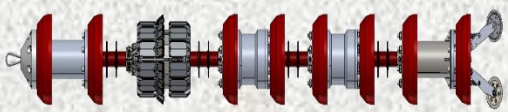
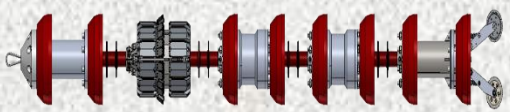
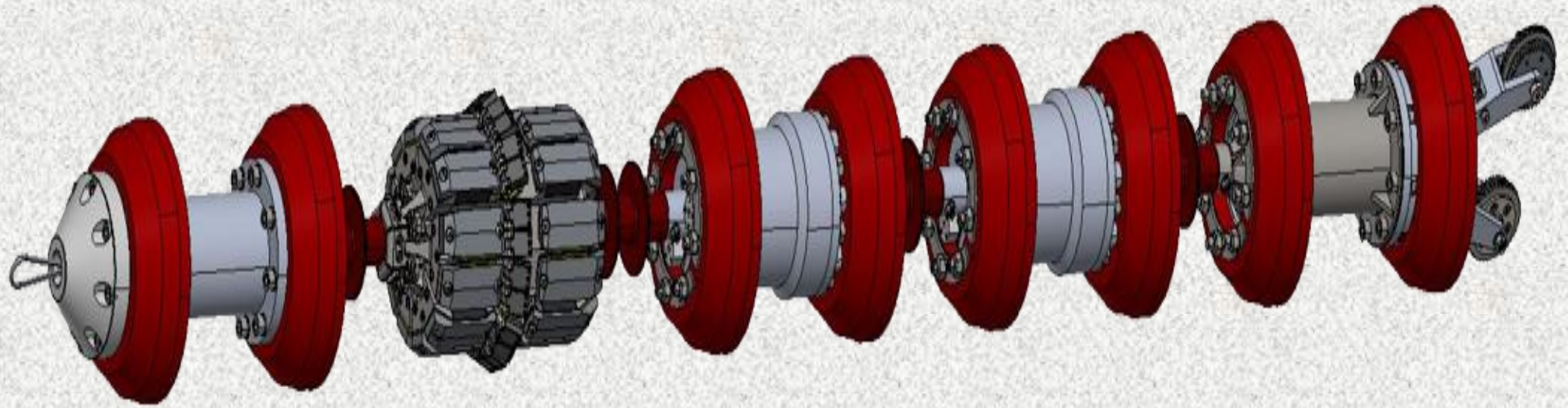


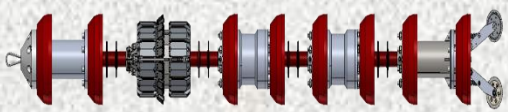
VDT Pipeline Integrity Solutions Pvt. Ltd.

In Line Inspection Technology



VDT In Line Inspection Technology



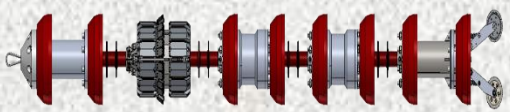


Contents:

- Who we are…
- Magnetic Flux Leakage Technology
- Eddy Current Geometry Inspection Technology
- Pipeline Cleaning Tools
- XYZ Mapping

Investors

- GAIL (India) Limited
- Oil and Natural Gas Corporation Ltd. (ONGCL)
- Incubator, IIM Lucknow, Noida Campus

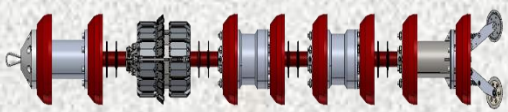


Supporters

- IIT Bombay
- Intel Corporation

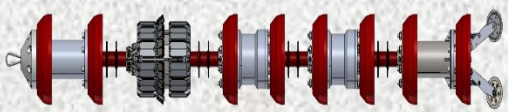
Global Presence

We are committed to develop world-class innovative solutions in the Oil and Gas sector



Objective:

Safety monitoring and health inspection of Oil and Gas Pipelines to ensure efficient operations of Petroleum Industries.



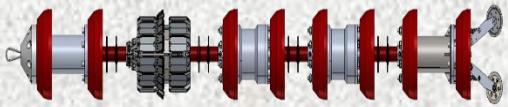
Milestones :

2017

⇨ *Company founded by Shri Bhuvanesh Kumar Sharma*

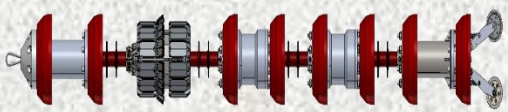
2020

⇨ *Research & Development of MFL Tool competent with Patent*



- Research & Development of Eddy Current Geometry Tool competent with Patent

- India’s first 10” Eddy Current Geometry Tool & MFL Tool tested successfully at Oil India Ltd



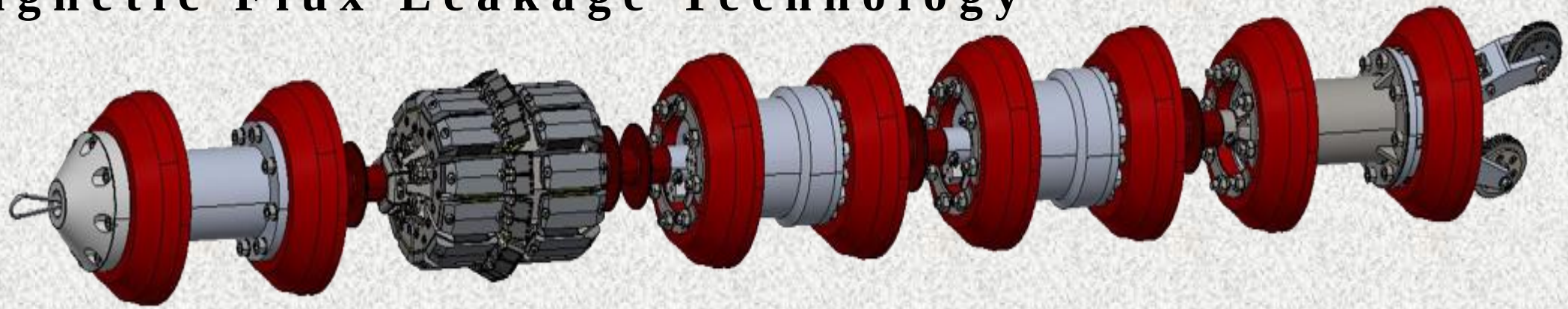
2022

- Successfully Run MFL Tool for Oil India Ltd
- Research & Development of Eddy Current Tool competent with Patent

2023

- 12” Eddy Current Geometry Tool & MFL is ready to run
- 16” and 18” Eddy Current Geometry Tool & MFL Tool is ready to be manufactured followed by it’s test run

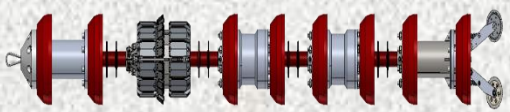
Magnetic Flux Leakage Technology

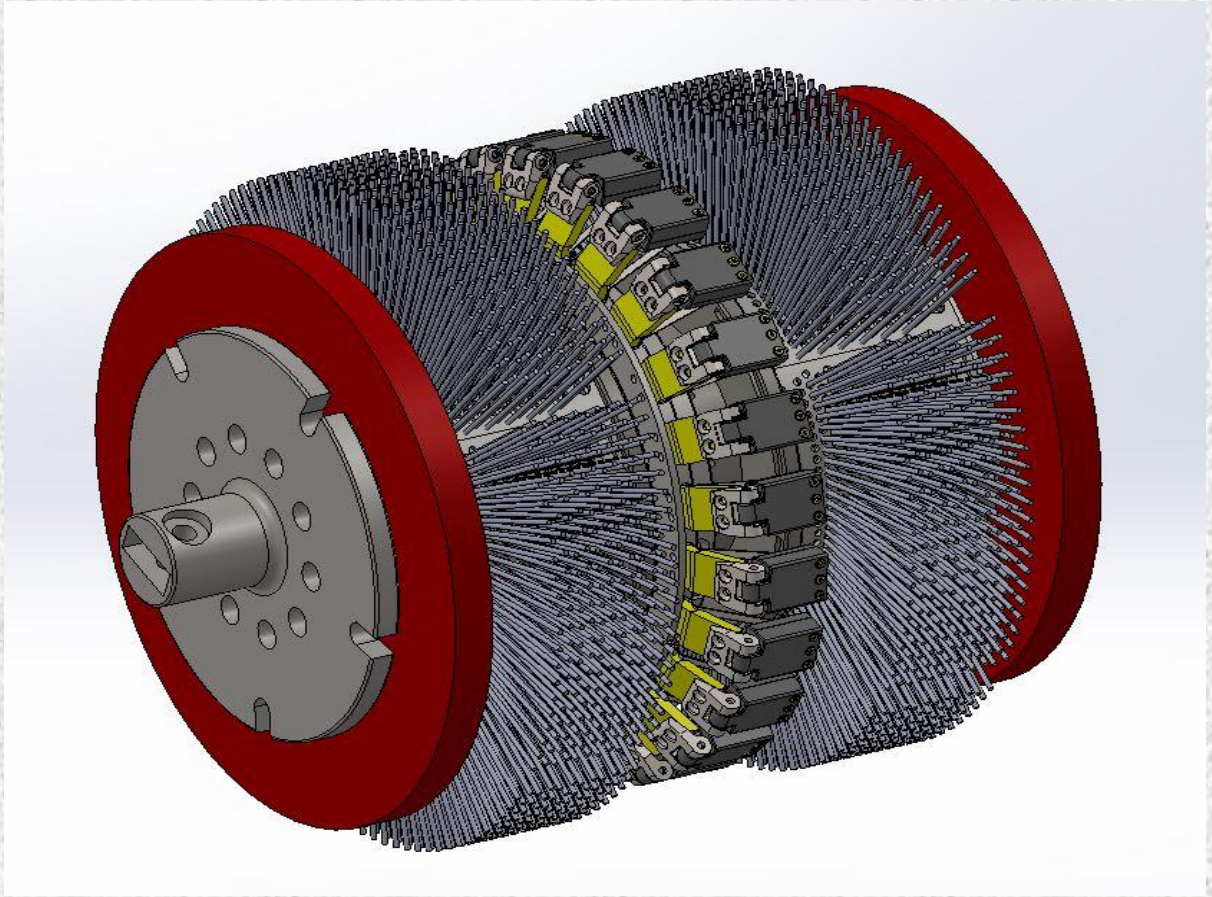


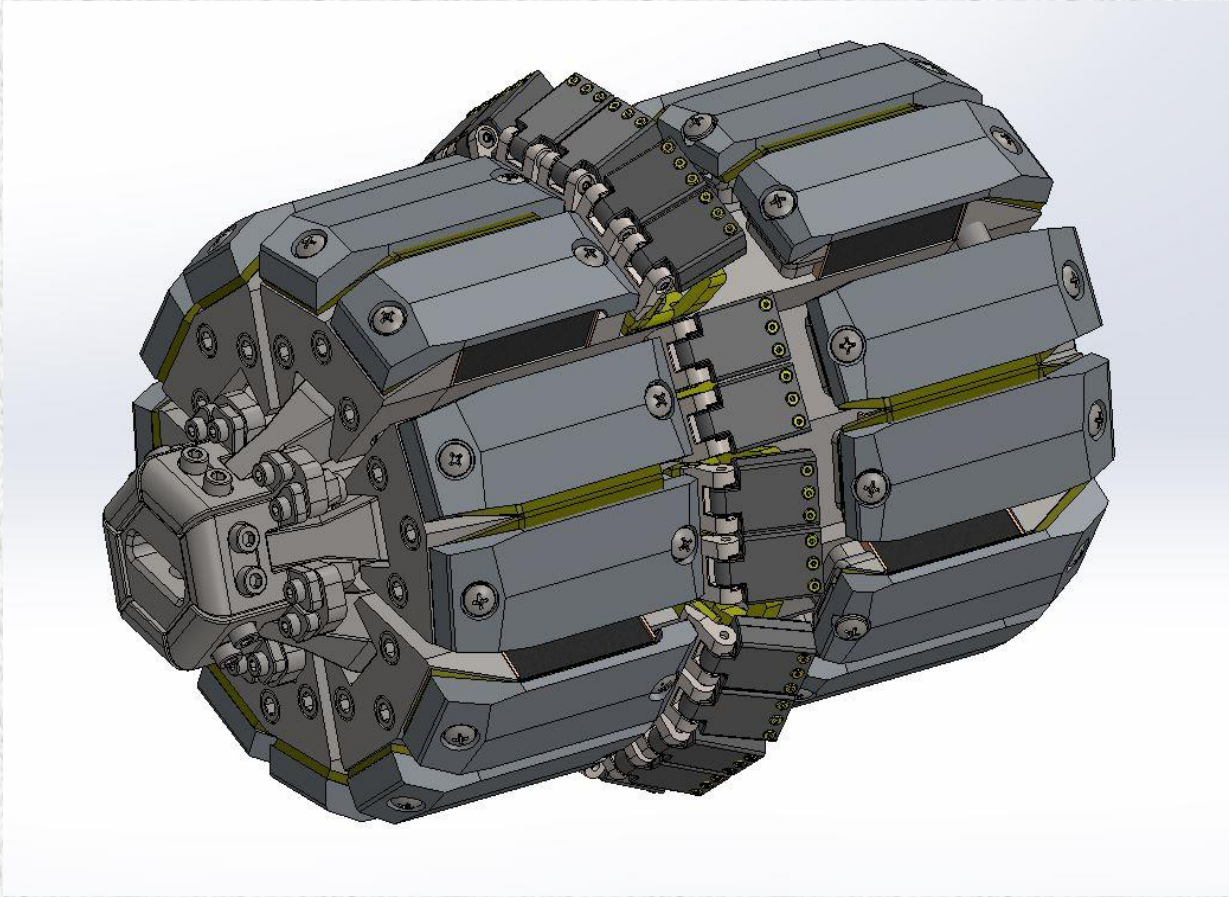
- Magnetic Flux Leakage (MFL) Tool use Permanent magnets to magnetize the pipe wall to saturation. We used Hall effect sensors with double data sampling rate than that of the existing tools offered by competitors.

- The objective of Pipeline integrity program is to determine the condition of a pipeline and the maintenance required to avoid critical failure of the asset using Non-Destructive Testing (NDT) methods.

Expansion

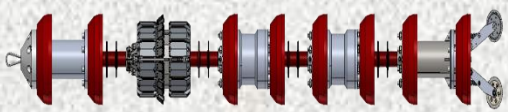






A-MFL

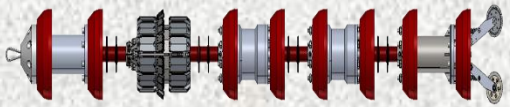
G-MFL



Salient feature :

- Indigenously developed Patented Magnetic Flux Leakage Technology
- Compatible with shorter length Launchers and Receivers due to it’s shorter overall length
- Decreased data interpretation time by using our state of the art automatic Data Analysis Software
- Reduced run failures and complications due to shorter length of the tool
- Lesser chance of stuck of tool in pipeline
- Shorter bend radius can easily be achieved by the Tool
- Increased Ruggedness of the tool
- Higher Resolution and data Sampling rates

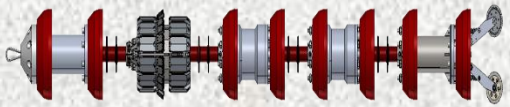
Potential Pipeline Threats:



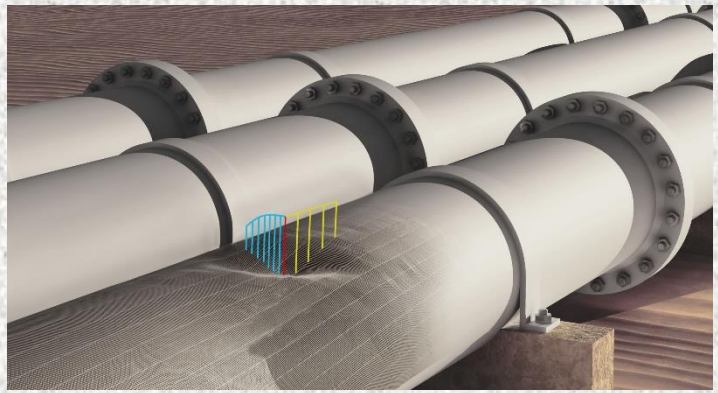
- Metal loss (internal and external corrosion, slotting, pitting, pinholes and grooving etc)

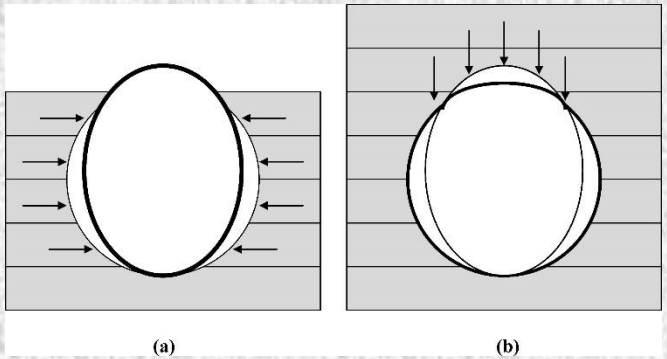
External corrosion

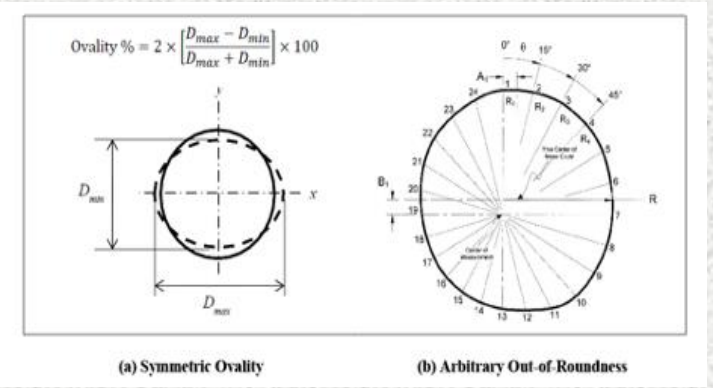
Internal corrosion



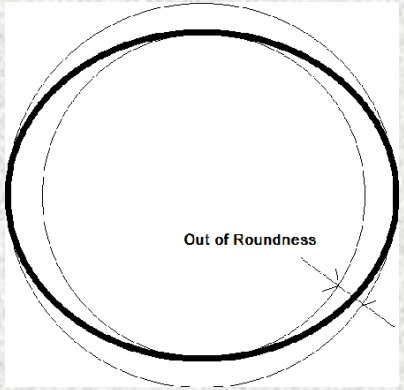
- Geometric deformations (dents, buckling, rippling/wrinkling, gouges, ovality and peaking etc)







Ovality

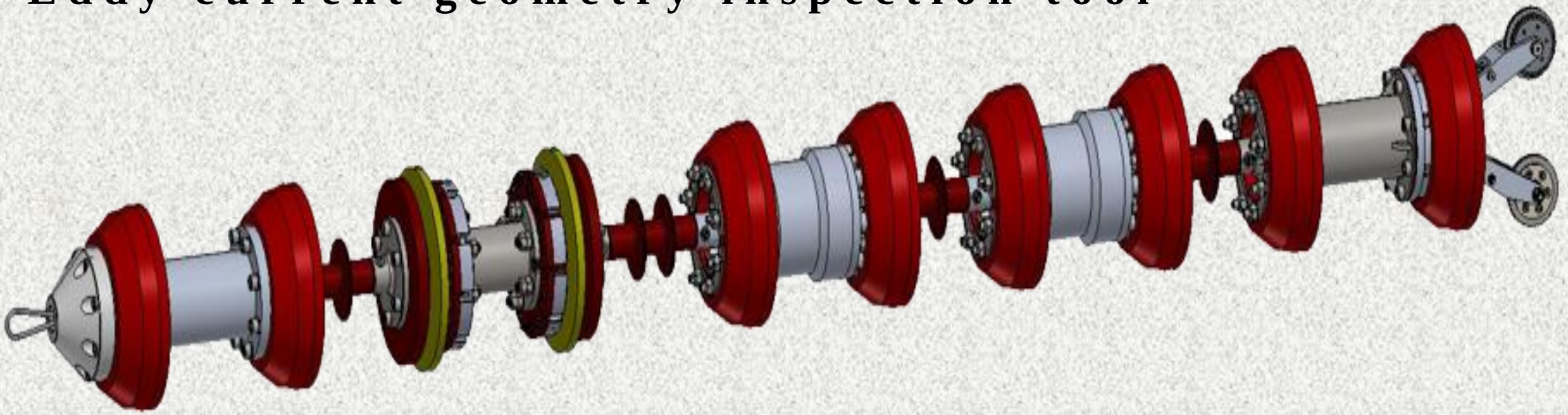


- Cracking and crack-like anomalies (weld cracks, stress corrosion cracks, fatigue cracks, hook cracks etc).

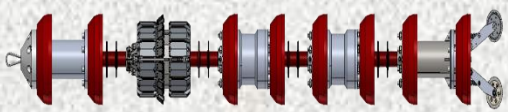
Weld cracks

Fatigue cracks

Eddy current geometry inspection tool



- This tool is capable to detect internal inspection of pipeline including geometry inspection
- This tool is working as Anti-theft inspection tool for oil pipeline.

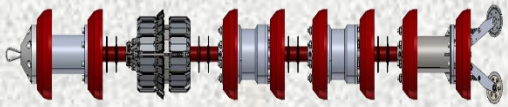


Expected Outcome:

- Improvement in Pipeline efficiency

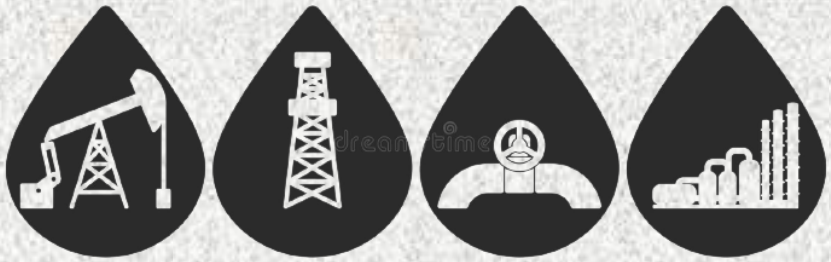
- Longevity of Pipeline

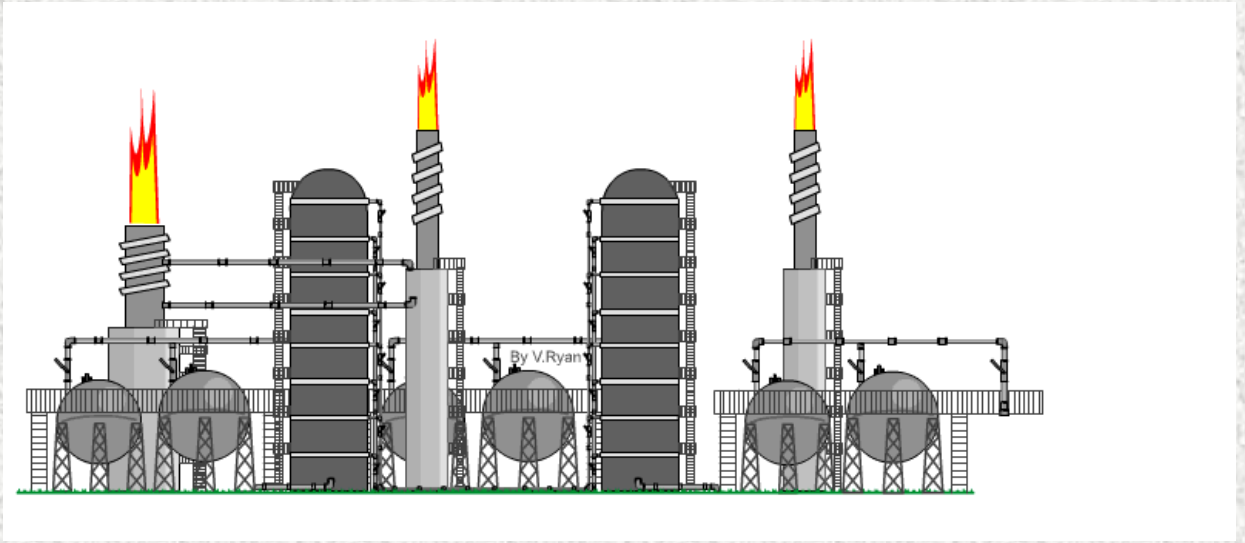
- No incidents due to Integrity

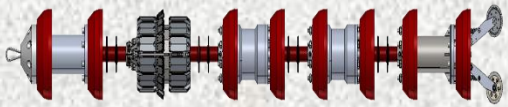


- Lower Breakdown

- Improvement in operational safety







- Overall cost saving

- Saving of foreign exchange

Pipeline Cleaning Tools

Bi-Di/Gauge PIG

Brush/Magnetic PIG

Cup PIG

Scrapper PIG

Cleaning Tools

Cups

Brush

PIG Mandrel

Gauge Plate

Guide Discs

Sealing Discs

Spacer Discs

ILI Run

ऑयल इंडिया लिमिटेड
(भारत सरकार का एक उद्यम)
Oil India Limited
(A Government of India Enterprise)

Pipeline Headquarters, P.O. Udayan Vihar
Guwahati-781171, Assam, India
पाइपलाइन मुख्यालय, डाक : उदयन विहार
गुवाहाटी-781171, असम, भारत
Tel / दूरभाष : 0361-2657618, 2643725, 2640145
Fax / फैक्स : 0361-2643686
E-mail / ई-मेल : oil_pipeline@oilindia.in

Conquering Newer Horizons

संदर्भ स / Ref. No. : PL/Cont-03/3-32/F-2506/22-23/174 दिनांक / Date : 31.05.2022

To whom it may concern

This is to certify that **M/S. VDT Pipeline Integrity Solutions Private Limited, IIM Lucknow, Noida Campus, L-Incubator, B-1, Sector 62, Noida- 201307, Uttar Pradesh (Vendor Code- 413100)** was awarded the following Contract by OIL INDIA LIMITED, Pipeline Department, Guwahati, which they have executed/ completed as per terms of the contract.

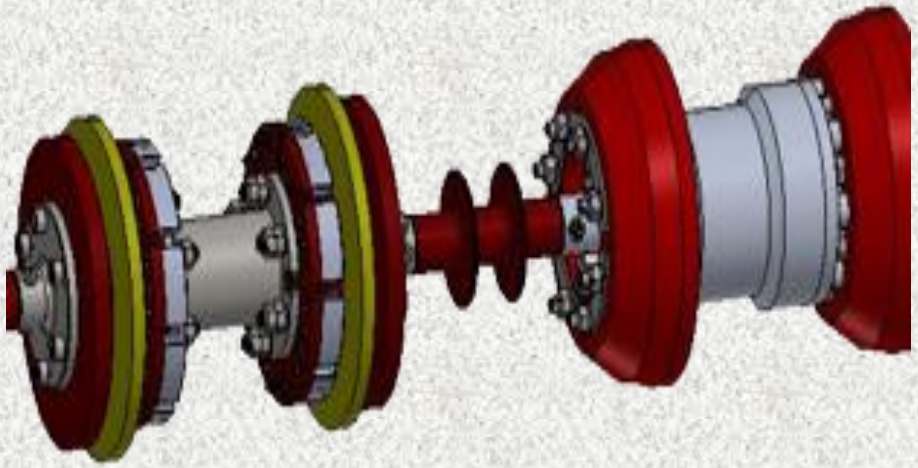
Contract No:	6115887
Work order No:	8125571
Description of Work :	**"Intelligent pigging Survey (IPS) of 254 mm (10") OD Crude Oil Pipeline from Pump station -5 , Noonmati to Guwahati Refinery."**
Original Contract cost:	
Name of the Firm	**M/S. VDT Pipeline Integrity Solutions Private Limited.**
Starting date as per work order:	01.11.2021
Completion date as per work order:	30.04.2022
Actual date of completion:	30.03.2022
Final value of work done:	
Work Performance:	Satisfactory

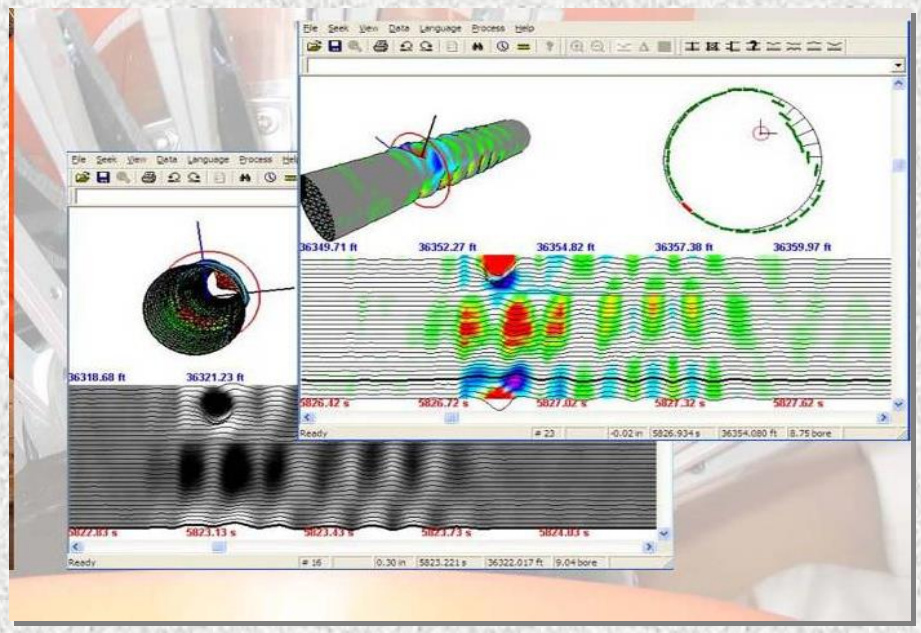
(Ramanuj Dutta) 01/06/22
General Manager (C&P) PL
For- CHIEF GENERAL MANAGER (PLS)

Mat. Code : 91-77-4499
P.O. No. 7120193/GOS/A1

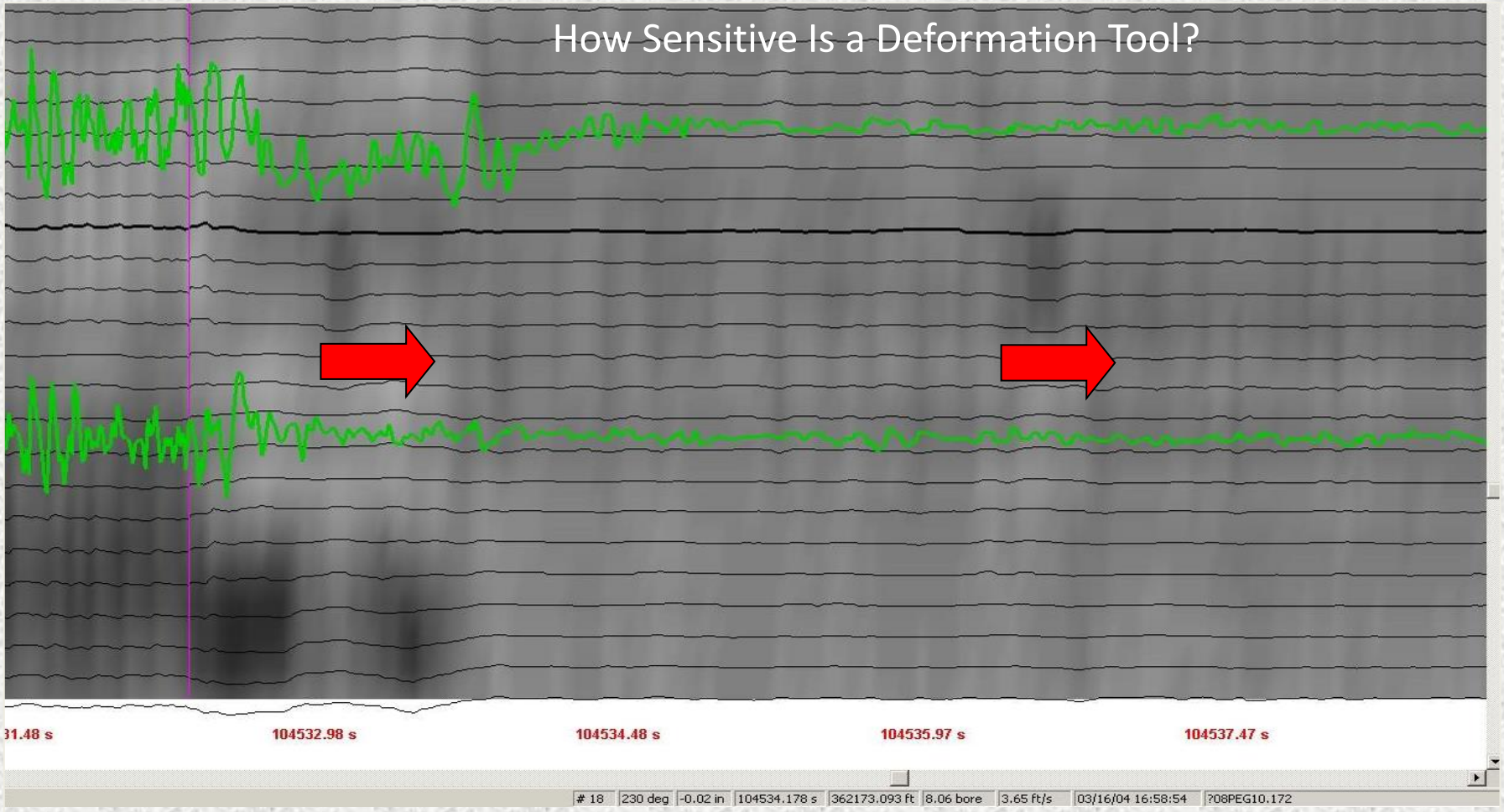
Deformation

- 0.50” (12.7mm) circumferential sensor spacing
- Sensors ride directly on the pipe wall
- All tools will pass 1.5D bend and 25% from pipe OD restriction
- Ideal tool for expansion detection

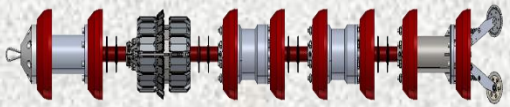


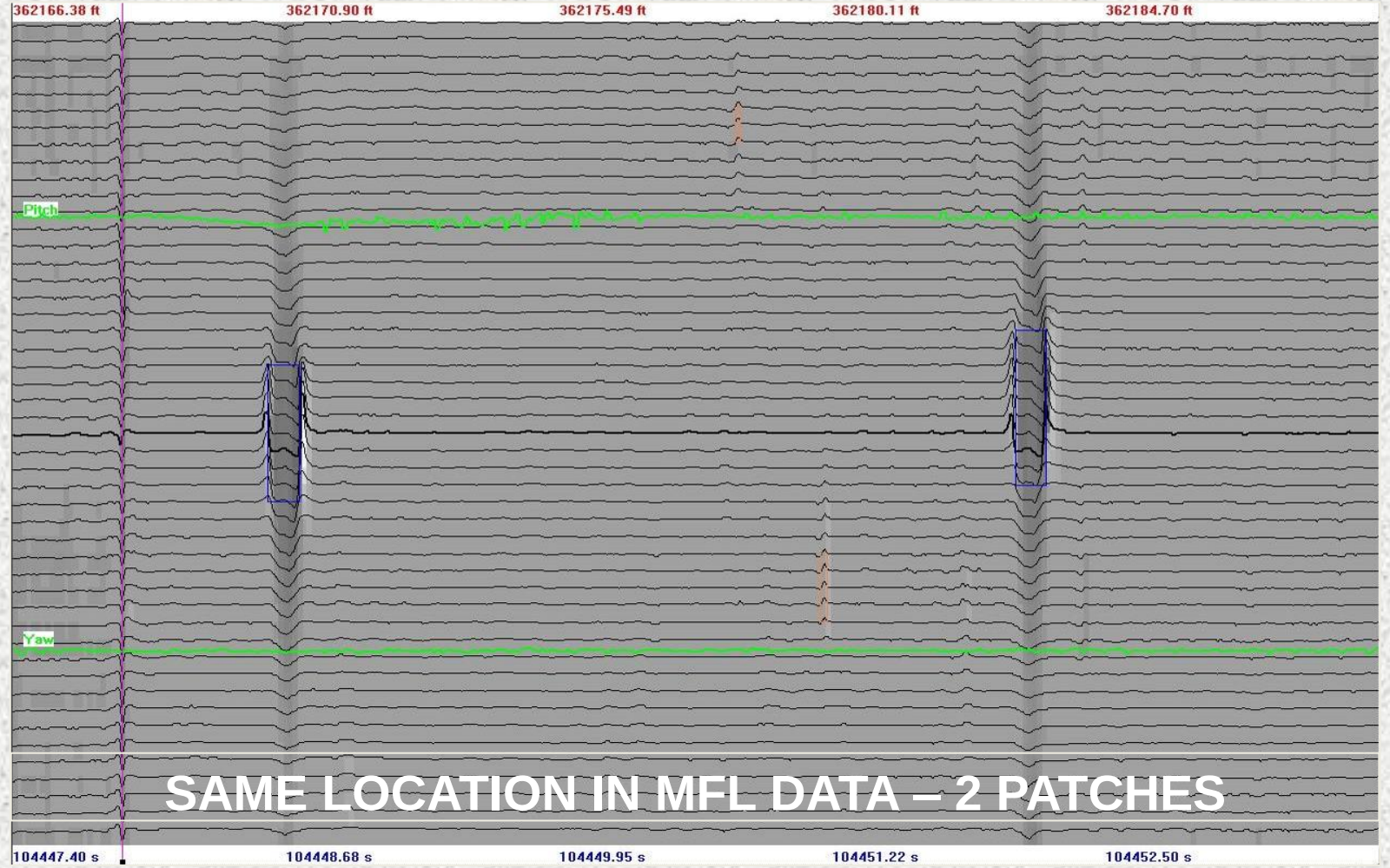


Deformation



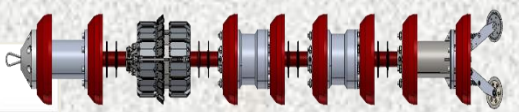
Deformation

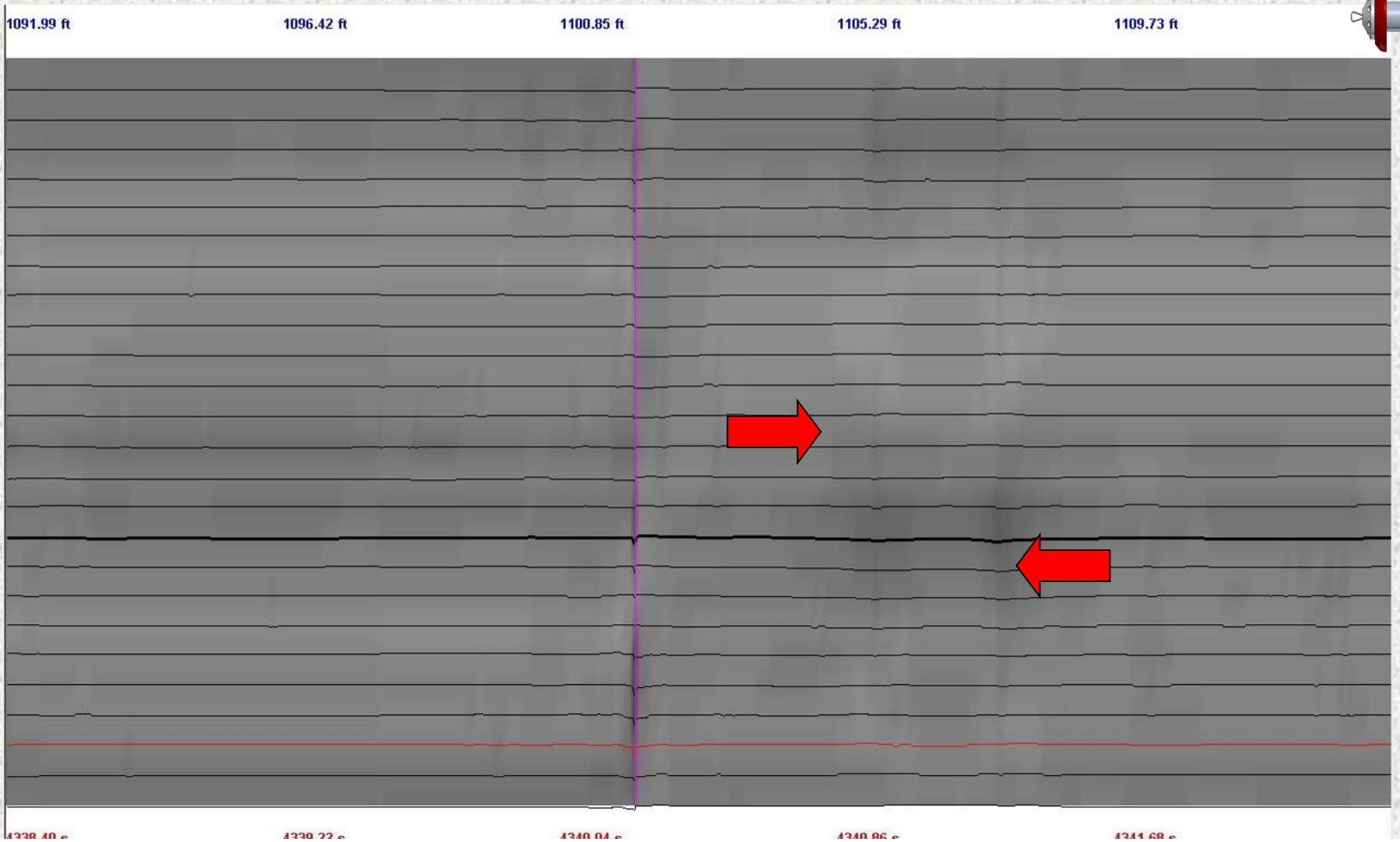




SAME LOCATION IN MFL DATA – 2 PATCHES

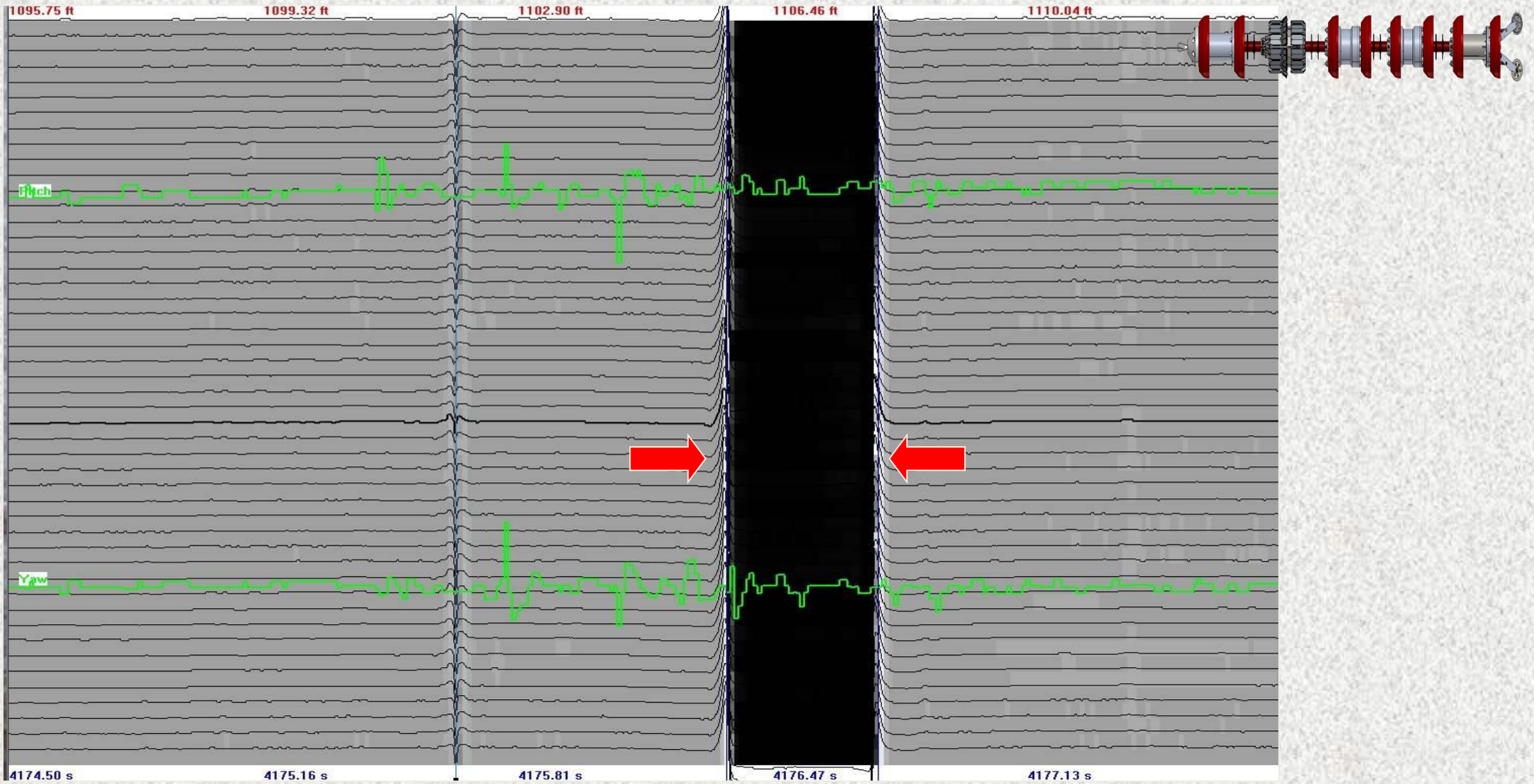
Deformation





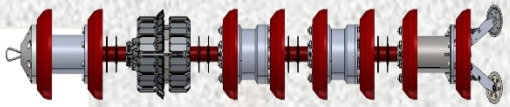
SLIGHT INDICATIONS IN DEFORMATION DATA

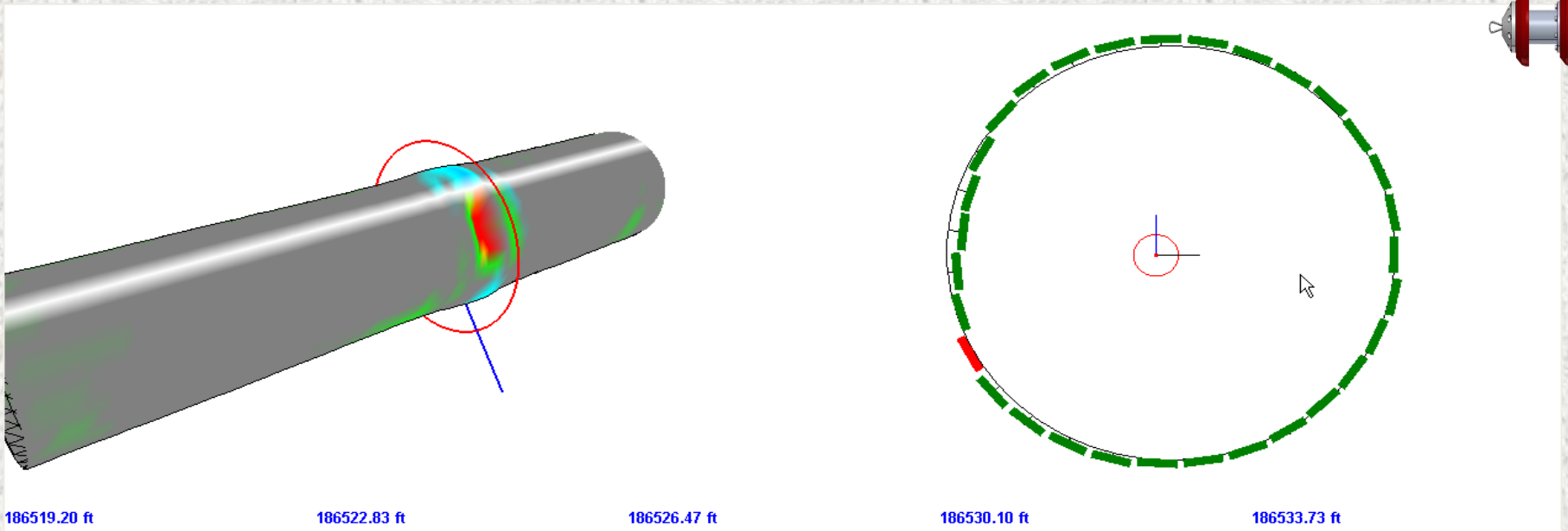
Deformation



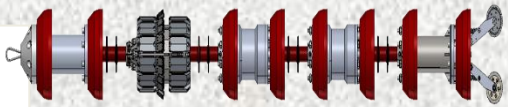
SAME LOCATION IN MFL

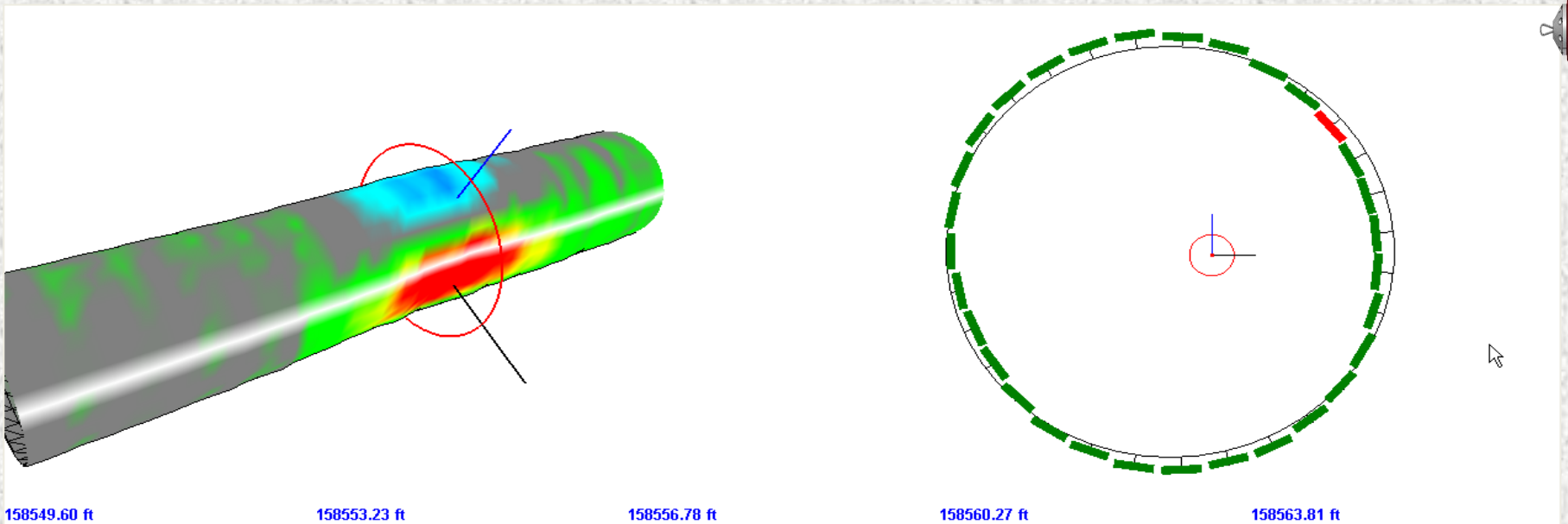
Deformation

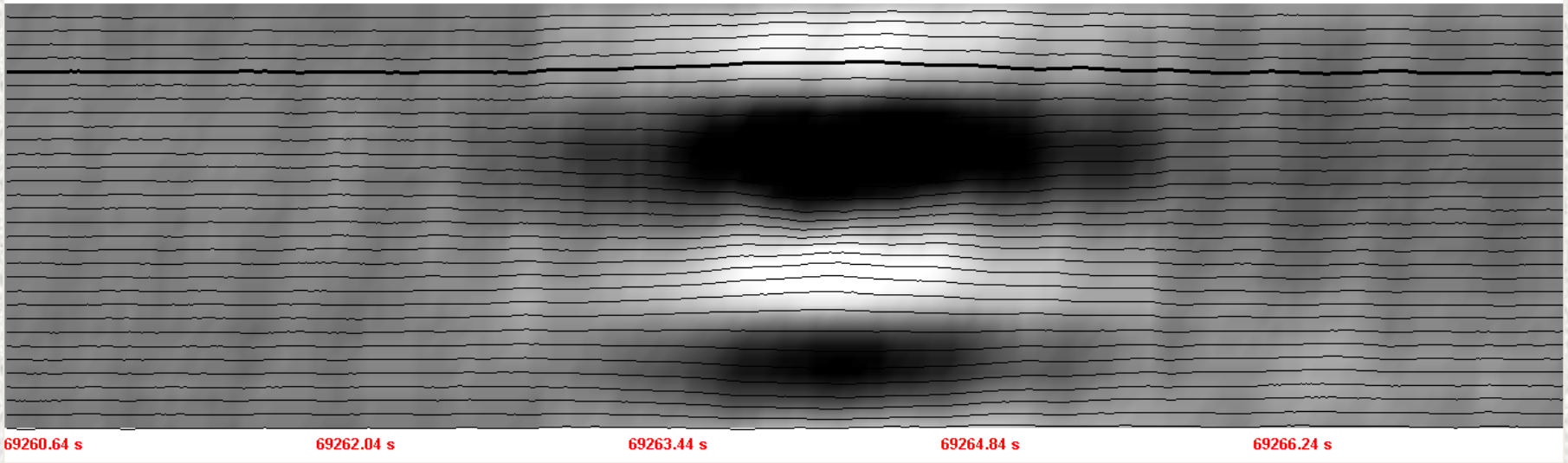




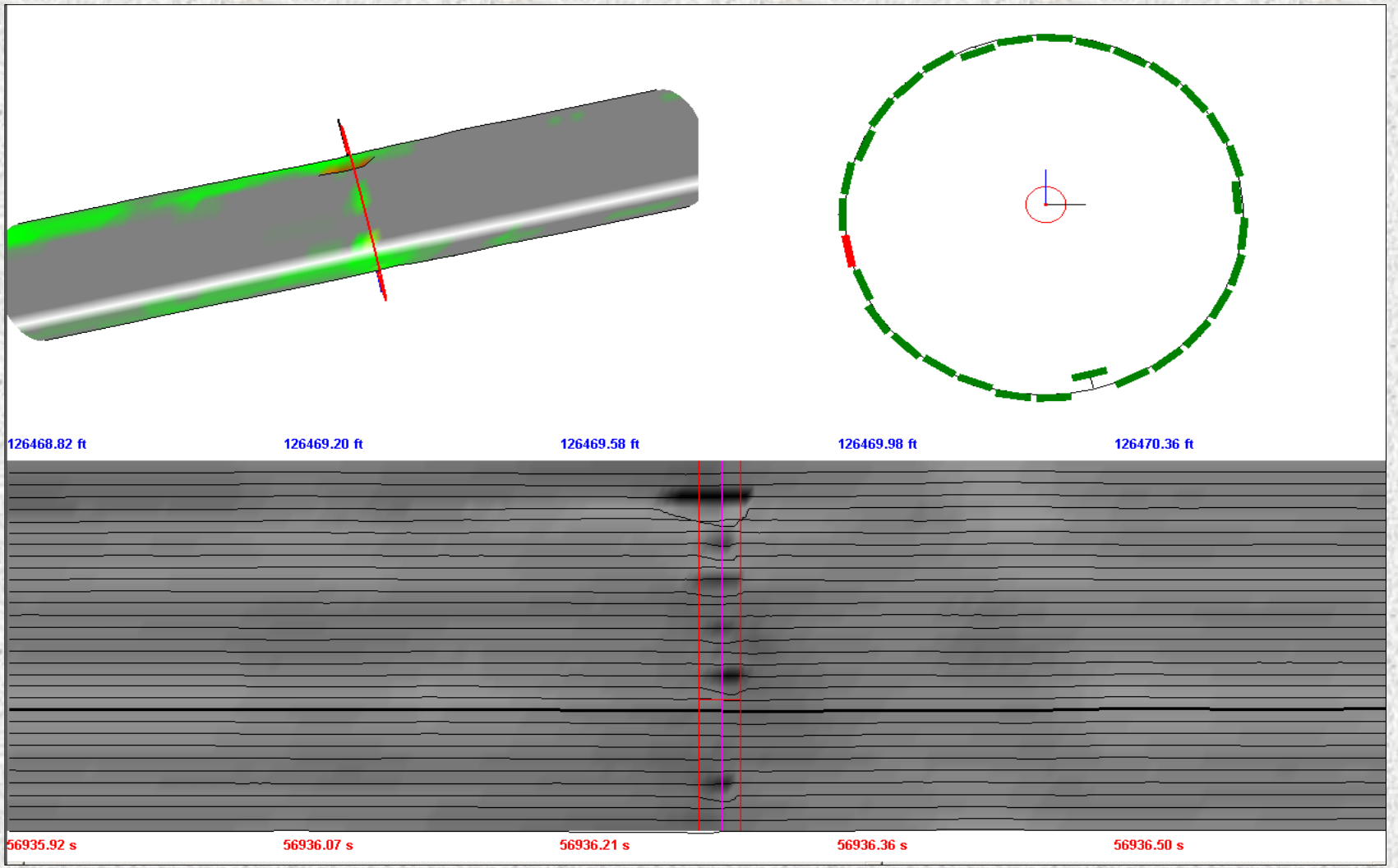
Deformation



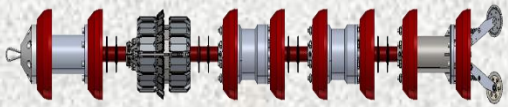


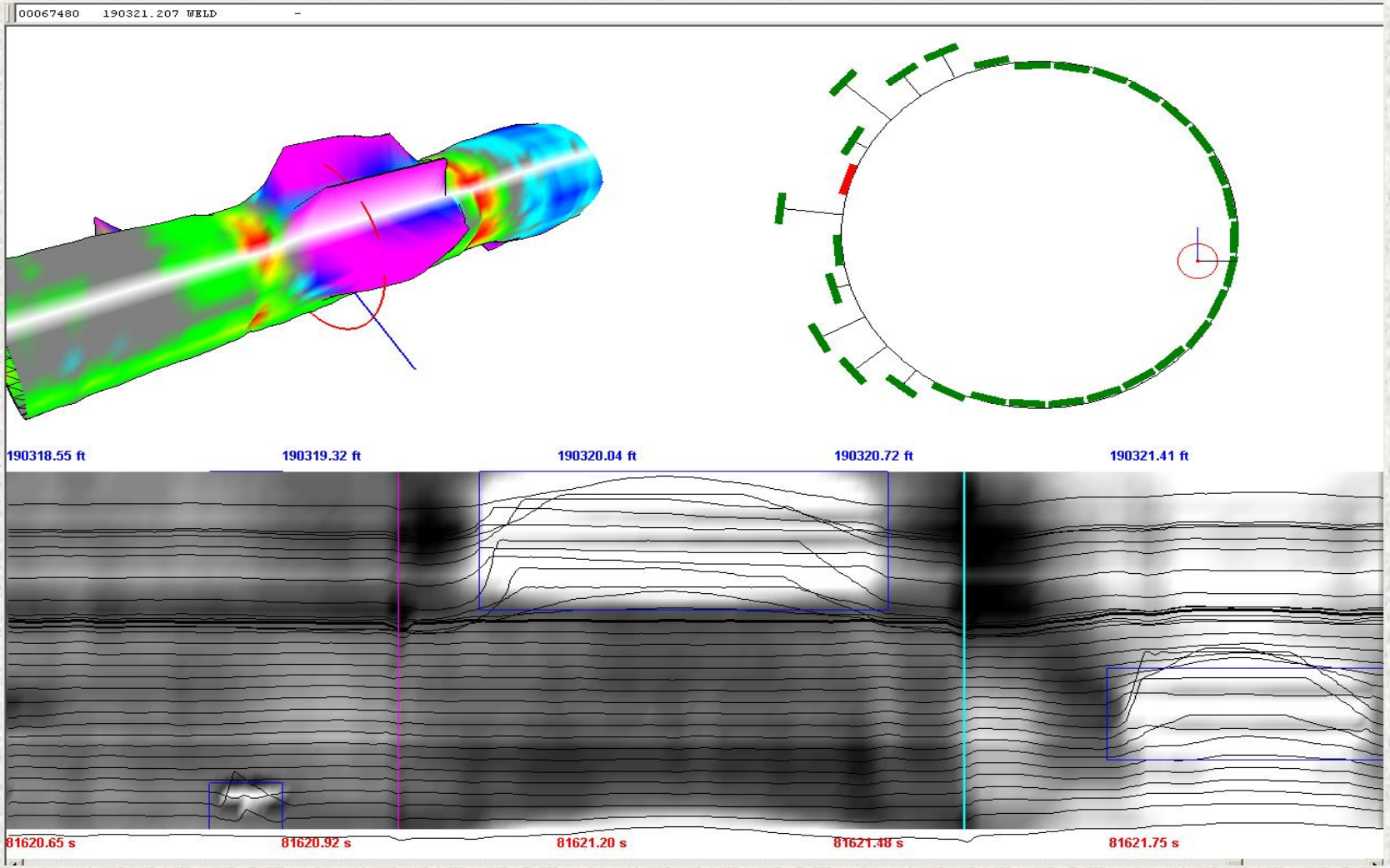


Deformation

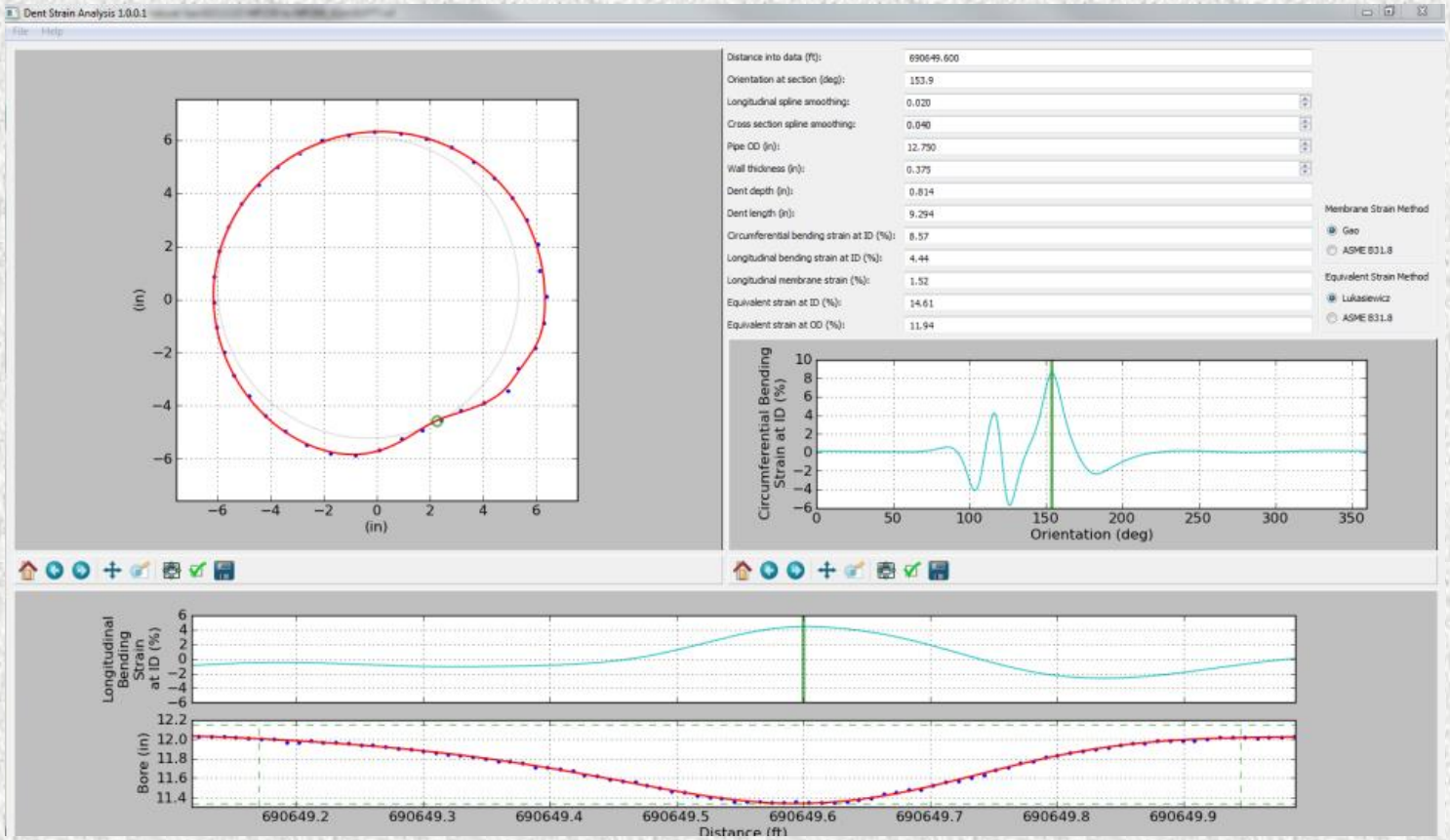


Deformation



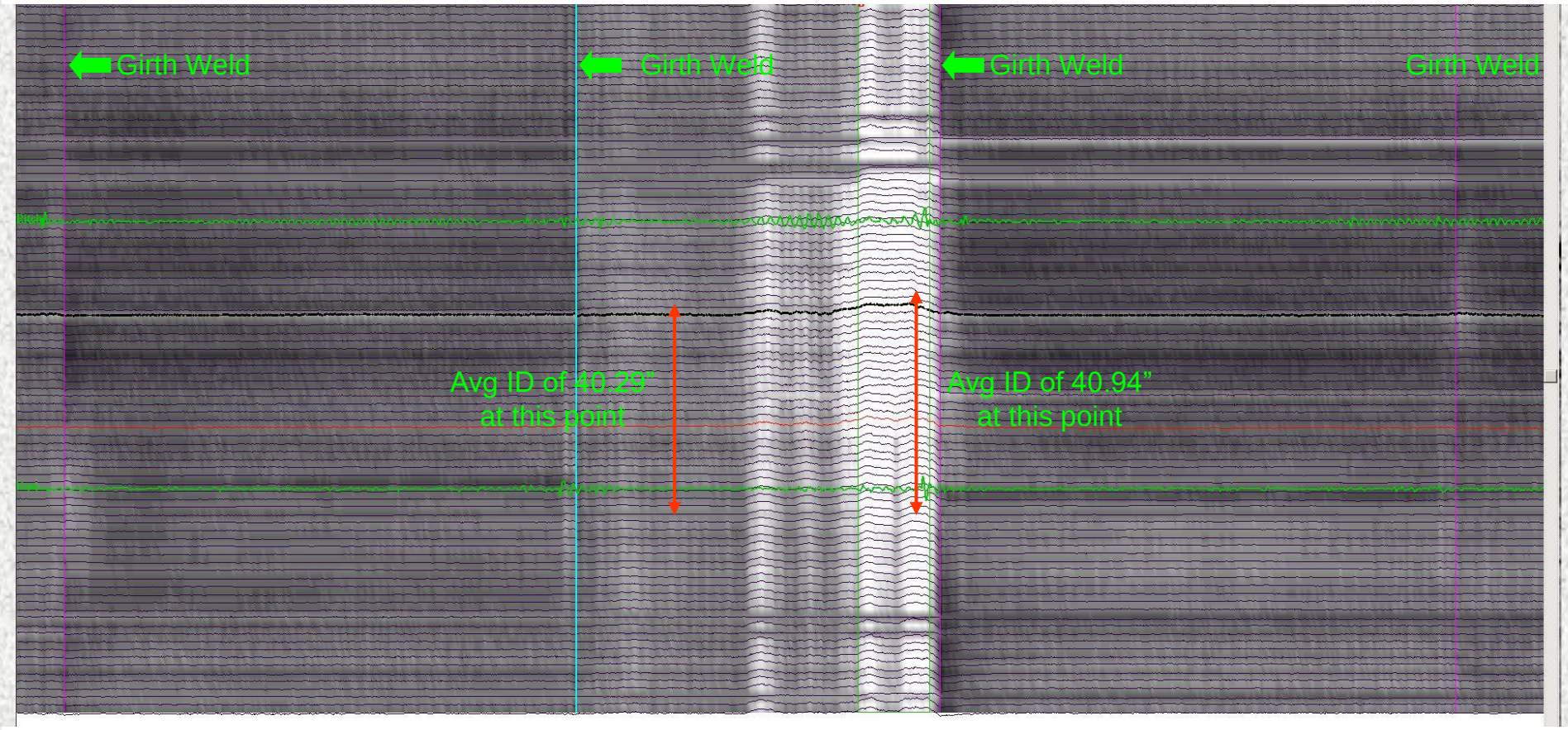


Deformation

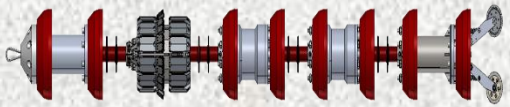


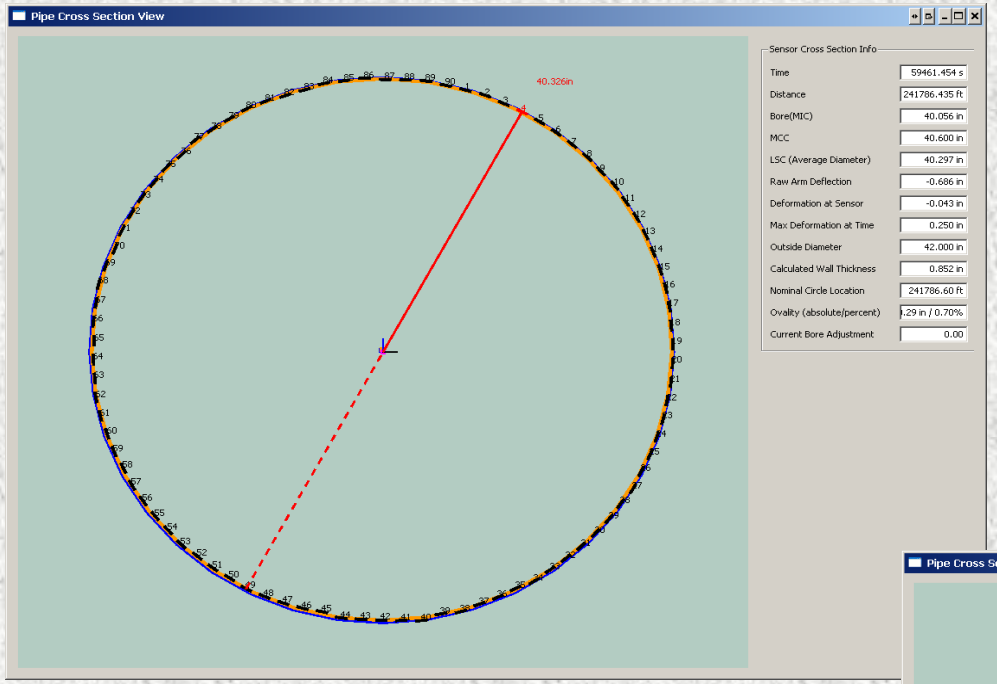
Strain Analysis

Expansion


Girth Weld
Girth Weld
Girth Weld
Girth Weld
Avg ID of 40.29"
at this point
Avg ID of 40.94"
at this point

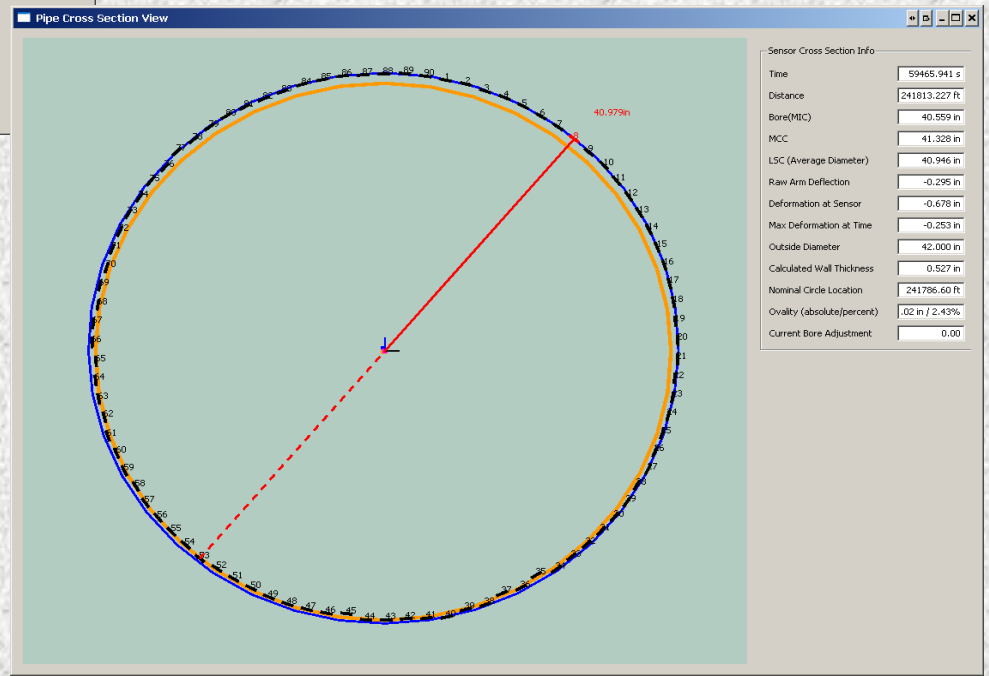
Expansion





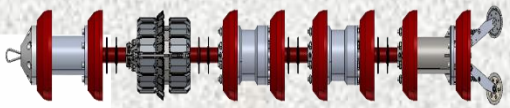
Cross Section at Nominal

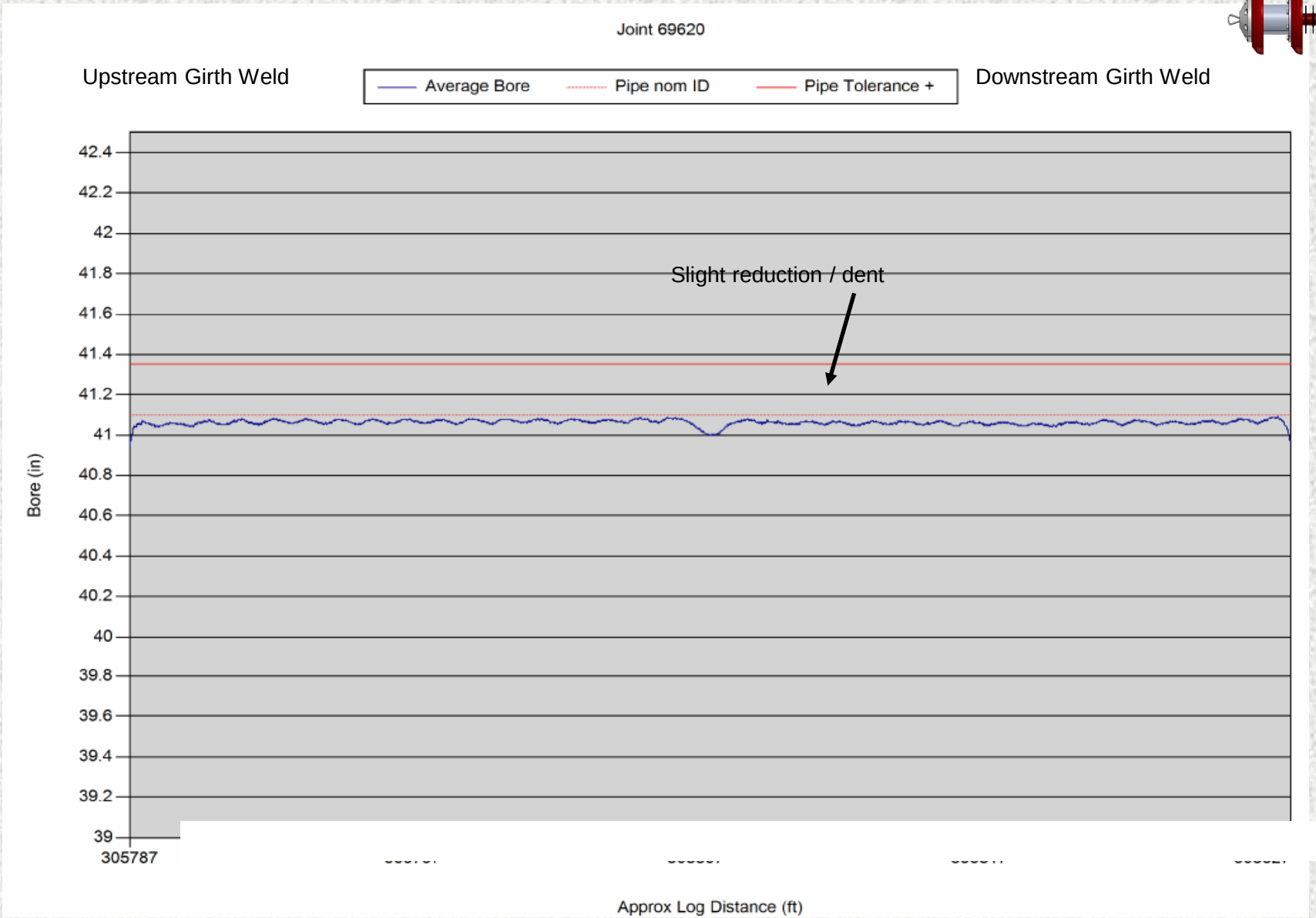
Cross Section at Increased ID



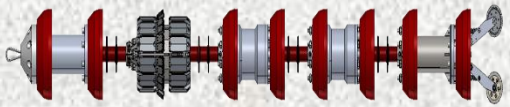
The orange circle in this view represents the nominal ID of the pipe. The Blue circle represents the maximum ID at the specific location.

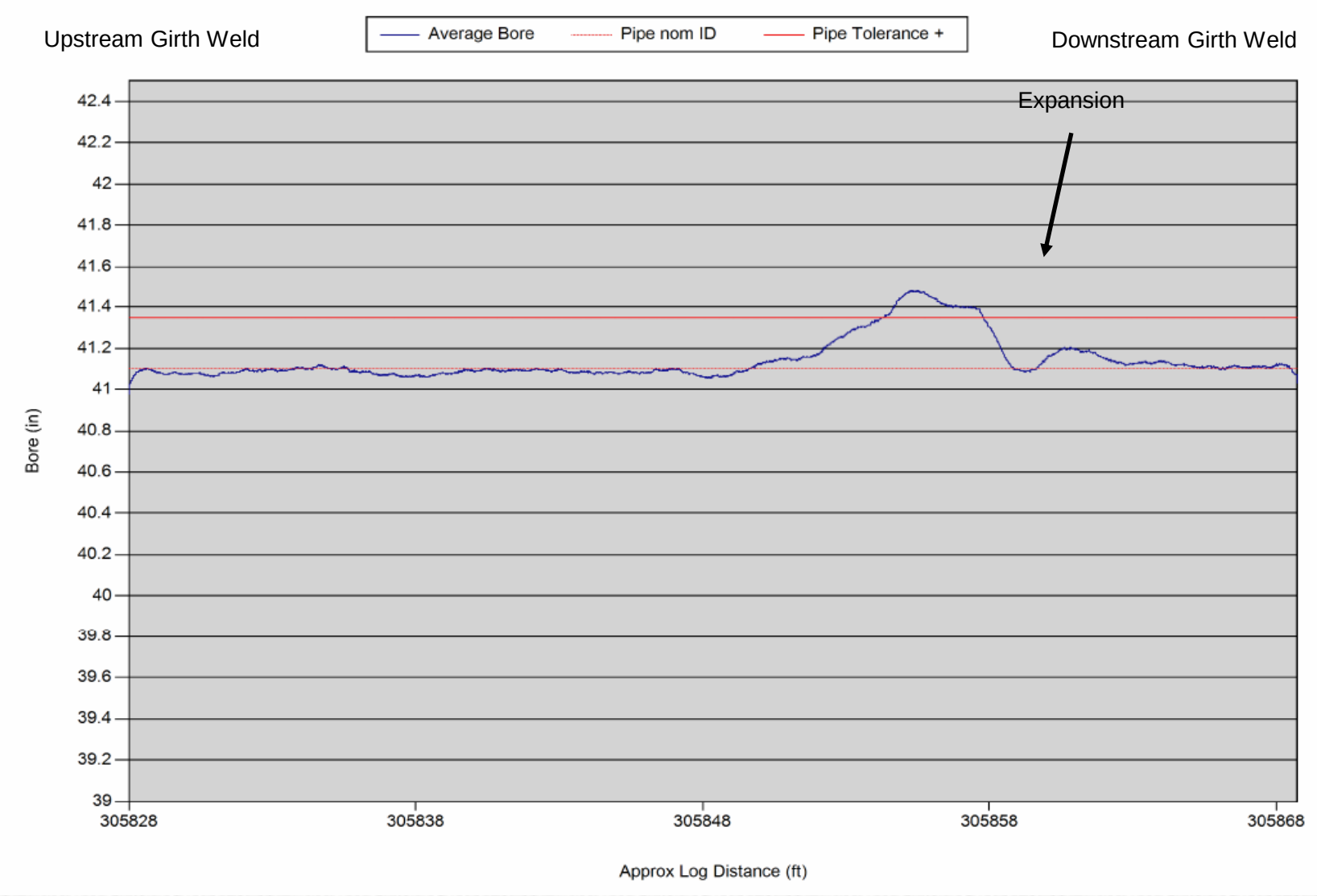
Expansion



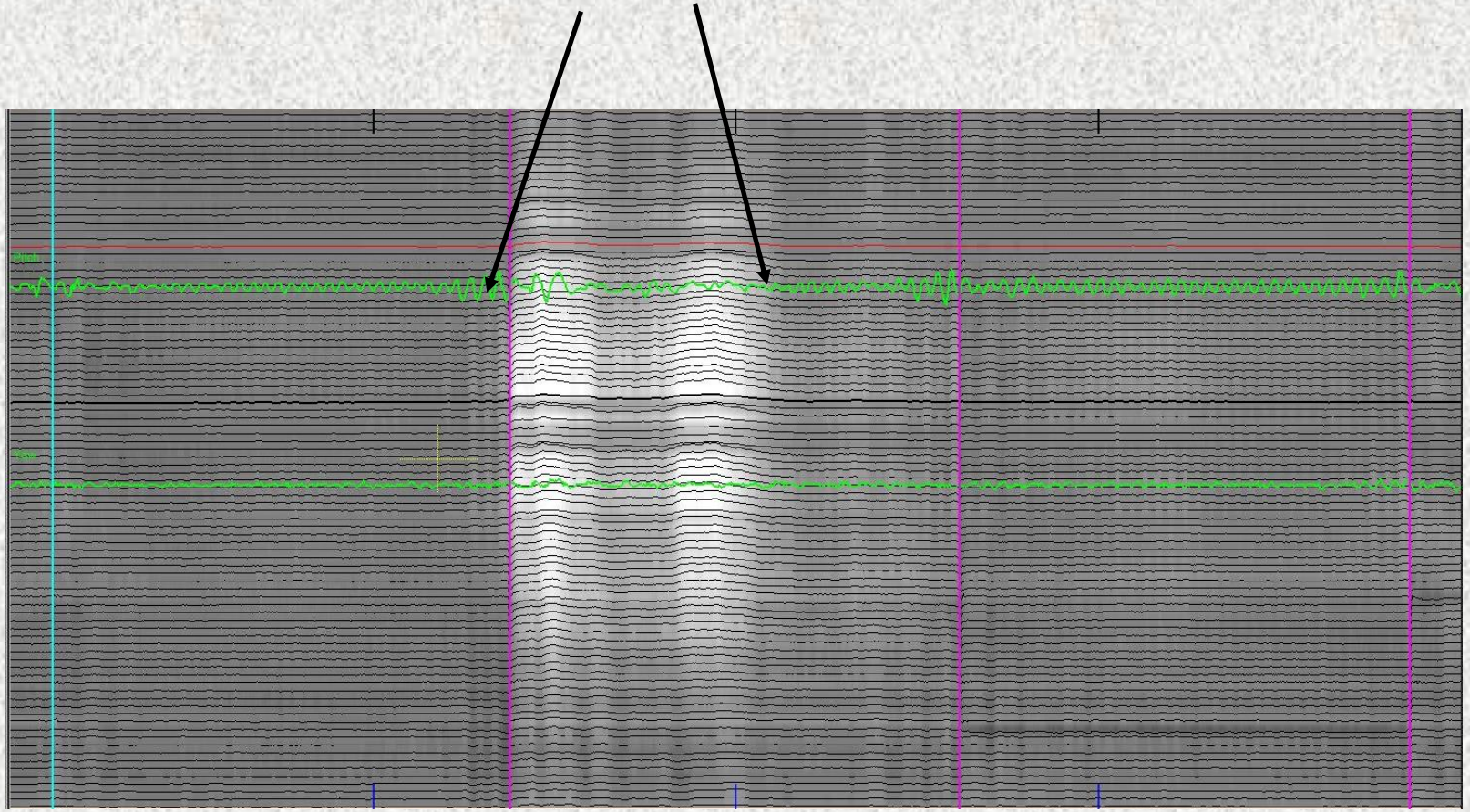

Joint 69620
Upstream Girth Weld
Average Bore
Pipe nom ID
Pipe Tolerance +
Downstream Girth Weld
Slight reduction / dent
Bore (in)
42.4
42.2
42
41.8
41.6
41.4
41.2
41
40.8
40.6
40.4
40.2
40
39.8
39.6
39.4
39.2
39
305787
Approx Log Distance (ft)

Expansion

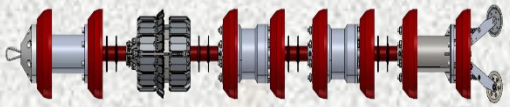


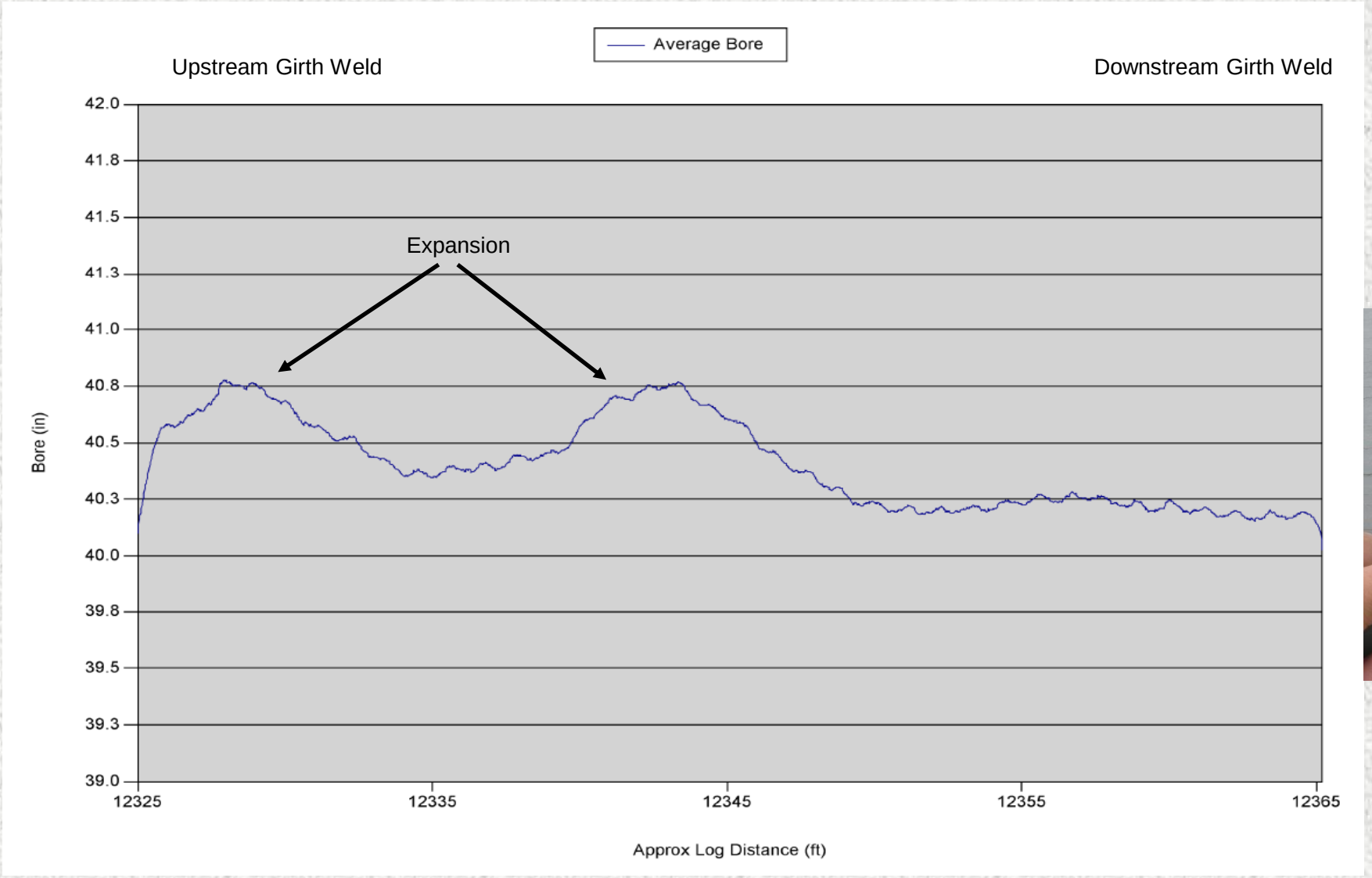

Upstream Girth Weld
Average Bore
Pipe nom ID
Pipe Tolerance +
Downstream Girth Weld
Expansion
Bore (in)
42.4
42.2
42
41.8
41.6
41.4
41.2
41
40.8
40.6
40.4
40.2
40
39.8
39.6
39.4
39.2
39
305828
305838
305848
305858
305868
Approx Log Distance (ft)

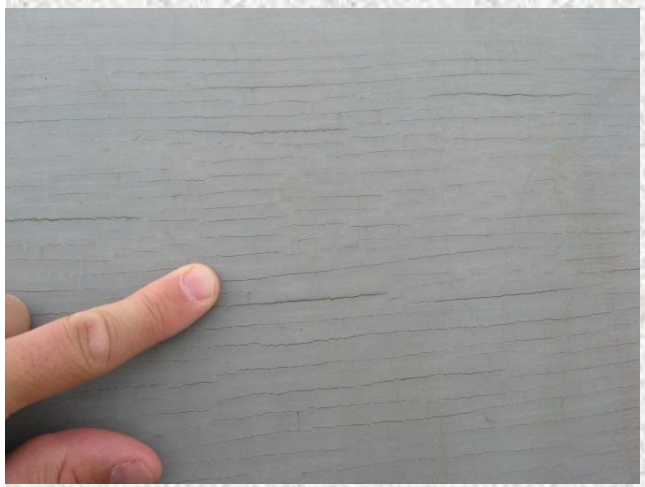
Expansion



Expansion

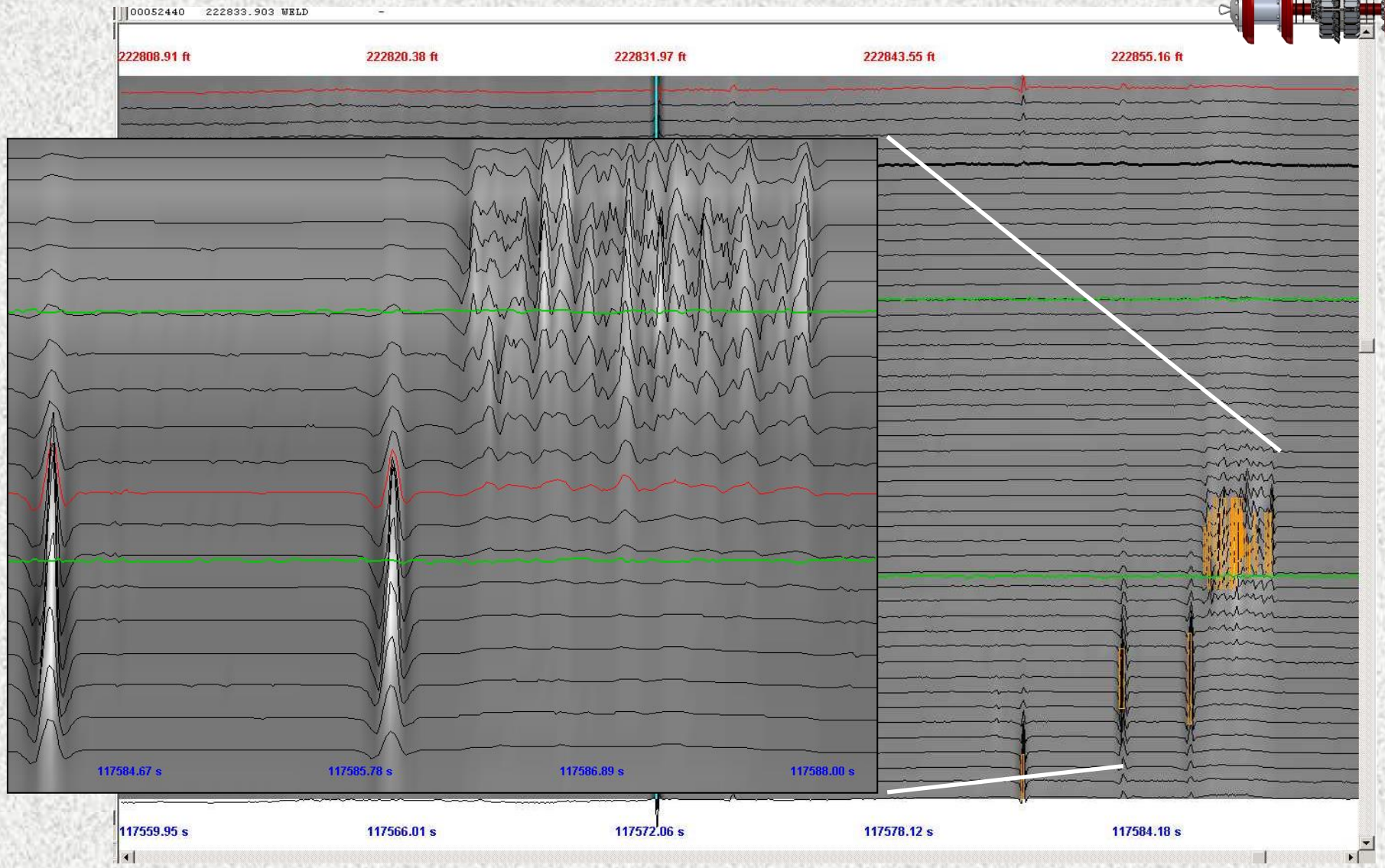



Average Bore
Upstream Girth Weld
Downstream Girth Weld
Expansion
Bore (in)
42.0
41.8
41.5
41.3
41.0
40.8
40.5
40.3
40.0
39.8
39.5
39.3
39.0
12325
12335
12345
12355
12365
Approx Log Distance (ft)

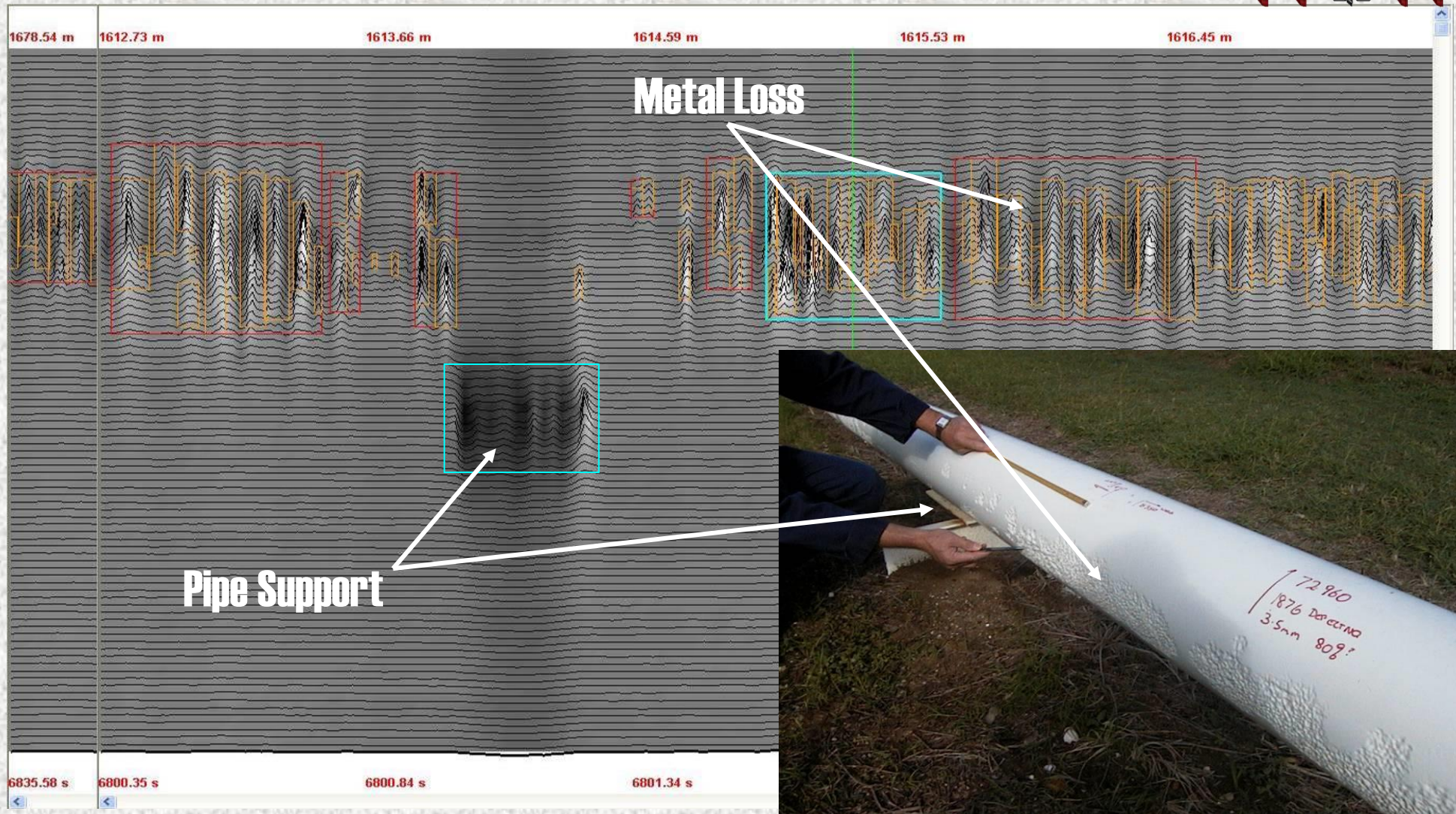


Expansion

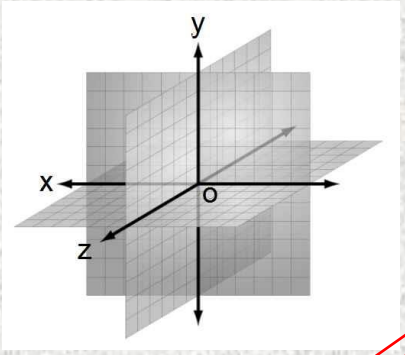
Metal Loss Inspection

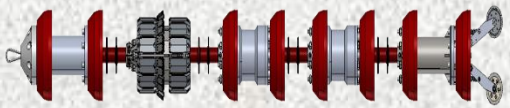


Metal Loss Inspection



X Y Z Mapping

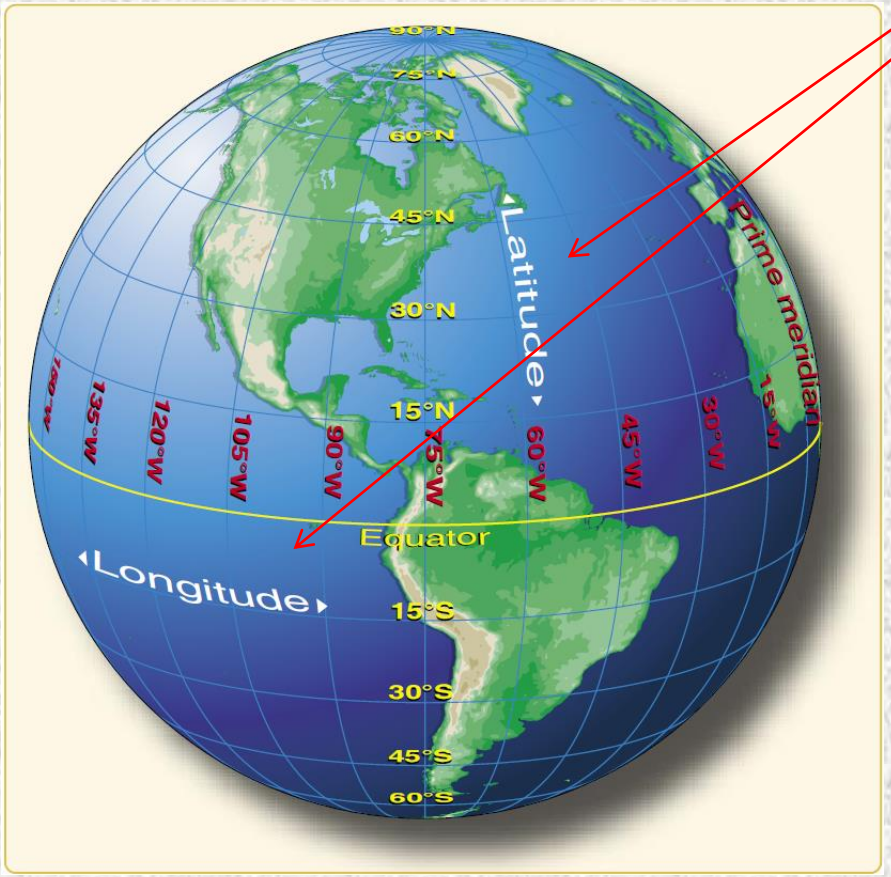


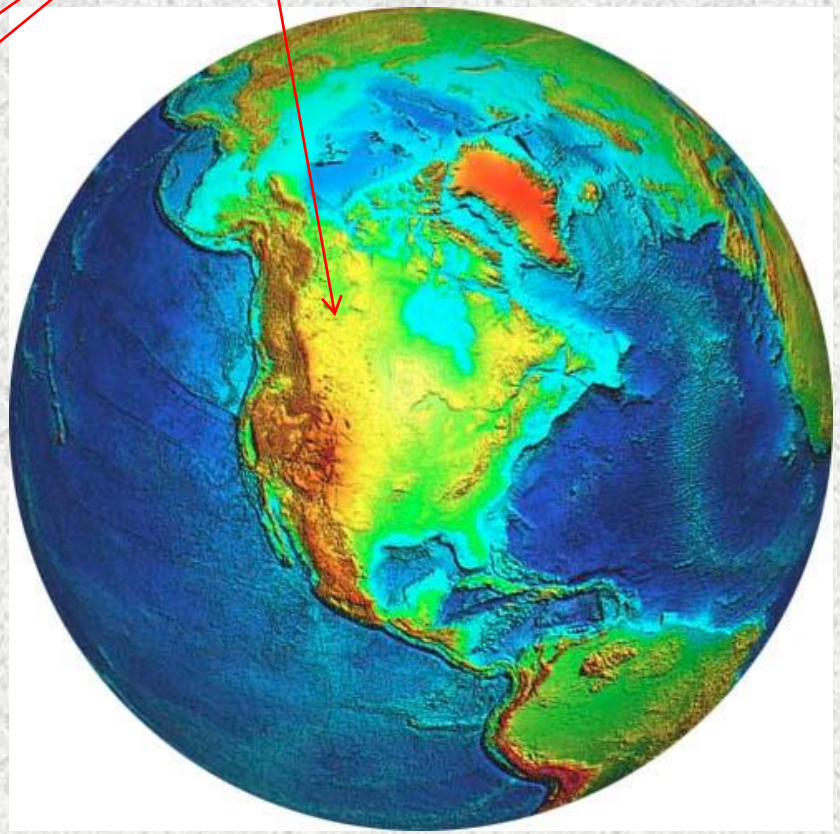


Latitude

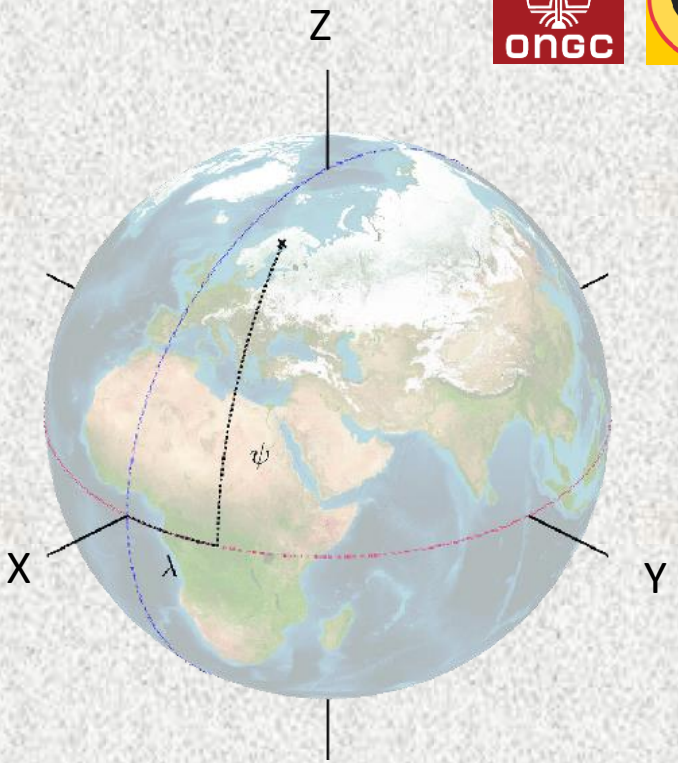
Longitude

Elevation





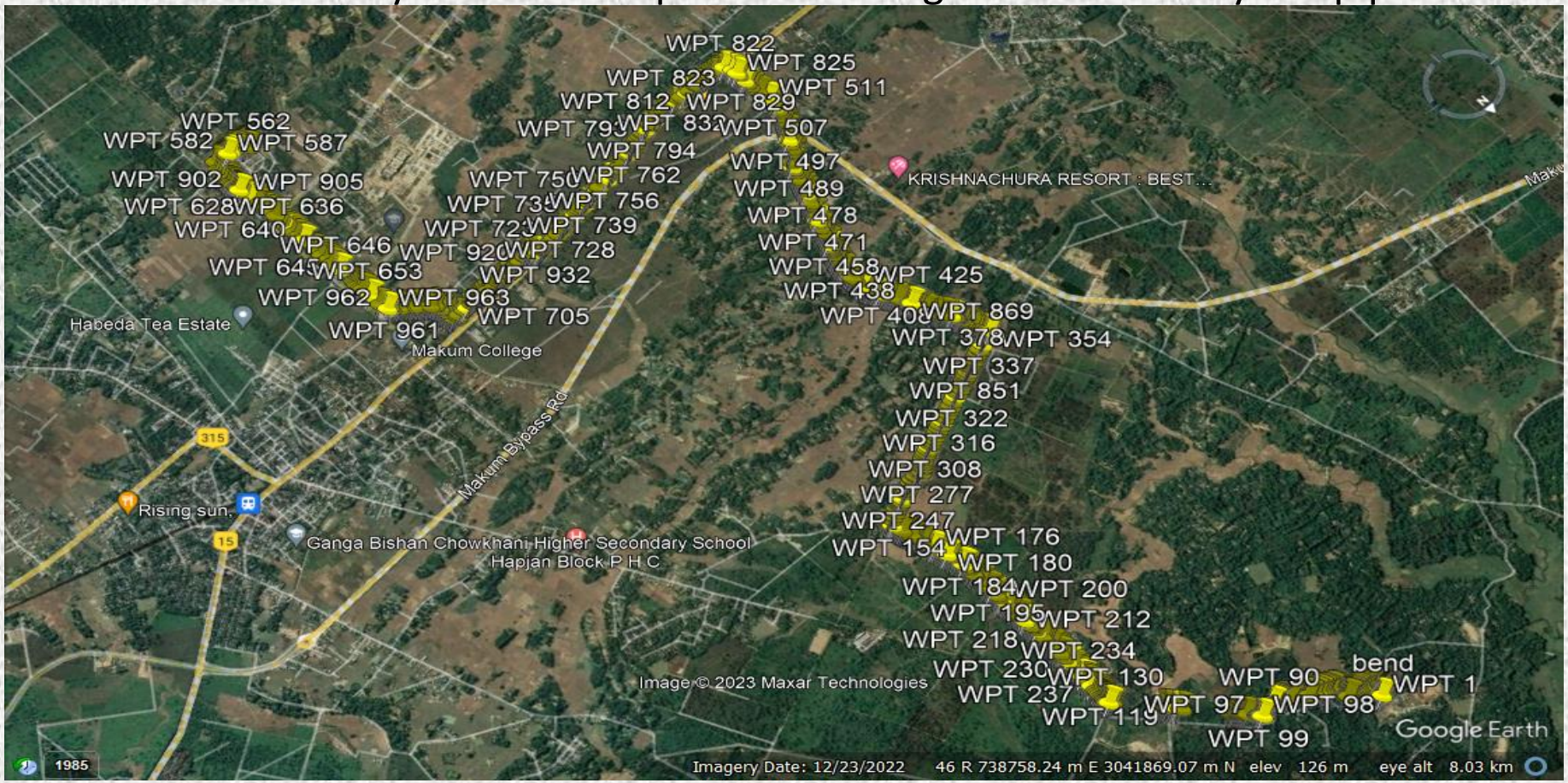
XYZ Mapping



- Sub-centimeter survey data that was obtained prior to the inspection is plotted in Google Earth
- These survey points are paired with Above Ground Markers (AGMs) to help correct any IMU drift that occurs during the inspection

XYZ Mapping

- Once the data is analyzed it is then plotted in Google Earth to verify the pipe centerline



XYZ Mapping

Bending Strain

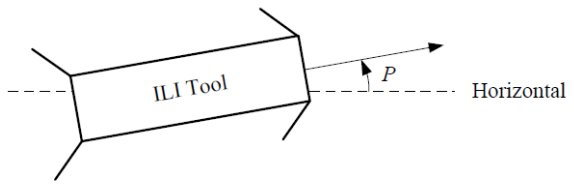


Figure 3. Pitch angle definition.

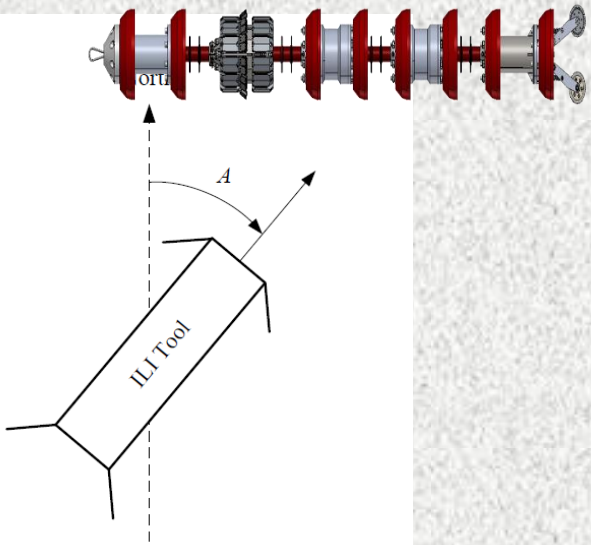
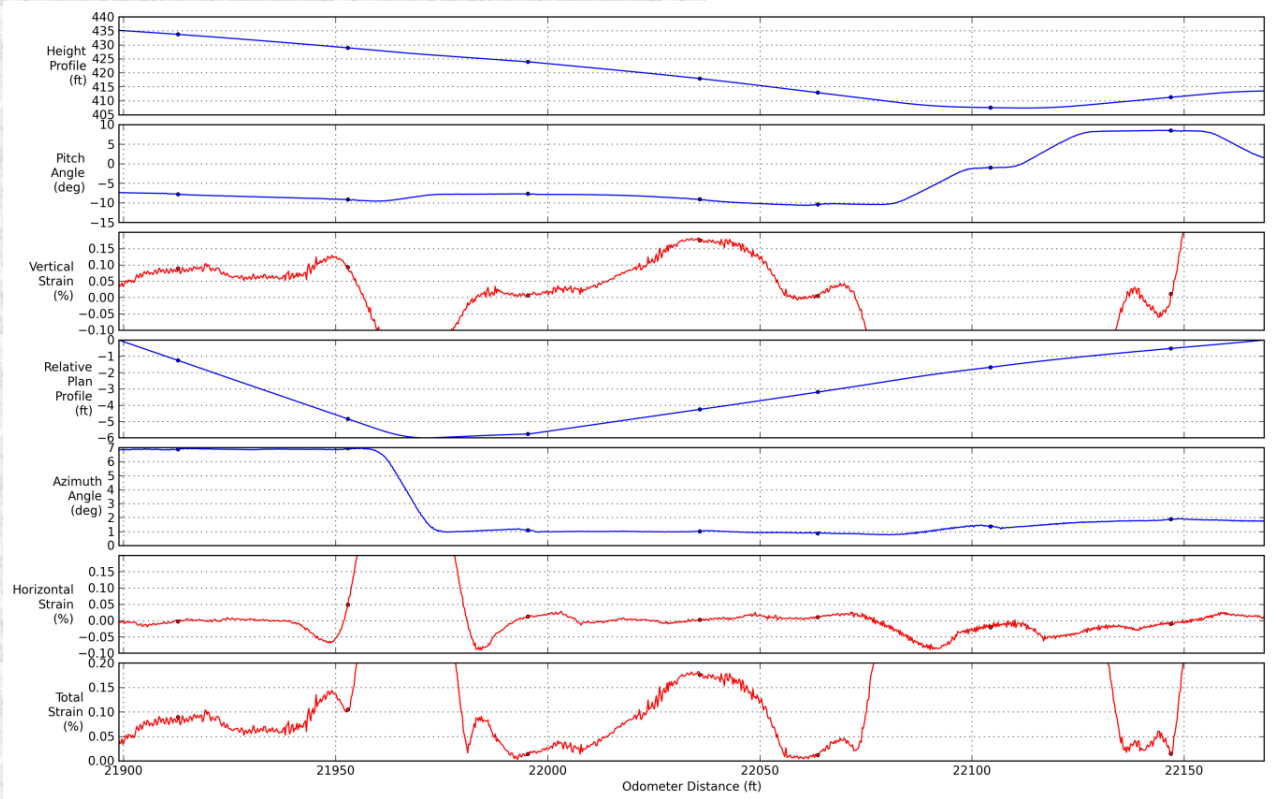
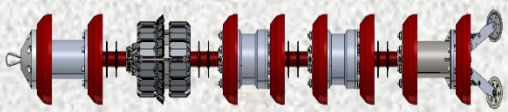


Figure 2. Azimuth angle definition.





Thank you