Application

A continuous monitoring system for pipeline corrosion assessments

The Equipment

One of the main advantages of guided wave screening is the ability to inspect large lengths of inaccessible pipe from a single location. However, it is still necessary to gain access to the pipe in at least one location in order to perform the inspection. In many cases, gaining this access accounts for a large fraction of the inspection cost. This is a particular issue offshore and on buried pipe, and at any location where scaffolding is required. Where regular inspection is needed, leaving a transducer ring in place on the pipe and taking a cable from it to a connection box in a convenient-to-access location can provide substantial cost savings. On buried pipe and on elevated sections, this involves bringing a connection to ground level, while on risers the connection can be made on the platform.

The gPIMS® system has been developed to meet this requirement. It comprises a ring of transducers fabricated on a flexible sensor assembly that is bonded to the pipe, while a cable connects the ring to a connection box positioned in a convenient location.

A summary of PIMS is as follows:

- A permanent transducer that can be installed and left on most pipelines
- Allows data to be collected from a remote location at any time to assess pipe condition.
- Encapsulated in polyurethane to protect transducer from most environments allowing results to be obtained from buried, subsea, sleeved or pipes in contaminated areas.
- Gives results virtually identical to standard Wavemaker transducer rings.
- Stable over time for excellent repeatability.
The Service
The gPIMS is installed as part of the initial inspection of the pipeline using the Wavemaker system. These permanently installed systems can be installed as part of an on-going integrity management project and trend analysis can be formulated to manage and understand potential corrosion rates.

Applications
The choice of polyurethane limits the maximum operating temperature to 95°C, though the gPIMS® will survive excursions to around 120°C. The system is therefore particularly suited to buried, offshore and other locations where moisture resistance is particularly important and temperatures are relatively low. Plans are underway to develop a higher temperature variant using a silicone moulding following roll out of the pre-moulded polyurethane system.

The system is particularly useful in the following locations:

- Above ground pipe work
- Buried Road Crossing
- Buried pipe
- Inaccessible pipework at elevated heights (negating the need for expensive scaffolding)
- Offshore

Subsea
The Guided wave system can now also be utilised for subsea pipelines and specialised PIMS units can be manufactured to specific application needs. They can be installed by utilising either our diver or ROV services.

Typical Results
Above ground pipe work
The result below shows a typical PIMS result from a long section of straight above ground pipe. Three sets of data over the course of just over 1 year are shown. In ideal cases like this range of more than 100m and sensitivity to changes of less than 1% in cross-sectional area can be achieved.

Above ground straight uncoated pipe, 3 data files taken over 13 months.