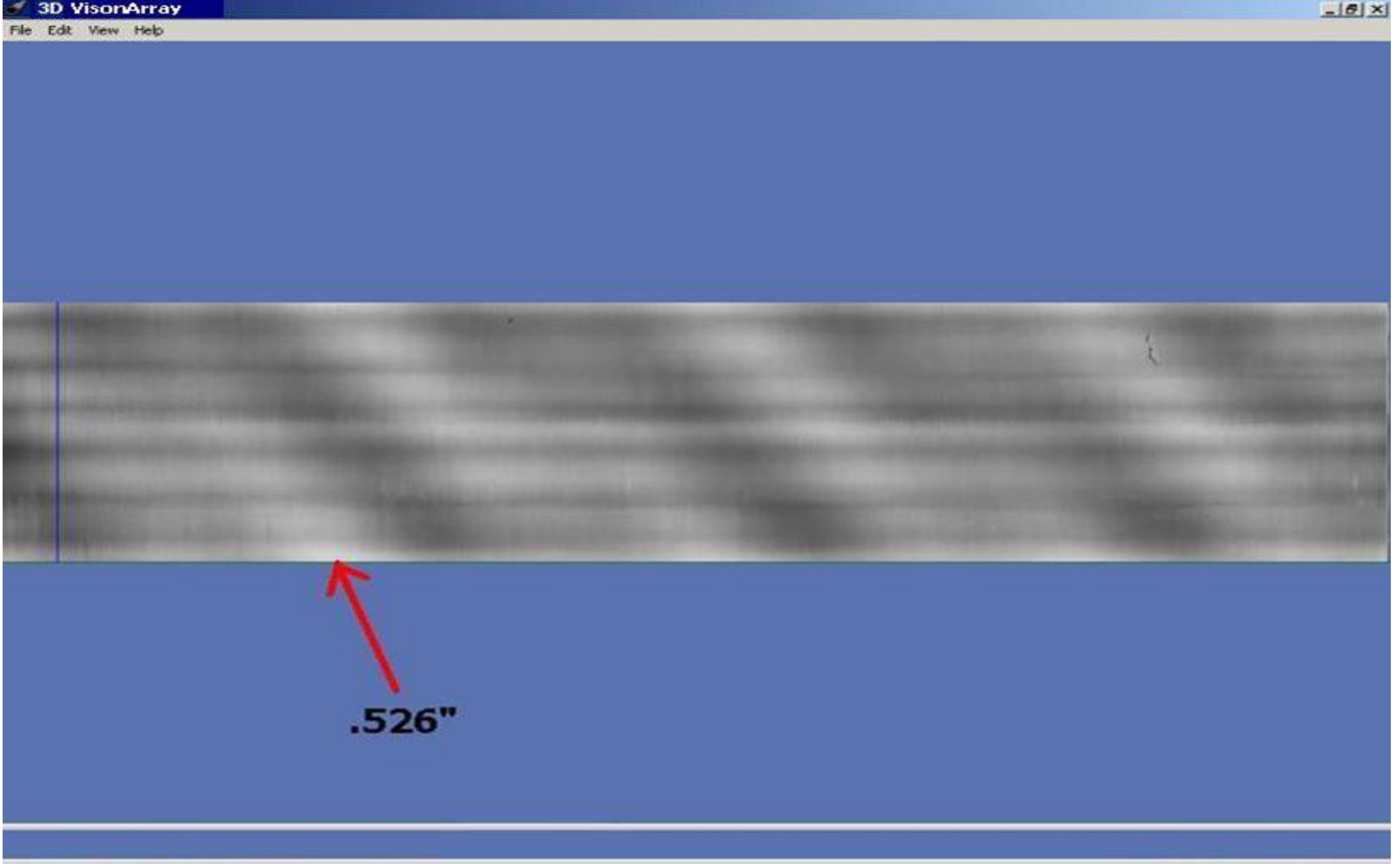


Cross-sectional Area (CSA)

Current competitor Report: Joint No. 164 = .546"

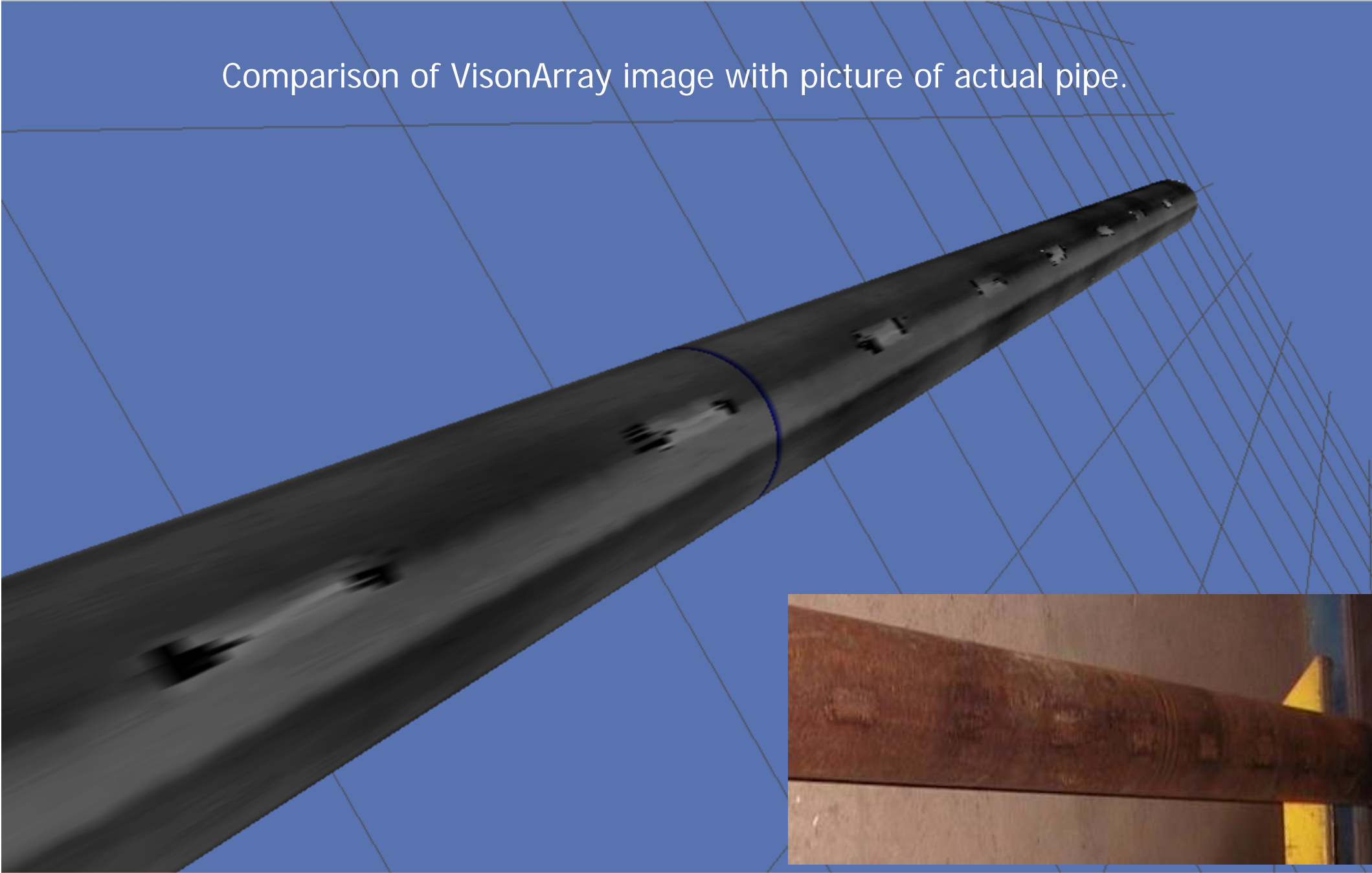


Surface conditions that effect CSA calculations

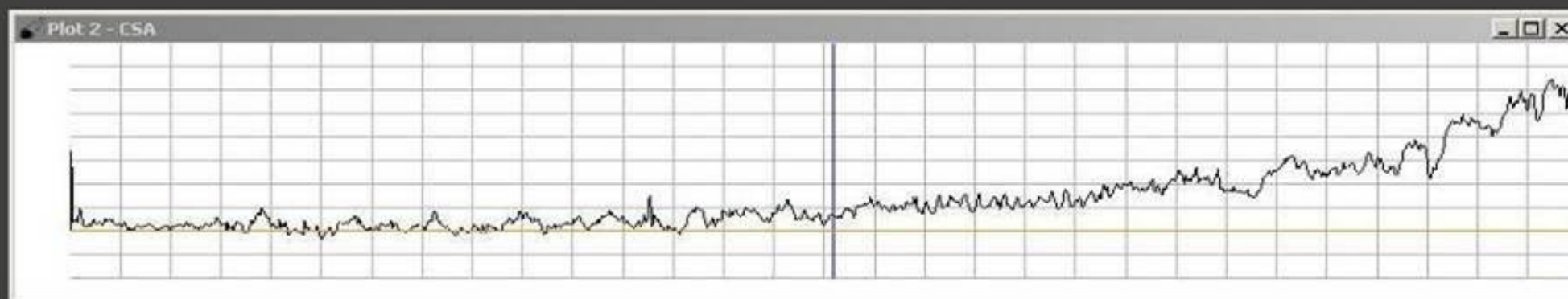
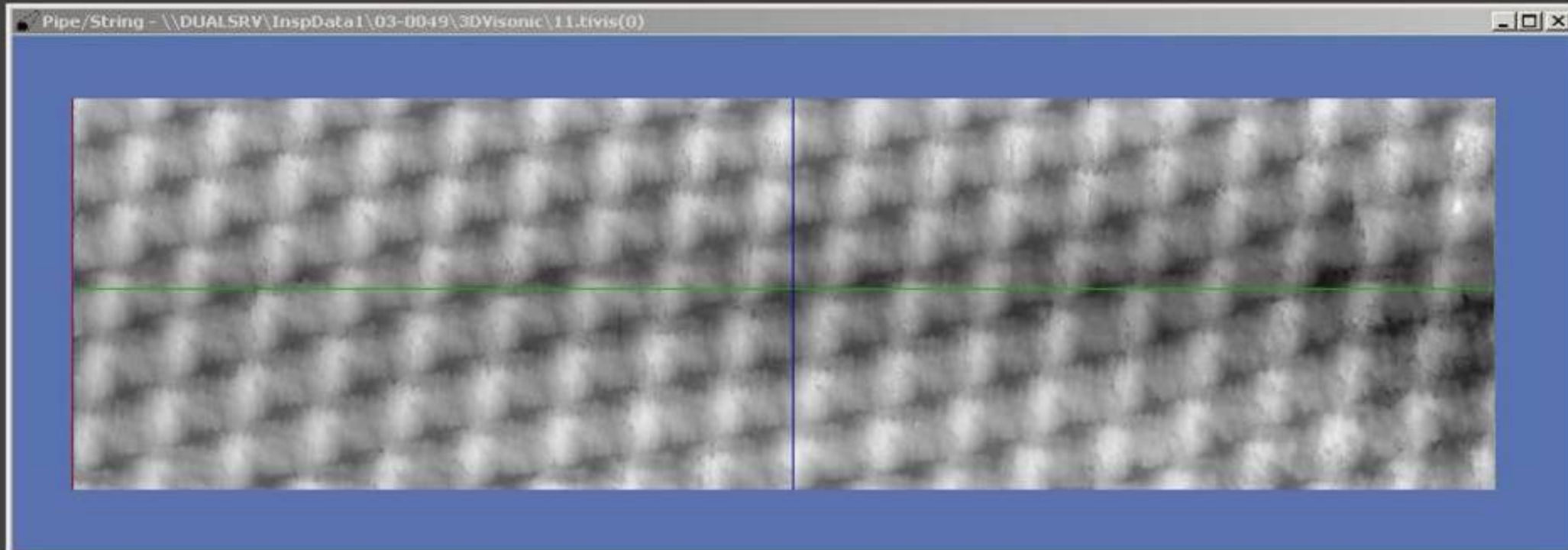


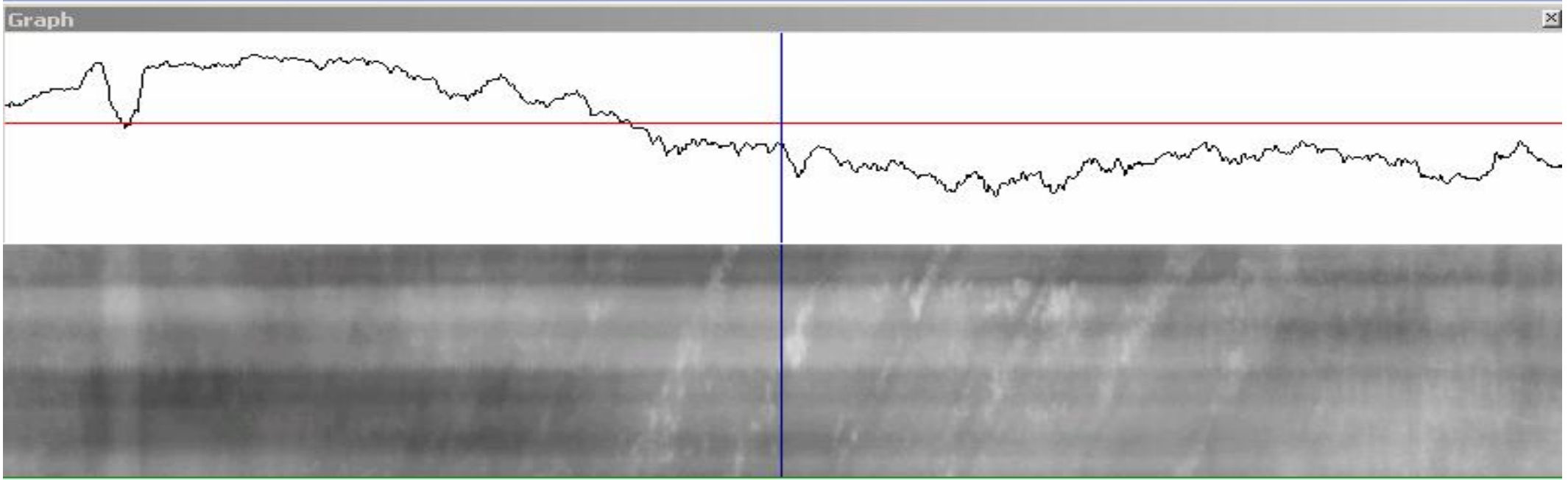
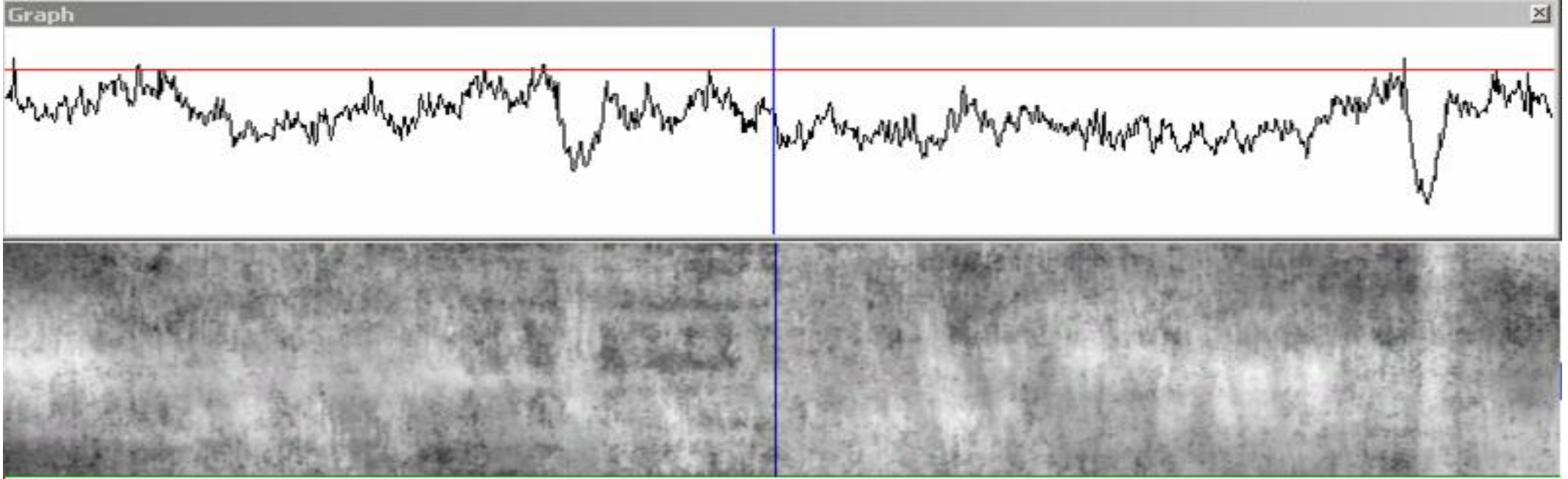
Surface conditions that have improved after sand blast.

Comparison of VisonArray image with picture of actual pipe.

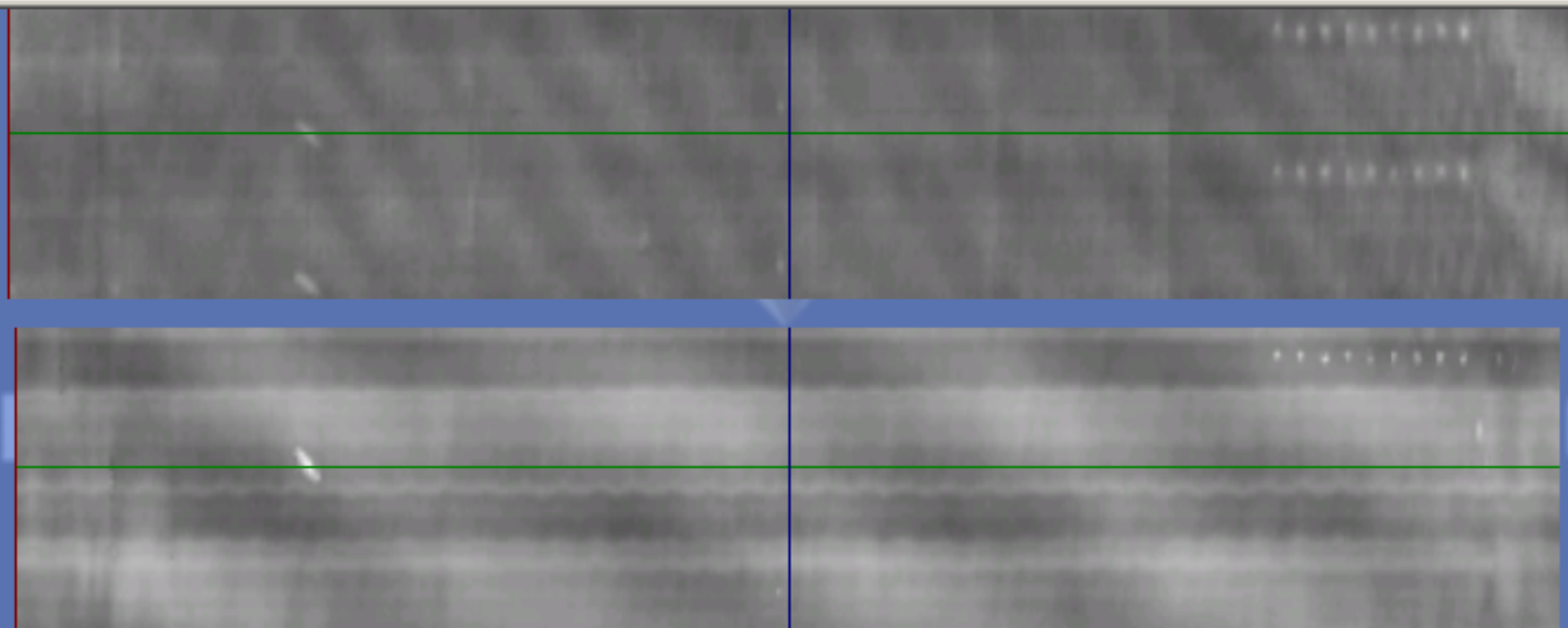
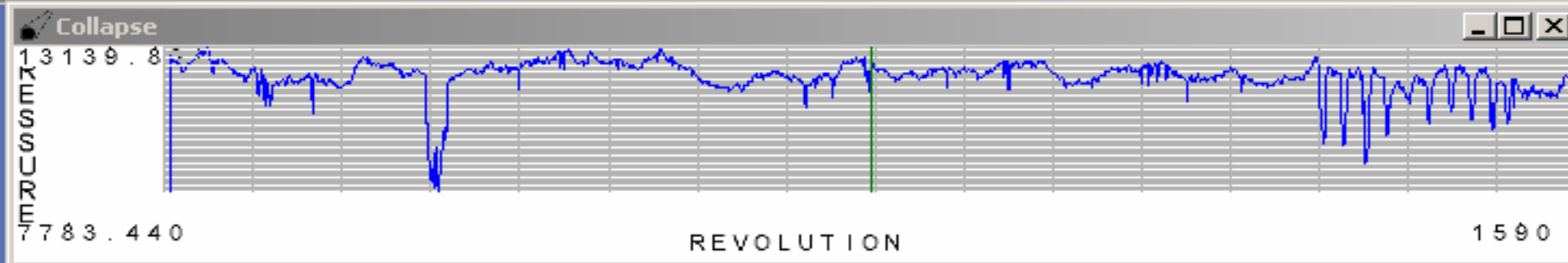


17 7/8" casing with graph of CSA

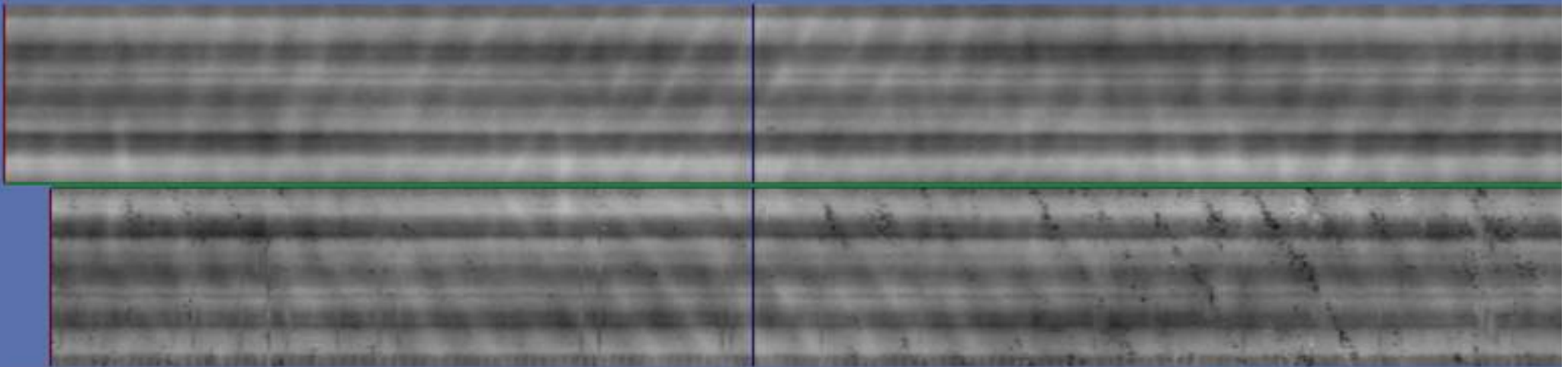
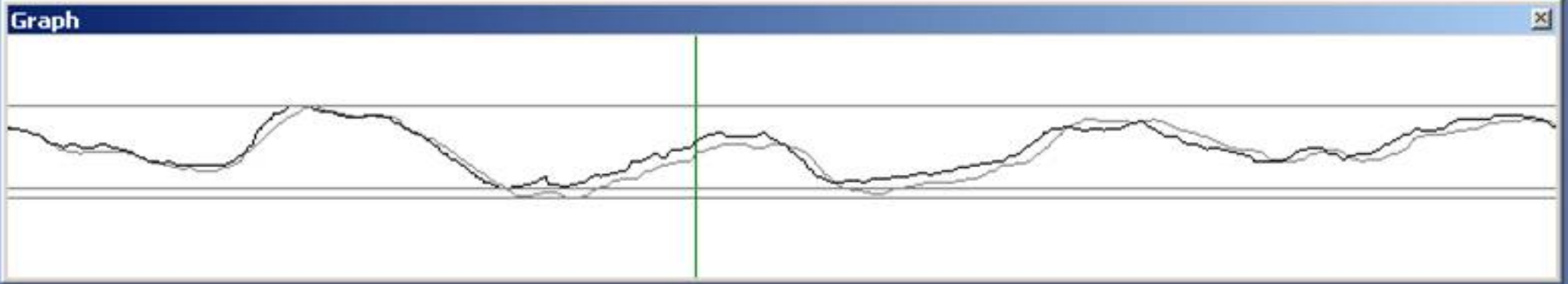




Drill pipe with ID corrosion, 5 1/2" OD, .500 nominal wall



Statistics			
Location	Wall	OD	ID
X: 0.000"	Current: 0.620" (99.200%)	Current: 9.964"	Current: 8.719"
Y: 0.000°	Min: 0.592"	Min: 9.945"	Min: 8.685"
268.000"	Max: 0.644"	Max: 9.977"	Max: 8.755"
194.640°	Avg: 0.618"	Avg: 9.960"	Avg: 8.722"
	CSA % Ave: 99.045%	Ovality: 0.321%	
	Eccentricity: 8.406%	OS: 0.000"	



Navigator

Control

◀ 1/1 ▶

All Current Overlay

X Speed: 12.000 "/sec

Y Speed: 12.000 deg/sec

Wall Sample

214.665" 160.036 deg. 0.369"

X: 201.070" Y: 15.036 deg. WALL: 0.375"

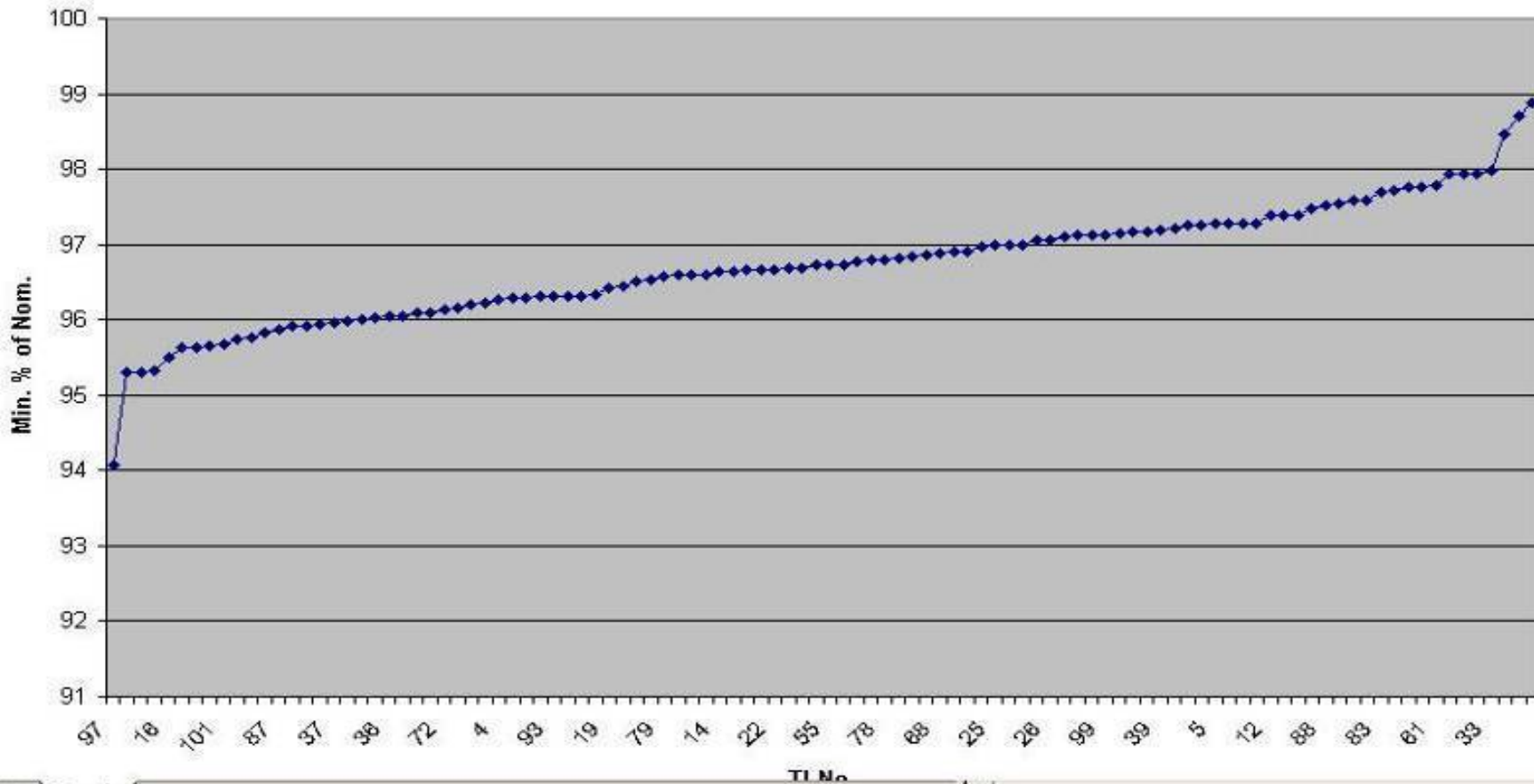
Stats

101.944% 11.902% N/A

CSA Min %: 102.415% Eccentricity: 10.766% Ovality: N/A

Pipe "Fingerprinting", 5" OD, .362 nominal wall

Min. % of Nom. Vs. TI No.



Graph of pipe sorted by minimum CSA percent of nominal.



Expandable Pipe Failure

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Indications

Indication #	Channel #	Indication Type	X Loc.	Y Loc.
1	4	3 22ID	1.583	46074
2	4	3 22ID	2.833	107090
3	11	6 450D	23.000	1071756
4	2	2 22ID	27.000	1245582
5	2	2 22ID	34.500	1859998

Wall Thickness

WALL

0.310"

0.190"

ANGLE 360°

Statistics

Location

X: 0.000"

Y: 0.000"

WALL

0.000" [0.000%]

Current: 0.250" [106.383%]

Min: 0.244"

CSA % Ave: 105.082%

Navigator

Quick File Browse

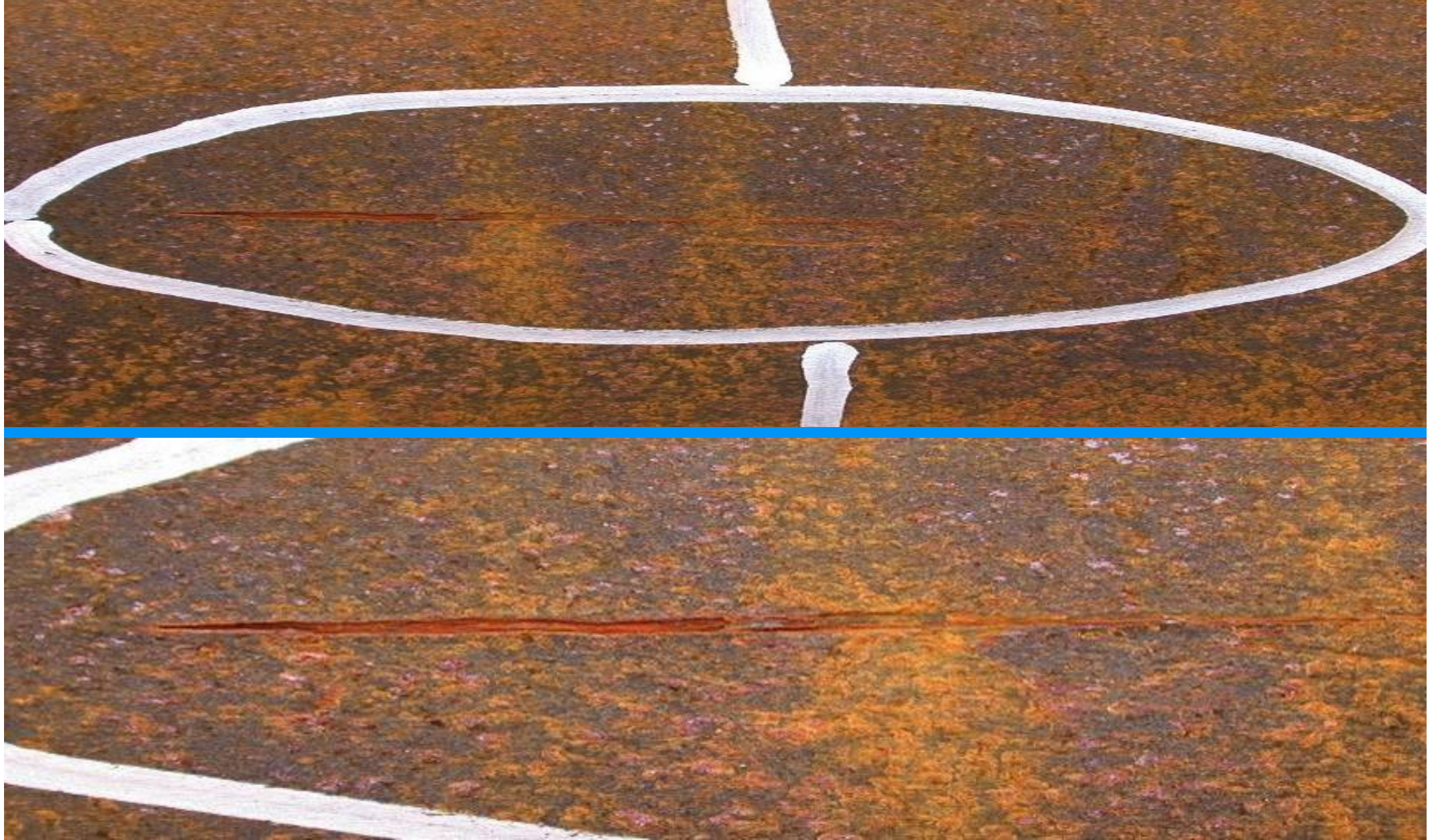
Pipe Scroller

Control

X Speed: 12.000 "/sec

Y Speed: 12.000 deg/sec

Locating Indications on pipe



Expandable Pipes VisonArray™ Inspected



Comparison Table Between EMI / FLUT / FLUT Phase Array / Technical Industries Inc. Visonic.

	EMI	FLUT	*FLUT Phased Array	VISONIC™ 3D Imaging
1. Detection capability (Standard API detection capability longitudinal, transverse & wall thickness)	Yes	Yes	Yes	Yes
2. Detection capability (Exceeding API including oblique defects and wall thickness measurement)	No	Yes	Yes	Yes
3. Ability to inspect both non-ferromagnetic and ferromagnetic pipe	No	Yes	Yes	Yes
4. Ability to inspect API pipe range I & II & III pipe	Yes	Yes	Yes	Yes
5. Ability to inspect pipe below 10' short pipe and coupling stock	No	No	No	Yes
6. Ability to inspect 1" and over wall thickness pipe for heavy weight drill-pipe and coupling stock	No	No	No	Yes
7. Coupling between transducers and pipe	Good	Good	Poor	Good
8. OD Pipe size inspection capability	2-3/8" - 14"	2-3/8" - 20"	2-3/8" - 20"	2"-26"
9. Wall thickness over 0.430" penetration capability	No	Yes	Yes	Yes
10. Standard chart defects & wall thickness graph display capability	Yes	Yes	Yes	Yes
11. Wall Thickness, CSA (Cross Sectional Area) capability	No	No	No	Yes
12. 64 points wall moving average	No	No	No	Yes
13. Defects severity virtual imaging display capability	No	No	Yes	Yes
14. Whole pipe virtual imaging including defects & wall thickness	No	No	No	Yes
15. Whole 100% pipe virtual imaging four including Defects & wall thickness and OD/Ovality	No	No	No	Yes
16. Simulation of tensile strength capability	No	No	No	Yes
17. Simulation of burst capability	No	No	No	Yes
18. Simulation of collapse capability.	No	No	No	Yes
19. Expandable pipe imaging including identification of failure areas.	No	No	No	Yes
20. Whole pipe image storing capability for future reference	No	No	No	Yes
21. Minimum ID imaging capability	No	No	No	Yes
22. Maximum OD imaging capability	No	No	No	Yes
23. Measuring pipe volumetric capability	No	No	No	Yes
24. Pipe identification finger printing capability	No	No	No	Yes
25. Pipe manufacturing process imaging capability	No	No	No	Yes
26. Pipe straightness imaging capability	No	No	No	Yes
27. Threads imaging capability	No	No	No	Yes
28. Networking system enabling the monitoring of the unit performance, inspection results and customers inventory	No	No	No	Yes
Proven technology	Yes	Yes	Prototype	Yes
RESULTS	5/28	8/28	6/28	28/28

* FLUT Pipe Phased Array inspection system methods are different than Shaw Group Phased Array Weld Inspection Methods. FLUT Phased Array includes the rotation of transducers or the pipe and the traversing along the length of the pipe. This method has proven to cause frequent transducers coupling loss. Therefore, causes loss of signals.