

Comminution concerns

As energy costs rise, crushing and grinding designs are coming under increased scrutiny.

John Chadwick presents some of the new ideas and technologies

Crushing and conveying are often inexorably linked and since both are covered in this issue, let us start by considering one of their potential combinations for better mine economics, in-pit crushing and conveying (IPCC). As Dos Santos International (DSI) notes, "in today's economic environment, with sky rocketing oil prices and increased environmental pressures, the case for the use of belt conveyors is clearly compelling. The push for 'greener' operations is driving the mining industry to explore how to accomplish both cost efficiency and minimisation of the environmental cost. IPCC is a prime example of how technological advances in belt conveying can help achieve these goals."

In-pit crushers reduce the mined rock to a conveyable size, but with their high efficiency and low maintenance costs, belt conveyors generate the lion's share of benefits in an IPCC installation, DSI says. Advances in the conveying systems such as DSI Snake sandwich belt high angle conveyors, now facilitate a direct high angle path to the surface, up pit walls, without additional unproductive excavation. The DSI Snake has a small footprint, both physically and environmentally. "The low energy consumption of the high-angle elevating system is in stark contrast to the high energy, high petroleum consumption of the typical truck-only haulage system," DSI contends.

A notable sandwich belt system was installed at the Majdanpek copper mine in the

former Yugoslavia, at the end of the 1980s. The most important part of the IPCC system, the high angle conveyor, demonstrated its suitability for coarse ore elevating duties directly up the pit wall. Its performance over a five-year period demonstrated savings of \$12 million per year, reducing the truck fleet requirements by two thirds (compared to a truck only haulage system). Despite this success few other mines have followed suit and a great potential for improved performance and profits has remained largely untapped.

Studies and other installations across the industry have demonstrated the cost savings with DSI Snakes. DSI Snake installations continue to demonstrate their suitability for elevating mined products at mine perimeters and in facilities – imposing a minimal foot print and consuming minimal energy.

Another approach, in smaller operations, may be a mobile crusher. In July, Barhaul took delivery of a Rubble Master RM80 compact crusher, the first machine of its type in Scotland. The company is under contract to process the 50,000 t/y of baryte from the Foss mine.

Patrick Bradley, Managing Director of Barhaul, explains. "With rising diesel costs and increasing maintenance and unreliability of the existing equipment, we had either to replace the existing configuration or find a more efficient solution. My only concern was whether the Rubble Master could cope with the density of the material and the volume. It has proved more productive than envisaged, and the mobility of the unit allows us to process the material according to grade, directly into different bays. With the static machines we had to rehandle from a central crushing area."



DSI snakes at Victor diamond mine