

4D, 4C: A First For Western

Western Geophysical has acquired the industry's first 4-D, 4-component (4-C) seismic survey in the Gulf of Mexico. The survey was conducted for Texaco in Block 354 of the Eugene Island area. Data processing is currently underway.

The 4-D/4-C survey was acquired using Western Geophysical's ocean-bottom cable (OBC) surveying technology and specially designed multicomponent recording equipment from Input/Output, Inc. Western Geophysical plans to repeat the survey in approximately six months and several additional times in the future. Any changes in the attributes of the seismic data volumes can be correlated with possible changes in petrophysical properties of the reservoir.

Such a time-lapse 4-D comparison will allow Texaco to monitor fluid movement in the reservoir over time.

The 4-C aspect of the survey refers to the use of a three-component geophone and hydrophone at each receiver station. Western Geophysical uses the hydrophone data to perform its proprietary Dual Sensor (SM) processing for eliminating water-bottom multiples and increasing bandwidth.

The three-component geophone data allows for acquisition of shear-wave (S) seismic data. Acquiring S-wave seismic data as a supplement to conventional compressional-wave (P) seismic data helps distinguish between lithology and pore fluid effects in the reservoir, and enables enhanced reservoir characterisation and monitoring. Relatively unaffected by fluids, S-wave data are used to obtain structural information in areas where P-wave data fail to produce coherent images. S-wave data also help determine fracture density and orientation.

Texaco views the multicomponent aspect of this project as being at least as important as the 4-D time-lapse aspect.

For more details on this survey, contact **Larry Scott**, manager of marine/OBC operations, in Western Geophysical's Houston office at 713-963-2419 or fax 713-963-2471.