

Long Range Ultrasonic



Long Range Ultrasonic Pipe Screening

As a major company offering advanced inspection world wide, FORCE Technology can supply state-of-the-art technology services with the long range ultrasonic *pipe screening* equipment, Wavemaker™. The new ultrasonic equipment provides fast ultrasonic *pipe screening* in order to locate corrosion within a minimum of time, and thereby, reducing the overall inspection cost per metre of pipe.

Long range ultrasonic (or guided wave) inspection operates in a much different fashion than most conventional inspection techniques. Instead of scanning the region directly below or near to the transducers, guided waves travel down the length of the pipe. This allows 10's of meters to be inspected from a single location. As shown in the pictures a ring of transducers is attached around the pipe. From this location waves are sent in both directions screening areas otherwise difficult to access.

After the corrosion is located, a measurement of the remaining wall thickness may be performed by means of the automated ultrasonic examination system, P-scan, or digital radiography.

Introduction

Ideally, pipe lines on offshore installations, refineries, petrochemical plants, power plants etc. should be monitored 100% in order to avoid unforeseen production stops. However, no inspection techniques are able to cover all areas at a reasonable cost. Therefore, many industrial companies have implemented Risk Based Inspection (RBI) as means for optimizing the inspection efforts and minimizing the overall inspection and maintenance cost.

Implementation of Risk Based Inspection requires information such as material, diameter, thickness, current component working condition such as process parameters etc. Some information is accessed easily, however, selecting optimal locations for inspection is not always straight forward.

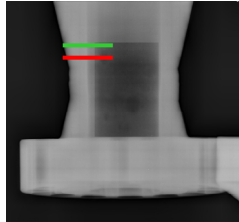
The advantage of the Long Range Pipe Screening method is that otherwise inaccessible areas may be inspected, e.g. buried pipes at road crossings, areas beneath supports, clamps. For insulated pipes only a short length of insulation has to be removed to inspect several metres of pipes.



Applications

Typical areas of application are as follows:

- Road and river crossings
- Offshore pipeline
- Refinery pipeline
- Chemical plant pipeline
- Sphere tank legs
- Pipe bridges
- Beneath pipe clamps
- Beneath pipe supports



Typical range, sensitivity, accuracy etc.

Some of the typical features for the guided wave inspection have been listed below:

Ideal conditions

- $\pm 80\text{m}$

Pipes with little internal or external corrosion

- $\pm 40\text{m}$

Pipes with some general corrosion

- $\pm 20\text{m}$

Pipe wrapped in factory applied foam

- $\pm 15\text{m}$

Heavily corroded pipe or pipe that is bitumen wrapped

- $\pm 5\text{m}$

Diameters

- 50 mm to 1220 mm (2 to 48 inch)

Temperature

- $-40\text{ }^{\circ}\text{C}$ up to $125\text{ }^{\circ}\text{C}$

Up to six welds

Up to the first flange or the second bend or branch

Detection of internal and external metal loss

Sensitivity

- metal loss down to 5% of pipe wall cross section
- reliable detection of 10% metal loss

Location with axial accuracy within

- $\pm 100\text{ mm}$

Productivity

- up to 300 meters per day
- approximately 10 x faster than conventional techniques

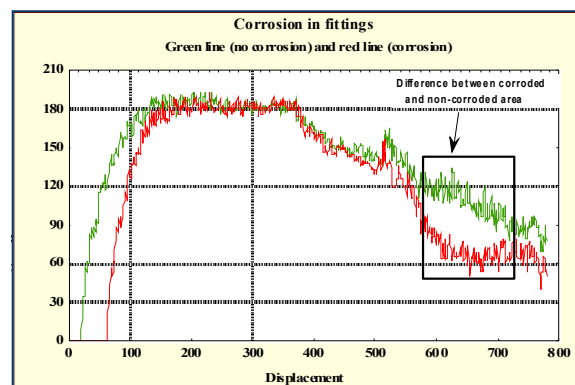


Additional inspection

Long range ultrasonic or guided wave inspection locates corrosion or metal loss. In order to obtain wall thickness measurements, additional inspection methods such as automated ultrasonic corrosion mapping or digital radiography must be applied.

Automated ultrasonic corrosion measurements can be provided with the P-scan system, which is developed by FORCE Technology. Normally, an area will be scanned for corrosion in order to obtain not only the minimum wall thickness but also the corrosion distribution, which may be used during preventive measures or failure analysis.

Digital radiography is utilized on pumps, tees, valves, elbow lets etc. where the geometry is complex and impossible to inspect with other methods. A comparison and measurement of the corrosion is easily made.



Further information:

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