



Wellbore History

GENERAL

Well 34/10-17 was the first well drilled on the Beta structure in the SE segment of block 34/10, south-west of the Alpha-structure, which contained the Gullfaks Sør Field. The primary objective of the well was to evaluate possible hydrocarbon accumulations in the Middle Jurassic Brent sandstones. The secondary objectives were the Early Jurassic Dunlin and Statfjord sandstones.

OPERATIONS AND RESULTS

Wildcat well 34/10-17 was spudded with the semi-submersible installation Deepsea Bergen on 22 February 1983 and drilled to TD at 3466 m in the Early Jurassic Statfjord Formation. The well was drilled down to 2687 m without special drilling problems. At 2687 m a heavy flow was observed after a drilling break. The well was shut in, and due to a plugged cement hose and kill line failsafe valve, about 200 hours were used to circulate out the influx, stabilize, clean up and condition the hole. Further technical failure and tight hole caused extensive time logging the 6" section, and the logging programme was reduced. The well was drilled with Seawater/gel spud mud down to 668 m and with seawater/gel/Lignosulphonate mud from 668 m to TD.

The Brent Group was encountered at 2685 m with hydrocarbon bearing sandstones in the Tarbert and Ness Formations. FMT pressures indicated a gas/oil contact at ca 2862 m, and an oil/water contact at ca 2914 m in the lower part of the Ness Formation. The logs indicated a total oil and gas net pay of 122.5 m with average porosity 22.5% and average water saturation 27%. Also the underlying water bearing Etive and Rannoch Formations of the Brent Group had good reservoir quality sandstones. The Dunlin and Statfjord sandstones were water bearing. Shows were recorded on cores down to 2947.5 m in the Rannoch Formation, and a geochemical core extract from 2923 m showed a chromatographic fingerprint no different from core extracts taken in the oil-zone. Otherwise no significant oil shows were seen in the well outside of the oil-bearing reservoir.

A total of 16 cores were cut continuously through the Brent reservoir section down to ca middle of the Rannoch Formation. The core-log depth match was generally good, but with minor deviations due to expansion of the cores after they were landed. The FMT tool was run for pressure samples in the Brent and Dunlin Group and in the Statfjord Formation. Segregated fluid samples were taken in the Brent Group at 2697 m (gas and condensate) and at 2889 m (oil).

The well was permanently abandoned on 8 July 1983 as an oil and gas discovery.

TESTING

The well was tested from four zones in the Brent sand. One DST produced water, the other produced hydrocarbons.

DST 1 tested the interval 2934 to 2944 m and produced only water at a rate of 1024 Sm3/day through a 40/64" choke in the main flow. Maximum down hole temperature recorded in the test was 108.1 deg C.

DST 2 tested the interval 2880 to 2890 m and produced 545 Sm3 oil and 134000 Sm3 gas/day through a 28/64" choke in the main flow. The GOR was 246 Sm3/Sm3, the oil density was 0.85 g/cm3, and the gas gravity was 0.74 (air = 1) with ca 1% CO2 and 1 ppm H2S. Maximum temperature recorded in the test was 106.0 deg C.

DST 3 tested the interval 2835 to 2845 m and produced 452 Sm3 condensate and 364000 Sm3 gas/day through a 32/64" choke in the third flow period. The GCR was 805 Sm3/Sm3, the condensate density was 0.78 g/cm3, and the gas gravity was 0.72 (air = 1) with trace CO2 and no detectable H2S. A somewhat higher oil rate and lower GOR was recorded on a 48/64" choke in the second flow period. Maximum temperature recorded in the test was 104.3 deg C.

DST 4 tested multiple intervals from 2754 to 2790.5 m and produced 320 Sm3 condensate and 428000 Sm3 gas/day through a 32/64" choke in the third flow. The GCR was 1338 Sm3/Sm3, the condensate density was 0.76 g/cm3, and the gas gravity was 0.71 (air = 1) with ca 1% CO2 and 0.6 ppm H2S. Maximum temperature recorded in the test was 101.2 deg C.

LITHOSTRATIGRAPHY & HISTORY FOR WELL: 34/10-17