Abstract:

ABSTRACT Purpose. The objective of this study is to determine the best operating conditions for the most notable drilling parameters (i.e. weight on bit (WOB), rotary drilling speed (RPM), and characteristics of drilling fluid) using field data obtained from El-Sharara Oil Field. Methods. The used data has been extracted from daily drilling reports of well named (NC-186/K04h) field. Such data contains information about the geological formations, casing strings, drill-bits, fuel consumption, flow rate of drilling fluid and other drilling parameters. Findings. The results reveal that the lower geological formations of El-Sharara Oil Field, the harder are the upper formations. Therefore, it is recommended to apply heavy loads (i.e. WOB of 45000 lb) with low drilling speed (i.e. 100 rpm) in the lower formations; and to apply small loads (i.e. WOB of 19000 lb) with high drilling speed (i.e. 160 rpm) in the upper formations. Originality. This study evaluates the performance of drilling operation based on the interaction between rock formations and machine drilling parameters. Practical implications. Understanding such interaction between rock formations and machine drilling parameters will remarkably improve the rate of penetration (ROP) in the related geological formations. Consequently, the overall drilling costs will be reduced in terms of drilling time, life of drill-bit and fuel consumption.

Keywords:

Keywords: improvement of drilling operation, operating parameters, rock properties, oil well drilling, El-Sharara Oil Field

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