

Low-Cost Reservoir Access using Slim-Hole Multi-Stage Completions in Norway's North Sea

Norway



Packers Plus, in partnership with Marwell, successfully completed a pilot program in Norway's North Sea that demonstrated a new approach to accessing bypassed oil reserves. By drilling slim-hole laterals with coiled tubing and installing multi-stage liners, the operator brought new production online without drilling additional wells. The pilot proved that coiled tubing-based completions offer a cost-effective, lower-risk alternative to conventional methods while maintaining production from existing wells.

BACKGROUND

The operator's goal was to access small, untapped pockets of oil adjacent to existing production liners. Historically, reaching these reserves required drilling new wells or pulling tubing to sidetrack an existing well—an expensive, complex, and time-consuming undertaking in the North Sea.

Instead, the operator chose to utilize coiled tubing drilling through tubing to sidetrack from the reservoir liner with a slim-hole multi-stage completion lining the hole. This liner needed to be deployable on coiled tubing and allow for multiple, isolated acid stimulations to target specific points along its length.

The operator engaged Marwell and Packers Plus to develop and provide a slim-hole completion system that could meet this target. The goal

was to create a practical solution that would reduce costs, accelerate timelines and increase access to new reservoirs, all without affecting the production of the parent wells.

CHALLENGE

The central challenge was accessing oil-bearing zones near existing liners without compromising current production. Conventional completion techniques would have required shutting in or abandoning the original well.

Drilling laterals with coiled tubing offered a more efficient path forward but introduced new operational limitations: reduced string weight, lack of rotation, and restricted ability to circulate while running liners. These constraints demanded a new completion design that could be installed in stages, ensuring reliability in the field.

SOLUTION

Packers Plus designed a 2.875-in. × 3.75-in. system tailored to these requirements. Key components included:

- FracPORT® sleeves with degradable balls for multiple isolated acid stimulations.
- RockSEAL® H2HT packers for zonal isolation between frac stages and water shut-off.
- RockSEAL® IIS packers for both anchoring drop off liner and liner top.
- Drillable / Closeable FracPORT® sleeve with degradable ball to allow continued production from parent well.
- Dissolvable Guide Shoe to allow latch-up of liner segments while allowing balls to later pass for acid stimulation.

This configuration enabled targeted acid stimulation of individual reservoir intervals, far more effective than a traditional acid wash through perforated pipe. It also provided flexibility to isolate water or other unwanted inflows.

To maintain flow from the parent wellbore, a Drillable-Closeable FracPORT was installed with the liner hanger placed above the window. After stimulation, this sleeve could be opened to restore production from the original completion. In addition, RockSEAL IIS packers with a PBR acted as a drop-off system, allowing more stages to be installed than coiled tubing alone would normally permit in a single deployment trip.

continued on reverse



RESULTS

The pilot program validated this slim-hole approach as a viable intervention strategy. Two multi-stage frac wells and two matrix wells were completed successfully, and were all put on production.

Despite the operational challenges of hole geometry and downhole conditions, the system proved highly adaptable. Real-time adjustments ensured successful installations, confirming that coiled tubing-deployed slim-hole liners can reliably unlock reserves that would otherwise remain uneconomic.

Notable outcomes from implementing this strategy included benefits such as:

- **Reduced Cost:** Avoided the high cost of equipment, labor, and time by drilling smaller-diameter holes within existing wells.
- **Accelerated Production:** Brought new reserves online faster than conventional methods, with less complexity.
- **Maintained Production:** Ensured production from the parent well was maintained.
- **Multi-Trip Installation:** Demonstrated a repeatable method for economically accessing bypassed reserves from existing production liners.
- **Multi-Stage Stimulation:** Enabled targeted acid stimulation across multiple intervals within the new liner, which is more efficient and cost-effective than conventional acid wash through perforated pipe.

Packers Plus is a leading supplier of multi-stage fracturing systems, providing field-proven stimulation technology for completing wells with superior production results in numerous formations around the world. For more information, visit packersplus.com.