
Fahud Changing Image - Seismic Processing Contribution to the Rejuvenation of Oman's Oldest Oil Field

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Fahud is PDO's oldest and largest oil field. It measures 17 km by 2.5 km, with an STOIP of more than 6 billion barrels of oil and produces from the Natih carbonates.

The topography of the Fahud field is a rugged limestone jebel (mountain) underlain by soft Fiqa shales. The anticline is dissected by wadis (dry river valleys), with surface elevations varying between 140 and 350 meters.

The 1994 seismic data was re-processed in 1997, without resolving all data quality issues. After thorough analysis of the data, and a 2D/3D pilot project, a new 3D seismic survey was acquired in 2004 combined with acquiring 20 up-holes, drilled to a depth of 150 m AMSL.

Significantly improving the seismic image quality for the field required solving the complex surface and near surface problems. This was achieved through building a high fidelity velocity model, for the near surface and the deeper velocity variations, used to tackle both the static and dynamic positioning errors through application of statics and pre-stack depth migration. The model incorporated elevations, up-holes, well-tops, check-shots, near surface geology, remote sensing data, interpretation of near surface seismic reflections and seismic velocities.

The paper will demonstrate how this was crucial to extract value from Fahud and how this contributed to the rejuvenation of the FDP for Oman's oldest and largest oil field.
