

# Oceaneering Combines Inspection Methodologies for Holistic Corrosion Under Pipe Support (CUPS) Campaign

## Corrosion identified with quantitative short-range guided wave technique



### Project Overview

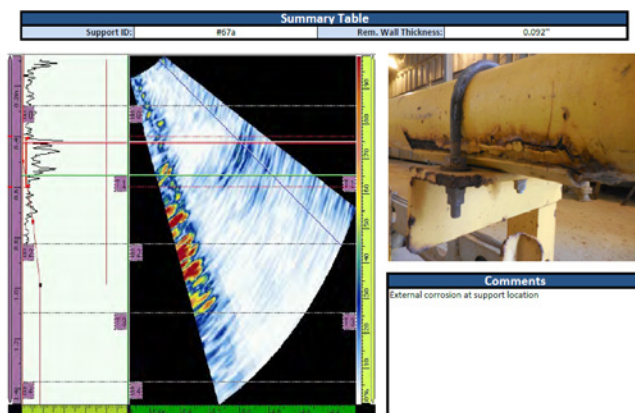
After a large oil & gas operator acquired an existing production facility in early 2018, an initial visual inspection highlighted issues with corrosion under pipe supports, also known as CUPS. The operator required further inspection support to confirm the condition and severity of the touch point corrosion, which had developed over a long period of time. To address the issue, Oceaneering adopted an holistic approach to the inspection, which was not only unique to the operator but also a first in the region.

### Issues

Since the operator had just recently acquired the facility, this customer's initial concern was that inspection and validation needed to be completed without moving or upsetting the pipework. Oceaneering reassured the customer that it could conduct the inspection without disturbing any equipment and also limit the amount of U-bolts and pipe supports removed.

The initial consideration was to use fabric maintenance (FM) to treat the corrosion, but Oceaneering demonstrated that FM posed an additional risk, given the lack of visibility and

understanding of the severity of the corrosion. Blasting and painting could cause additional erosion with the potential to cause a failure or loss of containment. Oceaneering determined that assessing the integrity of the pipework was the safest and most commercially effective method.



### The Oceaneering Solution

Utilizing existing data and our experience in managing the integrity and inspection of many facilities, the Oceaneering team reviewed the operator's issues and provided an inspector to assess all of the pipe supports in question. The Oceaneering inspector conducted an in-depth visual walk-through in the facility and collected over 400 images.

Oceaneering subject matter experts then reviewed the data to determine how the project would be planned and executed, and also identified the five types of non-destructive testing (NDT) and specialist NDT required. A fully encompassing pipe support inspection solution was then developed with details on how to inspect it, along with which methodology of inspection was to be used, and whether rope access or other forms of access were required.



### Execution Plan

The Oceaneering team (consisting of two advanced NDT technicians, one Rope Access Level 3 supervisor, and one radiographer) was then deployed to the site for 12 days. The multi-disciplined rope access inspection team utilized a combination of quantitative short-range electromagnetic acoustic transducers (EMATs), guided wave testing, manual phased array ultrasonic testing (UT), digital radiography, and visual inspection to complete the work scope and obtain tangible results that were later used to further assess and determine remedial actions.





### Challenges

- » Many of the pipe supports were located at heights, requiring the Oceaneering team to use rope access.
- » The removal of structural hardware had to be limited, forcing Oceaneering to use specialist NDT methods to assess corrosion levels.
- » No existing data was available; therefore, Oceaneering had to ensure that the information collected and processed was robust, accurate, and usable.
- » Oceaneering had to prove to the operator that inspection was the best methodology over FM due to safety and commercial risks associated with FM.

### Equipment Highlights

- » QSR1®, a quantitative short-range device by Guided Ultrasonics Ltd.
- » Wavemaker Pipe Screening System by Guided Ultrasonics Ltd.
- » Manual phased array equipment by Olympus
- » Digital radiography equipment by GE

### Results

Corrosion was identified before any serious issues arose. The data that Oceaneering provided will be used to remediate the areas of corrosion that were most at risk, and will also drive an inspection and maintenance plan for other areas.

### Project Highlights

Oceaneering provided an holistic approach to managing and executing a CUPS inspection program. The blended combination of methodologies enabled a full inspection to take place that resulted in a quantitative and qualitative inspection report. Oceaneering provided a unique solution that mitigated the necessity to move any of the pipe supports and also identified several areas of concern, which the operator was then able to rectify.





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