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Automation Provides Unique Insights into the Rock Record and Subsurface through the Delivery of a Robotic Sample Collection and Analysis Device

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ABSTRACT

From the very early days of oil and gas exploration, appraisal and development drilling, samples have been collected at the rig by mud logging personnel in order to conduct a preliminary geological analysis of the rock being drilled. This collection typical involves a sample collection recipient, board or bucket in order to collect a sample of rock over the desired interval. The sample is then sieved and cleaned in the appropriate way depending on the type of drilling fluid being used. As penetration rates have increased in some instances to in excess of 400 ft. / hr. the sample resolution has deteriorated exponentially. From an ergonomics perspective the highest frequency to which a person onsite can collect a sample is one every 20 minutes. At 300 ft. / hr. this translates to 100 ft. jumps in the rock record. A new device has been developed and deployed which automates this manual process and thus ensures faster and more accurate collection of geological samples of the drilled rock interval. Sample resolutions of 5ft rock intervals have been attained at 400 ft./ hr. This technology has provided an important technological breakthrough and enables reduction of personnel at the rig site with a subsequent reduction in cost and HSE risk, particularly in areas of H2S. It further has provided for the potential integration with Measurement while drilling personnel. For both conventional and unconventional play development this has provided oil and gas operators with an important and cost and risk reducing modus operandi compared to conventional drilling and evaluation techniques.