

Case study: Barents Sea, Norway

# VisiTrak service ensured optimal well placement

The Goliat field, operated by Eni Norge AS, has two separate sandstone reservoirs planned for development—the late Triassic/Jurassic Realgrunnen subgroup at approximately 3,609 ft (1,100 m) mean sea level (MSL), and the Middle Triassic Kobbe formation at approximately 5,906 ft (1,800 m) MSL. The Goliat field is the first oil-producing field in the Barents Sea.

The operator selected two gas injectors as the optimum production solution. Before the Goliat development, there were no horizontal wells in the Kobbe formation.

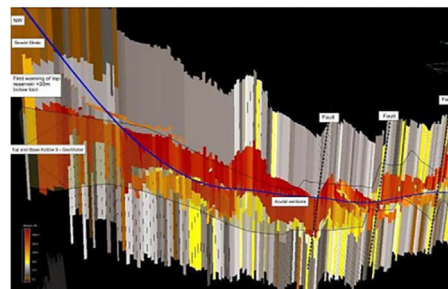
Although the field’s geometry requires horizontal production wells for effective drainage, its structure is relatively steep and prone to faults. Because of this, all compartments must be penetrated to ensure optimal gas injection to enhance oil recovery, but the wellbore’s trajectory was restricted to 1.5° dogleg severity after the landing.

To map the reservoir’s boundaries within 98 ft (30 m) of the wellbore, the operator used the **VisiTrak™ reservoir navigation and analysis service** and **AziTrak™ deep azimuthal resistivity service** from Baker Hughes. Multilayered response modeling using proprietary inversion modeling software was also used to provide high-quality, real-time structural information and reservoir thickness mapping.

Reservoir navigation services interactive software, in conjunction with the inversion modeling software, delivered an enhanced understanding of the reservoir, enabling the operator to navigate within the pay zone.

Real-time inversion interpretations were also enhanced by deployment of three-dimensional (3D) visualization techniques to understand differences with the geomodel. Interpreted formation tops were delivered to the operator in real time to correlate and crosscheck with input seismic horizons.

When landing the well, the service detected the top of the reservoir 66 ft (20 m) away, providing a 325-ft (99-m) measured depth warning and ensuring optimal landing into the reservoir. The operator drilled approximately 3,281 ft (1000 m) with an average ROP of 92 ft/hr (28 m/hr) and achieved an 80% net-to-gross ratio.



Real-time inversion results along the well are presented in 3D.

## Challenges

- First oil-producing field in the Barents Sea
- Complex structural environment
- Wellbore trajectory restricted to 1.5° dogleg severity

## Results

- Gathered all measurements in real time using logging-while-drilling (LWD) services
- Provided all interpretations in 3D environment
- Mapped reservoir boundaries within 98 ft (30 m) of the wellbore
- Drilled 3,281 ft (1000 m) with average ROP of 92 ft/hr
- Provided real-time inversion answers