

Case Study

Project DRS Inspection of Pipework with Composite Repairs on a North Sea Platform

Requirement An inspection to measure the steel wall thickness (WT) profile under composite repairs on produced water lines in locations of significant internal wall loss.



Solution The DRS inspection provided steel WT maps for two locations with composite repairs. The maps show two different corrosion profiles. The first location has a single isolated pit and the second shows more widespread localised corrosion. This illustrates the benefit of corrosion maps over manual spot checks which record only minimum WTs.

Although the repair on the first location was relatively thin (5 mm), the DRS signals did not transmit through it in the areas shown in white. This behaviour is typically seen where flaws such as delamination or contamination are present in the repair. At the second location, the DRS signals easily penetrated the 10 mm thick repair. The corrosion at the second location was found to extend beyond the repair, which begins at the zero axial location on both maps. Since this inspection was carried out, the DRS system has been modified to operate with only 100 mm of clearance, allowing access to tighter locations.

A key requirement of inspection of steel under repairs is to allow corrosion growth rate estimates to be made. The reliability of corrosion growth rate estimates is determined by the accuracy of the technique, typically ± 0.5 mm (80% tolerance) for DRS. Furthermore, the DRS data is provided in the form of corrosion maps whereas manual UT typically provides a single minimum thickness measurement for a region. As such, relying on the manual UT performed prior to repair installation as a baseline does not allow reliable corrosion growth rate estimates. A baseline DRS inspection at the time of repair installation is preferable as this allows a statistical analysis of the wall loss over the entire map.

Benefits Understanding the condition of the composite repairs and underlying steel means that

- The risk of ongoing operation is effectively managed
- The cost of replacement can be deferred or avoided
- Production is maintained – a shut down is not needed

