

Improving drill productivity and delivering better geophysical data faster

D Palmer¹, T Hopper² and K Ott³ (initials and surnames only)

1. General Manager, RIG Technologies, Perth WA 6056.
Email: darren.palmer@rigtechnologies.com.au
2. Managing Director, RIG Technologies, Perth WA 6056.
Email: tim.hopper@rigtechnologies.com.au
3. R&D Manager, RIG Technologies, Perth WA 6056. Email: kai-uwe.ott@rigtechnologies.com.au

Keywords: Mining, New Technology, Machine Learning, Ore Characterisation

ABSTRACT (USE 'HEADING 1' STYLE)

RIG Technologies has developed new technology that can successfully acquire natural GR and hole deviations downhole while drilling on reverse circulation drills. This technology survives the hostile downhole environment with shocks of between 2,000 – 3,500 gs for multiple days at a time. The service eliminates the need to run through rod surveys, either by the driller or by wireline trucks called in saving a minimum of 15 minutes per day of productive time. This time saving is immediately in the middle of the drilling process enabling drills to keep drilling for more of the productive period of the day.

Additional to the natural GR and hole directional survey, the downhole tool is equipped with sensors to measure the downhole dynamic response of the drilling system providing insights into rock hardness, density and potentially clay types. These channels have never been acquired before and coupled with surface measurements from the drills themselves form a rich dataset for trainable machine learning algorithms shortening the time to receive advanced geophysical answer products from sometimes months, to live feeds directly from drills.

A live, high speed, two way data link between surface data acquisition systems and downhole geophysics tools has been established and incorporates calibrated surface measurement of dynamic forces directly on the drill string to match up with those measured downhole. Receiving live streams of natural GR and hole deviation surveys as the drill is drilling allows true remote decision making with live data available anywhere in the world. The combined data from surface and downhole dynamics builds a dataset that could begin to enable true optimisation of autonomous drilling processes.