

AGR Petroleum Services achieves the first rig-based hydraulic fracture and well test in the UK southern North Sea.



CHALLENGE

AGR Petroleum Services had previously drilled the well in December 2006–January 2007 and was returning to complete and fracture the well in summer 2008.

Complicating Factors

- Securing a rig slot.
- No availability of a dedicated fracture stimulation vessel.
- The well work needed to be performed in a short time frame as the gas delivery deadline was autumn 2008.
- The installation of the subsurface production tree was from a jack-up rig instead of a semi-submersible rig.

RESULT

AGR successfully re-entered, completed, performed a rig-based hydraulic proppant fracture stimulation and tested the well some 18 months after drilling and suspending the original well. The project was executed between June and August 2008 using the ENSCO 100 jack-up rig, and the client flowed their first UK North Sea gas production in October.

This was accomplished by leveraging AGR's

- Leadership in multi-well multi-operator rig campaigns, which enabled it to provide a rig slot from its 2008 ENSCO-100 consortium.
- Tremendous engineering resources to develop an innovative solution to the problem of how the fracture stimulation

could be successfully accomplished on the rig within the limited deck space available and the client-defined cost and timing parameters.

- Experience of subsea tree installation from jack-up rigs gained on previous AGR-operated southern North Sea and eastern Irish Sea production wells.

As a result AGR provided

- The first ever rig-based hydraulic fracture operation in the UK SNS.
- The first ever subsea run of the Plexus M2S Pos-Grip wellhead system including a unique connector.
- The first run of a Vetco Horizontal Xmas Tree Structure for AGR Petroleum Services.
- The first gas production for the client 18 months after initial discovery, as the fracture stimulation enabled production from previously unattractive tight reservoir sands.

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KEY DATA PANEL

Total depth	9,634 ft TVD SS	Hydrocarbon type	Gas
Directional profile	Vertical	Province	Southern North Sea
Other	Fracture stimulation with 259,577 lb proppant		

TECHNICAL NOTES

From the outset, the logistics of the Victoria project were seen as a key challenge. The ENSCO 100 jack-up is a Gorilla-class drilling unit with a large deck space, four Le Tourneau cranes and a large tank capacity. The rig was the ideal candidate for the Victoria well as it would have to be able to hold the fracture, coiled tubing, nitrogen, subsea control, slickline and well test equipment simultaneously. AGR spent a substantial amount of time planning and designing this operation to ensure execution without any incident or downtime. This included detailed 'complete well on paper' exercises, risk assessments, 'load-out on paper' exercises, logistics planning meetings, pit management exercises, yard trials and lifting plans. After completion, the well was successfully perforated in two runs before preparing for the fracture operations. A mini-fracture was performed (for data analysis) followed by the main proppant fracture. A total of 259,577 lbs of proppant was pumped and placed without any lost-time incidents or non-productive time (NPT). This required the use of specifically-designed pump units and large proppant silos. In addition, contrary to normal fracturing operations, the rig pits were used to mix and store the frac gel.

KEY ENABLERS

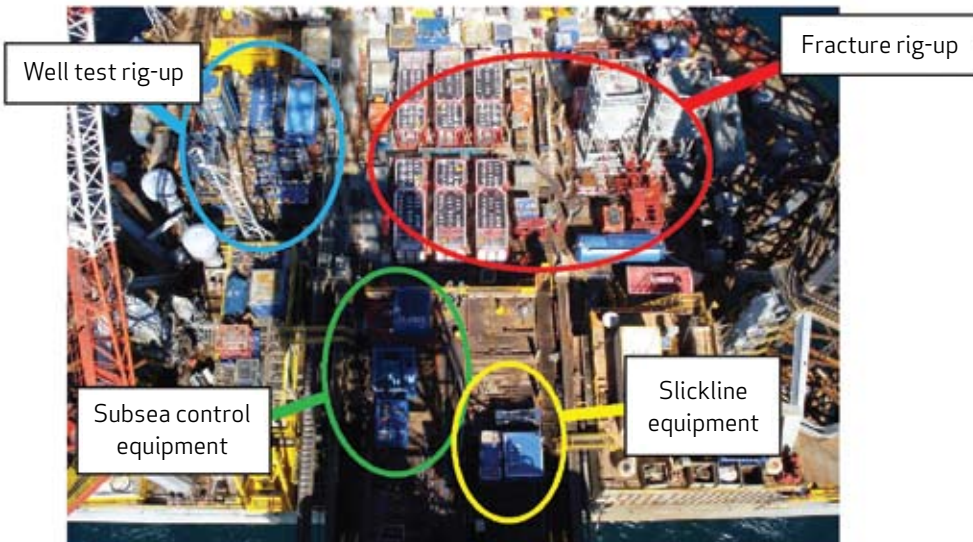
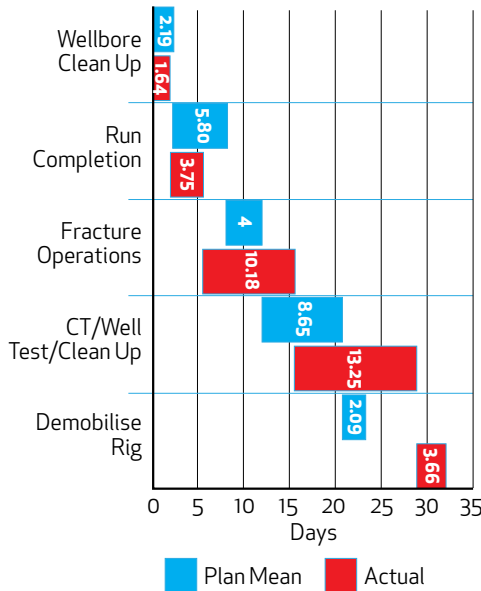
- Access to a suitable rig during a tight rig market.
- Access to an integrated team of technical professionals including drilling, subsea, completions and well-test engineers, frac engineers, a drilling superintendent, a well team leader, a project manager and dedicated materials and logistics co-ordinators.

KEY ENABLERS (CONT.)

- Integration with the client's project team.
- The development and use of a unique wellhead system (Plexus Pos-Grip M2S).
- Fracture stimulation to unlock a tight reservoir.

KEYWORDS

SNS, jack-up, summer 2008, ENSCO 100, hydraulic fracture, test, complete, re-entry.



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