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SEPTEMBER 2021



SCANIA INTRODUCES NEW LEVELS OF EFFICIENCY TO VANEDI FREIGHT'S BUSINESS

WHEEL LOADERS: Factors driving wheel loader efficiency

DIESEL ENGINES: Diesel engines: the road to zero harmful emissions

OPERATOR TRAINING: Joint sponsors offer entry-level operator training to six women

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SCALING UP AFTERMARKET SERVICE CAPABILITIES

Those who closely follow developments in the local yellow metal equipment sector will be aware of the significant changes we have witnessed in dealer partnerships this year alone. The most recent one, detailed in this edition of **Capital Equipment News**, is Liebherr's appointment of Kemach as its earthmoving equipment dealer for South Africa.

Several other high-profile brands have changed hands in recent times. We have

seen John Deere and Bell Equipment ending their decades-long partnership, while Kemach and JCB have also gone their separate ways after many years together, with the latter joining forces with Bell Equipment. As a result of these changes, we have also seen BOMAG moving to Kemach, which recently gained the dealership for BULL backhoe loaders and McCloskey International's crushing and screening range.

The common denominator in these changes is that manufacturers are leveraging the opportunity to scale up their aftermarket service capabilities more rapidly. The dealer is a crucial interface between the original equipment manufacturer (OEM) and the end customer. The dealer acts as an extended arm and a telescopic eye for its OEM. It is of paramount importance for the OEM to maintain a healthy relationship with its dealer, a vital facilitator for its brand in the marketplace. If this relationship is good, then the dealer will serve as the greatest brand ambassador for the OEM. Equally, a strained relationship can be detrimental to the customer's brand experience.

These changes come at a time when manufacturers are increasingly starting to offer more aftermarket services. Traditionally, manufacturers focused on selling equipment, while aftermarket services remained as an ancillary business, and so the overall business models were mostly transactional in nature. However, over the past few years, due to the changing market conditions, many manufacturers have been moving towards a relationship-based business model, selling outcomes.

Changes in customer demands, increasing market maturity, cyclical fluctuations in new equipment sales and pressure on pricing are some of the major factors

driving many OEMs to seek new aftermarket opportunities. The shift appears to be taking place as more customers insist on service level agreements that guarantee product uptime and are thus looking for service providers who can proactively support their equipment. In return, these customers are willing to pay a premium to keep their equipment running.

As new equipment orders are disrupted and capital spending comes into question, aftermarket products and services will be an increasingly essential and stabilising part of the capital equipment business mix. Manufacturers are therefore taking advantage of the disruption to push through long-planned changes and innovations around aftermarket that can change the nature of their relationship with their customer base and channels.

For some manufacturers, according to a recent report by Deloitte, aftermarket already accounts for the entire profit generated by the company. In many cases, new equipment is no longer sold to generate profits, but to fuel the future aftersales business on the installed base. Many manufacturers generate 40 – 50% of their overall profits from services.

With uncertainty ahead, the expansion of aftermarket services is likely not a choice, but rather an imperative for all OEMs. OEMs and their dealers are prioritising relationship-building; aftermarket services offer the ability to support customers in different ways, such as building trust by supporting longer equipment lifespans during a downturn. In a crisis, customers may decide to switch to self-service, but now, more than ever, is the time for OEMs and their dealers to stay connected with their customers and ensure business continuity. 🌟



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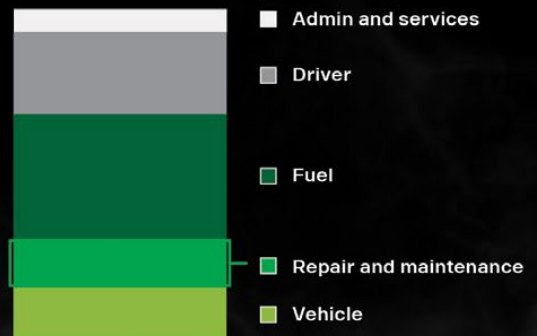


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*Fuel consumption figures calculated using monthly data collected from Scania Fleet management monitoring system on the NTG R500.

SCANIA



Freedom Khumbulani Vane, owner of Vanedi Freight, with one of his four Scania G460 trucks.

SCANIA INTRODUCES NEW LEVELS OF EFFICIENCY TO VANEDI FREIGHT'S BUSINESS

In an environment where margins continue to tumble, Vanedi Freight's decision to swap its fleet of used trucks for new Scania G460 units is paying dividends. Company owner Freedom Khumbulani Vane tells *Capital Equipment News* that the Scania range has ushered in new levels of efficiency and uptime, writes *Munesu Shoko*.

Transport operators in South Africa are facing some serious problems right now, notes Freedom Khumbulani Vane, owner of Midrand-based transport company, Vanedi Freight. Increasing fuel prices, a generally tough economy and a competitive business landscape are factors behind low margins in the transport business. To be able to run profitable operations in such a challenging environment, transport companies are looking for every opportunity to cut costs and improve efficiency and uptime.

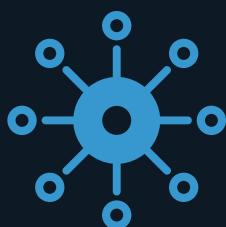
That was key in Vanedi Freight's decision to upgrade its fleet of used trucks with new Scania G460 units late last year. Having entered the transport industry in 2017 with a single used truck from one of the premium brands, the company soon added another used truck to its fleet as part of its expansion programme. It was not long before Vane realised that although the capital cost of a used truck was enticing, the maintenance costs were



For peace of mind, all of Vanedi Freight's Scania trucks were purchased with Scania's Repair and Maintenance contracts.



Having started its business with used trucks, Vanedi Freight bought its first new Scania G460 in October last year



The company has grown its fleet of Scania G460 trucks to four, with further expansion on the cards



Vanedi Logistics reports a 5% fuel saving on average, which is a game changer for the business



For peace of mind, all of Vanedi Freight Scania trucks were purchased with repair and maintenance contracts

QUICK TAKE



In an environment where fuel prices continue to soar, the Scania NTG range offers greater fuel efficiency through improved powertrains and better aerodynamics.



not sustainable, and therefore outweighed the lower capital outlay. Despite this realisation, Vane went on to replace the two trucks with a different premium brand, hoping for a different outcome. By 2019, the company was running four used trucks in the timber industry in a coastal region of South Africa.

Later that year, the decision was made to move the fleet to the inland market, operating mainly between the Mpumalanga, North West and Northern Cape provinces and the ports of Durban and Gqeberha (formerly Port Elizabeth), as a subcontractor to some of the biggest names in the game. When COVID-19 hit at the beginning of 2020, Vane had a hard look at his business, which led to the decision to dispose all the four used trucks in his fleet, in search of better efficiency to survive the tough business conditions.

"We went into the market and our research showed that Scania could give us a better shot at success. After selling the four old trucks we had, we bought our first brand-new Scania G460 in October last year. We have been adding a new truck to our fleet after every two to three months since then. We are to date operating four new G460 units that we purchased from Scania Southern Africa," he says.

The four Scania trucks have been deployed in the side tipping application, transporting chrome, manganese and other commodities from the mining provinces of North West and Northern Cape to the ports of Durban and Gqeberha.

Efficiency matters

In his years in the transport business, one of the important lessons that Vane has learnt is the significance of fuel efficiency. Fuel is the biggest expense for truck operators, yet this important resource has almost doubled in price over the past decade from R8,45 per litre in December 2010 to R16,52 (inland) in September this year. In fact, Automobile Association figures show that the price of diesel climbed nearly 20% in just eight months since January this year.

"Fuel is by far the biggest cost for any transport operator. This makes lowering fuel consumption a quick win for dramatically reducing total cost of ownership," says Vane. "In Scania G460, we have found an efficient truck ideal for our application and operating conditions."

Vane has seen a 5% fuel saving on average, which, according to him, is a game changer for his business. "It makes a huge difference, especially under the current tough business circumstances. As a subcontractor, our profit margins are already low, so every drop of fuel counts. Achieving a 5% fuel saving across our fleet is a breath of fresh air for our young business," he says.

Since its launch in May 2018, the Scania New Truck Generation (NTG) range has set itself apart through market-leading fuel savings. In an environment where fuel prices continue to soar, the new truck range offers greater fuel efficiency through improved powertrains and better aerodynamics. Some customers running this range have reported as high as

10% fuel savings, sufficient to offset maintenance costs.

Peace of mind

For peace of mind, all of Vanedi Freight's Scania trucks were purchased with Scania's Repair and Maintenance (R&M) contracts. R&M contracts have helped the business improve its truck uptime significantly.

"Part of our business strategy is to have all our vehicles come with R&M contracts. When the vehicles are due for service, we send them in and they get serviced. In case of a breakdown, Scania's branch network is a phone call away and they sort out any problems quite quickly to get our mission-critical assets back on the road with minimum downtime," says Vane.

He says since the vehicles are serviced by experts, scheduled downtime related to maintenance is kept to a minimum, thus increasing uptime and truck availability. The R&M contracts run until the replacement cycle of three years/600 000 km. "R&M contracts allow us to focus on our core business, which is transport, and leave the maintenance part to the professionals," he says.

R&M contracts, he adds, also enable the company to budget more effectively over the life of the vehicle. This approach also decreases the amount of administration and personnel required. Contracts are invoiced monthly rather than having to provide purchase orders or make payments every time a vehicle visits the workshop.



In his years in the transport business, one of the important lessons Freedom Khumbulani Vane has learned is the significance of fuel efficiency, and this is the reason he switched to Scania.

Keeping an eye on the fleet


To keep an eye on the fleet, Vanedi Logistics also makes use of Scania Fleet Management Services (FMS). Vane considers fleet management to be one of the most important functions in any fleet-driven business. "Managing a fleet is a huge challenge, to say the least, but the incorporation of a fleet management system can make the entire process very simple and efficient. With that in mind, we have taken Scania's Fleet Management Services with all our trucks," he says.

Scania's FMS is a set of services that connects fleet owners with their vehicles and drivers while they are out in the field. They can get all the vehicle data, fleet position and reviews of driving performance, among other key parameters. The system helps fleet owners identify and use key details to increase the productivity of fleets and maximise their total operating economy.

"Fleet management puts me as the owner in the 'driving seat' of the vehicle. It allows me, at any given time, to retrieve information and put corrective measures in place. It helps us utilise vehicle and driver follow-ups as well as obtain operational information to support our decisions," he says.

Additionally, Vanedi Freight also makes use of Scania Finance, allowing the company to deal with a single service provider for all its needs. A major advantage of Scania's captive finance is the cooperation between different functions that are embedded within the company. There are different functions within the Scania organisation, including Scania Parts, Scania Fleet Management, Scania Rental, Scania Finance and Insurance, as well as Scania Used, to mention a few, which are driven by the same values, making the company a one-stop shop for transport operators' needs. Dealing with a single organisation for all these needs, all the way from the product, through to finance and aftersales service, maximises uptime for customers.




"We are happy with the Scania product and the service we have received from the OEM thus far. As we look forward to further expanding our business, Scania will remain our transport solutions provider of choice," concludes Vane. 🌟



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The loader and load receiver must be matched to optimise the number of passes.

FACTORS DRIVING WHEEL LOADER EFFICIENCY

Wheel loader efficiency is a principal objective for every site manager. In a one-on-one with *Capital Equipment News*, Volvo Construction Equipment product manager Anteneh Gebremeskel takes a closer look at the key parameters that affect wheel loader efficiency and some of the innovations the OEM has brought to market to help operations achieve high loading efficiency. By Mark Botha.

Loading efficiency – loading as much as possible as speedily and as optimally as possible – depends heavily on matching the required production, which relates to sizing the wheel loader correctly for the payload, to the amount of material to be moved. This is the view of Volvo Construction Equipment (Volvo CE) product manager Anteneh Gebremeskel, who says that work with a wheel loader often involves passing the load to a hauler or other load receiver, and that the number of these passes should be optimised by matching the loader to the receiver.

“The loader should be configured according to boom length and the attachments to be used, among

others. These must be matched to prevent half-bucket passes as this constitutes waste.”

The right machine settings, too, play an important part: “To be efficient, you need the right settings for how the transmission or hydraulics system should behave for each application – all these factors must come together for optimal efficiency.”

He says that, while some owners may prefer to have one setting for all applications, Volvo CE’s machines can do better than that. “Our approach is to give operators more flexibility and control over their work environment, as they also play an important part in loading efficiency. In doing so, we strike a balance between providing

the right number of settings without making it too complicated and cumbersome.”

Operator technique

Volvo conducted an internal survey some years ago to determine how operator skill impacts tonne per hour and tonne per litre performance.

“We invited some 80 operators with skills levels ranging from ‘rookie’ to professional. These operators were selected from within Volvo and from external staff, who are more skilled since operating wheel loaders is their daily work.

“The range of their efficiency is alarmingly wide, even among professional operators. We saw a difference of up to 30% in fuel



Volvo CE's L150H wheel loader.

Volvo Construction Equipment (CE) presents the EcoOperator training programme for operators around the globe, an advanced course for experienced operators. The programme helps operators work more productively while reducing fuel consumption, machine wear and unplanned downtime.

"We conduct an initial machine data analysis to identify areas for improvement, and a site visit to gather information and complete the assessment phase which also includes machine inspections and an assessment of the client's operating practices and site conditions."

He says Volvo CE can also monitor and follow up on these operators' improvements once they return to work after their training, "as long as their equipment is connected to our CareTrack telematics system". This system is, however, not available in Africa due to "regulatory challenges" in some countries.

Gebremeskel notes that it is costly to remove operators from production for up to two weeks of training, which is why some clients choose to invest in Volvo CE's training simulators.

These simulators, which can either be used at dealerships or be installed in air-conditioned shipping containers on clients' work sites, provide a realistic experience of sitting in the real machine and is a "great way to train operators", he says.

Productivity

Besides the efficiency of the loader, operator and the load receiver, productivity is also dictated by on-site conditions.

"You need the right site layout in terms of the location of the 'face' and of the length of the transport strait. Distance also dictates whether you use the wheel loader or a hauler to transport the material from face to the first processing station.

"Changing the site layout is costly and must be done correctly the first time. Volvo site simulation calculates the effect of adding a truck or changing the size of a wheel loader on site on parameters such as production targets, fuel consumption and maintenance."

He says the simulation is "ideal" for calculating the optimum number, type and capacity of machines to reach production and efficiency targets. Volvo uses drone measurements and photos to create more accurate 3D models of customers' sites before they invest in real-world changes.

"We cooperate with the client to gather data from their site. Jobsite-specific

QUICK	TAKE
Loading efficiency depends heavily on matching the required production, which relates to sizing the wheel loader correctly for the payload, to the amount of material to be moved	
The operator can work 30% less efficiently than what the machine is capable of	
At the Uptime Centre in Eskilstuna, Sweden, Volvo CE specialists monitor key parameters of clients' equipment remotely	
Simulation is ideal for calculating the optimum number, type and capacity of machines to reach production and efficiency targets	

consumption among these operators. The disparity was even greater in terms of productivity."

The take-away from the survey was that operator skill can have a greater impact on efficiency than the technology featured on the machine.

"If we develop a new technology such as a hybrid driveline or a fully electric machine, we spend many years and millions of rand to produce a 30 or 40% more efficient machine, but the operator can work 30% less efficiently than what the machine is capable of. So, training operators is as important as investing in new technology."



Onboard Weighing on Volvo's H-Series loaders provides real-time insight into bucket load.

TALKING POINT



"Our approach is to give operators more flexibility and control over their work environment, as they also play an important part in loading efficiency. In doing so, we strike a balance between providing the right number of settings without making it too complicated and cumbersome."

Anteneh Gebremeskel, product manager,
Volvo Construction Equipment

factors such as bank density, swell factor, average bucket fill percentage and ground conditions are entered into the tool. It is also possible to scan your site with a GPS device or drone."

He says the goal is to have dealerships equipped with and trained in this technology, and to have site simulation experts at hand.

The company also provides Volvo Uptime Services for telematics connected machines.

"We have an Uptime Centre in Eskilstuna, Sweden, where specialists monitor key parameters of clients' equipment remotely. Warnings and errors are flagged to the dealer before the customer is even aware of any potential issues occurring."

Innovations

Gebremeskel says Volvo CE has focused much on its 'Assist' services in recent years.

"For our wheel loaders, we have Load Assist, an umbrella for the products and services we provide to assist wheel loader operators to improve and become more efficient."

The first Load Assist service he

highlights is Onboard Weighing, available to Volvo's H-Series wheel loader for the African market.

"The load weighing system provides real-time insights into the bucket's load in order to eliminate overloading, underloading, reweighing and waiting times," says Gebremeskel.

Another Volvo innovation is the Load Assist Operator Coaching app which provides operators with real-time guidance and helps them understand how their actions influence machine productivity and efficiency while identifying areas for improvement or changes in technique.

"With this app, operators can gauge their own performance in terms of parameters such as brake usage and idling. It motivates them to set performance targets of their own."

Turning to tyres, Gebremeskel notes that they comprise one of the most expensive components on any wheel loader: "The cost of tyres is so high that some companies appoint third-party service providers just to monitor the tyres on their equipment."

Volvo's answer to this is the Load Assist Tyre Pressure Monitoring System which allows the operator to monitor tyre condition from the cab in real time.

Load Assist also features Map, an app that allows operators to monitor on-site traffic in real-time. The app orientates the operator in terms of the site and allows them to adjust their driving behaviour according to traffic conditions.

Operator

In a bid to aid the operator in their work, Volvo CE has included the eco-pedal on its H and Gz wheel loader models, which Gebremeskel describes as "a simple feedback mechanism allowing the operator to work at optimal fuel consumption".

Eco-pedal incorporates a mechanism situated under the accelerator that resists pressure exerted by the operator when the engine revolutions exceed the needs of the task.

Another operator aide is the automatic boom kick-out function which stops the bucket and linkage in pre-selected positions.

"Kick-out can also be set for lifting and tilting," says Gebremeskel. "Instead of pushing the lever all the way until the bucket goes up or down, the operator simply taps the lever for the same effect." He says wheel loader operators spend many hours a day in the cab, doing repetitive, exhausting work.

"Our mission is to simplify the operator's work and to make their environment inside the cab as comfortable as possible."

Reverse by Braking (RVB) is another Volvo-patented feature designed to increase operator comfort and to extend component life.

"When the operator reverses and then changes direction to go forward, they should slow down the machine because it involves great inertia and stress on the drivetrain components. This is not always done."

The braking function therefore slows the machine when the operator wants to change direction, by applying the service brakes automatically.

Comfort Drive Control (CDC) lever steering is particularly effective in fast-paced truck loading operations where continuous turning of the steering wheel can be trying over the course of a typical eight-hour day.

"With CDC, you have a gaming-type joystick which allows the operator's arm to stay on the armrest while the controls are at their fingertips.

"Again, this improves operator comfort and increases productivity and efficiency," says Gebremeskel. "Comfortable operators take care of their machines and stay productive." 🌟

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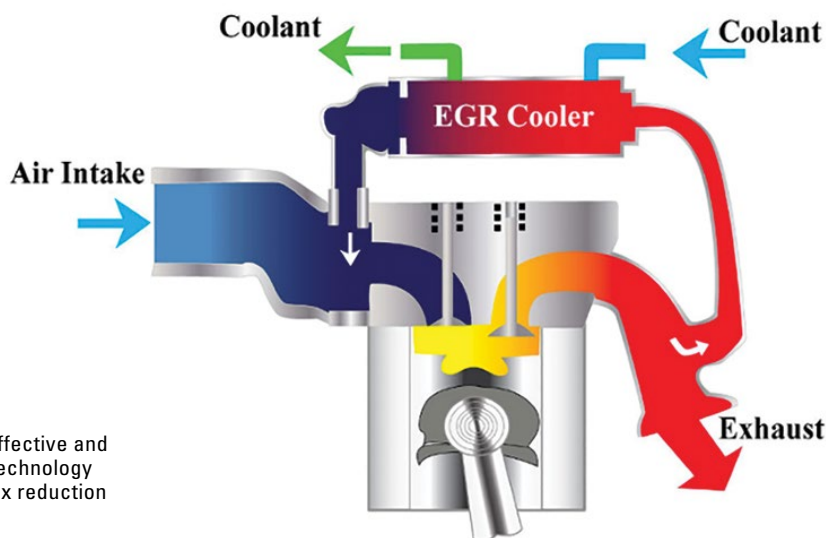
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DIESEL ENGINES: THE ROAD TO ZERO HARMFUL EMISSIONS

WearCheck technical manager, *Steven Lara-Lee Lumley*, unpacks diesel engine emissions and outlines the legislation and technologies being put in place to mitigate against harm.

“Barely a week goes by where climate change, global warming and the quality of air and airborne pollutants are not in the news, and quite often vehicle emissions are the primary focus of the headline,” Lumley begins.

Every day, millions of diesel-powered ships, trains and trucks busily move consumer goods and raw materials from ports, distribution centres and rail yards to stores and industrial facilities throughout the world. Diesel engines are also widely employed in pipeline pumps, electric and water plants, industrial machinery, mining equipment, factories and oil fields.

Unmatched in their reliability, durability and fuel efficiency, diesel engines play a fundamental role but, through their exhaust emissions, they are also associated with a number of

environmental and health-related issues.

“To successfully navigate the road to zero harmful emissions, we must understand the emissions we are trying to limit, the standards that govern them, the technologies we can employ and the role of the fuels and lubricants we select,” she says.

Diesel exhaust gas emissions we are trying to limit

The four main pollutant emissions generated by diesel engines are carbon monoxide (CO), hydrocarbons (HC), particulate matter (PM) and nitrogen oxides (NOx). NOx is a general term referring mainly to nitric oxide (NO) and Nitrogen Dioxide (NO₂) gases.

The gas portion of diesel exhaust is mostly CO₂, CO, NOx, sulphur dioxides (SO₂), and HCs, including polycyclic aromatic hydrocarbons (PAHs). CO and HCs are generated in the exhaust as the result of incomplete combustion of fuel, but exhaust hydrocarbons can also come from the lubricant.

SO₂ is generated from the sulphur present in diesel fuel, so the concentration of SO₂ in the exhaust gas depends on the sulphur content of the fuel. Oxidation of SO₂ produces sulphur trioxide (SO₃), which is the precursor of sulphuric acid which, in turn, is responsible for the sulphate particulate emissions and acid rain.

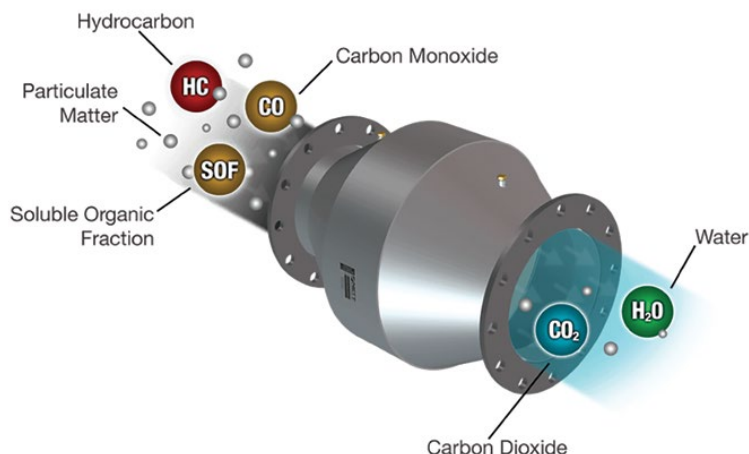
Out of the various compounds produced, NOx gas and PM are typically portrayed as the two ‘bad boys’ of diesel exhaust and have proven to be the most challenging of regulated pollutants when it comes to



“Barely a week goes by where climate change, global warming and the quality of air and airborne pollutants are not in the news, and quite often vehicle emissions are the primary focus of the headline.”

Steven Lara-Lee Lumley, technical manager, WearCheck

Diesel oxidation catalyst



of a human hair, particulate matter varies in size from coarse particulates (less than 10 µm in diameter) to fine particulates (less than 2.5 µm) to ultrafine particulates (less than 0.1 µm).

Ultrafine particulates, which are small enough to penetrate the cells of the lungs, make up 80-95% of diesel soot pollution. When one inhales these microscopic particulates, they can become embedded in your lungs and impair their breathing function. As a result of this, diesel PM was officially classified as carcinogenic by the WHO in 2012.

The standards that govern diesel emissions

Emission standards set quantitative limits on the permissible amount of specific air pollutants that may be released from specific sources over specific timeframes. They are generally designed to achieve air quality standards and to protect human life. Different regions and countries have different standards for engine emissions. In order to conform to these emission standards, engines need to produce cleaner exhaust emissions by producing less harmful by-products.

There are four main sets of emissions standards: United States (TIER), Japanese (CEC Central Environment Council), India (BHARAT) and European (EURO) with various markets outside of these regions mostly using these as their base. The European standards are the most widely-followed vehicle emission guidelines in the world, and as such South Africa has elected to follow this standard - although in a somewhat lagged fashion.

Although emissions regulations date back to 1970, the first EU-wide standard – known as Euro I – wasn't introduced until 1992. Since then, there has been a series of Euro emissions standards, leading to the current Euro VI version introduced in September 2015.

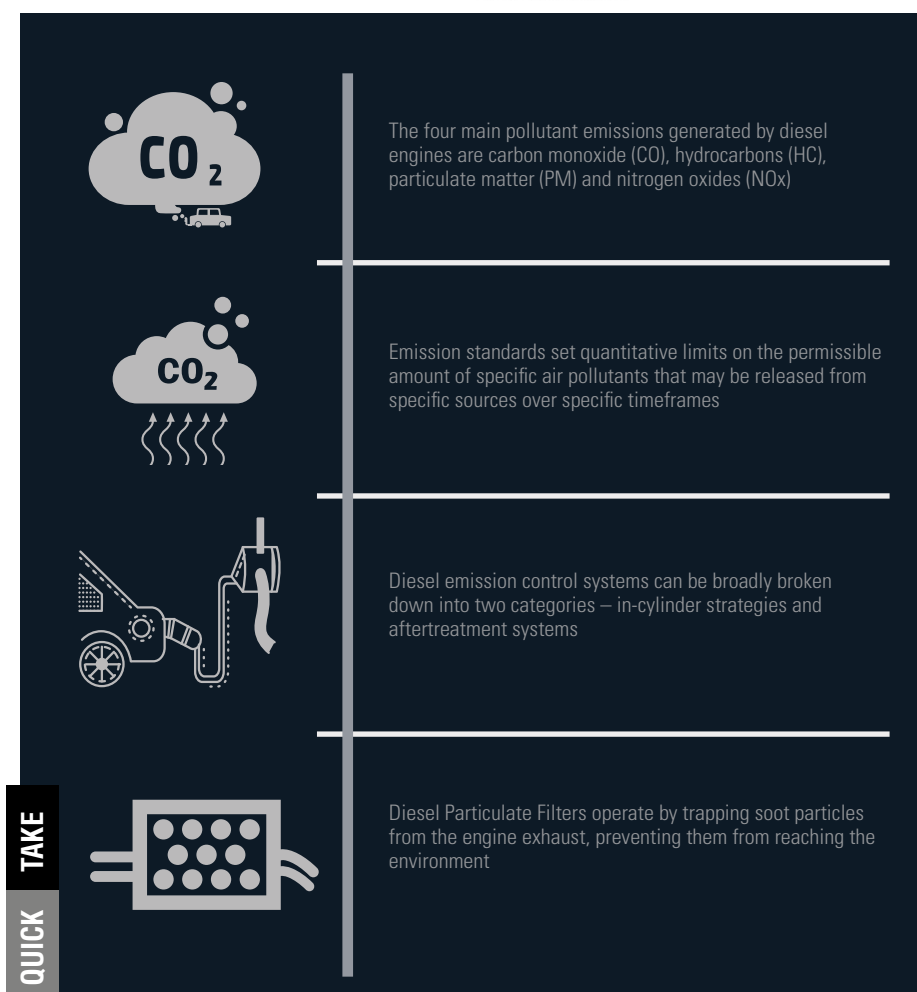
The aim of Euro emissions standards is to reduce the levels of harmful exhaust emissions, primarily NOx, CO, HC, PM emissions and, in the case of Euro VI-compliant engines, ammonia (NH₃).

Emission mitigation technologies we can employ

Diesel emission control systems can be broadly broken down into two categories: (1) in-cylinder strategies and (2) aftertreatment systems. The selection and configuration of which technologies are used dependent on the engine manufacturer and machine application.

In-cylinder technologies

As emissions standards tightened, more



diesel engine design that is compliant with emission standards.

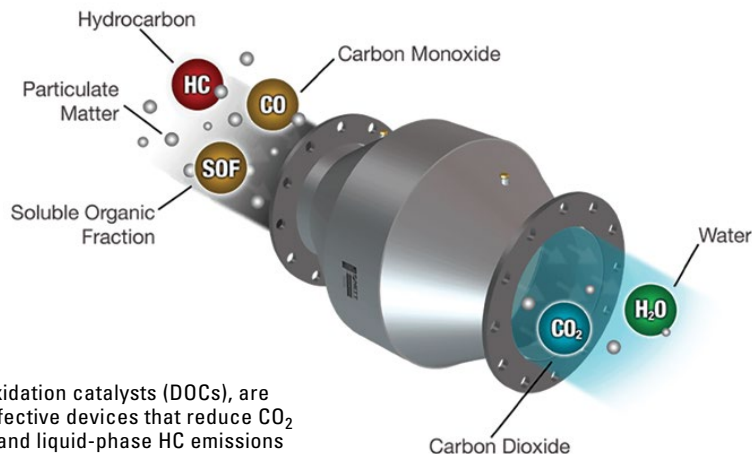
NOx gases are generated from nitrogen and oxygen under the high pressures and temperature conditions in engine cylinders. Diesel engines run both hotter and at higher pressures than their petrol counterparts and subsequently produce more NOx gases.

Diesel emissions of NOx contribute to the formation of ground level ozone, which irritates the respiratory system, causing coughing, choking, and reduced lung capacity. Ground level ozone

pollution, formed when nitrogen oxides and hydrocarbon emissions combine in the presence of sunlight, presents a hazard for both healthy adults and individuals suffering from respiratory problems.

PM or soot is created during the incomplete combustion of diesel fuel. Its composition often comprises hundreds of chemical elements, including sulphates, ammonium, nitrates, elemental carbon, condensed organic compounds and heavy metals such as arsenic, selenium, cadmium and zinc. Though just a fraction of the width

Diesel oxidation catalyst



Diesel oxidation catalysts (DOCs), are highly effective devices that reduce CO_2 and gas and liquid-phase HC emissions by 80% or more.

advanced in-cylinder control strategies were applied, that included energy-efficient cylinder heads and valve train systems, closer piston-to-bore clearances and modified ring positioning to assist in lower emissions output. In the last two decades, the design of diesel engines has progressed rapidly, most significantly in the areas of fuel injection systems, electronic controls and air handling through the use of variable-geometry turbochargers.

Many of the latest generation engines have common-rail or unit-injector designs, a common feature that produces far higher injection pressure than the old mechanical systems, coupled with precise electronic control of injection timing. Other in-cylinder techniques also include the adoption of the Miller cycle, diesel water injection and homogenous charge compression ignition (HCCI). These various techniques help achieve a more complete combustion and reduce particulate formation and fuel consumption.

Air handling strategies have been focused on the use of variable geometry turbochargers to provide the right amount of air under specific engine operational conditions. Tuning these parameters minimises production of both PM and NO_x .

Another popular in-cylinder technology for NO_x control is an exhaust gas recirculation (EGR) system, which recirculates a portion of cooled exhaust gas back to the engine's cylinder, reducing peak combustion temperatures and temperature-dependent NO_x formation. EGR is the most effective and commonly-used technology for in-cylinder NO_x reduction in diesel engines.

Since EGR reduces the available oxygen in the cylinder, incomplete combustion and the production of PM increases when EGR is applied, so NO_x and PM must be traded against each other in diesel engine design.

Aftertreatment systems

An aftertreatment system treats post-combustion exhaust gases prior to tailpipe emission. In other words, it is a device that cleans exhaust gases to ensure the engines meet emission regulations.

Within the aftertreatment category there are a further two classes – filters and catalysts.

In chemistry, a catalyst is a substance that causes or accelerates a chemical reaction without itself being affected. Catalysts participate in the reactions but are neither reactants nor products of the reaction they catalyse. A catalytic converter is a device that uses a catalyst to reduce the toxicity of emissions from an internal combustion engine either through the process of oxidation or reduction.

The first diesel emission catalysts, introduced in the 1970s for underground mining applications, were simple oxidation catalysts designed for the conversion of CO and HC, but as the years rolled on and requirements intensified, more specialised catalysts were developed.

Filters do exactly as their name implies, they physically filter out something. To be more specific, these are porous devices for removing impurities or solid particles from a liquid or gas passing through it.

Ultimately, using a combination of physical mechanisms and chemical reactions these systems can, under the right conditions, achieve near complete removal of particulates and harmful gases. Let's take a closer look at some of these technologies and how they work.

A diesel particulate filter (DPF) is a device designed to remove soot from diesel engine exhaust gases. DPFs operate by trapping soot particles from the engine exhaust, preventing them from reaching the environment. Unlike catalytic converters, which are designed to reduce gas-phase

emissions flowing through the catalyst, the particulate filter is designed to trap and retain the solid particles until the particles can be oxidised or burned in the DPF itself, through a process called regeneration.

The most common DPFs in widespread use are cellular ceramic honeycomb filters with channels that are plugged at alternating ends. The ends of the filter, plugged in a checkerboard pattern, force the soot-containing exhaust to flow through the porous filter walls. While the exhaust gas can flow through the walls, the soot particles are trapped within the filter pores and in a layer on top of the channel walls. Soot particles are captured and retained in the DPF through a combination of depth filtration inside the filter pores and surface filtration along the channel walls. Given the small pore size and design of the honeycomb filters, DPFs can achieve a particle trapping efficiency of 99% or greater.

The honeycomb design provides a large filtration area while minimising pressure losses, and has become the standard, so-called wall-flow filter for most diesel exhaust filtration applications. Ceramic materials are widely used for particulate filters, given their good thermal durability, with the most common ceramic materials being cordierite, silicon carbide and aluminium titanate.

However, over time the trapped soot accumulated in the filter, if not removed, increases backpressure, which can compromise engine performance, increase fuel consumption and eventually lead to DPF failure. To prevent this, the DPF must periodically be regenerated to remove soot through a process that burns off (oxidises) the soot. There are two broad categories of the regeneration processes, (1) active and (2) passive, although most commercial applications use some combination of the two.

Active regeneration requires the addition of heat to the exhaust to increase the temperature of the soot to the point at which it will oxidise in the presence of excess oxygen. The combustion of soot in oxygen typically requires temperatures in excess of 550°C . Since these high temperatures generally do not occur in the exhaust/DPF during normal engine operation, active regeneration systems may include the use of a diesel burner to directly heat the exhaust entering the DPF; or the use of a diesel oxidation catalyst (DOC) to oxidise diesel fuel over the catalyst as a means for increasing the DPF temperature.

DOCs also require excess diesel fuel in the exhaust, which may be accomplished through a fuel injector/hydrocarbon doser

Diesel particulate filter



Diesel particulate filters (DPFs) are designed to trap and retain solid particles until they can be completely oxidised or burned.

mounted in the exhaust upstream of the DOC; or through late in-cylinder post injection strategies. Other forms of active regeneration include the use of electrical heating elements, microwaves or plasma burners. The use of a DOC in combination with some form of exhaust fuel dosing is, however, the most common active regeneration strategy currently used for on- and off-highway applications.

Passive regeneration, as the name implies, does not require additional energy to carry out the regeneration process. Instead, this strategy relies on the oxidation of soot in the presence of NO_2 , which can occur at much lower temperatures. In order to achieve this, a passive system uses a catalyst, which contains precious metals such as platinum, to convert NO in the exhaust to NO_2 , which reduces the ignition temperature of the soot to below 550°C . In some cases, the catalyst coating is applied directly to the DPF; or an upstream oxidation catalyst may also be used. Many commercial systems utilise a combination of a DOC and Catalysed DPF (C-DPF).

Catalytic converters

Diesel oxidation catalyst: CO, as well as gas and liquid-phase HC emissions, result from the incomplete combustion of diesel. Diesel oxidation catalysts (DOCs), are highly effective devices that reduce these emissions by 80% or more from diesel.

In most applications, a DOC consists of a stainless-steel canister that contains a honeycomb structure called a substrate, which is made up of thousands of small channels. Each channel is coated with a highly porous layer containing precious metal catalysts such as platinum or palladium. As exhaust gas travels down the channel, CO and HCs react with oxygen within the porous catalyst layer to form CO_2 and water vapour.

Using a DOC also protects the DPF. Hydrocarbon liquids or vapour can interfere with the DPF's ability to trap and remove

particulate matter, so engine manufacturers often route the exhaust through the DOC first, then into the DPF.

Selective catalytic reduction (SCR): NO_x gases generated from nitrogen and oxygen under engine combustion conditions can be successfully converted to N_2 and water using SCR technology – one of the most effective technologies available today. SCR systems are classified into two groups, Urea-SCR and Hydrocarbon-SCR, the latter being most commonly known as a lean NO_x catalyst (LNC).

Urea-SCR uses a reductant known as a diesel exhaust fluid (DEF), which is injected into the exhaust gas to help reduce NO_x emissions over a catalyst, with aqueous urea ($\text{CH}_2\text{N}_2\text{O}$) being the reductant of choice in SCR systems for mobile diesel engines.

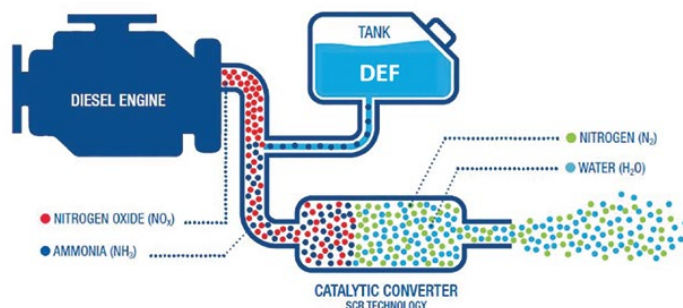
The urea-SCR system uses a metallic (e.g. vanadium-based) or ceramic (e.g. zeolite-based) wash-coated catalysed substrate and the chemical reductant – usually aqueous urea – to convert nitrogen oxides into molecular nitrogen and oxygen in oxygen-rich exhaust streams.

On thermal decomposition in the exhaust, urea decomposes to ammonia (NH_3), which serves as the reductant. As exhaust and reductant pass over the SCR catalyst, chemical reactions occur that reduce NO_x emissions to nitrogen and water. Urea-SCR catalysts are often combined with a particulate filter for combined PM and NO_x reduction.

The reaction between NO_x and NH_3 is never perfect and, even though SCR systems can achieve efficiency rates often higher than 95%, there is sometimes a waste stream of un-reacted NH_3 that goes into the atmosphere. This excess NH_3 is known as NH_3 slip.

For this reason, SCR systems may also include an oxidation catalyst, called the ammonia slip catalyst (ASC), downstream of the SCR catalyst, which oxidises ammonia slip to harmless N_2 and water, usually over a platinum/aluminium oxide base. The ASC

Selective catalytic reduction



Selective catalytic converters use a diesel exhaust fluid (DEF) such as aqueous urea to successfully convert NO_x gases into N_2 and water.

is increasingly important in SCR systems designed for high NO_x conversion efficiency, especially in the higher-rated Euro engines.

Lean NO_x catalyst (LNC): Catalytic reduction of NO_x with hydrocarbons is an attractive NO_x abatement method under lean burn conditions, especially when the diesel exhaust is used as a reducing agent. In this process the system injects a small amount of diesel fuel or other hydrocarbon reductant into the exhaust upstream of the catalyst. The fuel or hydrocarbon reductant serves as a reducing agent for the catalytic conversion of NO_x to N_2 .

A lean NO_x catalyst often includes a highly-ordered porous channel structure made of zeolite, along with either a precious metal or base metal catalyst. The zeolites provide microscopic sites that are fuel/hydrocarbon rich where reduction reactions can take place.

NO_x adsorber catalysts (NAC): NO_x adsorber catalysts (NACs), also referred to as lean NO_x traps (LNTs), provide another catalytic pathway for reducing NO_x in an oxygen-rich exhaust stream. They are known as adsorbers or traps because part of their function also includes trapping the NO_x in the form of a metal nitrate during lean operation of the engine.

Typically, NACs consist of precious metals (e.g. platinum or palladium), a storage element (e.g. barium hydroxide or barium carbonate) and a high surface area support material.

Under lean air to fuel operation, NO_x reacts to form NO_2 over the precious metal catalyst, followed by reaction with the barium compound to form barium nitrate.

Following a defined amount of lean operation, the trapping function becomes saturated and must be regenerated. This is commonly done by operating the engine in a fuel-rich mode for a brief period of time to facilitate the conversion of the barium compound back to its original state and giving up NO_x in the form of N_2 or NH_3 gas. ☼

Kemach will offer a full line of Liebherr hydraulic excavators.



LIEBHERR SCALES UP SALES AND SUPPORT CAPABILITIES WITH KEMACH PARTNERSHIP

Having previously taken a direct route to market, Liebherr has adopted a dealership approach to its earthmoving equipment business in South Africa, following the appointment of renowned capital equipment supplier, Kemach Equipment. The new partnership – effective August 2021 – will scale up Liebherr's sales and support footprint and enhance customer satisfaction in what is deemed to be the largest, yet competitive, yellow metal equipment market in Africa, writes *Munesu Shoko*.

On the back of a competitive market landscape in the South African yellow metal equipment sector, Liebherr is leveraging the opportunity to scale up its aftermarket service capabilities with the appointment of Kemach Equipment as a sales and aftersales support partner in the country.

Speaking to *Capital Equipment News*, Tendayi Kudumba, GM Earthmoving at Liebherr-Africa, says the partnership will not only boost Liebherr's sales and support footprint, but also enhance customer satisfaction through enhanced product uptime.

Liebherr-Africa has traditionally sold its products directly to market, except for the period between 2012 and 2017, when it had a local South African sales partner for excavators and dozers. "The change in strategy," explains Kudumba, "was necessitated by the need to grow our market share and to better serve our customers in South Africa." He, however, reiterates that, as part of the partnership, both Liebherr-Africa and Kemach will offer sales and aftersales support services across the country with no particular allocation of regions.

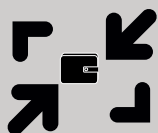


"On the one hand, Kemach gives us a strong sales and support footprint to expand our reach in South Africa, and on the other, the Liebherr range affords Kemach a high-end earthmoving product to offer to its customers."

Tendayi Kudumba, GM Earthmoving at Liebherr-Africa



The Liebherr range of wheel loaders L 524 – L 580 impresses across applications with its proven productivity and efficiency.



Liebherr has appointed Kemach Equipment as its sales and aftersales partner in South Africa, effective August 2021



As part of the distributorship agreement, Kemach will offer a full line of Liebherr hydraulic excavators, from the 20-t Liebherr R 920 to the 100-t Liebherr R980



Kemach will sell and support a full line of Liebherr wheel loaders, from the 10,4-t L 534 to the 25-t L 580



Liebherr dozers – from the 20-t PR 736 to the 73-t PR 776 – also form part of the distributorship agreement

Why Kemach?

Commenting on why Liebherr-Africa chose Kemach as its partner in South Africa, Kudumba says the company possesses all the key values and qualities that the OEM wanted in a partner. “We are excited to have entered into what we believe will be a long-standing working partnership with Kemach,” says Kudumba.

Established in 2003, Kemach is a well-known supplier of premium equipment brands to the mining, construction, quarrying and plant hire industries in South Africa and neighbouring countries. The company boasts a strong sales and support footprint of nine branches in all key regions of South Africa, namely Johannesburg, Rustenburg, Nelspruit, Bloemfontein, Durban, East London, Gqeberha (previously Port Elizabeth), Cape Town and Kathu, as well as two sub-dealers in Polokwane and the North West Province.

Kemach’s support footprint will be complemented by Liebherr-Africa’s own formidable branch network that comprises Springs (headquarters), Middelburg, Cape Town and Kathu, to enhance speed of service and customer experience. Kudumba believes that it is in the coastal regions where Kemach’s presence will be a game-changer for the Liebherr brand in South Africa.



The best on offer in Liebherr's dozer range is the PR 776 – the first dozer in the 70-t class to be hydrostatically driven.



The Liebherr telehandler range, first introduced locally by Liebherr-Africa in 2019, will also form part of Kemach's product offering.

The partnership benefits from strong synergies between the two companies. "On the one hand, Kemach gives us a strong sales and support footprint to expand our reach in South Africa, and on the other, the Liebherr range affords Kemach a high-end earthmoving product to offer to its customers. The two organisations also share the same business ethics, passion for product, customer engagement and the desire to grow our businesses," explains Kudumba.

Les Lothian, CEO of Kemach Equipment, is equally thrilled to have added Liebherr to the company's growing portfolio of premium offerings.

"Our experienced sales team is now equipped to provide current and future customers with a 360-degree solution to construction and earthmoving needs with the strong product line that Liebherr is bringing to us," he says

Full range

As part of the distributorship agreement, Kemach will sell and support a full range of Liebherr earthmoving equipment across the country, including excavators, wheel loaders, bulldozers and telehandlers.

In its earthmoving equipment portfolio, Liebherr offers an extensive range of hydraulic excavators, crawler tractors, telescopic handlers and wheel loaders. High quality standards, says Kudumba, are achieved by in-house production of main components which are developed and manufactured by Liebherr. Among these are the drive and control technology, diesel engines and a variety of components for hydraulics, gearboxes and electronic systems.

Kemach will offer the full line of Liebherr hydraulic excavators, all the way from the 20-t Liebherr R 920 to the 100-t Liebherr R980. This is complemented by a full line of wheel loaders from the 10,4-t L 534 to

the 25-t L 580. The Liebherr range of wheel loaders L 524 – L 580, says Kudumba, impresses across applications with its proven productivity and efficiency. High tipping loads at low operating weight permit high handling capacity. Meanwhile, strong construction and rugged components result in reliable and powerful performance.

"A key talking point on Liebherr wheel loaders is the lower fuel consumption. With this range, it is simple to do more, moving larger volumes of material with less fuel compared with conventional loaders. The Liebherr driveline achieves a reduction in fuel consumption of up to 25%. This reduces operating costs and increases profitability," explains Kudumba.

As part of the agreement, Kemach will also sell and support a full line of Liebherr dozers – from the 20-t PR 736 to the 73-t PR 776. Power and innovative technology are key features of Liebherr's generation 4 dozers. The power-to-ratio of the PR 744, PR 754 and the PR764 ensures maximum productivity in all operating conditions.

The best on offer in this range is the PR 776 – the first dozer in the 70-t class to be hydrostatically driven. The principal benefit of a hydrostatic transmission on a dozer is the absence of gears, resulting in seamless operation, uninterrupted power flow and infinitely greater variable speed control.

The PR 776's 73-t operating weight makes it a perfect fit for mining and large-scale quarrying operations. The large operating weight is complemented by larger blade capacities of 18,5 m³ (semi U-blade) or 22 m³ (U-blade).

The Liebherr telehandler range, first introduced locally by Liebherr-Africa in 2019, will also form part of Kemach's product offering. The two model lines comprise the top-of-the range models for materials handling or production applications (identified by the suffix S), as well as the simple, cost-optimised (standard) models for stacking and lifting applications.

Each model line has eight new models, available in 26 different versions. The range's load bearing capacity spans from 3,2 t to 6 t, with a lift height from 6 m to 10 m. The standard range comprises the T 35-6; T 32-7; T 36-7; T 41-7; T 33-10, T 46-7; T 55-7 and T 60-9. The premium range comprises the T 35-6s; T 32-7s; T 36-7s; T 41-7s; T 33-10s, T 46-7s; T 55-7s and T 60-9s.

"The standard range is targeted at construction markets, including civil engineering, road construction, demolition and building construction. The premium range fits the bill for industrial applications, including timber, sawmill, waste recycling and compost plants, among others," concludes Kudumba. 🌟

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TEREX TRUCKS REBRANDS AS ROKBAK

Articulated hauler specialist Terex Trucks has rebranded as Rokbak. The Scottish manufacturer unveiled the new brand at a digital launch event attended by *Capital Equipment News* on September 1. By *Munesu Shoko*.

Rokbak is the new name for Terex Trucks, with the new brand said to represent the continuation of the company's "strong hauling heritage with a future-focused vision". Throughout the past four decades, says MD Paul Douglas, the company has delivered its promise to produce powerful and reliable articulated haulers – and that legacy remains front and centre within the new brand.

"At the same time," he says, "the Rokbak name represents an exciting new future

and reflects the significant advances the organisation has made in recent years as well as its new strategic priorities."

"Our company has an incredible history and a proud heritage," says Douglas.

"Seven years ago, we became a member of the Volvo Group, which allowed us to make major improvements in every part of our business. Millions of pounds have been invested in improving our products, modernising our facilities, expanding our network and developing our people. It has been a process of continual evolution. That's why we feel it's right to recognise this evolution with a new brand name to launch an exciting new chapter in our history. And we will keep investing to further improve our machines for our customers."

Investments and improvements

The significant investments and improvements in the company's articulated haulers in recent times have ensured they remain among the most robust and reliable machines around, says Douglas. Now, he adds, with their foundation in the predecessor models from Terex Trucks, the 28-tonne payload RA30 and 38-tonne payload RA40 from Rokbak "are the most productive and efficient articulated haulers the company has ever made".

As part of the new brand launch, the machines now come in Rokbak colours and livery. While maintaining the experienced design, craft and precision that are synonymous with the company's haulers, the RA30 and RA40 are said to deliver better fuel economy, lower emissions, improved safety and greater durability.



"We are very excited to reveal our new brand, and of course our haulers are the shop window. Rokbak stands for power, performance and reliability. We already have a very healthy order book for the new brand, and we want to further expand our reputation, dealer network and market share."

Paul Douglas, MD of Rokbak



"We are proud and excited to have the modernised Rokbak brand continue as a fundamental part of our organisation. We believe in a sustainable future, innovation and the power of our people and we see that all encapsulated in Rokbak."

Melker Jernberg, president Volvo CE and executive vice president Volvo Group

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The 28-t RA30 and 38-t payload RA40 from Rokbak are said to be the most productive and efficient articulated haulers the company has ever made.



Rokbak is the new name for Terex Trucks, with the new brand said to represent the continuation of the company's strong hauling heritage with a future-focused vision



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In product design, the company has introduced Stage V engines for better fuel efficiency and operation for customers



Other improvements include a new transmission on the 28-tonne machine, the introduction of the Haul Track telematics and a stronger focus on operator wellbeing and safety

QUICK TAKE

areas: product design, sustainability, safety and people.

In product design, the company has introduced Stage V engines for better fuel efficiency and operation for customers. Other improvements include a new transmission on the 28-tonne machine, the introduction of the Haul Track telematics and a stronger focus on operator wellbeing and safety. In terms of sustainability, the company's manufacturing plant has shifted to 100% renewable energy as well as operating within Science-Based Targets and ISO standards, plus targeting CO2 emission reductions.

The focus on safety has been emphasised in all areas, but particularly on its employees. Changes in processes at the factory have seen a stronger concentration on maintaining employee safety while simultaneously delivering high standards and low downtime. For the company's people at the heart of Rokbak, there is a continual focus on professional development, keeping the team at the forefront of skill and expertise. Similarly, Dealer Operating Standards and training ensures the expanded dealer network continues to deliver the highest levels of service.

"We are proud and excited to have the modernised Rokbak brand continue as a fundamental part of our organisation," says Melker Jernberg, president Volvo CE and executive vice president Volvo Group. "We believe in a sustainable future, innovation and the power of our people and we see that all encapsulated in Rokbak. At the same time, the company has its own personality, heritage and loyal customer base and it will be exciting to see the brand evolve further as it sets out on this new stage of its journey." 🌟

With a tough design that's built to last, says Douglas, the haulers power through hard work with ease, boosting customers' productivity no matter how tough the conditions.

"We are very excited to reveal our new brand, and of course our haulers are the shop window," continues Douglas. "Rokbak stands for power, performance and reliability. We already have a very healthy order book for the new brand, and we want to further expand our reputation, dealer network and market share. We are still the same skilled, experienced, and passionate team, committed to making rock-solid haulers every day. But we also have a clear vision for where we want to go and who we want to be."

Steady evolution

As part of the Volvo Group, Rokbak has experienced steady evolution over the past seven years. While this has taken place across the board, it is particularly prominent in four key



JOINT SPONSORS OFFER ENTRY-LEVEL OPERATOR TRAINING TO SIX WOMEN

Nkwe Platinum Limited, a wholly-owned subsidiary of the Zijin Mining Group, and leading original equipment manufacturer SANY Southern Africa, have jointly sponsored an entry-level excavator training programme to six women from the Garatau Platinum Mine's communities, writes *Munesu Shoko*.

In a sector where women constitute just 12% of the 400 000 workforce, the initiative by Nkwe Platinum and leading Chinese original equipment manufacturer SANY Southern Africa, seeks to empower women by affording them the opportunity to tackle tasks that are traditionally regarded as men's work.

Nkwe Platinum Limited is a 74% shareholder of the mining right in respect of the Garatau Platinum Mine, which is situated in the Eastern Limb of the Bushveld Complex in Limpopo Province, South Africa.

To commemorate Women's Month, the companies came together to provide an entry-level excavator training programme to six women from Nkwe Platinum's mining communities. During the week-

long training programme, the women learnt about basic components and the structure of excavators, and were also afforded the opportunity to perform basic functions of the machine.

Speaking to **Capital Equipment News**, Samuel Zhang, GM of SANY Southern Africa, notes that women are dramatically under-represented in the mining industry. Empowering women with top quality excavator operator skills and training, using state-of-the-art equipment, he says, will give them the competitive edge to advance in the sector.

"We are pleased to embark on this training programme with Nkwe Platinum," says Zhang. "We sourced two experienced trainers and offered a new 36 tonne SY365H Pro excavator for the training programme. We believe



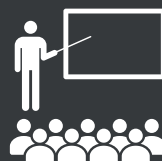
The week-long training programme took place at SANY Southern Africa's Boksburg facility.

QUICK TAKE

Nkwe Platinum and SANY Southern Africa have jointly sponsored entry-level excavator training to six women from the Garatau Platinum Mine's communities



During the week-long training programme, the women learnt about basic components and the structure of excavators, and were also afforded the opportunity to perform basic functions of the machines



SANY Southern Africa provided two experienced trainers and a new 36 tonne SY365H Pro excavator for the training programme



The companies recognise the potential that women can unlock for successful mining operations and understand that their skills development forms a vital foundation for a more productive community



aspects of mining have traditionally been regarded a men's territory, with women relegated to support functions. With this operator training programme, she says, Nkwe Platinum and SANY Southern Africa are challenging the status quo.

"The traditional cultural stigmas associated with the mining profession have always prevented women to take jobs such as operation of large mining equipment. As a progressive mining company, it is our duty to dispel the notion that women are not capable of operating these huge machines. This initiative is a clear demonstration to young women within our mining communities that women can be at the mine face, too," says Siphugu.

Advocate Vuyokazi Nontso, risk and compliance Manager at Nkwe Platinum, is proud of what the six women achieved during the week-long training. When **Capital Equipment News** visited the training site on the third day of the programme, the trainees could independently operate the 36-tonne excavator, showing few signs of being novices.

"This is a clear indication that women are capable to operate the big mining machines. The problem is that they are not afforded opportunities to do so. There's no doubt that women work just as hard as the guys do. In most instances they feel as if they have to outdo their male counterparts to get the credit. And I would say, based on my experience, 99% of the time they out-do the guys," she says. "All women want is a fair deal when they get to a jobsite and to be treated just like the rest of the crew. Give them that and you will be surprised at what you will get from them work-wise."

Commendable effort

The government has commended Nkwe Platinum and SANY Southern Africa for

that women empowerment is critical for economic growth. When society talks about growth, women have traditionally been left out. We believe that true community development is achievable when women are empowered."

Zhiyu Fan, MD and CEO of Nkwe Platinum Limited, agrees, saying that Nkwe Platinum and the Zijin Mining Group believe that the inclusion of women in the mining sector contributes significantly to mining communities'

sustainable development and long-term economic growth.

"We recognise the potential that women can unlock for successful mining operations and understand that their skills development forms a vital foundation for a more productive community," says Fan.

Challenging the status quo

Shudufadzo Siphugu, finance manager at Nkwe Platinum, says the technical



Shudufadzo Siphugu, finance manager at Nkwe Platinum (left), congratulates one of the women upon completion of the training programme.



Advocate Vuyokazi Nontso, risk compliance manager at Nkwe Platinum (left), with one of the trainees.

this collaborative effort designed to empower women in a male-dominated industry.

Shalen Gajadhar, spokesperson for the Department of Women, Youth and Persons with Disabilities, says there is greater need for women to be trained in industries believed to be under the ambit of men only. Sectors such as mining and construction are believed to be spaces reserved for men only, he says, with women resigned to administrative or secretarial duties.

"The theme for Women's Month 2021:

The Year of Charlotte Mannya Maxeke: Realising Women's Rights, speaks to the role women can play in society if they are able to enjoy true equality. Women's economic exclusion remains one of the biggest barriers they face, and economic dependency is a contributing factor to women 'tolerating' abuse and mistreatment," he says.

"It is therefore imperative that job opportunities in male-dominated sectors be created to attract, retain, develop and promote women. Opening new sectors to women allows for more

employment opportunities, changing the circumstances women find themselves in. One such sector is mining. Mines operate close to towns with the potential to provide opportunities to thousands of women who are otherwise confined to lives of poverty. "Gajadhar says the department is encouraged by the efforts of mining companies like Nkwe Platinum who, in a co-sponsorship with SANY Southern Africa, have identified a gap in women representation as operators of heavy mining equipment.

"Programmes like these benefit women such as Agnes Kgoetiane and Janet Mankgela, both from Maandagshoek, near Burgersfort in Limpopo, who have been mine labourers but expressed an interest in operating excavator equipment," he says.

"This programme is welcomed, especially during Women's Month 2021, as it calls for the economic empowerment of women, one of the apex priorities of government and civil society. Women's economic justice remains a dream for many women who are marginalised and excluded due to a myriad intersecting inequality vectors resulting in multi-dimensional poverty for many women and girls. Programmes by the private sector to empower women must form part of standard operational plans to increase women participation in the economy. The department encourages the mining sector to showcase similar programmes aimed at empowering women," concludes Gajadhar. 🌟

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SP281

The SP281 is an all-position tyre with a premium tread depth of 19.2mm. Designed for short-haul, on and off-road steer applications. The tyre is also well-suited for short to regional-haul, on and off-road trailer applications. The 4-rib, wide shoulder block pattern, with wide tie-bars, provides excellent resistance to shoulder rib failures in tight turns and scuffing on tri-axle trailers. Stone ejectors prevent stone trapping and stones drilling into the casing for improved retreadability.



SP571

The SP571 is an all-position tyre well-suited to mainly on-road or smooth off-road conditions, in short to medium-haul, steer and drive applications. It features a 4-rib design with a special high wear-resistance compound. The SP571 also works well on short to regional-haul, on-road or smooth off-road trailer applications.



SP581

The SP581 is a 4-rib design tyre with a premium tread depth of 18.9mm, made for short to medium-haul, on and off-road conditions on steer and drive applications. It can also be used in short-haul, off-road, trailer applications.

The tread pattern design enhances wet grip and includes a special tread compound for cut and chip-resistance with stone ejectors fitted in the grooves for improved retreadability in harsh conditions.



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The construction industry is still struggling, and clients tend to move between insurers, purely for reduced premiums.

INSURANCE COVER FOR CAPITAL EQUIPMENT DURING COVID-19

The COVID-19 crisis continues to impact capital equipment owners and the wider economy. Full or partial loss of income is a reality and could lead to some businesses being unable to afford insurance premiums for their mission-critical assets. *Capital Equipment News* approached two South African insurance providers for their take on the pandemic and its effects on the insurance industry. By Mark Botha.

King Price engineering insurance partner Justin Faure says the biggest impact of the COVID-19 pandemic on capital equipment owners' ability to ensure their assets has been reduced revenues and impaired cash flow because of a slowdown in construction work since 2019.

"When engineering clients take out cover, they provide us with an estimated annual turnover, upon which their premium is based," he says. "At the end of each annual period of insurance, they declare their actual turnover, and adjustments may be made to their premiums. We have seen some massive differences between estimated and actual turnovers in the past 12 months."

He says the construction industry is still struggling, and clients tend to move between insurers, purely for reduced premiums.

Auto & General Insurance head Ricardo Coetzee agrees: "The pandemic has been financially devastating and caused much uncertainty for many business owners. It also placed the spotlight on the dire consequences of not having insurance cover in place."

He says that, for some business owners, Business Interruption cover was a lifeline during the national lockdowns.

"Auto & General was one of the first insurers to announce that it would honour all valid claims from business owners who were affected by loss of income caused by the lockdowns."

He says the same goes for the civil unrest which occurred in South Africa during July this year.

"Insurance was critical for the businesses affected during the unrest. We were the first insurer to fast-track civil unrest-related South African Special Risk Insurance Association (SASRIA) claims in an effort to help our customers recover quickly. Ensuring business continuity in times of uncertainty is the purpose of insurance."

Trends in the marketplace

He says numerous trends have emerged in the market as a result of the pandemic.

"In the insurance space, we quickly realised that today's end-user is a lot more insurance and digitally aware than before the pandemic and we provide fast and simple digital tools to assist our customers."

Auto & General Insurance has also extended its business asset cover to include those working from home during the pandemic.

According to Faure, one of the biggest trends since the advent of the pandemic has been a growing uptake of usage-based insurance.

An example of this is King Price's 'pay as you farm' product, which bases premiums for agricultural machinery on actual usage.

"We're currently working with an external service provider to develop an app that will enable capital equipment owners to switch their cover on and off, as needed."

"Globally, we're seeing a move towards specialisation. For example, in the USA, insurers don't offer liability for their contractors' policies, as they believe this should be dealt with by legal specialists."

The pandemic has also accelerated the



Ensuring business continuity in times of uncertainty is the purpose of insurance.

QUICK TAKE

For some business owners, business interruption cover was a lifeline during the national lockdowns



Today's end-user is a lot more insurance and digitally aware than before the pandemic



One of the biggest trends since the advent of the pandemic has been a growing uptake of usage-based insurance



King Price's engineering division has discounted premiums, excluded liability cover and restricted cover to fire and theft



Auto & General introduced premium flexibility, policy pauses, retrenchment waivers, halts on policy reviews, excess waivers and discounts of up to 20%



break in cover as this will affect premiums going forward," says Faure. "Secondly, it's crucial that mission-critical assets remain protected against unforeseen incidents and accidents."

He says a leading global reinsurer's data shows that fire is responsible for more than a quarter of all engineering claims, for example: "It doesn't happen often, but when it does, the losses are significant."

Relief efforts

Capital equipment premiums often cater for liability exposure and, in response to the pandemic, King Price's engineering division has discounted premiums, excluded liability cover, and restricted cover to fire and theft.

"We also adjusted premiums to account for the reduced risks around movement of equipment and human error," says Faure.

"The discounts were less about the premiums and more about human response. Our discounts were consistent with the rest of the industry, with all insurers coming to the table to try to help clients through tough times."

Coetzee says Auto & General focused on offering peace of mind to its customers, and on aiding its broker partners and small business, including those within its value chain.

"We introduced premium flexibility, policy pauses, retrenchment waivers, halts on policy reviews, excess waivers and discounts of up to 20%. Beyond premium flexibility, customers were provided with complementary access to a medical hotline which provides advice on COVID-19."

Business insurance customers were also given access to a service providing small businesses with technical support while they work remotely.

Auto & General's holding company also launched a R70-million relief fund to assist small and medium enterprises (SMEs).

insurance industry's move towards greater use of technologies such as artificial intelligence, which allows insurers to score risk more consistently and to underwrite with greater certainty.

Importance of maintaining cover

There are two main reasons for capital equipment owners to maintain their insurance cover, even in tough times.

"Firstly, it's important that there is no



"The pandemic has been financially devastating and caused much uncertainty for many business owners. It also placed the spotlight on the dire consequences of not having insurance cover in place."

Ricardo Coetzee, head: Auto & General Insurance



"One of the biggest trends since the advent of the pandemic has been a growing uptake of usage-based insurance. Globally, we are seeing a move towards specialisation. For example, in the United States, insurers don't offer liability for their contractors' policies, as they believe this should be dealt with by legal specialists."

Justin Faure, engineering insurance partner, King Price

"We responded to the President's call to unite in the fight against the pandemic and its ripple effects with a pledge of R320-million in support to the community. R50-million was donated to the National Solidarity Fund and a further R200-million supported feeding schemes in our neighbouring communities. In August 2021, our fund was bolstered with an additional R50-million," says Coetzee.

He says R1-million was donated to #OperationCovid19 to assist with essential food items for the vulnerable and destitute during the national lockdown period.

"We also provided additional support to a Diepsloot-based food security programme which was mobilised to supply additional food to the Diepsloot community in Johannesburg, at a time when good nutrition is the backbone to building a strong immune system.

"The uncertainty is far from over and we continue to stand together to respond appropriately and responsibly to help South Africa triumph over this pandemic," he says. 🌟

The insurer's multi-faceted approach towards supporting communities in need includes a R320-million relief fund and the provision of food and supplies to the homeless and destitute.

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Volvo CE's Load Assist Map is an app that allows operators to monitor on-site traffic in real time.



DIGITALISATION: MAINSTAY OF SAFETY, EFFICIENCY AND PRODUCTIVITY AT MINES AND QUARRIES

Digitalisation has brought to the mining and quarrying industry improved operational safety, risk management, productivity and efficiency through data collection, data transfer and analysis. This feature explores the effect of digitalisation on safety and unpacks some of the digital technologies available in the market today, writes **Mark Botha**.

John Deere sales manager Construction and Forestry MEA Griffiths Makgate says safety is crucial to the mining and quarrying environment because, as mineral demand increases, more people are being employed underground and on site.

"Managing these people goes hand in hand with both their safety and with the safety of the product and the equipment running on site," he says.

Digitalisation and safety

Putzmeister SA technical advisor Hennie van Niekerk says digitalisation at mining and quarrying operations is meant to remove human error to minimise accidents and improve safety.

"Unfortunately, you still need common sense, and the human factor can never

really be eliminated. Safety will always be jeopardised as long as systems can be bypassed."

Hexagon's Mining division senior director Products and Innovation Marcos Bayuelo says digitalisation plays an increasingly important role in protecting miners and mining equipment: "While we continue to place people in high-risk environments, we will see safety incidents occur at mining and quarrying operations. It is unrealistic to consider zero-harm achievable overnight in an industry as large as mining."

However, digitalisation accompanied by change management can improve the safety of people in operational roles.

"At the mine design phase, where processes and workflows become defined, digitalisation can help mitigate hazards by preventing risk. Knowing risk-related issues in real time empowers action while trending

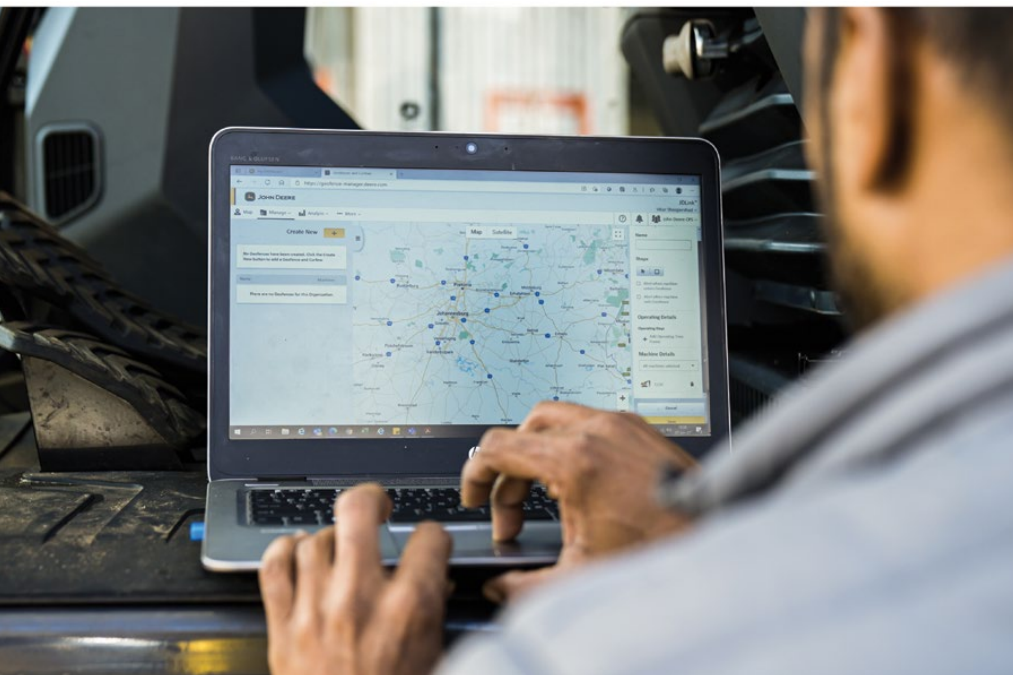
information from historical data can improve risk mitigation plans."

He says sensor technology in particular is increasingly important to improving operations' safety by helping people make better decisions and to assist them in conducting their jobs safely amid the daily grind of an operation.

As an example, he points to the Earth Moving Equipment Safety Round Table (EMESRT), a global initiative by six major mining companies to engage with key industry OEMs on the design of operationally safe equipment.

"EMESRT has been integral to categorising nine levels of control for vehicle interaction risks, and to guiding the industry on how these risks can be managed, from technology design to implementation."

He says that, while these measures have



Mining and quarrying equipment from John Deere features JDLink vehicle tracking.

helped operators take better decisions and avoid accidents, they have also accelerated the use of technology to intervene semi-autonomously in certain risk situations in order to remove the 'human factor'.

"EMESRT's Control Levels 7 to 9 on safety illustrate technology's evolution in the last five to ten years," he says. "These levels, representing systems to manage residual interaction risk, include Operator Awareness; Advisory Controls and Intervention Controls.

"Thanks to the Industrial Internet of Things (IIOT) and the variety of sensors becoming available, mines can now select a wide range of solutions to address the main control

scenarios proposed by EMESRT."

He says sensor fusion of GPS, radars, cameras and LiDar are enabling complete situational awareness in many mine environments.

Volvo Construction Equipment head, Region Europe & International Carl Slotte says safety is one of the company's core values: "In fact, safety forms part of our Triple Zero Vision drive – zero accidents, zero unplanned stops and zero emissions."

He says Volvo CE builds into its products safety features including Volvo Co-Pilot and the Assist series of apps including Operator Coaching, Onboard Weighing and Map, to help prevent collisions.

"Safety is built into every design element of Volvo machines to ensure that every working shift ends without a hitch. Our vision of zero accidents demonstrates our commitment to the safety of all personnel and equipment."

With regards to digitalisation improving safety, Volvo Co-Pilot and the Assist app series help prevent dangerous operation while CareTrack analysis identifies potentially dangerous operation in the short term.

"In the longer term, we are testing remote controlled operation over a 5G network. This has the potential to improve safety dramatically by removing the operator from dangerous environments," says Calle Skillsäter, technical specialist Connected Machines.

Makgate notes that digitalisation especially mitigates the danger of machine-to-machine collisions.

"One of the most important contributors to on-site safety at mines and quarries is visibility, both to machine operators and pedestrians on site. Digital technologies that help to mitigate these collisions include cameras in blind spots for the machine operator and motion sensors which sound alarms or stop the machine when a collision is imminent.

"We have now reached the stage where the machine will control itself automatically to avoid incidents. The more safety technology you add to capital equipment, the better your control over incidents on site."

COVID-19

Bayuelo says the reduction of personal interaction in response to the COVID-19 pandemic has forced the implementation of advanced safety protocols.

"Hexagon's digital reality solutions which connect sensor, software and autonomous technologies, were well positioned to assist in the global response to the crisis – and not just for the mining industry."

He says the company offers simulations of the effects of social distancing; mapping



At the mine design phase, where processes and workflows become defined, digitalisation can help mitigate hazards by preventing risk



Sensor technology in particular is increasingly important to improving operations' safety



The more safety technology you add to your equipment, the better your control over incidents on site



One of the most important contributors to on-site safety at mines and quarries is visibility, both to machine operators and pedestrians on site

of the spread of the pandemic in real time; drone technology delivering COVID-19 tests, and geospatial information, among others.

"Social distancing, lockdowns and travel bans present unique challenges to the mining industry. Most mines are under pressure to stay ahead of the technology curve to remain safe, sustainable and productive. Human interaction is at the heart of implementing new solutions and training staff."

He says Hexagon's Mining division, like other mining companies, was faced with the problem of connecting with technical experts who are prevented by lockdowns from entering the country. Digitalisation, however, was "at the heart of our innovation to overcome the distance dilemma".

"Implementing technology from a distance to make automation a reality has helped deepen partnerships with customers by making it easier to tap into our expertise."

He cites the example of a recent safety installation at Gold Fields' Tarkwa Mine in Ghana, where over 220 mine vehicles were equipped with the MineProtect Collision Avoidance System with minimal delays despite lockdowns preventing travel by South African staff to Ghana.

Hexagon technicians use RealWear headsets and the HINDSITE knowledge management platform in the field. They are also currently leveraging Smith Optics safety glasses with Google Glass Enterprise Edition to support hardware repairs in local offices around the world.

"This has reduced hardware repair and return times, lowered costs, enabled the sharing and capturing of implicit knowledge in a corporate repository and, ultimately, improved the customer's experience."

Makgate says mining and quarrying equipment from John Deere features JDLink, which allows the client to track

their machines' performance in terms of productivity and efficiency.

"As of 14 July this year, customers no longer need to renew their JDLink connectivity service subscription and can enable the service on any compatible machine in their organisation at no additional charge and at no subscription cost."

Digital technologies

The MineProtect portfolio by Hexagon connects systems for collision avoidance, operator alertness, vehicle intervention and personal protection.

"These technologies offer a 'digital layer' of protection to improve safety in mining," says Bayuelo. "They enable drivers to prevent accidents, supervisors to take better decisions, and management to plan, predict, measure and react towards safety targets."

He says Hexagon helps customers with their digitalisation plans and connects previously siloed processes in a strategy known as Autonomous Connected Ecosystems, or ACE.

"Through integration with another Hexagon company, IDS GeoRadar, the MineProtect Collision Avoidance System (CAS) can now receive real-time equipment visualisation with timely alerts about hazardous areas for people and machinery. Workers and equipment are protected by being forewarned of no-go zones on site."

These zones are identified by IDS GeoRadar's IBIS Guardian software, which creates geofenced zones and hazard maps, and is correlated with radar alarms. Guardian's integration with CAS and complementary HxGN MineProtect solutions, Personal Alert and Tracking Radar, ensures that alarms are triggered automatically when a no-go zone is approached.

Digital technologies from Volvo Construction Equipment include Volvo Smart View to help the operator see all angles and ensure safe rotation in confined working areas. A PIN Code Lock option reduces the risk of machine theft while the Speed Limiter for articulated haulers and wheel loaders regulates maximum speed automatically and prevents the operator from exceeding the speed limit.

Volvo CE also designed the integrated Anti-Theft system for our Volvo crawler excavators. Several triggers such as machine movement, tamper detection, time and geo fencing functionalities detect unauthorised use, allowing the client to immobilise and track the machine remotely via the CareTrack web portal.

"In 2019, we teamed up with Ericsson and



"Safety is built into every design element of Volvo machines to ensure that every working shift ends without a hitch. Our vision of zero accidents demonstrates our commitment to the safety of all personnel and equipment."

Carl Slotte, Volvo CE head, Region Europe & International



"Remote controlled operation over a 5G network has the potential to improve safety dramatically by removing the operator from dangerous environments."

Calle Skillsäter, technical specialist Connected Machines, Volvo CE

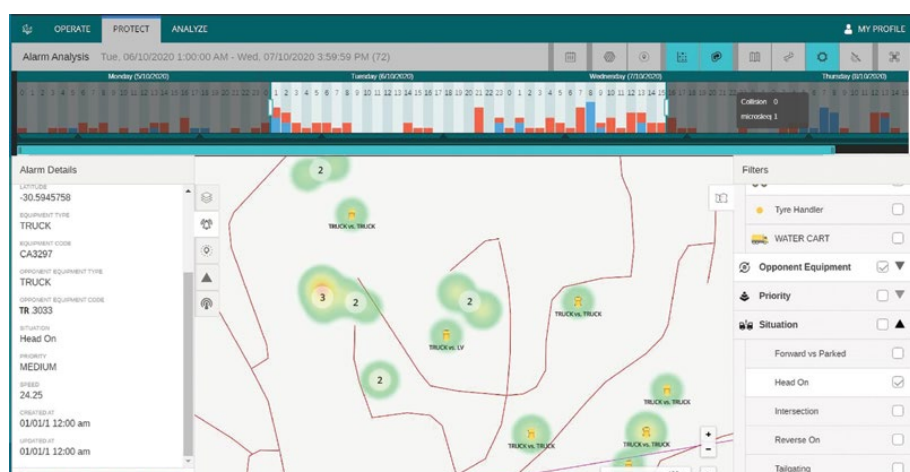


"The human factor can never really be eliminated. Safety will always be jeopardised as long as systems can be bypassed."

Hennie van Niekerk, technical advisor at Putzmeister SA



The Putzmeister MIXKRET 5 low-profile concrete transporter and mixer features an air conditioned cabin and an automatic speed regulation system.



Hexagon Mining's collision avoidance system uses advanced sensors to track the location of nearby vehicles in order to prevent collisions.



"At the mine design phase, where processes and workflows become defined, digitalisation can help mitigate hazards by preventing risk. Knowing risk-related issues in real time empowers action while trending information from historical data can improve risk mitigation plans."

**Marcos Bayuelo, senior director
Products and Innovation, Hexagon
Mining**



"One of the most important contributors to on-site safety at mines and quarries is visibility, both to machine operators and pedestrians on site."

**Griffiths Makgate, John Deere sales
manager Construction and Forestry
MEA**

TALKING POINTS

Telia to launch Sweden's first 5G network for industrial use at Volvo CE's facility at Eskilstuna. This makes us one of the first OEMs in the world to use 5G technology to test remote-controlled machines and autonomous solutions," says Skillsäter.

The trials in Sweden include the remote control of a conventional wheel loader, as well as further tests of the HX2 concept load carrier.

Volvo CE is also currently developing the TARA solution for electric autonomous vehicles to improve safety by removing operators from dangerous environments.

A new testing site was erected at the Volvo CE Customer Center in Sweden, to test and demonstrate the latest innovations in sustainable power, connectivity and autonomous solutions.

This 66 000 m² innovation zone includes a secure track for fully-electric, automated and tele-operated machines with charging infrastructures and 5G connectivity; a control and training room building; a spectator stand and a training area for the Volvo Co-Pilot assist functions.

Makgate describes John Deere's JDLink system as a proactive machine management system allowing the company to monitor clients' machines remotely.

He says the 4G JDLink MTG modem connects to the machine to allow the user to stream machine and field data to their John Deere Operations Centre account.

"This enables machine-to-machine communication and remote support from the dealer," he says.

JDLink, which enables remote diagnostics and programming and tracks maintenance requirements, is also instrumental in preventing theft, tracking overall fuel consumption and idle time, as well in tracking the time and fuel spent on the job site.

Van Niekerk says Putzmeister has developed digital business models for clients in cooperation with digital consultancy etventure since 2015. This resulted in the Germany-based Innovation Factory which, in turn, produced the Pumpnow online platform which offers a flexible way of hiring screed pumps.

In 2019, the company introduced its Machine Cockpit, an advanced fleet management technology for its range of stationary concrete pumps and truck-mounted boom pumps.

This innovation, says Van Niekerk, provides the customer with real-time information on the status of pumps at the jobsite, as well as critical status alerts and remote diagnosis; key figures for delivery rate, machine use and fuel consumption; alerts when machines are on the move, and maintenance reminders.☀

BKT solutions for mining and quarrying

With their rocky and uneven surfaces and rough terrain, mines are a real challenge for the machines operating in this sector and above all for the tyres fitted to them.

It is therefore essential for operators to be able to count on resistant and reliable products that can withstand cuts and tears. This guarantees a prolonged product life cycle, while also providing traction and stability. Replacing a tyre due to damage or other problems would mean not only new investment, but would also impact on productivity.

That is why BKT wished to pay particular attention in developing tyres suitable for this type of application, studying them closely in minute detail.

The tyres in BKT's EARTHMAX range are designed for the toughest operations. It is a broad range of radial solutions designed to facilitate the best possible ground load distribution for dump trucks, wheel loaders, dozers and graders.

All EARTHMAX tyres are distinguished by their All Steel structure which provides resistance to the casing and so against impacts. These are essential features when faced with particular obstacles on the ground which could expose the tire to serious risk of puncture or damage to the casing.

In particular, this range includes three



The tyres in BKT's EARTHMAX range are designed for the toughest operations.

models which, thanks to their large size, are particularly suitable to handling mining operations under the toughest conditions.

EARTHMAX SR 46 is fitted to rigid dump trucks which operate in rocky environments such as mines. Specifically designed to transport heavy loads, this tyre guarantees a high level of resistance to cuts thanks to its casing with a steel belt. Thanks to the specific design of the tread with blocks and grooving on the circumference, it guarantees reduced damage to the surface of the product and improved performance on bends.

EARTHMAX SR 45 is also designed for rigid dump trucks and has a specific design of blocks and a deeper tread, which guarantees the product an extended life cycle.

EARTHMAX SR 53, classified L-5, has

been designed for loaders operating in difficult conditions. The tread consists of a compound which is particularly resistant to cuts. In addition, it is designed to offer extraordinary self-cleaning properties, which facilitate the expulsion of stones and other foreign bodies.

In response to market demand, BKT has launched a Giant version of EARTHMAX SR 46 for rigid dump trucks operating at mines, dams and large worksites. This solution is available in the largest size which BKT has ever made: 33.00 R 51. With a diameter of over 3 m, this tyre weighs 2 400 kg.

The addition of a new Giant size is a strategic choice for BKT, since it makes it possible to satisfy the needs dictated by new trends in the sector. 🌐

Volvo Group invests in automated vehicle verification and validation company

Volvo Group Venture Capital AB has announced a new investment in a leading company in the field of measurable safety for driver assistance and autonomous vehicles. Foretellix Ltd was founded in 2018 by a team of verification and validation pioneers whose mission is to make automated driving systems safe and efficient.

One of the main challenges of autonomous systems is deciding when a product is safe enough to commercialise. This is what Foretellix is tackling with its verification platform. It uses intelligent automation and big data analytics tools which coordinate and monitor millions of driving scenarios to ensure that the autonomous vehicle behaves correctly under all possible driving conditions, including edge cases.

In addition to the Volvo Group Venture Capital investment, Volvo Autonomous Solutions formed a closer partnership with Foretellix earlier this year with the aim of jointly creating a coverage-driven verification solution for autonomous driving that operates both on public roads and in

restricted areas.

"Volvo Autonomous Solutions and Foretellix entered into a partnership in March this year. We clearly understand the ongoing progress and the benefits of working with the Foretellix team and their verification platform. Based on our experience, Volvo decided to invest in Foretellix as well," says Nils Jaeger, president and head of Volvo Autonomous Solutions.

"The team is very experienced and the solution is attractive to a vehicle manufacturer like Volvo. We think that the Foretellix business model and technology will play a part in future mobility. Foretellix can provide the Volvo Group with further insights into safe autonomous driving," says David Hanngren, investment director Volvo Group Venture Capital.

"The investment from Volvo Group Venture Capital further strengthens our partnership with the Volvo Group and will help Foretellix to continue accelerating the safe deployment of increasingly advanced automated driving systems," says Ziv Bin-yamini, CEO and co-founder of Foretellix.



One of the main challenges of autonomous systems is deciding when a product is safe enough to commercialise.

The role of Volvo Group Venture Capital is to make investments that drive transformation by facilitating the creation of new services and solutions and to support collaborations between start-ups and the Volvo Group.

Against the background of the trends shaping the future of transportation and the strategic priorities of the Volvo Group, the key areas of investment for Volvo Group Venture Capital are logistics services, site solutions and electrical infrastructure. The organisation has a global scope and focuses on Europe and North America. 🌐

Brokk introduces Pedestal Boom for efficient breaking

Brokk, the world's leading manufacturer of remote-controlled demolition robots, has introduced the Brokk Pedestal Boom, a compact, stationary breaker boom system for the mining and aggregates industry.

The new machine range allows producers to apply the power and precision of Brokk's demolition robots to primary breaking tasks that feed mobile crushers, jaw crushers, gyratory crushers and grizzlies.

It offers an unrivaled range of motion, pairing Brokk's revolutionary three-part arm system with 360-degree slewing for maximum versatility in underground applications. The unit can be operated with either the tethered remote or from a control room.

Depending on network configuration, the machine can be manoeuvred from 2 000 m away or longer, using video monitoring and operation to increase safety and efficiency. At the same time, the Brokk Pedestal Booms feature a rugged design and compact footprint, continuing Brokk's tradition of powerful solutions for confined spaces.

Brokk will showcase the Pedestal Boom and highlight other innovative robotic mining solutions at MINExpo, September 13 – 15, in Las Vegas.

"Brokk saw an opportunity to give our customers a better solution for breaking over-size rock in crushing and grizzly applications. We have developed technology that is powerful, compact, flexible and easy to install," says Martin Krupicka, president and CEO of Brokk Group. "The new Brokk Pedestal Boom provides a plug-and-play solution that is perfect for underground spaces with low headroom or other space constraints. We are leveraging our 45 years of experience and proven technology platforms to create a smart, safe and user-friendly solution."

The Brokk Pedestal Boom is based on the proven arm system and power pack of Brokk's world-leading demolition robots. The machine body is then mounted on a pedestal, rather than tracks. This allows the machine to be installed in a stationary position next to a crusher or any area where primary breaking is needed. Unlike existing breaker boom options in the market, the Brokk Pedestal Boom system integrates the power source and arm for a compact breaking solution with just a single power cable. No external power pack or hydraulic hose connection is needed.

Model sizes for the range include the



The unique three-part arm design allows producers to reach closer to the crushers and manoeuvre in as little as 72 180 cm of height clearance.

Brokk 200, Brokk 300, Brokk 500 and the Brokk 900 Pedestal Boom, which is capable of producing 3050 J/Nm at a rate of 330- 680 blows per minute with the BHB 1500 breaker to power through even the toughest rock formations. 🌀



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Volvo ADTs for Durban Solid Waste

As part of its mandate to protect the environment and communities through safe waste management policies, Ethekewini Municipality's Durban Solid Waste (DSW) department has invested in 22 30-tonne Volvo articulated dump trucks (ADTs) to be used at four landfill sites in KwaZulu-Natal.

Supplied by Babcock, the exclusive distributor of Volvo Construction Equipment in southern Africa, the A30G dump trucks will be used as standard ADTs, water tankers and for hoisting of skips with hook lifts. Babcock partnered with ETT to undertake the modifications, transforming standard Volvo A30G dump trucks into water tankers and hook lifts.

ETT specialises in professionally engineered special vehicle solutions for mobile industrial equipment. Other modifications included installing of fire suppression and degreasing systems, and branding in DSW's signature blue and white colours.

DSW took delivery of eight A30G trucks in June, with a further eight trucks to be delivered in September and October. The final six will arrive in South Africa early next year.

Jay Moodley, regional GM at Babcock, says that the company has supplied Volvo ADTs to other government departments in the past, and the trucks' proven productivity and reliability played a key role in the sale, combined with the outstanding after-market



DSW took delivery of eight A30G trucks in June, with a further eight trucks to be delivered in September and October.

support offered by Babcock.

"These types of trucks operate in a very high productive environment, working long hours every day, sometimes 24-hour shifts. It can cost customers millions if trucks are standing. We aim to keep our customers up and running 24/7," says Moodley. "To provide support to our KZN-based customers and the fastest response times in the market, we have a service facility in Pinetown that is equipped with a workshop with six bays (excluding the wash bay), and a parts centre that holds over R5,5-million worth of spares. Our team of technicians, apprentices and foreman pride themselves on their professional, fast service and excellent workmanship," says Moodley.

He adds that Babcock strives for flexibility in meeting customers' needs, and delivers quick decision-making from directors and aftermarket personnel to ensure maximum productivity for our customers.

Volvo is the world's leading manufacturer of articulated haulers, having invented the concept, and has been developing and building these machines for over 50 years.

Craig Sanday, sales manager at Babcock, says that strength and durability are hallmarks of the Volvo articulated hauler, and that the Volvo A30Gs are ideal for this particular application. Designed for heavy hauling in severe off-road operations, the trucks' underfoot capabilities are excellent, especially on higher inclines. 🌟

First remote-controlled articulated roller for the local rental industry

Talisman Hire Wadeville has become the first tool hire company in the country to acquire a remote-controlled articulated roller, designed specifically for trench compaction.

The Ammann ARR 1575 is an articulated trench roller that provides perfect ground contact and optimal compaction. The machine and its padfoot drum provide results, even where other compactors have failed. Its ability to work in cohesive soils can prevent the need for soil removal and replacement, providing a significant financial impact. Two steering cylinders help make the ARR 1575 responsive and precise, while the oscillation feature provides excellent stability on uneven surface of a ditch.

Morné Venter of Talisman Wadeville says that apart from the obvious safety benefit of having the remote-controlled roller in the trenches, the rental opportunity provided by Talisman Hire Wadeville will allow contractors to dramatically speed-up trench compaction work and provide their own customers with superior compaction results. The Two different settings of amplitudes and compaction performance also enable varied

machine usage on constructions sites.

"We purchased this machine to address the need for faster, safer trench compaction and to eliminate the need for multiple workers in dangerous deep excavations. In terms of productivity, it easily replaces a dozen or more men using rammers and the quality of compaction is simply incomparable.

"For example, where the standard width of rammers is in the region of 300mm and achieve up to 12 Kn of compaction force, the padfoot rollers of the Ammann ARR1575 with a width of 850 mm can achieve up to 75 Kn of compaction force with great accuracy. A clearly visible compaction level indicator also gives the operator a visual representation of compaction progress and eliminates the risk of over compaction thus saving time.

"Trench rollers, also called multipurpose compactors, perform well in cohesive soil types, such as clays, that can be very difficult to compact. The ARR 1575 is able to overcome the high moisture content in clays through their extreme compaction energy and the kneading effect of their padfoot drums. The machines perform effectively



Ammann ARR1575 roller in action.

and quickly on less challenging soils, too.

"In certain regions clay and other poor soil conditions require the soil excavated from a trench to be discarded and more suitable fill-material to be trucked in. With the clever compaction ability of the Ammann ARR1575 this is not required as the compaction happens at soil particle level and padfoot breaks the bonds that usually prevent clay soils from compacting uniformly and 'bouncing back'. This on its own can save hundreds of thousands of Rands on a project by eliminating the need to replace the excavated materials." 🌟

Smith Power launches U17-3 mini-excavator



The Kubota U17-3 particularly excels in tight working spaces.

Smith Power Equipment has introduced the new Kubota U17-3, a 1,7-tonne compact excavator that punches above its weight with greater power and smooth performance in space-restricted working environments.

Since the initial introduction of Kubota mini-excavators in South Africa in 2015, the range has proven why the Japanese OEM is the global leader in compact excavators. Replacing the predecessor U15 model, the new Kubota U17-3 further entrenches Kubota as the 'pick of the bunch' and an unquestionable first choice for tackling jobs in the tightest of spaces.

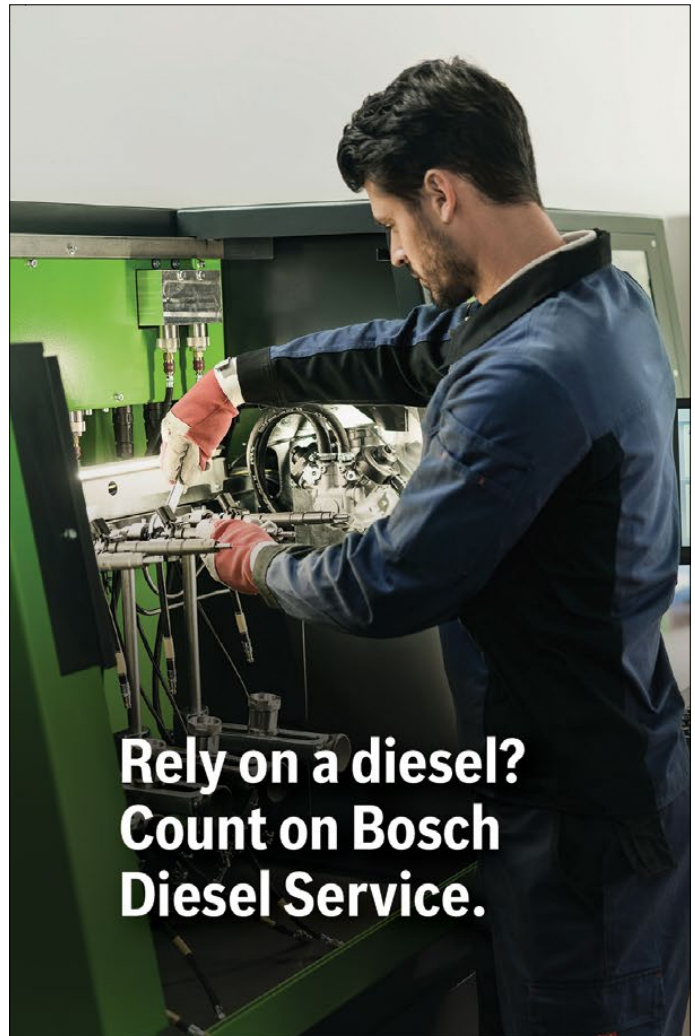
While the machine is similar to the U15, Michele Cicognani, national product & sales specialist at Smith Power, says the U17-3 "packs a bigger punch" with more power under the hood to handle a variety of tasks as well as better ground breaking force, excellent digging depth and reach.

"One of the key selling points is the Kubota 16 hp engine, delivering superior horsepower and performance, as well as low noise, vibration levels and exceptional fuel efficiency," says Cicognani. "With a working performance of 15,2 kN, 2 310 mm digging depth and 3 900 mm digging radius, the U17-3 has the power you need, when you need it most."

The HMS hydraulic system also ensures greater operational performance. Kubota adopts a 3-pump system, which uses three independent pumps for boom, arm and swivel to make the cooperation of bucket, boom and swivel as smooth and efficient as possible. It allows the high capacity control valve and hydraulic variable pumps to realise superb excavating and loading performance.

The Kubota U17-3 particularly excels in tight working spaces. The zero-tail swing means that the operator can rotate the cab of this 1,7-tonne excavator in any direction without any part of it going over the tracks. This makes it a perfect choice for working in tight, enclosed areas where bigger excavators can't get to. "The zero-tail turn, combined with the 2 310 mm maximum digging depth, means the Kubota U17-3 is a versatile excavator that can be deployed across applications in farming, plumbing, fibre trenching and construction contracting," says Cicognani.

With the U17-3, Kubota also paid particular attention to operator comfort, which is critical to overall productivity on site. The work station is more spacious than the predecessor model and features a selection of enhancements to make long days more comfortable. The deluxe high-back seat provides optimal comfort for any size operator and the wide foot area is spacious and reduces operator fatigue. 🌱



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UD Trucks opens new service dealer in Vaal Triangle

UD Trucks Southern Africa has announced the opening of a new service dealer in Sasolburg. Strategically located, UD Trucks Vaal will serve fleet owners in the industrial heartland of the country with certified UD Trucks service, parts and roadside assistance. This brings the total number of independently owned UD Trucks dealers in South Africa to 38.

"As UD Trucks, we believe in offering our customers more than just a vehicle. It is about providing a complete transport solution," says Filip Van den Heede, MD of UD Trucks Southern Africa. "The UD Trucks dealer network has been developed according to a carefully planned strategy. All dealers adhere to stringent quality requirements, and as a result, we can deliver the same level of quality service to our customers, no matter where they are."

One of the main reasons for UD Trucks Southern Africa's continued success is the emphasis the company places on building relationships with fleet owners.

"In the highly competitive transport business, we know that every cent and every minute counts. We live this vision from the inside out," explains Van den Heede. "That is why we are very pleased and excited with the opening of the UD

Trucks Vaal Service dealership. We believe in the team and know that they are truly committed to provide our customers with the kind of support and service that they expect and deserve."

The service dealer facility is owned by Highpoint Group, a local company with more than 20 years' experience in mining, manufacturing, engineering, and vacuum technology.

As a UD Trucks customer themselves, they have the unique expertise to anticipate and deliver on fleet owners' unique business and transport requirements.

"Throughout our dealings with UD Trucks, we have come to know and trust the products and services built on the principles of drivability, fuel efficiency, safety, productivity and uptime – all essentials in any transport business," says David Gade, MD of UD Trucks Vaal. "But most importantly, we believe in the UD Trucks people."

He says the company is passionate about customer service and therefore the UD Trucks brand promise of 'Going the Extra Mile' resonates with what they are already doing in their daily operations.

"I also believe that the technical expertise in this dealership is exceptional and customers in the Vaal Triangle will



Filip Van den Heede, MD of UD Trucks Southern Africa.

benefit from this knowledge and skills," says Gade.

The UD Trucks Vaal team is led by Dealer Principal, Sonnika Oosthuizen. "Everything we do is focused on giving our customers superior levels of service and support. It is all about saving our customers time, by getting their vehicles back on the road faster. Ultimately, our customers' success is our top priority," states Oosthuizen. 🌟

Dedicated support footprint the backbone of FAW Trucks in southern Africa

For the past 27 years FAW Trucks has shown its commitment to local customers by steadily growing its product offering and establishing its own assembly plant in Gqeberha in 2014, while also strengthening its presence across southern Africa.

With 24 dealerships and service centres located around South Africa, and another seven situated in other southern African countries, the brand is well positioned to capitalise on the increased sales momentum it is experiencing.

The strategic location of FAW dealerships and service centres has played a major part in the impressive sales success the brand has enjoyed, particularly since January this year, when it took the top spot in the heavy commercial vehicle (HCV) segment of the local market for the first time. By concentrating on larger metropolitan areas and industrial hubs, as well as key cities and towns along major routes, FAW Trucks has placed itself in an ideal position to cater to various markets. These include transport and logistics, agriculture, mining and construction.

There are currently three sales and service centres in Johannesburg, two in Pretoria and one in Midvaal, covering Gauteng.

Facilities in Cape Town, Gqeberha and George handle sales and services in the Western and Eastern Cape. In Mpumalanga there are also three centres, located in Ermelo, Middelburg and Nelspruit.

Centres situated in Mahikeng and Klerksdorp look after clients in the North-West Province, while the Free State is covered by centres in Bloemfontein, Bethlehem and Harrismith. KwaZulu-Natal customers can turn to centres in either Pinetown, Port Shepstone or Richards Bay with their sales or servicing needs. The Northern Cape and Limpopo province have one sales and service centre each, located in Upington and Polokwane respectively.

FAW Trucks is literally represented in all four corners of the country and each facility is committed to providing products and service of the highest quality.

"With FAW Trucks' reputation for strength,



FAW Trucks has 24 dealerships and service centres in South Africa.

reliability, ease of operation and value for money, the units virtually sell themselves. Our other focus is to ensure that we provide customers with dedicated service and support of the highest quality. Buyers need to know that we are here to stay and that we will honour all warranties, service plans and aftersales requirements. They also need to know that they can rely on a reliable and steady supply of parts. FAW Trucks are built to last and our dealerships and service centres need to instil that same confidence, no matter where they are located," says Yongjun Li, CEO of FAW Trucks SA. 🌟

SHAKING UP YELLOW METAL PROCUREMENT FOR LARGE MINING HOUSES

With commodity prices on the rise, heralding the advent of a potential super-cycle in the mining industry, focus is on the availability of large yellow metal equipment, and this is where equipment disposal specialist MHS Plant & Equipment stands to play a critical role.

With an international network built up over 25 years, founder and owner Conrad Smith can source machines from anywhere in the world at the most competitive rates, in addition to dismantling and rigging, shipping and transportation and reassembly at the required destination.

“What we have found is that the larger mining houses do not understand the true value of their large equipment, which is simply placed on a platform and advertised for sale, or they opt for the auction route, which does not necessarily guarantee the highest possible return. This is where our international experience and expertise comes in, as our intelligence can pinpoint where similar machines are being operated, indicating the best disposal market,” explains Smith.

Reduction in new units

The impact of COVID-19 has resulted in a 30% to 50% reduction in the output from yellow metal equipment manufacturers globally, with limited numbers of new units especially in the larger size ranges. As a result, some mining companies have decided to delay their procurement or rebuild plans, while suppliers are reluctant to take on the risk of having too much stock on their books.

“It is very much a waiting game at the moment,” stresses Smith. “We have seen such cycles before, which generally tend to last eight years. We are definitely on the upward swing at the moment, which could see some of the major players opt to outsource their equipment requirements due to the anticipated scramble to get enough machines onto the ground as quickly as possible to take advantage of the expected upturn.”

An example of this is MHS Plant & Equipment’s involvement with the Mutanda Mining (MUMI) copper mine in the Democratic Republic of Congo (DRC), which is expected to resume operations in 2022 after being placed on care and maintenance due to the pandemic. “That is going to be a major source of equipment for us,” notes

Smith. He has worked with this particular mining house before, assisting with a mine closure in South America and even sourcing machines from Japan.

“This is an example of the type of long-standing relationships we wish to forge with Blue Chip mining companies. The business world has changed after COVID-19. The mining industry has traditionally adopted a conservative approach to its business models, but it now has to change with the times and become far more flexible and responsive to changing trends and developments,” argues Smith.

A helping hand

MHS Plant & Equipment also prides itself on lending junior miners a helping hand, getting some of these companies up and running from a zero base to where they now own entire equipment fleets and contribute meaningfully to the mining industry as B-BBEE participants. “Times are tough in the local market at present, which is why we are prepared to assist where we can,” explains Smith.

Apart from the trading side of the business, the company also owns equipment that it rents out to cement and aggregate producers, for example, and even a diamond mine in the Northern Cape. This gives Smith the opportunity to rotate his equipment and ensure that the fleet is always current, which in turn gives clients peace of mind that maximum uptime and productivity is guaranteed.

Great track record

Smith studied law for two years, but was always interested in equipment as his father ran an auction house. He cut his teeth as plant manager for Scribante Construction for close to two decades, before establishing MHS Plant & Equipment eight years ago. The fledgling company’s first big break was when Eqstra Holdings bought out MCC, and it was contracted to handle the shutdown of the latter’s operations in South Africa, Namibia, Mozambique and Botswana. The two-year contract involved the plant hire



MHS Plant & Equipment can source machines from anywhere in the world at the most competitive rates.

and mining side of the business. “That really got us onto the map,” adds Smith, who has also carried out work for major companies such as Moolmans, Basil Read, Liviero Group and multinationals like Emeco Group.

Smith keeps close track of global currencies, with major yellow metal equipment priced mainly in US dollars. If one particular global mining region experiences a dip, he will pay an exploratory visit to see what machines can be acquired at the best prices. The company has acquired equipment from as far afield as Australia, Argentina, Chile, Malaysia, Peru and Saudi Arabia, among others. The global flight restrictions due to COVID-19 has meant that Smith has had to hire experts on the ground wherever equipment is available in order to carry out the necessary inspections.

Smith has carefully built up the business to focus on large opencast mining equipment in particular, from draglines to the larger loaders, dozers and excavators. This particular niche has served the company well over the years, allowing it to dominate the high end of the market. “There are smaller brokers and then the auction houses, but we are really unique in the one-stop solution we are able to offer,” points out Smith. From transportation to insurance, he has established a close circle of specialist service providers to assist him with the logistics and execution of all of the company’s contracts. 🌟

AI AND TELEMATICS CAN IMPROVE DRIVING BEHAVIOUR UNDER SA'S NEW DRIVING LAWS

South Africa's Department of Transport announced the implementation of the Administrative Adjudication of Road Traffic Offences (AARTO) Act, which will introduce a new licence points demerit system geared towards imposing stricter penalties for road rule infringements. By Justin Manson, sales director at Webfleet Solutions.

It's estimated that between 15 and 20-million fines a year will be issued countrywide once the new system is fully implemented, with the first phase coming into effect on July 1, 2021.

Unfortunately, the AARTO Act could prove detrimental to South African drivers, fleet operators, and businesses alike, even if similar systems have been successful in other countries. This is because South Africa was ranked by Zutobi as the world's most dangerous country to drive in due to number of deaths on the road, maximum speed limits and the number of people who don't wear a seat-belt.

With this ranking and the newly proposed driving laws, industries across the country will need to reevaluate their employees' driving behaviour.

Major obstacle

The Zutobi study, which ranked 56 countries, found that only 31% of South Africa's front-seat occupants wear seatbelts. Adding to this, the International Transport Forum's (ITF) Road Safety Annual Report 2020 shows that although South Africa experienced a 77% decrease in traffic during the lockdown, there was still an increase in average speeds and the severity of crashes.

The group's report shows the growing concern of reckless and distracted driving behaviour with distractions usually involving the use of cell phones, grooming, and eating.

South Africa's distracted driver behaviour poses significant danger to drivers and other road users. In addition, it remains a key contributor to drivers receiving infringement notices for disregarding traffic laws – which then puts the fleet sector at risk of losing experienced drivers with the suspension of their driving licences.

Fleet operators and drivers, therefore, need to monitor driving behaviour and ensure drivers have access to adequate training programmes and tools that can provide feedback on the road.

Combining AI with telematics

For decades, telematics technology has allowed fleet operators to monitor



Fleet operators need to monitor driving behaviour and ensure drivers have access to adequate training programmes and tools that can provide feedback on the road.

their vehicles on the road, allowing them to see when a driver was braking too hard or speeding. Combining the capabilities of telematics with vehicle camera footage, offers fleet managers context of why these events occur. The integrated solution gives fleet managers and decision makers full transparency and clarity, allowing them to protect their drivers from non-fault claims and coach them to drive more safely.

Driver-facing cameras, using Artificial Intelligence (AI), also assist in better driving by detecting various types of unsafe behaviours and alerting the driver to correct their course before an accident occurs. Solutions like the Webfleet OptiDrive 360 go as far as providing in-cab feedback and warnings to drivers through a driver terminal as well as an AI camera that alerts a driver when detecting unsafe driving behaviour like mobile phone usage or when the driver is not wearing a seat belt, amongst others.

Drivers also benefit from real-time feedback on their speeding, idling, gear shifting, harsh braking, harsh cornering, and coasting. They receive active driving advice before, during and after their trip, and they can analyse their performance after each trip to take steps to improve their driving style. Combining this sort of



Justin Manson, sales director at Webfleet Solutions.

feedback along with AI feedback from the in-cab camera is similar to having a driver coach in the cab at all times.

Using these detailed insights, fleet operators can also assign specific drivers on more optimal routes based on their driving behaviour and even offer incentives that encourage a driving behaviour change.

Solutions that combine telematics and AI have become essential for fleet managers and drivers, helping them pre-empt risks, reduce costs, and improve driving behaviour in preparation for the new AARTO system. 🌟

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