Hoop Basin

Drilling success and playground for new exploration methods

P-Cable data across 23rd license round blocks

23rd round blocks
Production licenses
TGS 3D coverage
Approx. location of P-Cable line
The Hoop Fault Complex has been a focus area for several exploration companies since 2009 and the first 3D seismic data set was acquired by TGS. Five exploration wells have been drilled, resulting in two light oil discoveries in good Jurassic reservoirs. The relatively shallow exploration targets make the area suitable for other geophysical methods than "normal" 2D and 3D seismic data. The industry demands higher resolution data. The large Hoop Fault Complex data set has been reprocessed using broadband processing techniques and P-Cable 2D and 3D seismic is being acquired to satisfy industry demand. This reprocessing is providing new information about the presence and phase of hydrocarbons in the structures, and Controlled Sources Electromagnetic (CSEM) data has been proven as a useful tool in the area. While all these methods are valuable on their own, the integration of several data sets will be essential for hydrocarbon exploration in the Hoop Fault Complex area.

**STRUCTURAL GEOLOGY OF THE HOOP FAULT COMPLEX AREA**

The Hoop Fault Complex has experienced several episodes of faulting. Deep in the section faults are cutting Carboniferous and possibly older strata. The Triassic, Jurassic and Cretaceous successions are offset by a younger series of faults trending north-northeast south-southwest. These faults and successions make up the characteristic Hoop Graben, which can be seen in Figure 1. Overprinting these episodes of faulting, the Upper Triassic to the crest of the Cretaceous section has also been affected by a late east-west trending pattern of faults. These faults are important for the definition of fault bounded structural closures in the Jurassic section, which have been targeted in the successful Wisting Central and Hanssen wells. The different structural styles seen in the Hoop Fault Complex can have large implications for the migration and re-migration of hydrocarbons into the shallow structures.

**POTENTIAL RESERVOIR ROCKS**

Post-Eocene erosion has removed a lot of Cretaceous and possibly younger strata from the Hoop Fault Complex area. This has implications for hydrocarbon exploration. The erosion of the upper part of the section has made older strata more easily accessible for explorationists. In certain areas near the Hoop Fault Complex, the Jurassic succession in shallow fault blocks has been successful, with several light oil discoveries in good reservoirs. The Hoop Fault Complex is now one of the core areas for the Norwegian 23rd licensing round.

**INTEGRATION OF DATA SETS**

Integration of different geophysical and geological data sets are essential for effective exploration in the Hoop area. It is a complex area and one data set alone will not provide all the answers. TGS offers a turn key suite of products for exploration in this highly prospective area, from micro- to macro-scale. Long offset 2D and the 20,000 km² of broadband processed 3D enables TGS clients to understand the regional geological map, all structure closures, and examine sedimentary burial histories in the area. It also gives the opportunity to perform AVO studies on the many leads and prospects. The shallow Jurassic leads can be examined in the greenest detail using P-Cable 2D and 3D data, and CSEM will help understand the presence and saturation of hydrocarbons in the structures. Further the risk of prospects can be done by examining the results from the seafloor sampling.

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