

عنوان مقاله:

Numerical analysis of open-hole multilateral wells considering intermediate principal stress

محل انتشار:

چهارمین کنفرانس ملی ژئومکانیک نفت نوآوری و فناوری (سال: 1401)

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نویسندگان:

Erfan Rahimi - Graduate of Petroleum Geomechanics Engineering, Department of Civil Engineering, K. N. Toosi University of Technology | Tehran, Iran

Hasan Ghasemzadeh - Associate Professor, Department of Civil Engineering, K. N. Toosi University of Technology | Tehran, Iran

Mohammad Ali Iranmanesh - Assistant Professor, Department of Civil Engineering, K. N. Toosi University of Technology | Tehran, Iran

خلاصه مقاله:

Safe drilling is an essential parameter in the oil and gas industry. Modern drilling methods such as multilateral(ML) wells increase production efficiency. However, drilling such wells is associated with mechanical instability. Those issues depend on the formation strength parameters, in-situ stress, well-direction, pore-pressure, and fluid parameters. The study of stability requires a failure criterion. Hereof, some failure criteria do not consider the role of intermediate principal stress(σ_2), which is proven to have a considerable effect on mechanical failure. Our study uses the three-dimensional(3D) finite element method (FEM) to investigate the stability and solid deformation of an ML well that follows the Mohr-Coulomb (MC) and Mogi-Coulomb (Mogi-C) failure criterion to studying of mechanical failure. Our results revealed that the weakest range in these wells is at the junction of branches. Due to the principal stress effects, using the Mogi-C criterion is more safe and closer to reality.

کلمات کلیدی:

(Multilateral Well, Intermediate Principal Stress, Mogi-Coulomb, Well Stability, Finite Element Method (FEM

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