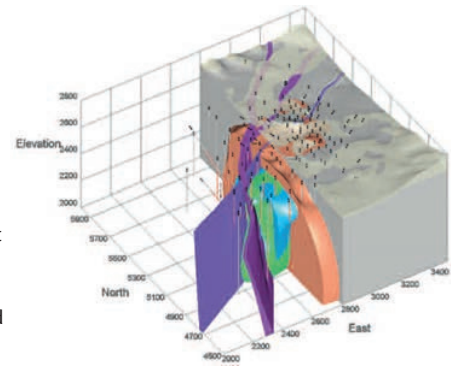


build and manage complex models comprising many different geological events sequenced within a timeline. These timelines and the geological events within them may be built as a package, and easily updated and rebuilt as new data becomes available. Knowledge of a deposit's structural evolution will help a geologist sequence and re-organise geological events in the timeline area to create perfectly clipped surface and solids representing their interpretation of the deposit. These complex models are airtight, and may be used as a basis for domain creation when transitioning to the resource block model phase. GeoLogic supports the ability to name and save

models and their parameter sets, and to use and update them in the future.

GeoLogic allows users to maximise field data information by combining surface mapping point, downhole data point, and downhole and surface orientation to create realistic surfaces and solids. The Potential Field method expands on the existing implicit modeling functionality. The potential field data consists of a collection of direction vectors that can come from a variety of sources (downhole or surface strike/dip data, for example). This data will influence the shape of the fitted surface or solid and will allow for more accurate modelling of geological structures. www.hexagonmining.com



Metso Metrics drives digital analytics

As part of its Life Cycle Services offering for the mining and aggregates industry, Metso is now introducing a new digital solution to help further optimise mobile crushing and screening equipment operations and maintenance. Metso Metrics Services is another step in Metso's digital development, leveraging the possibilities offered by advanced analytics and cloud-based technologies. The new service was launched at CONEXPO-CON/AGG in Las Vegas, March 7-11, 2017.

Mobile crushers frequently move between sites, making it challenging to track, monitor and maintain a fleet of equipment for maximum performance. Through a remote communication device mounted on a mobile equipment, Metso Metrics Services provides a dashboard view of critical operational and maintenance data – from utilisation rates to production levels and

fuel consumption. With secured access, the solution allows for data-driven decisions that impact crushing operations.

“Making the most out of the assets depends on data you can trust: Having the right information at the right time helps customers make important operational or maintenance decisions to improve uptime as well as utilisation and production rates. Metso Metrics Services is designed to collect and provide this crucial data in one easy-to-use interface. Combined with the expertise of Metso's network for troubleshooting or optional assistance with analysis, the solution provides tools for continuous improvement, both in performance as well as safety and sustainability,” says Giuseppe Campanelli, Vice President, Service Solutions at Metso. Metso Metrics Services helps to identify



underperforming assets and training opportunities, as well as to control maintenance and inventory costs. With the equipment maintenance plan integrated into the solution, plant operators can stay on top of their equipment's needs – making it easier to anticipate change-outs of spares and wears. “Metso Metrics is an excellent example of how we can help our customers take their operations to the next level with digitalisation,” Campanelli concludes.

www.metso.com

Rajant's multiple paths

Rajant further outlined its underground offering in a recent interview with *IM*. Network solutions for underground and above ground have key differences – underground networks are much more difficult to design due to the cramped conditions; meaning it is not possible to have unhindered wave fronts, and therefore multiple hops (using nodes) are needed as well as repeaters on equipment, to deliver the networks that modern underground operations need in areas where permanent fibre optics are not going to be installed. Rajant says with its Breadcrumb technology it is in an ideal position to fill this market; with the ability to successfully implement 17 or more nodes (proven already) though many more are theoretically possible; and underground networks can consist of 100s of nodes. The key is that they are easily movable to the next active development or mining front and allow uninterrupted communications. A very important point is also that Rajant nodes operate on multiple different frequencies all the time in multiple directions, meaning that there are multiple paths for the data, unlike other network options that see data restricted to just a few routes. Rajant has no single point of failure.

Rajant told *IM* that some years ago it did

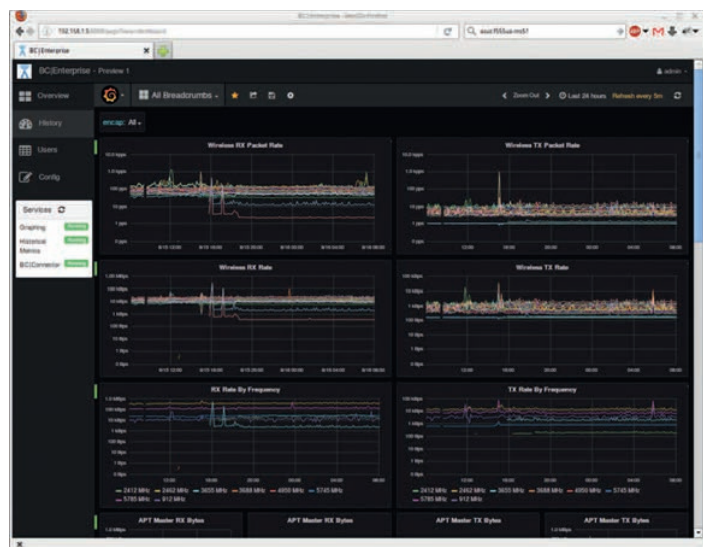
develop an intrinsically safe network for coal mines that worked well, but the driver for network development now is automation as well as open pits transitioning into complex underground operations.

Despite the fact that underground sensor networks are today brought together efficiently by an integrator, which may include combining video, LIDAR, radar, and other technologies, the data produced needs to be available instantly and analysed to allow the operator to make decisions back in a remote

operations centre. And with automation and the safety aspects involved, network reliability is even

more critical. An example is autonomous vehicle to vehicle comms for recognition and collision avoidance, where maintaining connectivity is vital, something Rajant systems are very good at. And of course the vehicles themselves act as repeaters.

The power of Rajant systems underground in terms of data handling also extends to combining



Screenshot from Rajant BCIEnterprise showing mine wireless network performance

existing systems into a more compact solution. Last year in work done with an underground equipment OEM, Rajant took no less than eight radios in one machine down to one box, meaning less complexity and less RF radiation, and of course less maintenance.

Another issue with autonomous operations underground is data security. Once key equipment is autonomous, and given the sensitivity of production data, you don't want networks to be vulnerable to hacking. The Rajant unit Rajant West is dedicated to creating hardware and software for

mining and other industries that is safe from hacking, using technology first used in the defence market. And returning to the certification issue, Rajant says it is looking at how to handle explosive environment certification for the latest networks, including cases that are used for hardware such as the nodes themselves, in a way that is cost effective for the customer.

Finally from its point of view, Rajant says of its close relationship with 3D-P: "Rajant collaborates with 3D-P as 3D-P specialises in complicated mining network systems which require the

resilience, high bandwidth, and reliability that kinetic mesh systems bring to the table. There is an inherent reciprocity between the companies in that Rajant values its mining and consultative expertise, and 3D-P respects Rajant's technology, which resolves many of the mining challenges 3D-P's customers encounter in the field. 3D-P has incorporated Rajant technology into its Hornet Portfolio of Intelligent End Points, but its partners also plan, design and install Rajant's portfolio of wireless BreadCrumb nodes." See *Future Mines Underground* in this issue. www.rajant.com

Flowrox PVEGs perform at Kara

Tasmania Mines Ltd (TMM) in Tasmania, Australia, at the Kara mine site, has relied on Flowrox PVEG Pinch Valves for the past two years.

"Practicality and OH&S issues were the key when choosing the valves for our hydrocyclones, but of course the price played a role too," states one of the process managers from TMM. "The steel housings are heavy and vulnerable to corrosion, and various types of metal pass through them, so the valves need to meet very tough challenges and conditions," he adds.

"The PVEGs are an ideal solution where shut-off applications involve abrasive or corrosive slurries, and they are designed to meet even the most demanding customer specifications," states Martti Lahtinen, Flowrox Managing Director, Australia operations.

"All application and slurry characteristics are different, so we provide tailor-made flow control solutions precisely in accordance with the customer specification," Martti continues. "To



meet the customer requirements we offer a comprehensive sizing and selection service to ensure the right product with the right material in the right place."

At the heart of the valve is the sleeve. The sleeves are critical, and many times the competing valves fail internally fast. "Our operators like the fact that they can really rely on the equipment," TMM's Process Manager confirms.

The sleeve is the only part of the valve that is in contact with the medium, and it is also the only replaceable part. "What makes our valves so easy to maintain is that the sleeves can be quickly changed on site," Lahtinen says.

"What we also like about the PVEGs is that they are easy to install and handle," TMM's Process Manager adds. The valve recommended for TMM for this process, a PVEG50M with 50 mm manual polyamide body, has been operating well since installation. www.flowrox.com

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