

APC Guided Wave Inspection with WAVEMAKER® G4™ RAPID PIPE SCREENING SYSTEM

The inspection of large structures using conventional ultrasonic bulk wave techniques is slow because scanning is required if the whole structure is to be tested. Ultrasonic guided waves provide an attractive solution to this problem because they can be excited at one location on the structure and will propagate many metres. However, guided wave testing is complicated by the presence of many possible wave modes, most of which are dispersive. These guided wave characteristics offer a wealth of opportunities for the extraction of information about the structure, but it is crucial to manage this complexity if the test is to be useable in industrial practice.

THE SOLUTION

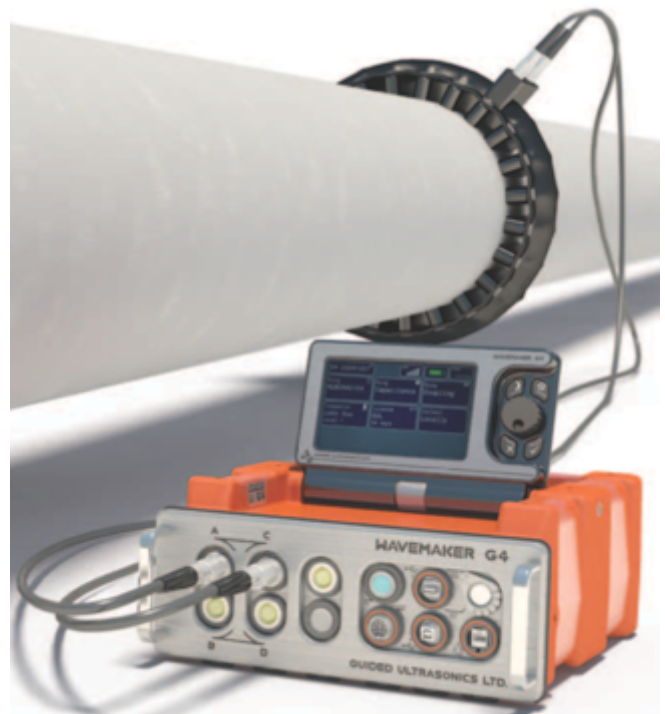
The Wavemaker®G4™ is GUL's newest platform for collecting guided wave inspection data. Released in 2011, it builds upon the proven success of the Wavemaker G3. It contains 32 transducer channels for interfacing to all of GUL's transduction systems. It also contains a range of peripherals to ensure quality guided wave data is collected quickly and efficiently; these include automatic transducer detection and diagnostics, an operator identification method, and a built in GPS.



KEY ADVANTAGES

- The Wavemaker®G4™ pipescreening system allows long lengths of pipes in difficult access areas to be quickly screened for corrosion and other defects.
- not needed disconnection of the equipment at the time of diagnostics;
- minimized costs of preparing for the testing;
- time savings and high reliability of the identification of potentially dangerous areas of the pipeline;
- time saving on carrying out the technical diagnostics;
- The Wavemaker®G4™ system employs lightweight transducer rings to send guided waves along the pipe
- Sophisticated software routines help categorize reflections from changes in the cross section of the pipe

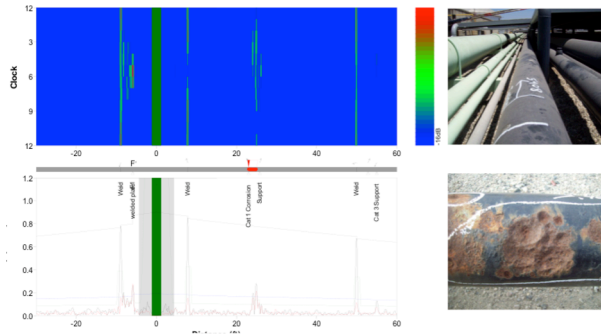
Getting a complete picture of the technical condition of the pipeline allows easier, faster, and more valid expert conclusion about the suitability of the test object for further operation.



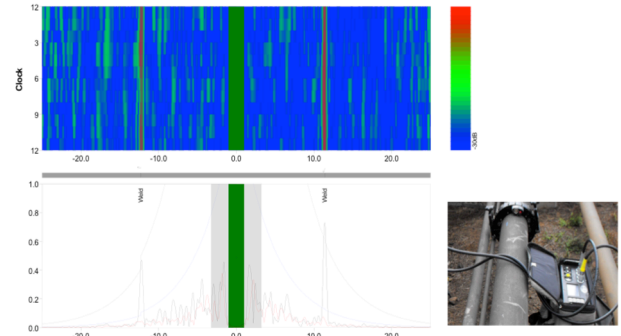
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EXAMPLE OF APPLICATIONS

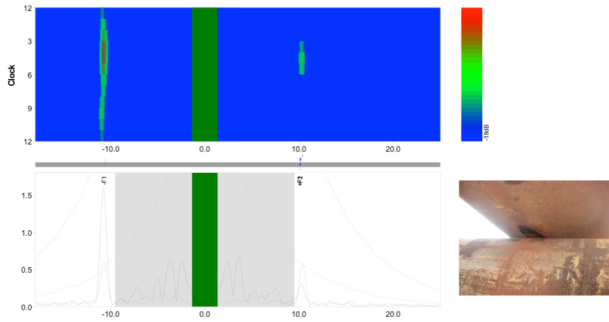
External Corrosion



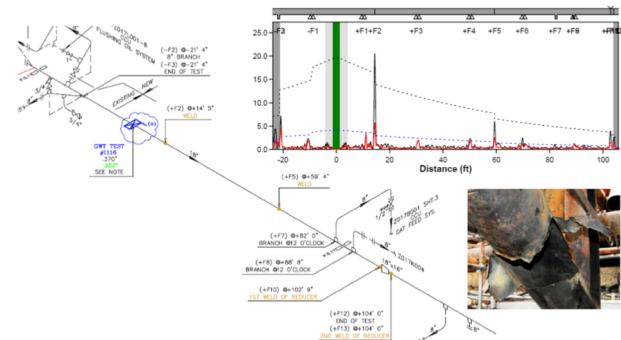
Internal Corrosion and Pitting



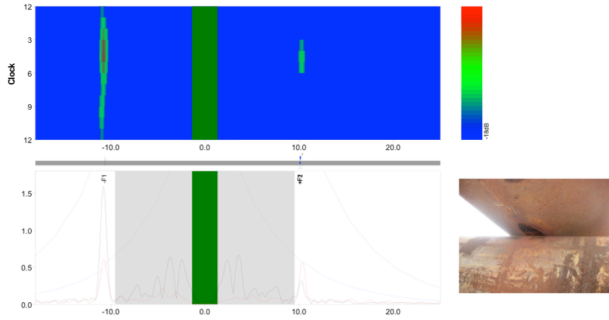
Localized Corrosion



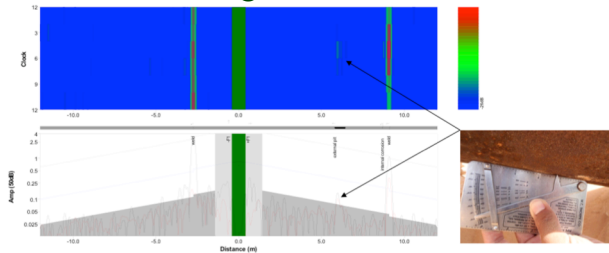
Weld Identifications



Mechanical Wear



Localized Pitting



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SPECIFICATIONS

- Integrated internal battery capable of operating for at least 8 hours or 30 guided wave collections over 20 meters test range for each way.
- 32 data channels
- Output voltage 200/400V peak to peak
- Torsional or Longitudinal capable (but only torsional used as standard)
- Capable of utilize symmetric and non-symmetric wave
- Stand-alone data collection (without a laptop)
- User interface (colour touch screen) for parameter entry and checks
- Frequency range from 8Hz - 70KHz
- 80dB Sampling gain range
- Automatic test set up
- Low and high pass filters for plant noise rejection
- Data averaging options (2, 4, 8, 16, 32) for improved signal-to-noise
- Dedicated calibration and self-diagnostic test channel
- Automatic coupling check
- Automatic capacitance and continuity testing for cables and transduction
- Working with pressure inside piping up to 250 bar
- Collection time of less 3 minutes with a 20 meter test range (minimum of 10 frequencies and 1kHz interval)
- Simultaneous testing in both directions, with 100% of the pipe is inspected – 360° (within the diagnostic length of a test)
- Options for Pulse-echo, Pitch-catch and transmission testing
- Automatic operator recognition (i-button)
- Connectivity via Wired Ethernet, USB and Wi-Fi, built in GPS



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