SUCCESS STORY

CORROSION MAPPING OF Externally corroded Ast walls

THE PURPOSE

This document is composed to assist our clients and the supply chain to better understand our capabilities and experience with corrosion mapping of externally corroded atmospheric storage tank walls.

T



CORROSION MAPPING OF EXTERNALLY CORRODED AST WALLS

PROJECT DESCRIPTION

An Atmospheric Storage Tank (AST) had been regularly standing in water at intervals over a number of years. This had led to visible external corrosion. Random internal corrosion pitting had also been noted during previous internal inspections. Concerns had been raised over the possibility of coincident internal and external corrosion causing the corrosion allowance to have been exceeded. The incumbent inspection contractor had arranged to remove all corrosion product from the external surface, but were only able to take thickness readings at isolated locations due to the irregular surface giving contact problems.

SOLUTION

Sonomatic is experienced with the evaluation of coincident internal and external corrosion through ILI verification activity of pipelines, both subsea and terrestrial. The technique involves careful selection of probe characteristics to ensure the tightest beam possible and performing automated measurements form a stable platform using the immersion technique. In this manner, both the external and internal wall profiles can be accurately mapped.

A flexible carbon fibre composite track was attached to the tank wall with magnetic feet. The track ensured conformity in the circumferential direction whilst providing a rigid platform in the vertical plane. The ultrasonic probe was mounted a fixed distance from the external surface and coupling to the surface was achieved using a water column (bubbler). A band of measurements was collected 150 mm above the wall to annular plate attachment weld at locations where corrosion could be seen visually to be most severe.

Figure 1. Details of the observed external corrosion and potential internal corrosion.



Figure 2. Nautilus scanning system configured for scanning on a tank wall.





Figure 3. Composite corrosion map over parts of the tank circumference.

Figure 4. Detail of a corroded area

Wall thickness plat





Internal profile





CONCLUSION

In this example, the internal random pitting was shown not to be coincident with external corrosion. The minimum wall thickness was, therefore, greater than would be the case for overlapping corrosion. The high-quality data was used in a statistical analysis to estimate on a probabilistic basis, the worst case condition. The findings of the inspection and analysis supported a case for continued operation of the tank with no need to remove it from service for repair or replacement. This resulted in substantial business benefits to the client.

The data obtained also forms a reliable baseline for accurately monitoring future corrosion growth, thereby efficient through-life management of the tank. The data can also be exported directly into a finite element model for fitness-for-service assessment.

Figure 5. Wall thickness distribution plots.

CONTACTS

EUROPE AND AFRICA

lan Daniel

Global Tank Integrity and Inspection Manager T: +44(0)1925 414 000 M: +44(0)785 0100 707 E: lan.Daniel@sonomatic.com

Stuart Ley

Topside Project Manager T: +44(0)1224 823 960 E: Stuart.Ley@sonomatic.com

Donna Stewart

Integrity Operations Coordinator T: +44(0)1224823960 E: Donna.Stewart@sonomatic.com

Danielle Gunns

Project Delivery Manager (Warrington) T: +44(0) 1925 414 000 E: Danielle.Gunns@sonomatic.com

WORLDWIDE

Australia & NZ

Alex Cesan - General Manager Australia & NZ T: +61 498 442 666 E: Alex.Cesan@sonomatic.com

Americas

Esteban Cecan - General Manager Americas T: +1832 977 0303 E: Esteban.Cesan@sonomatic.com

South East Asia Zach McCann - Region Manager T: +61 404 797 670 E: Zach.McCann@sonomatic.com

Middle East

Gordon Reid - Region Manager T: +9712 658 0708 E: Gordon.Reid@sonomatic.com





www.sonomatic.com