# CONFIDENTIAL CLIENT
# DPS-1 SEMI-SUBMERSIBLE MODU

## Deck Extensions, Pipework Upgrades and Drill floor Modifications, Australia

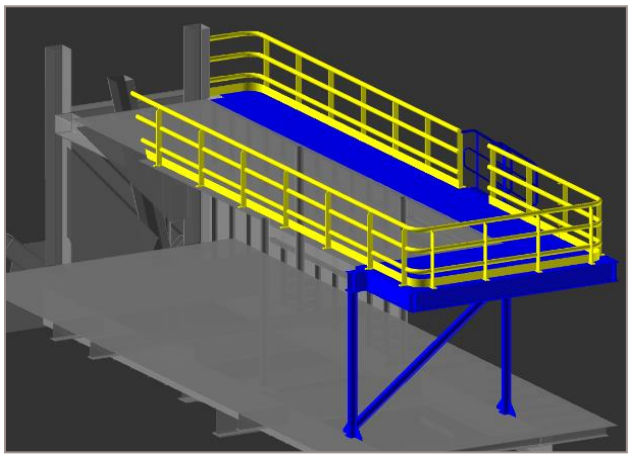
ICON was contracted by Valaris to engineer, design, fabricate and perform offshore installation of modifications to its DPS-1 semi-submersible MODU in preparation for a recent drilling campaign by an international Operator.

ICON provided the project management, structural and piping engineering, drafting, fabrication management and support logistics, offshore construction crew and personnel including client liaison both onshore and offshore.

The permanent rig upgrades included:

- Extension to Welding Shop Roof deck.
- Deck Infill near Port Crane.
- Platforms in the Shaker House.
- Mousehole added in the drill floor.
- Low pressure pipework upgrades to water, diesel, brine lines and Oil and Gas flareboom lines.
- High pressure pipework upgrades to Well test line and Gravel pack line.

All works were designed, fabricated and installed by ICON over a period of 5 ½ months. The design phase involved extensive use of 3D scanning to convert the rig into point cloud data that could then be overlaid with 3D CAD modelling. Interface checks were carried out in-office and allowed ICON to prefabricate structural components and pipe spools onshore and thus streamlining offshore execution.



3D model of welding shop roof deck extension

ICON provided all crew, equipment and logistics to facilitate the upgrade works. The offshore team comprised of site engineers, boilermaker welders, pipe welders/fitters, scaffolders, Rope access techs, NDT, pressure testing & heat treatment technicians.

ICON offshore team on helideck

### Welding Shop Roof Deck Extension

Due to the campaign requirement to have multiple drilling and completion vendor spreads set up simultaneously, rig deck space was at a premium. ICON's challenge was to locate a Completions spread comprising of a control cabin and 2 x completions line spoolers together without taking up valuable riser deck space and ensuring the spoolers could route control hose through the derrick's V door. ICON's solution was to complete an extension to the existing welders shop roof, allowing all equipment to be positioned on this modified deck.

The extension was engineered in modules, ensuring each piece was easily transported by both road and supply boat and offshore installation effort was minimised.

Lifting in new deck module for welding shop roof extension

### Port Crane Deck Infill

A deck extension was needed to re-route walkway access around the port side pedestal crane. A tubular truss was first lifted into place over the side and welded to the hull plate with ABS approved welders. The deck piece was transported and lifted in a single section. As the worksite was inside the crane's working radius, innovative construction techniques and rigging solutions were implemented.

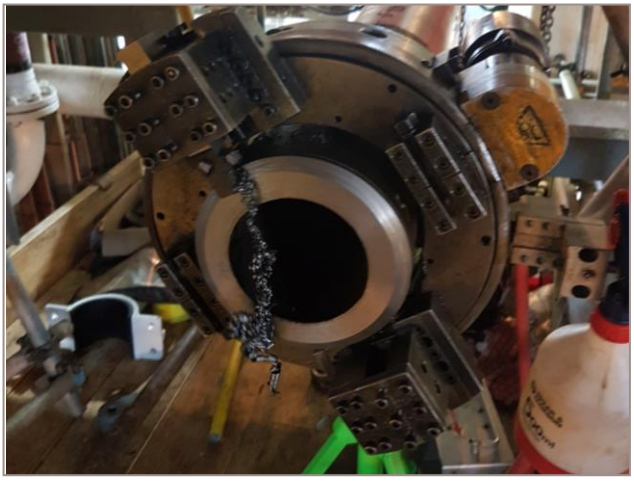


ICON Engineering Pty Ltd
busdev@iconeng.com.au
Ph: +618 6313 5500

Deck Infill being lifted into place

ICON also completed design, fabrication and installation of a number of pipework scopes on the DPS-1 these included:

- New 3" High Pressure, 10,000psi extra heavy thick wall (15.24mm) 4130 Gravel Pack line from Riser Deck up to the Drill floor then a separate standpipe from drill floor up to above the bellyboard level.
- New 6" High pressure 15,000psi extra heavy thick wall (25.4mm) 4130 Well test line running from the well test area all the way up the derrick to the Coflexip hose gooseneck.
- Modifications to 4" and 6" A106 Oil and gas flareboom lines.
- New drill water to freshwater tie in (316 S/S).
- New 1" diesel lines (approx. 100m in length) to provide fuel to vendor equipment on the port and starboard sides.



6" Extra heavy wall thick pipe being prepped for welding

**High Pressure Piping**

The client's welding code stipulated 100% Radioactive testing (RT) was used to NDT all site welds on lines rated above 2500psi to ensure they were free from defects. A total of 4 separate HP lines were installed; 2 gravel pack and 2 well test.

**3" Gravel Pack line**

This line was installed for the campaign's gravel pack operation. The line ran from the Port side main deck and penetrated the drill floor. A second line was installed running from the drill floor, up the derrick and terminating at the fingerboard level approximately 16m above drill floor.

3" Gravel Pack line below drill floor

**6" Well Test Line**

An extra heavy wall thick 6" Well test line was installed from the Well test area on main deck up to the drill floor and into the derrick. The pipework was expected to carry sour product and therefore needed to be fully compliant with NACE guidelines. The rig's existing 5" line was also removed to accommodate the new, larger line which was routed in the point cloud 3D model space.

Well test line routing in 3D point cloud model

Final positioning of the lines was carried out on site, ensuring perfect alignment between the below drill floor piping run and derrick standpipe.

**Freshwater to Drill Water Lines**

A stainless-steel fresh water-drill water bypass line was installed in the starboard column of the rig. Following welding the lines were flushed, passivated and painted.

**Diesel Lines**

Diesel lines were installed to allow for more convenient refuelling operations of the deck equipment. Hard pipelines were tied into existing diesel line that wrapped around the rig on the port and starboard sides of the rig and terminated to a soft line reel and nozzle.



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