A look at diverless inspection and repair technology

BY **DANNY CONSTANTINIS (EXECUTIVE CHAIRMAN) EM&I GROUP.**

THEdrive to improve safety, cost, risk, and POB (People on Board) reductions is a key driver for the HITS (Hull Inspection Techniques and Strategy) JIP (Joint Industry Project).

Key criteria in this process included the EM&I - the international asset integrity specialists – has led the development of diverless and robotic innovative integrity technologies, encouraged by the JIP, for the last 9 years.

Significant progress has been made in this direction with 'full scope' UWILDs (Under Water Inspection in Lieu of Drydocking) and inspection and repairs of hull, sea chests, sea valves, mooring systems, and most recently, hull side shells.

ODIN® UWILD (Under Water Inspection in Lieu of Drydocking) technology…

The multi role Integrity Class ROVs developed by EM&I can carry out the full underwater inspection scope required by class

Hull Survey

This includes general and close visual inspections of the external hull and mooring systems, thickness measurement and cathodic protection readings, mooring chain link and chain angle measurements. Cleaning of seachest inlet grids and other items to be inspected are also carried out by the ROV using specialised cavitation cleaners.

Moorings

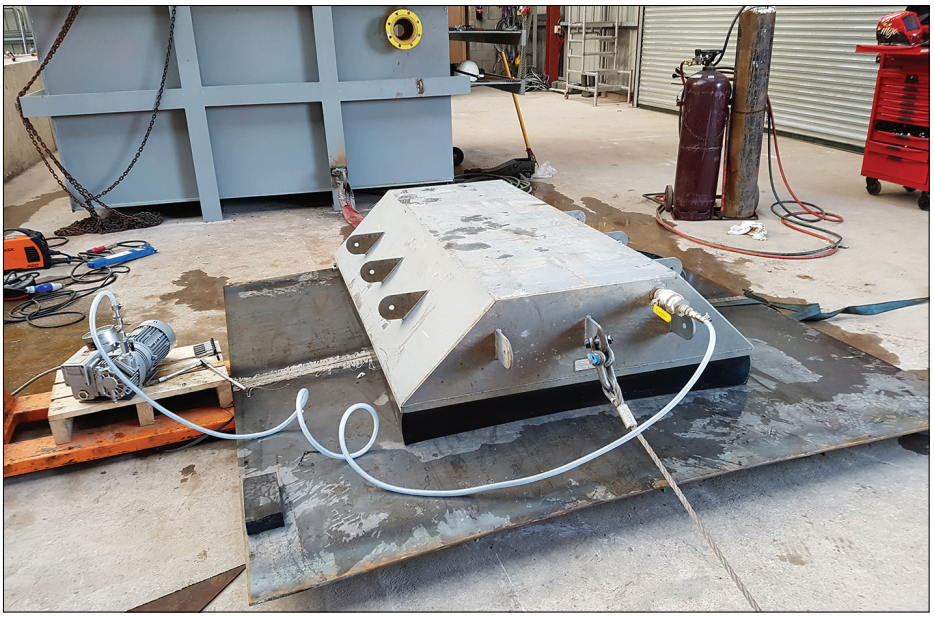
Other developments in the pipeline include the LORIS™ technology for inspection and repair of mooring chains and risers. LORIS will be tested offshore in the near future to prove it's shallow and deep-water capability and laser and photogrammetry inspection systems.

Critical Valve Inspections and Repairs

The ideal procedure for critical valves is to examine their condition and functionality from within the valve and this method was developed using the ODIN access port concept to enable a CCTV camera to be inserted into the piping adjacent to the valve.

The benefits of the ODIN valve inspection and repair technology can be summarised as follows:

- Easily installed during normal operations
- CCTV – inspects the valve operating
- Early detection of problems
- Diverless, no weather dependence



- Only 10-15 critical valves
- Low initial cost (USD 25K per port)
- Very low-cost re-inspections (USD 6K per port)
- Pay back on first inspection cycle

Sea Chests can also be blanked, cleaned, inspected, and protected without divers…

Sea Chests can also be cleaned, surveyed, marine growth prevention systems and protective anodes installed and maintained diverlessly using ODIN technology.

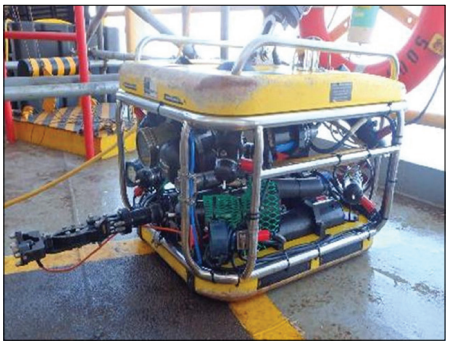
Protecting the hull from corrosion….

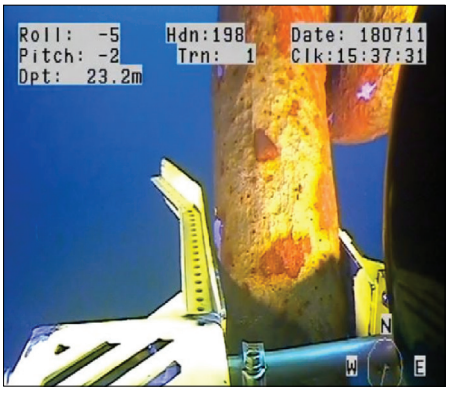
Hulls can also be protected using the EM&I's diverless 'periscope type' HullGuard® retractable anodes, which can be installed for operation, and retracted for inspection, cleaning, or replacement, all performed from inside the hull

Repairing the hull….

One of the most difficult repairs to undertake on floating assets such as FPSOs are hull repairs. An adaptation of the ODIN system, first designed in 2016, was used in combination with EM&I's multi role ROVs and purpose designed cofferdams. The concept was further developed at EM&I's Technology Facility before the work was executed successfully and safely on an asset for a Supermajor.

The successful project, the world's first to be executed offshore, was the result of close collaboration of specialists from the Owner, the Operator, specialist contractors and partners who worked together to overcome the many





challenges, including dealing with a world pandemic.

All the work described here can be carried out while the vessels are on station, on hire, and in operation…

These technologies bring cost reductions, budget certainty and a high safety profile, while minimising disruptions of normal operations, vital benefits as our industry moves more and more towards reducing risk to people and business with modern technology".