

Combination of Geological, Geophysical and Reservoir Engineering Analyses in Field Development: A Case Study

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Abstract : A sequence of different Reservoir Engineering methods and tools in reservoir characterization and field development are presented in this paper. The real data of Jin Gas Field of L-Basin of Pakistan is used. The basic concept behind this work is to enlighten the importance of well test analysis in a broader way (i.e. reservoir characterization and field development) unlike to just determine the permeability and skin parameters. Normally in the case of reservoir characterization we rely on well test analysis to some extent but for field development plan, the well test analysis has become a forgotten tool specifically for locations of new development wells. This paper describes the successful implementation of well test analysis in Jin Gas Field where the main uncertainties are identified during initial stage of field development when location of new development well was marked only on the basis of G&G (Geologic and Geophysical) data. The seismic interpretation could not encounter one of the boundary (fault, sub-seismic fault, heterogeneity) near the main and only producing well of Jin Gas Field whereas the results of the model from the well test analysis played a very crucial rule in order to propose the location of second well of the newly discovered field. The results from different methods of well test analysis of Jin Gas Field are also integrated with and supported by other tools of Reservoir Engineering i.e. Material Balance Method and Volumetric Method. In this way, a comprehensive way out and algorithm is obtained in order to integrate the well test analyses with Geological and Geophysical analyses for reservoir characterization and field development. On the strong basis of this working and algorithm, it was successfully evaluated that the proposed location of new development well was not justified and it must be somewhere else except South direction.

Keywords : field development plan, reservoir characterization, reservoir engineering, well test analysis

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