

Fracturing geological model and fracturing optimization in tight gas reservoirFu Ninghai¹, Liu Linqing² and Guo Zhi¹¹PetroChina Research Institute of Petroleum Exploration and Development, P R China²Research Institute of Exploration and Development, PetroChina Southwest Oil & Gas Field Company, Chengdu, Sichuan

Tight sandstone reservoirs have strong heterogeneity, different distribution characteristics of effective sand bodies have different technical requirements for staged fracturing of horizontal wells. How to make full use of geological conditions and optimize the technological parameters, while controlling the investment cost and improving the fracturing effect, has become the key to further improve the development benefit of horizontal wells. Based on the geological and development characteristics of the research area in Eastern Sulige gas field, the study on the influence factors of horizontal well development effect is carried out. The main controlling factors including the size of the effective sand body, the stacking pattern of the reservoir and the fracturing technology are analyzed. According to the geology and production characteristics, combined with the differences of fracturing technology, the geological factors affecting the fracturing effect in the study area are refined into four elements: effective sand body, blocking zone, sand body and mudstone. On this basis, four fracturing geological models affecting the horizontal well reconstruction effect are summarized: massive thick layer type, multiple stacking type, local concentrated type and scattered isolated type. For the four types of geological models, the corresponding numerical simulation models are established, and the relevant parameters are optimized. The developing strategies are presented corresponding to the models. The massive thick layer type can only fracture the gas layer evenly, the multiple stacking type can fracture the gas layers mainly and fracture the sand bodies individually, the local concentrated type can fracture both gas layers and sand bodies, and determine the number of fracturing segments according to reservoir conditions, the scattered isolated type can fracture gas layer and isolated sand body, and the non-reservoir section can be fractured when reached a certain length. The study enhanced the combination of fracturing geology and fracturing technology, improved the pertinence of fracturing design of horizontal wells, and improved the fracturing effect.

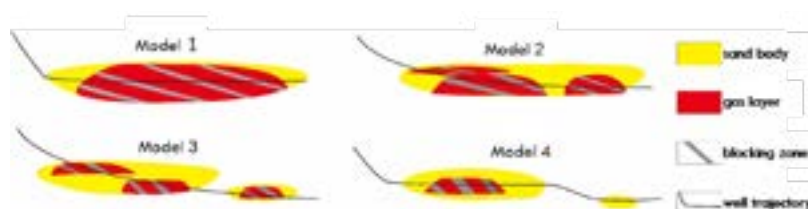


Fig. Four fracturing geological models

Recent Publications

1. The evaluation and recoverability analysis of low-quality reserves in Jingbian gas field[J], 2012, Acta Petrolei Sinica, EI.

Biography

Engineer, born in 1981. Master degree, Graduated from China university of petroleum (Beijing) in 2008. Mainly engaged in natural gas development for nine years. Research on gas reservoir engineering, numerical simulation and low permeability tight gas reservoir development and evaluation.

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