

# FULL SUBSEA HIGH-PRESSURE RISER SYSTEM AND ASSOCIATED EQUIPMENT DELIVERED WITHIN JUST 12 WEEKS

CLIENT:  
**MAERSK DRILLING**

PRODUCT:  
**SUBSEA HIGH-PRESSURE RISER SYSTEM**

Maersk Drilling required support with their abandonment program requirements in the central North Sea, for 8 wells on the Leadon field and 2 wells on the James field.

Following a successful tender process, we delivered a full High Pressure Riser System, the associated equipment and a full riser analysis report to the Maersk Gallant by February 2017. The rig was initially deployed to the James field in March 2017 where the high pressure riser was run allowing for the re-entry into the well for the abandonment program to begin.



**BACKGROUND** The Maersk Gallant was the chosen rig to carry out the abandonment program. As an ageing rig that has never been used previously to carry out subsea riser operations, a series of challenges for all involved with the project would need to be overcome to allow for a successful outcome, especially considering that the operational water depth of 120m would push the rig to its technical limits.

Throughout the early stages of planning, it was clear that the rig would require some key modification work in order to accommodate the running of a high pressure riser system, as well as the associated abandonment equipment. If this was not challenging enough, our in-house Riser Analysis team had also identified that due to the environmental conditions anticipated on location, that the riser would experience Vortex Induced Vibration (VIV), which would have to be counteracted through a suitable suppression system.

**SOLUTION** Aquaterra Energy's engineering teams worked very closely with Maersk Drilling by engaging in a series of rig surveys and client meetings. This allowed for a prompt development of solutions to the challenges associated with running high pressure riser offshore. The key areas being:

1. Development of detailed procedures allowing for the handling and storage of the high pressure riser and its associated equipment on a rig that has never run used subsea riser.
2. Complete detailed and field specific riser analysis modelling culminating in a comprehensive riser analysis report covering the entire operation and operational envelopes.
3. Engineer a solution to install both a lateral and vertical riser tensioning system on board the Maersk Gallant. This would counteract the expected loads modelled by our riser analysis team and allow the system to withstand a 50 year storm.
4. Engineer a solution to counteract the effects of VIV lock on identified as an issue during riser analysis.
5. Carry out a series of risk assessments and Hazard Identification sessions (HAZID) to identify key operational project risks to mitigate and document.

In Q4 2016, the Maersk Gallant was harboured in Invergordon, Scotland to allow for the final rig modifications to be incorporated prior to the mobilisation to the James field. This was the climax to several months of intensive planning and preparation that was deemed successful upon completion of a successful trial riser run on board.

**RESULTS** Both wells on James were successfully abandoned to conclude operations on this field during Q2 2017. Following this, the riser was required to be demobilised and placed into storage due to alternative contractual commitments with the Maersk Gallant for a short period. During Q3 2017, the riser was remobilised once more at short notice to commence operations on the Leadon field, demonstrating our ability to react quickly to operational requirements.

Throughout the project life cycle, we constantly assessed any lessons with Maersk Drilling hence allowing for continuous improvements to be implemented. This enabled increased efficiencies and cost reductions for Maersk Drilling via the reduction in rig time required to successfully complete operations offshore. Examples include procedural development to allow for the riser to be jumped between wells as opposed to carrying out a full recovery and re-run. Also carrying out optimisation for the final riser pressure testing configuration prior to installing the BOP saving approximately 3 hours of rig time for each operation.

## HIGHLIGHTS:

- Full subsea high-pressure riser system and associated equipment delivered within 12 weeks of purchase order award
- VIV Strake suppression system installed to the riser to counteract the effects highlighted by Aquaterra Energy's team of in-house riser analysts
- Zero lost time incidents