

عنوان مقاله:

An Evaluation of Rock Integrity and Fault Reactivation in the Cap Rock and Reservoir Rock Due to Pressure Variations

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نویسندگان:

Mohammad Abdideh - Assistant Professor, Department of Petroleum Engineering, Omidiyeh Branch, Islamic Azad University, Omidiyeh, Iran

Yaghob Hamid - M.S. Student, Department of Petroleum Engineering, Omidiyeh Branch, Islamic Azad University, Omidiyeh, Iran

خلاصه مقاله:

Cap rocks are dams which can prevent the upward movement of hydrocarbons. They have disparities and weaknesses including discontinuities, crushed areas, and faults. Gas injection is an effective mechanism for oil recovery and pore pressure. With increasing pore pressure, normal stress is reduced, and the integrity of impermeable boundaries (cap rock, fault, etc.) becomes instable. A successful strategy for reservoir development is the inevitable necessity of conducting geomechanical studies and modeling the reservoir. The construction of a comprehensive geomechanical model, including the stress state is a function of depth (direction and amount), physical properties of the reservoir rock and its formations (rock resistance and elastic moduli), pore pressure estimation, and description and distribution of fractures and faults. In this work, analytical and numerical methods have been used in geomechanical modeling of gas injection into the reservoir and, simultaneously, the operation of Asmari reservoir and Marun oilfield cap rock in the southwest of Iran were carried out. The threshold of reactivating faults and the critical pressure of induced fracture were calculated, and the results were presented as analytical and numerical models. Moreover, in addition to analyzing the stress field at depths, the resistance parameters of the formations were determined. The results showed that the most changes and instabilities were around the wellheads, .fractures, and the edges of the field

کلمات کلیدی:

Cap Rock, Discontinuity, gas injection, pore pressure, Geomechanical Model, elastic rock properties, Numerical modeling

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