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本期视点

克拉美丽气田火山岩气藏开发主体技术

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摘要:

位于准噶尔盆地陆梁隆起东南部滴南凸起西端的克拉美丽气田, 是以石炭系为目的层的火山岩气藏。火山岩气藏的气井存在产量低、递减快的难题。为此, 中国石油新疆油田公司采用“整体部署、分步实施、井间接替”的原则, 形成了下列配套开发技术, 为提高该气田开发效果奠定了基础。火山岩岩性岩相识别和井震结合的有利储层预测技术主要搞清了火山岩的岩性岩相特征, 进而预测有效储层的展布。不同储层地质条件下的钻、完井方式优选技术成果主要包括: ①在储层厚度较大、距边底水较远、裂缝相对发育的区域优选直井压裂投产; ②在储层物性好、厚度大、距边底水较远的区域优选欠平衡直井投产; ③在厚层、距边底水较远、夹层发育的区域, 优选水平井压裂投产; ④在距底水近、物性相对好的区域, 选用欠平衡水平井裸眼完井投产。钻井工艺优化技术包括: ①以优选钻头为重点的综合提速技术; ②优化防漏堵漏技术; ③欠平衡水平井钻井技术。增产改造及采气配套工艺技术和成果包括: ①深层火山岩储层压裂技术; ②井下作业储层保护技术; ②直井和水平井现场压裂施工获得成功。

关键词:

Main development technologies of volcanic gas reservoirs in the Kelameili gas field

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Abstract:

The volcanic gas reservoirs in the Kelameili gas field, situated in the western Dinan salient of southeastern Luliang Uplift of the Junggar Basin, are taking the Carboniferous as the pay zones. The exploratory wells here presented low gas deliverability and a high decline rate. Therefore, the PetroChina Xinjiang Oilfield Company, adopting the principle of "planning as a whole, implement by stages, interwell succeeding", has developed a series of the matching development technologies to pave the way for improving the gas yield in the Kelameili gas field. The technology of favorable reservoir prediction, through combining lithological character and lithofacies identification with crosswell seismic technique, makes it clear for us to know the petrophysical properties of volcanic rocks and the distribution of favorable reservoirs. The optimized technologies in drilling and completion operations under different geological conditions include a. fracturing completion of vertical wells for the reservoirs with a big thickness, relatively developed fractures, and a rather long distance from the edge bottom water; b. underbalanced vertical wells for the reservoirs with good petrophysical property, bit thickness, and a rather long distance from the edge bottom water; c. fracturing completion of horizontal wells for the reservoirs with a big thickness, a rather long distance from the edge bottom water, and a developed interbeds; and d. underbalanced horizontal openhole wells for the reservoirs with a relatively good petrophysical properties and a short distance from the edge bottom water. The optimized drilling technologies include a. a complete ROP technology with the optimized bit as the focus; b. the optimized technology of leakage prevention and lost circulation control; and c. underbalanced horizontal drilling technology. The achievements of simulation treatment and gas production include a. fracturing treatment in deep volcanic gas reservoirs; b. reservoir protection in downhole operation; and c. successful fracturing operation for both vertical and horizontal wells.

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