



Wellbore History

GENERAL

Well 25/4-6 S was planned to prove the hydrocarbon potential in a structure located on the northern extension of the Heimdal Ridge. The structure is located in the NE corner of block 25/4, fairly close to the Heimdal, Frøy and Frigg Fields. Four-ways closures were mapped on all levels from the "Near top Frigg sequence" marker to the Base Vestland Group Marker. The structure above the Base Cretaceous Unconformity is a fairly simple dome/mounded feature, while the Vestland Group and deeper sections consist of an antithetic tilted block. The objective of the well was to explore all closures down to at least Vestland Group level. The primary target was the Vestland Group; secondary targets were the Frigg and Heimdal Formations, while the Statfjord Formation was a third, optional target. Based on data from surrounding wells, no abnormal pressure was expected. To achieve an optimal position in reaching the targets the well was planned deviated.

OPERATIONS AND RESULTS

Wildcat well 25/4-6 S was spudded with the semi-submersible installation West Vanguard on 15 April 1991 and drilled to TD at 4170 m, 41 m into the Statfjord Formation. The well was drilled vertical (max 2 deg deviation) through the Frigg and Heimdal prospects down to 2424 m. From here angle was built up to a maximum of 22.5 deg at 3025 m before it was dropped off again to 3 deg at final TD. The hole opener cone was lost at 266 m resulting in 8 days and 15 hours lost time before drilling could be resumed. The FMT tool got stuck at 3836 m with fishing unsuccessful. Thus it was decided to set a cement plug on top of the tool and perform a sidetrack. The well was drilled with seawater and viscous pills down to 197 m, with bentonite mud from 197 m to 1220 m, with KCl/polymer mud from 1220 m to 2503 m, and with lignosulphonate mud from 2503 m to TD.

The Early Eocene Frigg reservoir was not found, and the Palaeocene Heimdal reservoir was water bearing. Top Vestland Group came in at a depth of 3716 m, 37 m deeper than predicted. The group was 222 m thick and hydrocarbon bearing over the uppermost 120 m (hydrocarbon/water contact at 3836 m). The reservoir fluid type was assumed to be a condensate/wet gas with a 0.486 g/cc gradient over the HC-bearing zone, according to the RFT measurements. The Statfjord Formation was water bearing.

A total of 12 conventional cores were cut from the Vestland Group, Dunlin Group, and the Statfjord Formation. The mismatch between core depth and logger's depth was large. Core depth had to be added a correction of 8.5 m to 11 m in order to match with the logger's depth. A total of 25 sidewall cores were attempted and 19 were recovered. Two FMT fluid samples were taken, at 3803.5 m in the Hugin Formation and at 4141.5 m in the Statfjord Formation. Both recovered salt water with a small volume of gas.

The well was suspended on 24 August 1991 as a gas/condensate discovery.

TESTING

One DST tests was performed in the interval 3802-3819 m and flowed at a rate of 461700 Sm3/d gas and 688 Sm3/d oil through a 20.64 mm choke. The GOR was 671 Sm3/Sm3 with an oil density of 0.82 g/ml (41 deg API).

LITHOSTRATIGRAPHY & HISTORY FOR WELL: 25/4-6 S