

Multicomponent Seismic (3C) Data Acquisition – A Case Study From Oil India Ltd. Operational Area in Upper Assam Basin

K. L. Mandal, A. K. Khanna, and Dr. R. Dasgupta

Oil India Limited, Duliajan, Assam, India

klmandal@oilindia.in

M/s Oil India Ltd. (OIL) has several old & matured fields in Upper Assam Basin, India, wherein the reservoirs are at various stages of depletion. In these fields, the producing reservoirs are of mainly sand-shale sequences of Late Oligocene Barail group and Miocene Tipam group. The Late Miocene Girujan formation is also prospective in places and has lots of potential hydrocarbon bearing sands. To sustain hydrocarbon production from these fields, it has been decided to arrest the declining production by finding un-swept/by-passed oil as well as new hydrocarbon bearing sands within Girujan, Tipam and Barail formations, which still remain undetected through conventional seismic.

Towards this aim, OIL has decided to carryout Multi-component seismic survey in its fields for having superior subsurface image and improved reservoir model in terms of lithology, types of fluid present and presence of anisotropy & fractures etc.. Multicomponent seismic survey is cost intensive. So, before doing a full-fledged multi-component seismic campaign in the fields, a feasibility study has been carried out using well log data & review of available seismic data to understand the suitability of the multi-component survey. The feasibility study found that the multi-component survey can yield good results in indentifying the hydrocarbon bearing potential sands. The whole survey campaign is planned in two phases. In the first phase, a pilot study is planned comprising of acquisition of 2D-3C profiles over the couple of oil fields and a 3D-3C in one of the oil fields. It is also been decided that if the pilot study yields good results then routine 3D-3C will be carried out in other fields in the second phase. The data acquisition is almost complete and that will be processed & interpreted soon.

As a whole, multi-component seismic survey has three stages viz. Acquisition, processing and interpretation. There is a scope to make the entire survey campaign cost effective if the data acquisition is a low cost one. Quality data can be acquired in a low cost way through proper planning and using 'Fit for Purpose' methodology. This paper covers a case study in this regard in OIL's operation areas of Upper Assam Basin.