

Remote operations delivers superior RNS, creates sustainable well delivery model for North Sea operators

In 1998, Baker Hughes initiated a program to begin drilling North Sea wells from the company's onshore bases in order to minimize health, safety and environmental (HSE) risks, drive efficiencies, and improve overall performance quality and consistency. Last year, the value of that investment was clearly evident.

In 2019, **Baker Hughes Remote Operation Services** drilled a record number of North Sea reservoir sections (64)—navigating more reservoir footage (117 000 m/384,000 ft) than ever before. Baker Hughes used its **AutoTrak™ rotary steerable systems (RSS)** and **VisiTrak™ reservoir navigation service (RNS)** to drill these wells remotely and set another annual record with an 88% average net-to-gross (N/G) ratio.

In addition to the impressive annual results, there were a significant number of individual projects worth spotlighting throughout the year.

January:

An operator's drilling department contacted Baker Hughes to execute a re-drill of previous well. The previous service provider had achieved only 68.6% N/G over a 750-m/2,460-ft interval due to the thin reservoir's undulating geology which made proactive geosteering difficult. Combining the expertise of the remote operations center with deep-reading VisiTrak RNS, Baker Hughes achieved an 88.5% N/G ratio while mapping the reservoir's geological structure and architecture across a long (1350 m/4,429 ft) interval.

February:

Baker Hughes deployed a remotely managed reservoir navigation service to map the surrounding pay and precisely place a well 2-3 m (7-10 ft) above the reservoir's oil-water contact. Likely as a result of Baker Hughes delivering an impressive 100% N/G ratio in the interval, the operator reported that the well was producing at a greater-than-expected rate.

April:

The Baker Hughes remotely managed geological mapping services provided the operator with an accurate picture of the geology—resulting in more pay being targeted on several of the operator's wells. The Baker Hughes remote team drilled three geological sidetracks to target and quantified the additional reserves. The service also precisely mapped the reservoir's lower section, leading the operator to determine that the reservoir base and oil-water contact were both deeper than previously believed.

June:

The Baker Hughes remote operations services team drilled the longest well from surface to total depth (TD) (8534 m/27,999 ft) in one operator's North Sea field. This well also ended up being the longest 8 ½-in. reservoir navigated in that field to date with a total length of 6334 m/20,781 ft measured depth (MD).

These successes were only possible because of the investment Baker Hughes made in its people,

Challenges

- Drive RNS efficiencies
- Improve net-to-gross ratios
- Reduce operational costs
- Minimize HSE risks

Results

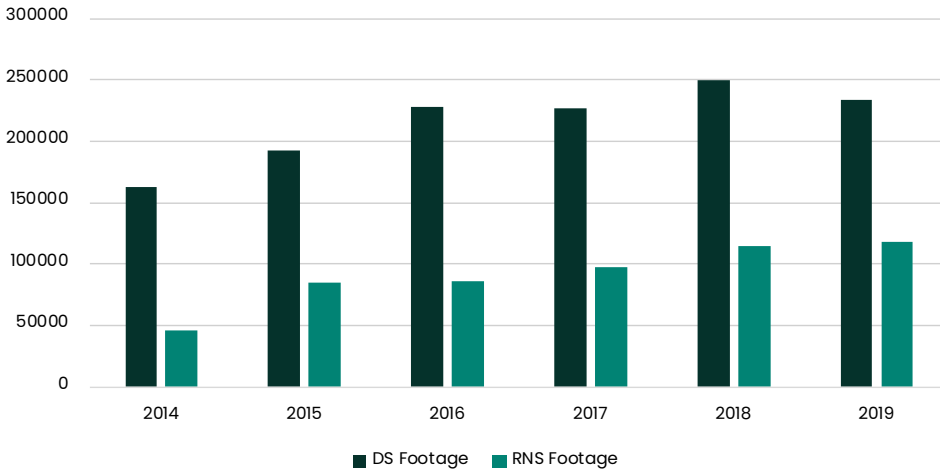
- Executed RNS and numerous additional services remotely
- Remotely drilled more than 117 000 m/384,000 ft with RNS
- Remotely navigated 64 reservoir sections
- Remotely drilled more than 250 000 m/820,200 ft on Troll wells in H12019
- Continued to drive down personnel-on-board numbers via remote operations services
- Achieved superior HSE results

systems, and technology over the previous decades. Baker Hughes operates and supports its 24/7 reservoir navigation services remotely from the company's BEACON center in Tanager, Norway, 365 days a year. During these critical operations, the company's RNS supervisors and

BEACON RNS engineers remain in close contact with customers to deliver flawless, real-time execution of the jobs while ensuring proper pre- and post-well planning occurs in order to drive learnings and rapid adoption of best practices.

Today, building on the investment in Norway, Baker Hughes is delivering an ever-increasing number of services remotely to ensure high-quality, efficient, and consistent performance everywhere it operates.

Footage drilled (8.5-in. and 6-in.)



Baker Hughes Remote Operations Services and its RNS team has helped drive efficiencies in the North Sea. Note the steady increase in reservoir footage as a percentage of total footage.