Operator awareness

Safety focussed on collision avoidance and fatigue management remains a top priority in the mining industry, and the technologies available are now achieving impressive results, reports Paul Moore

The integration of the most promising technologies into the mining industry's key suppliers is a natural progression. This has been seen in fatigue management solutions with Caterpillar and Seeing Machines, and with GE Mining and Optalert. Last year this trend continued when **Hexagon AB**, a global leader in digital solutions, announced the acquisition of Guardvant, a global player in operator safety solutions for the mining industry.

Guardvant's flagship solution, OpGuard, is used to detect and respond to driver fatigue and distraction – the most common underlying cause of accidents. To further mitigate operator-related accident risks, Guardvant's fatigue monitoring capabilities are complemented by collision avoidance and proximity detection solutions, which provide drivers with 360-degree situational awareness. The combination of safety-enhancing technologies keeps drivers safe, equipment protected, and productivity rising.

"The benefits of Guardvant's safety-enhancing solutions are applicable to any industrial worksite, as well as improving transportation safety in industries such as trucking & hauling and aviation. Its market expansion plans are now supported both by new product additions and the ability to leverage Hexagon's wider market footprint."

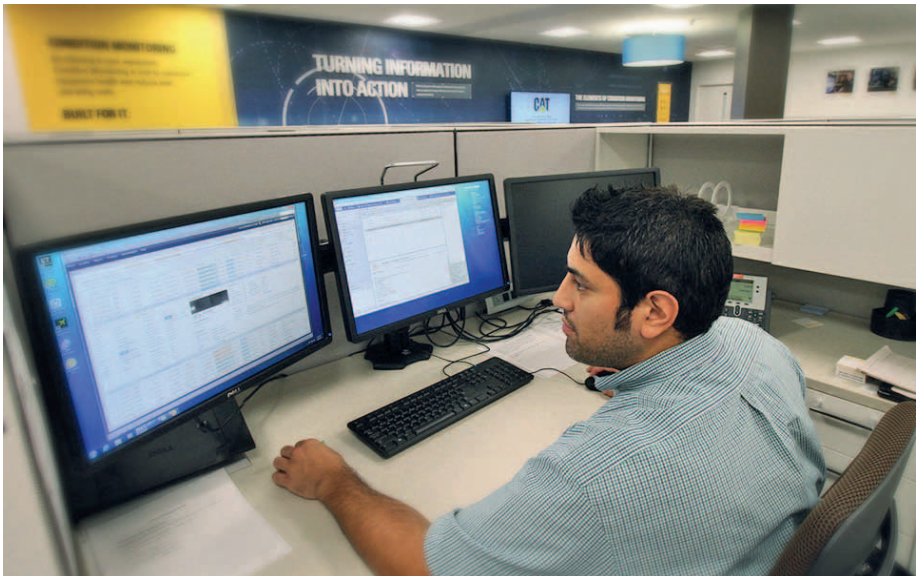
"Guardvant's highly dedicated and experienced team is a natural fit for Hexagon. We share the vision that driver-assisted solutions are an integral part of safe, efficient, productive operations – whether in mining, construction, agriculture or any industry facing the inherent challenges and risks of operating fleets," said Ola Rollen, Hexagon's President and CEO. "Our combined expertise will enable us to better meet the increasing demand for 'zero harm' safety goals while providing a natural bridge to fully autonomous systems. This is key as more and more of our customers express interest in moving beyond automation into the world of autonomous technologies – a trend we are uniquely positioned to embrace." Headquartered in Tucson, Arizona, US, Guardvant is now operating within Hexagon's Mining division.

Newcrest Mining's Lihir gold operation in Papua New Guinea recently went live with a full installation of GE Mining's collision avoidance system (CAS)

Caterpillar's impressive DSS results in oil sands

A recent case study from **Caterpillar** from the oil sands shows the power of fatigue management technology. The company sets the scene as follows: "It's 6:00 am on a Wednesday. A crew of miners is starting a shift of seven, 12- hour work days for a major oil sands mining project in Canada. In two hours this group of fathers, mothers, spouses and friends will experience the highest level of fatigue risk during their work week. That's not a hunch. It's a quantifiable fact proven through the power to 'see' and measure fatigue risk across this operation."

"It isn't a matter of if one of our operators will fall asleep at the wheel of a 400 ton (363 t) haul truck, it's a matter of when," said the Mine Operations Manager. "We won't eliminate that



A Caterpillar fatigue monitoring analyst overseeing data coming in from mines worldwide

risk, but we're doing everything in our power to protect our people against it." So on this day the crew is starting its shift with a discussion about fatigue. Routine educational sessions are part of the company's robust Fatigue Risk Management System. Operators are empowered with information to personally manage their sleep health, but they're also provided peace of mind that technology will protect them if the formidable force of fatigue bears down.

That technology is the Cat® Driver Safety System (DSS), an in-cab fatigue and distraction monitoring and mitigation device. A camera that utilises non-intrusive facial mapping technology watches for physical signs of weariness. If the operator nods off for a couple seconds – experiences what is called a 'microsleep' – the system activates a rumble in the seat and audible in-cab alarm.

In its initial pilot test of the technology, the DSS was installed in just five of the company's haul trucks and a 90-day, three-phase approach to quantifying fatigue risk and mitigating incidents ensued. To see and measure the scope of the problem, for the first 30 days the in-cab cameras recorded microsleep events, but the alert systems didn't activate to alert drivers. In one month 63 fatigue events were recorded. Operators travelled 1.6 km while sleeping.

A three-phase Fatigue Risk Assessment uncovered its scope of risk (Phase 1), started mitigating incidents (Phase 2) and initiated comprehensive fatigue risk management (Phase 3).

"Seeing those numbers made the threat and ability to reduce it so obvious that our senior leadership committed immediately to using the technology across our fleet," said the mine's Technical Services Manager. "When I saw operators falling asleep at the wheel, I couldn't in good conscience turn away from this system." The alarms in those first five trucks were activated and fatigue events diminished by 86% in the next 60 days.

"Of all the safety hazards on a mining site, fatigue is a unifier – because no one can escape it. At some point, every human gets so sleepy that decision making, reaction time and overall cognitive power is compromised. For miners, the potential for reaching that ultra-weary state is heightened because 24/7 operations require people to work when the human body is wired to be sleeping.

Similar in concept to a safety harness, the DSS serves as personal protective equipment – ready to catch operators if they fall. The system also includes living, breathing protection in the way of safety advisors who work in a 24/7 Fatigue Monitoring Centre. When a DSS unit activates because the operator's eyes have closed for 1.5 seconds and the truck is moving at least 10 km/h, a short video clip of the event is captured, sent to the monitoring centre and reviewed by a safety advisor. If the analysis confirms a microsleep occurred, the safety advisor contacts a dispatch officer on site to communicate the incident.

What happens next is dictated by a Fatigue Intervention Plan designed with guidance from a Caterpillar fatigue management expert. The protocol involves direct human contact with the operator, possibly a break from driving, but never punishment. "When the DSS alerted me, I didn't believe I had really fallen asleep – until I saw the video," said one operator. "Often we don't realise how fatigued we are, and likely don't even know we're falling asleep."

Data from a 90-day fatigue risk assessment

Statistic	Phase 1	Phase 2	Phase 3
Total Mobile Hours	2,966	1,981	2,005
Total Fatigue Events	63	31	9
Average Fatigue Events (per mobile hour)	0.020	0.020	0.004
Distance travelled while fatigued (metres)	1,611	922	369

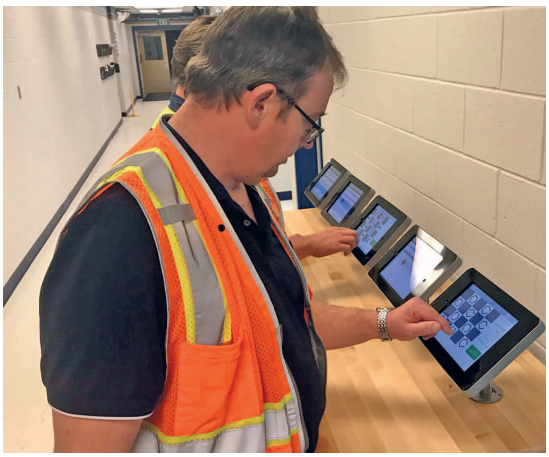
Analytics from the Driver Safety System (DSS) have revealed previously hidden trends that are shaping the organisation's incident prevention strategy. For example, data from this site shows the first day of a seven-day shift is the most likely time for an operator to succumb to fatigue. Longitudinal reporting shows precisely which hours of the day and night are high-risk for each crew, and which hours operators are most alert.

The company tracks every data point possible and continually refines its management system. It's become a passion, because many here bear emotional scars from a time before fatigue was taken so seriously. "Three years ago we had a fatality, we lost someone we loved, and we believe it was due to distraction," one crew member shared. Distraction is a common symptom of fatigue because operators often move around to avoid nodding off, so the DSS watches for both distraction and fatigue.

"If we had the DSS at that time, there's a strong possibility our co-worker would still be with us today. This initiative is very personal," the crew member added. That loss catalysed a culture change in this organisation, which like many in the industry once perceived fatigue as a sign of weakness, something shameful. The way management has responded to each DSS alert has shaped a new attitude about fatigue and forged trust between leaders and operators. "No one has ever been, nor will ever be, punished for having a fatigue event," said the Technical Services Manager. "The technology will only protect people if they trust the purpose, and you have to earn trust – you can't buy it."

Within two years after the first DSS units were installed, more than 2,000 fatigue events were recorded on this site. That doesn't surprise management, nor discourage them. In fact, DSS alerts have prevented about 500 km of fatigued driving in that time. "Imagine, two, three years ago we were driving hundreds of kilometres a year while asleep," said the Coordinator of Mine Operations.

An effective Fatigue Risk Management System delivers benefits beyond its primary objective to protect operators. Reduced berm contact and prolonged tyre health are typical outcomes of increased operator alertness. Over two years this company reduced equipment maintenance spending by $500,000, savings management attributes to increased operator alertness. The organisation is growing, and with each acquisition or expansion comes new assets. Every one of the haul trucks is upgraded with a DSS, an expense management doesn't hesitate to make. The power to see, mitigate and manage fatigue risk is saving this company much more than money.



Barrick's Cortez mine recently completed two important pilot projects to help its people combat fatigue in the workplace

Barrick Cortez addresses fatigue

Barrick's Cortez mine recently completed two important pilot projects to help its people combat fatigue in the workplace. The month-long pilots involved haul truck drivers who worked on day and night shifts. Among the key findings were that day shift workers hit their highest level of fatigue on the last day of their work week. Night shift workers, however, experienced high levels of fatigue as early as their second work day through to the last day of their work week.

"Fatigue is a term used to describe a wide variety of conditions," says Justin Tueller, Industrial Hygiene Specialist at Cortez. "We summarise it as the feeling of being tired or weary because of insufficient sleep, lengthy periods of mental or physical work, or prolonged episodes of stress or anxiety."

Cortez identified fatigue as a key risk to worker safety and the pilot projects are a proactive way to address the issue. A person struggling with fatigue will show slower reaction time, make more errors, and experience decreased cognitive ability. The type of shift, number of breaks, consecutive shifts, and hours worked per shift influence the risk level in the workplace.

One of the pilot projects was called the "Predictive Safety" pilot. It involved short two-minute tests on tablets conducted before and after shifts at the Cortez open pit. Each shift, 20-25 participants filled out a sleep questionnaire and took an 'alert monitoring' test which calculated reaction time based on how quickly participants completed the questionnaire. The results were entered into an algorithm that produced each employee's fatigue level. There were three levels: guarded (low fatigue), significant, or high.

The second project was called the "Smartcap" pilot utilising the namesake technology from Australia's **SmartCap Technologies**. Using Bluetooth technology, it connected haul truck systems to specialised headbands worn by operators. The headbands monitored the fatigue levels of 20-25 open pit operators per shift by taking Electroencephalography (EEG) readings. The device, which fit into a standard hard hat or cap, is similar to an Echocardiogram but it monitors electricity emitted from the forehead rather than the heart. The EEG results appeared on a monitor mounted inside the cab of the open pit haul trucks every 2-3 minutes. Drivers experiencing high levels of fatigue would be notified by alerts from the system. If a driver received three high-fatigue alerts without taking a break the system would flag this for a supervisor who could then intervene and assess a driver's fitness for duty.

The projects helped employees self-manage their fatigue and determine when they may experience a fatigue "wall." Seeing the results and acknowledging how their fatigue progressed throughout their shifts helped employees identify the most opportune time to counter fatigue by drinking a glass of water or taking a quick walk. "Many participants have acknowledged an increased awareness when it comes to their personal fatigue management," Tueller says. "This awareness will help minimise fatigue-related incidents."

Cortez is evaluating data from the projects and determining whether to proceed to a site-wide implementation. This would see the SmartCap system expanded to more equipment such as loaders and graders, and the use of the Predictive Safety testing tool in other divisions such as Cortez Underground. The tool may also be adopted at the Goldstrike mine.

SmartCap taking next steps

On the back of a major update in late 2016, SmartCap says it has seen significant growth in the mining sector. Daniel Bongers, Chief Technology Officer at the company told ***IM***: "A large copper operation in Mongolia has expanded its use of SmartCap to protect operators in the open-cut HME, long-haul concentrate transportation and its bus fleet for workforce transport. They have achieved significant reductions in incidents across the board, with a total elimination of fatigue incidents for SmartCap users. Similar results have been achieved by an iron ore operation in South Africa, who have successfully transitioned to the new SmartCap product suite after years of incident-free operations using the earlier generation. Utilisation has increased as a result of the improved comfort, and the greater usage and engagement with the technology has led to near-immediate increase in the effectiveness of responses to early warning alerts."

However, Bongers added that perhaps the most notable trend of late has been led by a multi-site deployment in Chile that have taken the next step in data-driven improvements by providing individual assistance to workers identified by a high SmartCap alarm rate. "Their formal processes have helped uncover underlying health issues and impacting lifestyle choices, and the follow-on treatment or education is having a positive impact on their risk profile and rate of fatigue interventions, and providing value to both their customers and employees."

Antofagasta's Critical Control Management

All International Council on Mining & Minerals (ICMM) members implement the 10 principles that underpin its Sustainable Development Framework. Principle 5 requires companies to continually improve health and safety performance with the ultimate goal of zero harm. The Health and Safety strategy of Antofagasta Minerals is focused on Critical Control Management. The Mining Group has identified 22 fatality risks, all of them with defined Critical Controls and verifiable on site by workers. One of the main risks to Antofagasta Minerals is Equipment Loss Control, which is a factor present in 20% of the high potential incidents recorded in the company. Therefore, the Mining Group is permanently evaluating the performance of the control and seeking for improvements and optimisations.

Fatigue is a major cause of accidents associated with operating heavy equipment and has been seen to be present in fatal accidents that have occurred at Antofagasta Minerals. For this reason the company decided to implement a critical control that allows the effective management of fatigue in operators. A study that considered the most used technologies on the market with respect to fatigue and drowsiness control was carried out. The result showed that the solution most align to Antofagasta Minerals Standards are technologies with real-time feedback, helping operators manage their alertness and alerting a control room for continuous monitoring.

The fatigue alert system consists of a device installed in heavy equipment and a sensor that operators must wear in helmets, caps or headbands. If a fatigue episode is detected, an alert is emitted to the operator and the control room, generating different actions according to the alert intensity. The system was defined as a critical control, implying a mandatory use of the sensor by operators, a continuous system operation and verifications by supervisors and executives.

The fatigue alert system as a critical control is being implemented in Centinela with a focus on operators of heavy equipment, mainly haul trucks. Subsequently, the critical control will be standardised in all Antofagasta Minerals assets.

GE's CAS goes live at Newcrest Lihir

Newcrest Mining's Lihir gold operation in Papua New Guinea recently went live with a full installation of **GE Mining's** collision avoidance system (CAS). This follows the CAS being fitted to equipment in the Telfer open-pit mine (Western Australia) and the gradual installation of units at Lihir. Since installation over a year ago at Telfer, vehicle-to-vehicle collisions have reduced by 33%, Newcrest said in its recently-published sustainability report.

Proximity detection technology has been progressively rolled out across the company following incidents at its operations involving collisions or near misses between vehicles and other vehicles, vehicles and pedestrians, and vehicles and infrastructure.

Supported by Newcrest's Executive Committee, a working group comprising representatives from Newcrest's Group Safety, Technology & Innovation, Group Supply, and key stakeholders from each of its sites, developed a strategy to deploy the technology and identified solutions suitable for use in surface and underground mining, supplied by GE Mining and **Newtrax** Mineprox, respectively.

Newcrest started implementing GE Mining's CAS at Lihir back in October 2017. Around 1,500 employees were to be protected in addition to up to 250 vehicles.

In addition to the GE Mining contract, Telfer and Gosowong (Indonesia) underground operations have awarded tenders to Newtrax to deploy Mineprox on the mobile mining fleets. Contractor mobilisation at Telfer commenced in September 2018. And there could be more contract awards on the way. Newcrest said: "Given the anticipated automation and teleremote system programme of works at Cadia (New South Wales), the business has adjusted the criteria for its proximity detection solution and is expected to award a contract soon."

GE Mining told ***IM***: "Our initial success at Newcrest's Telfer mine, with the relatively smaller deployment of 140 vehicles, led to the expanded technology rollout at Lihir of 250 vehicles. As mentioned, since installation over a year ago at Telfer, vehicle-to-vehicle collisions have reduced by 33%. We are also currently installing GE CAS at the Newcrest Cadia mine site, a third mine, based on the success at Telfer and Lihir."

Previous to the progress with Newcrest, Pilanesberg Platinum Mines (PPM) was in the process of evaluating CAS solutions when the Department of Mineral Resources for South Africa's North West province, where the mine is located, set a deadline of April 31, 2016 for area mines to outfit 25% of the fleet with CAS solutions. "With the clock ticking, PPM selected GE's CAS to meet the mandate. The timeline was aggressive, with just three months between the order and the first deadline. Fortunately, GE had deployed its solution on other customer sites around the world and could adapt quickly."

On the bigger picture, GE says it has a clear roadmap to evolve to the Level 9 Intervention Controls — an industry goal, and an international standard tabled by the Earth Moving Equipment Safety Round Table (EMESRT), of which Newcrest is a member.

"Managing vehicle interaction risk (which may include L9 intervention controls) is now also a key initiative with the global body ICMM , who are targeting 2025. The system being installed at Lihir is currently rated Level 7 Situational Awareness, and already incorporates some Level 8 Advisory Controls capabilities. In order to address the significant challenges in achieving a Level 9 CAS system, GE has developed proprietary software logic that is able to interpret and anticipate the complex scenarios presented during normal mining operations. This enables the GE CAS system to operate seamlessly with the operator and confidently act as the last barrier, should the operator not take the appropriate action. GE is committed to delivering a world-class Level 9 CAS system to the global mining community, in their efforts to continue to support the mining companies in their efforts to reduce the risk exposure of operators."

Anglo deploys Komvision at Mogalakwena

Anglo American Platinum recently brought two KomVision-equipped Komatsu 930E mining trucks into production at the Mogalakwena Complex. The **Komatsu** KomVision technology is a significant step towards improving safety at the mine as it gives the truck operator a 360-degree bird's eye view and significantly reduces the risks associated with a man-machine interface.

The new system has an additional eight radars – over and above the current standard of front and rear radars – and six cameras that provide zero-metre visibility of the truck's footprint. Mogalakwena Mine General Manager, Richard Cox said: "This technology sets a new benchmark. It improves our ability to integrate into future collision avoidance systems. In line with our strategy of FutureSmart Mining™, it will generate close-to-real-time health and performance data that will support us in optimising our operations."

Anglo American Platinum's safety strategy is based on four pillars – systems; people and behaviour; engineering solutions; and wellness in the workplace. The Komatsu trucks are included in the significant investments in engineering controls that the company has made to manage risks.

Chris Griffith, CEO of Anglo American Platinum, said: "Investing in this technology is a major step

in increasing safety levels at our mines. We remain committed to our objective of eliminating fatalities with a zero-harm mindset. We put safety first and believe that every employee has the right to return home unharmed every day. And we recognise that although we have made significant progress in improving safety over the years, there is still much to do. This technology will eliminate a number of risks and we look forward to benefitting from the improved safety and operational features of these trucks."

"The case for innovation in mining remains highly compelling. To deliver the step-changes required to create a truly modern, safe and productive industry on a sustainable basis that society demands and that our customers expect, the industry must continue to evolve. Therefore, Anglo American continues to invest time working through how innovation can help the industry address its major challenges. Through FutureSmart Mining, the company has successfully drawn on the expertise of diverse stakeholders, including employees, partners in academia and civil society, peers in the mining and parallel industries."

The company continues to focus on driving a more sustainable approach to mining through cutting-edge mining software and other technology-led innovations. Production Manager Judd Barlow said: "We are proud to partner with Komatsu as this technology allows us to maximise capacity and safely deliver on our promises."

Cox added: "What excites me most is that these two vehicles offer a fully integrated system that will deliver on our safety requirements, while reducing maintenance and downtime." The new trucks will be the first earthmoving vehicles at Mogalakwena to fully integrate a range of business improvement initiatives, including:

- Collision avoidance ready technology
- A tyre monitoring system
- A safety standard fuel saving card and extended fuel tank
- An optimised payload system for payload monitoring
- An Ansul foam fire protection system which combines dry powder with foam
- A lightweight bowl

Hexagon adds to layers of safety with CAS Analytics

Hexagon's Mining division recently introduced HxGN MineEnterprise CAS (collision avoidance system) Analytics, a web-based reporting and analytics platform that adds a powerful layer of safety to its portfolio. MineEnterprise CAS Analytics monitors and controls critical risk events by connecting a multitude of data sources via live dashboards, visualising all aspects of the CAS.

All mine stakeholders will now be able to access the right data at the right time, gaining unprecedented insight into a wide variety of safety scenarios and performance trends. Based on situational safety data, users can identify and analyse the root causes of failing operational controls.

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Seeing safety data at a granular level empowers users of MineEnterprise CAS Analytics to drill down to locate vehicles operating under risk and vehicle types exhibiting higher-than-average numbers of incident events. The tool's alarm analysis module used together with situational analysis can help to reveal hazardous locations and operational flaws: dangerously close interactions at dump sites and low visibility at poorly designed intersections, for instance.

MineEnterprise CAS Analytics' optimised mobile interface delivers real-time safety information on tablets or cell phones to supervisors in the field. This helps strengthen the integrity of daily, weekly and monthly performance indicators for safety process improvement.

"Accessing relevant data in real time is the key to operational safety success," said Safety Product Manager, Marcos Bayuelo. "HxGN MineEnterprise CAS Analytics provides all the dashboards necessary for monitoring and minimising accidents while also offering the tools to build and manage customised dashboards. The technology needed to create reports for short-interval control, daily and monthly safety management tasks, fleet management, personal protection, fatigue monitoring and vehicle intervention – it's all at your fingertips!"

Mine vehicle operators face numerous distractions. Busy pit traffic, blind spots, poor visibility because of bad weather, fatigue and the monotony of a 12-hour shift can all conspire to divert a driver from their task. The last thing an operator needs on top of all that is a cabin cluttered with display panels.

In keeping with its commitment to help mines with a digitally integrated strategy, Hexagon Mining has now also embedded collision avoidance technology into its fleet management system: one solution that allows heavy and light vehicles to be seen and heard, no matter their location in a mine.

The integration means an improved user experience, greater oversight for dispatchers, and quicker communication of vital safety and operations data. Client demand for data about safety incidents and their effect on productivity, contributed to Hexagon Mining's release of a consolidated system. "It makes sense for safety and operations data to be in a single repository. Now customers can quickly make sense of that data for greater insight into how operator behaviour, environmental conditions, and road conditions affect mine safety and productivity.

"It's one more way we are helping customers to run safer, more productive mines using digitally integrated technology. The latest version of our FMS system informs controllers of the location of all vehicles equipped with our CAS, and of alerts if, for instance, visibility is poor. Controllers can warn operators to pay more attention, or enforce a lower speed limit to improve safety."

CAS is used in more than 25,000 mine vehicles in over 55 mines worldwide. Besides CAS anti-collision alerts, the latest version also alerts for rollovers, potential obstacles, and over-speeding. CAS symbols are integrated into the Jigsaw platform so that users of both systems require minimal training during the transition.

"Additionally, vehicles equipped with just CAS are visible in our FMS – one controller, one FMS-CAS system. For instance, now a contract light vehicle equipped with CAS is visible in the FMS. The controller's life becomes much easier when tasked with monitoring so many types of vehicles."

Netstar responds to industry need in South Africa

Ensuring safe working conditions for the mining sector is a challenge, particularly when it comes to complying with regulatory standards such as the Department of Mineral Resources' collision avoidance system requirements for mine vehicles.

Pierre Bruwer, Group MD of Altron subsidiary **Netstar**, explains how the company has stepped up to the plate and developed a unique and fully

compliant solution that helps mitigate some of the potential for accidents for mine fleets.

"Our system for surface vehicles in mining operations was developed by us and is a first for South Africa. We are proud to be able to offer such a solution to the mining industry and be part of finding solutions to ensure safe conditions for people working on the mine site."

Netstar's fleet solution for mines, recently unveiled at Electra Mining Africa 2018, the largest convention of its kind for the industry, it says benefits mines across South Africa and the globe, and speaks to Altron's vision of creating innovative technology solutions that aid in creating safe, compliant and secure working environments for all.

The solution was developed following the Department of Mineral Resources' 2015 legislation amendment of the Chapter 8 Act, which made it mandatory for all vehicles on mines to be fitted with collision avoidance proximity systems. This law was enacted to improve safety on mines, especially when vehicles as tall as 30 m are in operation, such as in open-cast operations, as well as aiding in the reduction of injuries associated with pedestrian mining accidents.

Bruwer adds that the system provides drivers with a 360-degree view, via an in-vehicle display, of the proximity of other vehicles as well as pedestrians and is particularly effective in dusty conditions and at night, when visibility is significantly reduced.

"The system works by alerting drivers audibly and visually ahead of potential issues, which not only reduces accidents, but also improves operational efficiencies. Furthermore, the system provides real-time data and connects through a variety of options, including cell networks, Wi-Fi, Bluetooth and radio," as additional fail safes.

As the Department of Mineral Resources' requirements ramp up, so will the system be upgraded to ensure compliance. By June 2019 the solution will have the added functionality to be able to take over control of a vehicle and slow it down if the operator does not acknowledge the presence of a vehicle, person or object, referred to as a level 8 intervention, and by June 2020, the solution will be able to automatically come to a stop without human intervention, a level 9 intervention.

In addition, when coupled with Netstar's other fleet functionality, the solution enables companies to optimise their fleets as it monitors driver behaviour, which aids in cutting down on excessive fuel usage, alerts managers as to when maintenance services are required, and provides valuable data that will aid in the event of an insurance claim.

"By incorporating telematics and collision avoidance software into our current toolkit, we have created a fleet solution that makes mining – a core part of South Africa's economy – safer," adds Bruwer. The real-time solution, however, is also relevant to other sectors, such as warehousing, distribution, manufacturing and logistics. "No matter what vehicle you use, our solution will be fit for your purpose," Bruwer concludes.

At Polyus Olimpiada gold mine in Russia, the whole fleet is equipped with Orlaco cameras, radar and monitors including the Cat 785C truck fleet as well as IZ-Kartex rope shovels

Orlaco RadarEye tech at Olimpiada

Orlaco, the global supplier of camera-monitor vision solutions for mines has come up with a solution where its RadarEye camera technology can integrate with any monitor in the machine: "If workplace safety is an important issue for you, your fleet will no doubt be equipped with camera monitor systems. You can now make your machines even safer by integrating RadarEye on your monitor. This active detection system is now available for all existing Orlaco monitors and third-party monitors.

"RadarEye prevents collisions by actively warning you about objects and people around the machine. You therefore know what is happening in the vicinity of your vehicle and can work even more safely, comfortably and efficiently."

RadarEye provides additional safety for the greatest risk areas around vehicles, from trucks to mining machinery. For example, in the case of loaders, which constantly drive back and forth, there is a high risk of collisions around the machine due to the limited view from the cab. "With RadarEye, you can ensure that people or objects that are too close to the vehicle are detected in time. A clear audible signal will warn the operator, and the hazard area will be highlighted via an overlay on the monitor."

Thanks to an SRD interface, RadarEye can be integrated with third-party monitors that have a PAL/NTSC video input. This means that RadarEye can now be used independently of the SRD monitor, and standard camera systems can easily be expanded with active radar detection. "Using the box, you can integrate radar alerts directly into the view on the existing monitor via visual overlays. Audible signals can also be used. Via the SRD interface box, you can now also connect the DVR One Channel recorder to RadarEye to record camera images. The system can be further expanded using master/slave cables and a switcher to add multiple sensors and cameras."

Orlaco's RadarEye camera systems are deployed widely in the global mining industry, such as at the Polyus Olimpiada gold mine in Russia, where the whole fleet is equipped with cameras, radar and monitors including the Cat 785C truck fleet as well as IZ-Kartex rope shovels, whose operators can now view the engine, cables, dipper and counterweight, all on their monitors. This gives them the control they need to remain flexible in all conditions and keep the constant flow of dump trucks driving up and down the mine filled up.

The fleetwide installation followed a successful pilot in 2016, after which all excavators, loaders, dump trucks, bulldozers, pipe layers, motor graders and other mining vehicles were equipped with the Orlaco system, totaling 1,500 cameras and 320 monitors. This was done by VIST Group, Orlaco's Preferred Partner in Russia.

Orlaco states: "Since installing the systems, safety in the mine has increased. There have been fewer impacts, collisions and cases of damage, and loaders have not been involved in any incidents at all. This has helped reduce downtime for vehicles and therefore increase efficiency. Drivers say that they no longer have to twist to look behind them while reversing, resulting in fewer physical complaints. There has also been a drop in stress at work thanks to improved vision. This is part of the reason why PJSC Polyus is going to equip its vehicles in a second Siberian mine with Orlaco's vision solutions for heavy duty vehicles. Loaders may also receive an additional camera to gain a view of the area beneath the bucket toward the front of the machine. With this, the Russian gold producer is once again demonstrating that it takes mine safety and the working comfort of its employees very seriously." IM