Directional drilling today

Directional drilling's application and use has changed significantly over the past 25 years. REI Drilling company director **Jeff Schwoebel** and president **Dan Brunner** examine the shifts.

What was once a service used only by operators of gassy coal mines, directional drilling has found a niche in almost all coal operators' tool boxes. From the start of the company a quarter of a century ago until around 10 years ago, REI's directional drilling projects concentrated on providing methane drainage services and routing collected gas to the surface to create a safer mining environment.

In some cases, the operator utilized or sold methane into a natural gas pipeline. Since the 2002 Quecreek mine inundation, US coal operators have increased implementation of directional drilling as their primary method to explore for old workings in advance of mining. Long directionally drilled boreholes have proven to be effective and are acceptable by Mine Safety and Health Administration (MSHA) under 30 CFR 75.388 to provide a coal operator an option to conventional face drilling.

REI works with the mine operator to formulate a drilling approach to minimize possible inadvertent mine through into old workings. The borehole plan will generally require (i) in-seam boreholes, (ii) intersection and presence in various coal splits, and (iii) provide closure of the boreholes as practical. These aspects appear to be critical in having a borehole plan accepted by MSHA.

With the recent strong pricing of coal, a growing number of operators are dusting off old projects and reserves that still have significant minable high-quality coal remaining. Many of these projects require long hole directional drilling for safe exploitation in and around the old workings.

As a result of these factors, currently only around 20% of REI's projects are for methane drainage and the remaining distribution of projects are primarily exploration related, such as old workings, geology, and other applications, as well as water drainage.

On the surface, the company has successfully used its underground high thrust long hole directional drilling equipment to provide 3000-plus-foot laterals in shallow depth (ie less than 500 feet deep). This approach is a significantly lower-cost alternative to conventional oil and gas "surface to in-seam" technology that is used commonly for coal bed methane and other unconventional gas drilling projects. REI had at least one drill on surface drilling projects throughout 2007 and into the first quarter of this year.

REI and DPI equipment manager Mike Hardin atop one of REI's drilling units.

REI's trend into exploration drilling and similar strong pricing of metals has encouraged US hard rock and metals mine operators to follow the lead of coal operators and ramp up exploration programs. The company currently has two drills working diamond drilling in hard rock mines.

There is a notable lack of availability of exploration drilling services in the US, which more than justified the company's recent purchase of a Fordia Group Versadrill Model kmB 1.4 for its expansion into the hard rock sector.

REI also intends to make these drills available for coal mining projects for exploration, as it receives periodic requests for a drill that can drill vertical up or down from the working seam.

Having recently acquired Saber Drilling and forming Drilling Products (DPI), the company is now providing down-hole directional drilling products.

"DPI has recently sold 20 down-hole motors and we feel that we have a superior down-hole motor product tailored 'by drillers and for drillers' for coal and hard rock conditions. Specifically, based on our own directional drilling experience we have incorporated options for a higher torque motor, heavy duty u-joint/bearing assembly and longer lasting/wear resistant u-joint and bearing assembly," DPI manager Mike Hardin said. CU