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A RECIPE FOR SUCCESS

The Gomes name has been associated with construction since 1936 when Gerardus Gomes started mining building sand, topsoil and river sand by hand.

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Weir Minerals Africa offers a diverse portfolio of aggregate machinery and comminution processing equipment that is designed to perform optimally in the toughest conditions.

SUPPLY CHAIN

THE IMPORTANCE OF **CAREFUL IMPLEMENTATION**

The level of activity in the quarrying industry is directly linked to the level of infrastructure development and building, which in turn is directly linked to the growth of the economy. Recently, Econometrix economist Dr. Azar Jammine unpacked the national budget and outlook of the South African economy, in particular what will be spent in the construction industry and for infrastructure. For the quarrying industry, this will directly impact whether stockpiles get bigger or smaller, whether there will be more or fewer work shifts and whether there will be more or less investment in capital equipment to increase production.

The event, hosted by AfriSam and attended by stakeholders from across the industry, soberly painted a picture of an industry crawling along, without hope of a solution anytime soon.

The budget, presented by Finance Minister Enoch Godongwana in Parliamant boldly budgeted R903b for infrastructure in the medium term. But, even though this number may seem impressive, the reality is that it is done so in a context that makes it highly unlikely that the full budgeted amount will be spent.

Dr. Jammine listed the many factors that will inhibit infrastructure development to unleash its potential of accelerating economic growth. These factors include endemic corruption, inefficient SEOs, low levels of investment mainly caused by the country's energy insecurities and overregulation and bureaucracy that caused (and will cause) budgeted projects not becoming a reality.

In Q3 of 2022, construction accounted for 2,6% of SA's GDP. Despite this, it is one of the biggest sectors for employment as it is labour intensive. It employs 7,8% of all the labourers across sectors (utilities, mining, agriculture, transport, manufacturing, finance, trade and community & social services). It is a hugely important sector and can potentially significantly influence SA's GDP growth if it flourishes.

But it is not. The number of building plans passed has been declining for non-residential construction, while the healthy growth that residential building had post COVID, has now cooled down with a decline in growth. Geographically the Western Cape is the one province in South Africa that has seen a significant increase in building plans passed. This has directly influenced the production of sand products in the area.

Energy and Water & Sanitation have 17,5% and 14,7% of the total budget respectively, while Transport and Logistics accounts for 38,9% of the budget. If the plans to spend the budget within these sectors are implemented, the production of building materials and aggregates will increase significantly. However, despite Government's promise of a pipeline of projects across various sectors that would have kept the supply chain healthy while creating jobs, not much progress has been made. If there was any growth at all, it was because companies were sustaining their own capital projects rather than state expenditure on infrastructure. A Seifsa report says that the 'rollout of infrastructure generally has been very slow to non-existent." And when projects were rolled out, they took on the form of "Big Bang orders" which overwhelmed local manufacturers and suppliers.

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Letisha van den Berg of ASPASA.

SURFACE MINERS **GET ENERGETIC NEW LEADER**

New ASPASA Director, Letisha van den Berg, is living her dream as she takes the helm of the association from the beginning of this year bringing a positive new dynamic to the well-established and respected surface mining organisation.

She recalls a conversation several years ago when she startled Collin Ramukhubathi, who had been interviewing her for a position at Afrimat, revealing that her ambition was to head up ASPASA one day. As an up-and-coming multi-skilled manager that was evidently not the answer her soon-to-be colleague and mentor had expected.

Now, having fulfilled most of her ambitions in various roles, including various managerial safety roles within some of the smallest and medium mines locally, she could not turn down the opportunity to apply when her name was put forward as a possible candidate by her peers. And her successful application is penned in history.

Fighting fit

It would be hard to ignore the passion for ASPASA that exists within Letisha. Since her first interaction with the then newly established association in 1998, she has attended hundreds of meetings and workshops along the way and become known for her in-depth knowledge of everything surface mining as well as no-nonsense approach to issues that affect the industry.

Those who have misjudged her petite stature and friendly smile when dealing with controversial topics or challenges to the sustainability of the industry have done so at their own peril. Van den Berg is a fighter when she needs to but is otherwise known as a keen strategist, hard worker, industrious leader and a fair and uncomplicated character.

These traits will surely be displayed when she takes on the new role and gets to grips with all the opportunities and threats the industry is facing and will face in years to come.

Solid foundation

"I plan to build from the strong base that was laid before me. We will assess where we stand in terms of our members and how we can add more value and broaden our appeal to the surface mining market including smaller

role players.

"Having started my career on a small mine I understand the challenges and how difficult it is to reach compliance with limited resources and being measured with the same legislation and processes. We need to find the small non ASPASA members and get them onboard. Cost is also a factor for these mines and we will relook at the levy model so that we can make it affordable at all levels.

"Lobbying on behalf of the industry and ensuring we always compete on a level playing field still remains a priority. We will intensify our efforts in dealing with issues like illegal mining, technicalities regarding the payment of Royalties and other issues. Importantly, we want to ensure that legislation is written specifically for our mines rather than the current one size fits all approach as this has a direct impact on members abilities to comply.

Team work

"To do this ASPASA will work closely with state, tripartite structures nationally and regionally to make our voice heard. I also plan to work more closely with related industry bodies such as the Institute of Quarrying, Minerals Council, construction industry bodies and others.

"Once we have reviewed our services and communications we will also look at regions including the tripartite forum of the Mine Health and Safety Council. There will be more collaboration with members including roadshows and visits - I like getting my boots dirty," Van den Berg says.

"Developing SMMEs and bringing up-and-coming youngsters will also be a focus. Plans are already being developed to package compliance and quality documents that will assist SMME's to meet requirements. Simultaneously, the development of the next generation of surface miners is being planned with learnerships already being investigated and planned for the near future."

Challenging times

She continues that there are many challenges that still need to be met and many opportunities that need to be covered and made available to ASPASA members. The safety of women in mining, one size fits all mines legislation and the tough economy spring to mind, as well as opportunities that exist in working with Government and industry to unlock upcoming construction contracts.

"I am bringing in a lot of energy and want to incorporate the expertise of every generation into our organisation to share information and build knowledge for the future. With the interaction of all role-players in the association we will grow from strength-to-strength." ●

Traditional self-propelled machines see the majority of their maintenance downtime and costs from engine, transmission and associated parts repairs.

FIVE EQUIPMENT DEALERSHIP TRENDS THAT WILL SHAPE 2023

If you have been working around quarrying equipment you have probably heard of the "Equipment Triangle", a philosophy that is one of the fundamental tenets of the Association of Equipment Management Professionals (AEMP). The theory behind the equipment triangle is that all transactions between end users, distributors, and OEM/suppliers should be a win-win for all parties.

With major changes in the construction equipment industry underway, dealerships and manufacturers will need to adapt to keep the Equipment Triangle in balance. Here global industry leaders to share their views of what the future holds.

Online sales and online rentals will increase significantly

In 2021 online sales of automobiles reached 30% of the market, their highest level. In July 2022, Ford announced it would move sales of its electric vehicles online at a fixed price, following Volvo and Tesla. "Whatever happens in the auto industry, is coming to construction equipment dealerships," says Garry Bartecki, CFO of a Top 100 rental company and former CFO of the Associated Equipment Distributors (AED).

In a 2021 study from McKinsey & Company, sponsored by AED, more than 40% of off-highway dealers surveyed think it is very likely or somewhat likely that the OEM(s) they represent will implement a direct-to-consumer model within five years. They expect fully digital sales (including the actual purchase) for new equipment to increase from 7% to 29% and digital rentals to increase from 7% to 33% within five years.

"We definitely see things moving in this direction," says Jefferson Yin, Director of New Business Models and Commercial Intelligence at Volvo Construction Equipment. In 2020, the company began allowing customers to pre-order new electric equipment online, and they recently launched an online configuration tool for those machines, which allows customers to "build and price" their ideal model.

"Dealers are behind the curve and contractors are ahead of the curve when it comes to utilising the Internet," says Ron Slee, Managing Director Learning Without Scars, a training resource for dealers. The shift to e-commerce creates what he calls "the Amazon effect," which means dealers will have to transition from selling things to selling services.

With brand differentiation waning in the heavy equipment market, Dale Hanna, CEO of Foresight Intelligence, a provider of business systems and telematics software, also believes the battle for customers will be based on customer experience. "Dealers need to adopt more technology to be able to serve more customers with the same amount of people or to attract better people," he says.

Electrification will disrupt the dealer's revenue model

Electrification of construction equipment is in its early stages, but Grand View Research reports that the global off-highway electric vehicle market size is expected to reach USD42,70b by 2030. Growth will be driven by lower operating costs as well as improved battery technology and lower costs for batteries.

"You are going to see the whole industry switch to battery-operated or hybrid machines," says Clegg. "The amount of parts drops by about 90%, so if your operating costs for a skid-steer were USD20 an hour, that drops to USD3 per hour."

Dealers make their money on parts and services, and a high absorption rate (+85%) is a key focus. This metric is an indication of how well the margin from parts and services covers all the expenses of the dealership.

"Electric machines will cut the maintenance costs, so the dealers will make less money and the OEMs will make less money," says Bartecki. "It's a whole new ball game."

To make up for the difference, dealerships will have to focus on new revenue sources. "Because they have the service expertise, I would recommend they move into supporting and servicing batteries, providing services such as recharging vehicles, tires, wear parts, and repair," says Clegg. "They can also expand into different lines of equipment."

According to Lars Arnold, Electromobility Product Manager for Volvo Construction Equipment, the company is working closely with dealers on sales and service training

Connected machines and jobsites will continue to reduce owning and operating costs

Telematics can greatly reduce owning and operating costs. Nearly all new construction equipment machinery is equipped with technology that allows equipment owners and dealers to avoid downtime through preventative maintenance and early detection of mechanical issues. The challenge has been getting equipment owners on board. "Across the industry, adoption of telematics is definitely under 50%, and maybe only 30%," says Henderson.

"The dealer has the trust of their customer, but they tend to be a single brand, while most customers have mixed fleets," says Hanna.

Slee believes OEMs have tried to protect their own at the expense of the marketplace, but he's starting to see some signs of change. "The machines need to be able to talk to each other as they do in other industries," says Slee.

According to Jim Bretz, Director of Service and Solutions for Volvo Construction Equipment, about 60% of Volvo's connected machines use the company's advanced telematics system called ActiveCare Direct. These machines are monitored 24/7/365 for alarms that indicate an issue. Actionable information (an ACD case) is then sent directly to the customer's equipment manager and the local dealer within minutes. Included is information that will help the customer address the issue without the help of a dealer. In addition, fleet reports are driving a change to the dealer's business processes. "It gives them a tool to proactively consult with customers and help them evaluate and improve machine operation and maintenance," says Bretz.

Technology will bring greater efficiency to parts and service

Parts are the bread and butter of a dealership, but for an end-user, buying parts is anything but easy. When a machine is down, the costs are astounding and end-users and rental dealers are likely to pay a premium to get a quality part as quickly as possible. Buyers often need guidance, and that may mean multiple phone calls and texts from multiple sources, including OEM and aftermarket parts dealers. Each part of the distribution chain has its own distribution, logistics, and markup.

According to Slee, OEM dealer market share for parts has dropped to 35-40%, about half of what it once was. Buyers today simply have more options, including Amazon.

Luke Powers, CEO of Gearflow, a web-based platform designed to work within the Equipment Triangle to facilitate the sale of parts, believes dealers will soon be competing directly with Amazon. "MRO supplies are the first entry point of Amazon coming into the industrial markets," says Powers.

Powers wants to take the inefficiencies out of buying OEM and aftermarket heavy equipment parts, and for that he created the Gearflow platform with Co-Founder Ben Preston, to make it easier for suppliers and end-users to work with each other. The platform provides one location for end-users to request parts from their existing suppliers or discover new ones, access their past parts order history paired to their machines, as well as centralise invoicing and reporting across their mixed fleet.

"The No. 1 way dealers lose customers is through miscommunication," says Powers. A messaging center keeps communications tied to each part's request and order, in a central location.

"We're trying to automate as much of the process as we can," he says, "which ultimately will allow end-users and dealers to focus more on productivity and service.

Rental continues to grow, while an Equipment-as-a-Service model draws interest

Rental is expected to continue its upward trajectory fueled by higher prices for construction machinery and rising interest rates. According to the America Rental Association, construction equipment rental revenue is expected to increase 12.5% in 2022 to surpass USD41,6b, with growth slowing to 7% in 2023, 2% in 2024, 3%in 2025 and 3% in 2026.

The concept of equipment-as-a-service, which would transfer responsibility for equipment to the manufacturer or dealer, allowing customers to focus on their core business, is also gaining interest. Unlike equipment rental, it might involve an entire fleet to be provided for several years with the potential to tie invoicing directly to usage.

Slee believes the concept has potential. "Contractors use the machine to dig a hole. They are only interested in the hole, and they look at the equipment merely as an operating cost," he says.

Volvo CE is currently exploring the concept. "One of the most positive aspects from a customer perspective is the payment flexibility that this model offers since it's usually linked to machine utilization," says Dr. Ray Gallant, Vice President of Product Management and Productivity for Volvo Construction Equipment. This would allow companies with seasonal operations to match equipment expenses with revenues. ●

PRODUCTION INCREASE? CONSIDER THE CONVEYOR TROUGH ANGLE

Production increases such as a boost in cargo volume, material size or conveyor speed, can result in changes in the conveyor tracking, spillage and safety. One consideration is how loaded (or overloaded) the belt is compared to the trough angle. Proper belt width and cradles with adjustable supports should be factors to consider. By R. Todd Swinderman, President Emeritus/ Martin Engineering.

The trough angle is initially selected based on experience or the existing idlers for standardisation. Belt width is selected by calculating the cross-sectional area of the bulk material by assuming a troughing angle, an idler with three equal roll lengths and the surcharge angle, lump size and flowability of the bulk solid being handled. There are two important cross-sectional areas to consider, **CEMA 100% full** and **full edge-to-edge**.

CEMA 100% full

The 100% full area is based on a standard belt edge required to prevent spillover between idlers as the belt sags on the carrying run. The full edge-to-edge loading is used to calculate the maximum potential load on the structure. The best practice is to select the belt width based on 85% of the CEMA 100% cross-sectional area to allow for surge loads, off-centre loading or normal mistracking (see Fig 1).

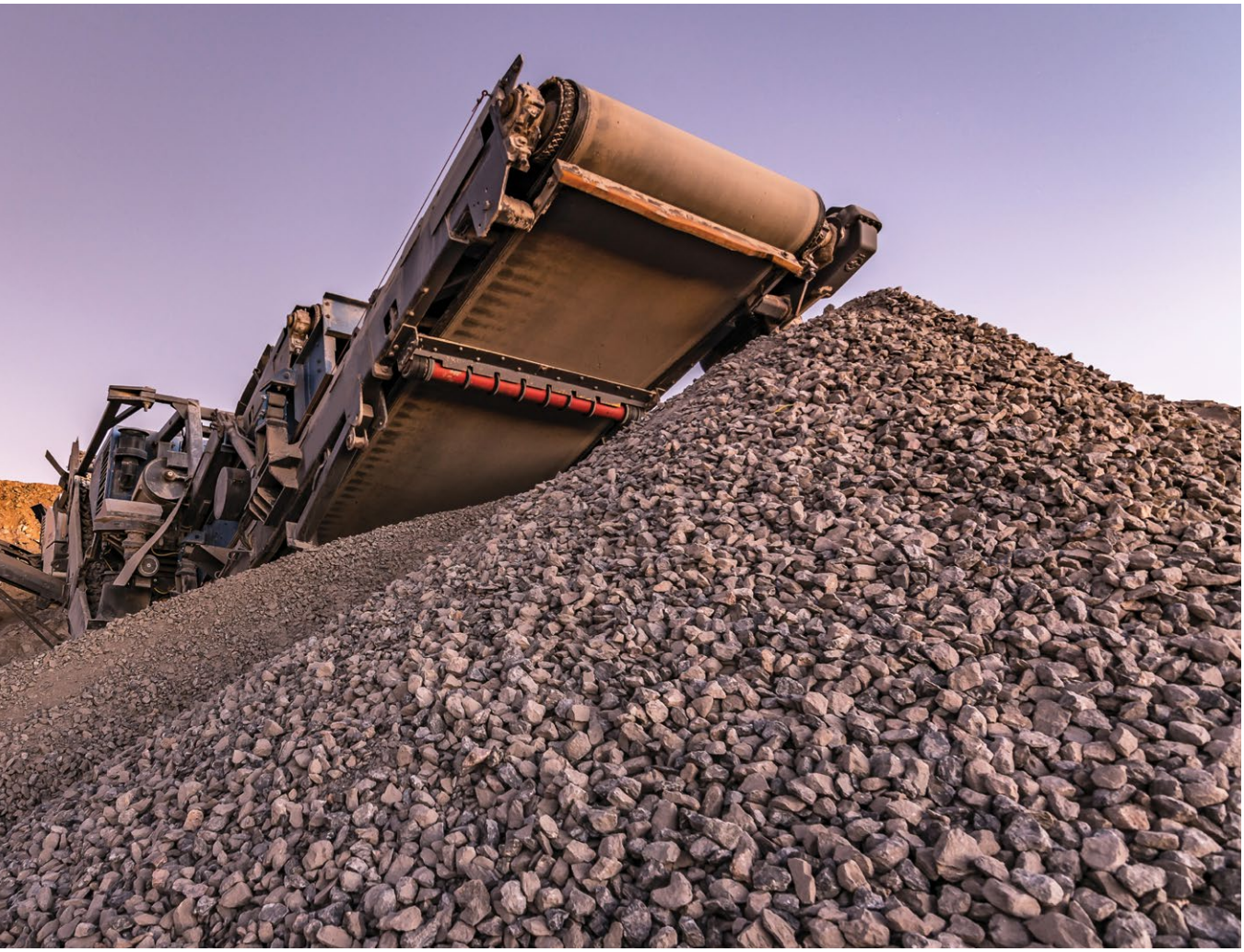
If operators are planning on upgrading the transfer chute to prevent spillage from mistracking, it may be possible to use a non-standard belt width, because the wing lengths of most troughing idlers allow more room than what is considered acceptable for mistracking belts. It may also be possible to change the standard trough angle or use a custom designed idler to allow for more cross-sectional area. Two common techniques can be incorporated into a new or complete conveyor design to make future upgrades less costly.

The first technique is changing the trough angle of the idlers to raise the capacity by increasing the cross-sectional area. In new designs, consider using 20-degree idlers. Upgrading to 35-degree idlers is a 27% increase in cross sectional area and going from 20- to a 45-degree trough angle is a 37% increase. Although 35-degree idlers are fairly standard, it is important to note that for retrofit upgrades, going from 35 to 45-degree idlers is only an 8% cross-sectional area increase (see Figure 2).

Full edge-to-edge

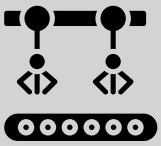
The second common technique for new construction is to design the structure for the next wider belt width and use CEMA wide-base idlers or Martin® Slider Cradles. The mounting dimensions of wide-base idlers or bumpers allow for a future replacement with a wider belt.

For example, if the structure for the 1 200 mm wide belt and 20-degree surcharge angle using 35-degree trough idlers was designed for wide base idlers, the belt width could be increased to 1 400 mm, resulting in a 33% capacity increase with the same trough angle and belt speed.



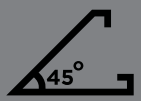
R. Todd Swinderman earned his B.S. from the University of Illinois, joining Martin Engineering's Conveyor Products division in 1979 and subsequently serving as VP and General Manager, President, CEO and Chief Technology Officer. He has authored dozens of articles and papers, presenting at conferences and customer facilities around the world and holding more than 140 active patents. Swinderman retired from Martin Engineering to establish his own engineering firm, currently serving the company as an independent consultant.

KEY TAKEAWAYS



Belt width is selected by calculating the cross-sectional area of the bulk material by assuming a troughing angle, an idler with three equal roll lengths and the surcharge angle, lump size and flowability of the bulk solid being handled.

The best practice is to select the belt width based on 85% of the CEMA 100% cross-sectional area to allow for surge loads, off-center loading or normal mistracking.



For retrofit upgrades, going from 35 to 45-degree idlers is only an 8% cross-sectional area increase.

The best practice is to select the belt width based on 85% of the CEMA 100% cross-sectional area to allow for surge loads, off-centre loading or normal mistracking.

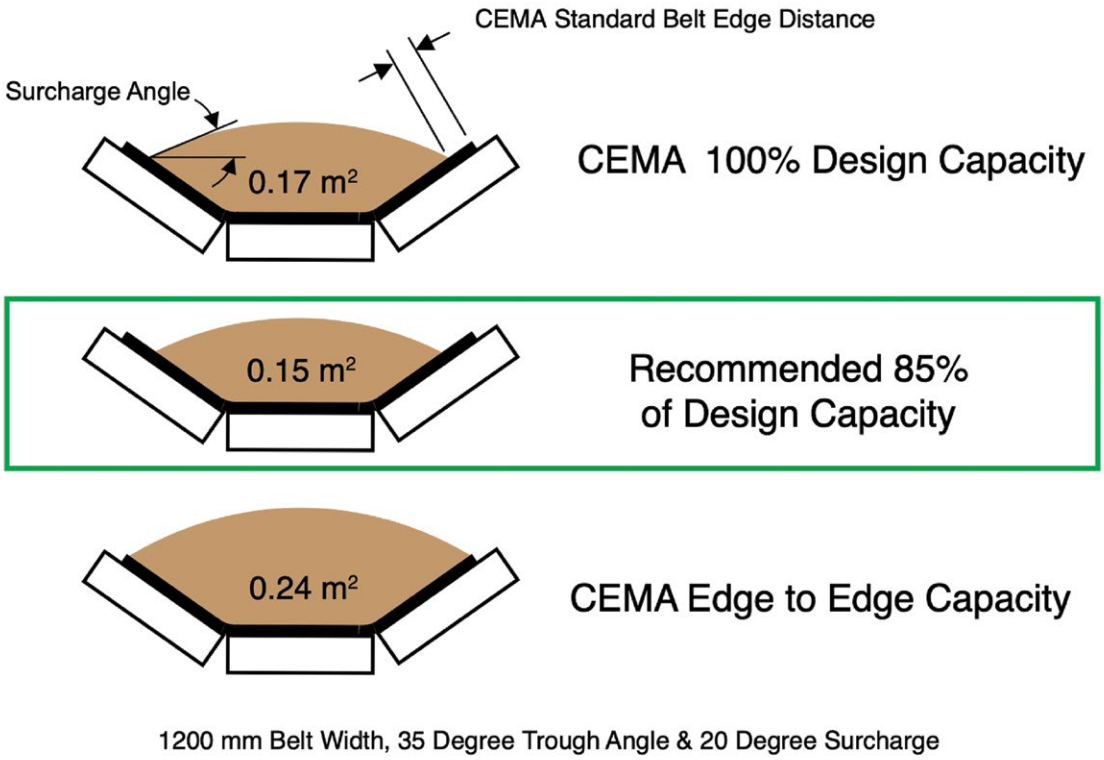


Figure 1: CEMA standard belt edge distance recommendations. © 2023 Martin Engineering

Trough Angle 3- Equal Roll Idler	CEMA 100% Cross-Sectional Area (m3)	Increase in Cross-sectional Area from Flat Belt	Increase in Cross-sectional Area from 20° Trough Angle	Increase in Cross-sectional Area from 35° Trough Angle
Flat Belt	0.064			
20°	0.132	106%		
35°	0.168	163%	27%	
45°	0.181	183%	37%	8%

Figure 2: Comparison of capacity increase by changing idler trough angle. ©2023 Martin Engineering.

Changing from a 35 to 45-degree trough angle and the wider belt and idlers would result in a 90% increase in cross-sectional area. This method is not often used, because there is resistance to increasing capital cost for a wider and higher load-bearing structure, higher material mass and larger drive. However, it is an excellent approach if there is an expectation of increasing capacity in the future. ●

Martin Engineering has been a global innovator in the bulk material handling industry for more than 75 years, developing new solutions to common problems and participating in industry organisations to improve safety and productivity. The company's series of **Foundations** books is an internationally-recognised resource for safety, maintenance and operations training. Martin Engineering products, sales, service and training are available from 16 factory-owned facilities worldwide, with wholly-owned business units in Australia, Brazil, China, Colombia, France, Germany, India, Indonesia, Italy, Mexico, Peru, Spain, South Africa, Turkey, the USA and UK.

CONVEYOR DOWNTIME CAN LEAD TO **LOST PRODUCTION AND MISSED TARGETS**

In the quarrying industry, minimising expenses and maintaining tight margins is crucial. Conveyor downtime can lead to lost production and missed targets, which often result in overtime to compensate for the lost time. The challenge of increasing production time while allocating sufficient time for planned maintenance to ensure optimal conveyor performance is ever-increasing.

To address these challenges, the industry requires innovative solutions that can improve production time without compromising conveyor system performance and maintenance. Fortunately, Truco has a range of solutions that have been successfully implemented in the toughest mining environments in Africa.

Second-hand conveyor belting has benefits, such as attractive pricing and good performance. However, there are also some challenges associated with it. Tracking issues, damaged areas on the belt, splicing different spec belts together are among them. Tracking issues can be caused by uneven tensioning, stretching of the belt in previous applications, improper storage, or trimming down a wider belt.

Truco offers a solution to improve conveyor belt tracking: the TruGuide. This belt training unit is designed to be installed on the return side of the conveyor and is selected according to belt width and conveyor tonnage output. For most aggregate applications, a 30 mm shaft is a suitable option. The TruGuide ensures that the belt runs straight as it enters the loading zone, giving it the best chance of running straight on the loaded/troughed side of the belt. The unit pivots off a 45-degree angle to guide the belt back to the centre point of the structure.

Damaged areas on a second-hand belt can quickly become a problem for the maintenance team. A tear or a hole is a weak point. Under additional stress, this area can further deteriorate. This can also cause tracking issues or product spillage (where holes or edge damage occurs). Product spillage increases maintenance requirements. Truco has an excellent solution in the form of Flexsol. There are two options that Truco focuses on, namely BF01 and BF03. Flexsol is a urethane-based product that adheres to Rubber and Metal.

The BF01 product is a self-levelling product that adheres to rubber only. It can be used to repair torn belt edges or holes in the belt. It has very high adhesion and flexibility characteristics that outperform 'also ran' products. If properly installed, it will still be attached to the belt at the end of its life.

The BF03 adheres to both rubber and metal. It has a putty-like consistency that makes it possible to repair belts upside down or on a vertical plane. Pulleys can also be repaired in situ. This is a huge time saver where lagging breaks away from the steel surface of the pulley. This can cause tracking issues and all the aforementioned problems that come with that.

Splicing different belt types can be a challenge, such as splicing a two-ply belt to a four-ply belt. TruSplice can help overcome this problem. It is a mechanical fastener that is countersunk when properly installed. This makes it scraper-friendly, and in most instances, it can be a permanent splicing solution for your quarry. The splice is reinforced with high tensile strength fabric that matches the strength of your belt. It is installed at a bias angle, and preparation time is minimal. TruSplice can be installed in rainy, muddy or dusty conditions.

In summary, maintaining efficient and reliable conveyor systems is essential for the quarrying industry to meet production targets while minimising costs.

TruGuide is a belt training unit designed to improve conveyor belt tracking and reduce the risk of belt damage and related issues. Flexsol is a urethane-based product that adheres to rubber and metal, and can be used to repair torn belt edges or holes in the belt, providing a fast and effective solution.

TruSplice is a mechanical fastener that can be used to splice different belt types with minimal preparation time, and can be installed by maintenance teams themselves after a brief training period. Free on-site product training can be given to your teams. ●

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THE ROAD LESS TRAVELLED **CAN OFFER GREATER SCREENING PRODUCTIVITY**

Global demand for aggregates and mining materials is on the rise with the industry facing an expected growth of nearly 4,2 billion tons over the next 15 years. That's a lot of material, which means producers need efficient equipment to meet spec and turn a meaningful profit. By Duncan High, Haver & Boecker Niagara Processing Equipment Technology Manager

Duncan High is the Processing Equipment Technology Manager at Haver & Boecker Niagara.

KEY TAKEAWAYS

- Every ton of material must go over at least one vibrating screen, so ensuring the equipment's efficiency is critical to an operation's success.
- Vibrating screens that are engineered with a double eccentric shaft assembly create a constant stroke to maintain g-force during material surging.
- By incorporating impact testing into an operation's regular maintenance routine, producers can ensure optimum screening performance and equipment reliability.
- The development of the double eccentric screen and other screening technology provides operations with innovative and cost-effective ways to increase their profits and efficiency.

Every ton of material must go over at least one vibrating screen, so ensuring the equipment's efficiency is critical to an operation's success. The good news is that there are technologies available today that can help increase or improve screening productivity. Integrating cutting-edge systems like eccentric screening technology, state-of-the-art screen media and diagnostic tools can prevent blinding, pegging, carry-over or contamination, improving screening performance, productivity and profits.

Heighten screening action

Vibrating screens that are engineered with a double eccentric shaft assembly create a constant stroke to maintain g-force during material surging. The double eccentric shaft design forces the screen body to follow the movement of the shaft. While the shaft travels up, the counterbalance

Integrating eccentric screening technology, state-of-the-art screen media and diagnostic tools can prevent blinding, pegging, carry-over or contamination, improving screening performance, productivity and profits.

weights move in the opposite direction and create a force equal to what is generated by the body. As a result, the forces cancel each other out and maintain a consistent positive stroke that handles material volume spikes without losing momentum.

One producer in western Canada quickly saw the benefits of switching to double eccentric screening technology when they replaced two horizontal vibrating screens with one double eccentrically-driven, four-bearing inclined vibrating screen. Changing their equipment helped to eliminate surging, blinding, pegging and material contamination challenges while increasing their production by 25%.

Reduce damaging vibrations

A vibrating screen's operation can have a large impact on a machine's surroundings. The metal springs on a traditional concentric vibrating screen, for example, can be noisy to operate. This metal-to-metal, up-and-down or side-to-side movement can cause excessive noise and vibration. To resolve this problem, double eccentric technology makes use of shear rubber mounts that are strategically designed to minimise lateral movement. The rubber mounts reduce noise while maintaining smoother operation, even in extreme circumstances such as overloading, surging and starting or stopping under load.

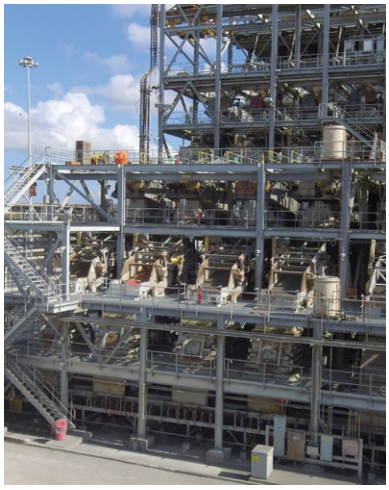
The use of eccentric technology virtually eliminates vibration in the structure - or chassis when used with portable equipment - which protects the integrity of the machine. This means producers can potentially use multiple eccentric vibrating screens in one structure, boosting productivity.

A leading phosphate producer in North America - producing nearly eight million tons per year - increased screening area by 60% by transitioning to double eccentric equipment. The mine incorporates a six-storey screening plant to house multiple vibrating screens that run 24/7. Multi-storey screen houses are common in the industry but can pose structural concerns due to the vibrating screens' size, capacity and force. Opting for double eccentric technology eliminated those concerns.

Improve stratification

Combining the use of advanced eccentric screening technology with the best screen media for the application is a recipe for success. Specifically, polyurethane screen media can be a beneficial asset to any operation seeking to prevent blinding and pegging while improving

Vibration analysis software monitors the vibrating screen's performance in real-time by detecting problems before they lead to diminished performance, decreased efficiency and increased operating costs.



Eccentric technology virtually eliminates vibration in the structure - or chassis when used with portable equipment - which protects the integrity of the machine.

material stratification and increasing wear life.

Polyurethane media offers the best combination of open area and wear life for both wet and dry applications. In particular, polyurethane screen media that is poured open cast can result in one and a half to two times longer wear life than injection-molded products.

The solution to improving material stratification lies in finding the ideal mix of screen media types to ensure all phases of screening work correctly. A screen media company that offers a variety of screen media types can help evaluate how material moves through the three phases of screening - from layered to basic to sharp - to give recommendations on the best screen media for an application. Producers can customise the screen deck by choosing screen media that maximises productivity for each phase by blending the best combination of open area and wear life.

Prevent equipment damage

A vibrating screen needs regular checkups to run optimally. Vibration analysis and diagnostic systems designed specifically for vibrating screens by OEMs are reliable tools for maintaining continued efficiency and longevity of screening machines. To ensure the best productivity, operations can partner with an OEM that specialises not only in manufacturing equipment, but also offers additional diagnostic tools, product-specific knowledge and years of engineering experience.

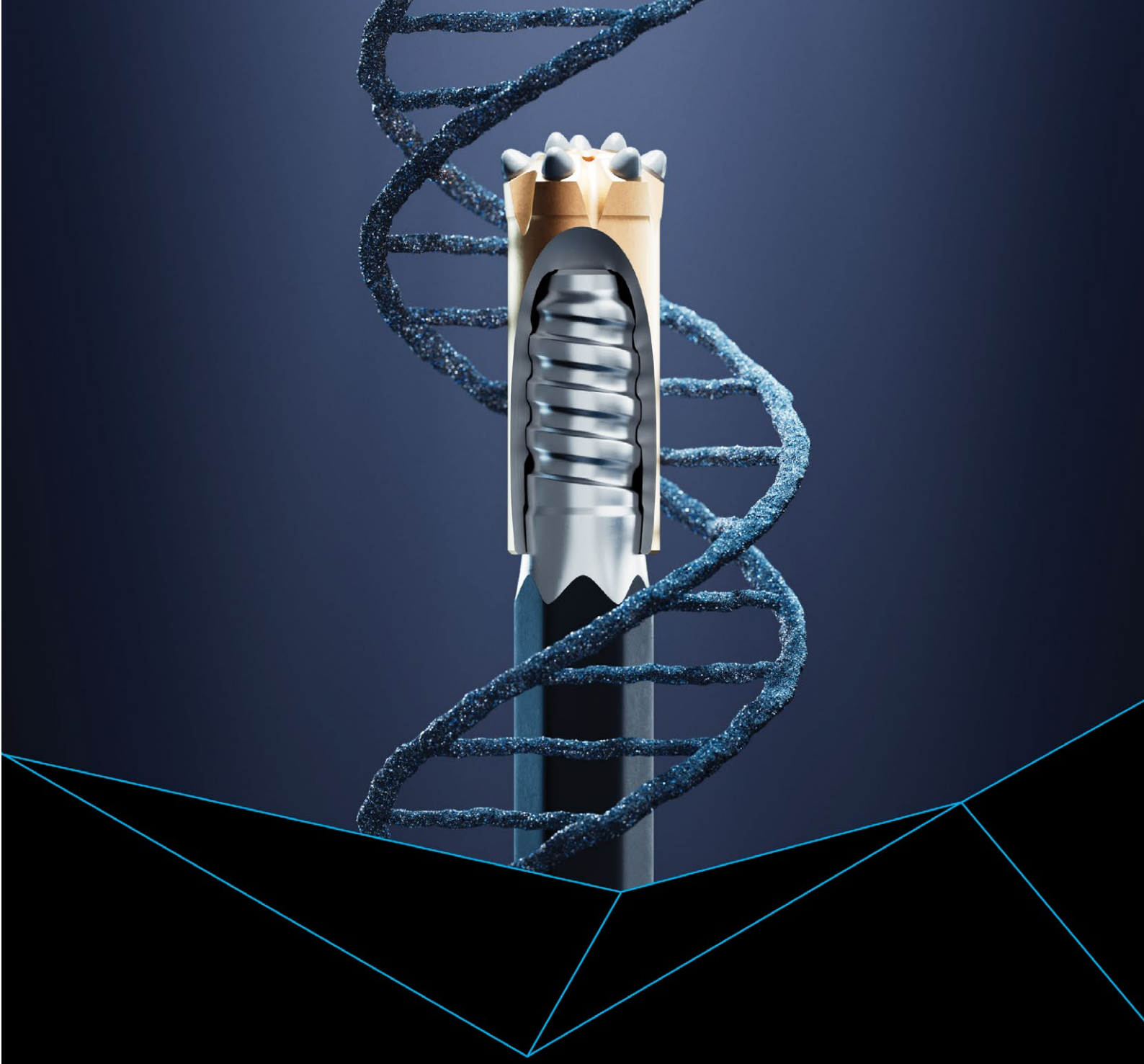
Utilising vibration analysis software, for example, allows mining and aggregates operations to monitor a vibrating screen's performance in real-time by detecting problems before they lead to diminished performance, decreased efficiency and increased operating costs. The most robust systems incorporate eight wireless sensors that magnetically fasten to key areas of a vibrating screen and measure orbit, acceleration, deviations and other important data points that indicate the condition of the machine. The sensors send real-time information wirelessly to be analysed, ideally by an OEM-certified service technician who can provide a detailed summary and recommendations.

Some manufacturers use vibration analysis technology to offer impact testing - or a bump test - which ensures proper machine calibration and promotes efficient operation. Impact testing involves striking the machine at key points with a dead blow hammer while the machine is off. Vibration analysis sensors are placed at key locations on the vibrating screen while a technician tests the natural frequency of a machine. By incorporating impact testing into an operation's regular maintenance routine, producers can ensure optimum screening performance and equipment reliability.

Another advanced diagnostic tool is condition monitoring, which is designed to monitor the health of vibrating screens using modern algorithms and artificial intelligence. The system utilizes permanent sensors that monitor the equipment 24/7 to capture real-time information and provide alerts via e-mail immediately upon the first sign of a potential problem. By constantly monitoring the accelerations of the vibrating screen, certain systems can even forecast the equipment's dynamic condition in regular intervals of 48 hours, five days and four weeks. With consistent use, condition monitoring software will accurately point out and predict critical issues and advise when to schedule maintenance, along with what to focus on during that planned downtime.

Increase profits through advanced technology

The development of the double eccentric screen and other screening technology provides operations with innovative and cost-effective ways to increase their profits and efficiency. By integrating the right equipment, screen media and vibration analysis systems, producers can see more uptime, higher quality results, increased productivity and greater profits. ●



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SANDVIK

A RECIPE **FOR SUCCESS**

The Gomes name has been associated with construction since 1936 when Gerardus Gomes started mining building sand, topsoil and river sand by hand. This fairly rudimentary business model eventually made way for the highly mechanised plant that has been operating since 2009 at its current quarry situated in Laezonia, where customers can collect sand and stone, or can order these. Modern Quarrying recently visited the 180 ha site and spoke to Mining Manager Gabriel Gomes and Pilot Crushtec's Charl Marais (Sales Manager) and Ben Armitage (Sales Engineer). This company has had a relationship with Gomes Sand for over 30 years and has supplied it with several pieces of equipment ranging from mobile screens, cone crushers, jaw crushers and vertical shaft impact crushers to washing plants.

"We produce all sand products here – building, plaster and river sand in addition to aggregates," says Gomes. "We only deliver in a 50 km radius to keep the price competitive." Gomes Sand operates and owns a fleet of 35 trucks. "Owning our own fleet means that there is efficiency in delivery as we can control every aspect right until the product is delivered to the client," says Gomes.

The quarry consists of four crushing plants and has the capacity to produce 150 000 tons of product a month. "In 2022 Gomes Sand produced an average of between 120 000 and 130 000 tons a month," says Gomes. "We work from 7:00 to 17:00 weekdays and seldom work overtime as we try to get the maintenance and production done in normal working hours."

KEY TAKEAWAYS

The fact that Gomes Sand owns its own fleet means that there is efficiency in delivery as every aspect, right until when the product is delivered to the client, can be controlled.

The plant is all aimed at achieving reduction ratios right up until the final product that is required. If there is a demand for aggregates, it can produce aggregates.

The GP330 offers installed power up to 315 kW, with a cavity feed opening of 238 mm which is able to accommodate feed sizes produced by the primary crusher.

All the sand produced by Gomes Sand – including the river sand – is a manufactured sand. It produces a wide range of products to cater for required specifications ranging from G1, 19 mm and 13 mm stone and river sand.

The Gomes sand aggregates plant sizing material after passing through a primary, secondary and tertiary crushing process.

A Nordberg® GP330™ cone crusher has remarkably high nominal power, effective stroke and cavity range, which brings flexibility to the crushing process.

Unique selling point

Gomes is quick to point out why Gomes Sand has been around for so long. "It is service, quality and availability of stock. If you go to Spar and there is no bread on the shelf, one does not go back there. The same applies with selling sand – when a client sends a truck to collect product, they do not want to wait. There has to be product availability to cater for their needs. They want to load and go as they have to manage their own risk," says Gomes. The company aims to maintain a 24 hour turnaround time for deliveries.

He says that the quality of the building materials that it produces is a result of experience. "One eventually builds up enough experience to be able to tell the difference between good and bad sand. In addition to knowing what you are mining, you need to know the geology, what the end product must be and you need to put up the plant to achieve this."

Gomes Sand has always had a good demand for sand. "We make what our clients need. If the demand is low, the plant is switched off and if demand increases, production in increased. There is always a demand for quality sand in South Africa. Many sand producers are producing building sand from recycled builder's rubble, but this does not necessarily produce a good quality building sand."

Gomes says there is a specific recipe to produce product. "This is combined with the know-how that Gomes Sand has accumulated over the years. The plant was mechanised and automated using the best combination of crushing, screening and washing equipment available.

"Over the years we have had hands-on experience with different types of equipment. The shortfalls of some and the benefits of others soon become apparent. It is through experience that you know what you want and you find the equipment to match this while understanding the geology and the mining process," says Gomes.

"All the sand produced by Gomes Sand – including the river sand – is a manufactured sand. We produce a wide range of products to cater for required specifications ranging from G1, 19 mm and 13 mm stone and river sand."

Gomes Sand mines granite. The quarry is situated on the edge of the Halfway House granite dome. "The sand we produce is quite consistent. We strip off the loose overburden and this is dug off by excavators. Whatever the excavators cannot dig out is drilled and blasted. The brown overburden is turned into river sand. Once the granite becomes more competent it is turned into aggregate," explains Gomes.

"The plant is all aimed at achieving reduction ratios right up until the final product that is required. It there is a demand for aggregates, we can produce aggregates too," says Gomes.

A partnership

"My dad started doing business with Pilot Crushtec in 1990. It has always been a one stop shop for us. The primary reason is the back-up service that we get from Pilot Crushtec. One can have the best machine in the world, but if there is no back up from the supplier, the machine is worthless. A crusher is an integral part of my plant – if it goes down, my entire operation comes to a standstill. I needed to decide to purchase a machine from a company that is going to support their product with after-market support such as parts holding and onsite technical support. When we need spares they must be able to deliver 24/7. That is why we bought from Pilot Crushtec and still do - it comes down to service, reliability, and stockholding."

The plant to produce the required product

After initially attempting to recycle rubble, Gomes Sand quickly upgraded the recycling plant to a hard rock plant from Pilot Crushtec. "There is no sense of recycling in South Africa yet," says Gomes.

The Metso GP330 cone crusher lube unit.

Ben Armitage, Sales Engineer Pilot Crushtec, Gabriel Gomes, Director Gomes Sand and Charl Marais, Sales Manager Pilot Crushtec.

The newly installed Metso GP330 cone crusher installed and crushing aggregates in process.

"As the pit got bigger we added a second plant from Pilot Crushtec. The plant has been revamped as the demand changed," says Gomes and adds that some 80% of the plant on site is from Pilot Crushtec.

It most recently supplied the Metso GP330 Cone crusher to Gomes Sand. "A machine was required to operate receiving feed from the primary jaw crusher on site and crush the material down to 40 mm in a closed circuit which can achieve 350 metric tonnes per hour," explains Marais. It was important to consider a cone crusher that could handle the top size from the jaw crusher and provide enough fines in the crushing process to produce filling material. "Another consideration was that the cone crusher had to be simple to maintain and have few moving parts to reduce standing time due to periodical maintenance," explains Marais.

This GP330 offers installed power up to 315 kW, with a cavity feed opening of 238 mm which is able to accommodate feed sizes produced by the primary crusher. "With variable eccentric stroke the unit can be optimised to suit several types of processes. The cone crusher chamber can be configured to operate from a secondary position in the plant all the way to a final stage quaternary crusher," explains Marais.

All operation data of the cone crusher is logged continuously and can be accessed by the standard on board Metrics monitoring system. This system has no monthly or yearly subscription and offers valuable data from the crusher from any device with internet access

Ben Armitage indicates that Gomes Sand has adapted well to circumstances in the market that determines the type of machines installed in a plant. "Certain machines have certain outcomes and Gomes Sand selects its equipment based on reliability and the outcome that is required for the end product."

Pilot Crushtec has been supplying and servicing the industry since 1990 offering unrivalled customer support, service and knowledge to keep customers operating competitively with a 100% commitment on stock holding from critical spares, wears and consumables. "We understand the frustration when spares are not available as well as the cost of standing time and lost revenue. Business works both ways and to be truly successful a partnership needs to be formed between supplier and customer," says Marais. ●

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170

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1 000

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MASTERING SAND PRODUCTION

Weir Minerals Africa offers a diverse portfolio of aggregate machinery and comminution processing equipment that is designed to perform optimally in the toughest conditions. Modern Quarrying spoke to Theo Hendricks – Product Manager Comminution at Weir Minerals Africa (Weir) about its Sandmaster™ range of sand wash plants. The Sandmaster™ washing solutions offered by Weir are innovative and market-leading and utilise processing equipment designed to deliver a high-quality sand in line with the needs of the client.

Theo Hendricks, Product Manager Comminution at Weir Minerals Africa.

Weir Minerals offers a wide range of Isogate slurry valves that perform in the toughest conditions.

The Sandmaster™ sand wash plant is one of the solutions Weir offers to the quarrying industry for the production and washing of sand. "These plants are highly efficient, rugged and reliable and designed to provide the lowest cost of ownership," says Hendricks.

"Weir Minerals offers two types of washing equipment for sand - its SP and DP range. The SP (single product) range produces a single type of sand while the DP (dual product) range can produce two products simultaneously," explains Hendricks.

The SP range has seven models in capacity ranging from 25, 50, 70, 100, 150 and 200 tons per hour while the DP range consists of three models – 70, 100 and 150 tons per hour.

Sandmaster™ SP series

This series removes excess fines or coarse material in a simple way. "It delivers clean, low moisture product that can be conveyed to the stockpile and discharges one type of sand," explains Hendricks. This single-grade washing unit can also be used to remove unwanted fines or clays, convert 'crusher dust' into saleable sand, recover saleable sand from effluent streams, recover tailings and grit, and wash recycled materials and construction waste.

Sandmaster™ DP series

Possessing similar technology as the Sandmaster™ SP series, the DP series is a dual-grade sand plant and enables the owner to create two separate products, at the same time.

"The Sandmaster™ DP series

A Sandmaster DP series sandwash plant in operation in India.

Cavex hydrocyclones can process higher volumes of product when compared to other cyclones of the same size.

Sand is washed on the Enduron dewatering screen where finer materials pass through the screen.

Weir Minerals makes use of Linatex rubber lining on all wear components to ensure a better wear life.

is ideal for an application where the client wants to simultaneously make two products – typically building sand and plaster sand, the first coarser and the latter finer," says Hendricks.

Hendricks explains that raw sand is fed onto the coarse side of the split-deck Enduron® dewatering screen. "This sand is washed on this side of the screen with spray bars and then discharged onto the stockpile." The finer material passes through the screen into the sump from where it is pumped by a Warman® WGR™ pump to the Cavex® hydrocyclone for ultra-fines removal. Before being discharged onto the stock pile, the fine sand moves over the fines side of the split-deck Enduron® screen for dewatering.

Hendricks adds that the two sand products may be blended if so required. This process involves a blending mechanism located on the discharge chutes.

The fines sand is pumped by the Warman slurry pump through to the hydrocyclones.

A market demand

Hendricks says that it made sense for Weir Minerals to develop sand washing solutions, as one of its core focuses is the supply and support of aggregate processing equipment. "Within this industry, depending on the requirements of the client, sand needs to be washed to achieve a certain specification. The different major components of the Sandmaster™ SP and DP ranges are manufactured by Weir Minerals. The market demand for such washing machines led to the development of these plants – there was an opportunity to put it all together in one compact unit, using all the different Weir Minerals products," explains Hendricks.

The building components of the machines such as Warman® pumps, Cavex® hydrocyclones, Enduron® screens and Isogate® valves are manufactured by Weir Minerals Africa. "We manufacture the majority of the components and assemble the plants here for the sub-Saharan African market. The plants also have a compact design, are skid mounted and are easily transported," adds Hendricks.

Innovation and cost of ownership

Hendricks says that the Warman® WGR pumps that the Sandmaster™ range is equipped with, offer clients the lowest total cost of ownership because of lower wear and power consumption rates.

"The machines are also equipped with Cavex hydrocyclones which offer laminar spiral inlet geometry that allows the processing of substantially higher volumes compared to a different hydrocyclone of the same size. This increases productivity and lowers the total cost of ownership," Hendricks explains. In addition, Enduron® dewatering screens dry the final product. "This means that when the final product lands on the stockpile it is already dry enough to load onto a truck and negates the need to dry the sand further before it can be transported," says Hendricks. This represents a time and cost saving.

Hendricks adds that the plant makes use of Linatex® premium rubber on all wear components as this ensures a better wear life. For Hendricks the modular and compact nature of the Sandmaster™ range is a distinct benefit for them. "Installation on site is fairly easy while the compact nature of the plant makes it easier when it needs to be moved on site."

In addition Weir Minerals can assist with a more environmentally friendly way to recycle effluent back to the plant without the need for a slimes dam – something that has environmental, legal and financial benefits.

The standard, but highly customisable models, can be reconfigured to suit the specific site and client requirement. "Weir Minerals has engineered to order (ETO) teams consisting of design engineers, draughtsmen and process engineers that are able to tailor-make a solution for a customer," Hendricks explains.

Answering the ROI question from clients

"Clients who want to purchase a wash plant with a hydrocyclone experience an increased production of sand. "Washing with older technology generally leads to the loss of saleable product as sand ends up as effluent in the settling pond. With the Sandmaster™ plant, instead of ending up as effluent, such fines become saleable product and production can increase by between 10 and 20%. This is a definite Return of Investment advantage," says Hendricks.

Maintenance

The modular nature of the plant takes into consideration that one needs to move around it easily for maintenance. There are stairs and access platforms which give access to the inspection hatches while the screen panels and hydrocyclone components – the spigot, for instance – can be changed easily. "The Warman WGR pump features a drainage plug, situated on the casing, which can be pulled in cold climates to prevent the pump freezing or clogging when it's stopped," says Hendricks. Linatex® premium rubber is used on all wearable parts facilitating longer wear life which ensures that plants run longer before these have to be changed.

The Sandmaster™ sand wash plants are compact and semi-mobile making them easy to transport and assemble. "Depending on the size of the machine, it can be assembled in as little as three hours and typically no longer than a day, which ensures downtime is minimised," says Hendricks. The process of setting it up on site is supervised by Weir Minerals Africa's specialist technicians but performed by the client's own team as they then get the opportunity to learn how the equipment works, and what to look at during maintenance.

Weir Minerals Africa's main warehouse in Alrode and its branches readily stock the spare parts as the machine is built using Weir Minerals' own products. "We also have service level agreements with our customers, whereby main spare parts are kept at the client's site – they pull from the stock and pay what is consumed," concludes Hendricks. ●

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WEIR

Minerals

The modular approach of the SmartPlant™ meant that the customer could tweak design parameters such as height, capacity and liner profiles.

FIRST LOCALLY MANUFACTURED SMARTPLANT™ IN AFRICA

A fluorite mine located some 100 km outside Pretoria, South Africa, is the first recipient of Sandvik Rock Processing' first locally manufactured SmartPlant™ in Africa. Following its recent commissioning, the 300 tph plant has already met process guarantees and reached nameplate capacity.

To improve efficiency and productivity, a South African fluorspar producer went into the market for a new processing plant in 2020. The SmartPlant™ concept from Sandvik Rock Processing appealed to the customer for several reasons, but mainly because of the fast delivery time, flexibility and substantial cost savings it would offer the operation.

SmartPlant™ is a range of pre-defined Sandvik SmartStations that can be mixed and matched to meet individual customer needs for maximum productivity and performance, thus reducing waiting time, maximising uptime and increasing profitability. Delivery generally takes about 22 to 30 weeks ex-works. Where there are peripheral design changes to the pre-defined SmartStations, lead times may be shorter than the standard 22 to 30 weeks.

According to Jaco Benade, Project Manager–Crushing and Screening at Sandvik, the deal was negotiated midway through the COVID-19 hard lockdown of 2020. The order was placed during Level 5 of the lockdown, with manufacturing commencing during Level 4. Despite the challenges brought about by the travel restrictions, compounded by the global supply chain disruptions, the plant was still delivered on time and within budget.

"A major talking point of the project was the short delivery time of 22 weeks ex-works at a favourable capital cost for the customer," says Benade. "The SmartPlant™ concept allowed the customer to choose from the pre-defined SmartStations, combine and configure them to meet specific site and operational needs, with no extra design and engineering costs."

While the designs are very much pre-defined, the

Sandvik opted for the mine to commission a conveyor supplier of its choice, purely to shorten the time to production and reduce costs for the customer.

> **SmartPlant™ is a range of pre-defined Sandvik SmartStations that can be mixed and matched to meet individual customer needs for maximum productivity and performance, thus reducing waiting time, maximising uptime and increasing profitability.**

SmartPlant™ still offered a great deal of flexibility for the customer. "The modular approach of the SmartPlant™ meant that the customer could tweak design parameters such as height, capacity and liner profiles, amongst others, without much concern about cost deviations and time implications," explains Glen Schoeman, Vice President – Sub-Sahara Africa at Sandvik Rock Processing.

Regarding flexibility, Sandvik's approach to the project was also a major plus for the customer. For example, based on its understanding of the customer's budget and time constraints, Sandvik opted for the mine to commission a conveyor supplier of its choice, purely to shorten the time to production and reduce costs for the customer.

In line with Sandvik's 'safety first' culture, the project was delivered with no lost time injuries, all the way from project inception to commissioning. "Despite the arduous conditions on site, ranging from excessive heat to wet weather conditions, the project was completed with an impeccable zero harm safety record," says Schoeman.

The new plant comprises a full suite of Sandvik equipment, including jaw and cone crushers, screens and feeders. Informed by customer needs, Sandvik opted for a much bigger front-end of the plant, comprising a large tip area and bigger jaw crusher. The Sandvik CJ412 primary jaw crusher, which takes a 750 mm top size, is fed by a box bin and a grizzly feeder.

The plant also employs two Sandvik CH840i cone crushers for secondary and tertiary crushing, the very first units of the company's 800i series range of cone crushers in Africa. Another first in Africa is the rotary feeder on top of the cone used to distribute material into the crusher. "This is a fantastic approach," says Benade. "The rotary feeder turns slowly, evenly distributing material around the edges of the crusher. This reduces pressure peaks in the crusher caused by uneven feed, a common challenge in crushing plants. The rotary feeder has passed with flying colours in terms of its performance at this particular site."

As the name suggests, the plant is 'smart' in every aspect. The CH840i cone crushers come with Sandvik's Automation and Connectivity System (ACS) as standard. The system continuously monitors and optimises crusher performance and controls the complete lubrication system, increasing uptime and reliability. It can automatically adjust crusher settings to compensate for crushing chamber wear, ensuring consistent product size.

In addition, the SAM by Sandvik digital service supports operational excellence in the plant. "SAM by Sandvik brings people, activities and data together in an easy-to-use, seamless and collaborative way. It allows both client and OEM remote access to the plant. The system itself provides a holistic view of the plant, enabling the customer to make informed decisions and the OEM to respond proactively to any equipment health and performance issues," concludes Benade. ●

AECI's PowerBoost technology is not only strategic in that it is no longer dependent on complex supply chains, but it also provides the additional option to establish localised manufacturing for remote regions.

AECI'S POWERBOOST IS A GLOBAL FIRST IN BOOSTER TECHNOLOGY

AECI Mining Explosives, constantly at the forefront of innovative explosive technology, has launched their new PowerBoost booster. PowerBoost is a global Industry first, that is set to transform the explosives sector as a result utilising non-explosive raw materials during the manufacturing of boosters.

"Moving away from conventional industry practices of combining explosives mixtures of PETN, TNT and/or RDX in the manufacture of explosives boosters, our new PowerBoost booster ingeniously creates a powerful booster from non-explosive, raw materials," says Hazel Bomba, AECI Mining Explosives Product Manager. Bomba continued, "We have been working on developing the PowerBoost booster for some time, with a keen objective to commercialise alternative technologies to meet the growing market demand for boosters worldwide". PowerBoost technology pivots away from the industry norm by eliminating the use, managing, handling and storage of traditionally used explosives-based mixtures, which come with heavy costs in terms of regulatory and legislative obligations. "We've managed to successfully introduce a simplified, safer manner of manufacturing boosters, whilst still providing a premium offering in the market".

An ongoing concern within the global mining explosives industry is the risk inherent with the storage and transport of bulk explosive material. Paramount to AECI Mining's vision is an acute focus to render the explosives value chain safer. The PowerBoost technology contributes to this quest, specifically enhancing the safety surrounding the manufacture of explosives.

Additionally, the decoupling of the booster raw materials from the established supply chains for global TNT and PETN, has strengthened AECI's ability to supply boosters into the market. COVID-19 and the resulting supply chain disruptions signaled to many industries the benefit of establishing shorter supply chain networks for optimised business sustainability. Recently, this fact was again highlighted by the supply disruptions induced by the Russia/Ukraine war. AECI's PowerBoost technology is not only strategic in that it is no longer dependent on complex supply chains, but it also provides the additional option to establish localised manufacturing for remote regions. This will bring the boosters closer to the end user and provide a more advanced sustainable way to conduct business. This option is not readily available with current booster technologies rendering the PowerBoost a game changer. Commercialising forward thinking technology to provide the market with a sustainably sourced, more safely manufactured booster that delivers on its promise of powerful performance. ●

SUSTAINED SAFETY FOCUS **EARNS BME ZERO CASE RATE**

After five years of steadily implementing its Safety for Life brand, Omnia Group company BME has successfully achieved one of its key safety targets – a zero recordable case rate (RCR) – for the year ending January 2023.

"We consider our zero RCR over the preceding 12 months as a proud landmark to have reached, based on the positive safety culture that our Safety for Life initiative has fostered within the business," said Ramesh Dhoorgapersadh, General Manager for Safety, Health, Environment, Risk and Quality (SHERQ) at BME. The South Africa-based company is a leading provider of explosives and blasting technology and services.

The RCR is based on the number of safety incidents which resulted in treatment beyond first aid. Dhoorgapersadh highlighted that BME's achievement has its foundation not only in sound policies and systems, but in the committed and practical application of these principles every day.

"Companies' systems and processes often look very good at face value, but these need to be effectively translated into action," he said. "A RCR of zero does not happen overnight and requires constant reinforcement from the highest level before it forms part of the prevailing culture in the workplace."

He explained that BME's safety protocols were driven by a range of safety interventions. These included working on visual felt leadership, process safety, near-miss reporting, driver awareness programmes and fatigue management. BME Managing Director Ralf Hennecke re-emphasised the importance of 'leading from the front'.

"Visual felt leadership has been vital in helping to embed the culture of safety in BME," said Hennecke. "This means a daily commitment by senior executives to focus on how safety plans are being applied on site."

He noted the corporate alignment of BME's efforts with the Omnia Group's vision of zero harm and positive impact through responsible business practices. These frameworks also aligned with the stringent standards of mining customers, many of whom are major global players.

BME's safety protocols are driven by a range of safety interventions, including driver awareness programmes and fatigue management.

"When it comes to health and safety, our customers expect no less from their supply partners than they do from themselves," he said. "We have therefore always worked to meet and exceed these standards."

Dhoorgapersadh said the zero RCR was not an end point in the safety journey. The challenge of safety, he explained, was to continue finding ways to improve – thereby steadily reducing any risk of incidents.

"In recent years, for instance, BME has placed growing focus on the medical wellness of our employees," he said. "They often work under very stressful conditions – frequently out in the open or on the road. Our medical surveillance programme has become more intense, to ensure that their physical condition is optimal at all times."

This intervention also included subcontractors, especially in the transport sector, to ensure that similar attention was paid to the health of all drivers. He said BME's focus on safety extended beyond people to the natural environment as well. The effectiveness of safety protocols had also contributed to the occurrence of no chemical spillages that could have an environmental impact.

Ramesh Dhoorgapersadh, General Manager for Safety, Health, Environment, Risk and Quality (SHERQ) at BME.

"We are very aware that, to sustain our enviable safety record, we need to be revisiting all aspects of our progress to look for ways to refresh our approach," he said. "An important aspect of safety management is about doing the simple things better and better. In every task, you need to be identifying where the risks are – and find ways of preventing those risks from becoming reality." ●

MINES MUST CASH IN ON DATA DIVIDEND

Taking a more holistic approach to tyre procurement and management is essential if mines are to improve safety and sustainability. By Carl Martins, Executive Manager: Mining Services, Bridgestone Southern Africa

"Between a rock and a hard place" is as good a summation of mining as any. The industry is defined by its tough operating conditions, a truly testing environment for both people and machines, as well as the supply chains that support them.

However, the light at the end of the tunnel is the growing ability to use data to improve safety and productivity, and generally make the operation more sustainable. In particular, the smart use of data can improve productivity and performance by transforming how the mine procures and manages its tyres, the unsung heroes that permit the heaviest of equipment to carry huge loads across testing terrain, day after day.

Tyre manufacturers like Bridgestone splash out on R&D to improve tyre design and manufacture, but we have come to believe that this is just not enough. It's only by managing the entire tyre life cycle that mines can realise the full benefits from their tyres: specialist expertise backed up by data is essential.

Here's how an ideal solutions-based approach would work:

Choose the right tyres. Each mine is unique. What is the type of rock the vehicles will be operating on? Will the tyres be used on long hauls and so need to be designed for heat resistance, or is cut resistance the primary consideration?

A solution-oriented tyre supplier is able to provide a site-severity survey to help scope the types of tyres needed for various applications on the specific mine.

Collect data continuously

Regularly collected data is vital in providing insights into tyre condition. Each tyre needs to be assessed to determine any damage and what remediation is required.

Tyre pressure, tread, tyre heat are all vital in order to ensure the tyre is operating optimally. GPS data can also be used to build up a picture of what kind of conditions the vehicles (and thus their tyres) operate; for example, cycle speeds and lateral and vertical acceleration are recorded and assessed in the light of the impact on the tyres.

In short, the more data it has, the better the company can understand the life cycle of its tyres and plan accordingly. It can also better understand the relationship between better tyre management, mine production, and reduced downtime. Increased productivity in the range of 7%-10% can be achieved.

Establish field services

The basic data from regular tyre surveys needs to be acted on, something that can be a challenge at a remote site. The mine needs the capability to undertake repairs to tyres and also to change them—no easy task given their size and weight.

Improve forecasting and planning to ensure timeous supply

A COVID-19 hangover and the Ukraine War have definitely disrupted supply chains but, these considerations aside, specialized mining tyres have an exceptionally long lead time from factory floor to fitment; four to five months is average as production takes a month, shipping 6-8 weeks and then there is the challenge of in-country logistics.

Carl Martins, Executive Manager: Mining Services, Bridgestone Southern Africa.

However, it needs to be recognised that the supply chain is vulnerable on multiple fronts, including container shortages, shipment delays and strikes, as well as normal production issues and shortages of raw materials. All of these factors make planning a complex business.

In conclusion, given all of these factors, it is clear that a solutions-based approach will have significant benefits. Not only will the mine have the right tyres for its specific conditions, it will become better able to make evidence-based decisions about how to maximise the performance of its tyres and so improve its bottom line. In turn, all of that information can be put to use to make certain that the mine never runs out of the tyres it requires to keep its operations running smoothly.

The choice is clear. Mines can either treat tyres as a simple question of procurement and then develop their own capabilities in managing their life cycles, or they can build long-term, solutions-focused relationships with their tyre suppliers. Of course, the former is theoretically possible, but it would undoubtedly be a significant distraction from core business. Building a relationship with a reputable supplier makes much more sense, and the long-term benefits will be much greater. ●

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GALVANIZED STEEL COMES INTO ITS OWN IN THE QUARRYING INDUSTRY

Galvanized steel plays a critical role in infrastructure in the quarrying industry. This ranges from steel shaft structures to stope structures (roof supports, pipe hangers), haulway structures (aggregate transfer stations, electrical stubbies) as well as surface structures (plant buildings, tank supports, pipe gantries, conveyor belts, stacks, stockpile structures, stairways, railings).

The environmental conditions in the quarrying industry can often be aggressive and the service demands on steel extreme, subjecting it to maximum demands. These conditions include water immersion, impact and abrasive conditions, extended surface wetness, variable temperatures, and corrosive underground atmospheres.

Hot dip galvanized coatings have a good track record in protecting many structural steel parts in surface mining environments.

South Africa's quarries have ever present corrosive water, which is where hot dip galvanized (duplex coated) steel really comes into its own. Thus, a cost-efficient, long-lasting, and maintenance-free protection system for steel should be specified, which means a duplex coated galvanized steel system, explains Simon Norton, Executive Director of the International Zinc Association (IZA) Africa.

Galvanizing provides a tough and abrasion-resistant coating as well as long-term corrosion protection of steel in two ways: As a physical barrier to corrosive atmospheres, and by means of galvanic or sacrificial protection, which is unique to zinc, significantly extending the service life of steel in even the most challenging environments.

Surface

Atmospheric environments are classified into different categories of severity by ISO 9223, which also provides a range of lifetimes for steel and zinc in these environments. There is a specific relationship between galvanized zinc coating thickness and expected coating life, defined as the

KEY TAKEAWAYS

- The environmental conditions in the mining industry can often be aggressive and the service demands on steel extreme, subjecting it to maximum demands.
- Galvanizing provides a tough and abrasion-resistant coating as well as long-term corrosion protection of steel in two ways: As a physical barrier to corrosive atmospheres, and by means of galvanic or sacrificial protection.
- Hot dip galvanizing provides superior corrosion protection to steel.
- Combining paint coatings with galvanized coatings is referred to as a duplex system.

time that can pass before coating maintenance is required to restore protection to the base metal.

Added corrosion protection: The duplex system

Organic (paint) coatings can be added for improved corrosion protection. If hot dip galvanized steel is then overcoated with a tough organic paint system, the resultant duplex coating has an extended lifetime, saving the mine owner money. On the other hand, continuous galvanized sheet is generally pre-painted in the same facility in which a thin zinc galvanized coating is applied. This allows for precise preparation of the galvanized surface prior to coil coating. Painted galvanized sheet can be roll-formed to give profiles as specified by the customer for roofing and cladding of surface plant.

Combining paint coatings with galvanized coatings is referred to as a duplex system. Duplex systems benefit from a synergistic effect that enables the combined life of the painted galvanized steel to be longer than the sum of the individual lives of the paint and galvanized coatings in the same environment. The synergy multiplier ranges from 1,8 to 2,7, depending on the severity of the corrosion conditions.

Hot dip galvanizing provides superior corrosion protection to steel. It is easily and swiftly applied and covers the entire surface of the steel article, even in inaccessible areas, provided the component is designed properly. Hot dip galvanized coatings offer a unique dual protection that prevents corrosion even if the coating is damaged.

> **Hot dip galvanized coatings offer a unique dual protection that prevents corrosion even if the coating is damaged," – Simon Norton, Executive Director, International Zinc Association Africa.**

Maintenance painting is often impossible in mining environments, meaning the only option with paint-only structures is complete replacement. Hot dip galvanized coatings, however, are hard and abrasion resistant. They provide long lasting and maintenance-free corrosion protection to steel even in aggressive mine environments, and provide significant savings compared with other protection systems that require maintenance.

REFERENCE

https://www.zinc.org/wp-content/uploads/sites/4/2015/01/Hot-Dip-Galv-in-Mining-Brochure-36pp.pdf.

Employees have an obligation to accept the workplace policies regarding alcohol and drugs, as well as a duty to confirm that they are abiding by all applicable policies and laws pertaining to substance-free programmes.

A SOBER WORKFORCE IS NON-NEGOTIABLE

A sober workforce is the most effective risk management tactic a company can take. Employees that abuse alcohol and other intoxicating substances cost their company time and money, while putting their livelihoods at risk. By Rhys Evans, MD at ALCO-Safe

Employers have a duty to provide a safe working environment for all workers, which includes preventing employees from entering the workplace under the influence of intoxicating substances. Employees have an obligation to accept the workplace policies regarding alcohol and drugs, as well as a duty to confirm that they are abiding by all applicable policies and laws pertaining to substance-free programmes.

While it is for employers in the transport sector to decide whether their workplace policies will involve drug testing (along with routine alcohol testing) as well as how and when these will be carried out, it is recommended that these policies be carefully relooked and brought up to date. Companies must establish that they are doing everything within their means to ensure a sober workforce is behind the wheel on South Africa's roads.

The Occupational Health & Safety Act takes precedence

Transport companies should already be accustomed to testing their drivers before they are permitted to get behind the wheel of any truck or transport vehicle. Testing drivers once they have arrived at their destination is an effective way of ensuring that such drivers have not consumed any intoxicating substances during their journey. This is important particularly for long-distance trips. For many drivers who have come under disciplinary action due to the fact that they were found to have consumed intoxicating substances or found with a breath alcohol level above the level permissible by the Occupational Health & Safety Act, it is important to remember that

At random times after the engine has been started, the IID will require another breath sample, known as a rolling retest, which is done to prevent someone other than the driver from providing a breath sample.

the workplace does not have to be a physical location for the driver. Their workplace is their vehicle, and as such, there can be no argument that the National Road Traffic Act allows for a higher permissible alcohol level with public road users.

Testing starts at the depot

Transport drivers are considered professionals, their vehicles their workplaces, and as such, the Occupational Health & Safety Act trumps the National Road Safety Act in requiring the strict enforcement of rules relating to workplace intoxication by their employers. While such drivers could not be prosecuted by the national traffic police in terms of the Occupational Health & Safety Act, their employers certainly can take zero tolerance disciplinary action within the full ambit of the law. Breathalyser tests at the vehicle depot are useful tools within the transport company's arsenal when enforcing workplace substance abuse policies. Saliva-based drug tests are useful for picking up a variety of substances (depending on what companies are looking for) that have been consumed within the previous two or three days.

Technology takes testing on the road

Additionally, testing technology has advanced to offer employers more effective safeguarding measures on their vehicles, to prevent intoxicated drivers from being a danger to themselves and others on the road. Many trucking companies are now making use of a device called an InterLock, which is a breathalyser that works with the ignition system of a truck. This ignition interlock device (IID) is a form of electronic monitoring that requires the driver to blow into a mouthpiece on the device before starting or continuing to operate the vehicle.

If the resultant breath-alcohol concentration analysed results exceed the programmed blood alcohol concentration, the device prevents the engine from turning on. At random times after the engine has been started, the IID will require another breath sample, known as a rolling retest, which is done to prevent someone other than the driver from providing a breath sample.

Trucking companies can now also make use of an app-controlled breathalyser test management platform for regular, remote capturing, sharing and tracking of breathalyser test data. This empowers fleet operators to facilitate the remote testing of drivers.

Drivers can be prompted to perform breathalyser tests on themselves, making the data instantly available for analysis and sharing, in real time. Tests are matched with photographic identity, GPS position, date, time, device serial number and test result, in order to eliminate the possibility of tricking the system.

Making IIDs compulsory

If the government were to make it compulsory for such electronic monitoring devices to be installed in 18-wheeler trucks and vehicles used for long-distance haulage, this would be effective in reducing intoxication-related accidents and fatalities.

This would take the responsibility of monitoring driver intoxication out of the ambit of traffic police, and place it squarely with their employers. These electronic monitoring devices would have additional risk-reduction benefits that would result in lower insurance premiums and safer roads for all users. ●

AUTONOMOUS EQUIPMENT **IMPROVES QUARRY SAFETY** AS WELL AS PRODUCTIVITY AND EFFICIENCY

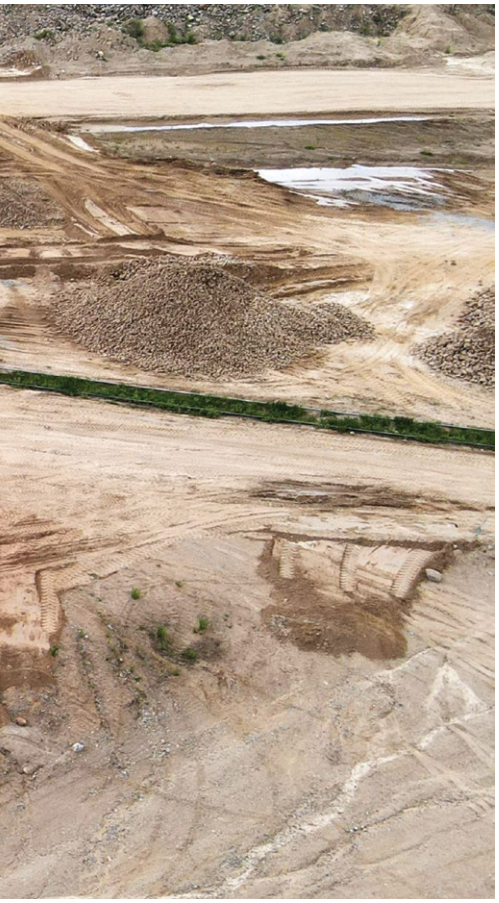
Artificial Intelligence (AI) and Machine Learning (ML) have begun to transform many sectors, and the mining industry is no different. The inherently hazardous environment within a mine can be made far safer with AI-based solutions such as autonomous equipment. By Maureen Phiri, Sales Manager at Oxyon People Solutions.

Not only do these solutions enable improved working conditions, but they mitigate the risk of injuries and fatalities while also improving skills development and enhancing productivity, efficiency, and profitability. Ensuring that mine workers have the skills to make use of these next-generation tools is imperative and partnering with an experienced Temporary Employment Services (TES) provider can be hugely beneficial in this regard.

The 4th industrial revolution

As the world has become increasingly digitalised, we have moved into the 4th Industrial Revolution, also known as 4IR. One of the hallmarks of this revolution is the use of automated technology to disrupt and enhance processes. In the mining industry, a sector that is already unpredictable and sensitive to change, investment in automation solutions can help to improve safety, sustainability, productivity, and efficiency.

With already high operating costs and dangerous working conditions, many mines are investing in the use of AI, ML, Virtual Reality (VR), and particularly robotic solutions, such as autonomous equipment. These solutions enable machines to perform dangerous tasks such as mapping and surveying, drilling and explosives handling, jobs which previously required the proximity of people, which in turn placed their lives in danger. Now, robots can take on these tasks instead, with greater accuracy, more efficiency and far less risk to human life.



Maureen Phiri, Sales Manager at Oxyon People Solutions

Long-term benefits

Autonomous mining equipment that operates remotely can not only improve worker safety but also has a host of other long-term benefits as well. Cost savings can be realised due to improved efficiency, and productivity can be reached faster because robots can work 24 hours a day – they do not require breaks or sleep, only periodic preventative maintenance. This increases output and profitability, improving stakeholder relations.

It also allows workers to transition from hazardous roles to the task of monitoring the automated processes and operating machinery at a distance using VR, which can also be used for simulation training to enhance skills development. However, there are numerous challenges when it comes to making the move to automation, robotics and AI.

Overcoming the hurdles

One of the most significant challenges for mines is that of infrastructure. Because mines are typically located in rural areas, or at least outside of main centres, the infrastructure is simply not available to support the use of next-generation technology. Upgrading this can be costly and time-consuming, but necessary if digitalisation is to take place. In addition, areas may be difficult to access, which makes security and mobility an issue.

Aside from these potential problems, the introduction of automation could lead to the loss of jobs for people whose skill sets are being replaced. Workers need to be trained and upskilled and given the tools and capabilities to adapt to meet the changing environment. Tertiary education facilities need to realign with new skills and new demand, and mines need to ensure that their training is brought up to speed. The already existing skills gap in the industry will only continue to widen if this is not adequately addressed.

Partnering with the right TES provider

Moving into the 4IR and working alongside digitalisation, AI, ML, robotics and automation is a cycle of continuous learning, adaptation and skills development to ensure employees are not left behind. The right TES partner, one that understands the changes and challenges, and one that can work with the industry stakeholders, can be an invaluable asset. They will help to ensure that the appropriate skills are in place, that skills development is aligned with need and demand, and that they work with mines to source and place the right talent. An experienced TES partner can also connect mining companies with facilities and training partners, with the specialists and skills required, to develop and adapt the skillsets, courses, training, and upskilling that are required for the movement into digitalisation.

Adapt or be left behind

Both employers and employees need to understand that technological innovation is necessary and can deliver enormous benefits. The change is already upon us, and if mines stay in the past and do not adapt, they will be left behind as its competitors embrace digitalisation. Moving with the 4IR is also key in maintaining the trust of investors, which is critical for sustainability and continued operations. The reality is that we cannot go backwards, and all mines need to start somewhere. The right TES provider can help, partnering with mining organisations to reach their goals, upskill and develop people, and enable them to move with the digital revolution. ●

Excavators for high productivity and long service life in tough conditions

Doosan DX450LCA-7M and DX450LC-7M crawler excavators - with their robust structure for dependable performance, stability on site and long service life - are valuable machines on any tough construction site and in mining, quarrying and civil engineering.

"These robust excavators have been developed for improved performance, efficient operating costs and minimal downtime in arduous conditions. Doosan's new generation of machines boasts an impressive combination of power and intelligence, which means operators can handle heavy loads and challenging tasks with ease," says Darrel Holton, managing director, DISA Equipment (Pty) Limited, trading as Doosan, part of Invicta Holdings Limited.

"The DX450LCA-7M excavators, with an operating weight of 44.3 ton and DX450LC-7M machines, with an operating weight of 44,4 ton, are able to operate efficiently with attachments designed for 50 ton excavators, with sufficient pump flow and lifting capacity."

Doosan's new DX12 engine, with outputs of 181 kW and impressive torque, deliver the precise power needed for each specific task.

Advanced features of this series include greater digging force and 20% more bucket load than other brands of machines in the same class. DX450LC-7M and DX450LCA-7M excavators also have a newly designed reinforced heavy-duty arm and boom, with an optional boom floating system.

The heavy-duty X-shaped undercarriage has an integrated track spring and idler, a durable box section track frame and self-lubricating sealed links. All welded structures are designed to limit stresses.

The re-designed cabin, which features the latest aesthetics, focuses on operator safety and comfort, in combination with advanced technology to ensure precise control during all tasks.

Doosan machines ensure easy access to all components for quick maintenance procedures and to prevent contamination to the surrounding environment.

Doosan recently launched advanced telematics and tracking technology – DoosanCONNECT – which is designed to make equipment and jobsites more efficient, economical and convenient. ●

Doosan DX450LCA-7M and DX450LC-7M crawler excavators - with high power ratings for greater productivity and a robust structure for dependable performance, stability on site and long service life - are valuable machines on any tough construction site and in mining, quarrying and civil engineering.

Springbok branch extends FUCHS' reach

Testament to the extensive reach of FUCHS LUBRICANTS SOUTH AFRICA is its Springbok branch in the Northern Cape. The branch is unique in that it supplies the complete lubrication requirements of leading mining businesses in the area.

Area Manager Dirk Coetzee explains that Springbok is part of a wider network serving the broader mining industry, including strategic locations such as Kuruman and Emalahleni. FUCHS Springbok currently services eight major customers and a host of smaller mining and private companies.

With 24 years' experience, Coetzee maintains longstanding business relationships with his key clients. He began his career in the lubricants industry in November 1998 at Lubritene, which was subsequently acquired by FUCHS. "We grew rapidly and had to move premises a couple of times," notes Coetzee. At that time the focus was largely on high performance grease, but Coetzee quickly expanded the branch's product offering to include commercial oils, which are sold into Namibia as well.

Today the Springbok branch is six employees strong, including one in Namibia. There are two warehouses comprising 700 m^2, together with offices and stores. "We also offer our clients on-site services, pump-on services and much more," highlights Coetzee. Stock is sourced from the main Isando, Johannesburg facility 1 400 km away. Due to the extensive logistics involved, Coetzee always ensures that there is sufficient stock on hand to meet the needs of the branch's regional client base.

FUCHS has been a trusted partner of the global mining industry for over 85 years, offering a comprehensive range of lubricants for the arduous operating environments represented by surface and underground applications. Products include RENOLIT greases for permanent and long-term lubrication for high performance, reliability and process compatibility, and RENOLIN industrial oils for diverse applications from hydraulic oils to turbine oils. ●

Reach new heights with Atlas Copco's PAC H pumps

The new Atlas Copco PAC H centrifugal pump is a high pressure performer, promising less downtime and low cost of ownership and is now available for either purchase or rent from dewatering pump specialist, IPR, formerly Integrated Pump Rental. The company is the appointed Master Dealer for these and other Atlas Copco dewatering pumps in southern Africa.

It is part of Atlas Copco's High Head series and according to IPR managing director, Lee Vine, it can pump to heads of up to 150 metres, with a capacity reaching 1,200 cubic metres per hour.

The Atlas Copco PAC H is well suited to a range of industrial applications, as it can handle liquids that contain solids up to 89 mm in size. This makes it popular in quarrying, mining, construction, municipal and agricultural applications – as well as in the oil and gas sector.

A key aspect of its reliable performance and long life is its protected seal. The exclusive closed impeller is equipped with deflector vanes that keep the mechanical seal clean and free of detritus. Vine says that this unique hydraulic design helps the mechanical seal last three times longer.

"With our customers focused on achieving the lowest total cost of ownership on dewatering pump installations, it is important to note that the PAC H boasts a number of features that help customers to reduce the cost of ownership through shorter repair times," he says.

The innovative Atlas Copco hinge kit makes maintenance easier by having a swing door that allows quick and easy access to the pump's internal workings. There is just a single bolt, for instance, to remove the impeller. The semi-cartridge seal enables changeout without dismantling the pump, and makes the lip seal and impeller easily accessible.

"As pump users embrace environmental responsibility and move toward lower emissions, the PAC H pump is there to support their efforts. The model complies with EU emissions requirements, and there are offerings that suit worldwide emission norms and certifications," Vine adds. "The pump features a 120% fully leak-free structure, making it the environmentally friendly option."

To keep the customer in full control, the PW controller series enables users to get the most out of the pumps in any application. There is automatic operation via a transducer and floats, as well as complete engine management with alarms and fault shutdown. ●

Volvo CE launches task manager to help keep projects on track

Managing a busy worksite can be time consuming and challenging, with many different and interdependent tasks and with numerous contractors, sub-contractors, sites and machines at play. Volvo Construction Equipment (Volvo CE) makes it easier to connect the pieces of the puzzle with a new digital solution, Task Manager.

An easy-to-use web application, Task Manager is a worksite management tool that connects people, machines and projects, providing real-time visibility of the many tasks taking place on a busy site and helping ensure activities are delivered on target, on time and to budget.

Robert Nilsson, Service Offer Owner at Volvo CE, says: "We understand the challenges facing our customers in creating an accurate project timeline. Task Manager was developed with this in mind and with the objective to take the strain out of worksite management. By making it easy to see the status in real-time of the many activities on-site either from your mobile or desktop, Task Manager helps everyone stay on track – whatever the brand."

Time for a change

with Task Manager, information on project status is instantly available wherever you are, whether on-site, in the office or at home, helping users stay apprised of developments and ensuring sites are as productive and efficient as possible. Once installed, new projects and work orders can easily be set up as required. Task Manager makes it possible to set targets and monitor progress, track material moved on site and manage data from a mixed fleet. And with all relevant information in one place, time spent on administrative tasks such as collating and consolidating data is reduced, leaving users more time to focus on the business in hand.

Task Manager is suitable for everyone from production managers and site supervisors to sub-contractors, all of whom have a vital role to play to keep infrastructure projects on target. Data can be filtered by different time frames, projects, activities, materials or work orders, providing updates in real-time and facilitating status update reports to management.

Task Manager also works hand-in-hand with the On-Board Weighing (OBW) functionality of Load Assist and Dig Assist with load receipts set up to automatically flow from the Volvo Co-Pilot into Task Manager. For customers without Load Assist or Dig Assist OBW, the operator can easily create manual load receipts. ●

Make sure of the right pump for the job

Selecting the right dewatering pump means being clear on what duty it is expected to perform, explains Justin Bawden, internal sales at Integrated Pump Technology – SADC distributor of Grindex pumps.

"Users need to ask a number of important questions when selecting a dewatering pump," says Bawden. "This starts with the flow and pressure (head) requirements – which can be measured in litres per second or cubic metres per hour."

Then the total dynamic head must be calculated. This is a function of the static head, which refers to the metres of vertical elevation, and the friction losses in the hose. To work out these friction losses, the user must estimate the 'run length' to the discharge point. The diameter of the hose, and its material of construction, must also be considered.

"The pump's kilowatt rating and impeller type can then be suited to the flow rate and the total dynamic head on the pipeline discharge point," he says.

Another key consideration is the size, percentage and specific gravity of the solids in the liquid to be pumped. This will affect the design of impeller required, as well as the material of construction for the pump or wear parts. Abrasive material, for instance, will demand that the pump's wear parts are made with suitably abrasion-resistant metals or compounds.

"Users must consider the acidity of the liquid, as this will cause corrosion if the wear parts are not constructed or coated with the right material," he warns. The dimensions of the sump should then be examined – in terms of its depth and the size of its opening.

The site itself may present challenges, including the type and quality of power available. Bawden advises users – especially contractors moving onto a new site – to check the voltage and phase of the power being supplied. He urges pump users to get expert advice in confirming their choice of pumps.

"Integrated Pump Technology has skilled and experienced distributors around southern Africa to advise customers on pump selection," he says. ●

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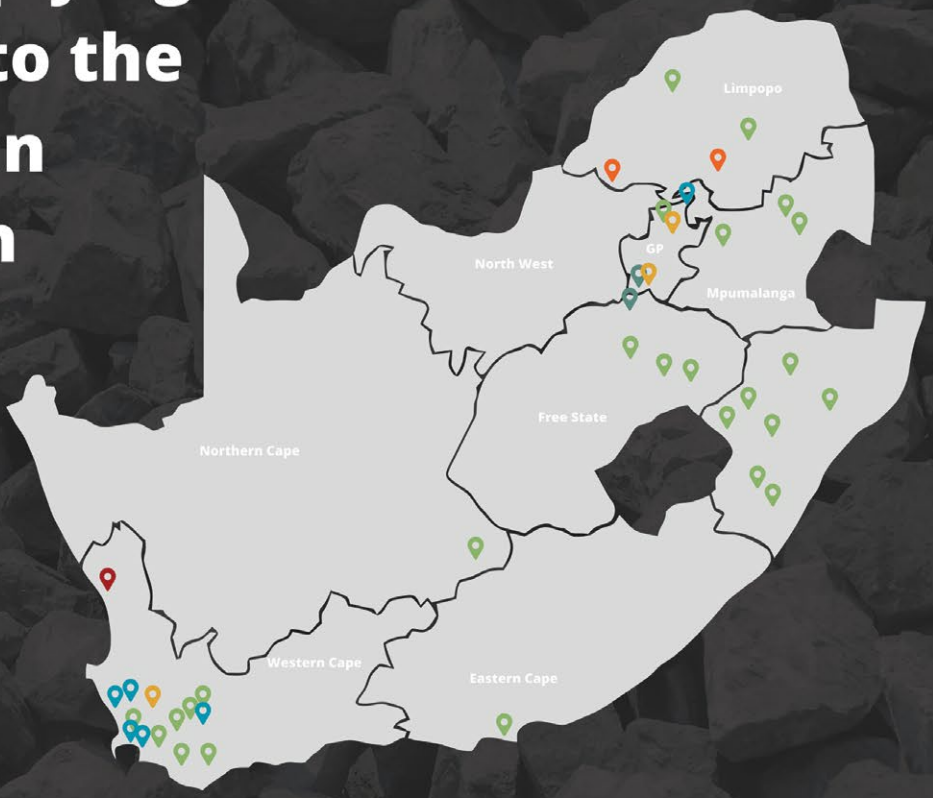

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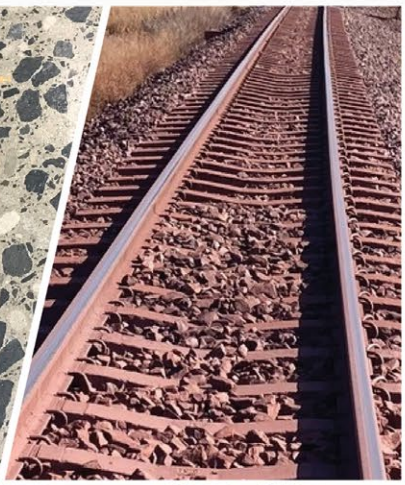

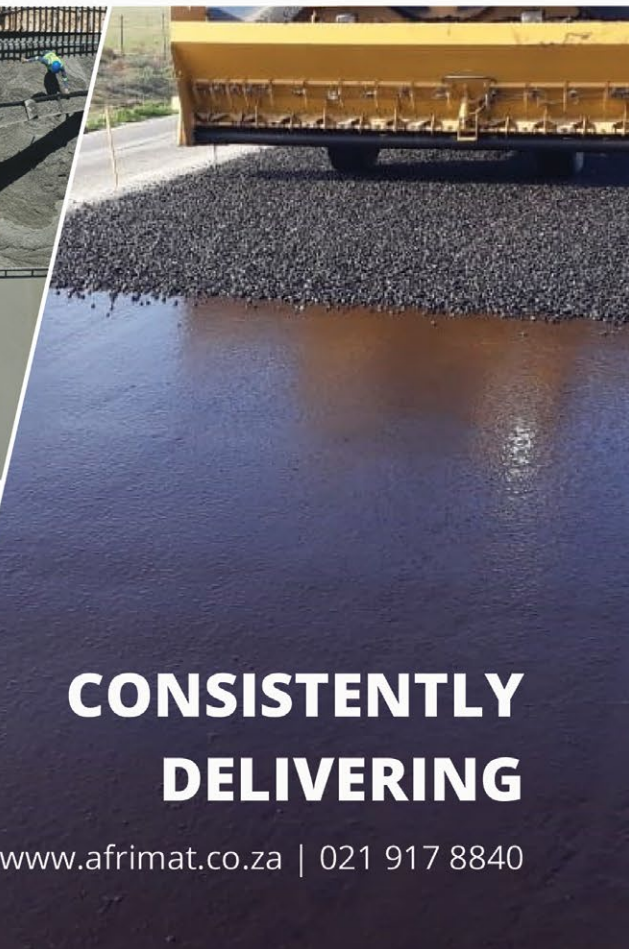

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