

Mittelplate-A14a - First Steerable Drilling Liner Application in Germany

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Abstract

Challenging environments such as unstable clay formations represent high operational risks when running tubulars after drilling is completed. The use of a Steerable Drilling Liner (SDL) system combines drilling and casing of the hole, thereby mitigating the risk of not being able to run the liner due to time dependent formation collapse.

On offset wells, the troublesome Dogger Gamma Shale (DGS) formation has caused high NPT and high trouble costs in the past leading to several technical sidetracks with high costs. Past experience shows that DGS has a time-dependency as the instability increases over time. In addition, an increase in overpull, pressure, torque spikes, and cavings (up to 100%) were observed. In order to lower the risk, opening time and reduction of mechanical / hydraulic impact on the troublesome formation has to be reduced. However, this is difficult to achieve with conventional methods.

MiPL-A14a was identified as a suitable candidate for the first steerable drilling liner (7") application in Germany. The case study presents the planning and the execution of the SDL operation as well as results compared to similar operations. The components of the SDL system will be reviewed and explained. Detailed planning is crucial for a successful SDL operation.

Despite two additional roundtrips in the beginning caused by downhole tool failures (one was not related to the SDL) drilling operations were carried out as planned. Drilling itself was very smooth with steady drilling parameters and a rate of penetration higher than in the offset wells. ECD was lower than simulated and good hole cleaning was achieved. The SDL was fully capable of Geosteering to land precisely in the reservoir formation. Having reached TD of the section, cementing was performed using a separate string which included a seal stem, liner hanger and liner top packer.

The SDL system allowed drilling of 726m of the 8 ½" section making this operation the third longest run worldwide. Compared to the conventional method, the openhole time of the DGS until the liner was set at TD was reduced significantly. This minimized the risk of any troubles substantially and made the whole project a success story.