MANUFACTURE, ASSEMBLY & TEST

CASE STUDY PACK

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Probe has been a trusted supply chain partner for engineering projects for over four decades. In this time, we have worked closely with our clients, building lasting relationships, to enable them to optimise asset productivity and performance.

Manufacturing oilfield equipment is at the core of the Probe offering. We are acutely aware of the demands and deadlines placed on our clients; so we are reliably responsive to their request to ensure projects are delivered quickly, but without compromising quality and safety. Our capabilities also extend to offer a full in-house assembly and test service for any manufactured item we make. Probe’s systems are manufactured from our raw material stock, assembled according to industry standard requirements and tested by our highly qualified inspectors.

Probe’s promise to you is always to find a solution to your engineering requirements, whilst delivering momentum to your project. The content of this case study pack provides insight into how we have provided unrivalled results to some of the design, procurement, manufacture and quality assurance challenges our clients have had over the years.

Thank you for taking the time to read this case study pack. We look forward to helping with your project very soon.

David Brennan Managing Director

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CASE STUDY 1

Innovative mooring connector solution

The problem
The Minesto wave energy project in Holyhead Deep off the coast of North West Wales, is a novel application, which flies a “kite” subsea, generating electricity via a turbine mounted in the front of the device. The kite moves in a figure of eight on its side and through 180 degrees as the tide turns. The loads imparted to the seabed anchor connector are constantly varying in magnitude and direction, so the client approached Acteon’s sister company, SRP, to design a bespoke solution to counter these high stresses, based on their standard current connector technology.

Having worked on many innovative projects with SRP previously, Probe were the ideal partner to manufacture, assemble and test the complete connector.

The solution
SRP offered a variant on their qualified subsea mooring connector, Rocksteady. The connector allowed the high vectoring loads to be transferred from the kite to the gravity base foundation.

To resist the extreme static and fatigue loads, the SRP connector generates a high preload between the mating halves of the connector to accommodate the bending, tension and shear loads applied. SRP supplied a full set of design drawings, specifications and procedures, to allow Probe to manufacture, assemble and test the full system. To guarantee that our product systems meet the clients’ requirements and specifications, all these services are delivered in-house. This in-house capability provides savings to the client, minimises inefficiencies and lead times.

Marc Saiche, Sales Engineer, Probe, said, “Whilst working closely with the SRP engineers, Probe manufactured all components, and subsequently aided the SRP engineers to fully assemble and comprehensively test the mooring connector using our on-site machine centre and state of the art testing equipment. The factory acceptance testing (FAT) was witnessed by the end user, with excellent feedback and approval. I am delighted that we were able work collaboratively with our sister company on this project and feel we have produced potentially an industry leading product.”

The result
For the end client, a successful solution to their high loading mooring requirement was achieved.

“Working alongside the Probe team enabled SRP to provide a solution that enabled our client to benefit from our collective experience and expertise. They received a full turnkey, project designed, manufactured and tested solution from the Acteon collaborative supply chain, in line with their expectations and timeframes. We now hope to cement our collaboration with Probe to provide a turnkey supply route for our Rocksteady range of mooring connectors moving forward.”

MARK HUDSON PROJECT MANAGER, SRP
CASE STUDY 2

Largest hot tapping tool for energy pipe intervention

The problem

Mirage Machines, an Actuant company, designs and manufactures portable machine tools from its headquarters in Derby, UK. The Actuant group of businesses are leaders in a broad array of niche markets including branded hydraulic tools and solutions. Mirage supplies and services on-site machining technology; enabling global customers across many sectors for the energy market to perform on-site operations efficiently, effectively and safely.

Mirage approached Probe to manufacture a number of components for their innovative large 48” hot tapping tool for the Chinese market. High pressure hot tapping machines are specifically designed for energy pipeline intervention and wellhead maintenance activity. The significant internal pressure balancing of these machines allow for higher pressure applications, as they have a working pressure capacity of 5,000psi.

The components requested from Mirage for this project, ranged from large drive couplings, sleeves, shafts, boring bars and gearboxes. The hot tapping tool and all manufactured components also required full performance and factory testing that had to adhere to industry standard requirements.

The solution

This was the largest hot tapping tool ever designed and manufactured by Mirage with a cutting tool diameter of 48” (1219.2mm). All specifications of the components Probe produced, had to adhere to Mirage’s design parameters and engineering drawings as well as cutting parameters, and under pressure conditions as would be observed during operations.

Marc Saiche, Sales Engineer, Probe, explained, “We manufactured most of the major components for the Mirage large hot tapping tool and aided in the assembly and test at our state of the art in-house facility utilising our 20 tonne gantry crane. This included an impressive 48” 900lb Blind flange - 70” diameter and test adaptor - 70” diameter x 2m long. All the manufactured components had to be delivered to a tight lead-time to meet the factory acceptance test (FAT) date which was witnessed by Bureau Veritas (BV), a third party testing, inspection and certification company, and our client.

“Even though this required a quick turnaround, Probe were committed to safety excellence: so as with all projects this activity was carried out with stringent HSE procedures and policies, and risk assessment and method statements (RAMS), to ensure a safe and rewarding outcome.”

The result

The client received a full turnkey solution from Probe with supported design and guidance, and manufactured and testing services to all the specifications required.

“One of the key drivers for using Probe is that we are always guaranteed that the solution they provide meets our requirements and specifications. Having a full in-house capability, along with Probe’s considerable experience, provides us with the reassurance that we are receiving a quality product. This is whilst achieving the savings we are looking for, as it minimises inefficiencies and lead times that other service companies may have. The hot tapping machine was supplied in the agreed lead-time and in-line with our expectations.”

RICHARD BARLOW GENERAL MANAGER, MIRAGE MACHINES
The problem
When Probe received an order for a coiled tubing stress joint, they found it was much more than just a standard manufacture solution that was required. The client, Helix Well Ops, were seeking design assistance/validation, manufacture and rigorous testing of the product in compliance with both their specific requirements and industry standards.

From playing a key role in the Macondo deep-water oil spill response, to end-of-life plug and abandonment work, Helix Well Ops is an established player in rigless offshore well intervention, providing fast, flexible and high-quality well management services. They enlisted the support of Probe to allow them to complete a well recovery project for a client.

Coiled tubing is a continuous reeled steel pipe which is used in well completion, workovers, drilling and production. The most important performance properties of coiled tubing are its rated values for axial tension, burst pressure and collapse pressure. The stresses are caused by internal and external pressures and the axial force that is either tension or compression. The required stress joint provides the transition between the flexibility of the subsurface release (SSR) connectors and the stiffness of the Christmas tree interface equipment.

The solution
The original order was to manufacture, test and certify a coiled tubing stress joint. However, as the project progressed, the specification changed significantly. The stress joint was to be used in two different modes. This meant that a very thin section between the flanges and special clamp assemblies were required to increase the outside diameter of the centre sections when used in the secondary mode. Probe responded by manufacturing the clamp assemblies and also the flanged pulling heads. These would be used during the hydrostatic testing, which would be carried out by Probe prior to the product being shipped.

When manufacturing the stress joint itself, the material requirements meant that it was necessary to part machine the forging close to its finished size and then heat treat and test the steel using a prolongation. Once the mechanical testing had been carried out, the stress joint was machine finished to the client’s requirements.

In the final stage of the project, Probe were required to carry out a range of testing on the stress joint. This included proof tension and compression as well as hydrostatic pressure testing. To enable these procedures to be performed, Probe fabricated a large bespoke test frame, weighing approximately nine tonnes. Strain gauges were installed to verify the results of the calculations provided by a design engineer. Full non-destructive testing (NDT) including magnetic particle examination, ultrasonic examination and hardness testing was then carried out. This was all witnessed by Bureau Veritas (BV), a third party testing, inspection and certification company who worked in partnership with us to assess the required standards and measure against them as required.

The result
Helix Well Ops received a full turnkey solution from Probe. We responded innovatively when the requirements changed throughout the project, resulting in a manufactured and fully tested stress joint which has two modes of use. The product was supplied painted to the design specification requirements. This piece of equipment was essential for Helix Well Ops to deliver efficiently and on time to the end client.

We are delighted to have provided a complete in-house solution for this project. We are extremely proud of our testing capabilities and this project has fully utilised these facilities, especially as we were required to produce a bespoke test frame.

DAVE GOOD TECHNICAL SALES MANAGER, PROBE

DAVE GOOD