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COVID-19 reshapes the face of the global economy.

Tomra has an appetite for diamonds.

Kal Tire plugs the gaps.

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An appetite for diamonds
Tomra prepares for a new product launch to help diamond miners maximise diamond recovery, says Tomra's Geoffrey Madderson.

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THE HEAT IS ON

Nelendhre Moodley

The girl's best friend is catching heat from all sides; from poor performance over the past few years to the added woes brought on by COVID-19 and having to fend off an increased appetite for lab-grown diamonds. Lightbox, a De Beers-owned company producing laboratory-grown diamond jewellery, recently opened a $94-million manufacturing facility in Oregon in the United States. The facility is expected to produce around 200 000 carats of lab-grown diamonds annually.

So what does this mean for the world's hardest material? Interesting times ahead, by the looks of it, especially now that Rio Tinto's Argyle diamond mine in Australia, the main source of pink diamonds, has halted production after 37 years. Following this announcement, speculation is rife that prices for pink diamonds will soar.

Despite the tribulations, the girl's best friend continues to hold appeal. In fact, so alluring is its shape that the Royal Canadian Mint recently launched the world's first 3D diamond-shaped coin. According to a press release, the pure gold diamond-shaped coin features a 0.2ct diamond embedded on one of the coin's engraved facets.

The beauty also made headlines and for the right reasons, with Kotti Srikanth, owner of The Diamond Store by Chandubhai, in Hyderabad, setting a new Guinness World Record for the most diamonds set in one ring. It used a whopping 7 801 natural diamonds in curating the ring named The Divine – 7801 Brahma Vajra Kamalam.

With diamonds a feature in this edition, *SA Mining* spoke to Tomra, a sensor-based solutions provider, to unpack how the company is helping diamond miners maximise diamond recovery and reduce costs (pg 20).

And speaking of breakthrough developments, Zan-Tech, an air-drying and purification equipment specialist, recently designed and built a bespoke mobile solution to deliver medical-grade oxygen and medical-grade breathing air for Anglo American and Siyanda Bakgatla Platinum's field hospitals (pg 26).

"Lightbox, a **De Beers-owned company**, opened a **$94-million** manufacturing facility in the US, to produce around **200 000 carats** of lab-grown **diamonds** annually."
– Lightbox

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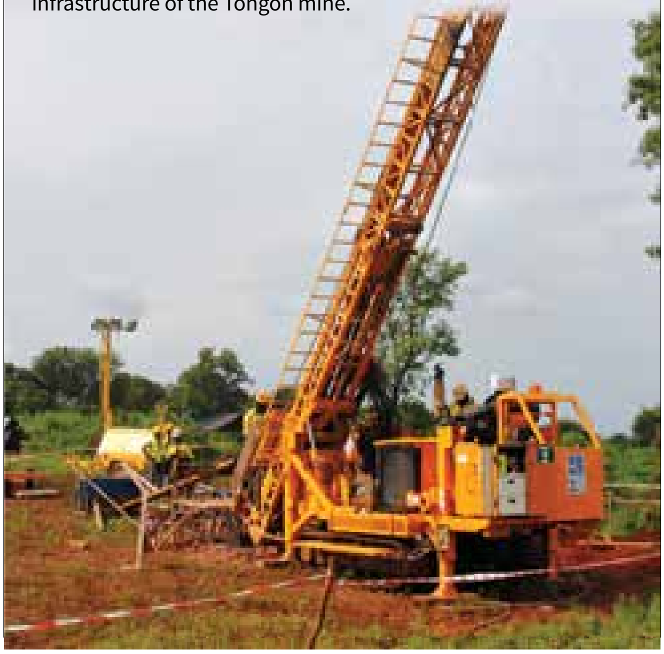
CÔTE D'IVOIRE

ASX-listed Manas Resources' new auger drilling results confirm major reverse circulation (RC) drill targets at its Mbengué Gold Project (MGP) in Côte d'Ivoire, West Africa.

The results significantly expand the area of the main LVP anomaly, which now consists of two zones 300m apart, says the company. Each of the two zones is over 2km long and 300m wide and open along strike. Manas plans a follow-up programme of RC drilling, focused on the wide high-grade northern portion of LVP. Chairman Alan Campbell says the results from the infill drilling support the view that a significant gold-mineralised system exists at MGP close to the existing infrastructure of the Tongon mine.



BURKINA FASO

An update of TSX-listed Teranga Gold's mineral resource estimate for the Golden Hill project has delivered positive results, including multiple near-surface, high-grade, oxide gold discoveries.

Golden Hill is an advanced-stage exploration project located in south-west Burkina Faso within the central part of the Houndé Greenstone Belt, a highly mineralised gold region that hosts three operating gold mines. Wholly owned by Teranga, Golden Hill is a key component of the company's growth pipeline. The drilling and preliminary engineering work has confirmed the potential for a high-grade open-pit gold mine at Golden Hill. The company expects to spend about $15-million on a resource expansion programme to reach its goal of outlining a resource of between two and three million ounces of gold.

MALI

Minerals exploration and development company Kodal Minerals has signed a memorandum of understanding (MoU) with Sinohydro Corporation, a specialist engineering, infrastructure, power developer and construction contractor, to develop the Bougouni project in southern Mali.

Sinohydro is currently active in Mali and recently undertook a site visit to the Bougouni project. Kodal Minerals is hopeful that the MoU will deliver many positive benefits to the Bougouni project and help in finalising the design, financing and construction process efficiently and cost-effectively.

BURKINA FASO

Endeavour Mining has restarted mining operations at its Boungou mine in Burkina Faso, following the mobilisation of the West African mining contractor and completion of infrastructure improvements.

The company has also confirmed potential synergies of $35-million to $40m during its SEMAFO integration process. The synergies are in procurement and supply chain optimisation and centralisation of technical services, among others. The Boungou plant has been processing stockpiles since early 2020. Following the acquisition in July, Endeavour has implemented infrastructure improvements and operating procedures for the mining restart programme.

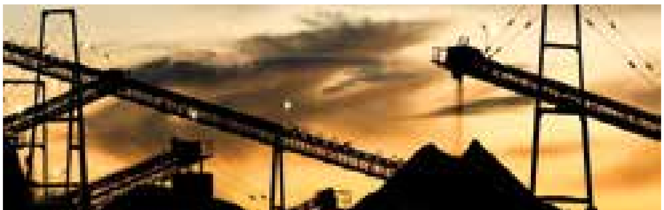
CÔTE D'IVOIRE

Gold explorer Mako Gold has been granted an exploration permit for Korhogo Nord in Côte d'Ivoire, which lies within the same Birimian Greenstone Belt as Barrick's 4.9moz Tongon Gold Mine.

The company will soon be launching an exploration programme on the permit and plans are in place for an exploration programme that would begin with soil sampling, geological mapping, and rock chip sampling, followed by air-core or reverse circulation drilling. The soil sampling programme is planned for after the rainy season, which usually ends in late October or early November, says Mako.

TSHIAMISO TRUST APPOINTS NEW CEO

The Tshiamiso Trust recently appointed Daniel Kotton as CEO. The appointment would enable the trust to carry out its mandate to implement the May 2018 class action settlement, the company said. The settlement is likely to see several billion rand paid over the next 12 years to an expected tens of thousands of former and current mineworkers who contracted silicosis and tuberculosis between 1965 and 2019 through their employment on mines owned or operated by the six mining companies that are parties to the settlement. A psychologist by training, Kotton has spent the past 15 years of his professional life in the financial and other services sectors, including in the health benefit sector.



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MINING PRODUCTION DOWN 3.3% IN AUGUST

Latest results from Statistics SA on mining production and sales for August indicate that mining production decreased by 3.3% year on year in August 2020, with the largest negative contributors being gold, which was down 14.8%, iron ore down 18.1% and coal down by 4%. On a positive note though, platinum was the largest positive contributor with PGMs up by 12.7%.

Stuart Gale.

WELBORN STEPS DOWN AS RESOLUTE CEO

Dual-listed Resolute Mining has announced that after five years with the company, CEO John Welborn has stepped down from the role. Resolute's CFO Stuart Gale has been appointed as interim CEO. The company has commenced a comprehensive process to recruit a new CEO with the skills and industry experience to lead the executive team and deliver on Resolute's strategy, the company said.

KAROO DEEP DRILLING RESEARCH PROJECT LAUNCHED

The Council for Geoscience (CGS) recently launched phase two of the Karoo Deep Drilling and Geo-environmental Baseline Project (KDD) in Beaufort West, Western Cape. The KDD is a geoscientific research project in the Karoo Basin by the CGS to conduct investigations aimed at developing a geo-environmental baseline model. The research's special focus is aimed at assessing the potential environmental impacts that could be brought about by the shale gas development in the Karoo, the CGS said. The KDD is seen as a possible game changer for the Karoo region and the South African economy. This outlook is based on the projected potential to explore and extract shale gas, and also provide an opportunity for the country to begin exploring the production of its own fuel. The United States Energy Information Administration estimates that South Africa has the eighth largest shale gas reserves in the world at 485 trillion cubic feet.

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MENAR STARTS OPERATING EAST MANGANESE PROJECT

East Manganese, Menar's first manganese asset located near the Northern Cape town of Hotazel, has been granted a mining right and water use licence, paving the way for mining operations to commence soon. The R250-million project was granted environmental authorisations in February 2019, a mining right in August 2019 and water use licence in September 2020. Menar MD Vuslat Bayoglu said: "East Manganese is part of our group's planned R7-billion investments. Speedy regulatory approvals are critical to unlock the investment spend and to contribute to South Africa's economic revival." East Manganese holds around a one million-tonne run of mine (RoM) ore resource, and will produce an estimated 30 000-tonnes-a-month RoM manganese ore.

AFRIMAT LOOKS TO SAVE NKOMATI ANTHRACITE

Open-pit miner Afrimat recently lodged papers in South Africa's High Court calling for Nkomati Anthracite to be placed under business rescue. Afrimat has a 27.27% shareholding in Unicorn Capital Partners, which indirectly holds 60% of the shares of Nkomati. As a creditor, Afrimat is within its right to request that Nkomati be placed under business rescue. CEO Andries van Heerden said the step was necessary in order to protect the interests of the employees, the local communities and the creditors. "This step makes it possible to securely inject post-commencement financing into the mine and prevent liquidation of the mine." Recent production disruptions owing to COVID-19 shutdowns and an extended illegal strike were some of the key reasons for the mine experiencing extreme difficulty. Van Heerden said Afrimat was of the view that should the application be granted, the mine and the associated jobs would be saved because Afrimat was keen to acquire the mine as it would help to build up its bulk commodities segment. "I am confident that future employment prospects in the surrounding community will be available and the business rescue will result in a better return for Nkomati's creditors."


Andries van Heerden.

CAPITALISING ON THE GLOBAL HYDROGEN ECONOMY

As part of South Africa's economic recovery plan, the country needed to develop new competitive industries in the global market space. Hydrogen could fulfil that role in a complementary manner to other initiatives and sectors, said PwC's economist Jonathan Metcalfe, who spoke at the recent launch of PwC's inaugural *Unlocking South Africa's hydrogen potential* report.

The key driving factors for hydrogen receiving significant international traction were the declining cost of renewables coupled with the fact that carbon emissions were increasingly being penalised. "Global momentum is growing across the hydrogen industry. At the beginning of 2020, the global hydrogen project pipeline, across grey, blue and green projects, stood at $95-billion," said PwC's James Mackay. Mackay added that the launch of national policies and government funding initiatives, including national hydrogen roadmaps, built on the momentum of existing pilot programmes. "Strategic memorandums of understanding between hydrogen countries that are ideally suited to the production of hydrogen and countries which have aggressive decarbonisation targets and want to use hydrogen are clear signs of the traction in the market." In the South African hydrogen space progress included initiatives such as the development of the first government-led hydrogen roadmap as well as a Green Hydrogen Atlas-Africa initiative. "Coherent government policy will be necessary to support the pace of hydrogen development," said Mackay. So far, hydrogen development in South Africa has been largely driven through initiatives in the mining sector, which remain focused on the use of PGMs in catalyst plates of fuel cells, including a fuel cell electric vehicle (FCEV) mining truck at Mogalakwena mine and Impala Platinum's FCEV forklift fleet operating at the Springs refinery.

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2020 THE YEAR THAT WAS

By Ogi Williams, associate director at In On Africa

Since early January, 2020 has been anything but uneventful. The onset of the COVID-19 pandemic has reshaped the face of the global economy, permanently impacting every facet of human interaction.

Social distancing restrictions remain in a number of countries, with safety rules on wearing protective attire being implemented stringently and many still holding travel bans in place. As with other industries, the global mining sector was severely impacted by COVID-19 restrictions with the operations of companies such as Alta Zinc, Anglo American and Rio Tinto among others grinding to a halt in early March across key production and processing markets such as Italy, Mongolia, Peru and South Africa.

The impact of this move has sent a shockwave through the industry, with the impact being felt most by labour with many miners experiencing retrenchments or going on unpaid leave.

With the pressing need to stem the tide in global COVID-19 infections, while also avoiding complete financial implosion, the industry has had to place impetus on fast-tracking automation and digitalisation in maintaining open operations.

Though negative in the eyes of some, the moves will be necessary going forward in keeping the industry operating. What will be important is maintaining open channels of communication and providing community support as the transition unfolds.

THE MAIN IMPACTS OF COVID-19 ON THE MINING INDUSTRY

The first few months of imposed lockdown restrictions had the biggest effect on the global mining sector. Imposed movement restrictions put a stop to mining operations across the world over the period March-May, and resulted in a ripple effect throughout the entire mining supply chain.

Everyone including producers, processors, refiners, transporters, traders and end-users were affected. Subdued economic activity led to a drop in demand for minerals and metals which placed stakeholders across the value chain in a precarious position.

Mining companies in particular were losing income while increasing expenditure to keep operations afloat until restrictions eased. Certain sectors, like platinum group metals, were more affected than others given the decreased demand for electronic products. Others like gold were stifled across the board and at a time when demand was on the rise.

By virtue of geographic separation, some producers were able to keep operations going, but the fragmentation of supply routes more generally drove prices higher, which in turn pulled demand down creating a circular downward spiral.

For producers like South Africa the lockdown period and the broader drop in demand had a considerably more negative effect given the large labour force which is employed by the mining industry. Even with the sector reopening in early May, the gradual spread of infections resulted in a number of operations being shut down for days at a time, disrupting both production flow and output. By July, this combination of factors had resulted in the Minerals Council South Africa projecting a 15% to 25% output drop for the year compared to 2019.

This comes at a time when the industry has struggled to attract investment for a number of years given infrastructure constraints such as unstable electricity access, poorly developed rail and road routes, an uncertain legislative environment and a persistently high incidence of corruption.

> “South Africa’s **weaker** preparedness to **automate** also places it at a **greater risk** of **losing market share** to others who are **better** positioned.” – Williams

IN ADDRESSING THE SHORT-TERM CHALLENGES, INDUSTRY STAKEHOLDERS SHOULD CONTINUE TO COMMUNICATE AND COLLABORATE

At the onset of the pandemic, a number of global mining companies began to open channels of communication between themselves in providing the necessary support to communities where they operate.

This was evidenced in the Australian market with the Minerals Council of Australia hosting working group meetings with senior executives to find solutions to alleviate the economic and social impact of the virus.

Funds and aid poured in from global miners into key markets like Australia as well as others where they have operations. Diamond miner De Beers contributed $2.5-million to providing support to Botswana and Namibia, while Barrick Gold donated between $1.5m and $1.7m respectively to Congolese and Tanzanian COVID-19 support programmes, and a further half a million to the Zambian

The global mining sector was severely impacted by COVID-19 restrictions.

> "Use of **drones** in **monitoring** operations alongside **self-driving trucks** will **mitigate** potential **risks** of transmission and **enhance** efficiency." – Williams

government. Some governments have also come to the table in offering support to mining operators including waiving mineral exploration costs (Greenland), deferring exploration costs (Australia), and extending wage subsidies (Canada), among others.

The South African mining industry too implemented a number of support measures, including the donation of personal protective equipment to hospitals and clinics worth millions. Communication channels between government and business representative organisations such as the Minerals Council have also remained open, which has alleviated further pressure on the already strained sector. Initiatives such as these need to continue going forward as the industry is set to undergo change in combating both the spread of COVID-19 as well as threats from other producer markets that are better able to combat spreading infections among their employees.

TO WEATHER THE LONG-TERM RISKS, AUTOMATING OPERATIONS AND SHIFTING TO DIGITAL WILL BE NECESSARY

A prominent challenge which the South African mining sector faces related to any future strategies of combating COVID-19 is the seasonality of labour and how it moves both inside the country's borders as well as across them. Interprovincial and cross-border travel of miners to and from Mozambique poses a considerable danger to controlling the spread of COVID-19 in the region.

South Africa's weaker preparedness to automate also places it at a greater risk of losing market share to others who are better positioned – the Syama Gold Mine in Mali for example is fully automated and can maintain operational output for the one commodity that remains high in demand despite stifled global economic activity. These considerations need to be taken into account in fast-tracking automation to combat lapses of activity caused by the spread of the pandemic. Use of drones in monitoring operations alongside self-driving trucks will further mitigate potential risks of transmission while enhancing efficiency in operations.

As the operational side of the industry has looked to adapt, other segments further up the chain such as auctions, conferences, and tender processes have moved online in doing the same. Metal traders and other companies including Gem Diamonds and Alrosa have embraced digital platforms in hosting tenders, while the World Federation of Diamond Bourses has developed a cross-bourse trading platform in allowing investors to continue trading despite movement and other restrictions. Implementing such structures will enhance the competitiveness of mining companies while also allowing them to keep processes moving.

THE WAY FORWARD

The current motions highlight how the supply line at the end of the value chain has started to adjust to the new normal, which will in turn necessitate the same for the start of the value chain. Those who have begun to shift towards fully or partially automated production will also be more competitive, both from an interruption-incidence point of view given rising infections, as well as from a cost-competitive perspective of production efficiency.

As a result, both automation and digitalisation have to form part of future development strategies and policy updates in keeping up with global alignments to working around COVID-19 risks – retraining and reskilling staff too will need to be included within working models to automate and digitalise.

As also noted, in the case of South Africa there is a need for sizeable infrastructure investment to assist in facilitating the future development of the industry, while also strengthening investor confidence and improving the business environment in overcoming the challenges that COVID-19 has brought, not only now but also for the indefinite future. ■

The COVID-19 pandemic has reshaped the face of the global economy.

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WATER CONSERVATION

Unpacking the latest developments in water

By Nelendhre Moodley

As South Africa's water crisis deepens, the foremost question remains: are measures that have been put in place to address the situation moving apace? *SA Mining* recently caught up with the CEO of the Federation for a Sustainable Environment (FSE) Mariette Liefferink to unpack some of the most recent developments related to the National Eutrophication Strategy and acid mine drainage.

NATIONAL EUTROPHICATION STRATEGY

One of the key developments under way includes the development of a National Eutrophication Strategy. According to Liefferink, the Department of Water and Sanitation (DWS) is in the process of developing the strategy, which will provide guidance to the DWS and the water sector at large on strategies to avoid, reduce, mitigate and manage the effects of eutrophication of South Africa's water resources.

"Sixty-two percent of South Africa's large dams are currently eutrophic or hypertropic. Climate change will exacerbate eutrophication."

Eutrophication is defined as a process of nutrient enrichment and the associated excessive plant growth such as algae and macrophytes in water bodies, which can be seen as either a natural ageing process in lakes or accelerated by human impacts.

Factors influencing eutrophication are high nutrient concentrations, prolonged periods of water stagnation, conducive temperature, oxygen concentration and proper light regime.

Eutrophication has been recognised as a priority water quality problem for over 30 years with wastewater effluents contributing substantially to the situation.

"The policy and approach to eutrophication control has been said to be inadequate for over the last 20 years. The need for nutrient attenuation interventions or remedial interventions is long overdue and is likely to be extremely costly," says Liefferink.

The strategy gives effect to the draft Integrated Water Quality Management (IWQM) Policy (2016) and Integrated Water Quality Management Strategy (2017).

LATEST DEVELOPMENTS ON ACID MINE DRAINAGE (AMD)

Given South Africa's mining history, AMD-related issues continue to adversely impact the East, Central and West Rand.

In recognition of the challenges associated with AMD in the Witwatersrand, an inter-ministerial committee was formed in September 2010. In February 2011, Cabinet approved specific recommendations made by the team of experts in the short term for managing AMD in the Witwatersrand, including the need for a Feasibility Study for a Long-Term Solution (LTS) to address the AMD associated with the East, Central and West Rand underground mining basins.

The short-term intervention commenced around 2012 in the Western Basin, in 2014 in the Central Basin and in 2016 in the Eastern Basin of the Witwatersrand goldfields.

The short-term intervention reduces the concentration of metals and neutralises the acid mine drainage. It's being operated by Trans Caledon Tunnel Authority (TCTC) on behalf of the DWS.

The feasibility study for a long-term solution completed in July 2013 recommended the construction of desalination plant/s to treat acid mine drainage abstracted via the short-term intervention infrastructure to a potable or industrial standard as a long-term solution for the salinity impact of AMD on the Vaal River System. Implementation of the long-term solution will reduce the need for dilution releases from the Vaal Dam and will augment water supplies to the Vaal River System, delaying the need for further augmentation.

The long-term solution was scheduled for implementation in 2014/2015, however the process was hampered due to factors including the DWS proposal for further studies on the impact of the effluent from the short-term intervention on the Vaal River System and National Treasury's unwillingness to fund the two-thirds capital and operating costs or have the costs included in the Vaal River System. The environmental impact assessment (EIA) activities relating to the long-term solution were also suspended.

According to Liefferink, the capital expenditure (CAPEX) and operational expenditure (OPEX) costs for the long-term solution to address AMD associated with the East, Central and West Rand underground mining basins are estimated at R6.6-billion for CAPEX and R990-million per annum for the operational costs for the short-term intervention and long-term solution.

Unpacking the latest developments relating to AMD, Liefferink notes that following the finding that the total dissolved solids' (TDS) load into the Vaal Barrage System from the Central and Eastern Basin showed that virtually no dilution was required from the Vaal Dam to dilute the high levels of salinity, the Integrated Vaal River Reconciliation Strategy Steering Committee (IVRS SSC) recommended a comprehensive recalibration of the salinity model for the Vaal Barrage Catchment.

Given that AMD treatment plants contribute 362 tonnes per day of TDS, this was a surprising finding, she says.

TDS refers to total dissolved solids and represents the total concentration of dissolved substances in water. TDS is made up of inorganic salts, as well as a small amount of organic matter.

The DWS and the Water Research Council (WRC) subsequently appointed a team of experts to undertake a situation assessment on the AMD in the Witwatersrand as well as to update all information from the time that the AMD mitigation process started in 2010.

The Vaal Barrage dilution model review concluded that updating and recalibration of the requisite planning models for the Integrated Vaal River System (IVRS) is necessary to support informed decision making regarding the magnitude and timeline for the AMD long-term solution implementation. The procurement process relating to further studies that were scheduled to commence in April 2020 have been delayed due to COVID-19. This process is receiving urgent attention and should be back on track as soon as possible. ■

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Roger Baxter.

CAN INDUSTRY REALLY GET MINING TO ABOVE 10% OF GDP?

By Nelendhre Moodley

If South Africa's mining sector could create the right framework to bolster industry, it could very well push mining's contribution of gross domestic product (GDP) – which currently sits in the region of around 7% – to above 10% of GDP.

Speaking at the recently held Joburg Indaba, Minerals Council South Africa CEO Roger Baxter said that following recent engagements with government and the mining sector, there was an emerging view that together industry could "get mining to above 10% of GDP and get South Africa's share of global exploration expenditure up from the current 1% to a 3-5% level within three to five years".

Baxter, who is part of the president's seven-person task team negotiating a workable framework to revive South Africa's economy, said the country was "at a real crossroads, or real inflection point", and that tough decisions needed to be made immediately to revive the economy.

He added that following the impact of the COVID-19 pandemic, the global economy was expected to experience a decline in global GDP this year and somewhat of a recovery by 2021. The impact on South Africa was profound given that the country was already experiencing a technical recession before COVID-19 hit.

"Based on the work done by Business Unity South Africa, South Africa is expected to experience a 9% decline in GDP, a 50% fiscal deficit and three million job losses. We have already lost 2.2 million formal sector jobs."

He added that the hard lockdown resulted in a massive decline in production, with slight improvements in mining production in August and September. The saviour for the sector has been the dollar-based commodities prices for most commodities with the exception of diamonds.

"Over the past two months we have been engaging extensively with government and Minister Gwede Mantashe on how to revive the mining sector. There's now emerged a shared view that we can get mining to above 10% of GDP."

In order to achieve this, the industry needs to tackle issues that are choking development, namely:

- Addressing the need for an economic and social leadership compact which includes communities. All stakeholders need to have a shared vision of inclusive growth and prosperity.
- Unlocking greenfields exploration investment. Currently there are a limited number of new projects in the pipeline.
- Constraints related to electricity supply coupled with a rapid and steep rise in prices.
- Logistical bottlenecks: over the past decade there has been no additional capacity brought on-stream, with marginal improvements related to coal and iron ore capacity and some growth on chrome and manganese export.
- Regulatory and policy uncertainty has negatively impacted on investment in the sector.
- Declining levels of competitiveness owing to lack of modernisation which has resulted in "too many companies sitting at the top of the cost curve".
- Licence-to-operate issues have led to tensions both in communities and organised labour.
- Crime and illegal mining continue to negatively affect the mining sector as a whole.

According to Baxter, there has been much progress in tackling the key issues, which includes working closely with Transnet to unlock logistical bottlenecks and crime-related issues affecting some of Transnet's rail facilities. There are also talks under way with government on unlocking certain areas of policy certainty that need greater clarification as well as fast-tracking the pace of modernisation in the mining sector. The council is working with the Mandela Mining Precinct to modernise the sector.

"A lot of work is being done in terms of the licence to operate, especially on how we collaborate on the social labour plan and how we drive the agenda. With regard to crime and illegal mining we have been calling for a specialised task force and for police officers to deal with mining crime."

With exploration a key consideration, Baxter noted the need to develop a greenfields exploration strategy, given that South Africa still had enormous geological potential. South Africa's high-level geophysical mapping was last done in the 1970s. ■

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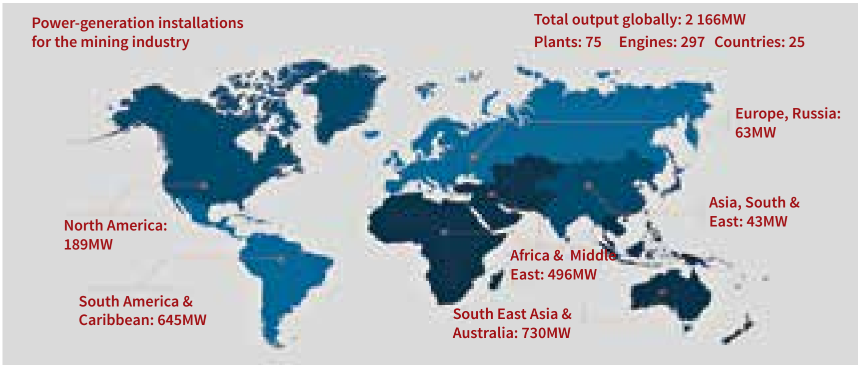
GEITA GOLD MINE

Reliable power generation in a remote off-grid location



When Geita Gold Mine required a highly reliable power-generation solution to support its growing operations, lifecycle power solutions supplier Wärtsilä provided a turnkey engineering, procurement and construction solution (EPC). The company also takes care of ongoing operation and maintenance (O&M). This integrated service ensures an uninterrupted off-grid power supply, eliminating revenue losses from power shortages, says Wärtsilä.

Geita Gold Mine, situated in the Lake Victoria gold fields of north-western Tanzania, is a flagship mine of AngloGold Ashanti, the world's third largest gold mining company based on production. To support its growing operations as it transitioned from an open-pit setup to underground mining and avoid revenue losses from production interruption, the mine needed a reliable power source that would remain available around the clock.

For AngloGold Ashanti reliability, a solid track record in the industry and a low unit cost of production were the key criteria for selecting a partner. The company approached Wärtsilä to install an EPC solution featuring a 40MW flexible power plant with four 32TS engine generating sets that offer great load-taking capabilities in isolated power systems. Once the plant became operational, a 10-year agreement for O&M services was put in place to ensure optimal operation for its entire lifecycle. This integration of technology and lifecycle services ensures reliable, always-on power that allows the mine to focus on its core activity.

> "Wärtsilä installed a 40MW flexible power plant at **Geita Gold Mine.**"

Thanks to the flexibility of the installation, the plant can also be optimised during its lifecycle through upgrades, modernisation and fuel conversion, which may be required if a need arises to shift focus towards power sources such as gas or renewable energy.

ALL PERFORMANCE TARGETS EXCEEDED

The power plant that the mine used before approaching Wärtsilä had experienced a number of reliability issues, with several breakdowns causing power shortages that led to operations being interrupted.

The reliability of the 40MW power plant installed by Wärtsilä helped to eradicate these issues, with the O&M agreement ensuring that maintenance schedules are optimised to minimise costs and maintain efficient power generation, and that any issues that may arise are immediately resolved thanks to the availability of spare parts and skilled service engineers.

All four of the plant's performance targets – availability, net heat rate, power capacity and specific lubricant consumption – have been exceeded, including 100% availability compared to a target of 98.7% and 0.31g lubricant per kWh compared to 0.8g. In addition, fuel efficiency has improved from 39% to around 43%, leading to approximately $2-million of fuel savings in 2019, the company said.

GUARANTEED PERFORMANCE WITH O&M AGREEMENT

Geita Gold Mine has benefited from an O&M service that is tailored to the mine's performance requirements, covering all tasks involved in the day-to-day operations, maintenance and administration needs of the plant. This is Wärtsilä's most comprehensive lifecycle solution, which maximises return on investment for the mine by guaranteeing the availability and reliability of the power-generation equipment as well as providing guarantees for both asset performance and lifecycle costs.

Wärtsilä remotely monitors the plant's performance through an Expertise Centre, providing operational support, troubleshooting and improvement advice to ensure optimal performance. Preventive and predictive maintenance ensures that any work is carried out as efficiently as possible and production interruptions are mitigated, allowing the business to continue its operations seamlessly. ■

GIYANI METALS TARGETS A ZERO-CARBON FOOTPRINT

Giyani Metals recently appointed Minviro, a UK-based sustainability and lifecycle assessment consultancy, to provide an ISO-compliant lifecycle assessment, including a carbon footprint evaluation, on the K.Hill manganese project. Giyani remains committed to delivering a low carbon footprint and high-purity manganese product. The work that will be conducted by Minviro over the coming months will help the company understand how to best achieve this and how the K.Hill manganese project compares against its peers, the company says.

Giyani Metals is a mineral resource company focused on the development of its K.Hill, Lobatse and Otse manganese oxide projects in the Kanye Basin, Botswana.

The company's flagship K.Hill project is a near-surface deposit currently going through a feasibility study to produce high-purity electrolytic manganese metal and manganese sulphate, both key cathode ingredients for batteries in the expanding electric vehicle market.

Giyani Metals is looking to achieve a zero-carbon footprint.

Robin Birchall, Giyani Metals CEO, says: "In parallel to our ongoing feasibility study and environmental and social impact assessment work streams, over the coming months Minviro will provide an ISO-compliant lifecycle assessment, benchmarked against that of our peers. In addition, Minviro will evaluate opportunities for Giyani to achieve a zero-carbon footprint. Giyani believes that there are several attributes that are unique to the K.Hill manganese project, that not only make it one of the lowest cost producers, but also [potentially] one of the lowest carbon footprint producers of pure manganese metal."

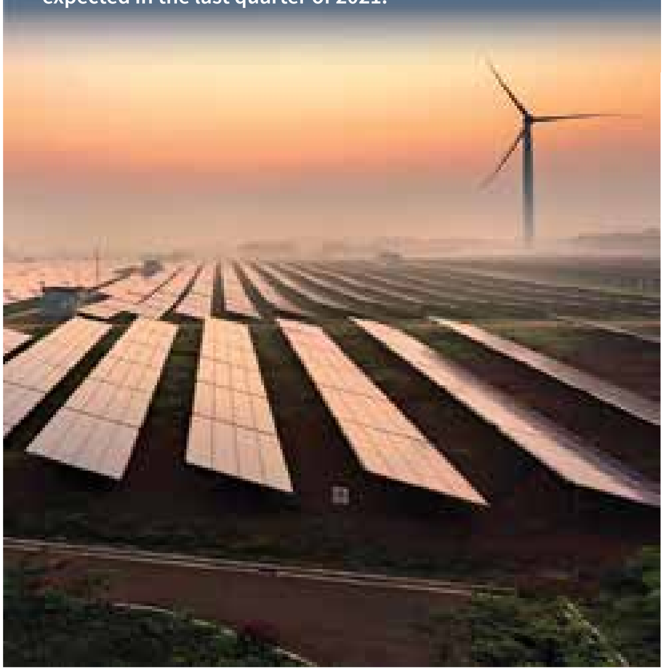
DR ROD MCEACHERN
DANAKALI'S NEW COO

Dr Rod McEacherm.

Emerging sulphate of potash producer Danakali has appointed Dr Rod McEachern as COO, effective from 3 December 2020. The appointment strengthens and deepens the company's potash mining and processing knowledge and leadership capability, given that McEachern has significant potash experience, specifically related to mining, production, harvesting, process engineering, logistics, environmental compliance, and safety, the company says. In the two decades before joining Danakali, McEachern held senior management roles as director, process and product innovation at Nutrien, Saskatoon and a number of senior roles with PotashCorp as senior director for innovation and GM at the Allan facility. Niels Wage, CEO of Danakali, says, "There are few people in the world with the unique potash experience that McEachern brings and I believe his well-established industry experience, technological competencies and long commitment to the industry sector will be very valuable for Danakali as we advance the development of Colluli."

A SOLAR POWER PLANT FOR BLANKET MINE

Gold producer Caledonia Mining Corporation has appointed Voltalia, a renewable energy provider, as the contractor for the construction of a solar power plant that would supply electricity to Blanket Mine in Zimbabwe. Voltalia is already active in Burundi, Malawi and South Africa. On completion, the solar power plant is expected to provide around 27% of the mine's total electricity demand. This will significantly reduce the risk to the mine of any further deterioration in the quality of grid power which would necessitate increased use of diesel generators (which are substantially more expensive than grid power). The plant will also reduce Blanket Mine's environmental footprint, the company says. Commissioning for the 12MW solar plant is expected in the last quarter of 2021.



KORE POTASH COMMENCES DFS FOR THE DX PROJECT

Potash development company Kore Potash, which has 97% ownership of the Kola and DX Potash Projects in the Sintoukola Basin in the Republic of the Congo, has announced that following its recent equity fundraise, work has commenced on the definitive feasibility study (DFS) for the company's DX Project. The DX Project is considered to be one of the highest-grade undeveloped potash deposits known globally. The DFS for DX is divided into two phases, with phase 1 focused on further drilling work to define measured mineral resources and proved and probable ore reserves for the project along with technical design aspects of the mine. The drilling programme for phase 1 will consist of up to an additional five holes in the deposit. The drilling commenced in October 2020. The work will assist the company's funding plans and development of DX.

AN APPETITE FOR DIAMONDS

Tomra Sorting Mining prepares for new product launch

By Nelendhre Moodley

The diamond industry has been under tremendous pressure over the past few years, owing to geopolitical and macroeconomic tensions, shifting perceptions related to sustainability and social welfare and more recently, the onset of COVID-19, which for a couple of months literally stalled the global economy.

The litany of challenges, which have greatly impacted the demand for and production of diamonds, also include legislative changes related to corporate social responsibility, the rising cost of electricity and the need for reduced consumption of natural resources, such as water.

With these market challenges front and centre, those in the diamond market value chain remain extremely conscious of the associated financial and cost implications.

As such, diamond miners continue to seek out solutions that help maximise diamond recovery while optimising costs, Geoffrey Madderson, diamond segment manager for Tomra Sorting Mining, tells *SA Mining*.

Despite the subdued demand, industry players remain hopeful of a resurgence in the diamond market, given that the global population continues to expand rapidly, currently sitting at just under eight billion people.

Tomra, a sensor-based solutions provider and leader in the X-Ray Transmission (XRT) market, offers an alternative to the traditional dense media separation/traditional cyclone recovery sorting technology. The company has been a key player helping diamond miners recover some exceptional stones.

"Tomra guarantees 100% detection in the specified range, irrespective of luminescence profile or coating, and a diamond recovery greater than 98%," says Madderson.

The supplier of XRT sorting equipment has installed between 97% and 98% of all XRT installations globally and will soon be releasing a new product to the market – an XRT Final Recovery Sorter with the ability to detect and sort diamonds between -32+2mm, setting Tomra's offering up to be "totally unique" and enabling a full recovery service with XRT from 2mm to 100mm.

An official product launch is set to take place in the first quarter of next year.

TOMRA DELIVERS CUTTING-EDGE TECHNOLOGY

Unpacking Tomra's product offering, Madderson explains that the company is able to tackle challenges a diamond operation might face, including having extremely >

TOMRA

- **Tomra designs and manufactures sensor-based sorting technologies for the global mineral processing and mining industries.**
- **It has a global presence on all continents, with a key focus on diamond recovery technology.**
- **Tomra's technology has applications in industrial minerals, white fillers, precious metals and base metals, among others.**
- **The company is also involved in the food-sorting and recycling business.**
- **It has around 100 000 installations in over 80 markets worldwide.**

Geoffrey Madderson.

TOMRA'S DIAMOND ACHIEVEMENTS

Tomra machines have been responsible for the recovery of four of the top 10 diamonds recovered, including the:

- **1 758ct Sewelo diamond purchased by Louis Vuitton.**
- **1 111ct Lesedi La Rona diamond, the fourth largest diamond ever found.**
- **910ct Lesotho Legend, which sold for $40-million.**
- **813ct Constellation diamond which was sold to Nemesis International for an impressive $63-million, making it the most expensive rough diamond in history.**

> "Tomra will soon **launch** an **XRT Final Recovery Sorter** able to **detect** and sort **diamonds** between **-32+2mm.**" – Madderson

low grades; fine diamond distribution, or the opposite, extremely course diamond distribution; and deposits with high-yielding ore or deposits embedded with diamond distributions in the highly prized type IIa or type IIb diamonds. Type IIa or type IIb diamonds are typically more difficult to recover using the traditional X-ray luminescence technology.

The company's XRT technology is able to recognise and separate material based on its specific atomic density. Its high-capacity sorters are effective in the recovery of free, liberated diamonds at high feed rates up to 400tph.

In looking to assist clients, the company aims for a collaborative approach – ideally getting involved at a projects pre-feasibility study and bankable feasibility study stage to ensure that it can help unlock benefits early on in the process using Tomra technology.

"At the onset of a partnership with a diamond miner, Tomra undertakes a detailed analysis of the customer's requirements and operational needs and works collaboratively to develop a tailor-made flow sheet redesign that combines its XRT technology with its near infrared (NIR) and laser solutions as needed."

Its customised approach allows Tomra to deliver on its promise of guaranteed results in hard-rock kimberlite, lamproite or alluvial deposits – each of which presents its own specific challenges.

Tomra's XRT machines have proved effective in alluvial operations as in the case of the Lulo mine in Angola which is operated by Lucapa Diamonds, where Tomra's XRT technology is used to process material between 18mm and 55mm in size. The process allows for the recovery of diamonds up to 1 100 carats. Tomra's technology was instrumental in the recovery of Angola's second biggest diamond in 2017, a 227-carat stone.

"Tomra's XRT technology replaces multiple stages of diamond concentration by virtue of its ability to concentrate diamonds to a hand sortable product after only as little as a single step," explains Madderson. "This concentration factor allows for the removal of multiple recovery steps, thus drastically reducing both the capital investment and operational costs to recover diamonds."

Tomra's solution eliminates up to seven concentration stages, dramatically reducing the complexity of the supporting plant and infrastructure. This results in significantly lower power and water consumption, which not only reduces costs, but also the environmental impact of the recovery process.

Interestingly, Tomra's XRT solution is also able to operate as a dry process, which drastically reduces its environmental impact and operational complexity. This makes it possible to mine deposits in arid areas where water access is minimal.

According to Madderson, once the system is fully operational, Tomra remains at the customer's side through its service level agreement, to ensure that the solution continues to deliver the desired results.

A tailored agreement can include on-site presence as required, seven days/week product support, application engineer visits, tiered urgency support, targeted site response, training, as well as spare and wear parts coverage to ensure maximum uptime and protect the customer's investment.

AFRICA – A STRATEGIC FOCUS AREA FOR TOMRA

Africa remains a key target area for Tomra, given that between 60% and 70% of its business is aligned with the Southern African and West African markets, particularly in Botswana, Angola, South Africa, Lesotho and parts of Zimbabwe.

"These are key diamond-producing areas and will remain so for many decades to come. Given that Africa has been identified as an important location for Tomra, we have established a large subsidiary based in Johannesburg, to service customers in the Africa region."

Tomra has been extremely successful in Botswana, having established a close partnership with diamond producer Lucara Diamonds, where it has installed a number of its products.

"We have also been successful with a number of smaller diamond producers around the world, which have taken to adopting our technology. However, in Southern African, significant diamond producer De Beers has not been an adopter of our technology given the miner is invested in its own technology development initiatives."

Tomra remains upbeat though stating that clients have been "actively calling us with requests to purchase our technology". ■

LOOKING TO SELL YOUR ROUGH DIAMONDS?

Then look no further than Alexander Bay Diamond Company. We have more than 25 years of experience in rough diamond marketing, and we are connected to hundreds of international, licensed diamond buyers.

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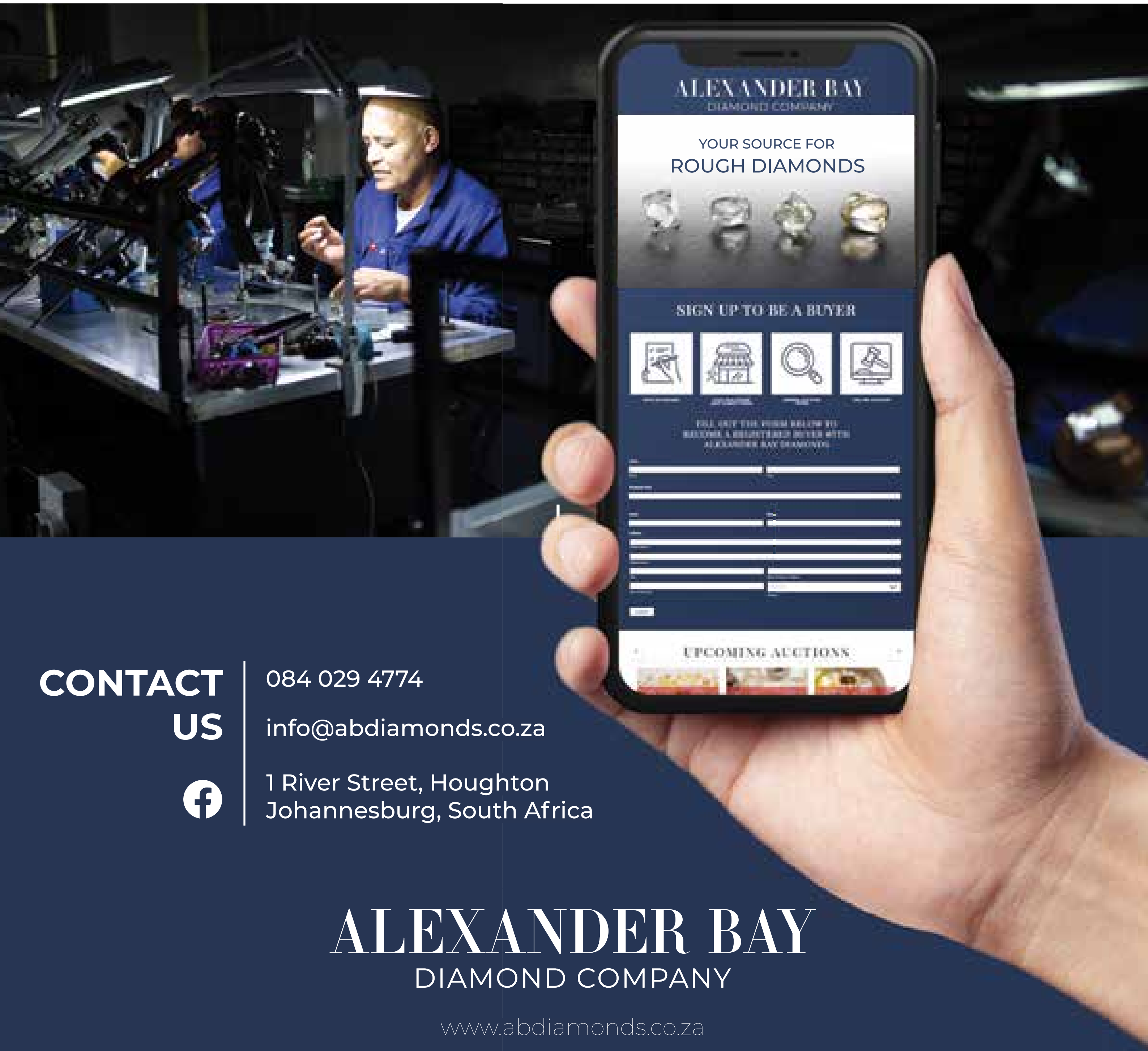

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ALEXANDER BAY
DIAMOND COMPANY

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KELLER PROVIDES EQUIPMENT FOR GRIB MINE

ARC1-Tube.

The Grib mine, located in Russia's Mezensky District in the Arkhangelsk Oblast, is the second biggest mine in the Russian part of the Karelian Craton, which itself houses one of the world's largest diamond deposits.

Low temperatures in the region present extreme challenges for the products used in the mine – they can get to as low as -25°C to -37°C in the area around Grib.

The Arhangelskgeolrazvedka exploration crew monitors underground water levels and temperature within a radius of 5km around the mine. The crew bored a total of 81 wells with depths of 20m to 270m between 2011 and 2014 to monitor the water levels. Each well is equipped with a water level monitoring system from Keller that consists of hydrostatic level and temperature sensors and 59 GSM remote transmitters (GSM-2 boxes).

SAVINGS POTENTIAL WITH THE MONITORING NETWORK

Measuring points located at a close distance to one another were grouped together in order to make it unnecessary to equip each of the 81 water wells with a remote transmitter. Up to three sensors could be connected to a single box module simultaneously, which reduced costs by eliminating the need to install 22 remote transmitters, Keller said in a statement.

"The use of an automatic water level monitoring system allowed the Arhangelskgeolrazvedka crew to save money." – Keller

REMOTE DATA TRANSMITTER AND DATA LOGGER IN ONE DEVICE

When linked to a pressure transmitter or water level sensor, the GSM-2 box module can autonomously collect up-to-date measurement values for pressure and temperature (and optionally for conductivity as well) and then transmit this data via SMS, e-mail or FTP using the GSM mobile phone network (GPRS connection).

The GSM-2 is robust, able to withstand short periods of immersion, available in different types of housings, and equipped with several sensor interfaces. The battery in one module is able to supply power to several level sensors if necessary. The GSM2 box collects and transfers data once a day over a period of several years in sub-freezing temperatures and can even do this with a weak or unstable signal.

As a result of this durability, the Arhangelskgeolrazvedka crew have never had to replace a single battery during four years of operation and were able to completely forgo manual monitoring at difficult-to-reach locations. The use of an automatic water level monitoring system allowed the Arhangelskgeolrazvedka crew to save money that otherwise would have been spent on special-purpose vehicles and additional staff, Keller said. ■

AIR AND GAS PURIFICATION SPECIALISTS

ZAN-TECH®

Zan-Tech has been a speciality supplier and solution provider to the Air and Gas purification industry for over 30 years.

We have a comprehensive range of stock in both our Durban and Johannesburg warehouse facilities.

Our technical departments have factory trained technicians, ensuring that we offer full technical after-sales and support.

COMPRESSED AIR FILTRATION

Compressed Air And Gas Filters

Zan-Tech stocks the new revolution range of threaded and flanged coalescing filters and cyclone separators. We offer the complete solution for compressed air filtration and separation.

REFRIGERATION AIR DRYERS

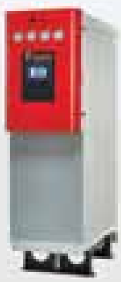
Refrigeration Air Drying Systems

Our dryers are supplied by OMI of Italy, who design and produce an extensive range of Air- and Water-cooled systems up to 24,000 m3/hr. All dryers are supplied with modular heat exchangers, variable speed fans, alarm outputs, fault recording and dew point displays.

CONDENSATE DRAINS

Turbo Drain - Zero Air Loss

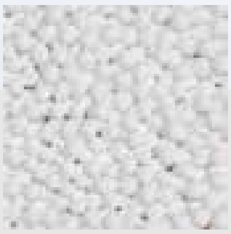
Zan-Tech offers a comprehensive range of mechanical, electrical and electronic condensate drains. Our Turbo Drain is the best mechanical ZERO AIR LOSS drain on the market.



DESICCANT AIR DRYERS

Moduler Heatless Dryers (PSA)

The modular REVOLUTION series is a non-pressure vessel desiccant air dryer design, employing a unique refillable desiccant cartridge system. All dryers have actuated control valves and dew point control as an option. Colour screen display shows inlet temperature, pressure, dew point as well as function data. Due to the modular design the dryers can be multi-banked to suite any customer flow requirement.



ADSORBENTS

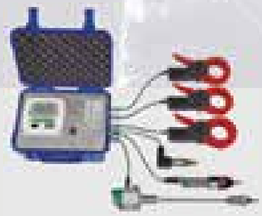
Activated Alumnia & Zeolites

Zan-Tech offers a wide range of adsorbent media (Ex Stock). These include Activated Alumina, Molecular Sieve, Silica Gels and Activated Carbon.

DESICCANT AIR DRYERS

Heat Regenerated

Blower purge, Heat of Compression and patented vacuum technology for energy saving desiccant regeneration with hot air. These units are PLC controlled with multi outputs.



AIR AUDITING & PROCESS MONITORING

Portable Process Auditing

Zan-Tech provides an air auditing service with the capability of monitoring and data logging critical compressed air process conditions.

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ZAN-TECH

supplies oxygen-generation solution

By Nelendhre Moodley

Having gone through the first bout of the COVID-19 pandemic, the world is now in the grips of a second wave with rising death rates in the United Kingdom and United States moving the fatality rate beyond the one million mark. Global and local entities are working around the clock to find solutions to best contain the effects of the pandemic. The South African mining sector has also been hard at work, targeting and rolling out solutions at its field hospitals which cater to its workforce.

Mining major Anglo American and platinum producer Siyanda Bakgatla Platinum recently put out a tender for a containerised solution for the supply of medical grade high-flow oxygen and medical-grade high-flow breathing air for their respective existing and newly built field hospitals.

Air drying and purification equipment specialist Zan-Tech was recently awarded a contract to design and build a bespoke mobile solution that would deliver medical-grade oxygen and medical-grade breathing air to Pharmacopoeia European standards. The company has been working tirelessly to meet the tight timeline of six weeks for the contract awarded in August, for delivery at the end of September.

"We designed and manufactured a portable containerised solution, which we equipped with the required oxygen and breathing air. What is unique about this project is the sheer size of the system which produces high-flow medical breathing air and oxygen at a minimum of 93% Fi02," says Zan-Tech founder and MD Warren Massey.

The air purification equipment specialist uses various components to compress, refine and purify air from the atmosphere for use as medical-grade oxygen and medical-grade breathing air.

"Our forte is breathing air, compressed air and gasses. We have been involved in breathing air-related solutions for numerous years and worked on many types of breathing applications around the country for both large industrial-scale and small-scale applications. However, this solution has been tailored around the specific event of COVID-19 and entails the supply of a turnkey solution for the high-flow continuous positive airway pressure (CPAP) breathing devices designed for COVID-19 patients," says general manager Brandon Grey.

> "Zan-Tech has **supplied containerised oxygen** generation solutions to **Anglo American** and **Siyanda Bakgatla Platinum's** field hospitals."
> – Massey

The contract is for the development and supply of four portable solutions – two solutions earmarked for Siyanda Bakgatla Platinum mine's newly built 80-bed field hospital in Swartklip, one solution for the existing Siyanda Bakgatla Platinum Health Hospital and one for Anglo American Platinum's Amandelbult mine's existing and fully refurbished hospital, located in the Waterberg District Municipality, Limpopo province.

Among the contractors involved, Collaborit was awarded the main tender for the newly built Amandelbult Hospital; LOG Industrial Automation and Control was responsible for the instrumentation and control philosophy; and Denemic Engineering for on-site quality control.

According to Grey, the containerised system has integral components built into it, including an online webserver, which allows for the entire plant room to be viewed and monitored remotely.

Key personnel are able to monitor elements including pressure, alarm system, oxygen content, dew point, air temperature and system parameters/controls which are broadcast via webserver. The webserver is linked to the hospital and to the mechanical and backup staff which allows key personnel to keep a close eye on the equipment at all times and helps to reduce downtime and failures, and ensure increased productivity.

Tied to the challenge of meeting the extremely tight timeline was the task of ensuring that imported items arrived timeously.

"Eighty percent of the critical items used in the project, such as generators, tanks,

Zan-Tech supplied oxygen-generation solutions to field hospitals.

> "There are **companies** that are **experts** in **individual** fields but being able to **apply** the **lateral knowledge** required **needs** the **specialist** know-how with which Zan-Tech is **equipped**."
> – Grey

breathing air purifiers, generators and special biological filtration, were imported from Germany and Turkey. But as Zan-Tech is the official sub-Saharan national agent for the companies from which the equipment was purchased, the process was made a little less stressful," says Massey.

Locally purchased items included compressors, air conditioners and fans.

Grey notes that while employees' spirits were high, "the limits of our staff in terms of productivity have been pushed beyond expectations. However, the team pulled together to get the work done on time".

Before being delivered to site, the mobile units were initially tested at Zan-Tech's facilities, where pre-commissioning and setup were required before tie-in to the hospitals and final commissioning.

"Given that the containerised solution is a movable asset, it can be used at hospitals or plants after COVID-19 facilities shut down to prevent it from becoming a white elephant," says Grey.

The contract has been an important one for the company as it allows Zan-Tech, which celebrates 30 years in business, to showcase its capabilities on a much larger scale in terms of breathing air and oxygen supply.

"This project shows that even though we are a small company, our capabilities are extensive. In fact, not many companies in South Africa have the history and experience in the breathing air sector that Zan-Tech currently has. We have been doing work of this type for over 30 years and are well versed in all the requirements necessary for such an application. This type of project requires a broad understanding of not only compressors, filtration and compressed air itself, but all the medical air, oxygen and sizing requirements that the hospitals/ facilities need. There are companies that are experts in individual fields but being able to apply the lateral knowledge required needs the specialist know-how with which Zan-Tech is equipped," says Grey.

The turnkey solution is the first of its kind in the country.

"It is certainly exciting to be at the forefront of an innovative development which is the first of its kind on home soil. And while we delivered on a large-scale project, our application can be reduced to cater to smaller hospitals," says Massey. ■

THE CONTAINERISED SOLUTION MET THE FOLLOWING STANDARDS:

- **ISO14001 standard: International standard for designing and implementing an environmental management system.**
- **SANS 7396-1:2009 standard: Specifies requirements for design, installation, function, performance, documentation, testing and commissioning of pipeline systems for compressed medical gases.**
- **SAN347: Relates to pressure equipment regulations and major hazard installation regulations.**
- **ISO 277: Respiratory protective devices — compressed air for breathing apparatus.**
- **Various other mechanical and electrical standards.**

COLLABORIT

ENABLING ASSET COST AND LIFECYCLE MANAGEMENT

Collaborit has developed and implemented a product and services portfolio to support the lifecycle of physical assets. The objective is to connect people, processes and technology to the asset, improving asset performance and reducing Total Cost of Ownership (TCO).

All aspects of asset management are addressed and customers are provided with solutions, services and models for each lifecycle phase.

IDENTIFY NEEDS/OBJECTIVES/RISKS

Business needs, objectives and risks drive the asset management strategy, and subsequent maintenance tactics. Collaborit assists customers with the development of maintenance strategies, dynamic risk-based tactics and maintenance plans. Techno Economic Models (TEM) compare and evaluate the value drivers to assist with prioritisation and decision making. Specialised tools are used to evaluate the impact of change.

PROCUREMENT

Asset procurement is influenced by business objectives, maintenance strategies and tactics, replacement cycles and usable life. Lifecycle Cost Models and the Asset Cost and Lifecycle Management Solution (ACLM) inform procurement decisions. Functionality to compile budgets and forecasts from maintenance plans and maintenance orders is provided.

CONSTRUCTION

Highly Skilled Engineering and Project Management Resources offers guidance during the feasibility, engineering and construction process, delivering formal Engineering, Procurement and Construction Management (EPCM) Services, with successful Engineering, Procurement and Construction (EPC) projects as well. Proposed methodologies have been tested on large projects across different industries.

COMMISSIONING

Commissioning includes the set-up/configuration of the asset in the Computerized Maintenance Management System (CMMS). Task List Workbench, Technical Object Workbench and Bill of Material Workbench enhance the process.

People aspects like training and change management are supported by methodologies and programmes including 100 Day Change Plans and Virtual Reality Training.

> “Customers are provided with **solutions**, **services** and **models** for each lifecycle phase.”
> – Collaborit

DETERIORATION AND MAINTENANCE

Structural integrity management solutions manage the integrity of civil structures to survive for as long as required. 3D scanning, modelling and digital twin development represent assets. Integration between systems and the enterprise asset management system ensure that information is available centrally with a single view of the asset.

The Collaborit EAM^{+} for SAP Solution Suite™ supports the work management process via a Graphical Scheduler, Mobile Work Management App, Notification App, Inspection Checklists, Measuring Points, Printing Solutions and Job-Card Digitisation.

The Work Management Workbench standardises and simplifies the process and embeds it in the system. FIELDTECH enables field workers to execute maintenance activities effectively.

CONDITION AND PERFORMANCE MONITORING

An Asset Performance Workbench, with a TCO and lifecycle cost design, reports on overall equipment efficiency.

The Energy and Carbon Management Workbench measures performance in energy consumption and complies with statutory carbon reporting requirements.

Reports help to analyse data, and identify problem areas and opportunities for continuous improvement. Analytical tools enhance reporting.

DECOMMISSION

With mothballing being common, the detail engineering interventions and TEM help to manage and maintain assets for possible future startup with minimum cost. Reliability engineering and EPCM experience in decommissioning projects reduce costs and phase out operations in the decommissioning phase.

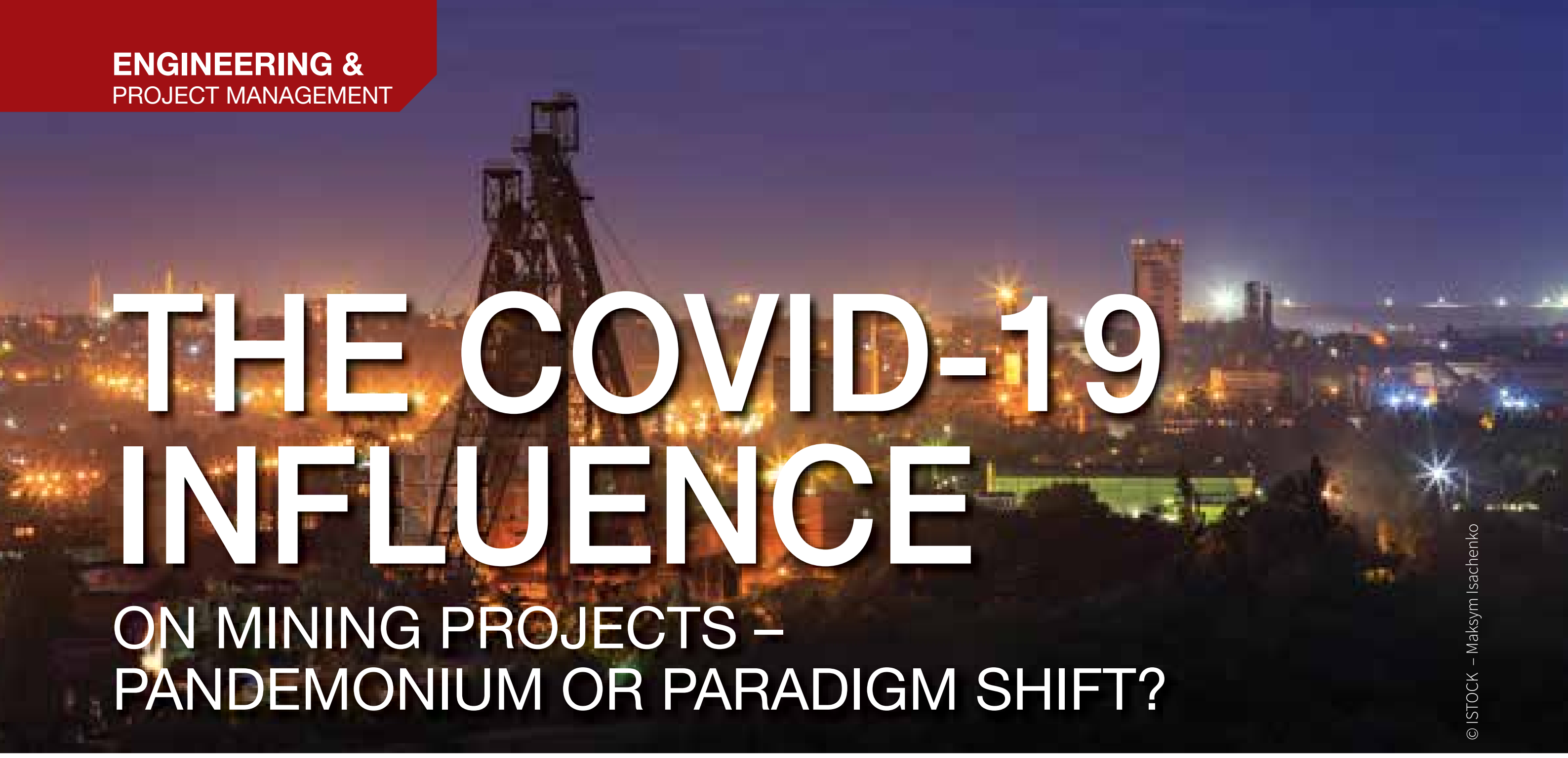
RENEWAL/REPLACEMENT

Lifecycle modelling determines optimum timing for the replacement or restoration of assets.

ACLM provides views/forecasts on asset replacement and maintenance budgets, allowing long-term scenario planning and forecasting. End-of-life forecasts are based on maintenance strategies, tactics and plans. ■

Collaborit
ASSET MANAGEMENT ENGINEERING

Collaborit is a global Asset Management Engineering organisation with the aim to provide our customers with innovative Digital Asset Management Solutions and Services - connecting People, Processes and Technology to the Asset.



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THE COVID-19 INFLUENCE

ON MINING PROJECTS – PANDEMONIUM OR PARADIGM SHIFT?

Three ways project development and delivery (PDD) has changed

By Albert Jacobs: Head of Project Development and Delivery at Ukwazi

Mining production in South Africa fell by about 28% year on year during the COVID-19 lockdown, as the industry's large migrant workforce makes the mining environment particularly vulnerable to pandemics. In addition to the supply-side shock and product transport limitations, there were also demand-side effects such as reduced consumption, leading to declining revenues, collapsing commodity prices and capital outflows from emerging markets. Given these widespread changes, how has PDD been affected?

PRIORITIES AND PRESSURES HAVE TRANSFORMED

The uncertainty associated with these conditions has had a major effect on construction projects in the mining industry, with stoppages or extensive delays being experienced. Inevitably, large mining companies have introduced capital expenditure cuts and put certain projects on hold until exchange rates and commodity prices become more favourable.

What's more, feasibility studies have also been put on hold or are being re-evaluated against new economic criteria. In the base metals industry for instance, global capital expenditure is down by an average of 19% year on year according to S&P Global Market Intelligence.

Mining companies are therefore under pressure to get more value for limited funds and come up with solutions that will address the risks in the current and future environments. Similarly, consulting companies are equally challenged to find new ways of working where personnel movement and site access have been restricted.

According to the White & Case Mid-Year Mining and Metals Survey, big, diversified miners were in good financial shape at the start of 2020 and acted quickly to preserve cash at the start of the pandemic. Going forward, mining executives will focus on building resilience and growth, increasing productivity gains and efficiencies and prioritising environmental, social and governance performance, as critical components of their respective corporate strategies.

PROCESSES AND PRACTICALITIES HAVE TRANSITIONED

Although mining companies are likely to consolidate in order to access funding for continued projects and growth, consulting firms have had to become more flexible and innovative to respond to rapidly changing requirements. While being client-centred and having the right building blocks in place are imperative, the onset of lockdown has forced these companies to review and adjust their processes, accelerating the rate of adoption of new technologies and tools.

Of course, virtual meeting tools such as Microsoft Teams or Zoom have come to the fore, enabling organisations to engage with clients globally, or teams at remote locations without the need for face-to-face interaction. These platforms now form an even larger part of all communication on a daily basis with internal and external parties. However, while some companies are allowing individuals to work from home for extended periods, there is still (arguably) a need for direct contact, especially when new relationships are being formed or new team members are being added. Here, an initial understanding can be created, forming the basis for effective communication.

The need for paperless workflows is equally vital in managing a virtual office, and a cloud-based document management system becomes indispensable when managing revisions and approvals with an extended team. Firms that have managed to integrate electronic workflows with manual practices – to such an extent that all documentation can be managed without the need for any hard copies to be produced – will be the winners in the long run. This not only extends to the computer-aided design environment, where design reviews along with virtual walkthroughs can be conducted and comments can be added, but also to the use of drones for scanning surfaces or facilities, data analysis and geographic information system mapping.

> "Consulting firms have had to become more flexible and innovative to respond to rapidly changing requirements." – Jacobs

©ISTOCK – James

"Firms that have **managed** to **integrate electronic workflows** with **manual** practices will be the **winners** in the **long run**." – Jacobs

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These systems also allow for ongoing information management services, where consultancies are able to be the custodians of the initial information generated during concept development as part of a project information model, and are able to update clients throughout the project lifecycle.

Managing the asset information model also becomes more efficient, aiding client support during the operation and maintenance of specific assets.

Further to this, current available technologies make it possible to remotely manage and evaluate real-time data from facilities through internet of things devices, limiting the number of people on-site and travelling.

PARTNERSHIPS AND PERCEPTIONS HAVE BEEN TWEAKED

The responsibility of helping clients in building resilience requires technical specialists to work more closely with clients than ever before. An in-depth understanding of key business drivers and objectives is essential to ensuring that appropriate solutions can be found from the enormous amount of data available. An effective way of achieving this is to allocate smaller, dedicated teams to communicate with specific clients to make sure that bi-directional knowledge transfer is enhanced and maintained. These specialists can then coordinate the response from the virtual team of consultants, and focus their efforts on the requirements identified.

To find innovative solutions, a questioning mindset and continued learning are important when making use of the proliferation of new ideas and technologies being developed globally. Even the traditional waterfall approach to project management for mining and minerals processing studies and projects is being reviewed, as some of the agile and lean project management methodologies practised in other industries allow for a more flexible and responsive approach.

Mining has always been an industry that finds a way to prosper, despite many challenges, and remains a cornerstone of the world's economy and manufacturing capability. From contracts, procurement and logistics, to production, maintenance and growth projects, players have had to find ways to improve efficiencies and increase productivity to remain relevant in this new environment. Most sector experts agree that the pandemic, while causing some pandemonium, has actually paved the way for profitability as well as a significant shift in thinking and subsequent approaches. It is not only possible to survive the influence of COVID-19 on our sector, but with cooperation and commitment, those with an understanding of the paradigm shift and an appreciation of the benefits to be obtained from new technologies will remain sustainable and continue to thrive. ■

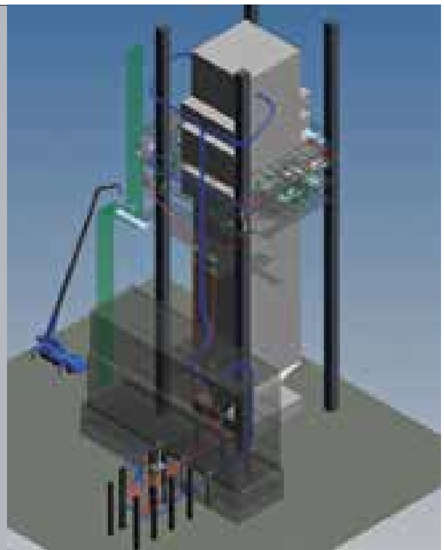
SMART ENGINEERING USING DIGITAL TWIN TECHNOLOGY

The smart use of data has become pivotal to Babcock's Ntuthuko Engineering business. According to Babcock, a large part of finding solutions to customers' challenges relies on developing a digital twin to improve operations, increase efficiency and provide predictive maintenance alerts before problems occur in real time. Manager of R&D Engineering at Babcock Ntuthuko Engineering, Indrian Govender, says that the technology associated with a digital twin enables its engineers to make faster, better informed decisions while ensuring sound asset management and integrity.

He says this is particularly true in the power industry where often data is not fully available or is of poor quality. Digital models fill the gaps by creating a simulated twin of a physical asset that is continually updated using real-time data. "Using our deep system engineering understanding of the assets we manage, we are able to extract the precise data to create a digital twin model," says Govender.

Babcock has successfully used digital twinning on a number of critical projects. Most recently, the company relied on 3D scanning and digital twin modelling to implement one of the first nitrogen oxide (NOx) abatement projects in the country.

The project required a modern approach to engineering that integrated various engineering disciplines. Babcock used its in-house 3D scanning and modelling capabilities to facilitate and optimise the design phase, while all stakeholders, from the customer and engineers through to operators and safety officers, were able to review the process safely, often without requiring on-site presence, the company said.




John Martin.

SERVICE ORIENTED

Kal Tire plugs the gaps

By Nelendhre Moodley

Following the onset of COVID-19, more industries than ever before are seeking options to reduce costs and improve efficiencies. *SA Mining* recently caught up with Kal Tire's VP for Southern Africa, John Martin, to chat about the effects of the pandemic on the tyre industry.

WHAT IMPACT HAS COVID-19 HAD ON THE GLOBAL TYRE SEGMENT, AND IN PARTICULAR, MINING?

Just about all countries introduced some form of lockdown as a means to control the spread of the COVID-19 virus. As a result, the retail industry serving the passenger and truck market most likely took the brunt of the resultant slowdown we have witnessed in the global economy. The global mining industry for the most part had continued operations throughout the various lockdown measures that were instituted.

In many countries, mining operations were declared essential services to the economy and through their naturally strong culture of safety and agility, were able to react extremely quickly to learn and refine new ways of working. By following protocols to keep team members safe, sites were able to help control the spread of COVID-19 and carry on operations. Bar a few exceptions, the mining tyre segment has been able to weather the storm without a significantly negative impact on the industry.

HOW HAVE KAL TIRE ADAPTED AND WHAT MEASURES HAS THE COMPANY PUT IN PLACE DURING THIS CHALLENGING TIME?

Kal Tire serves an industry that demands extremely close working relationships on our sites. This ensures that our services, our people and our processes align with our customers' objectives. Our reaction to the pandemic was as swift and efficient as our customers' responses. Their work was deemed essential, so therefore our work was also considered an essential service to the mining industry. The speed with which Kal Tire had to implement sanitisation disciplines, processes, procedures and equipment was critical to maintaining Kal Tire's high standards we are known for. COVID-19 infection rates within the global Kal Tire organisation are significantly lower than those of the global population, which is a clear testament to the adherence of the disciplines implemented throughout the company.

WHAT HAS BEEN THE RESPONSE FROM YOUR MINING CLIENTS AND HOW HAVE THEY BEEN FARING?

Global communities are continually learning how to manage and live around the COVID-19 challenge. Our clients have diligently adapted and applied those learnings as part of daily safety routines. In some instances, the global commodity prices have helped the economic outlook for some customers. However we know that some with marginal operations have struggled with sustainability, given the operational and financial burdens caused by COVID-19 in the early stages of the pandemic.

> "In many countries, mining operations were declared essential services to the economy."
> – Martin

HAVE THE EFFECTS OF THE PANDEMIC IMPACTED ON YOUR STRATEGY ON INNOVATION AND DEVELOPMENT?

Kal Tire's investment in innovation and product development has continued unabated throughout the constraints imposed on the industry by the pandemic. For Kal Tire, innovation strategy is part of our ongoing drive to enhance safety, as well as the improvement of operational efficiencies.

WILL KAL TYRE BE LAUNCHING ANY NEW INNOVATIONS IN THE NEAR FUTURE?

Kal Tire continues to focus on the rollout of TOMS, our proprietary Tire Operations Management System. Through TOMS, we're able to focus on more planned tyre work to improve tyre life, safety and fleet productivity, which is more important than ever for our customers. This is just one of several tools we've developed that enhance the breadth and quality of the on-site services Kal Tire offers and demonstrates our value to the global mining market.

With respect to product development of mining tyres, Kal Tire continues to collaborate with all our selected manufacturing partners, to not only optimise the product offering, but to continually drive product performance enhancement. For underground mining, Kal Tire represents two of the best performing brands available

in the South African market. However, new product versions of performance leading products are continually being tested to demonstrate the ongoing commitment to improving our customers' safety and financial indicators.

HOW HAS KAL TIRE BEEN SERVICING THE MINING SECTOR?

Kal Tire provides mining tyre management and supply to more than 150 mine sites across five continents. The work we do on-site every day continues to focus on helping customers achieve their goals and maximise their tyre investment – leveraging our breadth of expertise across commodities and conditions and our innovation in tooling, processes and safety.

ARE THERE ANY NEW TYRE-RELATED CHALLENGES THAT CLIENTS ARE REQUIRING SOLUTIONS TO?

Sadly, South Africa has witnessed the planned closure of another icon of tyre manufacturing – the 84-year-old Firestone factory in Port Elizabeth. This closure is not only devasting for the local economy, but also places a large stress on the SA mining industry, which has had to quickly source alternative products to compensate for the supply gap. Kal Tire is assisting the client base by sourcing sufficient products of adequate quality as viable alternatives to supplement the local Firestone supply.

The closure of the Firestone factory has created a great demand and many importers are looking to capitalise on an opportunity. Through our rigorous product testing policy, Kal Tire is able to ensure consistency and quality standards to a market fast becoming saturated with untested imports.

HOW IS KAL TIRE HELPING MINES STRETCH THEIR BUDGETS?

Given the great need for mines to stretch their tyre budgets and reduce the total operating cost of a tyre, we are seeing a rise in queries about Alpha Mining Systems' tyre and wheel combinations. These sets are tailored and proven for use in Southern Africa's coal mines because they can bear high loads and remain durable in the face of tough conditions such as low seam heights and wet terrain. Given that ability to stand up to stresses, our customers appreciate that they can last up to four times as long as competing tyres and reduce the need for wheel changes – which promotes safety and productivity.

Kal Tire and Alpha Mining Systems have again collaborated by taking the same unique approach to designing tyres for underground hard rock mining operations, where rugged, purpose-built tyres are being tested against the highest industry benchmark in both performance and total cost of ownership. ■

"The closure of the Firestone factory has created a great demand and many importers are looking to capitalise on an opportunity." – Martin

NEXT GENERATION CAT 785 PRODUCTION IN EARLY 2021

Equipment manufacturer Caterpillar will begin production of its Next Generation Cat 785 mining truck in the first quarter of 2021. The truck enhances operator safety and performance, provides more intuitive and predictable operation, delivers faster and easier access to data, and streamlines maintenance – to boost efficiency and lower costs. The new 150-tonne-class mining truck features an expandable technology platform, so it is future-ready, says the company. "The 785 was Caterpillar's first large mining truck, introduced in 1985. It's fitting that the first Next Generation Cat mining truck is the new 785 – designed to enable mining operations to optimise productivity today and tomorrow," says David Rea, GM of Cat Large Mining Trucks. "Cat Next Generation mining trucks feature a flexible technology platform and optional configurations that help each mining operation meet their goals."

One of MacKellar's five T 264s working at Dawson Mine.

LIEBHERR DELIVERS T264 MINING TRUCKS TO AUSTRALIA

German-Swiss multinational equipment manufacturer Liebherr Mining recently provided five new trucks to MacKellar Mining for use at Anglo American's Dawson Mine. Although MacKellar runs Liebherr excavators and dozers at other sites, the 240-tonne trucks are the first Liebherr mining machines at Anglo American's Dawson Mine, and MacKellar's first fleet of Liebherr trucks, the company says. Located in Central Queensland, Dawson Mine is an open-cut metallurgical coal mine, and a joint venture between Anglo American (51%) and Mitsui Holdings (49%). The Liebherr T 264 trucks are among an upgraded generation which includes a payload capacity of 240t / 265t with power ratings up to 2 013 kW/2 700 HP. The haul trucks were commissioned in early 2020. MacKellar, a mining and civil earthmoving company, operating multiple projects across Australia, runs 320 machines throughout the country. Its partnership with Liebherr began with the commissioning of MacKellar's first Liebherr machine in April 2016.

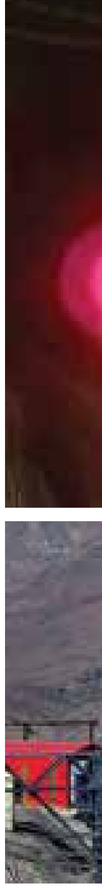
COEGA'S OPERATIONS EXTEND BEYOND SOUTH AFRICA

The Eastern Cape-based Coega Development Corporation (CDC), which operates the 9 003ha Coega Special Economic Zone (SEZ), recently extended its market offering beyond South Africa into Zimbabwe, Cameroon, the Central African Republic (CAR) and the Democratic Republic of the Congo (DRC) under the Coega Africa Programme (CAP). In Zimbabwe, the CDC is providing consulting services to develop the Norton (Lentsoane) and Ecosoft Special Economic Zones in Harare, privately owned by TD Holdings. The focus is on advisory services for the Water Treatment Plant in Harare with an estimated investment value in excess of $15-million; and SEZ and dry port in Norton-Harare with an estimated investment value of $336m.

The CAP further obtained a 20-year concession of logistics bases in Douala in the CAR for the development of a dry port for the storage of goods. The project will commence in April 2021 and has an estimated investment value of $30m.

The CDC is awaiting confirmation of projects in Cameroon and the DRC.

These developments are positive for South Africa and CDC in particular given the recent establishment of the African Continental Free Trade Area (AfCFTA).



STIMULATING THE ECONOMY

Rail is key

By Nelendhre Moodley

Following the devastating impact of COVID-19, government has identified infrastructure development as a key enabler to economic recovery and earmarked R2.3 trillion to stimulate growth. *SA Mining* recently caught up with Tomas Badholm, Africa Region head at Bombardier Transportation, to chat about developments in the rail sector and how it can help revitalise growth.

HOW IMPORTANT IS FREIGHT RAIL TO AFRICAN COUNTRIES' ECONOMIES?

It's critical to the ongoing development of economies, especially in the wake of the COVID-19 pandemic. We believe governments should be eyeing a significant road-to-rail shift. This would reduce the cost of doing business, promote international trade, reignite economic growth, and mitigate the impact of climate change given that rail transport is less carbon-intensive than road transport. All round, key economic and social drivers need to be considered.

Most stakeholders understand the need for rail but funding remains a burden. There is a renewed importance for public private partnerships (PPPs) to help advance freight rail in Africa, as this would help accelerate the development of the economy and create employment opportunities across the continent.

PPPs are essential to help continue building and implementing new infrastructure, to allow for freight rail to take place across countries, renovate older infrastructure, and also operate and maintain existing transport infrastructure and facilities. What is needed now is a focus on unlocking the wealth of capabilities, expertise and funding that exists in the private sector.

IS THERE OPPORTUNITY TO EXPAND THE RAIL OFFERING TO ACCOMMODATE A VARIETY OF OTHER PRODUCTS NOT CURRENTLY EXPORTED VIA RAIL?

Typical products that are currently transported via rail in Africa include ore from the mines, commodities, agricultural and industrial products and consumer goods. There is an opportunity to expand on this list but we would need the infrastructure to support it. As one ventures into increasingly complex products, time sensitivities and logistical conditions become a major factor. Furthermore, we have to think about safety. Are we providing the security for high-value products that manufacturers want to see?

Over $4.5-billion

Value of a contract to build and operate two monorail lines in Egypt

Swift transportation of products between countries (which would be possible once the African Continental Free Trade Area (AfCFTA) agreement has been advanced) is a reality, but we need to partner with governments to ensure that we are creating an environment that makes rail an attractive mode.

For new rail projects on the continent, there is a focus on increasing the average speed for freight trains to make rail transport more attractive and times between the destinations more predictable. Another important factor is to reduce the time for custom clearance between landlocked countries, as this can make freight transit more difficult.

IN TERMS OF INNOVATION AND TECHNOLOGY, HOW FAST IS FREIGHT RAIL ADVANCING? WHAT KEY DEVELOPMENTS HAVE RECENTLY BEEN ADVANCED?

Automation, liquid natural gas, biodiesel and hydrogen fuel are evolving quickly; this is certainly the space to watch. These can all be complementary solutions to increase the reach for the railway where electrification is not a financially viable option due to high investments in infrastructure.

Liquid natural gas is another factor being explored in trains, as the sector is looking to reduce fuel prices and emissions and using this gas allows them to do so. However, additional safety regulations would need to be created for organisations that would introduce this into their product offering to protect staff, as it can be dangerous.

Hydrogen fuel cells are another breakthrough in the industry, as they provide continuous power supplemented by a battery for peak power. Hydrogen fuel cells are attractive as they produce zero emissions other than water and are more energy-efficient than combustion engines, as liquid hydrogen can be created using renewable energy resources, which makes it attractive to train manufacturers.

Biodiesel is another renewable energy source, with sources such as rape, soya, corn and palm oil available on the continent. This can be an alternative source of fuel for a modern fleet of locomotives, if investment in biodiesel plants is put in place.

"Governments should be **eyeing** a **significant road-to-rail** shift." – Badholm

DOES THE AGREEMENT ESTABLISHING THE AFRICAN CONTINENTAL FREE TRADE AREA (AFCFTA) HAVE ANY IMPACT ON FREIGHT RAIL?

Africa is on the cusp of launching a free-trade zone that could meaningfully boost economic growth and unlock the continent's vast potential.

Slashing intra-regional trade tariffs is an important first step, and one that should be applauded – but other interventions are needed for the AfCFTA to be a success. Perhaps the most pressing requirement is the need for better transportation links between African states, particularly in the form of rail networks. So yes, the AfCFTA will put pressure on good rail infrastructure (including freight rail).

A reliable rail network would allow for the efficient movement of goods across the continent, while also improving Africa's links to the rest of the world, particularly the continent's landlocked nations. Rail is also a sustainable solution given that it is far more environmentally friendly than road and air transport – Africa's natural environment is one of its greatest assets, and it must be protected.

Ultimately, rail's contribution towards an integrated transport network will help Africa to attract investment and to be competitive in the global trade arena.

HOW COMPETITIVE IS YOUR INDUSTRY AND WHAT IS BOMBARDIER'S COMPETITIVE EDGE?

The rail industry is very competitive, as it is filled with long-standing reputable railway players, as well as emerging players that are eager to collaborate with governments and the private sector.

Innovation and collaboration are key to surviving in the railway business.

Bombardier Transportation has a competitive edge as we continue to provide innovative and integrated rail mobility solutions that create substantial benefits for operators, passengers and the environment.

For the mining industry, Bombardier provides cost-effective, streamlined and flexible solutions in its portfolio that optimise the movement of ore and freight, within a mine, from mine to port and across country borders, making the company a key contender in the freight railway industry.

The efficient movement of freight 24 hours a day, 365 days a year is essential to a modern and productive resource industry. Bombardier specifically designs industrial and mining rail control solutions to optimise and maximise the rapid transport of raw materials to enable fully automated, continuous, efficient and streamlined productivity. We ensure that our solutions provide greater cost-efficiency, speed and capacity as well as increased availability.

Bombardier's globally proven INTERFLO rail control solutions are the optimal choice for moving goods efficiently along heavy haulage mainlines, using the latest communications-based technology with a minimal wayside equipment footprint, while offering maximum rail capacity.

As well as offering the latest in mainline rail control solutions that support national and cross-border freight operation, leveraging the quality of our automated systems, we have a dedicated rail control solution helping mining operators to maximise their assets and capacity, intensifying ore extraction and freight transportation.

The dedicated INTERFLO 150 solution for industrial and mining operations provides a step change in rail productivity by enabling flexible and automated operations, fully integrated integration with a mine's loading and unloading systems. These systems achieve significant productivity benefits and major safety improvements, enhancing capacity in operations within the mine and from mine to a next destination. They are also scalable, making it cost-effective in mines of varying size and grades of automation around the world.

WHAT ARE SOME OF THE CHALLENGES FACED BY FREIGHT RAIL OPERATORS?

Investment in the railway sector has always been a key challenge for the industry, and with COVID-19 it has made it even more of a challenge as the sector (including the freight rail) relies on huge initial capital investments.

With African governments' resources increasingly constrained due to the outcome of the COVID-19 crisis and the responsibilities they have towards their citizens, there's a reduced appetite to invest in freight rail. One solution that could be further explored is the public-private partnership approach.

Other challenges for the freight rail industry include infrastructure development and maintenance, service delivery issues, theft or pilferage problems, government policy as well as organisational policy issues and the preference that organisations have to transport goods via trucks. ■

SKILLS DEVELOPMENT
ESSENTIAL TO DRIVE EMPOWERMENT AND INDUSTRY GROWTH

Numerous challenges are impeding the development of skills needed for South African miners to compete with their counterparts in major mining jurisdictions, such as North and South America and Australia. These include a history of sub-standard education and socio-economic inequalities, which have all left many lacking the necessary skills to succeed in the workplace.

It is imperative that mining companies, whether junior or major, assess South Africa's skills needs for the country's mining sector to succeed. A highly skilled workforce will be essential as mines become more mechanised and automated. Digitalisation of the mining sector will have an immense effect on the operations. If companies and their employees fail to adapt to the new digital realities, they will struggle to remain competitive.

Dineo Maphutha
Canyon Coal Group
HR Manager

Major mining nations are all investing heavily in skills development to ensure their workforces have the skills required for Mining Industry 4.0. The skills needed going forward are changing rapidly, from self-driving trucks to autonomous continuous miners. Mining companies need to assist graduates and current employees by offering them the skills they need to match the ever-changing needs in order to maintain the industry's competitiveness.

South Africa unfortunately lags far behind in skills development programmes and initiatives to effectively upskill and reskill those currently working in and those who will soon be entering the mining industry.

R143.5-billion

Mining sector contribution to employee earnings

LABOUR-INTENSIVE

According to the Minerals Council South Africa, the mining sector employs in excess of 460 000 people, provides over R143.5-billion in employee earnings and contributes around 7% to GDP, which demonstrates the sector's importance as an engine for employment and revenue generation in the country. The large number of employees is also indicative of how labour-intensive the industry is.

Having large numbers of people on-site, particularly working underground, brings with it significantly increased health and safety risks and high labour costs. South Africa has some of the deepest deep-level mines, with ageing infrastructure and depleting resources. The costs of mining are driving miners to consider more cost-efficient methods. The need to use modern technologies to improve efficiencies, reduce risks and extend life of mines has never been greater.

A highly skilled workforce is essential for mines of the future.

SKILLS SHORTAGES

The mechanisation of mining is resulting in greater technical knowledge to build, maintain and repair mining machinery and equipment. The depletion of resources means precision mining skills will also become key to success. Yet there is a shortage of well-trained and experienced artisans to service the growing number of trackless mining machinery (TMM) that is found on modern mines.

Moreover, existing TMM operators continuously need to be trained and kept abreast of new trends and the latest technological innovations that are being applied to these new advanced

The views expressed are the author's own and do not necessarily reflect SA Mining's editorial policy.

“The **skills** needed are changing **rapidly**, from **self-driving** trucks to **autonomous** continuous miners.”

technologies in order to correctly operate their machines and limit downtime. Mechanised training programmes provide artisans with specific skills in mechanised engineering that are not part of the traditional training syllabus.

Sadly, many graduates remain unemployed after completing their studies, even though they attended respected accredited training centres. This is because in many instances the curriculum did not match the needs of prospective employers, because it did not include training on the latest technologies being used in the mining industry.

Overhaul and updating of training programmes are needed as a matter of urgency to address this situation. Modern training needs to include blended training methodologies including e-learning, virtual reality, simulation and workshop practical hands-on training to allow trainees to receive comprehensive modern training that is relevant to a sector that is increasingly tech-savvy.

IMPACT OF COVID-19 ON TRAINING

The lockdown caused a significant disruption in all educational activities across South Africa, and mining artisan and engineering training was no exception. Training providers postponed and in some instances cancelled training programmes altogether. However, there were many institutions that were able to seamlessly transition their education and training programmes online.

Canyon Coal took the decision to freeze its internal training programme for the remainder of this year, but we continue providing full support on learnerships, bursaries and graduate in-training programmes.

COMMITTED TO UPSKILLING AND EMPOWERMENT

Canyon Coal strives to upskill local community members and increase their opportunities of securing a job within the mining sector. To this end, we offer a range of training programmes, such as articulated dump truck (ADT), diesel bowser and excavator training, as well as vacation work to our bursary holders.

For example, to address the mining skills shortage in the Bronkhorstspruit area where Canyon Coal’s Khanye Colliery is located, the company embarked on an upskilling programme for locals. Twenty community members attended a 30-day mobile machinery for surface mining training programme between November and December 2019 at Khanye Colliery.

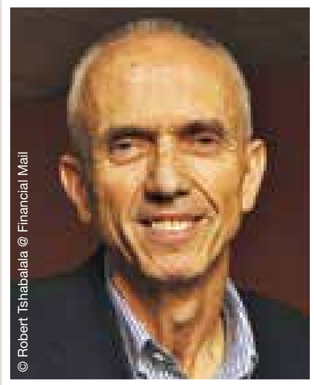
The trainees were given theoretical and practical training on how to safely and correctly operate machinery such as ADTs which are crucial to the transportation of coal in the mining pit and at the siding. The trainees also received hazchem firefighting and first aid training, which adds to their overall skills sets and employability.

Furthermore, we have success stories of individuals who have started off as bursary students and now are heads of department in the company. For instance, at just 29 years old, Nthabiseng Ocia Mueti was appointed as social and labour plan (SLP) manager on 1 October 2020.

She is responsible for implementing existing and developing new SLPs and local economic development projects. Mueti is a Canyon Coal bursary alumnus, who has been with Canyon Coal since 2017, having worked both on-site and at head office in various positions. She previously worked at Singani, Khanye, Ukufisa and Phalanndwa collieries as an environmental and SLP officer, and later was appointed as a compliance officer at head office. Before being appointed to her current position, Mueti served as a junior project manager in the Canyon Coal project team. ■

Canyon Coal offers a range of training programmes, including ADT, diesel bowser and excavator training.

REQUIEM FOR SOUTH AFRICA'S MINING INDUSTRY IN 2020

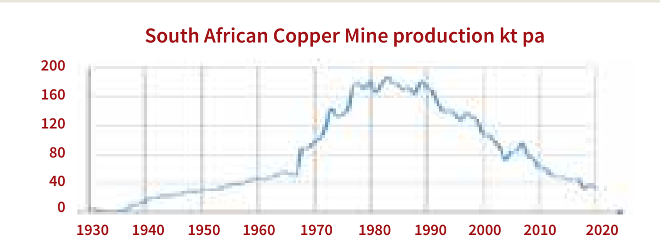


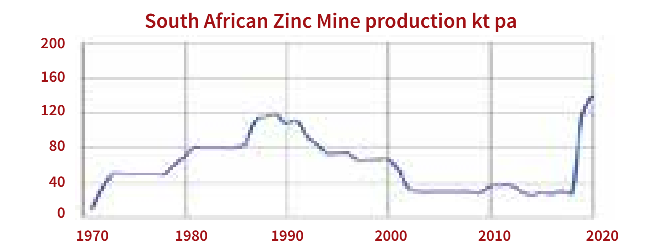
Peter Major
Mergence Corporate Solutions Director: Mining

A requiem is generally known as a mass for the souls of the dead – at least in the Catholic Church. So if one says requiem for South Africa's mining industry, are we to construe that it has now passed into the next life? Perhaps not quite yet. But the signs are ominous.

South Africa's miners entered 2020 under as much siege as ever, but with a lifeline of very high metal prices as a buoy. Not enough to save them long term; but enough to prolong their day of reckoning in the hopes that a major change in their operating environment occurs before it is all too late.

South Africa's base metal mines were the early warning litmus test of the negative change in environment for its mining industry. The country's base metals were the first mines "formally" developed and funded, starting with Okiep Copper in 1852. Later, in 1904, copper was found and mined at Messina near South Africa's northern border with Zimbabwe, with tin mining officially beginning at that same time in the Rooiberg area. But base metal mining was never big in South Africa; nothing like its diamond and gold mining, which started out fast and progressed quickly to big, especially in the Kimberley and then Johannesburg areas. Base metal mining was more modest and gradual as it grew into its own unique place in South Africa's mining industry. But the margins and scale were never really there for SA's base metal mines. So while they benefited from being managed by the growing and well-resourced mining houses, they were always regarded as the more fragile and delicate of its children. This meant they would be the most vulnerable and first to fall when the environment in the country for mining changed for the worse. And change for the worse it did.





By the mid-1980s, the large, mainly ANC-led unions were growing in number and importance all over South Africa, particularly in its mines. (Prieska Copper bore a huge brunt and was the first to close as a young Gwede Mantashe made his mark there.) Unions began taking increasingly larger roles in procurement, which the mines had managed for over 100 years. By the time the ANC gained government control in 1994, its powerful unions virtually controlled the mines as well. While directors and boards of the mining companies knew this, shareholders only grasped the full extent of how much many years later.

Coinciding with shareholders and management losing control of the country's mines was an operating environment changing rapidly and adversely. Metal prices across the board fell all through the 1980s and continued falling through the 1990s and well into the new millennium. With margins collapsing, workers revolting, wages rising in multiples, productivity falling sharply and capital cut off to those mines that had anything other than a magnificent orebody beckoning, the future was looking bleaker by the day. As expected, base metal mines were the first to be sacrificed under the 'new order".

By the new millennium, the real tsunami hit South Africa's miners – the launch of the Mineral and Petroleum Resources Development Act (MPRDA) and black economic empowerment (BEE) requirements for all phases of mining from ownership through to sourcing and selling. Corruption and intimidation were riding high in strangling mining in SA, just as the electrical, transport and community lifelines were being corrupted and destroyed as well. By the end of 2019, these plagues were all so ingrained that only the best-managed, finest orebodied mines were able to survive in the toxic environment.

But what a surprise was 2020, bringing with it a most dastardly virus and yet, perversely creating a new world for South African mining.

From being seen as a poster boy for every ANC aspiration of capture, punishment and exploitation, mining companies were suddenly expected to save the country and its masses from certain poverty and destitution. Coupled with a change of heart towards South Africa's miners by the government (and people) and a surge in most metal prices on the international market, was a weakened rand which considerably boosted the stakes. Even foreign investors, despite their disdain for the country, started giving the industry a tepid "Let's have one last look." Added to that, South Africa's unions and government started looking to the mines to save them from the COVID-19 "poverty pestilence booster" now enveloping the country.

All this positive environment is happening as we near the end of 2020. What a change. And like all good things in life – unlikely to last long – it must be harnessed and drawn on for however long it does last. High dollar commodity prices have a long history of reverting to the mean and then falling even lower.

The puny and unexpected investor interest in supplying capital to SA is fleeting. And government's plethora of asphyxiating and unfair legislation will not be rolled back even minimally, let alone rescinded. Eskom can't be fixed let alone ever brought back to previously reliable and economic power costs. And the unions, communities and government can only temporarily hold back their now totally unbridled lust for demonising and pillaging mines and companies.

Everyone knows this, especially the miners. So they will fully take advantage of this hiatus – this temporary manna from heaven of great metal prices, strong offtake demand and weakening rand. Dealing with unions, communities and government hasn't been this doable in decades and so the mines are making the most of this too – while it lasts.

This year, with all its adversities, has brought a reprieve for SA mining. What could 2021 possibly bring? ■

BI TO DISTRIBUTE MOTORS FROM ABB AFRICA

Low-voltage IE3 motors from ABB Africa will now be distributed by BI.

Low-voltage IE3 motors from ABB Africa will now be distributed by leading supplier Bearings International (BI). This is an extension of the existing partnership between the two companies, with BI already a distributor of ABB Dodge gearboxes. BI has been a mechanical power transmission partner for ABB since 2011. The advantages of the partnership with ABB include dealing with a local supplier versus direct imports and the availability of quick technical backup support. ABB in turn will be able to leverage from BI's extensive 47-branch network across South Africa, covering all of the major mining and industrial areas where BI has a major footprint, the company said.

WEARCHECK INVESTS IN TRANSFORMER TECHNOLOGY

Condition monitoring specialist WearCheck recently invested several million rand in four new laboratory instruments for their flourishing transformer division labs in Johannesburg, Durban and Cape Town. WearCheck MD Neil Robinson says the company's investment in the equipment has relieved some of the current sample volume pressure and reduced turnaround times in line with customers' expectations, ensuring that transformer oil samples are processed and analysed even faster than before. WearCheck's transformer division now has an additional two new high-speed gas chromatographs in the company's Johannesburg and Durban laboratories, an additional new polychlorinated biphenyl chromatograph in the Cape Town lab, and an additional new high-performance liquid chromatography in the Durban lab.

"Getting the analytical test results and diagnoses to our customers as fast as possible is a priority for us," says Robinson, "and our investment in the new instruments has ensured that our transformer sample testing capacity is more than doubled. Our transformer division also recently moved to a new, larger laboratory in Westville, where we offer a wide range of specialist transformer monitoring techniques."

RAILCARE LAUNCHES BATTERY-POWERED RAILWAY MAINTENANCE VEHICLE

Epiroc's collaboration partner Railcare Group AB recently launched the world's biggest battery-electric railway maintenance vehicle, using an Epiroc-developed technology platform. Railcare, a Swedish manufacturer of machines that keep railways safe and clean, launched a battery-powered version of its multi-purpose vehicle for rail maintenance applications. The new machine can be used to vacuum away stones, trash and other obstacles from the tracks, melt snow, as well as function as a towing vehicle for, among other things, ballast wagons during track work. Epiroc has developed a battery-electric technology platform that is modular and scalable, with batteries supplied by Northvolt. Although the battery system is designed primarily with the mining industry in mind, it is also well suited for other types of machines that operate in tough environments and are traditionally powered by diesel engines. As a result, Epiroc is providing its electric driveline technology to Railcare.

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1 x Cat 140H Motor Grader with Ripper
4 x Caterpillar 140G Motor Graders with Rippers
1 x Cat 120G Motor Grader

4 x New / Unused Case 770EX Magnum 4x4 TLB-86HP – 2020 Model
1 x New / Unused Manitou 844S 4x4 TLBS

1 x 2007 Hamm GRW18
1 x Ingersoll Rand -27 Ton PTR

2 x Bomag BW212D-40 SD Rollers
1 x Bomag BW212D-40 Smooth drum roller – 2014 Model
1 x Dynapac R 3 Point Steel Rolle-13 Ton

1 x Bell 2306D Tow Tractor 4x4
1 x Tecon Grid Roller
1 x Discharged Bin Trailer

4 X Etnyre K Chip Spreader's Refurbished, mechanical and electronic operated

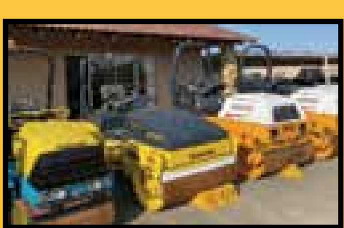
1 x 2016 Doosan DX62R-3 – Hours on clock: 1098
1 x 2010 - Cat 302.5c Mini Excavator
1 x 2013 Wacker Neuson 50Z3

1 x Caterpillar D6T Dozer with Ripper – 2010 Model Rebuild engine new undercarriage

1 x Komatsu GD650 Grader with ripper
1 x Cheng Gong MG2320B Grader with ripper and cat 3306 engine

1 x 2013 Hamm 3411 Padfoot Roller
1 x 2011 Hamm 3520-20Ton SDR
1 X 2015 Hamm 3411 SDR
1 x Bomag BW219 Smooth Drum Roller

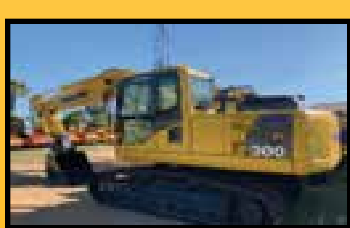
1 x Cat 938K Loader – 2014
2 x Caterpillar 950H FEL 2013 models 1 x Caterpillar 980H FEL – 2014
2 x Sem 668C Front end loaders – 2014



3 x Benford TV1200 DDV Rollers
1 x Bomag BW120AD-4 Roller
1 x Ammann AV12-2 Double DDVR

1 x JCB 535-140 Telehandler – 2014
1 x JCB 535-125 Telehandlers – 2014
2 x JCB 540-140 Telehandlers – 2016/15
1 x JCB 540-170 Telehandler – 2014

1 x JCB 456 ZX Front end Loader – 2014
1 x JCB 456 ZX Front end Loader – 2013
2 x Bell 1806E Front end loader's – 2011
1 x Cat 246C Skid Steer Loader – 2009



1 x Komatsu PC200-8 Excavator 2013 new undercarriage
1 x Komatsu PC200-8 Excavator – 2012
1 x Komatsu PC220-8 Excavator – 2011

1 x FAW 10M³ Tipper Trucks – 2016 Model with new Tyres

2 x 2013 Cat 428F 4x4 TLB 's
2 x 2014 Cat 428F 4x4 TLB's

2 x Bell Kamaz 65222 – 12M³ – 6x6
2018 Demo Models 3000 and 18000K

1 x Hamm HD70 DDV Roller
1 x Caterpillar CB434D Roller

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