

the past to torque and retorque 50 to 60 wheel nuts when removing a wheel and tire assembly.

TMS, a direct tyre pressure and temperature monitoring system has been tested on chained tyres by Chilean mining service company Bailac. The results prove that TMS will work within chained tyres and the system will continue to deliver tyre pressure and temperature data irrespective of the presence of the chains. Mandy Bromley, Director of TMS manufacturer AM Bromley said, "Maintaining the correct inflation pressure for a working earthmover tyre is the single most important means of maximising tyre life. Loader front tyres have been chained to reduce damage to the tyres, the environment means that valve mounted pressure sensors are exposed and risk damage. Until these tests it had been thought that the chains would act in a similar way to a Faraday cage and prevent the sensor from transmitting the readings to the operator interface inside the cab. The tests prove that TMS can now be used with chained tyres."

The proof that TMS can be used with chained tyres is particularly important to operations running radial tyres. Good pressure control is particularly critical for radials, under inflated radials are prone to bead turn-up and belt edge separations leading to early tyre failure. Bead damage due to under inflation means that a re-tread will not be possible nor would a major repair. Tyres typically account for 25-30% of haulage operating costs in quarries and open pit mines and site tyre life can vary by 30% or more depending on pressure maintenance.

Slope management

Slope stability management and mine safety are synonymous in open-pit mining. Reutech Mining reports that many significant advances in slope stability management were highlighted at the recent Slope Stability conference in Santiago, Chile. Topics included the numerous methods of reducing the risks associated with slope failures. Key focus areas discussed included safe geotechnical design, rock fall catchment systems and monitoring devices for advanced warning of imminent failures. Reutech Mining was prominently featured with its MSR 300 Movement and Surveying Radar system. According to Garth Day (MSR Business Manager: South America), "The MSR system has since its launch in 2006 changed the approach of geotechnical professionals in their management of slope stability issues. More and more leading mines are adopting the MSR technology to ensure a safer mining environment, currently MSR

systems are operating in 11 countries on four continents".

In many situations, pit designs and production schedules become highly sensitised to minute changes in economic variables and operating parameters. The real difference lies in "getting the most" out of the data so as to identify and minimise risk associated with these factors. Design of open pit slope angles is becoming more and more important as mining depths continuously increase. Small changes in the overall pit slope angle have large consequences on the overall economy of the mining operation.

"The MSR300 system with its long range (2,500m) is being adopted on an increasing basis by South American mines. This is largely due to the unique MSR Series features that make it unique in the world market today. These features include its proven reliability which is second to none, operation in extreme weather conditions, Georeferencing, integration of the mine's Digital Terrain Model, autonomous operation and continuous improvement, amongst others," continues Day.

When it comes to operational availability, the MSR has a great record with an average global availability of 97.4%, measured on all systems over the last 15 months, without the presence of a resident technician on any of the mine sites.

The company says "the MSR is also the only radar system available that can detect a 15 m bench failure at its full operating range."

Anglo Platinum is deploying the latest laser scanning technology in South Africa to further improve safety and increase production. The latest system supplied by 3D Laser Mapping is used in the Mogalakwena Central open pit to continuously monitoring the western highwall. The laser monitoring system, which combines a highly accurate, long-range laser scanner with monitoring software specially developed for mining, has brought great safety improvements.

3D Laser Mapping says the latest generation Riegl LPM-321 laser scanner it supplied "combines exceptional field performance with accuracies of up to 25 mm at ranges of 6 km. It measures at a rate of up to 1,000 points per second with a 360o field of view and combines laser measurements with imagery from a mounted high-resolution digital SLR camera.

"Laser scanning is an essential tool for our surveying

operations," commented Frans Benadé, Section Surveyor. "It enables us to remotely identify, measure and monitor inaccessible pit and dump slopes together with stockpiles, blast profiles and geological features. It is also used for the measuring of as-built construction."

Anglo Platinum is also using 3D Laser Mapping's leading mine monitoring system SiteMonitor, which automatically detects tiny movements in slopes and walls in open pit mines.

Riegl continues to develop its VZ³ 3D terrestrial laser scanner series and says the new "VZ -1000 offers very long range, up to 1,200 m, in combination with high-accuracy and high-precision, but is still operating in Laser Class 1 with protection class IP64 (dust and splash-proof).

Mining applications can be challenged by bad visibility due to dust and vegetation in old mining areas. Riegl says "the new target extraction technique, based on RIEGL's unique echo digitisation and online waveform processing, offers multiple targets on a single laser shot, which allows achieving superior measurement capability even under adverse atmospheric conditions and excellent laser-penetration of vegetation." It is light in weight and the integrated Human-Machine Interface (HMI) allows for standalone operation without a computer. The RIEGL VZ-1000 can easily be operated by a single person in the field. Helpful details like a water and dirt resistant keypad with large buttons for instrument control, an internal storage capacity of up to 32 gigabytes and the optional add-on rechargeable battery support straightforward, fast and efficient data acquisition in various surveying and monitoring applications. **IM**



Key features of the RIEGL VZ-1000 include:

- Very high speed data acquisition up to 120 lines/sec
- Wide field of view (100°/360°), controllable while scanning
- High accuracy of 8 mm, high repeatability of 5 mm
- Multiple target capability for high penetration of obstructions (vegetation, dust)
- Optional digital camera
- Integrated inclination sensors, laser plummet, and compass
- Integrated GPS receiver with antenna (for smooth integration in mobile scanning applications)