ICCES, 2023, vol.26, no.1
DOI: 10.32604/icces.2023.010343

PROCEEDINGS

Study on Variation Law of In-Situ Stress Around Well Under Different Fracturing Technology of Shale Gas Platform Well

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ABSTRACT

In recent years, shale gas development in Fengnan 4 well area of Xinjiang Oilfield is dominated by platform wells. In contrast to conventional fracturing development, the zipper fracturing is primarily used in this block. In this paper, the finite element model of platform well fracturing is established by establishing the mathematical model of multi-cluster fractures interacting with each other, considering the condition of multi-well and multi-fracture. The sequential fracturing of platform wells and the zipper fracturing (well alternating fracturing, fracturing stage alternating fracturing) are simulated in this paper, and the variation law of induced stress and horizontal principal s are established by establishing the mathematical model of multi-cluster fractures interacting with each other, taking into consideration the condition of multi-well and multi-fracture. Considered is the variance of in-situ stress in various fracturing techniques. The results show that: 1) In the fracturing of platform wells, due to the mutual interference of adjacent well fracturing, the non-uniformity of fracture propagation is high, which results in a non-uniform change of in-suit stress; 2) Under each fracturing process condition, the in-suit stress increases to some extent, with the minimum principal stress increasing the most, followed by the vertical principal stress and the maximum horizontal principal stress. 3) Zipper fracturing has a bigger impact than sequential fracturing on the platform intermediate well's peripheral stress value. The research results may be useful for optimizing the well fracturing mode on a shale gas platform.

KEYWORDS

Shale gas; platform well; fracturing technology; numerical simulation; in-suit stress

Funding Statement: The authors received no specific funding for this study.

Conflicts of Interest: The authors declare that they have no conflicts of interest to report regarding the present study.