

## Long Range Ultrasonic Solutions

The nature, shape and location of many structures in the Oil & Gas Industry present specific inspection problems. Often, these problem areas are of great concern and as such, solutions for inspection and assessment need to be available.

The majority of ultrasonic inspection is contact and requires access to the specific area to be measured. This is not always possible, as in such applications as insulated piping, tank annular plate and road crossings which are all commonly inaccessible areas.

To overcome these issues, QSL-Plus employs a range of UT techniques based on transmitting ultrasound as volumetric waves along a plate or cylinder such as a pipe. These techniques may employ a range of wave modes Lamb, Plate, Rayleigh, but have become commonly known as Guided Wave UT techniques.



Transducers are designed and placed so that the appropriate wave modes can be excited and transmitted in the structure. Reflections from fixed reference points, such as girth welds, can be detected as well as changes in cross sectional areas, such as cracks or corrosion. These reflections are recorded and analyzed to produce information on the probability, approximate size and location of the reflections. This analysis requires suitable analysis software in addition to trained and experienced personnel.

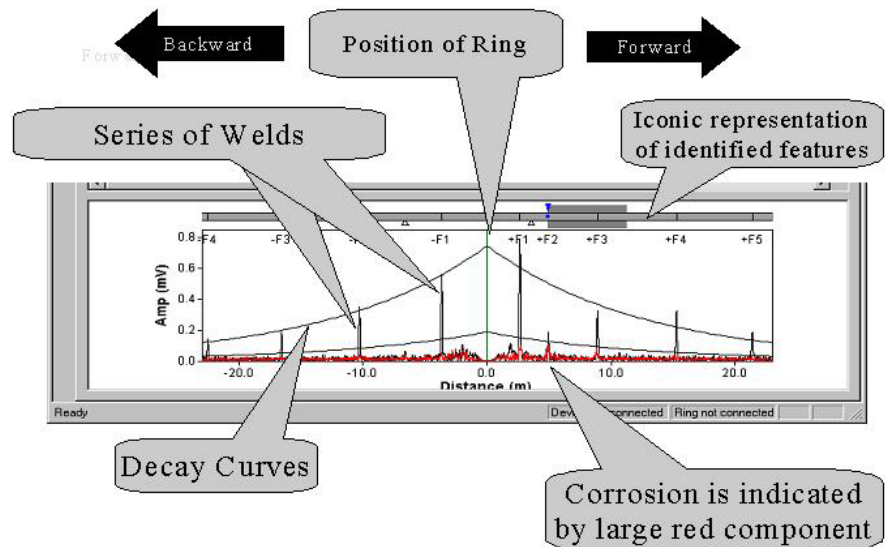
Long Range Ultrasonics can be effective over distances up to 197 feet from the sensor array. However, internal product and external coatings can significantly attenuate the signal to an extent that in some cases, such as buried pipe, with external bitumen wrap effective distance may only be 65 to 82 feet. The wave mode and frequency selected will determine the most effective inspection range.



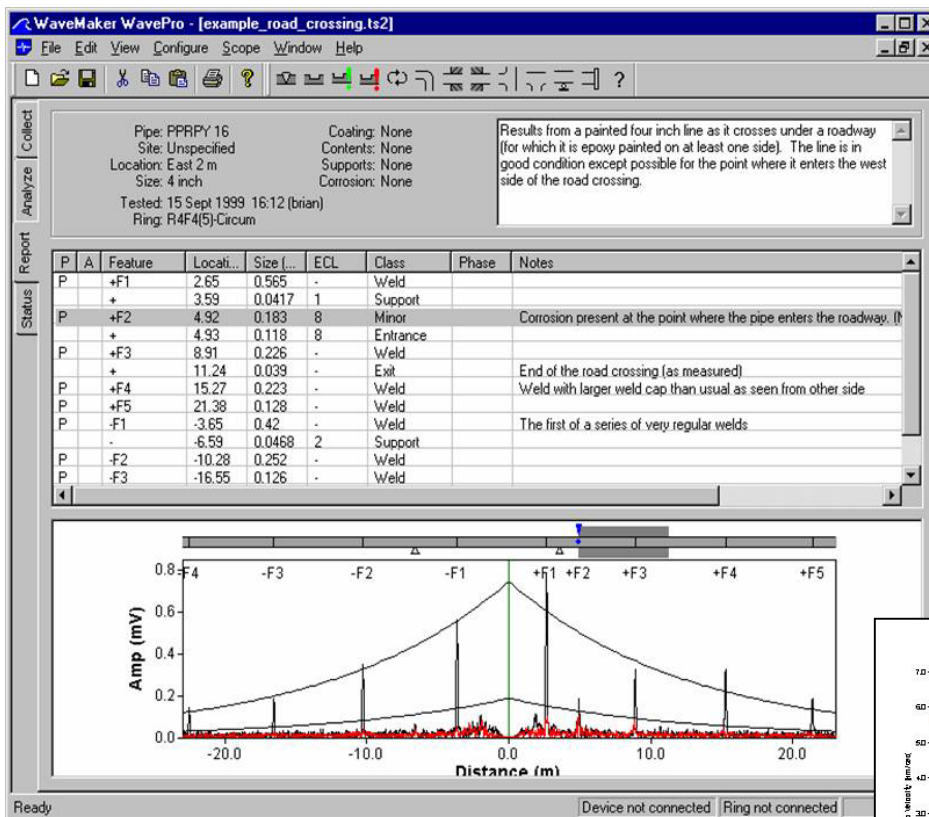
The techniques are generally sensitive to change in cross-sectional area of the component. As such you therefore typically require 5% change in cross section to produce an interpretable response indication.

This means that the technique is an effective screening method for damage in inaccessible areas. It is fast and cost effective when used in this manner. Ideal for:

- Buried Pipe/Road Crossings
- Insulated Pipe
- Pipe Penetrations/Bund Wall

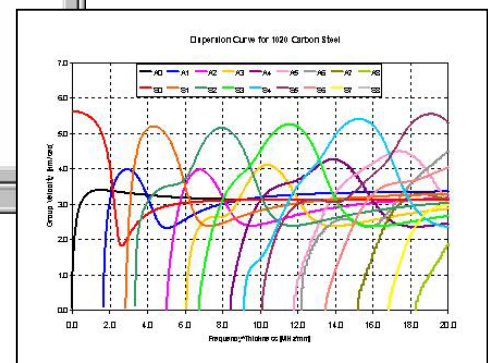


Software presentation of reflected response.



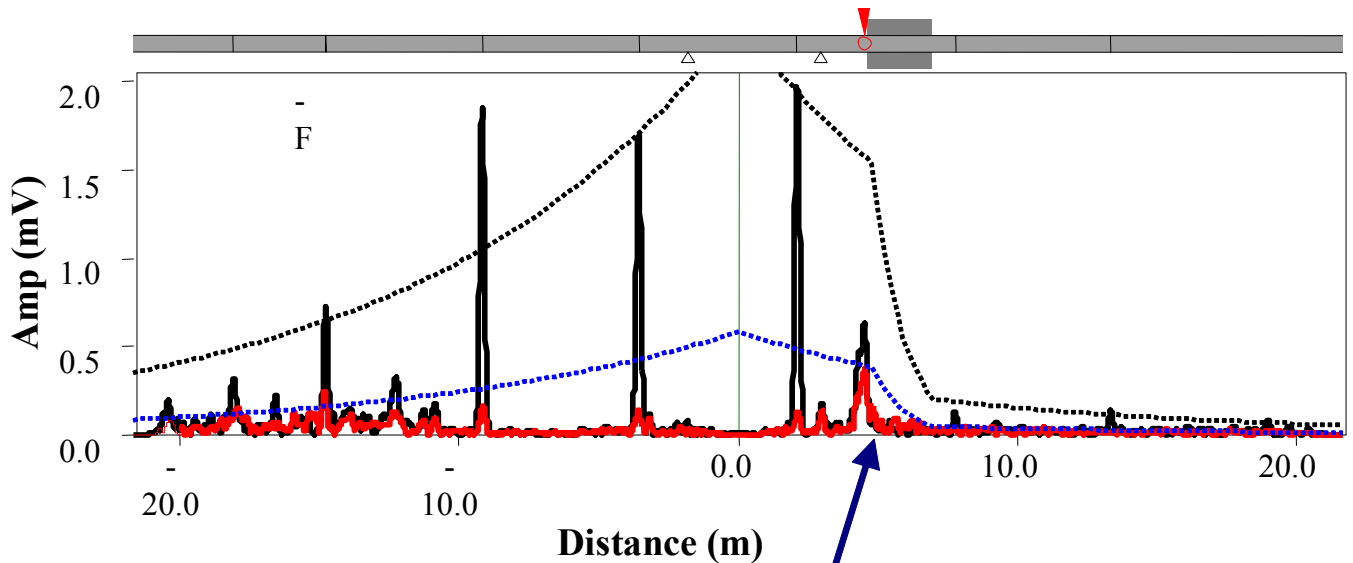
Reporting may be tailored to specific client requirements, but would normally include, as a minimum, the typical information shown above. Features are highlighted with location and interpretation. Since interpretation is critical, all services are delivered by qualified personnel and under our ISO 9000 Quality Program.

Selection of the correct ultrasonic wave mode for each application is critical. Through our in-depth understanding of wave mode generation in materials we can select and design an inspection solution that is most effective.



## Results from a 22" buried pipeline

The GUL system was able to detect a corrosion-affected area on a buried line. The indication obtained on the system screen is showing the relative position of the damage with reference to the position of the transducer ring.



Once the area is located, an LSI System is used to produce a detailed view of the corrosive condition of the pipe.