GEOPHYSICS PAPER 10

CONVENTIONAL APPROACH SEEMS TO BE THE BEST!

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Lateral and vertical velocity variations are among the key concerns for time to depth conversion especially in carbonate regime. A reliable velocity model should take account of these issues.

The K prospect area is well known of its geophysical and geological complexity. The targeted and proven reservoirs are believed to be a type of platform carbonate. Furthermore, the existence of channel filled by shale throughout the whole K block, in the shallower horizon, i.e. at W level had caused pull down effects until the basement level. The poor seismic data quality and the unavailability of stacking velocities have developed more challenges to the study.

There were three methods had been identified in order to produce a reliable velocity model meant for time to depth conversion purposes. The three methods are; average velocity model, 3D velocity model and conventional layer cake model.

The first model is an application of well average velocity with main focus on the targeted reservoirs. The 3D velocity model had used a 3D grid as a platform to incorporate all TWT surfaces, well and DMO velocities. A statistical concept of modeling had been applied to populate the well (primary trend) and DMO velocities (secondary trend) in a single 3D model. Then, an anisotropy function ({well velocity / DMO velocities} X DMO velocities) had been generated as to integrate the anisotropy factor into this model.

The third model is a conventional method which was generated based on observed velocity changes in sonic data vertically. Whilst, the TWT surfaces had been used as to control for lateral variations. Later, both well velocities and TWT surfaces had been incorporated with utilizing the Vo-K method as the basis of generating this model.

Based on the statistical report of residual errors, the third model turns up to provide the least amount of erroneous.

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