

Bridgestone underground monitoring system helps extend tyre life

In what is a first for the mining sector, Bridgestone Earthmover Tyres recently announced the launch of a new tyre monitoring system for underground mine application. Paul Comminos, the company's Senior Manager Engineering Services explains the background to the system's development and the features and benefits both Bridgestone and its customers are deriving from it.

Bridgestone Earthmover Tyres' UTM – which stands for Underground TKPH (Tonne Kilometres Per Hour) Monitor – system is designed to allow underground mine operators, and Bridgestone as a supplier, to get a handle on key operating factors impacting on tyre life and operating safety.

Underground mining applications are notoriously difficult in which to get a realistic appraisal of the severity of the conditions and, until Bridgestone Earthmover Tyres developed the UTM, an onboard monitoring system has not been available as a component on underground production equipment.

To our knowledge this is currently the only system of its kind in operation.

The UTM is designed to measure:

- Vehicle speed
- Distance travelled
- Angle of ascent or descent (using tilt sensors)
- Side loading.

In addition, a 3D accelerometer captures the lateral (side-to-side), longitudinal (front to back) and vertical (up-and-down) forces the tyres are being subjected to.

Bridgestone Earthmover Tyres' engineering team worked closely with our technology partner to develop the system, a process which took about five months. For the past year it has been trialled in over 20 underground mines across the country.

The system has been fitted to a variety of equipment types, including underground boggers and haul trucks, allowing us to provide customers with accurate data across the range of primary production equipment.

Ultimately, the UTM provides customers with detailed operating knowledge about the production equipment and validates that the specification of the



Paul illustrating how the UTM system presents data tyres being used are in line with production expectation. From our point of view, the system gives Bridgestone Earthmover Tyres an insight into the differences between the various customers and operations that we service, so we can compare and contrast between different sites.

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Bridgestone underground monitoring system helps extend tyre life *continued*



*The orange box contains the datalogger, tilt sensors and 3D accelerometer.
The radar speed sensor is sitting on the side of the engine down near the lights.*

We can then analyse the operations of one site that is not having any tyre related challenges and compare this with the data of another mining operation that is – and we can quickly see the difference between the two sites.

Before we developed the system we were kind of running a bit blind. Now, with accurate information on different sites and applications we service, we have enhanced our ability to accurately recommend the most suitable tyre specification for each mine's operation.

The data from the UTM enables Bridgestone Earthmover Tyres to provide customers with detailed information on their operations and advise on ways to improve areas of the site that are likely to increase tyre wear and damage.

The aim is to create a working environment which will generate safer operating conditions and longer life for the tyres.

We have also been using the UTM on sites where we are testing new tyre designs – as part of this we will conduct heat tests to give us an accurate result.

Tyre operating heat is a very good indicator of how difficult an operation is for a tyre; we drill the tyres to insert thermocouples and measure temperatures, and measure temperatures at up to nine different points across each tyre. Before the UTM system was developed, we had only a basic idea of how much work an underground vehicle was doing, the number of hours it was operating, the type of operation, and so on.

We couldn't get a direct correlation between the speed at which the equipment was operating and the heat the operating tyres was generating. With the UTM, we can get an accurate idea of the TKPH and compare this with the performance of the tyres, because we can expect the tyres to perform to a known value.

If the tyre is under-performing compared to the known TKPH, we can see that the operation is actually quite severe on the tyre; for example, there might be a lot of side forces.

The system shows all these correlations and highlights to both Bridgestone and site management where changes need to be made.

We are now in the process of adding another accelerometer to the system, so it can be placed in specific positions on a vehicle to ensure the data is consistent between the different sites we are analysing. That way we can create a map of all the sites we work on in Australia, and it will allow us to compare site by site – essentially a "site severity" map.

We can then tell customers that, compared to other mine sites, their site is more severe on tyres – or that they are one of the less severe sites we monitor. Based on the data, sites can then make informed changes to their operations to prolong tyre life and to improve operating safety.

Once we've conducted the study and provided the data, we can recommend that customers can adopt a certain

measures to enhance tyre life with their operation.

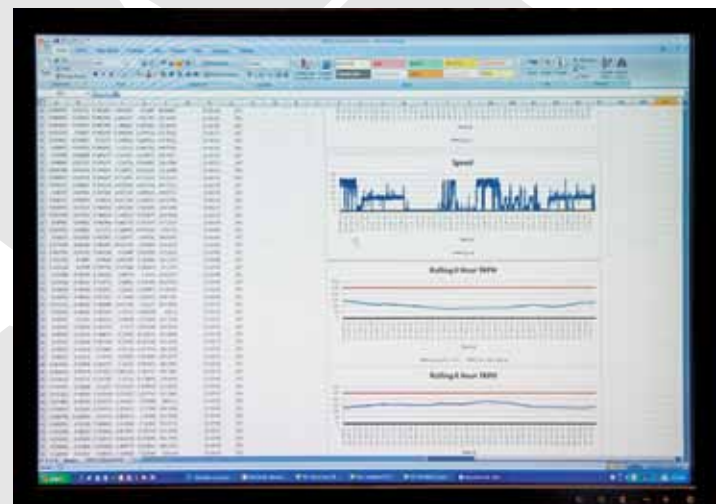
Two key issues are keeping haulroads clean and driver education.

Just paying attention to correct driver training can lead directly to massive increases in tyre life expectancy.

We recently conducted a site study which highlighted that operators of the boggers were driving in one direction and – before they came to a complete stop – were already in gear to shoot back in the opposite direction. This sort of practice puts the tyre under incredible stress.

Our UTM can now highlight this type of mis-operation, acting as an operational severity monitor.

With this tool at their fingertips, underground mine operators – with the assistance of Bridgestone – have the potential to see real extensions in tyre life, resulting in lower tyre costs, reduced downtime, and higher productivity.



UTM screen shot of data

New appointments at Bridgestone Earthmover Tyres

Along with the appointment of a new Managing Director for Bridgestone Earthmover Tyres, as outlined in the accompanying article, there have been two other recent appointments at the company's head office.

Masa Muneyasu was appointed Manager, Engineering Services in mid-March, while Louie Katsinas began as NSW Branch Manager at the beginning of March.

Masa, who joined Bridgestone Earthmover Tyres in January 2010, was previously in charge of engineering for the North American market, working out of Bridgestone Japan. This is his first overseas posting.

"I am very excited about working in Australia and one of my first priorities will be to improve tyre performance through improved engineering services," he said.

"I'm keen to visit as many mine sites as possible to better understand the different types of operation and our customers' requirements.

"An important part of my role will be to liaise between the Australian and Japanese operations of Bridgestone, which will help in future tyre developments," said Masa.

Louie Katsinas has been with Bridgestone Earthmover Tyres for the past 18 months, following a 10 year career in the passenger tyre market.

"I moved to Bridgestone Earthmover Tyres because I could see terrific career opportunities," said Louie.

"I am delighted with my new role and I intend to continue to improve on the already professional service our NSW Branch provides for Bridgestone Earthmover Tyres and to our customer base," he said.



Louie Katsinas



Masa Muneyasu

Bridgestone offers accredited tyre training for a safer future



Richard Wallin

As a registered training organisation (RTO), Bridgestone Earthmover Tyres offers industry-leading staff training in the areas of tyre fitting and tyre repair.

In recent years, the training program at Bridgestone Earthmover Tyres has been significantly upgraded and enhanced – with the company's National Training Manager Richard Wallin driving the changes.

Although Richard has worked at Bridgestone for just three and a half years, he has been working in the training field for more than 25 years.

One of Richard's first projects at Bridgestone Earthmover Tyres was to lift the accreditation of the company's tyre fitting training to a full Certificate II level. "We had to really restructure the whole training program, and the training and assessment tools," said Richard.

"We had to apply to the NSW Vocational Education and Training Accreditation Board (VETAB) to have it ratified and put on our scope for registration, which is a fairly long and drawn out process. It took us nearly 12 months, and it was a significant achievement."

Richard has also worked with Tyre Repair Manager Andrew Chapman to secure Certificate II accreditation for major tyre repair training.

Bridgestone Earthmover Tyres is the only major tyre manufacturer in Australia with this accreditation.

"Andrew was instrumental in our accreditation for major tyre repair," he said. More recently, as part of the process of upgrading training at Bridgestone Earthmover Tyres, Richard has helped enhance satellite training centres at the

Hunter Valley, Mackay and Perth, making it easier to deliver training in those areas.

"Because of Australia's size, there is no way that I can service the whole country on my own, which is why we've set up satellite training centres." Each training centre has its own training team consisting of engineers who work out of those locations, but who also double up as trainers and assessors. "If we didn't have this arrangement in place, we'd have to go to each location and take the whole circus with us – but with the training teams, they run the whole show on their own," he said.

Another challenge that faces Bridgestone when it comes to training is the fact that it's very difficult to conduct training and assessments at mine sites on real equipment.

"It's very complicated to do training on site; you have to have inductions for example. That means to do a simple assessment takes a lot of work, which is why we set up training simulators," said Richard.

"So, if you can imagine the back end of a dump truck with all the back axles set up: on the one side we've got one dual configuration of one set of wheels and, on the other side we have a dual configuration of another type.

"This means that, instead of going out onto a mining site and working on the trucks, they can be trained to do all the high-risk work at the branch under strictly controlled and supervised conditions – not only for their training, but also when it comes to assessing them for their qualification."

In addition to his work in training, Richard also serves on Bridgestone Earthmover Tyres' safety committee.

"Being part of the safety committee – a very important role – means I can assist and help in that area," said Richard.

"We need to make sure that all of our people have been trained up to a very high level – it's no good doing things half baked. The old 'she'll be right' attitude has gone right out of it today when it comes to safety."

Bridgestone seminars contribute to safer underground mining

During 2009, Bridgestone Earthmover Tyres ran a series of underground tyre and wheel safety seminars around Australia.

The six seminars – held in the underground mining centres of Mt Isa, Cobar, Ballarat, Kalgoorlie, Perth and Orange – were designed to specifically help this sector of the industry understand its responsibilities as set out in the new tyre maintenance and tyre repair standards, *AS 4457.1-2007 Earth-moving machinery - Off-the-road wheels, rims and tyres - Maintenance and repair - Wheel assemblies and rim assemblies*.

The day-long seminars, covered topics such as:

- How to safely use and manage underground tyres and wheels
- How to maximise tyre and wheel performance
- Safe management strategies for tyres and wheels throughout their life cycle.

According to Paul Comminos, Bridgestone Earthmover Tyres, Senior Manager Engineering Services, who helped design the seminar program, the underground mining sector had been requesting this type of educational environment for some time.

"We offer plenty of training programs, but these have typically been aimed at our larger customers such as the major open cut mining companies," said Paul.

"There have been many occasions where we've taken it to our underground customers, and they've said 'this is good information, it's appreciated, but we'd

really like something focused on our market.'

"So we went out of our way to create something that was exclusively relevant to this sector and focused on the issues that are unique that market."

Subjects covered by the seminars included wheel testing issues, tyre repairs, wheel repairs and tyre capabilities in underground applications.

"These seminars have been designed to work in conjunction with the training programs conducted by Richard Wallin and his team (see page 3 of Imprint)," said Paul.

"Underground customers have been looking for more information regarding the fitting and removal of tyres and wheels.

"As a result of this demand, we are now looking at a tyre/wheel 'bolt-unbolt' training course for underground mines that meets the national competency standard," he said.

"Our seminars were very positively received by the 100 plus delegates who attended from around Australia.

"They were pleased that non-biased information was presented by Bridgestone as an authoritative source of information in the industry."

Paul said similar seminars are planned for later in the year, depending on demand.

Change of managing director for Bridgestone Earthmover Tyres

Junya Ono, Managing Director, Bridgestone Earthmover Tyres Pty Ltd, is returning to Japan to take on a new role with Bridgestone Corporation. His successor is Takashi (Tony) Yokoyama, who starts in April.

Junya penned the following lines about his time with Bridgestone Earthmover Tyres in Australia.

It is with regret that I write to inform you I am returning to Japan to take a new role as General Manager, International Tyre Administration Department of Bridgestone Corporation in Japan.

My two years in Australia have been both challenging and fulfilling, and the time has passed by very quickly. My wife and I shall take many fond memories of friends, and of the wonderful places we have had the opportunity to visit.

My experiences in Australia have been greatly enriched by the generous support and cooperation customers and staff of Bridgestone Earthmover Tyres have

shown me, for which I am grateful.

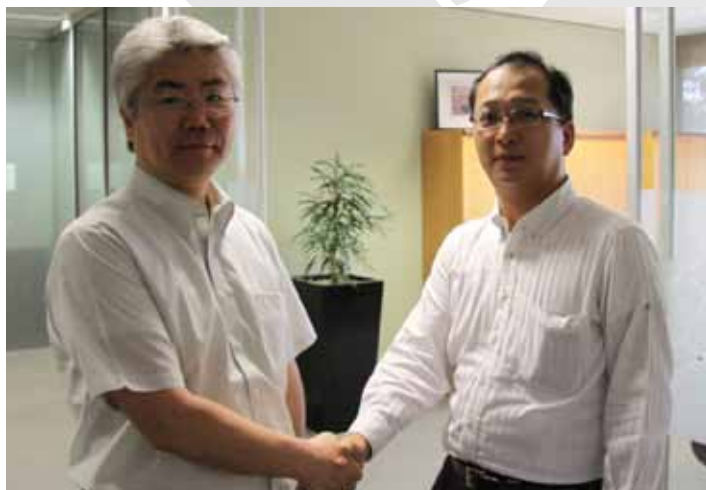
I do hope that you will continue to extend the same support to my successor at Bridgestone Earthmover Tyres, Takashi (Tony) Yokoyama, who will take over my position in April.

Junya's successor as Managing Director, Tony Yokoyama, joined Bridgestone in 1981 and moved to the Earthmoving Tyres division in 1989. He has always been involved in the management of overseas markets and has had a number of overseas postings, including Saudi Arabia, South Africa and Indonesia.

"Australia is a very large and important market for Bridgestone Earthmover Tyres and I am very pleased to be here," he said.

"I am keen to build on the good work that Junya has done and continue to see the company improve in all areas of process and product development.

"This way we will continue to deliver a market-leading service to our customers," said Tony.



Tony (left) farewells Junya (right)

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