

Force Analysis and Test of Bridge Plug Drilling

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ABSTRACT

To quantitatively control weights on bit(WOBs) and torques of the coiled tubing bit in the drilling of a bridge plug,and to eliminate problems related to oversize cuttings during the process,mechanical analyses were performed for the cutting of the compound bridge plug.By constructing the mechanical model for the cutting of bridge plug by the coiled tubing bit,the relationships among WOBs,drilling depths,torques and cutting volumes were analyzed to derive the dynamic equation for WOBs,torques and cutting depths.To confirm the accuracy of relevant calculation results,field tests were conducted in two wells to drill 9 bridge plugs.Test results showed the maximum relative error between calculation result and field application result was 15%,which was sufficient to satisfy accuracy demands at the expected plug-drilling depths.Research results showed the newly derived mechanical analyzing model for coil tubing bit to cut bridge plug could accurately high light correlation among WOBs,torques and cutting depths.The model is great significance to control the WOBs and torques in bridge plug drilling.