Permanent seismic installations at the sea-floor have emerged as a potential tool for oil companies in their work to actively monitor oil/gas flows and injection processes in order to increase hydrocarbon recovery and optimize production. The advantage of fibre optic over electric sensors is that the fibre optic sensor technology is completely passive at the wet-end, i.e. no short circuits will happen, longer life-time of components, high sensitivity, high dynamic range, less intrinsic noise, no corrosion of sensing components, fewer parts and potentially cheaper complete receiver systems. Fibre optic multi-component ocean-bottom receiver systems for 4D applications can now be produced and installed successfully at locations where the oil companies would like exploit the life-of-field seismic concept. The analysis of the data from the pilot tests confirms the systems high degree of vector fidelity, high signal-to-noise ratio, very good ground-station coupling, reliability and excellent response in general to wave modes in connection with ocean-bottom seismic. Fibre optic based permanent seismic monitoring systems represent a great opportunity for the field engineers to optimize production and increase the hydrocarbon recovery rate from existing fields.

We are advocating optical sensing technology to be an important part of the tool box for the oil companies in their work to implement the instrumented oil field in a cost efficient way. The “optical oil field” should represent the next step in technology in connection with reservoir monitoring in order to increase the hydrocarbon recovery rate.
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