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Futuristic well design approach to drill deep horizons in north region of Pakistan ; A case study

Shakeel K, Rizwan Jameel and **Muhammad Tashfeen**
MOL, Pakistan

Some operators have recently had hard time drilling deep horizons for oil and gas exploration in the north of Pakistan. A region known to have geological uncertainties which often causes drilling challenges such as wellbore instability, excessive hard reaming, lost circulation, and deviation control etc. The magnitude of these challenges increases even further when encountering formations with different pressure regimes in the same hole section. Tal Block, operated by MOL Pakistan, has many producing fields and operator is looking forward ways to enhance production by targeting deep horizons. Makoriri Deep-1 is the first deep well drilled by the company with conventional well design. Well was completed with casing strings: starting from 26" casing, to 5" production liner, with this conventional casing design bottom hole e target was not reached due to premature casing seats caused by drilling through highly stressed and depleted formations. After setting casings on unplanned depths operator was not left with any contingent casing string to continue. In this paper, we have discussed a well design with an addition of 11-3/4" liner in 12-1/4" hole undreamed to 14" which would provide us an extra dedicated string of casing to isolate troublesome formations. After evaluating the technical and operational challenges of running 11-3/4" liner, cost analysis, and real time data obtained while drilling Makori Deep-1 well, we ended up reaching our deeper target with 7" liner also having a contingent 5" liner. Furthermore, proposed well design is implemented in upcoming wells and detailed discussion in paper will demonstrate that our proposed well design is more reliable, safe and robust having more engineering control to fight with the drilling uncertainties.

shakeel_khan619@yahoo.com