

An Integrated Approach for Optimizing Drillable Parameters to Increase Drilling Performance: A Real Field Case Study

Authors : Hamidoddin Yousife

Abstract : Drilling optimization requires a prediction of drilling rate of penetration (ROP) since it provides a significant reduction in drilling costs. There are several factors that can have an impact on the ROP, both controllable and uncontrollable. Numerous drilling penetration rate models have been considered based on drilling parameters. This papers considered the effect of proper drilling parameter selection such as bit, Mud Type, applied weight on bit (WOB), Revolution per minutes (RPM), and flow rate on drilling optimization and drilling cost reduction. A predicted analysis is used in real-time drilling performance to determine the optimal drilling operation. As a result of these modeling studies, the real data collected from three directional wells at Azadegan oil fields, Iran, was verified and adjusted to determine the drillability of a specific formation. Simulation results and actual drilling results show significant improvements in inaccuracy. Once simulations had been validated, optimum drilling parameters and equipment specifications were determined by varying weight on bit (WOB), rotary speed (RPM), hydraulics (hydraulic pressure), and bit specification for each well until the highest drilling rate was achieved. To evaluate the potential operational and economic benefits of optimizing results, a qualitative and quantitative analysis of the data was performed.

Keywords : drilling, cost, optimization, parameters

Conference Title : ICOGR 2022 : International Conference on Oil and Gas Research

Conference Location : Montreal, Canada

Conference Dates : May 23-24, 2022