



Wellbore History

GENERAL

The appraisal well 6305/4-1 is located in the north western part of the direct hydrocarbon indicator (DHI) area of the Ormen Lange Field, in the eastern part of block 6305/4 in PL209. There were three main objectives for the well, all having equal priority. The first objective was to reduce the risk of the worst-case scenario of reservoir compartmentalisation. The second objective was to address the potential slide risk due to reservoir drainage of the main production area, and the third objective was to reduce the risk of worst-case GIIP through improved knowledge on the hydrocarbon distribution. Further important objectives were to test the reservoir quality closer to the NW margin of the gas field as well as to acquire a new check point for geophysical, geological and petrophysical interpretations.

OPERATIONS AND RESULTS

The well was spudded on 16 March 2002 and reached a total depth of 2975 m in the Late Cretaceous Springar Formation. In general, the drilling conditions experienced in well 6305/4-1 are as predicted. The well was drilled with seawater and hi-vis pills to 1756 m and with KCl/polymer/glycol (Glydril) mud from 1756 m to TD. In tie-well 6305/5-1 problems with borehole instability was experienced in the Eocene deposits. No such problems were reported from well 6305/4-1, but loss of mud to the formation was experienced during the leak off test at 1749 m.

All drilling objectives were met. All logging and well test objectives were met. The well proved good reservoir quality in the Egga Reservoir Unit, which was thinner than prognosed. A gas Down To situation was encountered in the lowermost Egga Formation. Isolated, overpressured water filled sands were found in the underlying units. Shows were recorded only in the reservoir section. A single day production test indicates dynamic sealing for parts of 3 of the 4 seismically interpreted faults, which surround the well location. One 60 ft core was cut in the Ooze section of the Brygge Formation from 1761 m to 1779 m (Core #1). Additional 3 x 60 ft cores were cut from 2769 m in the Egga reservoir sand to 2817.3 m. When Core # 3 was at rig floor it started to expand due to trapped gas. Approximately 1,5 - 2m of core came out of the inner barrel and partly disintegrated on rig floor. The upper part of the inner barrel contained therefore gaps between core pieces. As a result, the measured depths do not fit the actual depth of the reservoir for core # 3.

Formation temperatures using Horner plots were estimated at 2660 m and 2975 m giving 72°C and 84°C, respectively. This gives an average formation temperature gradient of 4.31°C / 100m TVD assuming 1.8°C at seafloor. It was prognosed a gradient of 4.4°C. The small discrepancy may be due to the uncertainty of the method used. The result was within the range of data from nearby wells. The average gradient may be further divided into one gradient of 4.52°C from seafloor to 2660 m and then one gradient of 3.81°C from 2660 m to 2975 m. However, the long marine riser is known to cool down the mud to such an extent that the use of only Horner plots to estimate the formation temperature becomes doubtful. The well was tested and a temperature of 86.9°C was estimated at 2783.5 m. This would give an average formation temperature gradient of 4.84°C/ 100 m TVD, which is higher than prognosed. With a gradient of 4.84°C/ 100 m TVD the BHST at TD (2975m) equals to 96.1°C. Eight MDT samples were taken in the Reservoir at 2788.8 m. All eight recovered gas. One MDT sample taken at 2811.1 m recovered water.

The well was permanently plugged and abandoned after testing as a gas appraisal well on 2 June 2002.

TESTING

A production test was carried out, producing 1.87 mil Sm³ gas and 153 Sm³ condensate /day through a 80/64" choke at 135 bar.á

LITHOSTRATIGRAPHY & HISTORY FOR WELL: 6305/4-1