



INNOVATIVE FULLY FORGED-DRILLING RISER SYSTEM INSTALLED IN THE NORTH SEA

Back in June 2014 Claxton secured the contract for the installation of a fully forged drilling riser system for a field development in the Central North Sea for Premier Oil using the Ensco 100. The High Pressure (HP) Subsea Riser will be used on at least 18 wells over the three-and-a-half-year period of the contract with potential opportunity for further wells. 18 months since the riser was mobilized a number of key milestones have been achieved which are summarized in this case study.

THE PROBLEM

With the field development located approximately 200 km east of Aberdeen in 85 to 95 m water depth, three major oil discoveries had been made in the Blocks 28/9 and 28/10c: Catcher, Varadero and Burgman (collectively referred to as the Catcher Area fields).

As part of the development, Premier Oil required a conduit between the subsea wellhead and the surface BOP, associated through life services, an innovative approach to drilling all 18 wells, the supply of new build equipment, associated project management and the supply of operations support.

THE SOLUTION

Claxton offered a fully-forged riser solution as well as the traditional welded design for the riser joints in the early tender stages. This was seen as providing value to the project by recognising that an extensive drilling campaign may affect the riser's strength over the period if manufactured in the traditional way.

Claxton provided 17 fully forged riser joints including two tension and stress joints. Each joint was forged from a

single billet of material with no joining welds, which makes the riser stronger than traditional systems. The connection also offers a backseat test port that allows both seals on each connection to be tested before being deployed subsea which gives the client further confidence with the system. The riser's fatigue life as a result will far exceed the duration of the drilling phase of this project.

The challenge in the initial equipment development was also that the xmas tree alignment was key for the tubing hanger position and the riser subsequently needed to be able to provide the critical alignment.



Claxton Stress Joint Assembly being used on the System Integration Test

Claxton therefore designed and manufactured a dedicated guide frame to interface with the client's chosen wellhead supplier's guide base and tubing hanger alignment and orientation tool.

We also manufactured a tension nut to be used with the riser's tension joint that has an integral rack machined on its surface. This interfaces directly with the rig's tension system that was previously supplied by Claxton. Using our hydraulically controlled riser handling tool reduced time significantly when deploying and receiving the riser subsea.

Owen Lewis, Project Engineer, Claxton, said, "We believe that the system we have designed and developed is unique and only available through the industry leading design services that we are able to offer all in-house. The system also features the NORSOK Compact Flange Connection (CFC) DN600, to be used with 18-3/4" BOP. This type of flange offers double seal design."

THE RESULT

For the client, the double seal design offers more confidence with safety of the well while drilling, as well as less probability of leaks to the environment. The project has been a success so far with everything completed earlier than scheduled and under budget despite the challenges faced with drilling in the North Sea.

Mal Evans, Drilling Superintendent, Premier Oil, said, "Claxton's innovative approach, combined with their continued offshore and onshore support means that the HP Riser has been used to successfully drill the first nine wells (at time of writing) on time and safely. We are confident the work will be completed successfully and used on the final wells for the Catcher, Varadero and Burgman fields in Block 28/09a up to the end of the contract in 2019."



Claxton Stress Joint Assembly being deployed through the Texas Deck using the Ensco 100.