SUCCESS STORY

SONOMATIC

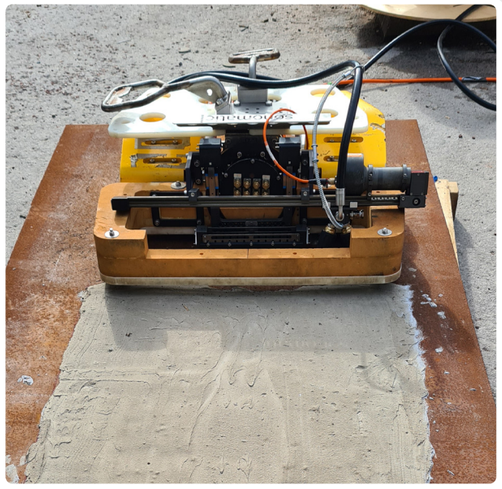
CORROSION MAPPING INSPECTION OF LARGE SUBSEA OIL STORAGE TANK

THE PURPOSE

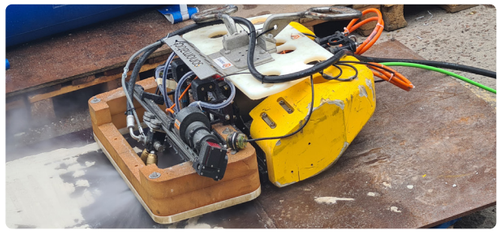
This document is composed to assist our clients and the supply chain to better understand our capabilities and experience within the subsea NDT sector.

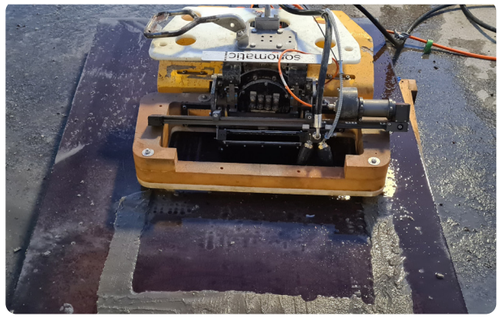
CORROSION MAPPING INSPECTION OF LARGE SUBSEA OIL STORAGE TANK

A client has a large subsea oil storage tank located on the seabed, in water depths in excess of 130m. The tank structure has a total surface area of 8550m2. A corrosion risk assessment was conducted on the tank by the client and Sonomatic, that identified key areas on the tank outer walls for inspection. The primary purpose of the inspection was to detect and monitor any possible corrosion, to ensure the tanks integrity and manage the associated risks to an acceptable level.



Each face of the tank required inspection for potential corrosion threats, including the bottom of the tank which is 1m above the seabed on a support frame. Due to the limited access to the tank bottom, it was inaccessible for most ROV systems to conduct/deploy an inspection system capable of collecting accurate corrosion mapping information. The tank has been in service for some time and had a build-up of marine growth and seabed silt on all surfaces. Any inspection solution had to be capable of conducting cleaning operations to obtain an acceptable scan surface condition and provide accurate thickness measurements required to satisfy the CRA requirements.





Sonomatic were approached by the client and the vessel operator to support with an ROV deployed solution that could inspect large areas of the tank walls with the tank still in operation. Sonomatic specialise in supporting situations such as these and have a selection of advanced subsea crawlers suitable to support with this inspection activity.

The aim of the inspection activities were:

1. Collect subsea accurate ultrasonic array corrosion mapping data, to accommodate the requirements of the CRA.

2. Develop and deploy a cleaning system on the front of the Sonomatic MAG-Rover magnetic scanner, to ensure the ability to collect high quality ultrasonic data. The solution was not only for the tank surfaces where host ROV support/access was not an issue, but also for the tank base where the MAG-Rover scanner would be up to 25m away from the host ROV.

CHALLENGES

- Build-up of seabed silt and marine growth on the inspection surface, especially the top of tank.
- Obstructions on the top of tank, causing navigational restrictions on longer runs.
- Long, full length (45m) scan runs to be conducted on top and sides of the tank.
- Deployment by WCROV of the Sonomatic MAG-Rover on the underside of the tank.
- Deployment and good cable management of 27m long ultrasonic and cleaning umbilicals for inspection on the tank underside.
- 360° Visual and navigational feedback from MAG-Rover on the underside of the tank to avoid anodes and other obstructions when operating 20+ meters away from the ROV.
- Heavy marine growth especially on the underside of the tank.
- Conduct cleaning and inspection simultaneously.
- Conduct a virtual FAT/Demo for the clients at our head office in Warrington.

INNOVATION

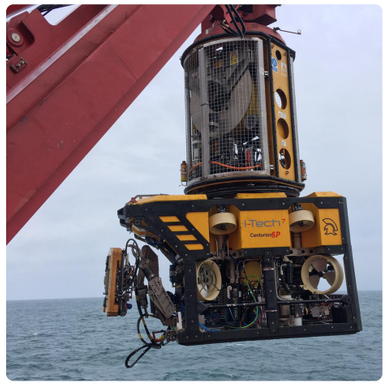
Although the MAG-Rover is a tried and tested system for automated ultrasonic subsea inspection, the capacity to conduct cleaning and simultaneously collect array inspection data on a subsea structure was a new challenge for Sonomatic. An intense development process was completed with limited time due to vessel operational timeframes. A FAT type demonstration/validation was conducted at Sonomatic's head office in Warrington, attended virtually by key stakeholders to assess the readiness of the scanner to conduct cleaning and inspection.

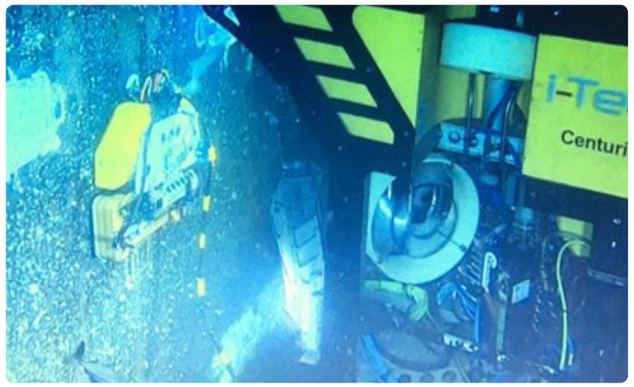
OUTCOME

Upon acceptance that the scanner and its cleaning solution was fit for purpose, the kit was mobilised onto the ROVSV. Once in field the MAG-Rover was put into action on the top face of the tank and commenced cleaning and inspection on selected runs covering 109.5m of accurate corrosion mapping data.

The MAG-Rover continued an intense inspection campaign on all four faces of the tank, cleaning, and data collection in excess of 450m of accurate corrosion mapping data. Prior to inspection on the underside of the tank, the client carried out a final risk assessment with all key stakeholders to assess the risks of deploying the scanner in a 1m gap between seabed and bottom of tank and driving up to 25m away from the host ROV.

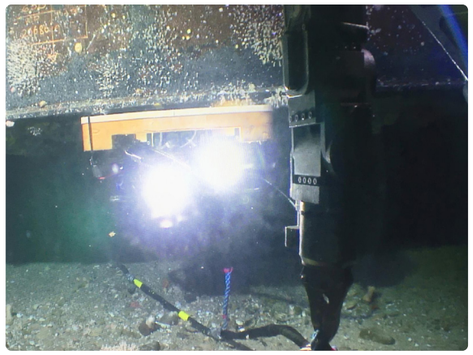
Several runs were conducted on the base of the tank, in a safe and tightly controlled evolution, managed by all parties. In total, over 700m of data was collected on all faces of the tank. The accurate corrosion mapping array data sets will provide sufficient information to satisfy the CRA requirements to show that the tank will be fit for purpose for several years to come.

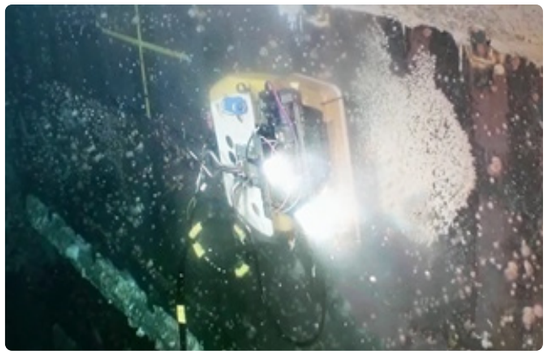




CLIENT FEEDBACK

The client was very satisfied with the outcome and was impressed with by the reliability of the Sonomatic MAG-Rover equipment spread, and the ability to conduct simultaneous cleaning and inspection operations. All parties and key stakeholders worked in unison to achieve the end goal, with very limited downtime, tight timescales and without major incidents.





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