Reutech Mining Newsletter

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REUTECH MINING

IN THIS ISSUE

A message from Reutech Mining

As the year draws to a close it allows for time to reflect on both the challenges and achievements that made this year particularly interesting for all of us at Reutech Mining.

2016 marked 10 years since the first MSR was delivered to the New Vaal colliery operated by Anglo American's Thermal Coal division. It has been a humbling yet very inspirational journey to say the least. What started out as nothing more than a block diagram on a whiteboard has evolved into the world's most advanced slope monitoring radar operational in over 22 countries . Sir Isaac Newton said that if I can see further than others, it is by standing on the shoulders of giants. For the MSR this cannot be truer; because building on the insights and feedback from industry has allowed us to take this product from strength to strength. From day one we endeavoured to develop a product inspired by the industry and moving forward we remain firmly committed to this cause.

During this past year we also added new products and distributors to our portfolio. The Perimeter Intrusion Monitoring System that relies on the advantages of radar to provide mines with early threat detection has been very well received and has already proven invaluable at various mining operations across Africa.

What undoubtedly delivered the most excitement for 2016 was our venture into the underground mining environment. The recent launch of our newly developed Sub Surface Profiler (SSP) - a revolutionary Ground Penetrating Radar – has opened our eyes to a new world with its own unique productivity and safety challenges.

But reflecting on the year that has passed naturally forces us to look at the year ahead, and we cannot be more excited! 2017 will see us launch new products and partnerships to further improve our offering and level of service. These initiatives will ensure that Reutech Mining keeps on delivering real value to our clients globally, and in so doing, remains at the forefront of technology within the mining industry.

Allow me to join hands with the Reutech Mining team to wish all of our clients, suppliers, contractors, distributors and partners a safe and blessed festive season. Whether you are heading for the beach or taking cover from the snow, enjoy the time with your families and friends.

Jan de Beer
Mining Executive

New ground penetrating radar set to make underground mining safer, more productive

A new compact and convenient ground penetrating radar system developed locally by Reutech Mining has just been introduced to the market and is set to help increase mine safety as well as making a contribution to increased productivity. What is more, although the system is more user-friendly than comparable products currently available, it is available at a very attractive price.

'We believe in designing innovative radar products that solve complex problems in simple ways. This passion drives our desire to think outside of the box; to rethink old problems and reimagine new solutions. It has led us to a product that improves underground mining productivity and safety in a revolutionary way,' says Jan de Beer, Reutech Mining Executive.

He explains that the Sub Surface Profiler (SSP) is a low-cost, light-weight ground penetrating radar (GPR) designed specifically for the challenges of the underground mining environment: 'It weighs less than 4.5 kg and its patented, compact ergonomic design allows for one-handed operation by one person in much the same way as a paint roller. The SSP is extremely power efficient, and makes use of small, rechargeable batteries which can be replaced during underground operations, allowing operation of the SSP to continue indefinitely.'

The data collected is wirelessly transmitted to a tablet computer, where it is processed in real time, thus giving instant feedback about fault structures, up to 6m inside the rock mass, present within the rock while scanning. 'This improves dynamic decision making, and allows for the precise management of ground-fall risks, as well as the optimal utilisation of support mechanisms in an environment where every second counts,' adds De Beer.

The development of the system was prompted by the safety and productivity challenges faced by underground mines internationally. Reutech worked with a leading South African mining group which needed a better solution to address ground-fall risks. A ground-fall event can have a devastating impact on the bottom

line of any underground mine: 'It could lead to a loss of life, damaged equipment and even mine closure,' says De Beer. 'If one can accurately identify fault structures hidden inside the rock – structures that cannot be seen by the naked eye - and also if you can improve the flow of information once a fault structure has been identified, it facilitates quicker decision making. This is key to successfully managing the risk associated with a ground-fall event.'

'How can we make it better?'

GPR has been used to help identify fault structures since the mid-1980s. However, adoption in the mining industry has been slow, because traditional GPR systems are heavy (weighing more than 20 kg) and difficult to use in the small confined spaces, since they often require more than one person to drag a heavy box along an underground tunnel.

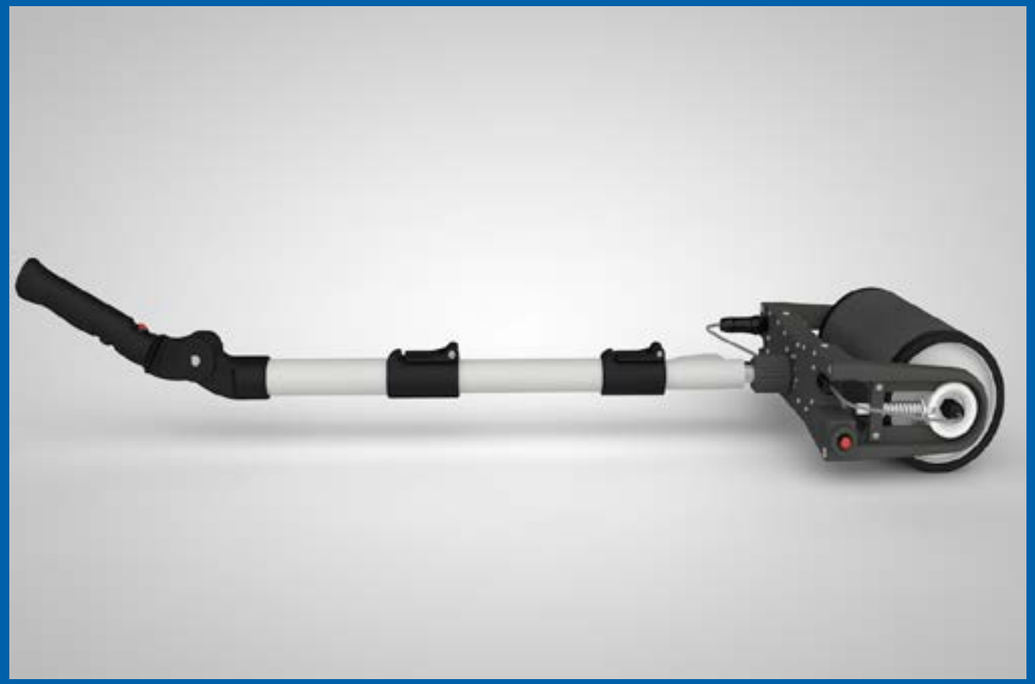
Reutech Mining sat down with our client and started thinking of how we can make this better; 'How can we rethink an old problem and reimagine a new solution? How can we design an affordable product that improves on the standard set by the costly, impractical and power-hungry systems which do not make use of up-to-date, readily-available communication technologies?'

They started mapping the production process, which typically comprises of the five phases of planning, drilling, blasting, support and loading. 'If you can improve the turnaround time on any one of those phases without compromising on safety, the entire operation becomes more productive. But it was in optimising the support phase that they experienced their biggest challenge,' says De Beer. 'The support phase is a critical step in the entire process where the ground-

fall risks are identified and managed through implementing roof support mechanisms.

'This is how the convenient, cost-effective and efficient Sub Surface Profiler came about.'

De Beer concludes: 'Reutech Mining continues to be a successful provider of the world-leading movement and surveying radar systems for the surface mining industry in 24 countries on six continents. We have provided information that saved numerous lives and enhanced safety in the surface mining workspace. We now bring the same quality and ingenuity to the underground environment, and look forward to contribute even more to this new mining segment.'



The Sub Surface Profiler (top and bottom)

Reutech Mining and the VIST Group discovers new opportunities in Russia

MSR 300 guards miners at one of the biggest Gold Mines in Russia

During May 2016 Reutech Mining's distributor for the CIS countries – VIST Group - deployed the first MSR 300 at the one of the biggest gold mines in Russia. Located in the far-east region of the country, this area is well known for its harsh environmental conditions which typically experiences long and cold winters well below freezing. The MSR 300 fitted with an extreme weather kit (operational down to -50ºC) ensures reliable performance throughout the year. The mine itself has been in full operation since 2007 and has already achieved a depth of 300 meters. Going forward the MSR will play a vital role in ensuring safety and productivity as the mine continues to grow larger and deeper.

The VIST Group provided the client with a complete solution which included the installation of a WiFi mesh, -50ºC rated power boxes and full autonomy in the event of an electrical power failure. Another one of the key features deployed was an integrated SMS and e-mail notification system. This system provides geotechnical engineers and mine management with immediate alerts whenever the MSR triggers a slope stability alarm. Ensuring that all personnel and mine equipment are evacuated in a timely manner is a key benefit of this system. Although the mine has only recently taken delivery of the MSR, they have already experienced the superior accuracy and reliability benefits of the MSR 300.

MSR 300 deployed in the far-east region of Russia

One of the thing to be installed in future is the automatic notification of all vehicles through integration with Mine Fleet Management system that mine is going to deploy in future.

VIST Group showed the MSR 300 at the Coal Russian and Mining fair

The biggest mining event in Russia – The Coal Russia and Mining Fair - took place from 6 to 10 of June 2016 in Novokuznetsk. Siberia is the largest coal producing region in Russia and with the fair being hosted there attracted a lot of visitors from Russia and the neighboring countries. The VIST Group had an MSR 300 on display which attracted a lot of attention from mining professionals as radar technology is becoming ever more prevalent within this part of the world. VIST Group also presented a technical session that dealt with the latest ScatterX software as well as the MSR Modular series.

Many of the mines in the region are considering the long term investment into radar technology so as to improve the safety of their operations. The VIST Group has a strong team of Reutech trained and certificated individuals to ensure outstanding support and maintenance within this region. The MSR 300 that was on display will be delivered to a nearby coal mine for a two month of demonstration period. This will also provide a platform for all mining companies to learn more about the performance and benefits of the MSR technology.

MSR 300 on display at the Coal Russia and Mining fair

The role of the slope stability monitoring radar at Kışladağ Mine....

Slope failures are a situation that may be encountered in our country and in the world of open pit mining environments. Arbitrary combination of uncertain stresses, strains and volumetric changes could potentially be hazard even in mines with conservative slope designs.

Safety and productivity in modern day open pits requires geotechnical engineers to oversee an integrated slope stability management program; with the most important aspects being the monitoring of rock slopes and the interpretation of measured data. Kışladağ Mine has three geotechnical engineers specialized on rock mechanics.

The utilization of radar technology at Kışladağ Mine forms a key part of the highly accurate integrated slope stability management program that is in place. The Movement and Surveying Radar (MSR) provides measured data to the Kışladağ Mine geotechnical team in near real-time on a 24/7 basis and more often than not, in the harshest of atmospheric conditions since August 2011. Movements can be detected to millimeter accuracy, depending on the range. There are two Movement and Surveying Radars serving in Kışladağ Mine with geo-referenced Geo-camera to get full coverage of the near circular geometry of Kışladağ open pit.

Seamlessly integrating radar data with other established systems that form part of the slope stability management program plays a pivotal role in assisting the geotechnical team to understand overall slope behavior. The data from the radar unit are transmitted through computers in an engineering office via telemetry for immediate visual review. Radar data contains; magnitude, location and direction of movement. Radar has the capability of triggering alarms at levels pre-specified by the geotechnical engineers, when these alarm thresholds exceeded, radar is able to send SMS and e-mail including the data of movement. As a result, the geotechnical team is able to quickly review and identify changing slope conditions which in turn facilitates accurate monitoring and ensures a rapid response to any anticipated slope failure.

The comprehensive slope stability management program at Kışladağ Mine has tremendous benefits for the safety and productivity of the mining operation as a whole. Data can be used to make key management decisions that impact the safety of workers and equipment.

ARTICLE BY Serdar Ergün, Senior Geotechnical Engineer at Kışladağ Gold Mine as originally published in the June 2016 edition of Altin Sayfa.