

The use of fast track 3D streamer and OBC data in the development drilling of Seligi

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A comprehensive depletion management study for the Seligi field in 1997 identified the need for a new 3D study. Since 7 active platforms are present over the field, a combination of Ocean Bottom Cable (OBC) and conventional streamer 3D techniques were deployed to ensure full fold coverage. Objectives of the new survey were to define the current fluid distribution over the field and thus to identify infill drilling opportunities. Streamer data over the Seligi-F area was fast-track processed in order to optimize development drilling which was on-going during that period. This fast-track cube enabled a number of major improvements to the interpretation and resulted in a very successful development drilling program. Similarly, OBC data over the Seligi-H area was fast-track processed for input into the ongoing North Seligi Development Plan.

In the Seligi-F area, three main areas of improvement were identified in the new fast-track survey. Higher resolution within the group K section has allowed more accurate identification of the DHI response for the K-10 reservoir. Improvements in the data quality and resolution can be attributed to using solid streamers for reducing noise, 4 times smaller inline spacing (25 m) and higher frequencies of 100 Hz vs. 70 Hz (at 2 secs) on the older 1985 3D survey. Additionally, inversion of this higher resolution dataset has enabled reservoir quality changes within the J-20 reservoir to be delineated on the basis of acoustic impedance. Finally, higher quality, denser spatial sampling coupled with more optimal line orientation has resulted in a better imaged fault network. Integration of this improved structural and stratigraphic framework with reservoir depletion management techniques has aided the completion of the 32 well Seligi-F development drilling program. Seismic input resulted directly in the drilling of 4 additional wells and added a further 6.7 MBO EUR to the going-in Seligi-F reserves.

In the Seligi-H area, the higher resolution and greater bandwidth of the OBC dataset has given a better delineation of the amplitude anomaly and stratigraphic events associated with the J-15/16 reservoir. Analysis of this anomaly and comparison with the older survey is being used to investigate 4D time lapse effects over the Seligi field.

Seamless integration and merging of the streamer and OBC datasets over the entire field is now enabling the improvements seen and interpreted on the fast-track cubes to be extrapolated to the entire field. Integration of this high quality seismic dataset with production data is currently being utilized to further optimize the Seligi field reservoir management.