

Improving the Well Construction Rate of the Mogollon Formation using New Technology

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Abstract

The Mogollon Formation, which has been produced for 50 years, is among the most productive reservoirs in Block X, located in Peruvian northwest. The drilling history of Mogollon shows a low rate of well construction including several changes of drill bits because it is composed by conglomerates and strongly cemented sandstones. These conditions reduce the expectations of the drilling projects.

Massive drilling campaigns have been carried out between 2005 and 2012 years, with intermediate formation as objectives with total depth average of 4500 ft. and with excellent results in construction rate and rate of penetration (ROP). These reservoirs are shallower than the Mogollon formation.

Good performance, knowledge and best practices acquired during the drilling campaigns allowed CNPC propose the drilling of Mogollon in order to develop the reserves of this reservoir and improve the cost of drilling.

The parameters that were worked and improved were the drill bit design, bottom hole assembly (BHA), drilling rig, and operational practice. These parameters were changed and accommodated according the results of perforation of a pilot project. The drill bit fit was a PDC with five and six gauge pad and cutter of 16 and 13 mm; the BHA used was directional LWD-MWD-APWD and the rig was hydraulic 1000 to 1500 HP with top drive.

The improvements achieved allowed CNPC increase the rate of penetration and construction rate to reduce the number of drill bit and BHA, to reduce connection times and finally to reduce the cost and time of drilling this reservoir. These conditions make multiple drilling projects more viable improve their performance.