



## PEC (Pulsed Eddy Current) Services



### FAILURES DUE TO CORROSION

Failure of steel support structures, piping systems or vessels can be caused by corrosion of the steel under passive fire protection or insulation and visual signs of degradation may not be evident.

Pulsed Eddy Current (PEC) technology can help detect such hidden corrosion before it becomes a potentially expensive and hazardous problem. MISTRAS Q.Pro employs an inspection approach based on this technology checking for corrosion under passive fire protection or insulation. A detailed visual inspection is carried out to look for signs of degradation and PEC technology is used to measure the wall thickness of the metal behind the fireproofing or insulation.

### HOW PEC WORKS

A PEC probe is first placed by the wall that is to be inspected. Then an electric current is introduced in the probe's transmitter coil, which magnetizes the steel beneath the probe. The current is then switched off and, as a result,

the steel demagnetizes. This sudden change in the magnetic field strength generates eddy currents in the steel, which diffuse inwards from the steel surface and decay in strength as they propagate. The induced field of these decaying eddy currents is detected by a set of receiver coils in the PEC probe and the signal detected is related to wall thickness.

PEC obtains a measure of the wall thickness by taking an average reading over the probe's footprint (the roughly circular area where eddy currents flow). This makes it ideal for measuring general wall loss.

### ACCELERATED CORROSION

Degradation of steel can start when water penetrates the interface between the metal and the fireproofing because of faulty seals or inadequate construction. The corrosion products that are created may exert pressure on the passive fire protection and cause it to crack. This can allow more water to reach the steel, which accelerates corrosion.

### BENEFITS OF PEC TECHNOLOGY

- No interference with production. PEC technology can be applied in-service, so there is no need to empty the storage spheres.
- No need to remove the passive fire protection. PEC technology can measure through up to 250 mm of material including the reinforcement mesh.
- Performed in service during plant operation
- Monitor to assess CUI or FAC damage
- Accessibility issues minimized by using rope access operators

# Detection of Corrosion Under Passive Fire Protection

## SPECIALIZED APPLICATIONS

### Petrochemical Plants & Refineries

Sphere Legs  
 Insulated Cryogenic Tanks and Piping  
 Tank Floors with Fiberglass Coatings  
 Pressure Vessels  
 Skirts

### Power Generation

Feedwater & Condensate Piping  
 Drain Piping  
 Coal Feed Piping  
 Feedwater Heater Shells  
 Re-circulating Water Piping  
 HRSG Finned Tubing

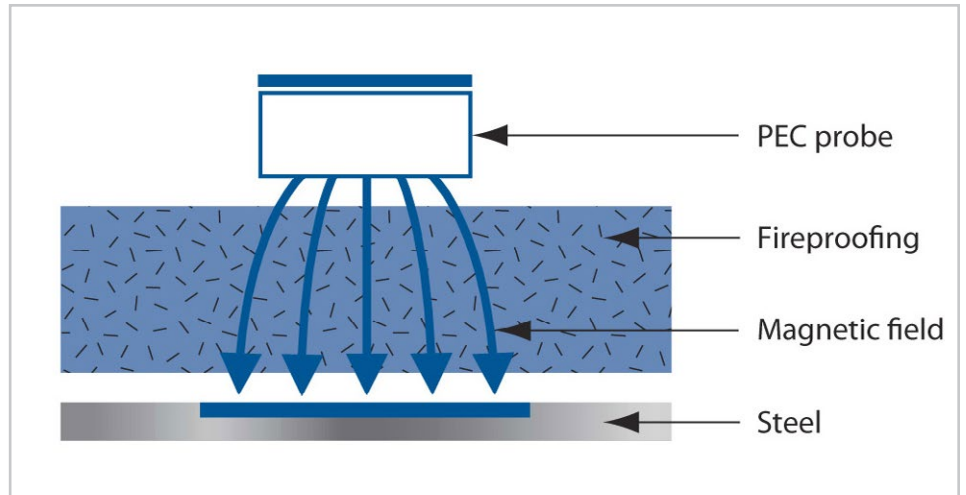
### Marine Applications

Offshore Platform Legs  
 Ship Hulls  
 Seawall Bulkheads  
 Bridge Pier Sheet Piling



## PEC TECHNOLOGY APPLICATIONS

- In the splash zone – improve safety cost-effectively when measuring caisson and riser wall thickness. Readings can be made through marine growth and up to 20 mm of coatings and corrosion products. The probe's misalignment tolerance also makes it suitable for deployment on a jig, thereby minimizing the need for divers
- For in-service wall thickness monitoring – monitor the corrosion rates of critical equipment to facilitate the safe extension of run times and the reduction of shutdown frequency and duration
- To annular rings – detect corrosion while atmospheric storage tanks are in service by measuring the wall loss of annular rings.



## FOR MORE INFORMATION:

Please call MISTRAS Q.Pro at 1-713-366-0700  
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