

Ekofisk Vectorseis[®] Test: Improvements in Vector Fidelity of 4C Seismic Data

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ABSTRACT

The ConocoPhillips Norway, Reservoir Characterization section performed a 2D OBC seismic test over the Ekofisk field in September, 2002. This test involved using Input/Output's recently developed VectorSeis[®] system based on their proprietary MEMS (Micro-Electro-Mechanical Systems) accelerometer technology. A single 2km prototype cable was developed for this test, resulting in the first deployment of the VectorSeis sensor in a marine field environment. The objective of this test was to evaluate the feasibility of using these new sensors to improve imaging in future OBC work at Ekofisk.

Previous OBC surveys in the Ekofisk area demonstrated poor vector fidelity of the three vector component geophones, yielding an inaccurate representation of the recorded vector wavefield. Due to the polarized nature of shear waves, poor vector fidelity had a negative impact on P-S converted-wave imaging from these surveys. The seismic industry in general has observed similar struggles with vector infidelity of marine OBC systems that are hindering the overall quality and reliability of converted wave data. Results from this test demonstrate how the VectorSeis sensors used in this study provided an improved vector fidelity response that should result in better imaging of converted wave data.