

# Stronger engineering capabilities

## BETTER ENGINEERED PRODUCTS

**Oceaneering Umbilical Solutions (OUS) – advancing technical development through customer focus and challenging boundaries.**

With extensive engineering knowledge, a solid track record in delivering solutions in challenging environments, a Tier 1 client list and a business growth strategy that demonstrates continued investment in technology, people and processes, it's no surprise that Oceaneering remains one of the leading global suppliers of subsea umbilical and cable connectivity solutions on land and in shallow and deep water applications.

At OUS, we recognise the importance to our customers of flawless execution in engineering design and delivery and in adding value to our offering through the depth and breadth of our engineering services, technical innovation and project management capabilities.



### Multiphase/ESP Pump Umbilical

Ideally suited to provide power to submerged pumps to overcome ultra-deepwater pressure, low reservoir pressure, long offset or high produced fluid viscosity limitations.



### Steel Tube Umbilicals

Designed to meet the needs of challenging deepwater and high-pressure tieback applications conveying hydraulic control fluid, injected chemicals or service lines.



### Thermoplastic Umbilicals

Providing proven cost effectiveness for electro-hydraulic applications. Hose bores range from 3" to 16" ID and hose pressures range from 3,000-15,000 psi. High Collapse Resistant (HCR) thermoplastic also available, for the injection of lightweight chemicals in deepwater applications.



### Integrated Service Umbilicals

Designed to solve a variety of more dynamic application challenges and can include a customized selection of flexible flowline, electrical cables, steel tubes and thermoplastic hoses.



### Electric Power & Fiber Optic Cables

These cables fulfil offshore platform-to-platform requirements for low and medium voltage electric power cables and fiber optics.



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# Delivering for our customers

OUS has successfully delivered over 2.9 million meters of product successfully engineered to meet the demands of increasingly challenging environmental conditions.

## Building confidence

Oceaneering Umbilical Solutions has one of the longest and most successful track records within the subsea industry. By applying engineering best practices, coupled with the innovation and persistence of our engineering team of more than 80 dedicated industry professionals, we support the full life cycle of product development from pre-FEED to product delivery. Our engineered solutions are based on sound analytical techniques and proven engineering principles.

## Adding value

The strength and capability of our engineering and project management teams is supported by our significant in-house technical knowledge and by our global manufacturing capability, which include:

- Three strategically located facilities totalling 132,000 m<sup>2</sup>
  - Panama City, Florida - USA
  - Niteroi, Rio de Janeiro - Brazil
  - Rosyth, Scotland - UK

Our local execution teams are supported by the strength and depth of our Central Engineering Group – maximizing the value created for our clients.

## Reducing risk

Our extensive in-house analysis capability allows us to confidently predict the behavior of our products. Our advanced analysis tools have been fully calibrated by our dedicated Test, Quality and Reliability facility in accordance with ISO13628- 5:2009. The combination of testing and engineering analysis provides OUS with a detailed understanding of our products and gives our clients the assurance that these products will withstand the challenging subsea environment. Combining the latest analysis tools with a modern test laboratory and 30 years of manufacturing know-how effectively underlines the strength and quality of our engineered solutions that represent a significant risk reduction for our customers.

## Working in partnership

OUS takes a collaborative approach with its' clients interacting early on in the process and working closely with them throughout the development of the engineered solution. This early involvement allows for a greater degree of input from both parties, a better understanding of the challenges and requirements of the project and ultimately, a better engineered solution.

## Continuous Improvement

Never satisfied with the status quo, OUS operates in a structured Continuous Improvement environment – using Six Sigma and Lean approaches, together with strategic development planning and a wide portfolio of R&D activities.





At OUS, we are relentless in our drive to continuously improve our engineering know how in order to deliver soundly engineered solutions that exceed customer expectations.

## Technical innovation & development

As operating environments become more severe and new challenges for subsea operations develop, OUS continues to invest in new technology, tools and applications to ensure we remain an industry leader in providing safe, reliable and robust engineered solutions. Some of that investment can be seen in the development of:

- Deep water and long offset cable gas/water mitigation & hydrogen permeation solutions
- Smart umbilical solutions for self-monitoring of umbilical temperature & strain
- New materials and processes for high pressure & duty cycle hose applications
- Large bore steel tube umbilical applications
- High cycle IWOCS solutions for heavy duty applications
- AC & DC power cables for the offshore renewable energy market

# Engineering services

OUS has delivered engineered solutions to every region within the World's subsea market.

We are structured to take full advantage of a centralised knowledge base of engineering expertise without sacrificing localized levels of engineering-tailored execution.

## Global Uniform Project Management

Feed Study



Concept Design



Detailed Design



Execution Engineering

Engineering Analysis

Test & Reliability

### Our engineered services process and capabilities include:

**Front End Engineering Design (FEED)** – to investigate potential solutions and conduct preliminary analysis to develop design concepts.

**Concept design development** – our engineering services will refine design concepts and conduct risk profiling to allow cost estimating, planning and procurement strategies to be developed for investment decision making.

**Detailed design** – with plans going through a rigorous engineering process based on proven methodologies and sound practices, to deliver 'best in class' implementation plans.

**Execution engineering** – with local engineering teams collaborating with project management and other key functions to deliver to exact client specifications.

**Analysis** – working across the whole design lifecycle using advanced tools and methodologies to simulate and predict performance of solutions in the intended environment.

**Test & reliability** – using state of the art equipment and processes to validate materials and structures to the limits of service.

## Project managed delivery

It is essential that the delivery of our services is appropriately managed in line with customer expectations. OUS maintains a world-class project management organization, providing project execution services that meet the client's scope, quality, delivery requirements and expectations, while effectively identifying and managing project risks.

Drawing from a global resource pool of over 20 experienced professional Project Managers, all who are Prince 2 or PMP certified, our Project Management Team operates to our proven structured project management methodology and applies its industry knowledge and skills set to effectively manage subsea projects and deliver value added solutions to our global clients.