

CASE STUDY

Flexible Solutions for Corrosion Detection in Critical Process Equipment

Application Benefits

Installation of a system for continuous online corrosion monitoring of four assets: horizontal pipeline; column; vertical pipe; column manholes.

Key Benefits

- CorrosionRADAR® technology provides support for more data-driven RBI programmes
- Continuous corrosion monitoring of asset health for CUI issues
- Strong correlation between sensor data and visual inspections

Challenge

Corrosion Under Insulation (CUI) is a major threat to industry, with results of CUI leading to high maintenance costs, unplanned shutdowns and in extreme cases, catastrophic failure.

Many of the current risk-based inspection (RBI) programmes used to tackle CUI can be static and reactive, risking missing areas of aggressive CUI.

A global materials and chemicals company, aware of the need for data-driven programmes for preventative maintenance and the move towards Industry 4.0, partnered with CorrosionRADAR (CR) to implement new corrosion monitoring technology at one of its plants in Spain.



Current RBI programmes lead to high maintenance costs and unnecessary system downtime.

Solution

CorrosionRADAR (CR) engineers oversaw the smooth installation of its patented Corrosion Monitoring System on four selected assets. This was carried out during planned insulation removals, causing minimal downtime.

The system comprises long thin flexible sensors, installed permanently underneath the equipment's insulation. Electro-Magnetic Guided Radar (EMGR) waves are sent through the sensor, with reflections pinpointing areas of corrosion. Sensor data is transmitted wirelessly, with a choice of communications protocols including 3G, 4G, LoRa, WirelessHART and WiFi. Data can be held on local servers or a cloud platform.



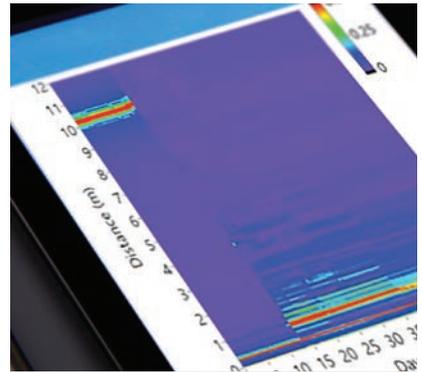
CR corrosion sensor mounted along a horizontal pipeline.

The ability for continuous remote assessment of CUI paves the way for more conditional data-driven RBI using continuous monitoring, enabling preventative rather than reactive maintenance.



Results

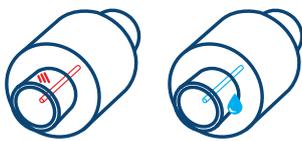
- All four systems achieved 100% uptime, transmitting data on asset health and CUI levels for analysis
- Corrosion was detected on two of the four assets and followed up with visual inspections
- Inspections strongly supported sensor data and allowed timely repair
- Accurate identification of the area of corrosion meant that full removal of insulation was no longer be required, reducing maintenance costs.



Sensor data pinpointed corrosion at 0.6m on the vertical pipeline. The steady decrease in signal strength from the first point of detection indicates propagation of corrosion.

2D amplitude plot of data from when corrosion was first detected. The first peak represents the transition from bridge cable to sensor while the second indicates the presence of corrosion.

Sensor Types



Corrosion

Moisture

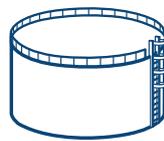
Asset Types



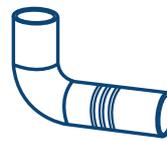
Column



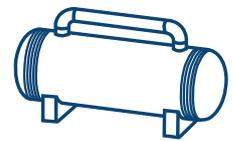
Dryer



Storage Tank



Pipeline



Heat Exchanger

You have been reading about [CorrosionRADAR's Corrosion Monitoring System](#) as applied to a pipeline. Above are further examples where predictive corrosion monitoring is effective. To find out more, please visit our [website](#).

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