



Wellbore History

GENERAL

Well 2/4-3 (named 2/4-2X by operator Phillips) was drilled to appraise the 2/4-2 Ekofisk discovery in the southern Norwegian North Sea. The target was to test the Tertiary and the top of the Late Cretaceous.

OPERATIONS AND RESULTS

Well 2/4-3 was spudded with the semi-submersible installation Ocean Viking on 27 January 1970 and drilled to TD at 3431 m in the Late Cretaceous Tor Formation. The well was planned vertical, but the deviation was significant. Maximum deviation was 1 deg at 618 m, 3 deg at 1077 m, 11.5 deg at 1316 m, 16.4 deg at 1605 m, 10 deg at 2167 m, 4 deg at 3002 m, and 1.7 deg at 3292 m. This indicates that TVD RKB is ca 30 m shallower than MD RKB at TD, but exact records are not available. The well was drilled with seawater and hi-vis mud down to 619 m, with CaCl₂ / Dextrid (modified potato starch) from 619 m to 1695 m, and with lignosulphonate / seawater from 1695 m to TD. One - four percent diesel was added to the mud below 619 m.

The Danian chalk (Ekofisk Formation) was encountered at 3090 m, and the Late Cretaceous chalk (Tor Formation) at 3253 m. The formations were tested hydrocarbon bearing from 3124 m to 3319 m.

Eighteen conventional cores were cut in the well. Core 1 was cut in the interval 1705 - 1717 m with only 0.6 m core recovered. Cores 2 - 13 were cut in the Danian chalk (Ekofisk Formation), while cores 14 - 18 were cut in the Maastrichtian chalk (Tor Formation). No fluid samples were taken on wire line.

The well was permanently abandoned on 31 May 1970 as an oil appraisal.

TESTING

Ten drill stem tests were carried out through perforations in the 7" liner. DST 1 and 2 tested the intervals 3352 - 3362 m and 3331 - 3341 m in the in the Tor Formation. They produced only water. DST 3 to 9 tested different zones in the interval from 3124 to 3319 m in the Ekofisk and Tor Formations. They produced gas and oil. The oils were in the range 33.2 to 36 deg API and the GOR varied from 182 to 243 Sm³/Sm³. DST 10 tested the interval 3016 - 3024 m in the Sele Formation. It flowed 2.4 Sm³ of water, and then died. Reservoir temperatures at mid perforation were reported to be: 134.4 deg C (at 3317.7 m) in DST 3, 133.6 deg C (at 3281.2 m) in DST 4, and 132.2 deg C (at 3238.5 m) in DST 5.

LITHOSTRATIGRAPHY & HISTORY FOR WELL: 2/4-3