A Novel Approach to Processing Vibroseis/Transition Zone Seismic Data

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Objectives: A large vibroseis survey over sand dunes and coastal plain and an adjacent dynamite/airgun transition zone survey were jointly reprocessed. Key to the processing was zero-phasing for the vibroseis and the impulsive data, before picking first-breaks for refraction statics. The objective is a more reliable seismic image of these oil fields.

Procedures: A vibroseis survey was reprocessed jointly with an adjacent transition zone survey in Abu Dhabi. The area covers two major low-relief oil fields. Data of high temporal and lateral resolution and of good structural and stratigraphic accuracy is required for mapping subtle faults and improved reservoir characterization. Accurate long and short wavelength statics solutions and reliable stratigraphic wavelet processing are critical.

The vibroseis survey comprised an area of sand dunes, hard sabkha plains, and flat lying shoreline. The transition zone survey comprised dynamite sources in land and shallow water and airgun sources in deeper water. Geophone and hydrophone receivers were employed on both surveys.

Starting the processing by zero-phasing the wavelet was employed to deliver consistent data character across the surveys. Excellent statics results were achieved in reprocessing due to careful first break picking after zerophasing, and integrating both uphole and refractor delay time information.

Results and Conclusions: The successful reprocessing of the merged transition zone and land surveys is due primarily to good teamwork, open two-way communication and critical project management between ADCO and PGS.

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