

WOODSIDE GOODWYN A PLATFORM ROV DEPLOYED & OPERATED SUBSEA TAUT WIRE SYSTEMS

Designed, fabricated & tested in just 4 weeks

ICON Engineering was engaged by Woodside Energy to undertake the design, fabrication & testing of three ROV deployed and operated subsea taut wire units. The entire workscope had to be completed in just 4 weeks.

As part of GWF-1 development a new riser was required to be installed into a conductor guide slot and an electro-hydraulic umbilical pulled through a J-tube. This was preceded by the installation of a riser & connector spool piece and the J-Tube by saturation divers.

During an ROV pre-survey it was identified that a significant volume of drill cuttings had built up below the GWA platform in the area of the lay routes and spool piece and J-tube locations.

In order to efficiently remove the drill cuttings it was determined that 'taut wires' would allow the dredging nozzle to be manoeuvred by the ROV in just the required corridors without having to perform excessive dredging works.

ICON was contracted to provide three taut wire units that could be:

- handled & installed by ROV into spare conductor slots with variable coverings of marine growth;
- could be operated by ROV to provide up to 2 tonnes of tension on the wire;
- could be easily removed by saturation divers some months later

The challenge ICON immediately faced was that we were given just 4 weeks to design, fabricate, assemble and test the units – all over the Christmas/New Year break when many fabricators are closed down.

The solution was to offer Woodside an innovative solution that would allow it to be done in such a compressed time frame, while also keeping the cost down. The first innovative approach was to use high density polyethylene (HDPE) for the assembly body rather than aluminium as the client had been anticipating. This approach meant there was no welding required anywhere on the entire assembly and, more importantly, meant that no buoyancy was required at all. This represented a good cost saving while eliminating critical path items.

The next challenge was to offer the client winches that were to be operated using the manipulator wrist rotate function rather than ROV hydraulic supply. This eliminated hydraulic motors, gearboxes, couplings, hot stabs, hydraulic valves, fittings & hoses. Potential excess torque from the manipulator was controlled by using low cost torque limiting couplings that were simply and easily integrated with the winches. The winches were off-the-shelf units that had to be imported from the UK for the project and adapted for use subsea.

Free pay-out of the taut "wire" (a high strength synthetic rope) was enabled in one of two ways: firstly by using the ability of the winches to be easily set to free wheel mode or secondly by allowing the rope to be coiled inside the assembly (as can be seen in figure 1).

The three units were successfully tested in ICON's Henderson yard just four weeks after award.



Completed taut wire unit



Taut wire units being tested in ICON's Henderson