Geological Society of Malaysia — Petroleum Geology Seminar 1988

APPLICATION OF VERTICAL RECEIVER ARRAYS IN 3D SEISMIC EXPLORATION

R. BEKKER
GECO ASIA PACIFIC

Substantial experience has been gained with a new acquisition technique which comprises two streamers towed at different depths forming a vertical receiver array. This method enables wave field separation into upgoing and downgoing parts.

The process is applied in two steps. Application of the first step gives results which can replace recordings with one streamers at a streamer depth equal to the vertical streamer separation. This permits continued acquisition in bad weather by lowering the streamers below the sea-state induced noise zone. In the second step a deterministic deghosting operator is applied yielding a wider frequency bandwidth and an improved potential resolution.

In addition to a large amount of 2D data, some 3D surveys have been acquired during 1987 using the technique. On one occasion the application was limited to infill lines, and on another it was confined to a local area of the total prospect. In this paper we will present data where part of a survey was shot twice, once conventionally and once with the over/ under technique, thus allowing for a unique 3D comparison. The ability of the over/under technique to match conventional data has been studied by merging these different 3D data volumes. Although the motivation was mainly economic related to the increased production weather window, the potential to obtain enhanced frequency bandwidth by application of the second step of the process was also analysed. Data examples will be shown. Time slices proved to be a suitable tool in this comparison.

Warta Geologi (Newsletter of the Geological Society of Malaysia), Vol. 14, No. 6, November-December 1988