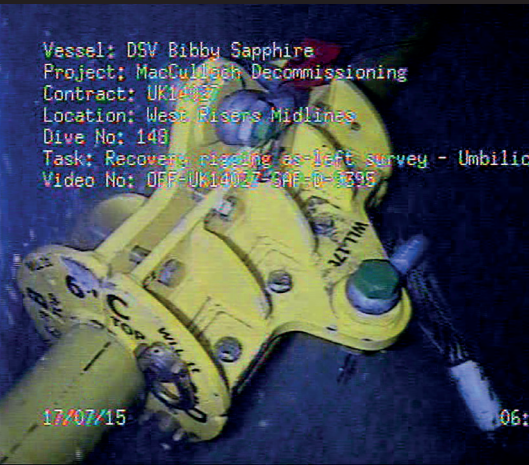




OFFSHORE CLAMP PRODUCT GUIDE

Vessel: DSV Bibby Sapphire
Project: MacCullagh Decommissioning
Contract: UK14027
Location: West Risens Midlines
Dive No: 148
Task: Recover, rigging as-left survey - Umbilic
Video No: OFF-UK14027-SAF-B-3695



INTELLIGENT ENGINEERING



Red Marine provides intelligent engineering solutions to global clients working in the oil & gas, nuclear and renewable energy industries.

With a broad skills base, a combination of first hand operational experience and over 300 man years of equipment design expertise, we have a proven track record of delivering high impact solutions that enable the successful delivery of the most challenging engineering projects.

Working as a trusted partner, we can solve engineering challenges fast with a range of services from consultancy, through the manufacture of innovative equipment to qualification testing.

Our core expertise relates to the development and testing of high integrity, bespoke equipment typically for product handling or remote intervention in a harsh environment.

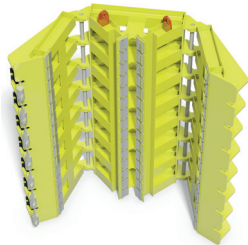
Joe Orrell, MD of Red Marine

PRODUCT RANGE

With our unique combination of design expertise, extensive knowledge of offshore installation operations and understanding of SURF product design and characteristics, Red Marine can be trusted to rapidly deliver reliable offshore clamps to meet your specific project requirements. From initial concept development, through detailed design, manufacture, qualification testing at our in-house test facility, to engineering support for installation and commissioning, we deliver turnkey clamp solutions for a wide range of offshore applications.

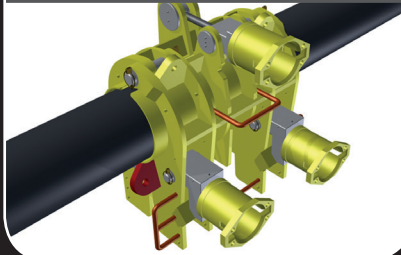
Pipelay System Clamps

- Hold back clamps
- Friction clamps
- Safety clamps
- A & R clamps



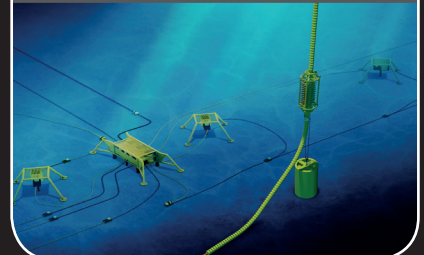
Installation/Recovery Tools and Clamps

- Pull Heads
- Riser pull down clamps
- Riser recovery clamps
- Flowline Lifting Tools



Product Positioning Clamps

- Umbilical Hold back Clamps
- Umbilical Tether Clamps
- J-Tube Clamps



TRACK RECORD



J-lay Collar Clamp Assembly

Design of a 1500t SWL collar clamp for integration into a high capacity J-lay system. The versatile clamp assembly can be used to handle pipe joints of different diameters and at a range of tower angles.



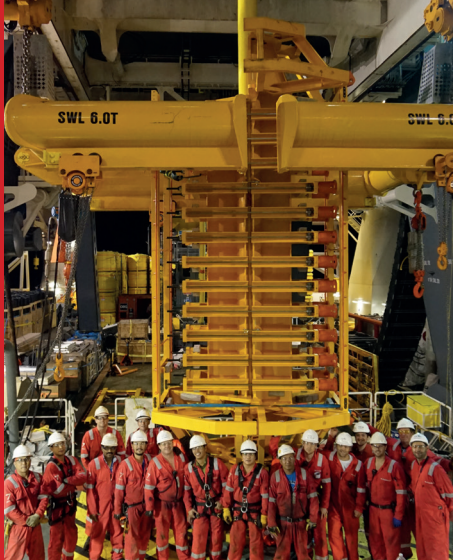
Piggyback Clamp System

Design and manufacture of a piggyback clamp system to allow the automation of piggyback blocking operations and a significant increase in lay rates. Red Marine's scope included the development and qualification of the thermo-plastic moulded clamp arrangement and the supply of vessel installed tooling for semi-automated clamp installation.



Riser Installation and Recovery Clamps

Red Marine has delivered a range of high quality, robust clamps to assist in the safe installation and recovery of flowlines, risers, umbilicals and cables – including both diver installed and ROV operated units.



Umbilical Tether Clamp

Delivery of umbilical clamps to provide life time positioning of a complex umbilical in 3000m of water. Featuring a titanium tension bar system and supplied complete with installation equipment, two of these clamps have now been installed in the Gulf of Mexico.

“Good work, my regards and thanks to you and the team for their hard work, diligence and achievement of challenging delivery timescales.”

Catho Bjerkseter, FMC Technologies



Umbilical Hold Back Clamp

A subsea umbilical clamp developed to securely ‘hold back’ a compressible umbilical with a low friction outer sheath during well intervention operations. The modular clamp comprised of six elements each housing a number of spring applied pads to ensure the application of a reliable clamping force to the umbilical.

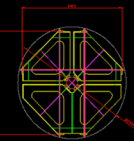


Wind Turbine J-Tube Clamp

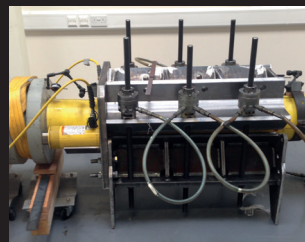
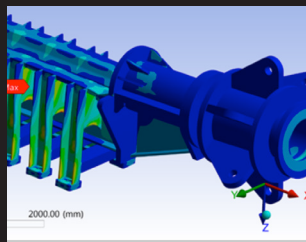
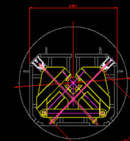
Working in partnership with a global energy company, the fast track development and delivery of a series of subsea clamps for installation at a UK offshore wind farm. Designed to position and secure power cables at the j-tube interface, the clamps had a 25 year design life and were manufactured from high grade materials including components machined from Inconel 625.



OPTION 1 - TIE-BARS
& QUADRANTS



OPTION 2 - TIE-BARS
& LEVER ARMS



CONCEPT



DESIGN



BUILD



TESTING



SUPPORT

CASE STUDY: **DEEPWATER TETHER CLAMP**

In one of its most challenging projects to date, Red Marine was contracted to deliver two first of kind subsea tether clamps for an ultra-deep-water oil and gas development in the Gulf of Mexico.

The project scope included initial concept development, proof of concept testing, detailed design, manufacture and full scale testing of the clamp solution. Extensive testing using Red Marine's in-house test facility was a key factor in the success of the project as it provided vital data regarding the umbilical's performance characteristics for the design process.

The clamps were designed to tether two control umbilicals that run from subsea wellheads to a surface FPSO in approximately 3,000m of water, a particularly challenging requirement as the diameter of the subsea umbilical will change over time during and post installation. An innovative, compliant clamp solution was therefore developed using titanium rods as the tension mechanism in order to reliably secure the control umbilicals for at least 20 years.

In parallel to the fast track supply of the subsea hardware, Red Marine also developed the installation methodology and designed and supplied the handling equipment required to install each clamp on the umbilical prior to installation, delivering a genuine 'turnkey' solution to the challenge.

“Red Marine’s performance was outstanding given the very short timescale to design, build and deliver two industry first umbilical clamps.”

Mark Varley, Subsea 7



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