

Johan Castberg — The First Giant Oil Discovery in the Barents Sea

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Abstract

In April 2011, the Skrugard prospect was the second prospect to be drilled in the Bjørnøyrenna Fault Complex in the Norwegian part of the Barents Sea, 24 years after the first, dry well. An 83 m (272 ft) column of 32 API oil with a minor gas cap was proven in 352 m (1150 ft) thick sandstones with excellent reservoir properties. Ten months later the neighboring Havis prospect proved a 127 m column of 35 API oil and similar volume of recoverable oil as Skrugard. Together they make up the main pools of the Johan Castberg Field. Both wells were testing rotated and eroded fault blocks in the Bjørnøyrenna Fault Complex. The Early to Middle Jurassic shallow marine and fluvial sandstone reservoirs were developed as prognosed, capped by Late Jurassic and Early Cretaceous shales and sourced from Late Jurassic source rocks. In the early exploration efforts in the Bjørnøyrenna Fault Complex and the adjacent Fingerdjupet Subbasin and Bjørnøya Basin from 1987-1993, five exploration wells had tested similar prospects, but all were dry, most with oil shows, and were interpreted to have leaked during Tertiary uplift and erosion. The Bjørnøyrenna Fault Complex and adjacent basins were abandoned by the oil companies after the disappointing early exploration results. In 2004, Statoil (Equinor from 2018) initiated new regional studies in the area and several prospects were identified on 2D seismic, some with seismic flat spots, but the volume potential was limited. In 2008, WesternGeco acquired the first 3D seismic survey over the area, and the analysis of these data immediately led to increased volume estimates and higher probabilities for discoveries, leading Statoil and ENI Norge to apply for an exploration license in the 20th exploration round, awarded in May 2009. Continued exploration in the license has been supported by the extensive use of integrated geophysical studies utilizing both 3D seismic, OBC and 3D CSEM data. The Skrugard and

Havis discoveries have been followed by an exploration program of 8 more wells so far, all discoveries. The Johan Castberg field reserves at PDO was 558 MMbbl of recoverable light oil with an estimated plateau production at 190.000 barrels per day.

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