

Systematic Geomechanics Applications for Drilling Optimization

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Abstract

In order to improve drilling performance and well production, various drilling methods have been developed, which include overbalanced drilling, underbalanced drilling, air drilling, foam drilling, and managed pressure drilling (MPD). For all of these drilling operations, essentially, the wellbore stability characteristics are crucially important for selecting the drilling method, optimizing drilling mud weights, and evaluating drilling operation risks. Comprehensive geomechanical models have been developed and implemented in petroleum industry, which can be used to investigate the wellbore stability features of various drilling operations. With an example case, this article illustrates the systematic geomechanics applications for selecting a drilling method, optimizing a casing program, recommending mud weights, and evaluating drilling operational risks, based on simulated wellbore stability characteristics.