



2H
offshore

Flexible Riser & Umbilical Engineering

an **ACTEON** company

Flexible Riser & Umbilical Engineering

2H Offshore has the capability and experience to provide flexible flowline and riser engineering, together with procurement, fabrication and integrity management support for both shallow and deep water applications. From concept design and FEED, to detailed engineering and installation analysis, this experience was gained through the execution of projects in areas including the Gulf of Mexico, North Sea, West Africa, Asia Pacific and Brazil, for a wide range of flexible pipe diameters and environments.



Services

Concept Design and FEED

- Feasibility assessment and concept design
- Preliminary analysis and engineering

Detailed Engineering

- Detailed global strength and fatigue assessment
- Ancillary component design and analysis
- Equipment specification and interface management
- Interference analysis

Procurement and Fabrication Management

- Requisition preparation
- Technical and commercial bid evaluation
- QA/QC witnessing and support
- PO management and expediting

Monitoring

- Specification of monitoring systems
- Engineering assessment of measured data
- Delivery management and integration

Integrity Management

- Development of integrity management plans
- Execution of risk based IM strategies
- Specification of inspection techniques
- Structural evaluation and recommendations
- Inspections
- DFIO dossiers

Installation Engineering

- Lay analysis
- Abandonment and recovery
- Vessel and interface loading
- Installation procedures

Verification Services

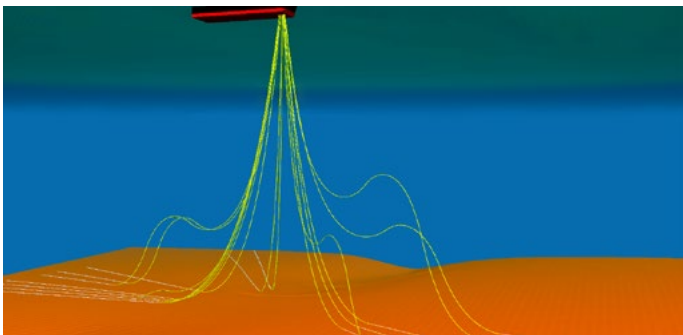
- Review and validation of design and installation documentation and procedures
- Structural evaluation and recommendations
- Certified verification agent (CVA) - design, fabrication and installation
- Witnessing of fabrication and installation



Key Projects

Tullow Oil - TEN Flexible Riser Engineering Support

Tullow Oil are developing the TEN (Tweneboa, Enyenra and Ntomme) fields offshore Ghana. 2H is integrated into the Tullow Oil URF delivery team to provide flexible riser and umbilical engineering technical assurance for the TEN development. This involves recommendations on how the projected layout will impact the dynamic response of the flexible risers and umbilicals and optimisation of the configurations to reduce clashing and maintain service life. As the project moves into the fabrication and installation phases, 2H will support Tullow Oil to ensure the flexible riser system meets the project specifications and quality expectations.

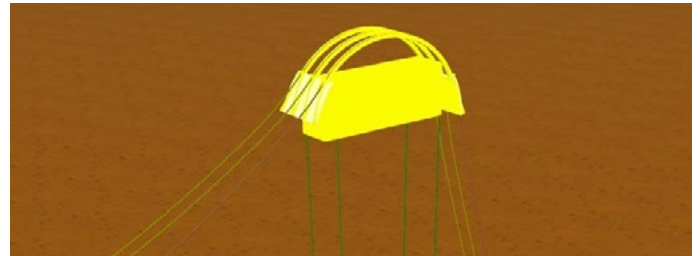


OIS - Lufeng Flexible Riser Installation Support

2H carried out installation analysis for two separate flexible risers including lay-down and pick-up of an existing 6in flexible riser to be reconnected to an FPSO mooring buoy and the installation of a new 8in flexible riser.

DUCO - TOTAL CLOV Umbilical Dynamic Analysis

2H was responsible for analysis of 5 dynamic umbilicals hung off from a spread moored FPSO in Block 17 offshore Angola. The scope of work included calculation of FPSO interface loads, interface analysis at the subsea arch, detailed extreme condition analysis and fatigue analysis.



Wellstream - Dai Hung Flexible Riser Global Analysis

2H successfully carried out the detailed analysis of six replacement flexible risers and two umbilicals hung-off an FPSO over three pre-existing mid-water arches for the Dai Hung field Offshore Vietnam in 110m water depth. In addition, 2H performed detailed motion analysis of the off-loading buoy and associated risers.

Perenco - Su Tu Nau Flexible Riser Feasibility Study

2H completed a feasibility assessment for a proposed field layout to assess usage of flexible risers to connect the north and south platforms with an existing FPSO. The feasibility study optimised the configuration and carried out a cost based analysis to determine the most suitable solution.



About 2H Offshore

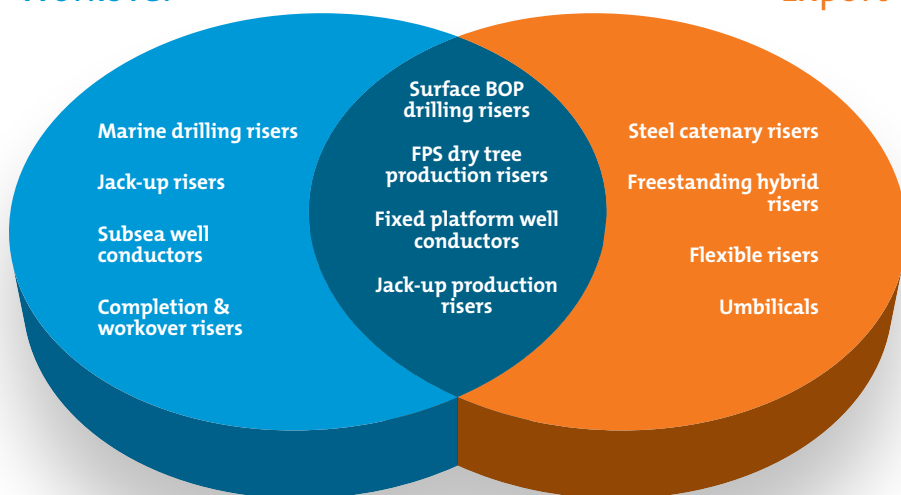
2H Offshore is a global engineering contractor specialising in the design, structural analysis and integrity management of riser and conductor systems used in the drilling and production of offshore oil and gas. Our capability and experience covers all types of risers, from shallow water fixed platform conductors, to drilling and production risers used in ultra-deep water.

Areas of Expertise

Our business falls into two primary categories, **Drilling, Completion & Workover** and **Production & Export**. Engineering of the risers used in each area of activity has many similarities in terms of the skill sets and experience required to conduct the work, but each area has many unique characteristics requiring specific experience and knowledge of the equipment and operations involved. The scope of each area of activity and overlaps that occur are illustrated below.

Drilling, Completion & Workover

Production & Export



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