Structural Monitoring
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2H Offshore has been delivering innovative and reliable structural monitoring solutions for subsea systems for over 15 years. Our in-depth understanding of riser and subsea system structural response is what enables us to develop robust and project appropriate integrated monitoring systems to help clients accurately monitor and proactively manage the integrity of their subsea assets.

2H’s structural monitoring and riser analysis experts recognize all the critical aspects involved in structural monitoring systems, and will deliver the best monitoring solution in order to meet project requirements. We maintain a practical view with a sound understanding of the field proven equipment available, the installation drivers and the operational needs of the customer, and employ sophisticated field data analysis techniques.

Why Monitor?

- Design verification
- Novelty of arrangement
- Severe environment
- Observed in-service problems
- Asset life extension
- Operational decision support

To date, 2H has successfully delivered over 500 structural monitoring systems globally for subsea structures including riser systems, subsea jumpers, flowlines, umbilicals, wellhead and conductor systems.

System Specification

2H designs tailored monitoring solutions which are optimized for capturing critical structural response, installation and post-processing. Field proven sensor, power and communication technologies are selected to meet project functional and operational requirements. Tight specifications are prepared to ensure an installable, operable, reliable and maintainable system.

Procurement Services

2H works independently, specifying and sourcing the most appropriate components on a project by project basis. Our procurement team qualifies suppliers, prepares requests for quotation (RFQs), manages suppliers and ensures reliable and timely delivery of the monitoring system and components, including advanced technologies selected for integrity-critical systems.

Data Management

2H uses advanced field data analysis tools and techniques to provide useful information to clients allowing them to meet their project objectives. Automated tools are available for sensor data quality checks and fatigue analysis in real-time for stand-alone, hard-wired or acoustic systems. State-of-the-art proprietary algorithms are used to calculate the fatigue damage of riser and subsea system response including wave and current induced motions.
Flexible Riser Monitoring System
2H Offshore supplied a flexible riser armor wire failure monitoring system for a Brazilian operator. The monitoring system detects the armor wire failure using a set of acceleration, angular rate and acoustic sensors. The monitoring system was validated based on extensive laboratory testing prior to offshore installation.

Shell Espirito Santo FPSO (BC-10) Mooring Line Monitoring
2H Offshore supplied the mooring line tension monitoring system for the Shell Espirito FPSO. The monitoring system measures mooring line tension by indirectly measuring inclination of the mooring line. The system also checks for progressive failure modes such as line creep or anchor slippage.

Key Projects

Chevron Tahiti’s Riser and Flowline Monitoring System
Chevron Tahiti’s riser and flowline monitoring system was designed and supplied by 2H Offshore in 2009. It is the first fully operational real time SCR monitoring system with both hang-off and touch down zone measurements. Periodic analysis of monitoring data provides valuable inputs to Chevron’s integrity management and R&D programs.

BP Drilling Riser and Wellhead Monitoring
2H has been providing integrity monitoring for a number of drilling risers deployed by BP in the Gulf of Mexico since 2004. In addition to riser fatigue, the complex issue of wellhead and conductor fatigue is tackled through the combination of monitored response and analytical predictions.

Murphy Kikeh Fluid Transfer Line Monitoring
2H Offshore was contracted by Murphy to provide monitoring and data back analysis for their ingenious Fluid Transfer Line (FTL). The FTL which is located 140m depth is monitored through a combination of acceleration and pressure sensors which are used to determine dynamic and global curvatures and FTL setting depth.
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**

- Marine drilling risers
- Jack-up risers
- Subsea well conductors
- Completion & workover risers

**Production & Export**

- Surface BOP drilling risers
- FPS dry tree production risers
- Fixed platform well conductors
- Jack-up production risers
- Steel catenary risers
- Freestanding hybrid risers
- Flexible risers
- Umbilicals

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