

# Permanently Installed Monitoring System

(PIMS)

There is increased demand to replace traditional non-destructive testing (NDT) techniques with permanently installed monitoring systems (PIMSs). PIMSs provide a solution for monitoring and inspecting difficult-to-access areas and the continuous monitoring of assets where an identified concern exists and areas where anomalies are anticipated.

Using a PIMS may result in reduced safety risk, reduced requirements for on-board personnel, optimized use of inspection resources, and reductions or elimination of costs associated with repeat inspections.



## FEATURES

**Portable and robust guided wave system**

**Advanced software and monitoring system**

**Wall thickness measurements at the sensor location**

# Permanently Installed Monitoring System (PIMS)

Oceaneering is an approved supplier of the Wavemaker® gPIMS® guided wave monitoring system.

The system advances the rapid integrity screening method widely accepted by the oil and gas industry. Typical applications include the screening of offshore risers, caissons, insulated pipes, and buried pipes.

The gPIMS® system is a transducer ring in which the active sensors are molded into an easily sealed, robust, and flexible polyurethane encapsulation. The gPIMS® system is clamped and bonded onto the asset and provides complete long-term environmental protection.

## The gPIMS® technology meets demands from asset operators to produce reliable inspection data while:

- » Reducing the risk to personnel during data collection
- » Optimizing the use of inspection resources and POB (person On board) allocation
- » Continuously monitoring of areas of known concern and anomaly locations
- » Monitoring and inspecting inaccessible locations
- » Reducing and/or eliminating cost of repeat inspection

## Capabilities

- » On-line inspection at sub-zero and elevated temperatures (-40°F to 194°F / -40°C to 90°C)
- » Fluid and gas do not affect test
- » Inspection of pipe from 3 in to 72 in diameter
- » 100% of the pipe is inspected (within the diagnostic length of the pipe)
- » Pulse echo type operation provides information on feature position and severity of anomalies
- » Sophisticated analysis aids interpretation of results
- » Interpretation possible between defects and standard pipe features
- » Ability to detect metal loss and planar defects at long range, both internally and externally
- » Detects increase in metal volume including those produced by welds
- » Sensitivity between 1 and 5% loss of cross-sectional area depending on conditions

At installation stage, qualified and experienced Oceaneering personnel position the sensor for optimum data collection and analysis using WaveMaker® G4™ instrumentation and software. The gPIMS® has been developed to use the complete portfolio of software features available for Guided Wave screening, including frequency animation and C-scan tools.

## Future Inspections

While the single test sensitivity of a gPIMS® is equivalent to that of a standard transducer ring, the monitoring and advanced signal processing capabilities of the system can significantly improve the test sensitivity. When combined with enhanced baseline subtraction techniques, residual sensitivities better than 1% equivalent cross-section change can be achieved.

Data is collected via a connection box, a sealed weatherproof unit with connectors which interface with either the WaveMaker® G4™ or WaveMaker® G4™ mini. The connection box's internal electronics store test parameters including pipe size, collection parameters, and previous test information to allow for direct comparison of results. The WaveMaker® G4™ mini electronically transmits data to remotely-based technicians for expert analysis and detailed reporting. This technology offers significant improvements in safety and cost efficiency.

- » WaveMaker® G4™ - requires trained, specialist Oceaneering personnel on site
- » WaveMaker® G4™ Mini - data collected by existing site-based Oceaneering personnel or customer's representatives (upon completion of basic system-specific training)

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