

Pulsed Eddy Current System

Non-contact inspection technique

Oceaneering offers Pulsed Eddy Current (PEC) using Eddyfi[®] Lyft[™] inspection technology for the detection of corrosion areas in carbon and low alloy steels. The system does not require direct contact with the inspection surface allowing measurements to be taken through any non-conductive material such as insulation, protective coatings, concrete, and marine growth.



FEATURES

In-service corrosion/erosion monitoring

Lightweight and battery operated

Requires minimal surface preparation

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Process of Inspection

The system monitors the rate of decay of the eddy current field within the steel wall and data can be used to generate an average thickness value. Readings are generated when a transmitter coil within a protective housing produces a magnetic pulse which induces eddy currents within the component wall. The eddy currents, in turn, induce a secondary magnetic field which is detected by a receiving coil.

Oceaneering has adopted the Eddyfi® Lyft™ system to meet customers' demands for expedited results. Individual readings are completed in under a second and dynamic scanning is possible at speeds of up to 75 mm/sec with 10 mm scan resolution. Encoded probes allow corrosion mapping of components which supports better characterization of anomalies and scanning of larger areas in a shortened timescale.

When inspecting thicker materials, dynamic scanning may not produce optimal inspection results. Grid mapping is a technique that can be used in this application and rapidly produces data at approximately one second per reading.

Features and Capabilities

- » Rugged (IP65), lightweight, battery-operated, and rope access deployable
- » Speeds of up to 75 mm/sec with 10 mm scan resolution
- » Wall losses are averaged over the footprint of the probe (typically 35 mm diameter for contact measurements and increases as distance from inspection surface increases)
- » For use with carbon and low alloy steel pipes with diameters 1 in and larger
- » Average wall thicknesses are given as a percentage of a nominal reading (usually the maximum reading found) unless access is available for a spot UT reading
- » Measurement readings through a maximum of 200 mm insulation and wall thickness up to 63.5 mm

Typical Applications

- » Suitable for general wall loss; isolated pitting defects cannot be detected
- » Detects corrosion under insulation (CUI), including through aluminum and stainless steel weather jacket
- » Inspects through fireproofing, coating, composite wraps, and marine growth
- » Identifies general wall condition through external corrosion (scabs)
- » Ideally suited to inspect risers and storage tank floor annular rings

Considerations

- » Requires minimal surface preparation to perform inspection
- » PEC wall thickness readings can vary by up to a 10% tolerance depending on the electromagnetic properties of the material
- » Geometry of the test object should be simple (pipework or vessel shell)
- » Wall thickness readings are affected by close-proximity nozzles, welds, internal fittings, and support structures
- » Inspection at the inside radius of a small bore 90° bend and at sharp changes in geometry may result in inaccurate readings
- » Inspects through some galvanized and aluminized sheeting with reduced sensitivity
- » PEC inspection is a screening tool for CUI and may require additional follow-up inspection methods for exact corrosion sizing
- » Wall loss measurement accuracy has certain limitations during inspection of corrosion under blisters/scabs