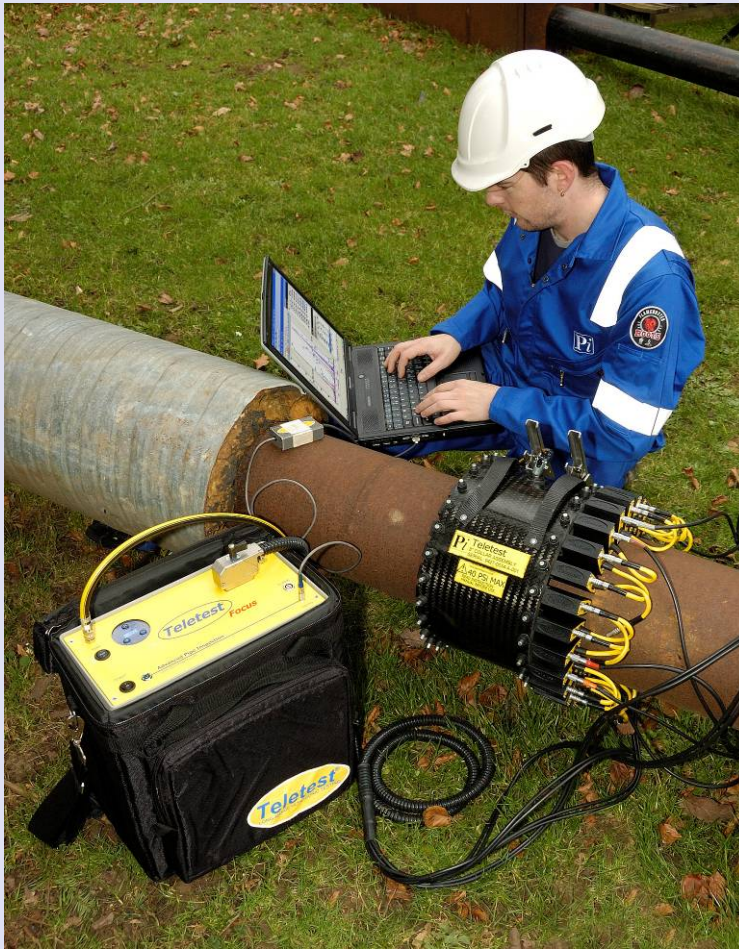


# ***Cased Pipeline Integrity Management Assessment***

**Dr Paul Jackson**  
**Manager – Plant Integrity**  
**Cambridge, UK**

# Plant Integrity Ltd



- **Manufacturer of the Teletest FOCUS Product**
- **Long Range Ultrasonic Testing**
- **Provision of Pipeline Inspection services**
- **Supported by \$3M per annum R&D program from TWI.**

# ***Subsidiary company of TWI***

## ***World Centre for Materials Joining Technology and allied Technologies***



- Membership based Research and Technology Organisation since 1946
- Limited by guarantee
- 580 staff worldwide
- \$80m turnover in 2006
- Over 3500 Industrial members in 60 countries
- 85% of business from Energy
- Non profit distributing
- Over 60 people within NDT

# *LRUT offers*

- Rapid screening for in-service degradation,
- Reduction in costs of gaining access
- Avoidance of removal/reinstatement of insulation or coating, except at location of transducer tool
- Ability to inspect inaccessible areas
  - Clamps
  - Cased or buried pipes
- 100% coverage

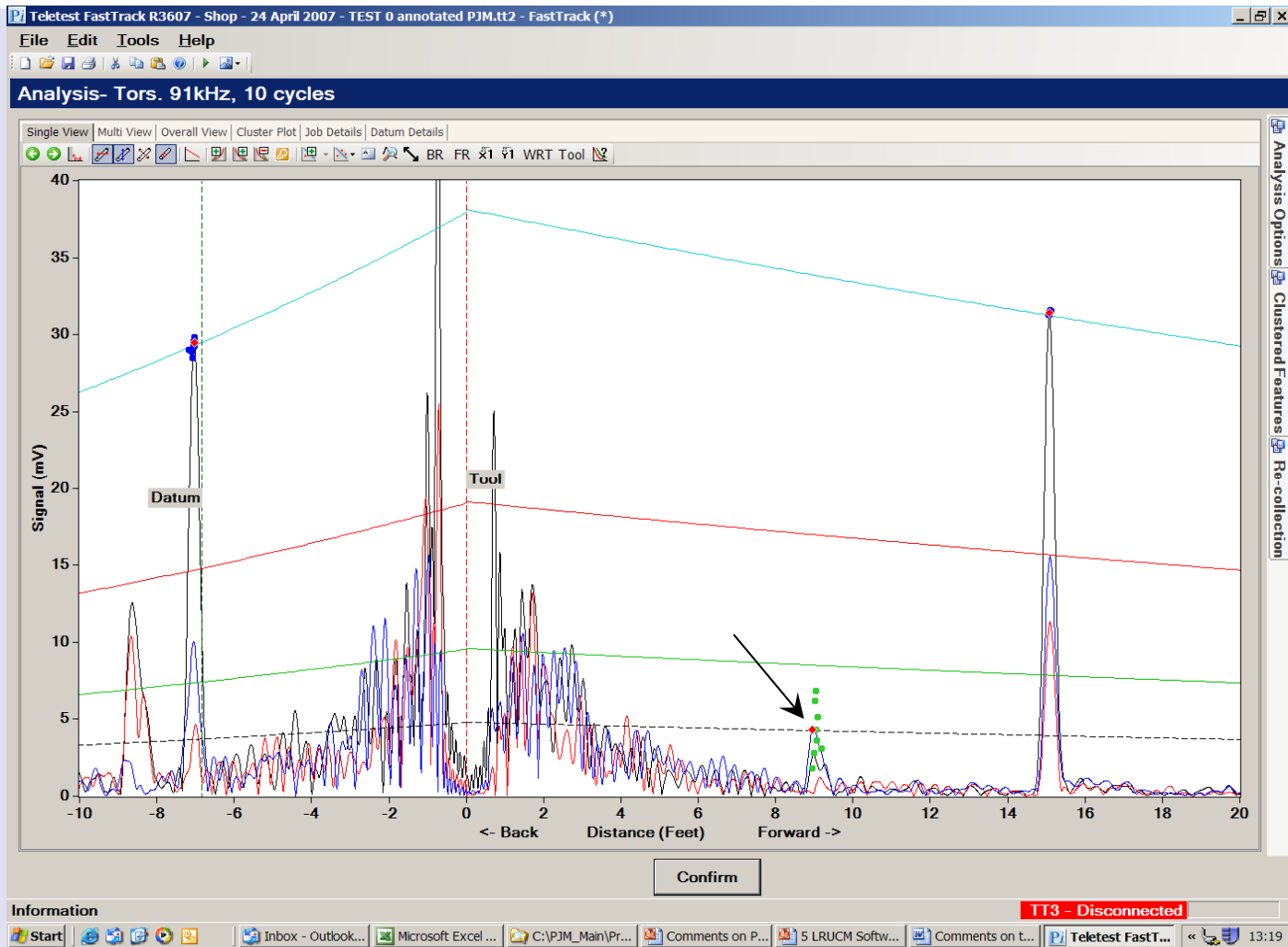


# Key Features

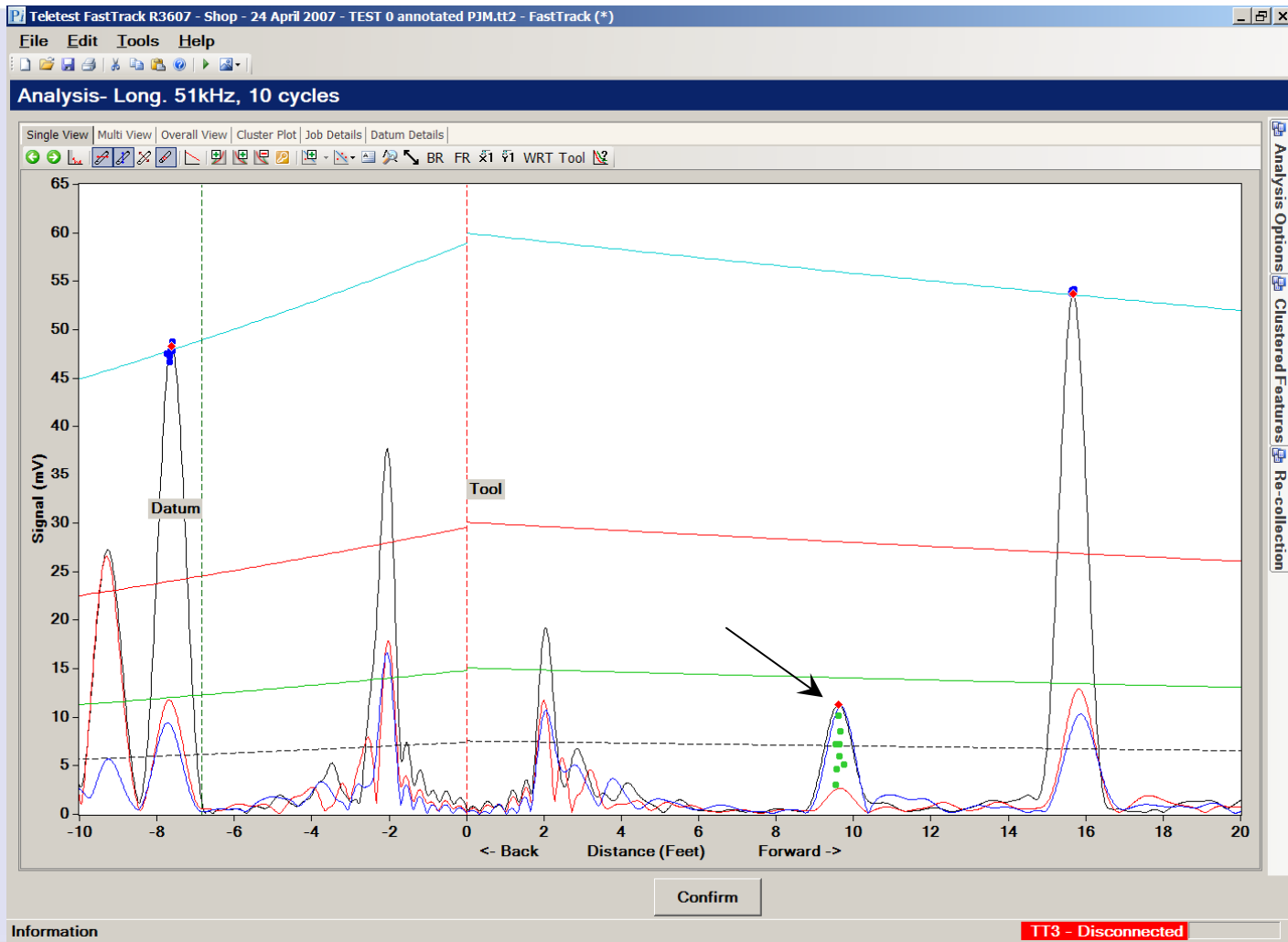


- Easy to use unit and tool design for quick data collection
- Multimode – Longitudinal and torsional wavemodes on one tool
- Focusing – Defect distribution around circumference “one-click” away
- User friendly interface with report manager generator

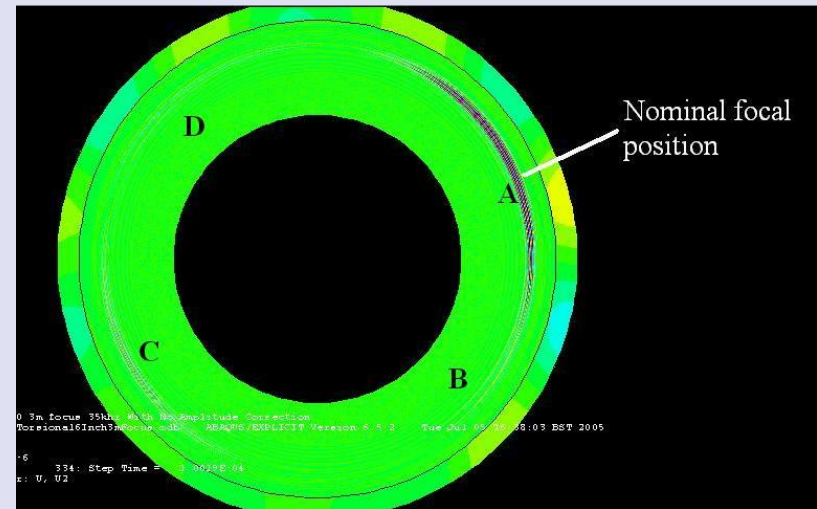
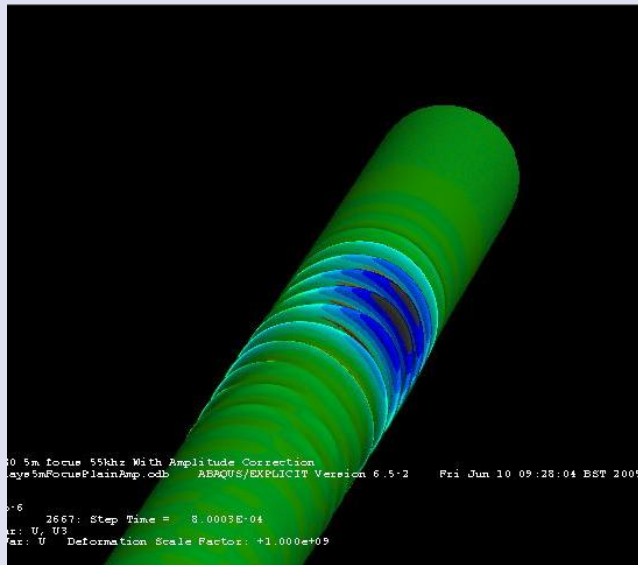
# Max torsional response 91kHz, - 17dB



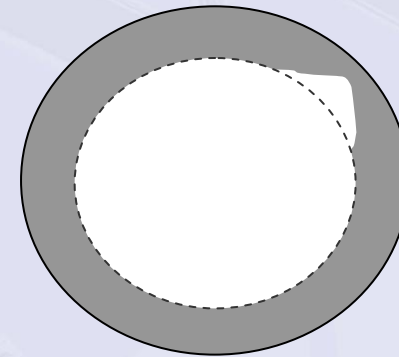
# Max longitudinal response 51 kHz, -13dB



# Benefits of focusing

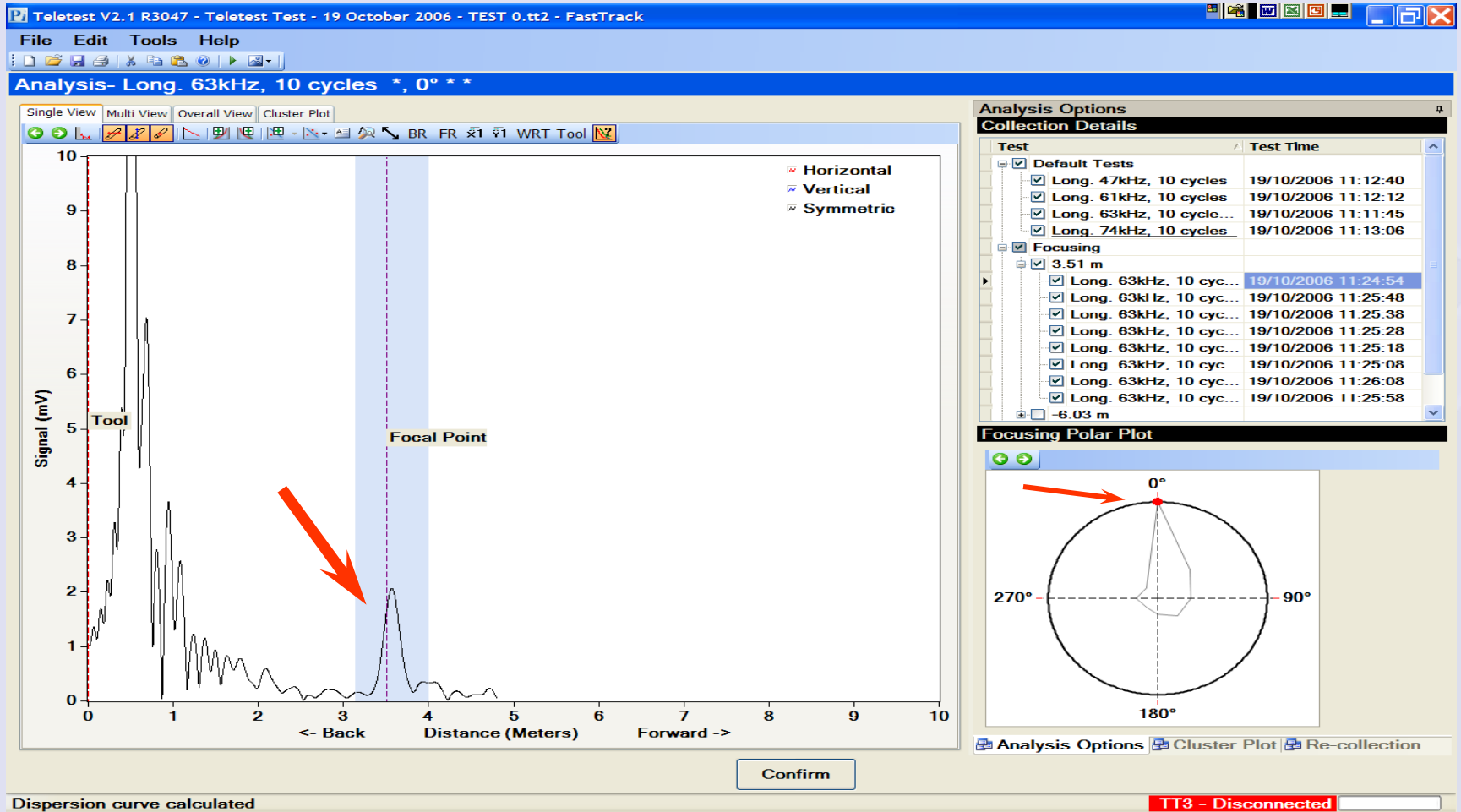


Focusing allows the energy to be concentrated where the defect is, increasing sensitivity and giving position and size information

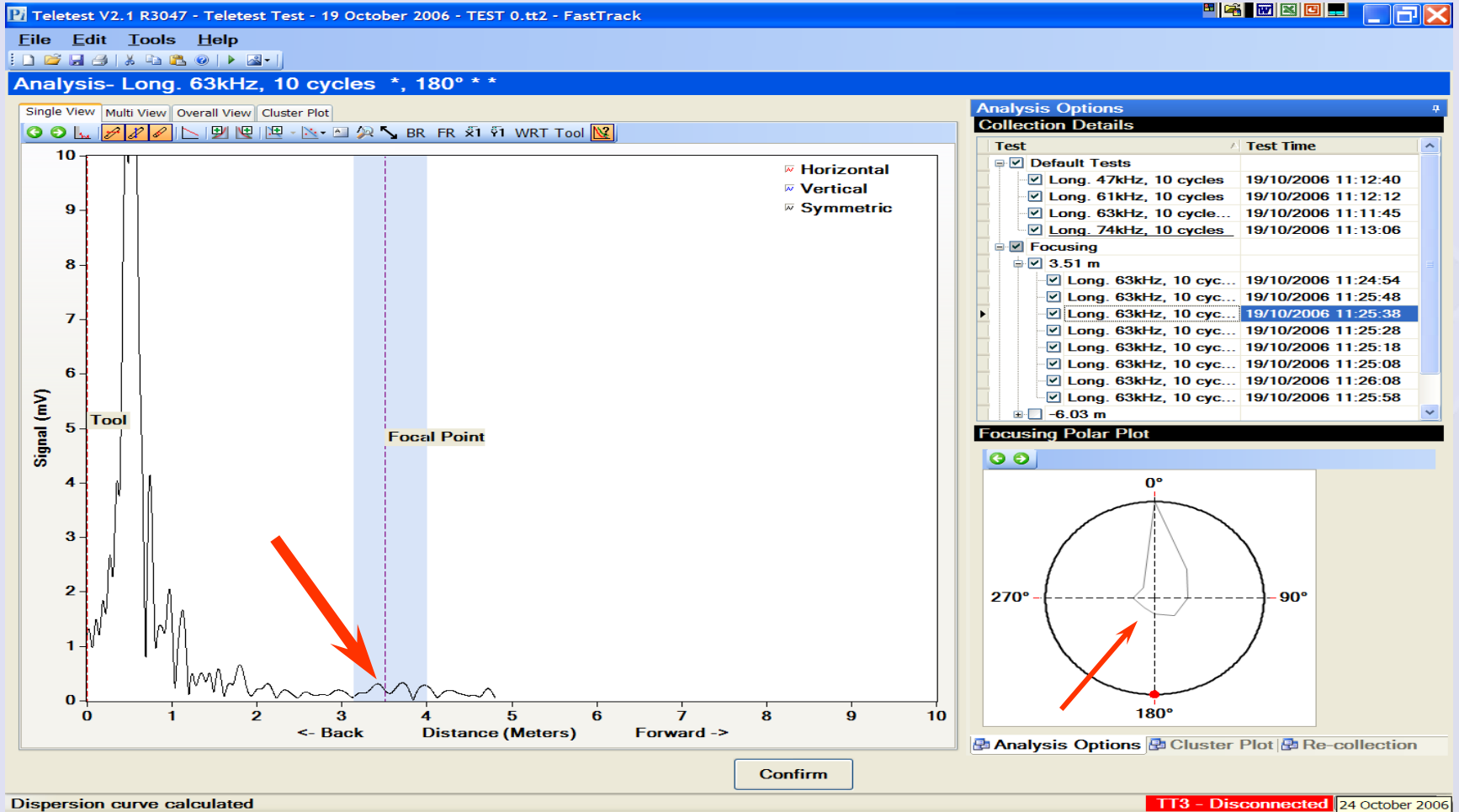




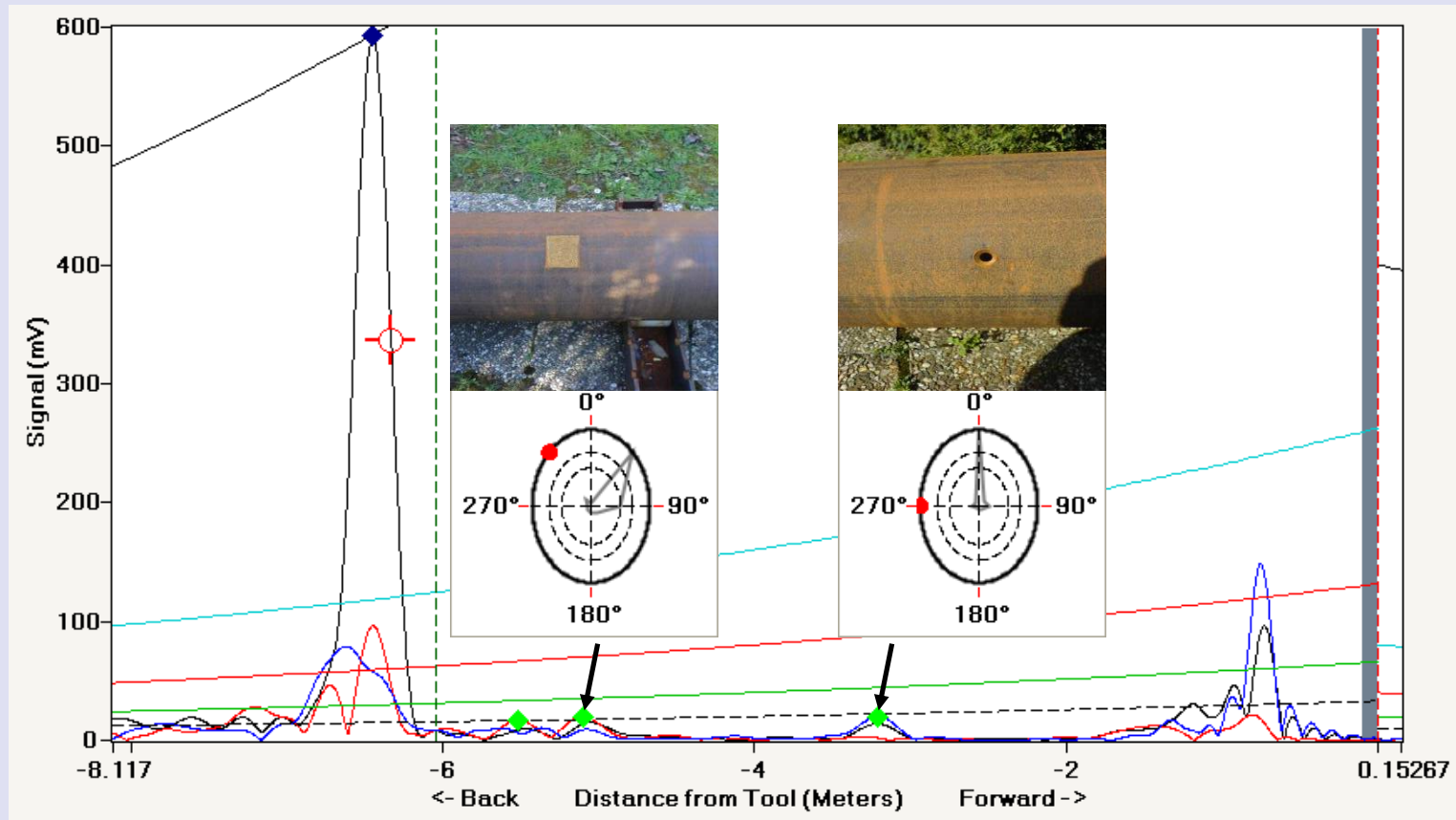
# Energy focused in-line with defect



# Energy focused 180° from defect



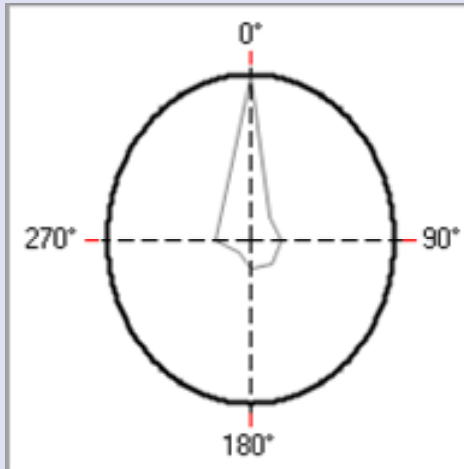
# Focusing information



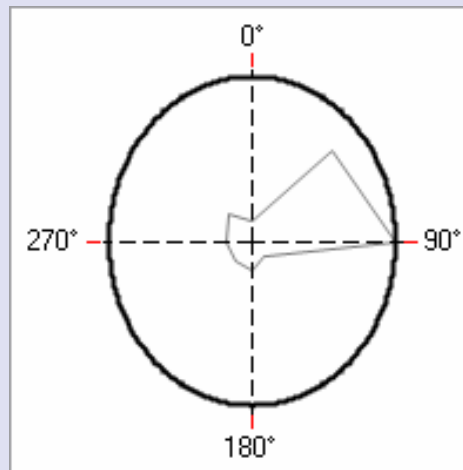
- Information about the circumferential extents

# Classification of focus responses

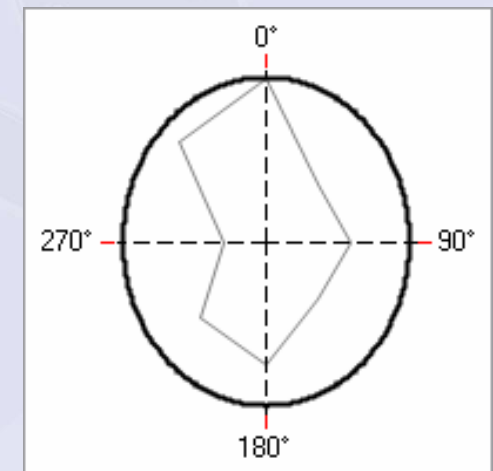
## Category 3 response



## Category 2 response



## Category 1 response



# Classification scheme

Product of C and D gives Follow up priority

Follow up priority		Defect Category, C		
		1	2	3
Directionality Distribution, D	0	0	0	0
	1	1	2	3
	2	2	4	6
	3	3	6	9

Low priority    Moderate priority    High priority

If  $C \times D = 0$ , the response is a weld

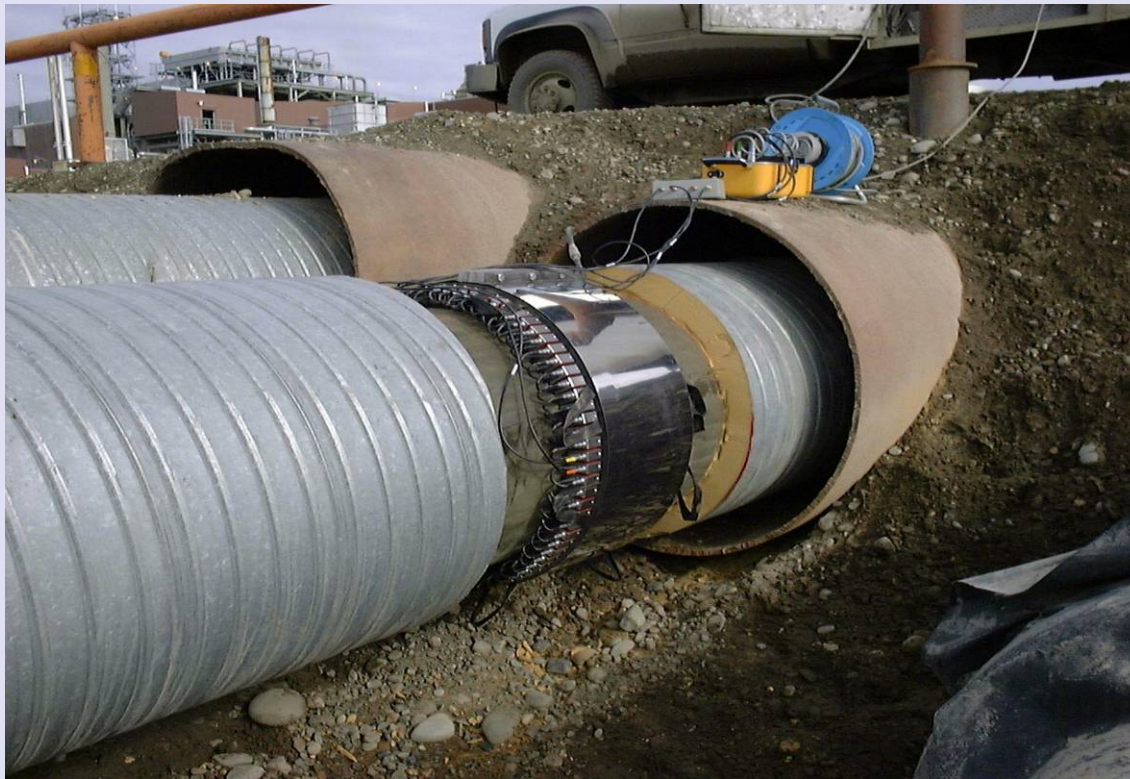
# *Road Crossings*

## **Inspection summary since 2003**

- **Road crossings up to 45m wide**
- **Diameter 3-24”**
- **Contains oil, gas, water or combinations**
- **Insulated with Polyurethane foam**
- **Corrosion at field applied weld packs**

# Road Crossings

- Over 175 crossings per year inspected



# 2003 - 2008

<b>Cased Crossings Inspected</b>	<b>522</b>
<b>Crossings excavated</b>	<b>69</b>
<b>Welds reported</b>	<b>113</b>
<b>Welds confirmed visually</b>	<b>109</b>
<b>Indications reported</b>	<b>142</b>
<b>Indications confirmed by NDE</b>	<b>93</b>
<b>False Positives</b>	<b>51</b>
<b>False Negatives</b>	<b>1*</b>

\* General corrosion along whole pipe length



# LRUT Training and Certification

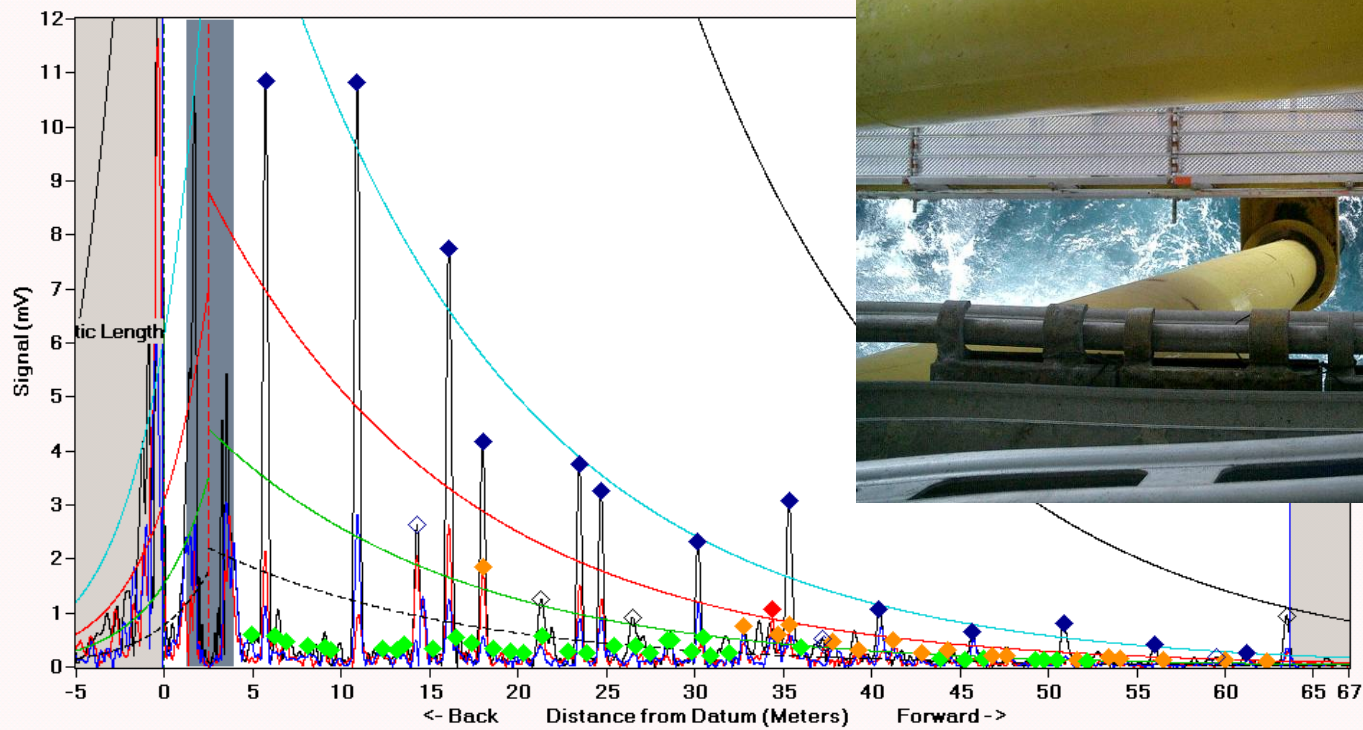
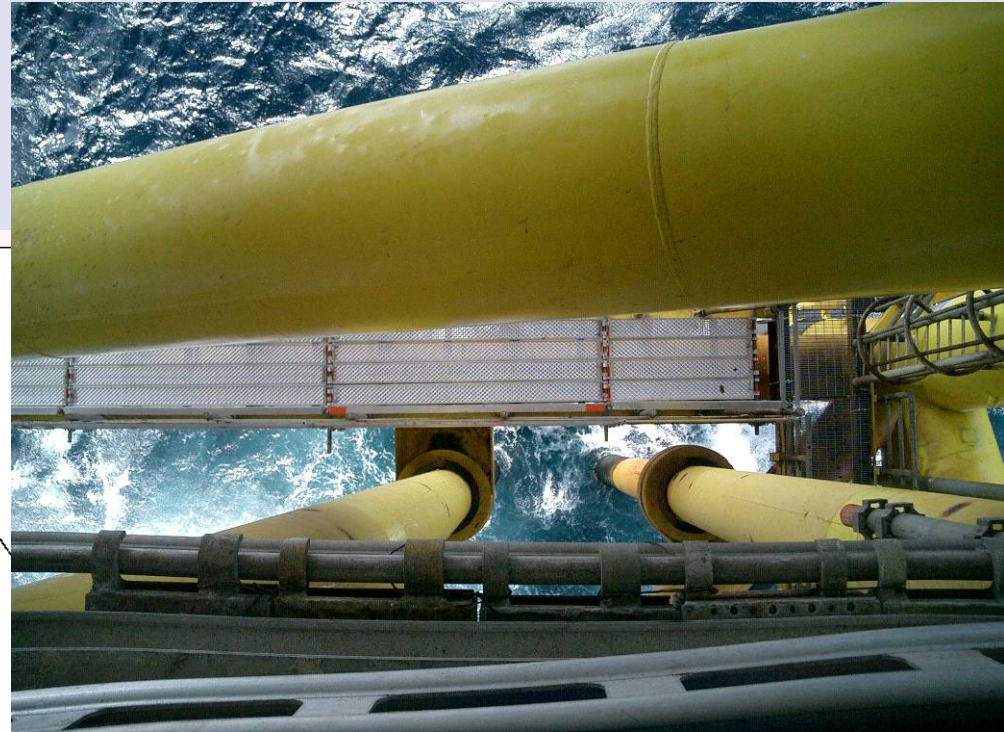
- Management and Technician LRUT Training
- Level 1/2 CSWIP Independent Certification
- Compliance with ISO 9712(1)
- Meets Requirements of EN 473(2)



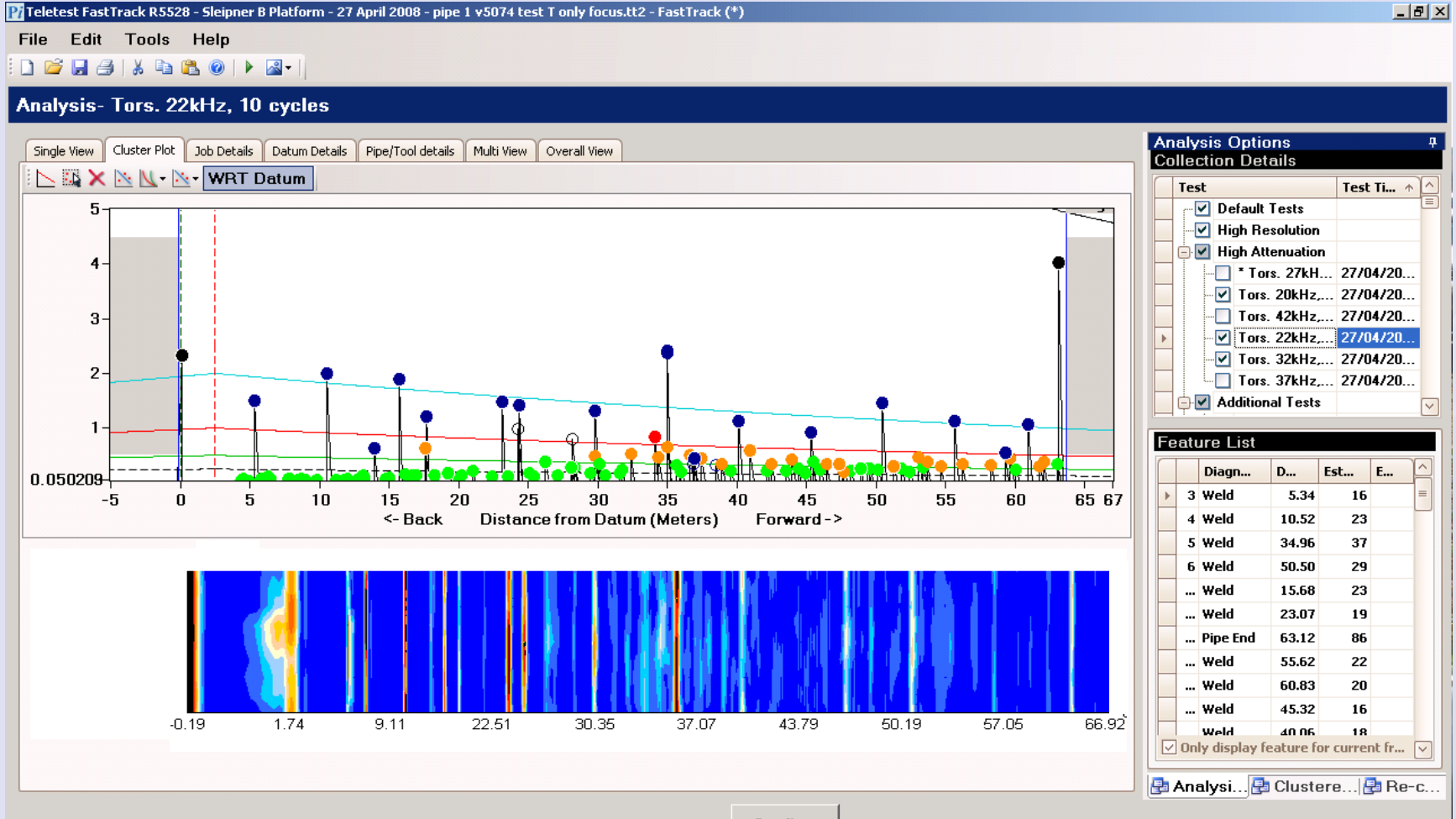
# ***Future Developments***

- **Fitness for Service**
- **Wireless**
- **Remotely located sensors**
- **Radical development of tooling to improve inspection of pipe with highly attenuative coatings**
- **Improved signal processing**

# C-scan Imaging (background)



# C-scan Imaging



# Teletest Permamount



- All benefits of Teletest Focus
- Low Profile
- Comparison of previous data
- Easy Installation
- Remains stable over long times in harsh environments

# Contact Us

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