

Drilling directions

Will economic instability and new regulations unbalance the new direction taken by underground coal mining in directional drilling?

Historically, directional drilling has been focused on methane drainage, though nowadays the trend is moving towards pre-mine development exploration near old workings, geological exploration and water drainage of pooled workings. However, recent and upcoming regulations, together with the ongoing economic crisis, have the power to either solidify the trend or cause yet another shift.

REI Drilling's Dan Brunner and Jeff Schwoebel say due diligence prior to mining is one of several significant issues for operations.

"With respect to directional drilling, REI is contracted an increasing amount by longwall mining clients to directionally drill for mine planning, particularly when moving to geologically complex, unmined, virgin districts, to enable strategic planning and layout of panels, maximize coal recovery near geologic anomalies, and to control water [and gas] to improve the efficiency of mining," Brunner and Schwoebel said.

A recent study by CRCMining in Australia showed that currently available technology should leave no room for mines to encounter unforeseen geological problems.

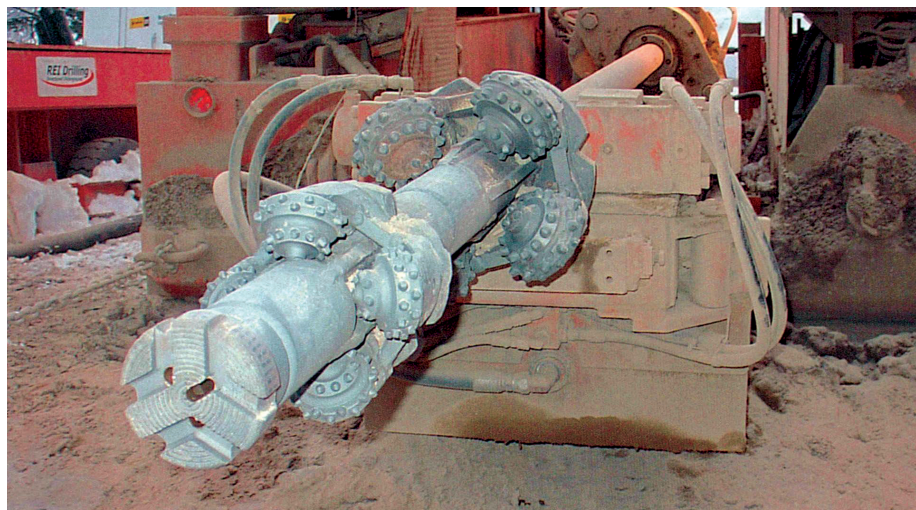
Despite the expense associated with encountering these anomalies and the relatively small investment in pre-mining directional exploration drilling, problems are still occurring – some have been large enough to significantly affect a company's production budget and revenue, and many cause mine plan changes and unscheduled longwall moves in the best-case scenarios.

As Brunner and Schwoebel note, profit margins are closing in as prices drop and costs rise; the option of exploring with continuous miners through gate road and mains development is no longer an affordable avenue.

Since 2007, federal regulators have encouraged mining companies to utilize directional drilling for many other applications, including the use of boreholes for water transfer to control water pressure on mine seals; to reach inby mine seals for gas monitoring and sampling; for the development of small-diameter ventilation passages to control the mine environment in specific locations; and for pressure balancing.

Feds take on mitigation regulations

Proposed rules adopted by the US Environmental Protection Agency, now under review, would require all coal operators to



REI Drilling's F4 drill equipped to ream a parabolic gob borehole directionally drilled from the surface at a western longwall mine.

report their greenhouse gas emissions starting next year – a move Brunner and Schwoebel feel is just the tip of the iceberg.

"Eventually, mine operators of even nominally gassy mines will need to evaluate methane drainage and methane mitigation strategies," they said.

Coal mine methane recovery is another industry trend taking hold.

While a number of options exist for its collection, they are most commonly grouped as either in-seam drainage techniques or gob degasification measures.

"Such projects can benefit from in-seam directional drilling, which can access large reserves in advance of mining and reduce gas content, or from directionally steered gob boreholes from underground or surface.

"Additionally, ventilation systems [exhaust air] require consideration, as they are the largest source of methane emissions from underground coal mines," Brunner and Schwoebel said, adding a CMM mitigation system should evaluate direct drainage techniques and ventilation air methane use.

CMM has several end uses, from direct sale of the higher-quality product to the generation of power, including combustion of low-quality methane from mine ventilation exhaust.

A cap-and-trade system currently being looked at by the government is likely to come to fruition, and for that reason revenues from all sources need to be reviewed in order to evaluate economic viability.

Taking on the drooping economy

"Coal mine operators have postponed or deferred their discretionary projects and are funding drilling projects that will enable them to comply with MSHA requirements [through mandatory projects], mine their most economic reserves and ensure cost-efficient mining [through directionally drilling]," the two men said.

They noted an unofficial rig count taken last December at the Northwest Mining Association Conference in Reno, Nevada, reflected 55% rig availability – a huge amount compared to zero availability the previous quarter.

Junior outfits normally looking for market equity cut their exploration programs, while the industry majors cut budgets and cancelled discretionary projects. The largest drilling contractors, which collaborated with majors, are holding on but not without some consolidation of operations and personnel furloughs.

"Diversified drilling contractors that are involved in several sectors – energy, civil and precious metal exploration drilling – have been able to better sustain operations and high-grade capabilities and improve their resources," Brunner and Schwoebel said, including themselves in that classification.

"Mature drillers with significant drilling experience, either exploration or directional, who were impossible to find a year ago are now more abundant," they added, noting that they were seeing the same trend with mining engineers and geologists.

In light of that, REI has recently beefed up its field and professional staff.

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