

PULSED EDDY CURRENT (PEC)



Oceaneering offers Pulsed Eddy Current (PEC) inspection technology for the detection of corrosion areas in carbon and low alloy steels. Measurements are taken through any non-conductive material e.g. insulation, protective coatings, concrete and marine growth.

Technique

It is an electromagnetic inspection technique used for measuring the thickness of steel objects, such as pipes and vessels, without the need for contact with the steel surface. This makes PEC very suitable for inspections where the surface of an object is not accessible. 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 produce a second magnetic pulse, which is detected by the receiving coil. The system monitors the rate of decay of the eddy current pulse within the steel wall and produces an average thickness value from the comparison of a calibrated signal.

Capability

- Provides the **average** remaining wall thickness measurement within the interrogated area (footprint).
- Direct contact is not required and wall thickness can be measured through any non-conductive material up to 150mm thick, e.g. insulation material, paint, bitumen, dirt, ice or sludge.
- Works through Stainless Steel and Aluminum sheeting $\leq 1\text{mm}$.
- Surface preparation is not required enabling measurements to be taken through corrosion products.
- Wide temperature range -100°C to 550°C .
- Good reproducibility of PEC readings at the same locations makes it ideal for corrosion monitoring.
- Rope Access deployable.
- Subsea and splash zone deployable.
- Battery operated and robust design.
- Fast and reliable data collection typically 700 to 1000 readings per day.



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Applications

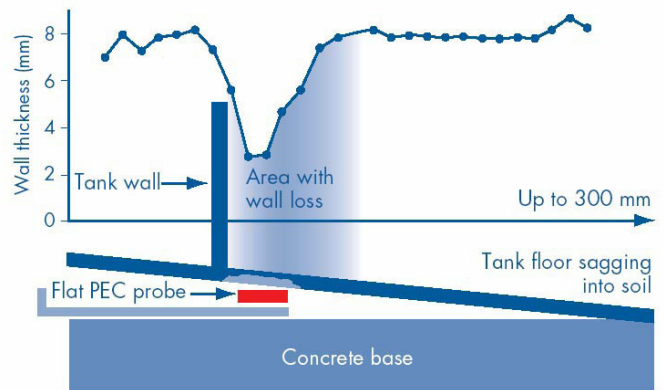
- Vessel and pipework inspection
- In-service corrosion/erosion monitoring
- Wall loss measurement through corrosion product
- Riser and cassion inspection above and below splash zones
- Storage tank inspection
- Ship hull surveys
- Refractory lined vessels
- Subsea Inspections

PEC Limitations

- Applicable to carbon steel and low alloy steels
- PEC is suitable for general wall loss. Isolated pitting defects cannot be detected.
- PEC wall thickness readings are relative values, showing variations in wall thickness on the object being inspected.
- Geometry of the test object should be simple.
- Wall thickness readings are affected by nearby nozzles, welds, internals, near supports and on sharp bends not possible.
- Requirements to test through Galvanised Steel sheeting is not possible.



Storage Tank Inspection: Inserting PEC probe into the gap between the annular ring and tank base is a simple operation and can be performed with the tank in service.



Wall thickness profile of the first 300mm of the annular ring

