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3D Transition Zone OBC Survey in India: In Quest of the Elusive Traps

We present the results of a recently completed transition zone 3D-OBC survey, extending from land to 30 meters water depth in Krishna-Godavari basin of India. A major Mio-Pliocene unconformity, followed by the deposition of thick clay sequence during Pliocene had made this area an excellent target for structural and strati-structural traps of Miocene. The 3D survey was aimed at targeting these subtle strati-structural plays associated with complex growth fault mechanism and lenticular sand bodies.

Single hydrophones, dual sensors and clamshell geophones were deployed to ensure optimum sub-surface coverage. The survey area is characterized by surf-zone, hostile river mouth, inaccessible sandbars, strong under currents and production platforms. Innovative measures like receiver rollback to circumvent surf-zone, clamshell geophones layout on beach, improvised equipment design and layout, meticulous 3D survey design, were adopted for dynamic fold solutions to achieve optimum offset-azimuth distribution throughout the prospect. Well-structured navigation and seismic QA/QC procedures were implemented to minimize the source-receiver positioning errors and receiver noise.

The processing was designed for geometry QC, removal of geophone/dual sensor noise, unambiguous merging of navigation and seismic data, improvement in signal-to-noise ratio using signal-enhancement algorithms, derivation of scalars for summation of geophone-hydrophone data and generation of 2D stacks, inlines, cross-lines, time slices and near trace cubes for in-field assessment of data quality.

The processed data shows good S/N ratio, better resolution and crisper fault definitions compared to the existing 2D seismic data. The final migrated 3D volume, after detailed interpretation, will provide significant leads for reservoir delineation and additional accretion.