

# LONG RANGE GUIDED WAVE

## BACKGROUND

**Long Range Guided Wave (LRGW) is an advanced ultrasonic inspection technique that allows large areas of pipework to be inspected from a single test position.**

Compared to conventional ultrasonic methods, LRGW uses low frequency, long wavelength signals, without compromising sensitivity and with the added bonus of rapid screening capabilities as opposed to spot measurements. Inspecta utilizes the Wavemaker G3 - 3<sup>rd</sup> generation equipment that has greater sensitivity, increased reliability and improved data analysis - capable of a speedy, in service inspection to locate wall defects.

## APPLICATIONS

LRGW is particularly suited to situations where there are long lengths of pipe to be inspected, with limited access, which often may be un-pigable. Inspecta also uses this technique as a rapid, baseline-screening tool to identify areas of concern. Current applications include:

- Buried / Submerged Pipe
- Road Crossings / Jump Overs
- Pipe with Restricted Access e.g. Pipe Racks
- Vertical Pipe
- Insulated Pipe (CUI)
- Un-pigable Pipe
- Offshore Risers
- Storage Sphere Supports
- Long Term Corrosion Monitoring (PIMS)

## PROCEDURE

Pipework is exposed over a small area (bell holes prepared if buried pipe, insulation & coating removed, flaking material scraped off), and a 360° transducer ring is clamped in place. Ultrasonic signals are then emitted in both directions, propagating along the pipe wall, providing 100% volumetric inspection.

The configuration of the equipment, choice of transducer as well as the test parameters are all determined by a number of factors including pipe schedule, condition, substrate, coating, sensitivity, range etc...

Interpreting the results requires extensive experience as well as local knowledge of the pipework being inspected. Reflected amplitude, symmetry, phase and orientation of reflection, behavior at different frequencies and reverberations are all taken into account.



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## ADVANTAGES

- Works on insulated and bare piping – above ground, buried, subsea.
- Will detect both internal and external defects.
- Can detect cracks/wall loss > 5% CSA with confidence, (down to 1% in ideal situations).
- Sensitive to defects at any through wall position.
- Full range of pipe schedules can be inspected – up to 72” diameter, up to 3” wall thickness.
- Relatively fast set up and operation.
- In ideal conditions, more than 100 metres of pipework inspected from single location.
- Detailed C-Scans show axial and circumferential position and distribution of defects.
- Lightweight & battery operated allows easy operation, including rope access.
- Equipment can be configured for in screening or monitoring.

## LIMITATIONS

- Buried pipeline needs to be exposed at transducer locations.
- Access needed on all sides of pipe for transducer – 30cm area.
- Sensitivity and range variable, dependent on several factors – substrate, coating etc...
- Usually limited to one or two bends per test.
- Complimentary NDT needed to “size” defect accurately.
- Extensive training and experience necessary for operation and data interpretation.
- Accurate information required from client to allow adequate compensation calculations.

*Should you require further information regarding our Long Range Guided Wave service, please contact Inspecta International by emailing [technical@inspectaint.com](mailto:technical@inspectaint.com), or contact your local office who will be happy to answer any queries [www.inspectaint.com](http://www.inspectaint.com).*



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