INTEGRATED SEISMIC RESERVOIR CHARACTERIZATION TECHNIQUES APPLIED TO UMID-BABEK FIELD

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Umid-Babek is a gas condensate field operated by UBOC. The principal reservoir rocks are Productive Series of Lower to Middle Pliocene age. Gas condensate is produced from Fasila Suite, known as horizon VII. Balakhany Suite, horizon V is a primary exploration target. A mud volcano is located between Umid and Babek. The block is situated within the area of high tectonic activity and is disturbed by complex system of faults.

The current work summarizes the methodology of integrated seismic reservoir characterization applied during the FDP by joint UBOC and SLB teams and showcases the main findings and conclusions.

Seismic data, reprocessed in 2020 was used in the analysis, which, despite certain outstanding issues, improved the results of structural interpretation and seismic reservoir characterization. Reprocessing involved anisotropic velocity model building by combining FWI approach and TTI Tomography. With this model three types of migration products, further used in interpretation were generated: RTM image and Q-KDM/LSMi set of full, partial stacks and AVO products.

Integrated seismic reservoir characterization involved full cycle of structural seismic interpretation, supported by application of advanced seismic attributes, enhancing the features of interest, stratigraphic analysis, rock physics, AVO/AVA modeling, AVO/AVA simultaneous seismic inversion and seismic reservoir prediction.

As a result, structural framework with reduced uncertainties, showing <1% mis-tie in newly drilled wells was obtained. Main mud volcano body, located between Umid and Babek was delineated for further use in geological and geomechanical modeling. Stratigraphy and depositional setting of the Balakhany, Fasila, NKP and NKG reservoirs was characterized.