

Jasper(PL 255B) Shallow Hazards Drilling Evaluation Through Innovative Seismic Processing

In November 2017 TEPN received approval to drill the Jasper prospect in the Norwegian Sea in 2018. Prior to getting a permit to drill, a site survey and shallow hazards evaluation is required. The weather conditions in the Norwegian Sea are rough and the site survey acquisition window is relatively narrow (mid-April – early September). Even during this period there is a high risk of waiting on weather and, thus, an increased cost. A normal industry way of doing a site survey for the Jasper well could then start in April with a standard acquisition program of around three weeks plus a minimum one month of interpretation. Taking into account the time of getting the rig contract, drilling preparations and permitting to be done, the earliest well spud date would be January 2019.

To avoid delaying the drilling the idea was to contract PGS to perform seismic processing existing 3D GeoStreamer data to image the shallow section as part of the shallow hazard evaluation to ensure safe drilling. This seismic processing (SWIM) uses the inter cable multiple energy for better seismic imaging. The processing project took a little more than two months and the results were delivered in a due time prior to the signing of a rig contract to spud the well on 1st of July 2018. One of the technical benefits of reprocessing using SWIM, compared to the standard HR2D (High resolution 2D seismic), is the 3D perspective. The deliverable was a 3D seismic volume with a wide frequency spectrum (equally wide as for HR2D) which made it possible to map out shallow features in 3D. During the seismic processing a very precise velocity model in the overburden was built (FWI), so the depth to the different events is accurately predicted leading to an enhanced shallow hazards evaluation and safer drilling.

The physical site survey program (done in April 2018) with seabed sampling, seabed scanning and a few HR2D seismic verification lines was reduced to a minimum duration of three days with a limited weather downtime exposure.

In the presentation, comparisons between HR2D seismic and seismic from the SWIM processing will be shown.

This project was initiated and successfully performed as a corporation between the license partner Equinor and the seismic contractor PGS.