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New Seabed Cable Technology for EM and Seismic Applications

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SUMMARY

A new exploration technology has been developed which combines the strengths of both seabed seismic and EM sensing into a single seafloor cable to locate and identify the content of hydrocarbon reservoirs. While conventional seismic methods offer the best means to map the sub-surface structural geometry, EM waves have the ability to identify reservoir fluids better than seismic P-waves. Therefore EM data acquired in combination with seafloor seismic (P- and S-waves) are considered the best way of determining hydrocarbon probability. The technology was first tested out in the Sognefjord and extensive field trials were performed in 2008 over the North Sea Peon discovery.

A new exploration technology has been developed which combines the strengths of both conventional seismic and EM sensing into a single seafloor cable to locate and identify the content of hydrocarbon reservoirs. The technology was first tested out in Sognefjord during February 2007, and extensive field trials were performed over the North Sea Peon discovery during a two week test period in April/May 2008. The operation went very well and resulted in the acquisition of a large amount of data. Dens sampled, very high quality multi parameter data were recorded. These will be used to further optimize the acquisition configuration.

The objectives of the Peon test were:

- Compare EM seabed cable data with existing node technology
- Compare S/N ratio for long (275 m) and short (25 m) electric field receivers
- Investigate effects of source height
- Prove concept of integrated seismic receivers
- Streamer tests

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The MultiField system applies to targets in water depths of up to 2000 m in the first version.

Controlled Source EM in combination with seismic by using ocean bottom cable.

Comparison of electric sensors within one cable segment of 300 m; antenna length is 25 m.

Comparison between state of the art node e-field receiver in red and cable inline e-field receiver in blue; antenna length in cable is 25 m.