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Our proud accomplishment

Welcome to 2015 and the first edition of Mining Review Africa’s first annual ‘Mining Elites in Africa: Suppliers & service providers yearbook’, officially sponsored by African mining engineering expert, DRA.

When you enter the final stages of putting together an annual, the sense of accomplishment is overwhelming, especially in this instance. I have worked on many annuals during my publishing years so far, but nothing to date quite compares to the satisfaction I feel in presenting to you the book you hold in your hands right now.

‘Mining Elites in Africa’ is the result of many long and hard hours of team strategising, working to conceptualise a product that has reader value and will prove an asset to any mining professional’s bookshelf and frequent referral. And this is it!

Everyone knows Africa remains the world’s last untapped mineral resource and everyone wants in on the action. But, and this is a big ‘but’, it has not proven easy thus far. Africa comprises 54 countries, each with their own legislative rules and regulations, and this makes developing the continent’s under-developed infrastructure an extreme challenge. Contending with common diseases such as Malaria and the recent Ebola epidemic adds further complications. Language barriers, community cooperation, environment protection, etc. have become critical components of consideration when building new mines in Africa. Nonetheless, the continent’s overall mineral riches make compensating for these challenges worth it.

So here you have it. A book filled with valuable information on which service providers and suppliers (largely South African) are doing business in Africa, how they are doing it and how they plan on enhancing their service offering further to the mining sector. Let it be said that this information should not be taken for granted. Developing a track record and footprint in Africa is difficult, and those who have and are successful should be applauded and now we have given them the opportunity to share this information and remind our mining sector why they are ready to help them deliver their mining promises of production – efficiently, effectively and without compromise on any level.

The hours, weeks and months spent putting together this information will probably go down in my history book as one of the most demanding, but most inspiring and rewarding projects ever. I hope as you read it, you will appreciate the effort that has gone into delivering it as well the effort made to ensuring all top stakeholders and mining decision-makers receive their own personal copy, hand-delivered and personally presented at all major global mining conferences over the 2015 year.

Never in our wildest dreams did we believe this book would be such a great success and so well received from day one. So enjoy it and use it! I look forward to welcoming you into the second edition of ‘Mining Elites in Africa’ in 2016.

Laura Cornish
Editor
Historians generally agree that the real ‘scramble for Africa’, the imperial conquest of Africa by the major powers of Europe, began with King Leopold II of Belgium and his belief that the Congo could deliver enormous mineral wealth. When Leopold asked for international recognition of his ‘personal property’ in the Congo, Europe gathered in 1884 at the Berlin Conference, to create policy on imperial claims.

As an indication of the impact of the subsequent ‘scramble’, in 1870 10% of Africa was under European control while, by 1914 this had risen to 90%, with only Abyssinia (Ethiopia) and Liberia still independent.

The history of this period is well captured in Thomas Packenham’s book, ‘The Scramble for Africa’ (1990), where he demonstrates that this was indeed a ‘defining moment’ for the continent as the mineral and agricultural wealth of Africa began to be both appreciated and exploited.
Arguably we are sitting on the cusp of another defining moment, a new scramble for Africa, again inspired by the dreams of mineral wealth; but this time the rules of engagement are, and will continue to be, somewhat different.

The years of independence since the 1960s have not been the easiest in terms of socio-political and economic development in Africa as populations have undergone but economic growth has not kept pace and has certainly not been cascaded through society resulting in substantial poverty, an educational and healthcare deficit and largely under developed infrastructure.

But now, with an ever increasing global interest in the world’s emerging economies, political and economic forces are combining to focus on Africa as the ‘next economic frontier’. Whereas it is most likely that, outside of Africa’s dozen or so major metros, mass consumer demand will not peak until the second half of the 21st century, there is no doubt that the next few decades will see Africa’s mineral wealth leveraged. However, this time it will need to be in true partnership with the host countries and their people.

We must be careful not to generalise and fall into the common trap that often views Africa through one lens and therefore as one entity. Africa is a continent, in fact the second largest continent, and it is comprised of 54 countries. There are almost a billion people who call Africa home and they represent a multitude of cultures, traditions, and belief structures. That, in turn, gives rise to a broad spectrum of regulatory environments and governance protocols for the mining and minerals sector to navigate. Add to this climatic extremes, inhospitable and often impassable terrain plus some of the world’s most challenging healthcare issues and you will appreciate that, as the late singer-songwriter Syd Kitchen claimed as the title of his 2001 album, ‘Africa is not for sissies’!

At DRA we have grown up as part of Africa; it’s in our blood. And even though we have grown from humble beginnings in South Africa to being one of the world’s leading independent engineering businesses, we believe that we are as well positioned as anyone to understand the risks and rewards that Africa presents. With safety as our underpinning value and an enviable track record, in terms of competencies and capabilities, I feel confident to claim that at DRA, ‘we know Africa’

DRA is proud to be presenting Mining Review Africa’s African Elite Mining Suppliers and Service Providers Yearbook 2015.

As a first of its kind the Yearbook offers mining suppliers and service providers a unique opportunity to reach the key stakeholders in the mining and minerals sector. We trust that the Yearbook will be of great assistance to connect the people who will help unlock Africa’s tremendous mineral potential which will, in turn, hopefully lead to an uplifting of Africa and all of its people.

Nkosi Sikelel’iAfrika

Paul Thomson
CEO, DRA
Conquer the Continent

DRA has been the African frontrunner in minerals processing since 1964, evident from the fact that it has built over 300 projects in 26 countries.
DRA’s journey over the past 30 years since it was first established has been a remarkable one. Today, its reputation for engineering excellence across the African continent, and further afield, is growing increasingly renowned.

A leader in platinum and coal – an emerging leader in all commodities

Although DRA made its entrance into the mining industry through coal (primarily), its introduction of dense media separation (DMS) technology into the precious metals sector has over the decades seen it emerge as the leading platinum beneficiation engineering expert. Today, the company boasts construction of 99% of the world’s platinum processing plants.

Fulfilling this role in the platinum sector both boosted DRA’s market reputation and provided it with the foundation and platform to grow its track record in other commodities such as gold, copper and iron ore over the years. “Our next objective is to take up leading positions across additional, strategically identified commodities and expand our leading reputation beyond the platinum and coal sectors specifically,” says Johann de Bruin, MD at DRA Projects. Considering its project portfolio is expanding with every passing year, this is a goal well within reach already.

Broadening services – for the client

DRA’s success today has also resided, and still does, in its ability to identify gaps in the market and fulfil changing client demands and needs alongside an evolving market. An example of this is the introduction and incorporation of its windes division into the
Group, De Bruin notes, which the company grew in-house and rolled out to the international mining market. “To date this remains an area of thin expertise in the sector despite the fact that shaft sinking remains one of the most efficient processes to get deep level minerals out of the ground. It provides us with access to new project work as a result of this.”

The company has also established an infrastructure development arm, driven by demand in African countries where, more often than not, mine-related infrastructure requirements can exceed that of the mine itself and determine a project viable or unviable. “We have invested heavily into securing our capabilities and expertise in this area and can compete competitively on this important African platform.”

DRA’s involvement in Randgold Resources / Anglogold Ashanti’s Kibali gold project in the Democratic Republic of Congo (DRC) highlights an additional new business area as well – green energy. Through Kibali, the company has already completed the development of its first hydropower plant for the project, and will follow through with an additional two plants. It represents the perfect power solution to the central African region, De Bruin highlights, and will be a specific focus for DRA moving forward.
Expanding – geographically
Although DRA remains a truly South African company, it has focused heavily on securing footholds in all mining-strong regions across the globe. Today it has offices (established organically) which include major mining hub continents Australia (Perth) and Canada (Toronto), in addition to South Africa (Johannesburg, Cape Town and Pretoria).
2014 has been a particularly active year for DRA in terms of geographic expansion, having negotiated and completed the acquisition of global coal expert Forge Group North America companies (Taggart Global) – which forms part of a larger strategy to change its ability to effectively globalise its business outside of South Africa.
The company, through its mining division, formed a partnership with Orelogy, a team of specialist mining consultants with specialist software designed to optimise open pit and underground mines. “The partnership is symbiotic – DRA will assist the company in terms of implementing projects in Africa and in turn Orelogy will assist DRA to gain exposure in the Australian market, specifically to service Australian companies with African tenements,” De Bruin outlines.
The next stop on its international growth path is gaining a foothold in the European (London) market and DRA is in the process of evaluating potential partnership opportunities with financial players and funders in this region. “The junior market has a significant presence in London and DRA recognises the ability to obtain new project work by establishing relationships with the sector and taking on a proactive and early-stage role in projects.”

Still an African company with African strengths
“Having outlined our international structure and intention, DRA upholds its proudly South African company position and status, sourcing the bulk of its revenue stems from the African continent. We understand the dynamics of the African environment and believe there is still a considerable amount of work to be allocated from its untapped resources. Our global reach simply makes us a stronger contender on the continent,” De Bruin declares.

“From a commercial point of view, Africa is the right place for us to be. This is where our strengths lie and we must play to these strengths. This, combined with our global reach, makes us a formidable force in the market.”

Johann de Bruin, MD at DRA Projects
challenges, DRA is a force to be reckoned with.”

Looking ahead to the near future, DRA aims to establish itself in an emerging commodity sector which is rapidly gaining momentum across the globe, specifically industrial minerals such as graphite, vanadium, and other rare earths as battery and energy technology are and will drive demand increasingly higher.

Projects demonstrating full spectrum skills set

Originally a process plant engineering specialist, DRA has clearly demonstrated its broadened skills set into new areas, with an emphasis on providing total solutions in four primary focus areas:

• Minerals beneficiation,
• Mining including winders,
• Infrastructure, and
• Operations management (Minopex).

Completing projects across all four areas is no aspiration – DRA is underway with and has already completed projects covering the four different spectrums.

Its track record and project footprint truly covers Africa in its entirety and continues to grow thanks to its current project list in Ghana, Liberia, Lesotho, the DRC and Mozambique. South Africa remains a key region for project work and as such, DRA is currently active in the Northern Cape (manganese), Belfast in Mpumalanga (coal) and even Randfontein in Gauteng (gold). In addition the company is underway with study work for a massive new platinum project on the Northern Limb of the Bushveld Complex and a new diamond project in Quebec, Canada.

Kibali gold mining project – DRC

“It is worth noting that Kibali was a very challenging project as it is located in the north eastern section of the DRC, which means there were significant logistical challenges to navigate amidst the on-going rebel activity during that time,” explains Phildi Scholtz, director at DRA Projects. Despite this, the project has been a huge success.

Today, Kibali is considered the largest operational gold mine outside
of South Africa – producing 600 000 ozpa of gold at nameplate capacity. Although DRA was awarded the process plant EPCM contract, two-thirds of the project was infrastructure-related. The first phase of the project also included the Nzoro hydropower plant (DRA is currently managing construction of the second hydropower plant – Amberau).

“The ‘significant’ section of the construction period at Kibali measured 27 months, from detailed design to the first gold pour in September 2014,” states Scholtz. The project timeline was an additional challenge from the outset and due to the tight schedule, DRA had to manage around 4 500 people on site at peak construction phase. “At the time we were consuming one million hours every month of construction-related labour which ultimately saw us achieve just over nine million LTI-free hours,” points out Scholtz. This is a record achievement for the company and sets a new standard in the industry.

Also notable were DRA’s efforts to work and operate within the local environment – a French-speaking region. DRA has subsequently translated all of its safety training information into French to assist the project’s locally employed construction staff and DRA’s DRC workforce, all of whom have been trained over three previous DRA projects in the country. Kibali however remains the company’s biggest DRC-located project to date and its first with Randgold Resources.

Karowe optimisation project – Botswana
In Botswana DRA is underway with a plant optimisation project for Lucara Diamonds’ Karowe operation, which produces in the range of 400 000 – 420 000 carats every year. Having
successfully completed the original process plant, operational since May 2012, undertaking a follow-through stage was a natural process. "We are introducing new technology Tomra X-Ray diamond recovery machines to the plant to improve its large stone recoveries and fitting a turbo-pulp lifter to increase capacity through the mill. "We are ahead of schedule and are within budget on this project which is always a noteworthy achievement," explains Scholtz.

"Interesting to this project specifically was our incorporation of technology and design from a Glencore operation in Australia. Tweefontein was benchmarked against that project’s performance; and construction philosophies used in Australia were adopted to minimise construction work at elevated positions to improve safety."

**Tweefontein coal beneficiation plant – South Africa**

Three South African projects have contributed significantly to DRA’s healthy 2014 project performance which includes one of the company’s largest fixed-price coal handling plants to date – Glencore’s 12.4 Mtpa ROM, 2000 tph Tweefontein project. While this plant is not DRA’s largest (in terms of throughput capacity), it is from an involvement perspective. "DRA has designed and managed not only the processing plant (CPP) but also the complete ROM receiving, materials handling and product load out facilities. “We are ahead of schedule and are within budget on this project which is always a noteworthy achievement,” states Scholtz.

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**Booysendal platinum operation – South Africa**

Work at Northam’s Greenfield UG2 180 000 tpm (ROM) Booysendal mine (now operational) comprises DRA’s entire service bouquet – undertaken in an environmentally sensitive area.
After the pre-feasibility study was completed in 2009, early works commenced in April 2010 with full approval being granted in August 2010. Five years down the line, DRA remains extensively involved with the project, again demonstrating its preference and ability to establish long-term relationships with its clients.

“The fact that we are involved in the mine design, all engineering and construction work, underground, and surface work as well as processing highlights Booysendal as a good example of our total-solutions work model,” states Scholtz. While Minopex is operating the plant, DRA continues to design and support the installation of infrastructure underground and has recently been awarded an extension for these services running until the end of 2015. It has also commenced a pre-feasibility study on mining and processing the Merensky reef.

Maseve PGM project – South Africa
DRA’s involvement at Platinum Group Metals’ Maseve 160 000 tpm PGM project, near Rustenburg, is similar to Mototolo – entailing again a total solutions package (excluding operation at this stage).

“Each plant is unique but we have used tried and trusted, and most importantly tested methodologies where applicable to save on expenses,” outlines Scholtz. The project is well advanced in terms of construction, which began in 2012 with the establishment of the North box cut. Plans for first-feed to the concentrator are scheduled for the last quarter of 2015.

DRA Mining was born expressly as a result of demand from industry. “We were established in 1998 as a division of DRA Mineral Projects through a request from one of its clients – who firstly experienced the successes of its project management skills in minerals processing plants and secondly wanted to extend these successes into their mining projects,” says Neale Goddard, DRA Mining’s MD.

This proved very successful and became a general service offering soon afterwards. And while the type of ‘mining’ work executed between 1998 and 2003 was predominantly in the engineering, infrastructure, mining equipping and management of contract mining companies, today it also includes mine design and scheduling thanks to the purchase of reputable mining consultant Lower Quartile Solutions (LQS) in January 2010.

“The acquisition of LQS and the upturn in the mining and metals industry were the catalysts for the phenomenal growth DRA Mining experienced from 2009 to 2012 (21 employees in 2009 to 260 employees in 2012) although this headcount has been slightly reduced as a result of the downturn currently being experienced,” Goddard notes.

Today, DRA Mining represents an integral component of the DRA Group offering. “DRA has developed a ‘pit-to-port’ capability and the mining business has become a key contribution towards that. We also provide an early entrance into new projects in light of our early entrant position into mining projects.”

DRA Mining’s strategic growth objectives
To maintain its current focus on technical excellence and quality product / service delivery in order to retain current clients, attract new clients and be positioned to support the Group’s globalisation strategy; and

To contribute towards the group globalisation strategy by acquiring/establishing a mining consulting and/or project service offering in the Americas, African, European, MENA and Australasian regions.

Notable
DRA Mining’s first notable mining project, the Marula “off-reef conversion project”, which included mining design and scheduling, was undertaken in 2004 on behalf of Impala Platinum and was successfully completed. “Subsequent to that we have completed or are busy with numerous open pit, decline and vertical shaft projects/studies and are constructing our first two backfill plants,” Goddard concludes.
The world knows it and Africa has welcomed and embraced it – China’s infrastructure (and mining) investment on the continent. But is this working? What does the future hold and should Africa be hopeful or cautious, questions Anthony Desir, Sami African Mineral Solutions partner.

BY LAURA CORNISH
IN 2013 it became apparent that the United States and China are, to a certain extent, competing to develop Africa’s infrastructure requirements – in essence the foundations upon which Africa’s 54 countries are reliant for economic growth. At present, Africa is only spending 2% of its overall GDP on infrastructure development. Europe by comparison was spending 8% after World War II. Clearly the continent needs the world’s assistance.

THE MONEY

In July 2013, President of the United States Barack Obama announced the ‘Power Africa’ initiative – a five year presidential concept aimed at delivering 30,000 MW of reliable, affordable and sustainable power to 60 million new homes on the continent. The programme is designed as a multi-stakeholder partnership among the governments of the United States, Tanzania, Kenya, Ethiopia, Ghana, Nigeria, Liberia, the United States and African private sectors. “It is seeded with US$7 billion of investment capital which was recently expanded by an additional $20 billion in private capital,” says Desir.

$27 billion to fund power in Africa sounds like a lot of money, Desir adds, but that capital is focused only on power within a broader infrastructure plan.

Subsequent to Obama’s announcement, China announced its plan to spend $1 trillion in supporting infrastructure over the next 12 years in sub-Saharan Africa. “If compared to the Obama plan, this equates to $83 million a year. Bear in mind that The World Bank, through its own studies, has determined the funding gap in infrastructure in Africa is roughly $90 billion a year,” making China key to Africa’s upliftment.

US$1 TRILLION The amount of capital China has committed to invest in sub-Saharan Africa over the next 12 years

THE PROCESS

So does this mean China has already bought out Africa? There is a difference between buying leadership and buying the hearts and minds of the people however. ‘Obama quite clearly has the hearts and minds of the people. He has their interests at heart and their goodwill. China by comparison has shown a different business style – developing government-to-government relationships while lacking transparency, which breeds corruption. China also does not have a ‘no-go zone’, as they are prepared to do business anywhere in Africa if there is a political will.” The United States by comparison has earmarked regions.

THE CURRENT SITUATION

The investment, volume and diversity of infrastructure projects China has invested in is staggering if Desir’s numbers are correct – 51,000 to date, he says. This includes:

• 43,000 rail projects;
• 5,000 water projects;
• 6,000 roads and bridges projects;
• 1,300 airport projects;
• 3,700 oil and gas pipeline projects; and
• 16,000 port facilities projects.

This excludes the number of mining projects they have picked up. “This alone should be enough to convince you that China is already here and that the Americans have a lot of catching up to do.”

INTELLIGENCE AND KNOW-HOW

But can China compete with American infrastructure know-how (talent and financial skills)? Considering it is the world leader when it comes to its own infrastructure spend, this again provides the answer – yes. China has in fact committed to building the equivalent (in size) of New York/Shanghai city every year for the next 25 years,” Desir states.

ALTERNATIVE PARTNERS

So is China’s infrastructure commitment spend enough to see Africa ‘bloom’? “Based on different estimates (from the global McKenzie Institute), it is estimated that between $57 and $67 trillion is needed to fund infrastructure in Africa over the next 30 years.” Essentially, the answer is therefore no, the scale is simply too big. This leaves room for alternative partners to make their move.

“If you look at what is happening on the ground, the Japanese, Indians and Koreans are also stepping into the African picture leaves room for alternative partners to make their move.

“The Obama Power Initiative’s purpose however has somewhat evolved. It has brought Africa into focus for investors who already have capital outside of the continent and is drawing attention to the continent, as opposed to making significant change through capital. The market has awakened and people are taking a second look and are aware of the opportunities on the horizon.”

This is good news for non-Chinese investment. Africa’s governments are becoming more mature in their decisions and China is struggling to adapt to their desire for more open and transparent procedures and simple relationships. Luckily for them, their involvement within the continent is already significant and extensive.

*Laura Cornish is the editor of Mining Review Africa

“...The reality is that in a face-off between China and the US, the dominant force is China. This is a fact. I’m not here to embrace the American or Chinese side. This is what is happening on the ground.” — Anthony Desir, Sami African Mineral Solutions partner
IN FEBRUARY 2012, The Economist wrote: “The immense ore deposits so far discovered, and soaring commodity prices on the back of rip-roaring Chinese demand, have convinced the world’s miners that the continent is the next big frontier.”

Mining activity increased, investment houses provided funding and expected good returns and mining companies went for marginal fields and technologically challenging projects. But over the last two years commodity prices have been volatile and China has halted its massive growth rates and infrastructure expansion. Iron ore and coal are moving into over-supply and key commodities such as gold have seen sharp declines in price.

In addition, costs have increased. In 2007, the spend for building new iron ore capacity was US$96/t. In 2012 that cost rose to $150/t. For thermal coal mining back in 2007, the costs were at $71/t, rising to $106/t in 2012. Gold is a similar story. With a $500/oz decline from 2011 to present, this is the steepest decline in 30 years.

Cost Cutting

Mining companies worldwide have had to look at stringent cost controls and have had to re-evaluate the efficacy of many marginal projects. The resulting closures and lay-offs, and the focus on core commodities from higher yielding fields, have given a short term boost to returns. This is not sustainable for longer term growth as talent disappears, innovation is thwarted and investment in technology reduces. However there is room for optimism over the next few years.

Optimistic growth predicted

The global economy is finally beginning to stabilise with most forecasts putting growth at 3% to 4% from now until 2020. It is true that emerging markets are experiencing a slowdown in growth. Indeed in 2015 and 2016 the advanced economies will overtake the emerging markets in contribution to GDP but by 2020 the picture will be different. China’s growth for example has been at 9% per annum and that is expected to decline to 7% by the end of the decade. Nevertheless, the overall GDP contribution from emerging markets will grow to 53% (in 2010 this was 45%). As a result of this growth, international flow of goods and capital will surpass the boom period prior to the 2009 collapse. As emerging markets achieve middle income status, so does the demand for consumer goods; and the investment in vital infrastructure products will increase. Clearly this growth requires an increase in mined commodities and Africa has the resources in abundance.

Mining and quarrying comprises 10% of total exports from Africa and 80% of this comes from just five of the 54 countries. These five countries scored highly when looking at all the factors that make an easy operating environment. Not surprising then that they have the bulk of the exports.

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When deciding to invest in any project, mining companies and their investors will look for:
• government stability, the burden of government regulation, favouritism in decisions from officials. Clear transparency and predictability of policymaking;
• a strong legal system to follow through on contractual issues and ensure investment protection;
• levels of corruption and transparency of contracts and payments;
• business regulations for local firms to create opportunities for them to engage with mining houses;
• infrastructure levels – quality of roads, rail, ports, storage and security;
• labour relations – hiring, firing, union activity, wage structures and skills levels; and
• predictable fiscal regimes with clear profit repatriation guarantees.

In recent research conducted by Deloitte 1 (with statistics taken from the World Bank, Transparency International, WEF, CIA and NKC Research), the top five mineral exporting countries fared very successfully as desirable countries in which to operate. The above criteria were used to assess the attractiveness of the operating environment and therefore the willingness to invest.

Rwanda ranked 1st for operating attractiveness. It currently produces gold and both tin and tungsten ores. Government has reduced the burden of regulation significantly and is very transparent in policy-making and dealing with corruption. Customs procedures are simple in comparison with its neighbours.

To set up a mining operation will normally take five to seven years of feasibility studies, then two to five years to develop the site and therefore up to 15 years to see a good return on investment. Clearly a long-term view is needed when investing and the more stable and transparent a country is, the more likely the case for investment.

In Rwanda there is a real government interest in exploiting coal reserves. For mining companies, Rwanda is an example of a relatively open and attractive country to invest in. Indeed there has been a significant increase in foreign direct investment, reaching $70 million last year covering 14 mining sites.

What can mining companies do?

The onus is not only on the mineral-rich country to provide the optimum environment for investment. The responsibility for sustained, profitable investment also lies with the mining company. There are government demands for infrastructure development in and around mine sites. The local communities have to be seen to be developed with local hospitals, schools, roads and rail transport. There are government demands for infrastructure development in and around mine sites. The local communities have to be seen to be developed with local hospitals, schools, roads and rail transport. The local communities have to be seen to be developed with local hospitals, schools, roads and rail transport.

The local communities have to be seen to be developed with local hospitals, schools, roads and rail transport being constructed with initiatives and partial funding from the mining companies.

<table>
<thead>
<tr>
<th>Ease of operating – rank</th>
<th>Commodities exported comprising 80% of all African mineral exports.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Botswana – 4</td>
<td>Industrial diamonds, copper, nickel, iron ore, silver, salt, soda ash, potash</td>
</tr>
<tr>
<td>South Africa – 7</td>
<td>Platinum, gem diamonds, uranium, chromium, gold, antimony, coal, iron ore, manganese, phosphates, tin, rare earth elements, copper, vanadium</td>
</tr>
<tr>
<td>Ghana – 9</td>
<td>Gold, industrial diamonds, bauxite, manganese, silver, limestone</td>
</tr>
<tr>
<td>Burkina Faso – 11</td>
<td>Manganese, marble, limestone, phosphates, pumice, salt and some gold</td>
</tr>
<tr>
<td>Tanzania – 18</td>
<td>Iron ore, coal, tin, phosphates gemstones, and gold, nickel</td>
</tr>
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What can the governments do?

When developing countries in Africa require high levels of mineral exports, it is essential for governments and mining companies to work together to develop local economies. This is the case in many African countries, where mining companies are responsible for the majority of government revenue and infrastructure development. For mining companies on innovation which will cut costs in the future?

The question for global companies over centralised management while maintaining local flexibility. Centralised supply chains, purchasing, mine planning and customer orders are all opportunities to save costs and improve relationships. Furthermore, centralised pricing, safety issues and predictive maintenance and risk management are all areas that will impact the bottom line. Senior management have to examine their operating models for sustainable growth.

For many mining companies, shareholders have become more active than before. New management has been brought in by the boards, new CEOs have been sought, skilled workers have been laid off in areas of smaller production and marginal fields have been closed.

To improve profits further, companies have been forced to choose projects offering high quality and high yielding sites within mining-friendly territories. Moreover, there has been reactive cost cutting through portfolio simplification, and prudent expenditure.

These critical questions follow:
• Are they new, leaner teams able to respond in a timely fashion to changing circumstances and renewed growth?
• Can they find new approaches to dealing with local communities with governments and regulatory bodies?
• Can they work with supplier companies on innovation which will cut costs in the future?
• Are there different power solutions using newer, cheaper, cleaner energy?
• Can conveyor belt technology, for example, replace the use of fleets of trucks and the resulting costs involved?
• Can early screening be used to verify the mineral quantity of any samples and thus the transporting of redundant rock?
• Will working with the supply chain, building partnerships, sharing data on forecasted demand leading to billing accuracy and tracking deliver cost reduction?

Much better to find solutions to all the above than squeezing every last penny out of suppliers, making them challenge their own supply chain or pushing them to a tipping point.

There is optimism for the years leading to 2020. Government and mining companies can work in partnership to exploit the natural resources. We must all work to a sustainable future where local communities thrive, miners produce the profits required by shareholders, suppliers are awarded contracts that develop into long term business and governments receive taxes and infrastructure development that benefit the whole country.

*Philip Vander Gucht, commercial director – publishing and media (Mining Review Africa)
Africa currently boasts some of the fastest growing economies in the world and has the same growth potential that India and China had 20 and 30 years ago respectively. **By Vicky Sidler**

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**Democracy kick starts Africa’s growth**

A vital factor fuelling recent progress has been the spread of democracy. Following the end of the Cold War in 1989, when the guns and money that were fuelling battles across the continent dried up, civil war in many African countries came to an end. As stability and democracy began taking root, the IMF, the World Bank and other institutions started looking at giving debt relief to Africa.

"Of course, that debt relief didn’t come without any conditions – one of the conditions was that we needed to put in place sensible economic policies and with that we created a better business environment across many parts of the continent. As a result, foreign direct investment has flowed into Africa over the last 20 years at an unprecedented rate," Lundy states.

Across Africa, the belief in democracy is undoubtedly on the rise, Lundy adds. "This is encouraged by better flows of information, which is supported by mobile communications and internet access. Between 1960 and 1989, only five African countries held elections on a regular basis. Since 1990, however, there have been over 30 changes of government through democratic processes."

As democracy increasingly takes root around the continent. Better macro-economic policies are being put into place, and this will lead to higher growth of gross domestic product in many African countries. Growth rates of over 6% in the next three years are expected in Angola, the Democratic Republic of Congo (DRC), Ethiopia, Malawi, Mozambique, Rwanda, Tanzania and Zambia.

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**Rising above negative perceptions**

Despite this, however, Lundy has noticed a hesitance amongst international investors to consider Africa’s potential due to the negative perceptions that the global community still holds. "This perception tends to be described by what I call the WWF view of the continent of Africa – that’s not the World Wildlife Fund – it is wildlife, war and famine. And to that you could add disease. That’s really what people think of when they think of Africa."

There is also an issue with public sector corruption in Africa. "However, we tend to blow this out of proportion in terms of the impact on attracting investment," Lundy said, citing Transparency International’s Corruption Perception Index, which showed that most African countries were generally at similar levels as Brazil, China, India and Vietnam, countries that are considered to be definitely...
worth investing in because they are fast growing.

“There is a perception that Africa has problems that other countries don’t have. However, the reality is we’re dealing with those problems, and we’re moving forward. Africa is starting to move more and more in the right direction. If you look at Rwanda, for example, it is now considered the 13th least corrupt country in the world. It is the least corrupt country in Africa, and is using this very specifically to attract more business.”

Consumer power
While many believe that Africa’s growth is driven purely by the exploitation of its resources, the years of civil war and neglect have destroyed the infrastructure needed to get those resources to markets and to ports. Now there is a tremendous amount of infrastructure investment to rebuild ports, roads and railways.

As such, there has been a positive change in the nature of economic growth as African economies have diversified to include more manufacturing and services sectors. “As that money flows into the economies across Africa, we’re starting to see more money being spent on things like consumer goods, telecommunications, housing, education, health care, services, banking, and so forth. Increasingly, money is being invested into manufacturing on the continent so that we’re not just importing goods, we’re actually making goods ourselves in our own continent.”

This consumer power is going to increase and it’s going to continue. Looking at the countries with the biggest populations in Africa, comparing 2010 estimates with the anticipated estimates for 2050, it is clear that countries like Nigeria, the DRC, Uganda, and Tanzania are expected to at least double their populations over the next 35 years.

“Africa is going to have the world’s biggest work force by 2035, considering that almost half of Africa’s population is currently under the age of 18, making it a huge consumer market attracting the attention of the world’s factories. This represents a tremendous growth of buyers and of makers of goods and producers of services – a real possibility for on-going growth and on-going movement into the future,” Lundy adds.

South Africa’s role in the continent’s growth

Only 13% to 15% of Africa’s trade is within the continent – compared to 63% in Europe and 40% in North America – leaving huge scope for better economic integration between African countries, observes Lundy. “We have a lot of work to do in integrating our regional economies, although borders are starting to become more efficient.”

Nevertheless, South Africa has been playing an important role in inter-Africa investment and trade. “We are seeing very strong investment taking place out of South Africa into the rest of Africa. In 2012, South Africa was the single largest investor in foreign direct investment projects in the rest of Africa – which is definitely a step in the direction of regional integration.”

In order to move forward solidly and steadily, Africa needs to focus on education and partnership, Lundy reveals. “Without education, all of this growth is likely to peter out as soon as the process comes to an end. The most important thing for both Africans and developing nations to focus on, if they were only to focus on one thing, is sustainable developments in education across Africa.”

Furthermore, Lundy encourages foreign investors to adopt a more nuanced view of Africa. “It’s a massive continent that is very diverse and very different from place to place. Don’t think of it as a country – think of it as a collection of 54 countries all very different from each other. Understand the differences between them and start to look at how you can benefit, how you can get involved in the growth where it’s happening, in the way that it happens best in each different place.”

To achieve this, Lundy argues that partnership is essential. “Come and talk to us rather than coming to tell us what we should be doing and how the world should be working. Come and work with us on the ground. We understand the place, we know what works, and we know what doesn’t work. If you partner with us, you can really benefit from being part of that growth story.”

Lastly, Lundy adds that Africa no longer needs aid – it needs trade. “Please come and do business with us: look at what we have to offer, bring your services and goods to us to help us develop ourselves as well. The historical view of Africa is a very different story to the view that we have going forward – we actually have a bright future for Africa.”

*Vicky Sidler, deputy editor of Mining Review Africa

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Guy Lundy, futures strategist

Promoting education and long-term growth

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AFRICA’S TOP 10 INVESTMENT COUNTRIES
Africa’s growth rate continues to rise, with sub-Saharan Africa’s 2013 growth rate of 4.7% set to increase to 5.2% this year. This is well above the developing country average of 3.9%. The World Bank and IFC’s Doing Business 2012 listed the following African countries, in ranking order, as the most attractive African countries in which to invest, due to their stable democratic political climates, established functioning free markets, large potential markets due to their large populations, huge raw material bases, as well as abundant and inexpensive labour forces:

• South Africa
• Nigeria
• Angola
• Mozambique
• Ethiopia
• Tanzania
• Ghana
• Botswana
• Mauritius
• Kenya

Nigeria currently has the most newly registered companies yearly, with 70,000. South Africa is second with 30,000 a year, and Kenya boasts the third highest number of newly registered companies in Africa with 22,000 being registered yearly. 2035 is the year in which Africa is going to have the world’s biggest work force, making it a huge consumer market attracting the attention of the world’s factories.
Miners, ministers and other mining industry players begin the year under a cloud of low commodity prices, rising mining costs and falling productivity – a risky environment that requires higher levels of technical certainty, according to SRK Consulting.

TOUGH ECONOMIC conditions are making it harder to fund new mines or even sustain existing operations, so explorers, developers and operators must ensure that the risk factors are well understood and mitigated,” says SRK chairman and corporate consultant, Roger Dixon.

As margins for proposed mining projects are squeezed between softer prices and higher costs, there is less room to deal with project risk, says Dixon; the key to success is to properly address the various ‘modifying factors’ that stand between a prospective deposit and a viable mine.

“Integrating the various technical disciplines is the only way to fully understand project risk,” he continues. “Open pit economics, for example, are heavily dependent on the pit slope angle. To optimise this angle, a detailed knowledge of the structural geology is required, as well as rock characteristics and groundwater behaviour. The three areas of knowledge can then be integrated into the preliminary mine design, and pit optimisation runs can be completed with confidence.”

He emphasises that this integration extends not only to technical factors but also to the engagement of stakeholders like communities, governments and non-governmental organisations, from the earliest possible stage in the planning process.

Vassie Maharaj, director and principal consultant in stakeholder engagement at SRK, says that mining companies’ social licence to operate – their acceptance in the host country and amongst host communities – is now ranked within the top ten operational risks.

“So companies realise that this is a mission-critical area, but many don’t know how to build and sustain those relationships beyond just doing what is necessary to comply with regulations or to get the permits they require,” says Maharaj.

Contamination of water resources is perhaps the key environmental consequence of mining.
“This poses real risks, as stakeholders are becoming impatient in their expectations of what benefits mining should bring, and are more assertive about their expectations and needs. With the rising tide of resource nationalism, host countries and communities hold greater power than ever to withhold their acceptance of mining activities.”

A related risk gaining more attention is the impact of mining on water resources in host communities and countries, according to SRK partner Kurt Uderstadt.

“Contamination of water resources is perhaps the key environmental consequence of mining,” he notes, “and any mine’s disregard for integrated water management issues will ultimately render it unsustainable.”

He said better planning at an early stage – to manage potable and non-potable water supply, surface drainage, groundwater supplies and groundwater ingress – would reduce mine development costs, improve regulatory compliance, avoid litigation, and provide sustainable mine closure initiatives.

According to Dixon, this reflects SRK’s aim of helping clients to plan mines with closure in mind – an approach increasingly demanded by national mining regulations across Africa.

SRK principal scientist and associate partner James Lake says more governments now require that closure planning and liability costing receive significantly more attention from operations than was historically the case.

“In the past, mine closure often received insufficient attention during mine planning, making operations difficult and very costly to close down – often requiring significant materials rehandling to meet closure criteria,” says Lake. “Authorities are likely to scrutinise aspects like the liability assessment more closely in future, and could hold mining executives liable for not implementing closure plans.”

More than ever, risk management in this increasingly regulated environment demands a multi-disciplinary approach based on technical excellence and expertise rooted in local knowledge, concludes Dixon.
INTRODUCING AFRICA’S ELITE SUPPLIERS
AND
SERVICE PROVIDERS
Tyre productivity and efficiency guaranteed

We know best how to buy and sell your tyres. BuyBigTires.com, part of the off-the-road (OTR) tyre world, buys and sells new and used OTR tyres for all types of heavy equipment, from cranes to tractors to mining equipment and everything in between. Its staff are knowledgeable, experienced and work hard to provide clients with even the most difficult to find OTR tyres to keep equipment in service and on the job.

Along with buying and selling OTR tyres, BuyBigTires.com also provide consulting services to heavy-duty equipment dealers and mining companies, ensuring that these companies get the best tyres to suit their needs and operating environment. The company has years of experience in both inventory management and procurement management.

“We continue our education daily through conferences, conventions, and more; and work closely with our long-time clients to help them time their tyre purchases to maximise cost savings while minimising inventory costs,” CEO Tom White says.

In addition to OTR tyres, BuyBigTires.com also sells PressurePro Tire Performance Management Solutions (TPMS). PressurePro TPMS sensors and displays provide operators with real-time accurate data on their vehicle’s tyre pressure and temperature. It also features remote monitoring capabilities.

“We are 100% committed to making YOUR business successful with the right necessities and are confident you will see the superior value we provide to all of our clients on a daily basis!”

In addition to OTR tyres, BuyBigTires.com also sells PressurePro Tire Performance Management Solutions (TPMS). PressurePro TPMS sensors and displays provide operators with real-time accurate data on their vehicle’s tyre pressure and temperature. It also features remote monitoring capabilities.
TPMS provides the following benefits for mine operators:

- Extended tyre life;
- Decreased downtime;
- Reduced maintenance;
- Decreased fuel use and;
- Added safety.

Africa a key growth strategy

BuyBigTires.com is working to open an office in Africa to better serve its current and potential African-based customers across the continent. "As the commodities market picks up we will determine the best location to place a sales team based on numerous factors including access to ports, infrastructure and distance to customers. As the OTR tyre market continues to evolve, we will be working alongside our customers to make sure they are using the best tyre maintenance procedures and employing the latest technologies to minimise downtime and get the most life out of their tyres," says White.

Today mining companies are being bombarded with different technical solutions to improve their equipment productivity. With so many choices, it is tough to determine the correct course of action. Employing the right mix of technologies can improve productivity at a mine tremendously using the wrong set of technologies can lead to cost over-runs and excessive equipment downtime. BuyBigTires.com will continue to help its customers make difficult decisions on which solutions to use across the globe.

The company believes there are tremendous growth opportunities in the mining equipment and OTR tyre business consulting sector. Mining firms the world over are looking for suppliers and partners they can trust to continually deliver high quality analysis, service and products. BuyBigTires.com is a proven OTR tyre supplier and has years of consulting experience with many
BuyBigTires.com’s countries served

- DRC
- Egypt
- South Africa
- Tanzania
- Morocco
- Ghana
- Madagascar
- Burkina Faso
- Niger
- Zambia
- Zimbabwe
- Benin
- Mauritania
- Equatorial Guinea
- Mauritius

Contact:
Scott Carroll
Sales consultant – Africa
† 919-300-7224
scott@buybigtires.com

"We aim to bring our superior procurement management services to more African mining clients in the next few years."

Working with the best ports of call

BuyBigTires.com routinely ships OTR tyres to clients located in Africa through the following ports:
- Port of Cotonou, Benin;
- Port of Tema. Near Accra, Ghana;
- Port of Durban, South Africa; and
- Toamasina, Madagascar (for deliveries in Madagascar).

The company uses these ports for two primary reasons. They are firstly located closest to the bulk of its major African clients and secondly, they are major ports on the continent capable of handling container cargo in an efficient and timely manner. The Port of Durban, South Africa is the largest and busiest shipping terminal on the African continent. The port is strategically placed on major international shipping routes, and is South Africa’s main cargo and container port. It handles up to 31.4 Mt of cargo each year. ‘It is our primary port for shipping tyres to clients located in the southern half of the continent.’

The port of Cotonou, Benin serves as BuyBigTires.com’s primary port for shipping tyres to clients in central Africa and the countries located along the western half of the Sahel.

Tema Port is the bigger of two sea ports of Ghana. It spans a land area of 3.9 million square meters and is flanked by an industrial city. The port receives an average of over 1650 vessel calls per year and these comprise an assortment of container vessels, general cargo vessels, tankers, Ro-Ro and cruise vessels amongst many others. The port’s surroundings serve as a logistic point for inland clearance depots, warehouses, transport and haulage companies, freight forwarders and related service centres. 70% of national trade and traffic flows through Tema port each year with additional volumes of trade and traffic to and from the landlocked countries of Burkina Faso, Mali and Niger. As a result, it has become one

different mining firms operating across continents. “Increasing our consulting business is a major component of our overall growth strategy in Africa and the world.”

Another major opportunity that BuyBigTires.com seeks to capitalise on is helping African mining firms with their OTR tyre inventory and procurement management. BuyBigTires.com has years of experience with helping mining operations right size their global tyre inventory. This experience is extremely valuable to clients of all sizes and...
Once our staff are on site, they are able to show the site operators other areas where they can cut costs, boost productivity or both"
of the company’s primary ports for shipping tyres to clients in West Africa.

BuyBigTires.com has been supplying dealers, international and smaller mine operators throughout Africa for several years and understands that the heavy equipment tyre market is truly global. Due to the demand for OTR tyres around the world and the supply shortage from the manufacturers, it is able to fill the gap and service clients throughout the continent in a timely fashion. In most cases its clients realise substantial savings as a result.

The recent downturn in the global commodities markets has compressed mine operators’ margins. As a result, operators are focusing a lot more on cutting costs and improving equipment productivity. BigBuyTires.com’s sales team has assisted mine opera-
tors throughout Africa in this regard by travelling to sites and analysing their current setups. “Our experience with mining systems analysis can reliably determine the optimal tyre for each piece of equipment and determine the optimal inventory level for each tyre model. In nearly every case, our knowledgeable consultants have helped them realise substantial cost savings,” White highlights.

“Once our staff are on site, they are able to show the site operators other areas where they can cut costs, boost productivity or both. Not only do we supply mine locations with tyres, but we often help them with inventory management as well.”

BuyBigTires.com has years of experience with helping mining operations right size their global tyre inventory. In some cases they may have an over stock of a specific tyre or have many tyres in a size that they no longer use. “In these cases we work on the site operators’ behalf to streamline their on-site tyre inventory by finding buyers for their excess or obsolete tyres.

With our worldwide connections in the mining industry we are able to get the most value for a client’s obsolete tyre inventory. This reduces inventory costs and provides additional revenue to the operator.”
“PressurePro arms you with the most trusted, proven and longest lasting TPMS solutions worldwide.”
The Michelin XTXL
BuyBigTires.com is excited to carry and deliver the Michelin XTXL underground mining service tyre. This is a fairly new tyre model from Michelin, and it provides performance enhancements in many areas compared to the XLDD1 in underground mining applications. Together with some of its clients the company has already proved that these tyres improve productivity and reduce operational costs.

Productivity Improvements
**Up to 10% more tyre life***
- More rubber, better distributed on the whole sculpture
- Thermal build up controlled thanks to the cooling system (Figure 1)

**Up to 20% increased resistance to aggressions***
- Robust design, inside and out (Figure 2)

**20% increased load capacity***
- Allows greater inflation pressures and higher load capacity
- Improves robustness and protection against crown and sidewall impact (Figure 3)

Safety and comfort
- Strengthened bead area thanks to B2 technology (Figure 4)

Improved tyre mounting
- Adapted contact area
  - Better positioning on the rim
- Bead wire, equipped with B2 technology
  - Better pressure distribution through the tyre/rim interface

Environment
- Environmentally-friendly tyre design
  - Free of aromatic oils
- Fewer raw materials consumed
  - Longer lasting tyre

PressurePro TPMS for OTR tyres
**Keeps vehicles producing**
With the climate of today’s market, it’s never been more important to maximise efficiency and productivity. Downtime of production vehicles due to tyre failure is not only costly, but detrimental. PressurePro’s market leading TPMS give fleets the tools needed to keep vehicles and production on the move. Featuring real-time tyre pressure and temperature alerts and readings, in-cab or remote, PressurePro revolutionises tyre maintenance programmes.

PressurePro arms you with the most trusted, proven and longest lasting TPMS solutions worldwide. Cutting edge technology and superior component quality ensure top durability in the harshest of conditions, while partnerships with leading telematics providers bring you the most advanced remote monitoring options available.

**HOW IT WORKS** PressurePro’s original TPMS continuously monitors tyre pressures and temperatures using wireless RF technology to transmit data from stem mounted sensors to an in-cab display monitor. Sensors have unique serial codes eliminating cross-talk and allowing custom baseline pressures from 10 to 30 psi.

The Techking 29.5R25
**An African favourite**
BuyBigTires.com carries many models of the 29.5R25 OTR tyres from Tech-
Over the years it has found that many of the small and mid-size mining operators in Africa have put their trust in Techking OTR tyres due to their rock solid reputation for reliability and performance. The 29.5R25 is a very popular size and fits on a wide range of small and mid-size equipment from tanker trucks and articulated dump trucks to wheel loaders and scrapers. The following is a list of Techking 29.5R25 tires that we almost always have on hand, ready to deploy to operators anywhere in Africa or elsewhere in the world.

<table>
<thead>
<tr>
<th>Tire</th>
<th>Type &amp; Description</th>
<th>Type</th>
<th>TRA Code</th>
<th>Pattern</th>
<th>Star Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>ETSA™</td>
<td>ETSA is designed with a steel radial construction for operating on desert and soft ground as well as paved roads.</td>
<td>Desert Petrol Tanking</td>
<td>E7</td>
<td>ETSA</td>
<td>**</td>
</tr>
<tr>
<td>ETSM™</td>
<td>The super-deep, smooth Techking LSS designed for maximum wear and reliability on wheel loaders and haulers working in severer mines, quarries and waste-handling conditions.</td>
<td>Loader</td>
<td>L5S</td>
<td>ETSM</td>
<td>**</td>
</tr>
<tr>
<td>ETNT™</td>
<td>ETNT is designed for underground trucks in underground mines.</td>
<td>Underground Truck</td>
<td>E4</td>
<td>ETNT</td>
<td>**</td>
</tr>
<tr>
<td>ETDL™</td>
<td>The ETDL radial tyres designed for severe and rocky surfaces guarantee good traction, stability and a comfortable ride. Not for underground.</td>
<td>Loader</td>
<td>L4</td>
<td>ETDL</td>
<td>**</td>
</tr>
<tr>
<td>ETDLSS™</td>
<td>ETDLSS is designed for surface application only, with special compound against sidewall tear or crack. It’s equipped with “Fuel-Save-Technology™” for lower CPH requirement.</td>
<td>Loader</td>
<td>L5</td>
<td>ETDL5</td>
<td>**</td>
</tr>
<tr>
<td>ETD2S™</td>
<td>The directional L5 radial tyre for wheel loaders is designed to provide a high level of stability, traction and protection combined with a cushioned ride for operator comfort.</td>
<td>Loader</td>
<td>L5</td>
<td>ETD2</td>
<td>**</td>
</tr>
<tr>
<td>ETDL5™</td>
<td>The ETDL5 is perfect for heavy-duty operation in open pits, quarries and underground mines.</td>
<td>LHD</td>
<td>L5</td>
<td>ETDL5</td>
<td>*** **</td>
</tr>
<tr>
<td>ETADT™</td>
<td>The ETADT pattern provides great traction and flotation.</td>
<td>Articulated Dump Truck</td>
<td>Super E3/L3E4</td>
<td>ETADT</td>
<td>**</td>
</tr>
</tbody>
</table>

MEET THE CEO Tom White  BUYBIGTIRES.COM CEO, Tom White, has been with the company for several years but has been involved in the OTR world for most of his life. He is constantly educating himself on OTR tyre needs around the world so he can better assist customers. Tom establishes new relationships on a daily basis with business owners seeking consultation for their tyre needs. He understands the competitiveness in the world and is here to ease your searching for the best product for your need. “It is a humbling experience to see how vast the world is and to know that I am able to serve it. I am extremely motivated, and enjoy helping customers find new ways to do old things. It is amazing to see all the different opportunities there are in the world of import and export. I look forward to serving you with your earth mover tyre needs – beginning TODAY!”

BUYBIGTIRES.COM
OTR TIRES

Buy Big Tires offers the largest selection of off-the-road tires of any retailer on the planet. We supply both new and used OTR tires from all the biggest brands and for nearly every OTR application.

If you need assistance with selecting the correct OTR tires, contact us and one of our knowledgeable consultants will be happy to assist you.

ABOUT US

Buy Big Tires is all about Off-the-Road (OTR) tires. We buy and sell new and used OTR tires for all types of heavy equipment, from cranes to tractors and everything in between.

We also provide consulting services to heavy duty equipment dealers and to mining companies to ensure that they get the best tire for their equipment and their operating environment. Our staff is knowledgeable and experienced.

We work hard to get you even the most difficult to find OTR tires to keep your equipment in service and on the job.

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CONNECT WITH US

For OTR tire inquiries please call us at: +1-919-300-7224
The mining sector accounts for the largest slice of Bell Equipment’s order book. With mining activities poised to increase substantially in the southern African region in particular, Bell Equipment believes it imperative to be well positioned to leverage opportunities.

Growth supported by products to meet every need

Key to meeting the needs of the earthmoving and mining sector is the company’s ability to provide a full line of premium mining equipment – equipped to handle Africa’s harsh mining conditions.
environment and supported by world-class customer support facilities. As a manufacturer, Bell has demonstrated the company’s ability to conceptualise, design, manufacture and support a varied range of vehicles that compete against imported products from significantly larger companies. In South Africa the company is a national manufacturing icon – competing successfully in the global market with its locally produced range of Articulated Dump Trucks (ADTs).

To complement its own product range in Africa, and to support the company’s strategy to become Africa’s preferred equipment supplier, Bell Equipment has partnered with premium global equipment manufacturers to provide customers with a comprehensive range of machines in the construction, forestry, mining and agriculture industries. Products to match every need are now part of the Bell stable.

Opening up new opportunities
As an ADT specialist, Bell Equipment has the largest and most comprehensive ADT range worldwide, from the B18D through to the flagship B50D, the world’s largest production ADT. Its range also includes the VersaTruck programme of customised ADT solutions, including water tankers and low profile ADTs, among many others.

To open up opportunities in the market traditionally contested by 60 t rigid trucks, Bell Equipment has developed the Bell B60, a 60 t truck that combines the ADT concept with a single rear axle.

The result is a unique machine configuration – a 4x4 with full articulation steering and an oscillation joint to keep all four driving wheels on the ground and fully utilise the available traction. This gives the B60 more off-road capability than any conventional rigid truck.

Bell ADTs offer leading performance, safety and reliability as well as the lowest operating costs on the market. Among the most sophisticated ADTs on the global market, standard features of Bell ADTs include on-board weighing, keyless ignition, HillAssist, Bin Tip Prevention, Auto Park Application (APA), Turbo Spin Protection and remote production monitoring.

Bell Equipment’s own fleet monitoring system, Fleetm@tic, has been designed in-house to provide customers with a tailor-made tool to meet their needs according to their operating environments.

The on-board weighing system tracks the mass of each load, providing customers with detailed knowledge of how their machine is running as well as how much their machine has carried. Complementing the ADTs is an extensive range of excavators and wheeled loaders providing well-matched loading tools.

Graders, rollers and stabilizers provide solutions for haul road maintenance and site development while the Bell range of tracked dozers are used at the tip area and for both mine development and rehabilitation.

The Bell Finlay range of mobile crushing and screening plants includes jaw, impact and cone crushers that are internationally renowned for their versatility and flexibility in the reduction and sizing of aggregates for mining and quarrying.

Delivery at your doorstep
Bell has 60 years of experience building and distributing equipment in Africa which is suited for African conditions and has an extensive footprint to provide first-class customer support – this includes superior parts availability and competitive parts pricing.

Bell Customer Service Centres (CSCs) are located close to the action and close to the Bell customer base in all mining-focused areas while the company’s Global Logistics Centre in Johannesburg supports the “best network in Africa.”

As part of its growth strategy on the continent, Bell has made massive investment into Southern Africa developing new customer service centres in key growth areas including Tete and Nacala in Mozambique, Lusaka in Zambia and Kolwezi in the Democratic Republic of Congo (DRC). More recently the company has invested in a new CSC in Kitwe, Zambia, which is a US$20 million state-of-the-art facility housing a regional parts depot and an eight-bay workshop.

In the Zambia, DRC, Mozambique, Zimbabwe and Botswana regions Bell has approximately 350 staff dedicated to customer service and support. Across Africa there are also about 120 apprentices in the Bell apprenticeship programme, who will qualify in terms of the South African Quality Authority (SAQA). This is part of the company’s commitment to growing feedstock from and investing in the region.

Bell Equipment is also investing in its CSCs in South Africa, most noticeably in the key mining areas. Over the past 18 months the company has opened a new Middelburg CSC, a world-class facility representing an investment of R50 million; as well as CSCs in the Nelspruit and the mining-rich area of Kuruman. A R40 million tailor-built facility at Rustenburg is currently under construction and due to open during 2015.
Born and bred right here - Bell is Africa’s very own global equipment supplier. With support from our strategic partners we deliver a full range of premium machines. All built tough for our harsh environment. All supported by Africa’s most comprehensive network of people dedicated to your success.

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The first edition of Mining Review Africa’s ‘Mining Elites in Africa’ provides you with a spotlight on the elite mining suppliers and service providers on the African continent. This is your personal guide to who is doing business in Africa, how they are doing it and how they plan to increase and expand their service offering further to help improve your mine.

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IMPROVEMENTS IN Vermeer’s technology now allows continuous surface mining of material well above 140 MPa (20 300 psi) efficiently and cost effectively when compared to drilling and blasting/primary crushing methods.

These include the elimination of the use of explosives and primary crushing, the ability to precisely extract the ore from the waste, or separate ores of varying chemistry and mine thin seams and non-homogeneous ore bodies cost effectively. In addition, precision surface mining extends the useful life of a mine by extending the mine boundaries. It can expand production capacity in existing mines and is particularly cost effective in Greenfields start-up mines. Precision mining techniques in general result in higher percentage recoveries.

During conventional drilling and blasting operations, there is little control over how the material fractures and the amount of mixing that occurs during the blast. In some mines/quarries this mixing will result in unacceptable product quality and increase the cost per tonne of the mined product to unacceptable levels. The ability to exactly control the cutting surface is what makes continuous surface mining into precision mining.

Since the surface miner is also the primary crusher in a mine, the type and size of the secondary and tertiary crushers can be linked to the product produced by the surface miner. This infrastructure is considerably less expensive to purchase and more quickly installed than a large primary crusher. Smaller size mines may consider using mobile crushing units to produce a product of the desired size fraction.

Vermeer has made a commitment to provide a complete family of precision mining equipment for the mining industry. It is expanding both the range of capabilities and the size of its Terrain Leveller SEM fleet so that flexibility is the rule in choosing the smart alternative.

In southern Africa Vermeer currently has Terrain Levellers working in the copper sector and recently successfully trialled in coal as well. It also has trials planned for uranium and limestone.
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THIS IS WHERE THE NAME ON THE MACHINE MATTERS MOST. Whether you’re facing the hassles of blasting or hammering, Vermeer and our global dealer network will be right beside you. We know the conditions you face are demanding — that’s why we make sure our equipment is up to the task. The Vermeer Terrain Leveler® surface excavation machine helps you get more value from the mine, while reducing the need for costly support equipment. So when it’s tough going out there, look to Vermeer — the trusted name for proven equipment and reliable support.

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WE LOOK FORWARD TO WELCOMING YOU TO OUR NEW, PURPOSE-BUILT PREMISES EARLY 2015!
Following its continued and measurable success across Africa, specialist drive engineering company SEW-EURODRIVE has intensified its focus on growing business in Africa.

**Strong expansion drive into Africa**

In total, SEW-EURODRIVE boasts a presence in over 46 countries. Locally, the company has 220 employees and four assembly plants in Johannesburg, Nelspruit, Cape Town and Pinetown – with a dedicated service plant in Port Elizabeth.

An African strategy team which was formed late in 2013 identified various key areas within Africa and during this time it was decided to allow for clusters with cluster managers to ensure a focused approach in each region. This strategy aligns with the company’s credo of getting closer to the customer ensuring the world-class service.
in AFRICA

for which SEW-EURODRIVE is renowned is available on the doorstep of the customer.

During this restructure, the South African company went from looking after 23 countries in Africa to a manageable and healthy 11 countries in southern Africa, allowing it to really focus on the customers in these regions and offer them the best service and more regular contact.

Rob Green, sales manager for SEW-EURODRIVE in Johannesburg, heads up the exports division and points out that SEW-EURODRIVE South Africa has experienced considerable success within southern Africa.

"Madagascar and Mauritius have been important contributors to this success over the past two years, thanks to the sugar and mining sectors. Another region performing well for us is Namibia, where we are seeing great success in the mining." According to Green, Angola is another market that holds enormous potential for SEW-EURODRIVE in Africa.

"Angola has developed from an agriculture-based economy into one of sub-Saharan Africa’s main oil and mineral producers. High foreign investment (current FDI inflows are estimated at USD$15 billion) and strong government spending has propelled Angola onto a robust growth path. The country has a prosperous future ahead of it, and SEW-EURODRIVE plans to play a major part in that."

In order to ensure that expansion into Africa is as streamlined as possible, SEW-EURODRIVE has employed a Portuguese speaking expert in the exports division. “This eliminates the obstacle of words being lost in translation, while showcasing our commitment to long-term development in the Portuguese speaking regions of Africa.”

As a result of continued success in the region, the head office in Germany recently opened an additional African branch located in Tanzania. The branch will service key developing markets, including Tanzania, Kenya, Ghana, and the eastern region of the DRC. An established office is already operational in Morocco to service the north of Africa.

Looking ahead, Green is optimistic of the future outlook for SEW-EURODRIVE in Africa. “We have experienced overwhelming success in recent years, and I anticipate that trend to continue, especially as investment across Africa looks set to rise exponentially in the coming years.”

\[\text{SEW-EURODRIVE has an impressive 80% stockholding – of the stock items that the company sells at any given time}\]

SEW-EURODRIVE has experienced overwhelming success in recent years, and I anticipate that trend to continue, especially as investment across Africa looks set to rise exponentially in the coming years.” Rob Green, sales manager

SEW-EURODRIVE general manager of operations Raymond Obermeyer notes that stockholding and spares form an important part of the company’s business strategy in Africa.

“It contributes a significant amount to our business, as we pride ourselves on the ability to offer availability of spares and accessories as part of our after sales support on a 24/7 basis,” he states.

Obermeyer reveals that there is constant demand for accessories and spares, with some customers ordering critical spares ahead of time in order to have them available when they are needed. There are numerous accessories that are available to customers through SEW-EURODRIVE, including cooling systems, condition monitoring equipment, maintenance operating manuals, as well as selection and design software.

SEW-EURODRIVE has an impressive 80% stockholding – of the stock items that the company sells at any given time – a business area of great pride. Obermeyer explains that if the required part is available from any of the company’s five South African branches, it can be delivered to the customer within a very short period of time.

The SEW-EURODRIVE South African office directly services 11 countries in the southern African region. These include:

Namibia
Angola
Zimbabwe
Zambia
Botswana
Mozambique
Malawi
Swaziland
Lesotho
Madagascar and Mauritius

Comprehensive stockholding
Ensuring competitive turnaround times for clients across Africa

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Obermeyer reveals that there are two types of customers in the African market, namely those who operate the equipment until it needs replacing, and those who make use of conditioning monitoring equipment and the benefits that it provides.

"There are several reasons for the different types of markets. Firstly, there is a lack of skills in the country, and people do not know how best to look after the equipment. Then there is the financial implication of maintaining equipment, as condition monitoring is expensive. However, investing in the maintenance of equipment results in a better return on investment when focusing on the long-term."

**Training in Africa**

**Satisfying a hunger for training**

In 2011 SEW-EURODRIVE launched the Drive Academy in South Africa – whose focus is to train the mining sector end-user in the application of drive technology, mechanically and electrically across any SEW product. Courses cover all product areas from product use to maintenance, trouble-shooting and assembly as well. "We have been so successful in this area that we are considering the establishment of a second academy," says Green. To date SEW-EURODRIVE has trained about 700 people.

Green believes that the Drive Academy gives SEW-EURODRIVE an edge over its competitors. "All training is developed to suit the specific needs of individual clients in different regions. This commitment to customer satisfaction through a value-added service offering clearly shows our willingness to remain an industry frontrunner."

Outside of the Drive Academy, SEW-EURODRIVE provides on-site training to clients in Africa, which most recently includes Madagascar where it assisted a client with the assembly and maintenance of its industrial gears. The company has provided this service to Malawi and Ghana as well in 2014 – with 70 on-site employees trained.

The training courses, developed in Germany, are internationally stan-
We have emphasised and intensified our African customer-specific training focus in 2014 having recognised a need for it. So many mines in Africa are located in remote regions and on-site workforces are not equipped to handle product-related issues. This is quickly and easily resolved through training,” says exports sales engineer Marcio Sicchiero. “We also train the trainer, enabling them to pass the knowledge forwards to new employees and provide demo models to assist the learning process. With new product technology being introduced on a regular basis, the need for training is further necessitated.”

SEW training specialists will spend up to a week on site training – covering both theory and practical applications. “We make use of on-site specialists for this in-demand job to ensure maximum value,” Green notes. “It also has the added benefit of introducing clients to new product upgrades and technologies, which is good for generating new sales and business.”

SEW-EURODRIVE in South Africa has developed the first industrial gears training – having seen a market need specifically for the product in the country which does not exist elsewhere.
1 Enabling mobile materials handling with Maxsolution

The latest solution to replace static conveying with mobile conveying

MAXOLUTION is an innovative new solution based on recent developments in materials handling, and could add substantial value to the minerals processing industry higher up the value chain.

According to SEW-EURODRIVE general manager sales and engineering Conrad Pilger, industrial gearboxes and motors are ideal for bulk materials handling, but are limited in their functionality when processed material, such as gold or platinum, becomes valuable.

“To reduce the potential for pilfering, human handling should be limited with the higher-value commodities, and this is where MAXOLUTION comes into play,” he explains.

The trend in the industrial environment is a move away from conveyor belts that just move products from ‘A’ to ‘B’, and instead having an item or station that moves from ‘A’ to ‘B’. Although standard in the automotive industry, this technology is brand new to the local mining industry.

This technology comprises wireless communication and inductive power transfer systems. Pilger explains that instead of having cable trays or busbars to transfer power to the mobile solutions, SEW-EURODRIVE makes use of its MOVITRANS contactless energy transfer system.

“Here, electrical energy is transferred from a fixed conductor to one or more mobile consumers, without contact. Instead the electromagnetic connection is made via an air gap, which means it is not subject to wear-and-tear and is therefore virtually maintenance-free,” he states. This type of power supply is also emission-free and resistant to contamination from external sources.

In addition, the wireless communication is shielded in order to prevent loss and interference.

How the system operates

An automatic guided vehicle (AGV) utilises inductive power supply in the form of transfer cables embedded into the floor. One of these is a leakage cable, which provides the communications. The AGV boasts a built-in safety feature that slows it down when humans are near its path.

Pilger notes: “This safety concept is based on a scanner that will detect any people in the vicinity, whereupon it will switch off and enter a ‘safe’ mode. This technology is particularly beneficial to the mining industry, which continues to place a greater emphasis on health and safety.”

SEW-EURODRIVE is able to offer a total solutions package for its mining customers. “We focus not only on the inductive power transfer, but also the gearboxes and motors – including the positioning system, wireless communication and power and control systems,” states Pilger.

Additional functionality can be added to the system in the form of an integrated hoist. Due to the positioning benefits, the user can swiftly and dynamically change their station layout for different production runs.

Pilger indicates that local project houses, designers and consultants have expressed a keen interest in the solution. “Feedback received indicates that they are all attracted to the higher technology due to the flexibility it allows them in changing production runs and volumes.”

Although the initial capital outlay for MAXOLUTION is high, Pilger notes that he is confident that the labour benefits and energy savings will entice more African mining clients to go this route.

2 New frequency inverters

Ideal for harshest Africa

A new range of robust MOVITRAC LTP-B frequency inverters, designed for use in various non-control cabinet applications, is ideally suited to the harsh African mining environment.

Electronics manager Norman Maleka says that MOVITRAC LTP-B frequency inverters are ideal for use in dirty or moist environments, and are available in IP55 rating in the power range 0.75 to 160 kW. The line voltages range from 3 x 230, 3 x 400 and 3 x 575 Vac.

“These frequency inverters have been designed and developed for controlling the speed of asynchronous and synchronous motors without an encoder and are particularly cost effective in conveyor and hoist applications, as well as in fans and pumps,” he explains.

There is also an option called the Smart Servo LTX package. The unit is able to control an encoder-less servo. It comes standard with motor control such as VF, VFC and VFC torque and can handle an overload capacity of up to 175%.

“To reduce the potential for pilfering, human handling should be limited with the higher-value commodities, and this is where MAXOLUTION comes into play.” Conrad Pilger, GM – sales and engineering
In addition, the unit comes with an integrated PID controller. One of the features of this unit is the ‘fire mode’, which is suitable for HVAC applications. This function, in the event of fire, enables the unit to ignore all errors and run until it is damaged. "This way, smoke and fumes can be extracted from the building," Maleka notes.

The MOVITRAC LTP-B frequency inverters feature a standard, integrated six-digit, seven-segment display keypad, which allows for parameter setting as well as monitoring. Maleka reveals that the keypad offers five functions, namely start/run, stop/reset, navigation, up and down.

"The start function enables the running of the motor, and reverses the direction of rotation if the bi-directional keypad mode is enabled. The stop function stops the motor, and also allows the user to reset a tripped drive," Maleka observes.

In addition, the navigate function displays real-time information, and stores parameter changes. If the user holds down the button, the device will enter or exit the parameter edit mode.

The up and down functions of the keypad allow for the increase or decrease of speed in real time, as well as for the increase or decrease of parameters in the parameter edit mode.

There is also a built-in brake chopper circuit, which can be used with an external braking resistor to convert regenerated energy from the motor into thermal energy.

"This function is generally needed for applications with a fast deceleration ramp or a high inertia load, such as hoist applications.

A flat-pack resistor is also available and can be mounted inside the drive unit without the need for additional space. “The flat-pack resistor is suitable for use with all MOVITRAC LTP-B units with low inertia applications.”

According to Maleka, line chokes reduce harmonic distortion and protect the MOVITRAC LTP-B units from harmful supply disturbances. "They can also protect the power input circuits of the MOVITRAC LTP-B against voltage spikes which can originate from lightning strikes or other equipment on the same system."

"These frequency inverters have been designed and developed for controlling the speed of asynchronous and synchronous motors without an encoder and are particularly cost effective in conveyor and hoist applications, as well as in fans and pumps.” Electronics manager Norman Maleka
“IP54 certification ensures that the unit is dust and water-tight, which enables the user to wall-mount it on the outside of a switch cabinet. Thanks to its user-friendly design, the unit can also be installed inside the switch cabinet too, if the application requires so.”

4 Versatile girth gears

Adding value to the mining sector
Flexible girth gear range assists in the transfer of drive torque from the gear motor to the rotary cylinder, simplifying manufacturing, transportation and installation. The SEW-EURODRIVE girth gears can be used by mining operations to drive large rotating systems such as rotary kilns. They are installed around the circumference of these systems and transfer the drive torque from the gear motor to the rotary cylinder.

Unlike traditional girth gears, which generally consist of two to four segments that are assembled together for processing, SEW-EURODRIVE girth gears are split into several identical segments in order to keep the component parts short and easy to handle. “Traditional girth gears need large and expensive machines for production, handling and heat treatment. The size of component parts also creates challenges with regard to casting and heat treatment. SEW-EURODRIVE uses austempered ductile iron (ADI) for girth gears, which boasts unmatched tensile strength compared to other materials,” says Pilger.

According to Pilger, the decreased size of the girth gear segments reduces the cost for the scrapping of blanks. “These blanks can be used without additional welding or oversizing. In addition, the use of ADI lowers the weight of the girth gears and features an above average contact fatigue strength thanks to its cold work hardening properties.”

These cold work hardening properties, when combined with an appropriate girth gear size, allow for a more compact and lighter gear design than traditional solutions. This low weight is important for the handling and assembly of the girth gear, as well as for achieving circumferential velocity.

The segmented design simplifies handling at the construction site. Due to this design, there is no need for special transportation. The segmented design also guarantees an initial pitch accuracy of ISO 8, which minimises the vibrations of the girth gears.

Pilger points out that a benefit of the segmented design is that if a segment or part is damaged, it can easily be replaced without the need for dismantling the entire ring. “In addition, with the correct dimensioning, alignment, load and lubrication, an ADI girth gear is almost wear-free.”

SEW-EURODRIVE provides entire drive packages, including girth gears. This includes the basic gear units, as well as the drive pinions, a base, housing, and any other parts that are required.

“When supplying girth gears, the process involves machine designers and users in order to determine the best technical and economic solution for the desired application. SEW-EURODRIVE specialists support the process from the consulting stage right through to the assembly and start-up,” Pilger concludes.

5 The X-Series’ X-cellence

Heavy-duty X-Series industrial gear units first introduced in 2006 have set the pace for significant growth in market share in Africa.

The robust X-Series helical and helical-bevel gear units have become recognised for their performance capabilities in driving large and industrial bulk materials systems such as high volume conveyor belts and bucket elevators. Its catalogue configurations offer torques up to 475 kNm with gear ratios up to 400. In addition, customised engineered-to-order solutions extend the product’s standard design range as well.

“The product has definitely gained recognition in the local market and is well associated with the name of
SEW-EURODRIVE,” says business development manager for heavy industrial solutions Steffen Reiblein. (Reiblein is based at SEW-EURODRIVE’s head office in Germany.)

“Considering our local presence in the market is less than 10 years, we are still in our infancy period with this product which means our scope for growth is significant.” And since SEW-EURODRIVE already holds a large market share in industrial gears in many markets throughout the world, large-scale growth targets in regions like Africa are not overly ambitious. “As we continue to prioritise this product and drive market awareness and growth into Africa, a continent SEW has ranked one of the top regions for heavy industrial gear growth, we need to communicate and educate on overall product awareness as well however.”

Reiblein is referring to X-Series’ modular concept. “Our connections in the industry include end-users and equipment operators, consultants, project engineers and numerous original equipment manufacturers positioned all around the world. In light of this, it is beneficial to our local assembly philosophy that the design concept of X-Series builds on a modular concept with multiple usages of components. This results in faster delivery, greater performance, easier maintenance and better spare parts availability (bearings and seals for example), regardless of country or time zone.”

A great product, constantly improving

Today the X-Series comprises 23 different sizes, each designed to suit specific torques, duty and motor needs and deliver the greatest accuracies. “It was a natural progression to enter this sector of the market following on our extensive experience with gear motors and drive systems. X-Series’ features and characteristics resulted from market and industry knowledge from numerous industry experts who worked jointly to derive the best product for market. We definitely consider this series superior,” Reiblein states confidently.

“Our attention to product enhancement through research and development is an on-going activity at SEW-EURODRIVE. We are constantly refining the units and developing new application-specific solutions for it, such as for mixing and hoisting applications. Since its introduction we have also created new housings for certain applications such as the thermal housing configurations designed specifically for conveyor belt applications (to reduce costly external cooling systems) where the units have displayed a high level of interest from industry.”

Heavy-duty X-Series industrial gear units first introduced in 2006 have set the pace for significant growth in market share in Africa

Business development manager for heavy industrial solutions Steffen Reiblein and Conrad Pilger

Conrad Pilger and Raymond Obermeyer with the first X-Series that arrived in South Africa in 2008
MEET THE MD – Ute Schoeman

**STRATEGICALLY GROWING THE BUSINESS**, SEW-EURODRIVE South Africa’s MD Ute Schoeman confidently boasts the company’s average growth rates of between 15 and 20% (year on year) over the last three years. This is attributable to numerous factors including service and maintenance in the mining sector, diversification and SEW-EURODRIVE’S approach to business – long-term innovative strategists.

“We continue to invest in South Africa, which services the SADC region, during the current challenging period. The company has invested about R47 million in current and new properties over recent years, focusing primarily on expansion in South Africa.

“In addition to expanding its 4 000 m² Durban, KwaZulu-Natal facility, it has also acquired new property in Johannesburg in line with its plans to expand its Gauteng-based factory. The company also makes yearly investments into its Nelspruit-based operation, in Mpumalanga. African countries, including South Africa, still hold abundant minerals and resources opportunities and remain focused on socio-economic development and growth. The result is opportunities for our business as well. When the markets turn, we want to be in a position to capitalise on our current investments for the future.”

Together with an excellent product we are confident in our ambitions to drive it fully into the African market.”

**Watch out**

SEW-EURODRIVE will launch a standardised X-Series gear unit design for vertical applications such as mixing and agitation in 2015 as well as the newly developed application-specific P-X-series solution for bucket wheel drives and apron feeder solutions. They will be both engineered and assembled to order by SEW’s local branch.

**Opportunities and challenges of the new engineering world**

With an emphasis on improving mathematical and science knowledge by education departments worldwide, and access to ever improving computer power, engineering services can literally come from anywhere in the world. What they may not be able to provide, however, is innovation, design and problem-solving skills. Skills that cannot be taught through any single subject, degree or faculty, but through experience and opportunities to learn in a supportive environment.

The ability to innovate, solve problems across multiple business layers and communicate across cultures and languages have been identified as key factors in the future prosperity of both individuals and nations. In the engineering field, the challenges to personal ability are even more intricate. Not only will the engineer of the future need to innovate, but they will need to call on multiple skills to make the innovation a reality.
Innovation + hands-on learning = opportunity

The PneuDrive Challenge, a student mechatronic engineering design competition initiated in 2008 and sponsored by SEW-EURODRIVE and Pneumax, is a practical example of how business, engineering faculties and students can collaborate in order to enhance engineering education.

This strategic learning experience annually allows approximately 400 mechanical, electronic and mechatronic engineering students from around South Africa to analyse, design and experiment with intelligent automation systems according to a structured learning path which is supported by coaches and subject matter experts.

Having access to engineering products and subject matter experts who can advise on how to best select products and test proposed applications is an important step for engineering students who need to learn how to practically bring together engineering theory with real-life engineering design challenges.

The PneuDrive Challenge presents itself as a very strong model for providing a bridge between academic theory and the business requirements of industry. The winners of the competition receive a ten day all expenses paid trip to Germany and Italy where they will have an opportunity to present their designs to the head offices of the sponsor companies – another invaluable learning opportunity for young engineers. SEW-EURODRIVE and Pneumax also offer more than R300 000 worth of equipment to competing universities to ensure that future students are afforded the opportunity to experiment with the latest in drive engineering and pneumatic technology.

This year’s judging panel included (from left) Norman Maleka (electronics manager, SEW-EURODRIVE), Theuns Greyvenstein (ombudsman - Maxolution Application Engineer, SEW-EURODRIVE), Andre Badenhorst - (technical director from SAR Electronics SA), Brandon Skinner (E&I engineer from DRA Mining), John Menasce (lead mechanical engineering consultant from HATCH), Heathcliff Barnard - (technical manager, Pneumax), Piergiorgio Bertoldi (MD, Industrial Electronic Services) and Russell Gill (SAPPA council member).

And the 2014 PneuDrive awards goes to.....

This year’s competition, themed Green Warehousing Logistics, called on students to analyse and design a solution for a specific operational problem in one of the following areas of a warehouse: Retrieval, Conveying, Placement, Packing, Palletising and Loading.

The top three places for engineering design went to:

1st – Stellenbosch University – MOVIPAL
Students Landolf Theron, Herman Nieuwoudt, Jos Van der Westhuizen and Stefan Nel proposed a mobile palletising solution. Their design addresses the problems associated with two warehouse operations, namely palletizing and local transport, and combines the functionality of a gantry style palletiser and a forklift, providing a mobile palletising solution. The target of the MOVIPAL is small to medium sized warehouses in the production and logistics industries.

2nd – Nelson Mandela Metropolitan University – TetraStack
TetraStack (also awarded the innovation prize) is an ultra-high throughput warehouse defragmentation system designed by Adriane Bestic, Shuldham Peard, Ashley Naude and Christopher Sephton was an idea based on the popular Tetris game. Their design mirrors the sorting action of the game by continuously rearranging crates within a racking matrix so as to consume the least amount of space, as low down in the matrix as possible.

WITS University – The Out-The-Box-Palletiser

Students Gareth Krisch, Adam Bartels and Eitan Kassuto presented a design that could be a solution to manual labour palletising problems by proposing a stand-alone, mobile and flexible palletising device. Their design could provide warehouses which mainly make use of manual loading with an alternative application that could reduce running costs, increase productivity, improve worker safety and has the potential to be flexible enough to fit in with most line palletising operations.

Accelerating the speed to competency

The approach of this year’s competition to offer a learning platform that presents warehousing and logistics challenges and business problems alongside the latest technology used in the industry, is a platform that many, if not everybody, engaged in South African business would support.

It is business that needs to support learning experiences that allow students to apply their academic knowledge on a practical level and in conjunction with the latest technology that is available.

The sponsors, organisers and judges of this year’s competition believe that students who immersed themselves in the competition, showed the right academic credentials and displayed appropriate problem solving skills, essentially have begun to open their own doors and take a confident first step into the engineering industry.
Brelko Conveyor Products’ claim to mining business fame. Coupled with an extensive and growing African footprint stretching back to the company’s inception, it is a materials handling force to be reckoned with.

Established in 1987, Brelko supplies and advises the bulk materials handling industry on spillage control. It also offers proactive and continual maintenance for preventative spillage control and optimum belt cleaning through a global branch, distribution and agency network across more than 40 countries.

The proudly South African and 80% black-owned company’s equipment is manufactured at its in-house 16 566 m² facility in Johannesburg and supported by an installation and maintenance package serviced by 37 service teams.

Its African equipment installation network is nothing short of impressive and includes Zambia, Namibia, Angola, Mozambique, Tanzania, the Democratic Republic of Congo (DRC), Gabon, Ghana, Mali, Mauritania, Sierra Leone, Egypt, Côte d’Ivoire, Senegal, Republic of Congo, Central African Republic, Madagascar, Mauritius, Zimbabwe and Botswana.

FULL FOLLOW-THROUGH

Once a project has been commissioned by Brelko (through its Johannesburg-based head office), it is fully assisted ‘on the ground’ by its local agent. Once fully commissioned, the agent assumes full maintenance responsibility which includes ensuring that adequate stock levels are kept to enable and maintain prompt service delivery. They are supported by Brelko’s Service division personnel who will fly out and assist agents wherever necessary. Agents are trained at Brelko’s head office four times a year. This is mandatory to maintain competency levels.

To date, Brelko has full maintenance contracts at the Debswana Orapa plant 1 and Jwaneng in Botswana and the Zimplats concentrator, smelter and portals 1, 2, 3, 4 and 5. In countries where the company does not have agents, it encourages the customer to either send personnel for training to Brelko or alternatively, the company will travel and provide on-site training.

THE BRELKO PRODUCT RANGE

Belt scrapers
A complete range of primary and secondary scrapers, V and Angle ploughs. Scrapers feature the patented ‘V double arm blade and torsion holder mounting. The system is designed for stability and makes maintenance and blade changing quick and simple.

Keyskirt chute sealing and belt support systems
The patented chute sealing system is designed to provide optimum containment of large lumpy material and is especially effective when used in conjunction with the Brelko feedboots belt support system, designed to be used at load points to support the conveyor belt, preventing belt sag between idler rolls and thereby ensuring maximum skirt sealing and spillage control. Ultra-high-molecular-weight polyethylene material is used to line the load surfaces, thereby reducing friction and wear.

Belt tracking systems
Brelko belt tracking systems can be installed on the troughing and return side of the belt to quickly and effectively centralise misaligned belts, and prevent belt edge damage, structural damage and spillage.

QUALITY MANAGEMENT

THESE THREE attributes are belt cleaning equipment manufacturer, Brelko Conveyor Products’ claim to mining business fame. Coupled with an extensive and growing African footprint stretching back to the company’s inception, it is a materials handling force to be reckoned with.

1 Business savvy

2 Technologically advanced and robust products

3 Manufacturing and delivery perfection

BEACON

TOP
Brelko’s massive warehouse

BELOW FROM FAR LEFT
Installing troughing belt tracking systems
Brelko’s equipment backed up by an installation and maintenance package serviced by 37 service teams
Brelko has a fully equipped training centre to meet the training needs of its customers, agents and staff
Brelko is a South African manufacturer, distributor and exporter. All its products are manufactured at its in-house manufacturing facility in Johannesburg.
TOTAL TRANSFER POINT SPILLAGE CONTROL

Product Range

- Air Cannons
- Belt Scrapers
- Belt Ploughs
- Chute Sealing Systems (Keyskirt®)
- Hi-Impact systems
- Impact Beds
- Belt Tracking Systems
- Belt Wash Systems.
- Service & Maintenance

Tel  : +27 11 013 4000
Fax  : +27 11 013 4150
E-mail : info@brelko.com
Web   : www.brelko.com
Defining the automation industry since 1980, and still going strong!
Defining the automation industry since 1980, and still going strong!

Ultimately, in order to realise Industry 4.0 following a genuinely holistic approach, three aspects must be implemented:

• horizontal integration across value creation networks – i.e. beyond the limits of individual companies
• vertical integration or networked production systems and
• the universality of engineering over the entire product life cycle.

Technological innovation
Leading from the start

An equal growth contributor to the Beckhoff business is the continuous development of new technologies and solutions on the basis of PC-based control. Many automation technology standards that are taken for granted today were conceptualised by Beckhoff at an early stage and successfully introduced to the market. Since the company’s foundation in 1980, continuous development of innovative products and solutions using PC-based control technology has been the basis for the continued success of Beckhoff.

The Beckhoff PC Control philosophy and the invention of the Lightbus system, the Bus Terminals and TwinCAT automation software all represent milestones in automation technology and have become accepted as high-performance alternatives to traditional control technology. EtherCAT, the real-time Ethernet solution, makes forward-looking, high-performance technology available for a new generation of leading-edge control concepts.

Technological innovation
Leading the way forward

Beckhoff is leading the world into the automation future through the ‘fourth industrial revolution’ or Industry 4.0. Ultimately, in order to realise Industry 4.0 following a genuinely holistic approach, three aspects must be implemented:

GLOBAL AUTOMATION EXPERT

Beckhoff Automation is on a growth trajectory which will be hard to stop according to the company’s MD and founder Hans Beckhoff.

“Following rapid growth in turnover totalling nearly 100% in a two year period from 2010 and 2011 and a downturn of 12% in 2012, we have now returned to a solid growth course of 7%. The signs look encouraging for the future and we think that we can grow more dynamically again in the coming years.”

In fact, Beckhoff predicts double digit growth in 2014, which would continue to see it outperform its peers in the market. One of the primary contributors to its growth success is the continued expansion of international sales networks, which in Africa includes Cairo, Egypt. Its South African subsidiary and product distributor (one of 33), which oversees the entire sub-Saharan region is also experiencing rapid growth.
Industry 4.0. This is a phenomenon pointing towards intelligent, networked systems: information technology (IT) and automation technology (AT) which combine traditionally separate production environments to create universal production worlds which are partly physical in nature, yet they attain new functionality in the cyber space of web connectivity. “Against the background of discussions regarding Industry 4.0 in Europe and the ‘Internet of Things’ in North America, PC-based control technology from Beckhoff proves to be the ideal automation platform to implement these forward-looking visions. “The convergence of IT and automation technology has always been the basis of our control philosophy, so that we – and our customers – are technologically prepared in the best way possible. We feel this all over the world and we are winning many new projects as a result,” says Beckhoff. New operating concepts, for example, via ‘Google Glass’ or the idea of ‘social automation’ based on ‘social media,’ are becoming constituents of automation.”PC control offers the as additional business models – e.g. via an “Internet of Services.” PC-based control offers a future-proof basic structure for all of this, especially since it can be adapted very flexibly to varying application requirements. Intelligence can be arranged in a hierarchically modular fashion under the central controller, but also decentralised, i.e. with equal rights if need be. It is with good reason that the traditional automation pyramid is already used very successfully everywhere and the analogy with biological evolution, for example, shows that precisely this hierarchical structure is a guarantee of success. It has produced largely centralised concepts.

First evolutionary steps have already been taken successfully

In practice, production systems, especially those implemented in Germany, are already connected to each other, even if they evolve further toward better networking and connectivity in a horizontal and vertical direction. If you look at it this way, modern production facilities which are connected to just-in-time suppliers or distributors and are capable of producing lot sizes of one, are in many cases the first existing examples of Industry 4.0.

The BIG picture

Industry 4.0 concepts are also being developed further in the field of research. In the technology network, “it’s OWL” (Intelligent Technical Systems OstWestfalenLippe), which was distinguished by the German Federal Ministry of Education and Research (BMBF) in 2012 as a “Leading-Edge Cluster,” Beckhoff, as consortium leader in the key project “ScAut,” (Scientific Automation) is researching the integration of engineering findings from the most diverse technical disciplines into automation technology in order to increase the intelligence of technical systems.

South African stand-out

The Beckhoff "new automation technology” philosophy represents universal and open control and automation solutions that are used worldwide in a wide variety of different applications, ranging from CNC-controlled machine tools to intelligent building automation. The South African wholly-owned subsidiary, Beckhoff Automation South Africa (with offices in Johannesburg, Cape Town and Durban) has highly-competent sales and technical support teams and a fully-equipped service and training centre. It supports its customers directly through experienced staff, as well as through a network of certified system integrators. Beckhoff SA guarantees proficient customer service and advice throughout South Africa and sub-Saharan Africa as well.

Training programme for over 160 junior employees

Beckhoff currently employs ± 700 people worldwide. Of this total, over 800 employees are engineers, which is more than 30%. “We are heavily invested in research and development. As a technology-driven company whose success is based on developing innovative solutions and bringing them to the market at an early stage, we have a very high requirement for skilled engineers,” says Beckhoff.

Beckhoff has also been supporting practice-integrated engineer training in the fields of mechatronics/automation and industrial engineering for three and a half years now.
Four components, one system: New Automation Technology.

IPC
- Industrial PCs
- Embedded PCs
- Motherboards

Motion
- Servo Drives
- Servomotors

I/O
- EtherCAT components
- IP 20 Bus Terminals
- IP 67 Fieldbus Box

Automation
- Software PLC
- Software NC/CNC
- Safety

www.beckhoff.co.za
Setting standards worldwide: PC- and EtherCAT-based control solutions from Beckhoff.
As renowned specialists for open automation systems, Beckhoff offers components for IPC, I/O, motion and automation applications that can operate individually or integrated as a precisely adapted control system. New Automation Technology from Beckhoff represents versatile automation solutions that are used in a wide range of applications worldwide. The growing presence of Beckhoff in more than 60 countries ensures consistent support around the globe.

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New Automation Technology

BECKHOFF
Since its establishment in Duisburg, Germany in 1921, KROHNE has evolved into a world-leading industrial process instrumentation manufacturer and supplier. Today the company has a widely spread footprint and is established in 18 countries and represented in more than 30 locations. It has been serving the industry in South Africa for over 45 years, providing cutting-edge solutions to various industries including mining, water and waste water and oil and gas.

Thanks to its innovative solutions approach, KROHNE continues to grow its track record in Africa. It offers this continent’s (and the world’s) clientele devices, which through continuous development now extend in size to DN 3000 with ceramic liners for the measurement of all kinds of slurries with high solid content. The company also offers complementary instrumentation such as fresh air or fresh water supply in mines.

KROHNE’s achievements in Africa are nothing short of ‘great’ having supplied the largest flow meter in South Africa. The 3 m diameter electromagnetic flow meter is used as the custody transfer point from the Department of Water Affairs’ Vaal Dam to the Suikerbosch water treatment plant owned and managed by Rand Water.

**Further accolades**

KROHNE was also involved in the upgrade of the metering facility SFF for the measurement of bulk crude oil into South Africa as well as supplying multiple ultrasonic meters and three meter provers for the new multi-product pipeline project for Transnet. The KROHNE ALTO V was recently given the nod of approval from state-owned petroleum transportation business Kenya Pipe Line Company.

**Staying ahead of the game**

KROHNE continuously employs state-of-the-art technology to keep its customers ahead of the game. With the development of the OPTIFLUX 400 electromagnetic flow sensor, the standard in the process industry and suitable for demanding, abrasive and aggressive applications, KROHNE consistently ensures that its products and services meet or exceed the requirements of its customers.

**Hands-on experience**

Johannesburg, South Africa-based John Boxley, CEO of KROHNE Africa, has worked for over 30 years exclusively in the industrial automation and control industry. His experience ranges from design and manufacturing of venture flow meters to servicing and maintenance in the process, oil and gas industries. He has played a major role in the introduction of new technologies including Coriolis, ultrasonic and pipeline leak detection, thus helping modernise the technological level of South Africa’s process industry. He is also involved in expanding the KROHNE brand in countries such as Kenya, Ghana, Mozambique, Uganda, Tanzania and many others.

Reliable instrumentation can have a significant and positive impact on mining/minerals processing production costs, throughputs and efficiencies. Thanks to instrumentation pioneering specialist KROHNE, customers are appreciating the value and engineered services this company has on offer to improve overall operational functionality.
KROHNE OPTIFLUX - the flow standard in mining since 1967

As a world leader for electromagnetic flowmeters we’ve been impressing our customers in the process industry for nearly 90 years with innovations that set the standard for our competitors.

OPTIFLUX4000 is abrasion, chemical and vacuum resistant making it well-suited for the mining industry where there are harsh and extremely abrasive slurries, aggressive processes and difficult environments. Based on years of experience in the mining industry in South Africa KROHNE has been able to offer the OPTIFLUX 4000 electromagnetic flow sensor as the proven choice when selecting a flow meter. The flow sensor in conjunction with IFC300 converter has provided a unique solution to mines in South Africa and the rest of Africa who require a reliable and accurate flow meter to perform under harsh conditions.

The measuring tube of the sensor has a smooth, cylindrical shape with a soft rubber liner and special conductive rubber electrode specifically designed for slurry which is resistant to corrosion; ageing and abrasion. The circular cross section (no internal or moving parts) and a homogeneous magnetic field are the basis for a flow-optimised pipe cross section. This provides reliable measurements that are largely independent of the flow profile. The OPTIFLUX 4000 means good performance, reduction in production and maintenance cost and longer lifetime.

KROHNE- Process engineering is our world

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Because Standards Matter
DQS South Africa have come a long way since it first opened its doors in 1995. Its main business purpose back then was to attract a client base for ISO Certification.

DQS South Africa has grown and matured beyond measure and today certifies a premium client base in South Africa. With a market increasingly maturing to international requirements and supplier expectations, DQS has positioned itself as a trusted brand with competent and motivated employees.

Today DQS remains a major role player in the market and certificates issued in South Africa count amongst two of the biggest in the country. This position is shared with the South African Bureau of Standards (Government Subsidiary).

Internationally recognized, DQS drives results by developing and executing innovative strategies, improving operations and reducing risk. We are correctly positioned in the South African and the International markets with a proven track record in industry to assist any size organisation with its management system requirements.

DQS is part of the international DQS-UL Group with 75 offices in more than 50 countries. DQS GmbH and UL Management Systems Solutions (MSS) merged at the end of March 2008. With their alliance, Germany’s first certification body for management systems and the MSS business unit of America’s most renowned product certifier Underwriters Laboratories (UL) achieved a place among the leading certification bodies for management systems in the world.

For the DQS-UL Group, relationships built on mutual trust should be created face to face. In this age of e-mails, voice-over-IP technology and video conferencing, can you put your faith in an ever growing network of international offices? Our answer is YES. Complex, global certification procedures spanning 50, 100, or more sites require well structured project management. And they require people who speak the language and know the culture at each site; people with customer proximity and a high level of competence, who can fulfill customer expectations by performing value generating services on site. Modern communication technology can support this – but it cannot take the place of personal contact.
With offices in more than 65 countries and assessors in every industry sector, DQS has the manpower and the expertise to conduct inspections and validations according to ISO 17020 & 17065 across the globe.

You claim it, we check it. Let us know according to which specifications you wish to produce and our auditors will perform an on-site validation audit.

Pre-shipment inspection (PSI) is an important instrument for supply chain management. It enables clients to check the quality, quantity and compliance of the goods they have bought.

Quality & Quantity control is an important aspect in the relationship with a supplier. To ensure that all contractual obligations have been met, and to prevent any possible disputes, a verification by an independent third party can save you a lot of trouble in the long run.
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You Can Use the tool for your internal audits and monitoring as well as for gap analysis prior to 3rd party certification

Available Self Assessments

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HOW PROTECTED ARE YOU?

0 seconds

25 seconds
Paul Andrews, Protect-O-Burn fire safety consultant, ponders on society’s evolution and questions why we can’t apply similar safety practice techniques in business as in our personal lives.

“Once upon a time we faced seemingly insurmountable difficulties and today the way...”

Victor Hugo (French poet, 1802-1885)

HOW FAR WE HAVE COME

“There is nothing more powerful than an idea whose time has come.”

Protect-O-Burn fire safety consultant, Paul Andrews, ponders on society’s evolution and questions why we can’t apply similar safety practice techniques in business as in our personal lives.

Once upon a time we faced seemingly insurmountable difficulties and today the way...
Protect-O-Burn has done the real-world testing and paid the school fees in trying and dangerous situations, so you won’t ever have to

we address them seems commonplace and not worthy of our time or consideration. But it wasn’t always that way. The same is true of how we can fight fires today and of how we will fight them in the future.

Since Protect-O-Burn’s inception 11 years ago, the company has remained true to its industry-‘bucking’ fire protection philosophy of hitting a fire early, hitting it fast and hitting it hard. We know that a good fire protection philosophy would resemble a good self-protection philosophy. Think about it.

Faced with the choice of shooting a would-be attacker with just one shot from the biggest gun you can safely manage, or little bullets from a small calibre weapon that will probably inflict little to no damage at all on your would-be assailant, what would you rather go for?

Personally, I think it’s a no-brainer.

The media reminds us daily that the assailants we face in home invasions, armed robberies, hijackings, etc., are ruthless, merciless and wholly-bent on our destruction for reasons that won’t be explored here, except to draw the comparison between them and fire. Because make no mistake, where today’s armed assailant has some motive of passion for his choice of crime, he might be open to reason if you can get through to him. Fire on the other hand is completely unfeeling, uncaring, unthinking and completely deaf and impervious to your cries for help or mercy. It has only one goal and that is to completely exhaust all the available fuel, even if that fuel is you.

So if it makes logical sense to protect yourself against an armed attacker with whom you might possibly be able to reason, with the most powerful and fast-acting self defense weapon possible; why would you not want to protect yourself against the heartless, mindless, devastating power of fire with anything less than the most powerful and fast-acting weapon available?

How protected are you? Really?

“I am protected with the best,” you say. But are you sure?

Does this sound like an exaggeration? Let’s test the theory

When exposed to temperatures in excess of 1 000°C, how long do you think it will take for load-bearing structural steel H-beams to start suffering fatigue, and for them to lose integrity such that an engineer would likely declare a building or structure unsafe?

5 minutes?
10 minutes?
15 minutes?

If you consulted your first-year physics text books and came to the conclusion that this would occur between 10 and 15 minutes, then you would be in agreement with a lot of well educated and properly informed people.

Which is odd, actually, because you would not be in agreement with the NFPA who thinks you should have enough water supplies and foam concentrate to fight a Class B fire for half an hour, or more.

And historically speaking, especially when considering fuel tank farms and the copper SX industry, the NFPA guidelines have been dismal failures when it comes to combating large-scale industrial fires.

So, that’s the bad news

You’re almost certainly not as safe as you perhaps thought you were.
The good news is we have the answer

Protect-O-Burn’s design philosophy for fighting super-massive Class B fires is based on a total extinguishment within 60 seconds, followed by foam blanket reinforcing for a further 60 to 120 seconds thereafter.

Furthermore, Protect-O-Burn’s patented, EN-certified, pre-manufactured fire fighting foam is installed in ready proximity to the fire hazard being mitigated against and our foam requires no dependencies such as a permanent water supply or an energy source to power a pump. It in fact requires no pump and also requires no foam concentrates to be safely stored or mixed, or aerating devices to improve the foam’s quality. All that’s needed is already self-contained in a pressurised stainless steel vessel standing close by, ready for immediate, hassle-free operation in split seconds.

Because of the unique nature of our self-contained fire fighting foam, we can install fire protection systems anywhere underground, on overland conveyor transfer points and at any height, on mobile track machinery such as massive stackers and reclaimers, on large mining vehicles, in SX trains, on tank farms, bulk fuel storage sites, and anywhere you can think of and especially where it was previously not thought possible. And we guarantee super-fast fire extinction, meaning you will face the absolute minimum exposure to damage.

And it’s not only in the field of fire protection systems that we buck the trend.

We also are an SABS certified, MIB registered builder of fire, rescue and hazmat response vehicles of all types, shapes and sizes. We have been building mining-tough, Africa-reliable emergency response vehicles since 2006 and have supplied our unique, custom-built vehicles to mining clients all over the SADC region.

We believe in using quality materials that have been proven to overcome adverse operating conditions such as the use of process water for fire-fighting and and equipment together with a first response fire fighting capability, to the heavy-duty fire engines needed to do battle on big sites.

All of the preceding capabilities together with our ability to supply all the accompanying tools and equipment, and necessary PPE, and portable fire extinguishers and wheeled trolley units, AND the ability to consult on all fire-related matters together with providing all related training courses, means you can count on Protect-O-Burn as your one-stop fire protection shop to help you manage a large and difficult chunk of your safety audit. And because we don’t just simply toe the line, but creatively solve fire protection problems with effective solutions that have your absolute best on-going interests at heart, you can rest assured we will help you find the most efficient and cost-effective ways to do so.

Since Protect-O-Burn’s inception 11 years ago, the company has remained true to its industry- ‘bucking’ fire protection philosophy of hitting a fire EARLY, hitting it FAST and hitting it HARD.

Building custom fire, rescue and hazmat response vehicles to your spec, and making sure they’re Africa tough and mining proof is a specialty of Protect-O-Burn’s vehicle building division

SAFETY
Late in 2013, Trysome, the largest single-source supplier of heavy-duty, auto-electrical components and collision avoidance systems specialist in South Africa, opened its doors in Tete, Mozambique - touted to be the current mining hotspot in the world and predicted to remain so for the next ten years.

THE MOVE is part of the company’s plan to increase its capabilities in Africa – geographically positioning itself to take its products and services closer to the customer. Each branch comprises branch management, sales, administration, field service, remanufacturing workshop, warehousing and distribution. In order to further enhance its offering with a broader African footprint, Trysome has added two new authorised distributors to its network: Preston Investments in Gaborone, Botswana and Erongo Auto Electric in Walvis Bay, Namibia.

The result? Trysome is now well represented in southern Africa with branches and distributors throughout South Africa, Zambia, Mozambique, Botswana and Namibia. The rest of southern Africa is serviced by a well-established export division.

In addition to servicing the mining sector, Trysome supplies parts and services to operators of heavy-duty automotive and earthmoving equipment. Full man-on-site services are also available where required and most of its branches now offer re-manufacturing services for rotating equipment and componentry.

The latest in safety
In addition to sourcing, Trysome is committed to the development and innovation of auto-electrical and safety products. The company’s state-of-the-art technology in collision avoidance and safety systems has already been adopted by, and is operational in, many of South Africa’s mines.

Most fatalities in open pit mining can be attributed to two main factors – blind spots and operator fatigue. Trysome has a broad product offering that focuses on operator safety and specifically collision avoidance which covers:

- collision avoidance systems
- fatigue monitoring systems
- radars
- back-up alarms
- camera and monitor systems
- work lights
- strobe lights
- solar lighting towers
- speed monitoring trailers
- wheel chocks
- tyre pressure monitoring systems

The above-mentioned products can be used independently but operate better as an ‘all-in-one’ collision avoidance system. This product has already been successfully adopted by open pit mines in Africa including Anglo American Thermal Coal and Kumba Iron Ore. Trysome’s systems also operate on mines in Zambia, Namibia and Botswana.

SOLE DISTRIBUTOR PARTNERSHIPS
Trysome has developed strong partnerships with world-renowned brands to bring to the market only the highest-quality products and is the sole distributor, in southern Africa, of the following fine brands:

- **SAFEmine** A compact GPS/RF traffic alert and collision avoidance warning system suitable for all vehicles in open pit mines.
- **PreView** Radar systems designed to detect objects in zones obscured from the operator’s view.
- **Q2** Q2’s rear-vision camera supports up to four camera inputs and the 7-inch flat screen offers various connection possibilities.
- **Delco Remy** Delco Remy’s worldwide facilities manufacture an extensive range of heavy-duty products including starters, alternators and components used in a variety of applications including Caterpillar, Cummins, Daewoo, ERF, Fiat, Freightliner, GM, John Deere, MACK, Mercedes-Benz, Renault and Volvo.
- **Nordic Lights** Manufacturer of a vast range of original equipment and aftermarket work lights used extensively in underground, construction and mining equipment.

* Trysome is one of two Master Warehouse Distributors in SA
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Not Drunk. 
Just Tired!

Fatigue! 
The Hidden Killer

SAFEmine’s FatigueMonitor System limits your risk!

Call us today for a full demonstration of the world’s first situation-specific fatigue monitoring system, integrated with 360° Collision Avoidance.

FatigueMonitor is one component of our “All-in-One Collision Avoidance” System which can consist of:

**Integration:**
- GPS Traffic Alert
- Camera Systems
- Radar

**Auxiliary Products:**
- FatigueMonitoring
- TrackingRadar
- DriverID
- Back-up Alarms
- Safety Lights
- Work Lights
- Tyre Pressure Monitoring Systems

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Trysome has its own service department with qualified technicians so that, unlike many wholesalers, we are able to provide complete after-sales service.
Leave the surplus

The focus in the mining industry is clearly on exploration and development. However, to fully utilise company capabilities and minimise employee distractions on other non-core business activities, mining companies must have a clear strategy and trusted partnership with an established vendor in the reverse supply chain. By John Cowing
to the experts

As equipment goes idle or becomes surplus to the business, companies need to move it off the financial books and receive maximum recovery through a streamlined, compliant process.

To better prepare organisations for the next phase of growth and empower leaders in choosing a partner in the reverse supply chain, GoIndustry DoveBid summarises the state of the industry and surplus disposition methods, our company’s approach and strengths, as well as a case study of success in the region.

State of the industry

South Africa is currently home to approximately 7% of the mining output worldwide. With much of the world’s largest reserves of gold, platinum, coal, iron ore, copper, and other minerals, this market shows no sign of slowing down. As a newer, global growth area, great activity exists across the board for mining companies. Thanks to improved economic stability, infrastructure upgrades across the country, government incentives for the industry, lower labour costs, and increased global demand, the industry will continue to grow and foster economic development for the country.

According to the African Economic Outlook 2014: Global Value Chains and Africa’s Industrialisation published by the African Development Bank, Development Centre of the Organisation for Economic Cooperation and the UN Development Programme, it is projected that “growth for the continent as a whole could return in 2015 to 5% or 6%, a level last seen before the onset of the 2009 global recession.

“With stabilising energy costs and re-treating food prices, the continent’s inflation rate decelerated in 2013.”

While there are potential challenges along with the opportunities the industry presents, including political interference, conflict, and health issues, among others, the industry is clearly a leading indicator for continent and country growth.

Surplus disposition in the mining industry

Surplus assets are not typically a focus area for businesses and are often left to operations or procurement staff to administer, on top of their other critical work. Unfortunately, handling the reverse supply chain solely in-house limits the potential value for surplus to the organisation. Historically, surplus assets are sold by live auction or tender.

Our approach and focus is the same as it’s been since the founding of the company – to benefit our buyers, sellers, and our planet as a whole through smarter management of the reverse supply chain.

While there are potential challenges along with the opportunities the industry presents, including political interference, conflict, and health issues, among others, the industry is clearly a leading indicator for continent and country growth.

GoIndustry DoveBid summarises the state of the industry and surplus disposition methods, our company’s approach and strengths, as well as a case study of success in the region.
In some cases, they are traded in on the purchase of new equipment. These tend to be the go-to-methods for most staff; however, all three of these methods have their own limitations, which include:

- **Live auctions** - Live events rely on the purchasers travelling to remote locations, costing time and money with no guarantee of success.

- **Tender process** - This is not a transparent process as it is unclear who ends up with the asset and there is less ability to measure proximity to actual sale price.

- **Trade-in process** - Sales are limited to original equipment manufacturers (OEM) supply of new assets. Additionally, real value is buried into the cost of purchasing a new asset, making it unclear if true value is being considered and received by the purchaser/seller.

Online auctions through reputable providers have spurred a dramatic shift in the options available for the industry when managing and disposing of surplus assets. This transformative method provides full transparency into auction bidding, and when an expert partner is managing the project they incorporate best practices.

This includes sales and marketing expertise, such as including asset information and photos in the auction listing. Additionally, when conducted through a trusted vendor, assets are exposed to a larger pool of buyers, enhancing recovery and value.

**Liquidity services’ approach in South Africa**

Our company has a dedicated team located in South Africa, well positioned to provide on-the-ground support for both medium-sized and major players in the...
mining and construction supply chain throughout Africa. Organisations in this industry with surplus assets who benefit from improved management, valuation, and sales strategy in their reverse supply chain include: mining companies, contract mining companies, construction companies, funding organisations, banks and government-backed funding organisations, scrap and demolition companies, and mine rehabilitation companies.

Our approach and focus is the same as it’s been since the founding of the company – to benefit our buyers, sellers, and our planet as a whole through smarter management of the reverse supply chain. We do this by utilising best practices for surplus and incorporating a customer-centric approach to solutions, inclusive of our value-added, comprehensive services delivered by our experienced team of experts. Our client partnerships do not apply a standard set of techniques, but custom design solutions based on client surplus, needs, and overall strategy.

We have over 2.6 million buyers worldwide, the largest base of surplus buyers in the world, and continue to increase our dedicated, global database of buyers for assets for construction and mining equipment.

Why we are different

Our value proposition for the mining industry includes a long story of success as well as dedicated staff with industry experience that differentiate us from any other competitor. In summary, these factors include:

- **Access to global markets** Advertising surplus equipment to solely local markets limits recovery and exposure to only local buyers. International participation is crucial for sellers to extract maximum value. Our scale and database of global buyers provides us with the ability to target the right buyer for the right assets at the right time.
- **Integrity and credibility** As a publicly-traded company, we follow the same compliance policies and procedures as Fortune and Global 1000 companies – many of them our clients. We utilise sound business principles across the board and incorporate a high standard of compliance in all of our client solutions.
- **Transparency of the sale process** Our clients appreciate that the process is clear to both buyer and seller communities with an online auction process that provides visibility on the bidding process, as well as photos and detailed item descriptions, which aid in purchasing decisions. Our teams take care of these details, saving valuable staff time for clients.
- **Inclusive metrics and reporting** We provide comprehensive reporting as part of our standard account support for clients and accommodate clients with additional levels of reporting and data to inform decision-making around their surplus assets.
- **Asset knowledge and industry competency** Our nationwide team of professionals is skilled in how to manage, value, and sell surplus for a number of industries, including mining and construction, and has years of experience to know and apply the best approach to each client project.
- **Aligned marketing and sales** We harness our global marketing expertise both through online and offline channels to best promote assets to the right buyer audience.
- **Established marketplaces** As a leader in our industry, our established marketplaces provide ease of use, multilingual capabilities, as well
as accommodating buyers with options for paying and shipping regardless of location. Our buyers know where to go to source surplus, and often, our sellers are also buyers and are offered high levels of customer and client service.

**Client base**
Our global client base expands a number of industries and includes government agencies as well as leading companies. Many South African companies currently leverage our services to better manage and sell their surplus to increase their results.

When looking for a partner in the reverse supply chain, the above criteria are important to evaluate and determine in order to best capture the full value of surplus and to have a leading edge over your competition.

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**CASE STUDY**
Multinational construction firm disposes of assets throughout Africa in a single sale

**BACKGROUND**
A South African based multinational construction company had completed several major projects in various countries in Africa including South Africa, Mozambique, Ghana and Sierra Leone. The options open to them were to bring the equipment back to South Africa for remarketing or alternatively, leave it in these countries and hope to find local buyers.

**SOLUTION**
Having considered the high cost of uplifting and removing these assets from the various countries the company decided to utilise the services of Liquidity Services’ GoIndustry DoveBid marketplace and its leading asset disposition team. Its team members visited each country and viewed all of the equipment to better assess it for sale. An expert marketing team compiled a sales and marketing plan incorporating the use of the company’s global marketplace website as a sales channel for surplus assets. The assets were marketed worldwide along with specific marketing campaigns in each of the countries where the assets were located.

Surplus assets included a wide range of construction equipment, comprising: bulldozers; wheel loaders; graders; dump trucks; rollers; buses; mixer trucks; mobile cranes; general construction equipment.

**RESULT**
Liquidity Services was able to successfully sell the majority of the equipment and return over US$2 million in value to the client. Buyers from 12 countries participated in the auction with assets being sold and redeployed to Europe, the US, and throughout Africa. Not only did the prices realised exceed expectations; the company enjoyed the benefit of not having to invest additional financial resources and time to uplift and transport equipment back to its operations in South Africa, saving significant costs. As a result of this success, Liquidity Services was signed up to a long-term service level agreement dealing with all the company’s surplus assets sales on a yearly basis. To date, it has performed five major asset disposal disposals for the company on an annual basis and continues to provide a high level of client service.

**IN CONCLUSION**
The future of the mining and construction industry in South Africa is promising, with more growth on the horizon. In order for companies to best position themselves to leverage opportunities and obtain a competitive advantage, it’s critical for organisations to incorporate strategies with a trusted partner into their reverse supply chain. Regardless of the surplus situation, a provider like Liquidity Services can design a compliant, streamlined solution to deliver results that contribute to the larger company strategy. With a trusted partner and thoughtful process that incorporates best practices and has an established buyer base and marketplace, mining and construction companies can focus on exploration and development opportunities, and leave the surplus to the experts.

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**MEET THE MD**
John Cowing

HE SERVES AS THE MD of GoIndustry DoveBid South Africa and previously served as its new business development manager from its office in the United Kingdom. With more than 30 years of experience in the auction and surplus machinery business, he serves as a trusted consultant to leading companies on the African continent.
Transforming the way business sells surplus capital assets

You have surplus assets and we have more than three million buyers who want to purchase them – now.

Let us customise a program for you.
Call 0861 GoDove (463683)
or email southafrica@liquidityservices.com.

www.liquidityservicesinc.com
In the world of heavy equipment, mining gear is definitely king of the hill. It’s big, it’s heavy, it’s powerful, and it’s nothing less than awe-inspiring. Every year, thousands of drilling and mining equipment items are sold at Ritchie Bros. Auctioneers (NYSE & TSX: RBA), whose globally held auctions often include amazing items.
Bidders join these auctions in great numbers. Every year, hundreds of thousands of people from all over the world rely on Ritchie Bros. to get the gear they need. They search equipment at rbauction.com, register for an auction and confidently place their bids on auction day.

Items can be personally inspected and bidders can choose to bid in person at the auction site, live online at rbauction.com or by proxy.

Every year, Ritchie Bros. conducts hundreds of auctions.
RITCHIE BROS. AUCTIONEERS

Auction site in Moerdijk, the Netherlands. Across the world, Ritchie Bros. Auctioneers has more than 40 auction sites in North America, Europe, the Middle East, Asia and Australia.

of auctions around the world and sells billions of USD worth of heavy machinery and trucks.
All Ritchie Bros. auctions are unreserved, which means there are no minimum bids or reserve prices on the items being sold – every item sells to the highest bidder on auction day, regardless of price. Because there are no set prices at Ritchie Bros., buyers can be confident that they are paying fair market value for their purchases.
Every day, mining and construction businesses of all sorts and sizes work with Ritchie Bros. to sell or buy equipment and trucks. Find your local Ritchie Bros. representative and more information at rbauction.com. We conduct live, unreserved public auctions with both on-site and online bidding, selling a wide range of used and unused equipment for:

- Construction
- Mining
- Transportation
- Agriculture
- Oil & gas
- Lifting & material handling
- Forestry & other industries

Over 300 unreserved public auctions across the globe every year.

For a complete and up-to-date auction calendar, visit rbauction.com or call +31 765 242 600
Meet Africa’s Mining Leaders

South Africa
Hon Ngoako Ramatlhodi
Minister of Mineral Resources

The mining industry is the alpha and omega of South Africa’s economy. It has shaped our industry’s past and continues to define our future.”

Namibia
Hon Isak Katlapi
Minister of Mines & Energy

Namibia contributes about 6% of the world’s diamonds by value but we have a lot of minerals to offer. If you are not exploring in Namibia you are being left behind.”

Guinea
Hon Kerfalla Yansane
Minister of Mines & Geology

Guinea is a well-endowed country in terms of its natural resources – water, soil and minerals – but Guinea is still very poor.”

Ghana
Hon Nii Osah Mills
Minister of Lands & Natural Resources

Despite the current environment, Azumah Resources and Asanko Gold are planning to commence production in the next few years and government will continue to give them all the necessary support.”

Gabon
Hon Regis Immongault
Minister of Mines, Industry & Tourism

Gabon and Brazil have similar geologies. We have 59 mineral exploration projects at present and are a good gateway into central Africa.”

Malawi
Hon Atupele Muluzi
Minister of Natural Resources, Energy & Mines

Thanks to the new Nacala railway line, which will export about 20 Mt of coal a day, investors coming to Malawi will be guaranteed of world-class infrastructure.”

Mali
Hon Boubou Cisse
Minister of Mines

The government of Mali is working towards creating conditions such that the name of Mali is no longer associated with security, but rather stability.”

Nigeria
Hon Musa Mohammed Sada
Minister of Mines & Steel Development

You don’t need to see the minister to get an exploration licence. There are certain guidelines you need to follow. If you fulfill them, you get your licence.”

Spanish speaking mining elites in Africa 2015

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SUDAN
He Osheak Mohammed Ahmed Tahir
State Minister of Minerals

“Half the country’s area is underexplored so the potential is high to find new discoveries. There are about 125 companies holding large tenements doing evaluation of gold, silver, copper, zinc and iron ore in Sudan. We have eight producing companies in gold, silver and iron ore.”

SOUTH SUDAN
Hon Gatwech Lam Puoch (MP)
Chairperson of Committee of Energy, Mining, Trade, Investment & Industry

“We are young in the mining sector. We want to establish the mining sector as a priority. We are setting up a cadastral system and a mining act. After 2011, we have suspended all mining exploration activities pending the establishment of proper procedures.”

ETIOPIA
Tewodros Gebre-Egziabher
State Minister of Mines

“We have world-class potential potash deposits. We have more than 10 Bnt of potash deposits, not far from the Djibouti coast.”

ZAMBIAN
Hon Christopher Yaluma
Minister of Mines, Energy & Water

“[Our] vision is for mining to contribute 20% towards our GDP in the next five years.” (It is currently 10.19%)

TANZANIA
Ngosi Mwihava
Deputy Permanent Secretary of Ministry of Energy & Minerals

“We encourage partners to come to Tanzania – we have the best untapped resources, we have a very stable social and political environment, we have a good fiscal regime that provides incentives which are internationally competitive and non-discriminatory but also stable and predictable.”

KENYA
Hon Najib Balala
Cabinet Secretary for Mining

“The Kenyan government is ready to roll out the red carpet and remove the red tape for serious investors.”

MAZAMBIQUE
Hon Joeli Valerien Lalaharisaina
Minister for Strategic Resources

“There are half a million small scale mining operators in Madagascar – 30% of those are informal, 30% of those are individuals and 40% are companies.”

The government is working in partnership with investment companies and other corporation partners to implement projects for building railways and other facilities to improve Mozambique’s logistics.”
Journeying the road less travelled

Mineral Resource Development

Staying true to its roots

Journeying the road
Retaining core strengths while journeying into new business areas filled with promising opportunities for growth!

The men in charge

Both Jacques Badenhorst (director) and Harry Larkins (operations director) have extensive metallurgical industry experience – starting their careers as special projects minerals processing engineers within the Anglo stable. During their time with the company they were involved in a multitude of projects and commodities including coal, diamonds and gold.

Both directors also gained substantial experience in the reclamation and hydraulic mining arenas having worked on the massive Ergo tailings project in South Africa and the Hillendale mineral sands project near Richards Bay. At the time, the implementation of hydraulic mining was a new concept in South Africa which allowed the operation to reduce its costs significantly and emerge as a profitable mining operation. The technique is widely used today, largely in tailings reclamation projects.

But Badenhorst had a vision to start his own company, develop an identity unique to the metallurgical world, and subsequently started MRD 13 years ago, taking with him strategic partners who he had worked with previously – including Larkins.

Mineral Resource Development (MRD) is not quite your average metallurgical and engineering specialist. Not only has it undertaken and completed a few unconventional projects since its start-up in 2002, but has aspirations to evolve its business into new revenue-generating areas which no other engineering company has attempted before.

The first phase

MRD has differentiated itself from the start by offering the market highly skilled process engineers with high-level expertise in metallurgical engineering design, build and
even process plant operation in Africa, but primarily South Africa. It boasts a century of expertise across its principal members. Having entered an industry already intensely competitive, it focused (and continues to) work with the junior and mid-tier mining sectors.

“Our entrance into the sector started with feasibility study and consulting work which ensured the company’s survival while we focused on relationship-building, brand management and creating general industry awareness. The natural progression to design and develop numerous small-scale projects set a solid business foundation, enabling us to start building a track record essential for long-term company growth and success,” explains Badenhorst.

Today, the company has secured and successfully completed a variety of projects and stays true to its core business philosophy – “establishing and nurturing partnerships with our clients,” and adapting its service offering and capabilities to suit the evolution and changing needs of the minerals processing sector. Today its capabilities include:

• **Contract metallurgical operations**
  This is the core function and focus of the company. The team has extensive experience in the evaluation of such projects, from Greenfields sites to plant construction, and has a wealth of experience in the operational management of such projects, including maintenance; forecasting; safety, health and environment aspects; client liaison; project optimisation, etc.

• **Process design**
  The team have all had experience in design work in various spheres in the industry. When the practical experience and knowledge of the team is combined with this design experience, then practical, cost-effective plant is the result. The plants also cater for the problems faced by the operator, and allow for ease of maintenance.

• **Plant and project optimisation**
  Again the depth of the operational
experience vested within the company allows efficient evaluation of a client plant and practical, effective recommendations can be made.

- **Project and construction management / plant modifications**
  MRD can project manage the complete design and/or construction of small, medium or large projects and plant modifications. The types of contracts can vary from EPCM (engineer, procure, construction management) right through to BOOT (build, own, operate & transfer). The operational experience within MRD is also utilised to ensure that the plant operator will have a practical plant that is operator and maintenance friendly.

**The next phase – getting bigger**

Like any engineering firm, MRD has a variety of completed projects under its belt. The company has been particularly successful in delivering high-profit generating, unconventional projects. Many of the plants it has designed and built have been smaller in processing size and volume and accompanied with short-to-medium lifespans, but have generated significant cash flows and profits in a very short timeframe.

In 2005 the company was awarded the EPCM design and construction of a metals-from-slag recovery plant for one of South Africa’s major platinum producers, Northam Platinum for example.

The plant and project, which concluded in 2012, was designed to process 4 Mt of current arising slag, as well as processing slag, from the operations’ slag dump. “The ramp-up went according to plan and exceeded the testwork metallurgical recoveries for all PGM (75% – 85%), nickel and copper (10%) material and was considered a huge success. Within three months it had paid for its costs,” Badenhorst notes. MRD was also responsible for managing and operating the plant.

In October 2005 MRD completed the construction of a plant designed to intercept a side stream of a chrome chemicals facility to recover 32 tpm of vanadium pentoxide and return the chrome to the facility in a useable form for Lanxess (known as Chrome International South Africa at the time). “What made this project unique, for the company, was our involvement in sourcing the finance for the build, own and operate project and as a result became the majority owner of the project as well, which lasted five years,” Badenhorst notes.

Outside of the ‘unconventional’, the company boasts a selection of flagship projects as well which really started
gaining momentum in 2004 thanks to a contract entailing process design modification and upgrades for a small, mothballed 75 tph diamond plant in Lesotho. It subsequently evolved to include a new plant’s construction as well.

**Emerging coal experts**

Having designed a 2.2 Mtpa thermal coal plant for Beacon Hill Resources’ Minas Moatize operation in Mozambique in 2011, MRD’s name is quickly emerging in the coal sector. Although the plant is currently on care and maintenance, the plant did successfully operate for a few months.

But the project MRD celebrates above all others is its most recent – Universal Coal’s Kangala coal operation near South Africa’s Delmas region. “We were awarded the turnkey project early in 2013 and successfully commissioned and produced first coal from the dual circuit 2 Mtpa plant in April 2014 – it took less than one year,” says Larkins. “This is a major achievement to deliver a full-scale plant in such a short timeframe,” he continues - “Especially in light of the client’s request for two scope changes including doubling the DMS plant’s capacity to 300 tph and doubling the product handling stockpiling facility – without extending the deadline.” The plant has also had particular success with its rotary breaker, rejecting unwanted stones and enhancing the performance of the DMS.

“In essence, the plant is fit-for-purpose and modular in design, two characteristics which enabled us to deliver such a fast-track project. We also revised the original design plan which significantly improved the capital expenditure,” Larkins continues. The contract included all plant elements, from water and mass balance through to process design, equipment selection, costing of capex and opex and control philosophy. The plant is dual circuit, comprising a 350 tph crushing and screening circuit and a 250 tph dense media separation circuit.

**Next phase in evolution**

MRD will always focus heavily on its metallurgical capabilities, largely in the gold, platinum, heavy minerals, coal, and diamond sectors. “The junior and mid-tier market remains our niche strength area, from design and build, through to operation. It never has and never will be our intention to compete with large-scale engineering houses,” Badenhorst notes.

“Our core engineering and metallurgical strengths however, will...
always remain integral to our business,” Larkins adds. As such, the company will soon start work on a new project in South Africa which will rely heavily on the company’s engineering expertise – for Ferrox Holdings’ majority owned Tivani ilmenite, iron, vanadium and phosphate project located in the Limpopo province.

The project firstly entails the construction of a box cut – the purpose being to verify and confirm that the first 20 m of material correspond with historical data and assays on record. “If affirmative, the plan is to proceed with the construction of a 20 tph/10 000 tpm pilot plant which will be used to process Tivani’s ore and do test work on the project’s reserve,” says Badenhorst. This will help both Ferrox and MRD best determine how to expand and develop the deposit accordingly. “Processing these materials, and ultimately smelting them, will be a complex, highly technical process.”

In years to come, this core focus will become one of many different MRD business arms. “We are branching into new areas in Africa which will see the company evolve over the next few years.”

Badenhorst is referring to a business strategy which entails expanding its key focus areas of expertise and project work to include energy generation in southern Africa and downstream beneficiation, specifically smelting. Success in these areas will ensure the company’s on-going growth and provide business security in South Africa’s repressed local economy.

“Engineering opportunities in South Africa have diminished in number but we are not taking a back seat as a result of this, we are going out and creating our own opportunities,” Badenhorst reveals. “Coal and energy generation are the two best bets in the country and we intend to exploit these sectors and generate sufficient business from them.” This includes purchasing/owning the resource, designing and building wash plants to produce product and furthermore generate downstream power. The company is far advanced with three major projects in this area in Botswana as well as the Free State and Eastern Cape.

The company is also looking to provide engineering and project management services within the smelting market, offering a greener, cleaner technology to generate product for export in the nearby future. “And we have further taken the decision to do our own plant manufacturing, in conjunction with reputable outsourced manufacturers, which we will do for this project once it goes ahead. It will improve our margins, afford us better quality control, ensure even faster turnaround times and enable us to do equipment pre-testing,” Larkin adds. The project will also represent another MRD first – mining. “We are on track to launch a mining division in the nearby future. Because this project is starting on a very small scale, we will rent the necessary mining equipment but our intention is to purchase and own our own fleet,” Badenhorst notes.
YEAR-ON-YEAR, since its inception just seven years ago at the height of the recession, the company has achieved phenomenal growth rates and increased revenues. How? Through superior products and technology, delivered timeously at cost competitive rates – anywhere in Africa.

**From Africa**

From South Africa, MIP is capable of servicing the entire African continent and it already has the track record to prove it. Its product range and growing footprint into Africa, within the minerals processing sector, includes the following:

- attrition scrubbers
- agitators
- bag filters
- clarifiers
- depressant make-up plants
- dust extraction plants
- flocculant plants
- slurry samplers
- horizontal linear screens
- mixers
- reagent plants
- screen-covers for vibrating screens
- thickeners
- wet and dry air scrubbers

The company’s acquisition of all the rights and technology to Alliance Dust Control Services’ (ADCS) technology and products in 2013 has further opened up an entirely new business avenue and will deliver massive business (and growth) opportunities for the company in the
Recession… what recession?

Near future. (ADCS has more than 30 years of experience in providing dust and fume extraction solutions to all major industrial sectors, including minerals processing and extraction.)

Into Africa, and beyond

Working off-shore in remote territories requires diligence and good project management, and MIP has both of these capabilities in abundance which can be attributed to its growing installation base across the mineral-rich African continent. Testing the equipment before it leaves also ensures quick and easy installation on site – another extreme benefit and advantage when working remotely.

“We have not only experienced growth within the African continent, but have already taken our expertise to foreign shores such as Australia, Russia, the Philippines, Brazil, Chile and Argentina, to name a few,” says MD Philip Hoff. To complement this international footprint, Hoff has established the MIP Process Corporation in the USA. This has been followed up with agency agreements in Brazil and Australia.

Now the company is looking to expand its agency network in Africa to accompany its expanding install base and has made this a top priority for 2015.

The list keeps growing and growing, as seen in the following timeline.

Thickeners and linear screens remain MIP’s ‘bread and butter’ product lines as its number of successful installations continue to rise since one of its first contracts, supplying two flocculant plants and a 21m clarifiers to a Boss Mining project in the Democratic Republic of Congo (DRC), was awarded in 2008.

The rest, they say, is history. The company ventured further north in 2009 when it supplied two 11 m diameter thickeners, requiring rare stainless steel material, to Egypt. In 2010 the company saw a spiked interest in linear screens after supplying two to a copper project in Zambia. This was shortly followed by a contract to supply three of the largest linear screens into Australia.

2011 took MIP to Gabon where it supplied a bolt-together thickener (a new product innovation) for a manganese project in Gabon. The company moved next door in 2012, supplying four linear screens (the biggest in the world to date) into Mali.

In 2013 the company supplied three large linear screens into the DRC for a gold project and returned to Mali to supply two 30 m thickeners, a flocculant plant, a coagulant plant and a copper sulphate plant – this is MIP’s biggest project (by value) to date. 2014 has been equally lucrative for MIP. “Most of our business this year in particular has been to the coal, platinum and diamond sectors in South Africa. The development of Brownfields coal tailings treatment plants amongst the Witbank mining majors has delivered us with significant thickener orders.”

MIP was further awarded the supply of two thickener contracts in Mozambique and has already supplied and commissioned the first one. It is also underway with a contract to supply two thickeners to a developing platinum project near Sun City along the major platinum belt, as well as linear screens and two 46 m diameter thickeners for a gold tailings upgrade project. The latest order on the books includes a thickener for a new diamond project in Lesotho.

Adapting to changing market conditions

Thickeners/clarifiers

MIP has designed two new thickeners recently to make construction, erection and flexibility easier to contend with in harsh, remote African environments. Having identified that on-site civil work is a key delaying factor for erection on site, causing equipment to stand idle for lengthy periods, Hoff has designed a thickener that overcomes this and numerous other challenges.

“Our customers are showing a preference for plant mobility (moving plants between sites as quickly as two years in some instances) as a solution to reducing operational expenditure,” Hoff discusses. MIP has subsequently introduced a bolt-together thickener which can be erected and disassembled quickly (in a third of...
MIP has been investing into its dust extraction business arm through a strategic approach we have already outlined which entails working with existing operations to implement a phased upgrade/changeover programme to meet requirements over time so as not to incur massive expenses in the short term.

Bearing this in mind, Hoff anticipates this business avenue will grow significantly over the next few years. “It will likely contribute as much as 50% of total business within the next five years.” Considering its contribution is already up from 6% in 2013 to an estimated 25% this year, the journey has already begun. Because R&D is considered a critical business element, ensuring industry demands can be met as they adapt, MIP has been investing into this area for its dust extraction business arm. “Smelters are typically known for releasing toxic gases during their tap-hole pours and having recognised a gap in this niche area to address this problem, we have developed a method to capture these gases.”

High speed delivery, service and maintenance

Despite operating primarily from South Africa, Hoff guarantees an MIP expert can be on site within 72 hours of request – anywhere in the world. This is a true value-add to clients and as such ensures minimal loss of productivity time.

MEET THE MD Philip Hoff

HE IS NO STRANGER to the mining industry – having worked in various sectors of the mining supply chain throughout his career. MIP is Hoff’s latest and biggest venture to date which celebrates his key minerals processing interests and strengths that can clearly be seen judging by the company’s success. It has more than tripled in size in terms of staff headcount, the number of new project orders and the size and value of new projects.

Hoff has made his mark by producing and delivering innovative and reliable equipment to suit customers’ individual requirements. He believes in going more than the extra mile at any cost or to any length. The MD has positioned his company with a product range fortunate enough to enjoy a fairly broad appeal within the coal, gold, diamond, manganese and platinum sectors.

A team of technical experts may oversee the general workload but Hoff remains the driving force behind the company’s project work success and growing order book. As such, he has enabled MIP to become a prominent leader in its field, despite the industry’s on-going economic struggles. Not many companies established during the recession can boast a 30% year-on-year increase in growth over a period just short of a decade.
Unparalleled process solutions | BEE empowered partner

Our current product range includes:
- Attrition Scrubbers,
- Agitators,
- Bag Filters,
- Clarifiers,
- Cyclones for dust extraction,
- Depressant Plants,
- Dry Air Scrubbers
- Horizontal Linear Screens,
- Mixers,
- Reagent Make-up Plants
- Screen-covers for vibrating screens,
- Slurry Samplers,
- Thickeners,
- Wet Scrubbers

MIP Process Technologies (Pty) Ltd. | P.O.Box 677; Kelvin; 2054 | Tel: +27 (0) 11 234 1007
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Chemineer Kenics Prochem Greerco
Ore beneficiation is a science. Customer service is an art. Where they meet is Senmin.

When it comes to beneficiating ore by means of flotation technologies, there is no substitute for 56 years of active account management experience and expertise.

This is why Senmin’s full service model and reagent suite are the first choice of coal, cobalt, copper, diamond, gold, iron, nickel, phosphate, platinum, titanium, uranium and zircon mines in South Africa, Africa, Australasia and Latin America.

As a world leader in mining chemicals, Senmin operates the world’s largest mining chemicals manufacturing facility in Sasolburg, South Africa. This includes the world’s first polyacrylamide plant that uses biotechnology. Safety, health, environment and quality (SHEQ) are strategic priorities. At Senmin, international standards are in place, namely ISO 9001, ISO 14001 and NOSA 5 Star. It is also a signatory to the global chemical industry’s Responsible Care initiative and supports AECI’s Green Gauge performance targets.

In recognition of our firm commitment to SHEQ, we received AECI’s Annual Health and Safety Award in 2013. Given the importance of research and development, Senmin invests in projects that optimise the current reagent suite and studies new technologies for future applications. In addition, Senmin sponsors many metallurgical programmes at AMIRA International, the South African Minerals to Metals Institute (SAMMI) and the University of Cape Town.

Senmin was established in 1958 and became part of AECI in 2004. Today, it falls within the Group’s Mining Solutions Cluster, which offers the convenience of explosives, ore beneficiation and water treatment through a single interface.

WHAT SENMIN OFFERS

Our suite of reagent product solutions is:

- **Xanthates (collectors)** A range of solid and liquid metal sulphide collectors
- **Senkol (collectors)** A range of formulated collectors
- **Senfroth (frothers)** A range of water-soluble and insoluble frothers
- **Sendep (depressants)** A range of water-soluble products, such as carboxymethylcellulose, guar gum and other natural polymers for gangue depression
- **Senfloc (floculants)** A range of polyelectrolyte flocculants and coagulants for improved solids thickening, water recovery, clarity and rheology modification

Our service solutions are:

- Bench scale/metallurgical evaluations
- Statistical evaluation and data validation
- Product development and optimisation
- On-site product management
- Site-specific account management
- Supply chain control (e.g. telemetry and bulk distribution)
- Plant safety audits
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AECI is Africa’s leading explosives and specialty chemicals company.

www.aeci.co.za
BLASTING MINES into the future
ABOVE AND UNDERGROUND

Orica has established itself as a world leader in mining explosives, ground support systems and gold extraction chemicals. With global headquarters in Melbourne, Australia, it has extensive presence in South Africa. Its position in the entire African region is quickly gaining in strength and recognition.
Orica specialises in three areas

1. commercial explosives and blasting systems
2. ground support
3. mining chemicals

Our vision

Clever resourceful solutions

Orica’s vision is to provide clever resourceful solutions to its customers around the world.

This vision is delivered by an organisation focused on customer needs and collaboration, operational excellence, innovation and the creation of value for customers and shareholders alike.

Our values

No accidents today

Orica staff are committed to the safety of each other, its customers and the community. Its aspiration is no harm and zero accidents of any kind – personal, plant or environmental. Our question is: “How can we have no accidents today?” If we have no accidents today and tomorrow, we can do it forever.

Succeed through collaboration

Orica works together as one business across many geographies and embraces the diversity of its team. It respects and values the participation of everyone. “Trusted partnerships are built with stakeholders and success is only achieved if they feel as though they have succeeded with us.”

Find valuable solutions

Orica looks for solutions that add value to its business and customers. “We are committed to continually improve, innovate and find better ways of doing things. We listen to our customers’ needs and invest in research and technology to develop new ideas.”

It’s our business

Orica acts with integrity and honesty. “We are accountable for our actions and make decisions in line with our economic, social and environmental responsibilities. We set goals and deliver results. We communicate our strategy so we can all participate and find opportunities to grow our business.”

The strategy

With a firm geographic footprint in the Southern African Development Community (SADC), the fully BEE-compliant Orica has a strategy that will see it quickly expand throughout the rest of the continent as the mining industry expands through new project development across the region. The Orica region of Europe, Middle East and Africa (EMEA) represents 13% of Orica’s gross sales globally. Africa is recognised as one of the company’s greatest opportunities for growth and this is reflected in its focus and investment.

That said, Orica Africa has positioned itself to gain maximum exposure from the African mining sector. Since its acquisition…

…and of a small explosives plant in Zambia, Orica has invested substantially in the region, clearly showing its commitment to the local mining sector’s development. Today, Zambia remains a key hub of Orica’s explosives operations in southern Africa. Its factory complex at Chambishi manufactures signal tube detonators and base emulsion that is transformed into bulk explosives on user sites. From Chambishi, the base emulsion is supplied to customers in Zambia and exported to Mozambique and the DRC. The Chambishi emulsion plant is also used to train staff for employment on major surface mine sites, where Orica erects similar plants to manufacture bulk explosives for immediate, on-site use.
“In addition to our current footprint, we have been making significant progress into new markets such as Tanzania where we have taken on board two new major clients,” Orica Africa general manager, Johan Strydom adds. Generally speaking, Orica’s business follows its global key accounts throughout the world, “as we have strategic alliances with them in terms of serving and pricing,” continues their Africa technical services manager, Wayne Sterley. “It is thanks to relationships and project work with mining majors that we are able to grow and expand our foothold in the DRC, Zambia, Tanzania and Mozambique.”

“We have also been making significant progress into new markets such as Tanzania where we have taken on board two new major clients” Johan Strydom, GM, Orica Africa

“...we don’t believe any other explosives specialists can hold the relationships and alliances that we have, which is sure to continue assisting our African growth strategy,” states Mining Services South Africa product development lead, Donald O’Connor. Orica currently has eight on-site explosive manufacturing plants located on large surface mines in Zambia, the DRC, Tanzania, Ghana and Senegal.

“...in Africa many of the new projects are being carried out by international majors which gives us a competitive advantage. We don’t believe any other explosives specialists can hold the relationships and alliances that we have, which is sure to continue assisting our African growth strategy,” Donald O’Connor, lead, Mining Services South Africa product development.
These sites, as with all Orica’s customers, benefit from its investment in research and development which is larger than any other supplier of commercial explosives globally.

**Changing perceptions**

“Over the 2014 year we achieved significant growth, exceeding 40% year-on-year,” says Sterley. He attributes this growth to new projects acquired in familiar territories including the DRC, Zambia and Mozambique as well as more distant territories.

Sterley adds that Orica’s objective to expand further into African markets is driven by the company’s strategy to redefine its reputation and industry status. “We want the industry to appreciate our capabilities as an expert service provider with superior and supportive products. To achieve this we are focusing on enhancing our services, technical advisory capabilities and our general processes to improve efficiencies and productivity,” he elaborates.

“We will build on our company’s key foundation success structure – which includes access to world-class technologies and best practices from around the world, alongside global alliance partners,” Strydom highlights.

**Explosives**

Orica has become recognised for its range of safe yet powerful explosives, productive and efficient loading systems and advanced detonators with electronic timing to precisely control the release of explosive energy during a blast.

“Some of our most advanced products have been commercialised in Africa while some are still being developed for the region. “We have made advancements in the product technology but the greatest benefit is achieved when you bring them together with a solution focus. The biggest advancement we have made so far is with our electronics, high energy bulk, wireless and booster initiation systems which have become cost effective solutions for clients. Our wireless technology is exclusive and will be available commercially during the course of this year,” explains Sterley.

Over recent years, Orica has invested heavily in its services capability and now offers a flexible range of service offerings to support its customers blasting needs. Considered its base business in blasting, Orica offers a ‘Down the Hole’ service for customers that have converted to bulk explosive systems. It also offers a ‘Total Loading Service’ under which it also prepares the holes and takes care of the stemming, tie and firing process. Under its ‘Blast Management Service’ Orica begins to truly optimise the post blast outcomes, as it brings a range of sophisticated and best-in-class technology to design the blast initially, then measure and evaluate the outcomes.

At the higher end of its service offering, Orica provides managed solutions for controlled and optimised frag-
BLAST BOX 310/310R
The Blast Box provides the voltage and command to fire the detonators in programmed sequence. The 310R (pictured) offers remote firing capability.

SCANNER 120/125
A barcode scanner that reads unique ID numbers on the detonators.

This is of great benefit for mines needing to optimise their digging, loading, hauling or milling operations. The blasting specialists combine a study of a site’s mining and processing needs with a vast array of leading technologies and global experience to provide fragmentation outcomes that best meet customer needs. Under these advanced contracts, Orica provides all elements of the blasting function to deliver broken rock to a set of agreed, optimum fragmentation specifications.

uni tronic™ – a new era for rock blasting
As an industry leader in electronic blasting systems, Orica is constantly working to make its products safer, more reliable and more efficient. Through ongoing investment in research and the development of new technology, the company continuously adds new features and functionality to make its systems the most effective in the market. To support such advanced technologies, Orica has built an African service team that gives customers expert guidance on how to get the best results from their blasting operations.

Its next generation of electronic blasting systems builds on over 20 years of laboratory testing and 10 years of in-field use. uni tronic™ 600 is one of three systems within the next generation range and is set to revolutionise rock blasting. The UT 600 system has the capability to fire up to 1 600 detonators when synchronised with two blast boxes. The maximum delay time is 10 000 ms, and can be programmed in 1 ms increments. Remote blasting is possible with up to 800 detonators with a range of up to 2 km.

At the heart of the system is a more sophisticated application-specific integrated circuit (ASIC), providing greater levels of safety and reliability. With new features such as on-bench testing and improved fully programmable millisecond timing, gains can be achieved in both efficiency and performance.

Electronic blasting systems are considered most valuable for customers in challenging mining conditions. Through more accurate control of the release of energy in the rock mass, the systems can, among other things, help mines to reduce overall cost, improve productivity and manage licence to operate or environmental impacts. This can be done through improvements to the mining process such as better rock fragmentation, improved wall stability, control of blast vibration, control of flyrock, improved rate of underground advance and ore/waste separation during blasting.

SHOTPlus™ blast design software
Orica’s SHOTPlus™ blast design software gives printed blast plans and is useful on the bench with the uni tronic™ 600 system.
MasterBlast – analysing blasting parameters

“We have just launched MasterBlast – a blast management programme for our mobile manufacturing units that will give us near real time feedback for analysis of blasting parameters,” says Strydom. The MasterBlast system aims to standardise the information collection processes and provide a one stop shop for recording and reporting of data. “This is so important. Data drives smart decisions and continual improvement for the benefit of our customers” he added.

i-kon™ – the blasting flagship

Sterley is overseeing a project that commenced in November 2013 in the DRC which features Orica’s flagship product, the i-kon™ electronic blasting system. This product is a “door-opener” along with the other technologies and services including vibration control and fragmentation analysis.

i-kon™ detonators are fully programmable and have on-board digital timing circuits and energy storage, enabling them to function independently once the fire signal has been sent. The Pentolite base charge is housed inside a copper/zinc alloy shell to provide appropriate dynamic shock resistance.

At the surface end of the detonator is a displacement connector which connects quickly and easily to the harness wire.

The detonator fits into all conventional boosters. For particularly harsh conditions, challenging geology or when seeking to optimise the results from blasting, the i-kon™ system can deliver superior performance.

Orica’s i-kon system has the capability to fire 4 800 detonators when synchronised with two blast boxes. The maximum delay time is 20 000 ms, and can be programmed in 1 ms increments. Remote blasting is possible with up to 2 400 detonators with a range of up to 2 km.

Converting to the i-kon™ II system has been made more efficient with software upgrades ensuring no current hardware is obsolete.

Shocktube Nexa Connectadet

The user-friendly Connectadet provides accurate surface delays for open cast blasting operations and is available in a wide range of lengths and delay times.
Ground support

Orica’s Ground Support division started in South Africa in 1975 under the name Fosroc. It became part of the Orica Group in 2007. Two of its locally manufactured products, Lokset™ resin capsules and Capcem™ cement capsules for rock bolting are strategically important for safety in South African mines and are also exported to African countries and beyond.

Orica Ground Support has factories in Isando and Alrode, as well as a repair workshop in Rustenburg. In keeping with Orica’s core value of “no accidents today”, all three facilities are managed to the highest international standards of safety and environmental responsibility. The quality systems are ISO 9001:2008 accredited. Lokset™ resin capsules and Capram™ cement capsules comply with the applicable South African National Standards and carry the required SABS certification marks.

“Orica Ground Support serves all of the significant mining houses across all minerals in South Africa. We also have an export footprint into Ghana, Zambia, Tanzania and Botswana as well as South America,” explains O’Connor.

With its deep-level mining, high temperatures and narrow stopes, the South African mining industry poses unique technological challenges. Orica Ground Support has a history of developing innovative solutions to meet these challenges. They include slim-hole drilling and resin bolting systems for safe and efficient rock bolting in both gold and platinum mine stopes.

In numerous instances, Lokset™ resin bolting has cut bolting time while simultaneously making operations easier and safer. The Autorock mini-drill rig has revolutionised rock bolting in stopes and was awarded an SABS Design Award in 2008.

Enhancing its resin capsules

The Ground Support division is currently looking at ways to extend the shelf life of its South African flagship resin capsules. “The capsules have always had a limited application in export markets due to their short shelf life of between four and six months. We are looking to add two months to this shelf life by changing their chemistry and logistics,” explains O’Connor.

Next generation bolting systems

The Ground Support division has a...
number of initiatives up its sleeve and is currently working with a major platinum supplier on next generation bolting systems following their theme of increasing mechanisation. This will ultimately see bolters being controlled remotely.

“We’ve also developed a slim-hole bolting system which enhances resin use underground,” states O’Connor. He goes on to say that there is a view in advanced mining countries that rock support has achieved the required level in terms of safety. The focus going forward will see the development of support systems that improve productivity further – through their ease and speed of installation.

“We have previously worked with a major coal mining company that saw us shave 15 seconds off a bolt installation time. This may not sound much, but it equated to an extra month of drilling per machine per year,” explains O’Connor.

In 2014 Orica delivered improvements across many key sustainability indicators. From its 2010 baseline, Orica has reduced its annual greenhouse gas emissions by more than 900 000 t. This is the equivalent of removing more than 300 000 cars from the road.”

Orica develops and commercialises differentiated services and products that enable its customers to progress their own sustainability objectives. The use of chemical energy to break rock in the blasting process can be up to 25 times more effective than electrical energy to do the same task by milling and grinding, resulting in lower greenhouse gas emissions.

Orica’s innovation and use of technology also assists customers with improved noise, vibration and fume control, all of which support a mine owners’ ability to maintain the support of their host communities.

The company has developed and implemented more than 100 site-specific environment management plans and has again been included in the Dow Jones Sustainability Australia Index and the FTSE4Good Index. (Source: 2014 annual report)
Becker Mining South Africa has never been more intensely focused on improving safety and enhancing productivity than it is now.

The last 12 months have seen the company introduce a variety of technological innovations guaranteed to deliver the safest and most productive mining operations.

**No more collisions**

Becker Mining South Africa has been at the forefront of collision avoidance systems (CAS) in the mining sector for over 15 years and will retain its position thanks to the recent launch of its latest generation safety device – the Intelligent Collision Avoidance System (ICAS) – that provides situational awareness for operators and ensures optimum safety.

This surface collision avoidance safety system also enhances productivity and operational continuity and reduces operating costs through the elimination or reduction of damage to assets. "ICAS is a critical safety system, which encompasses the latest industrial..."
By creating awareness and eliminating blind spots, these hazards are reduced, which means fewer collisions and a lower risk of injury. Operators have improved reaction time to make decisions that will avoid near misses and collisions.”

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technology, to provide reliable real time, 360° situation awareness for vehicle operators working in potentially dangerous and congested site applications, from coal pits to ports,” explains Johann Smit, chief sales officer, Becker Mining South Africa.

“Blind spots, poor visibility and driver distraction are common causes for unwanted vehicle interactions on mine sites, processing plants, rail and road networks and ports. By creating awareness and eliminating blind spots, these hazards are reduced, which means fewer collisions and a lower risk of injury. Operators have improved reaction time to make decisions that will avoid near misses and collisions.”

“This robust IP 67 marine grade device, which consists of three components – the display unit, GPS antenna and radio antenna – ensures equipped vehicles and fixed infrastructure are always visible and identifiable to operators, even in harsh, dusty environments.”

Applications for ICAS include heavy vehicle (HV) to heavy vehicle, heavy vehicle to light vehicle (LV), medium vehicle (MV) to LV and HV, vehicle to personnel, fixed and mobile plant, advanced train and rail track worker warning and rail level crossing activation.

“Our systems, which are designed for surface and underground environments, have evolved progressively, based on advancements in technologies and expanding expectations from customers, of the functionality of these systems,” says Smit.

Throughout the development of the CAS product portfolio, the company has maintained compatibility of the latest technologies, with even the very earliest releases of CAS solutions.

“This approach has ensured that users’ investment in these mine safety technologies would always be protected to the greatest extent possible, against the effects of obsolescence, as a result of technological improvement. Inevitably, this has resulted in a series

New ICAS collision avoidance
Becker Mining South Africa has recently launched its latest generation safety device – the Intelligent Collision Avoidance System (ICAS) – which provides situational awareness for operators, to ensure optimum safety on site. This surface collision avoidance system also enhances productivity and operational continuity and reduces operating costs through the elimination or reduction of damage to assets of readily available multi-technology components, used in combination with CAS systems, to suit exact requirements.

“The flexibility of Becker’s modular CAS system has proved to be a success story and the contemporary CAS solutions now offer cost effective solutions, specifically tailored to the needs of our customers’ vehicular and personnel inter-operational environments. These systems are delivered and maintained well within allocated safety system budgets,” Smit states.

In many cases, low profile machines operate in physically constrained surroundings with limited visibility for vehicle operators. This common scenario, coupled with the increasing volume of production traffic and inevitable proximity of personnel around these machines, creates circumstances conducing to injury as well as life threatening and fatal accidents.

Becker’s third and fourth CAS solutions remain in full-scale production and are fully supported through extensive pre and after sales programmes. In addition to core vehicular equipment, these solutions are complemented by personnel tags, vehicle tags, and infrastructure and self-test equipment, as well as connectivity solutions to Becker’s extensive underground communication product portfolio.

CAS – vehicle to vehicle alert
The detection of vehicles (vehicle to vehicle alert) and personnel (vehicle to person alert) is highlighted to the driver by changing the ambient lighting colour of the cabin with multicolour LED strips.

CAS – vehicle to person alert
Becker Mining South Africa’s latest patented tri-technology Collision Avoidance System (the CAS-400 series) with four proximity warning zones, has been designed to overcome the limitations of existing systems and can even bring the mine vehicle to a complete ‘STOP’, should this be necessary.
The ability of the company’s latest generation equipment to black box record and then report possible incidents to a centralised management information system – through the Becker Mining Systems communication networks – plays an important role in pre-emptive operational planning. This ultimately contributes to the avoidance of proximity related accidents and collisions, as well as pinch and crush incidents. Tags installed on vehicles and personnel facilitate additional value added functionality, such as tagging and tracking, as well as remote evacuation signalling.

The increased visibility safety officers now have of daily activities in potential near-miss hot spots, as well as the ability to issue mine wide evacuation instructions to personnel with the push of a button on surface control systems, ensures a safer working environment.

Although the loco driver is always responsible for controlling the locomotive, the LMS is programmed to check the operator, acting as a driving aid to prevent tramming accidents. "Although the loco driver is always responsible for controlling the locomotive, the LMS is programmed to check the operator, acting as a driving aid to prevent tramming accidents. The system is equipped with a global emergency stop facility and is able to halt other locomotives within radio range remotely from the guard car, loco or via handheld units. The LMS advises drivers when to slow down, bring the loco to a halt, or do an emergency stop. Parameters, which measure true proximities, are programmed for different speed, are programmed for different areas of haulage and for various speed limitations as required."

The LMS also provides reliable proximity detection and collision avoidance warnings between locomotives, trackless machines and pedestrians. Various events during operation and important parameters are logged as real time data and downloaded for analysis and evaluation. The user interface, which comprises an LCD screen and six function buttons, connects to the main unit via an umbilical cord.

Reliable and easily recognisable cautionary signals include programmable proximity warnings – a cab light illuminates red and loud buzzers warn the driver or guard of a potential hazard. The cab light illuminates white when the loco or guard door is opened. An orange light indicates an active RF link between the loco and guard unit and a red light illuminates in the event of a lost signal. The LMS automatically switches on the headlights and the pre-start siren of the locomotive and remotely activates the lights and siren of the guard car. This loco management system, which provides front driven and remote drive technology to underground trains, has an integral stored energy mechanical brake interface and an automated static and dynamic brake testing facility.

Becker Mining South Africa’s collision avoidance systems encompass the latest technologies for optimum efficiency, enhanced safety and compatibility with all CAS components.
power consumption. By reducing the charge current once $\text{DV}/\text{DT}$ is reached, batteries are charged at a significantly lower temperature."

With an improved power factor of 0.8 and a maximum input current which has been reduced from 42 A to 32 A, these energy efficient battery chargers offer power savings up to 10 kVA during maximum output current.

For the efficient management of mine traction batteries, Becker Mining’s robust chargers have an integrated power line communication (PLC) identification method, which automatically logs the serial number, as well as the charge history related to that specific battery.

The user interface is a full colour display which provides relevant information, including voltage, current, state of charge, temperature of stack, capacity charged, duration of charge, errors, time and date.

Becker Mining’s IGBT traction battery chargers are equipped with Wi-Fi to facilitate future downloading of data, errors and the charge history of each battery, or for viewing or analysis on the surface.

Becker’s hydraulic rail benders have been developed for bending and forming rails on railway lines in heavy industrial and underground transport systems on mines, easily handling rail up to 40 kg/m.

“These rail benders – standard on many South African mines – are powered by 25 t/250 kN hydraulic cylinders and activated by two stage hand pumps to cope efficiently in harsh operating conditions,” says Eugene Davids, product manager for Becker Mining South Africa.

The rail benders are manufactured locally at the company’s Bellambie Mining and Industrial facility in Alrode, according to stringent quality and safety specifications.

For ease of maintenance, the pump and cylinder are detachable from the rail bender. The main frame of these rail benders are cast and forged from ASTM-E487/78/110 steel and are fitted with specially designed handles for easy transportation. The back frame section, which provides stability to the unit, enhances portability and facilitates accurate alignment for faultless operation. Becker Mining’s range of hydraulic equipment also includes robust jacks, designed for safe and easy railcar and off-road equipment jacking applications.

There are three models of portable ratchet jacks available, with 5, 10 and 20 t capacities and lift capacities between 330 and 457 mm. Features include double lever sockets for jacking in heavy-duty rail benders bend

Becker ratchet jacks
Becker Mining’s range of hydraulic equipment also includes robust ratchet jacks, designed for safe and easy railcar and off-road equipment jacking applications.

Becker super jacks
Becker Super jacks, with a ratcheting screw jack design and low handle effort, have been developed to hold a load indefinitely.

Becker hydraulic rail bender
Becker Mining South Africa’s hydraulic rail benders, which bend and form rails on railway lines in heavy industrial and underground transport systems on the mines, easily handle rail up to 40 kg/m.

Becker mining solutions

IGBT mine traction battery chargers
Becker Mining South Africa’s recently launched IGBT mine traction battery chargers have been designed to charge underground traction batteries in the shortest possible time, at the lowest possible temperature, to ensure optimum battery performance.
**CURRENT AFRICAN PROJECTS**

Becker Mining South Africa is currently running its Collision Avoidance System – worth R11 million – at a mining operation in Zimbabwe. The company is further underway with a project in the Democratic Republic of Congo – running its underground communication leaky feeder system. The project is valued at R4 million.

This belt rip detection system, which is based on the highly efficient design of the original BRS-1 system, is used to detect longitudinal rips on steel cable and fibre conveyor belts.

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**Quick catch belt rip detection**

Becker Mining South Africa recently launched its BRS-2 belt rip detection system, which has been designed to increase the productivity of conveyor belts by detecting belt rips as soon as they occur.

“...This belt rip detection system, which is based on the highly efficient design of the original BRS-1 system, is used to detect longitudinal rips on steel cable and fibre conveyor belts,” says Smit. “The BRS-2 uses real-time loop diagnostics to continuously monitor the status of the belt and, in the event of a rip, stops the belt drives, which reduces any further damage and minimises downtime.”

To monitor the status of a belt, inductive loops are embedded in the belt. Once installed, the BRS-2 system carries out an identification run and the processor of the belt rip detection system unit (BRS/CU) stores the necessary data. Parameters include the succession of loops in the belt, belt speed and start up time of conveyors.

Quick Catch Belt Rip Detection

Confined spaces, multiple tooth pawls for additional strength and enhanced safety and a large base diameter ensures a firm, dependable foundation.

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**SERVICE DELIVERY AND MAINTENANCE**

Becker Mining South Africa has service level agreements with most of its African customers, established to ensure its equipment and technology is performing optimally – at all times. These agreements are customisable and include day-to-day; month-to-month; year-to-year, or quarterly contracts.

Stock is available in certain Africa countries through the company’s distributors but we can provide clients with any part/product requirements from our African head office in South Africa.
The earth is full of treasures. We know how to bring them to the surface.
Wholly-owned by the Metso Group, Metso South Africa’s ‘claim to mining fame’ is BIG solutions, BIG technologies and the BEST equipment and service offering solutions in Africa. And it has a 100+ year track record to prove it.
Metso, and its vast array of world-renowned equipment brands are African household names thanks to decades of supreme performance, service solutions and delivery across multiple stages of the mining and beneficiation process – including crushing, screening, fine grinding, process equipment, bulk materials handling and pyrometallurgy.

It is the company’s globally acclaimed brands, some of which have served the industry for more than 100 years, which helped form and today represent the foundation of Metso’s identity and include Nordberg, Allis Chalmers, Denver Sala, Trellex, Skeega, Barmac and Svedala – to name just a few in a list of long-standing and reputable trademarks.

Committed to Africa
Metso South Africa is unquestionably committed to the African continent and has been for more than a century through its impressive array of internationally renowned brands and branches that have been established over the past 60 years. It employs more than 1 000 people in Africa. Today the company has an enormous, well established installed base of quality equipment stretching across the continent with several worldwide manufacturing unit suppliers. Its broad black-based economic empowerment company, Metso Mining and Construction South Africa, is 25% black-owned, making it fully compliant with the South Africa’s Mining Charter. This move further entrenches the company’s commitment to support its base in South Africa.

Service, back-up and spares – Metso’s backbone
Service forms the backbone of the vast package offered by Metso, who works hand in hand with customers to reach the lowest and most efficient production costs.

The company prides itself on the outstanding support for its equipment with a huge inventory of original equipment manufacturer (OEM) spares, supported by comprehensive maintenance and service contracts throughout the continent and beyond.

The vast majority of Metso’s OEM spares are manufactured by its group-owned foundries in South Africa and are exported throughout the world. All spares carry a guarantee, which further enhances the longevity of wear components and equipment lifecycle.

Big technology ground breakers
Metso is continually creating new technology throughout its enormous equipment range and breaking new ground in Africa. The delivery of a new breed of new generation comminution machines – bigger and capable of higher throughputs, greater efficiency and reduced costs – is just one recent example.

• The Nordberg MP2500
  The Nordberg MP2500 is bigger and better than previous machine generations and is based on the operating principles and proven technology of its younger MP1250 cone crusher sister. All the best characteristics have been incorporated along with new features making it more powerful, more energy efficient, capable of handling bigger lump sizes and throughput and delivering larger yields. It is the biggest cone crusher in the world and weighs in at 465 t compared with its 159 t sister crusher, effectively doubling the crushing force. Metso has sold its first two MP2500 crushers, commissioned towards the end of 2014, to a copper project in Zambia.

• The C120 crusher
  The recently launched C120 crusher is on Africa’s shores with its first unit already in place and commissioned at a Mozambique quarry. During the design stages of the C120 project, Metso worked closely with its customers to collect field data from many sites to assess the design criteria. It required a combination of uncompromising reliability, crushing efficiency, safety, versatility in
Meeting Metso Management

Luis Santos, senior vice president of Metso Minerals, began his career at Metso in January 1985, implementing the company’s presence in Portugal. He has held several sales related executive positions in Europe and within the company’s construction business. During the period spanning 1992 to 2004, Santos headed Metso France and had the responsibility for the factory and operations in Macon. From 2009 to 2013 he headed all sales and service operations in Europe, the Middle East and Africa. To give focus to Metso’s business in Africa, he currently heads the Africa, Middle East and Turkey sales region.

capital costs are lower due to a simple, small footprint and rapid installation. The energy efficient grinding system also offers lower operating costs and reduced media consumption.

The proof is in the pudding ‘Out of the box’ thinking

An innovative approach and collaborative effort are the reasons Metso was successfully able to accommodate Kumba Iron Ore’s request to fast-track the early delivery of an apron feeder to the famous Sishen iron ore mine in the Northern Cape.

Normal practice is to assemble and factory test the unit but on this size machine, it would have been required to strip the machine again after testing and then reassemble on site.

Metso’s continuous development programme has also taken it to new levels in grinding technology with the new Vertimills and vertical stirred mills.

Having explored the possibility of lifting the apron feeder mainframe onto a low bed trailer, assembling and testing it whilst on the trailer, the solution was successfully implemented following the completion of a full detailed study. Modifications to the main factory access gate – to accommodate the turning circle of the laden trailer – were also accounted for.

The D9 machine is 3.66 m wide, (5.5m including head shaft), over 12 m in length and weighs 108 t when fully assembled. It is greater than the capacity of the cranes servicing the workshops.

The end result, despite many challenges and abnormal transport restrictions, was achieved and the apron feeder arrived at Sishen three days before the planned shutdown.

Chronic pegging of screening media was causing daily downtime and inefficiency at the large-scale West African open pit gold mine. Problems arose when the near-mesh rocks clogged the screening media openings, impeding the passage of the undersized material, leading to a higher recirculation load. Operators had to stop the line continuously to clear the trapped material. In addition, the tertiary bins became over-filled due to the bottleneck downstream.

After evaluating several suppliers, Metso’s Trellex LS modular rubber screens, which are anti-pegging, were installed in January 2011. They lasted 10 months versus an estimated three months on the previous screens, plus they did not collapse under heavy loads.

According to the most recent reports, annual operational downtime at the mines has been reduced by 90 hours, meaning that an extra 108 000 t of ore can be processed annually. The cost savings are at least USD$315,000. A huge added benefit is that it has made the mine a lot safer and a much cleaner place to work.

MEETING METSO MANAGEMENT Luis Santos, senior vice president of Metso Minerals, began his career at Metso in January 1985, implementing the company’s presence in Portugal. He has held several sales related executive positions in Europe and within the company’s construction business. During the period spanning 1992 to 2004, Santos headed Metso France and had the responsibility for the factory and operations in Macon. From 2009 to 2013 he headed all sales and service operations in Europe, the Middle East and Africa. To give focus to Metso’s business in Africa, he currently heads the Africa, Middle East and Turkey sales region.

stationary and mobile applications and easy to operate.

- Nordberg C-series
  The Nordberg C150 jaw crusher is also an addition to the C-series, improving on the previous C140 and C145. It has the ability to take in large feed sizes up to 1 m and crush them down efficiently to get the lowest possible cost per ton.

- Vertimill grinding mills and stirred media detritor
  Metso’s continuous development programme has also taken it to new levels in grinding technology with the new Vertimills and vertical stirred mills.

normal practice is to assemble and factory test the unit but on this size machine, it would have been required to strip the machine again after testing and then reassemble on site.

Gold Fields Ghana Tarkwa gold mine faced a challenge

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Adding value to your operation with Metso’s world renowned equipment

One name linked to many brands!

Metso offers OEM guaranteed spares for optimal plant reliability and extended lifecycle. Training and dedicated service teams with global competence and hand-on experience, for all our recognised brands, ensures peak performance.

BEE Ownership Compliant

metso.com – email: mmsa.info.za@metso.com
Experts in **decision support** and

In the space of just five years, specialised project and risk management services company VBKom Projects has emerged as a leader in its field. Not only does it already have a lengthy list of completed projects and clients in the SADEC region already but is planning to grow its footprint into the West African region as well.
Who is VBKom Projects?

VBKom Projects is a fairly young, privately owned affiliate of parent company VBKom Consulting Engineers and therefore part of the larger VBKom Group of companies as well. Having recognised opportunities for improvements in the level and quality of project support services in the mining industry, the company was formed in 2009 and has since then focused solely on delivering specialised project and risk management services in the mining sector.

Strategically, the VBKom group of companies operate side-by-side, thereby augmenting the specialist/technical offering of the other VBKom companies and offering clients an additional management service to supplement their projects’ technical work.

The VBKom name is a well-established and trusted brand in the mining sector and companies who have dealt with the VBKom Consulting Engineers mining engineering experts undoubtedly feel at home with the like-minded staff of VBKom Projects.

In Africa, but growing further

The VBKom Group is working diligently to increase its exposure and brand in the SADC region (via its Namibia office) and has an established work footprint in a number of countries including:

- Guinea
- Republic of Congo
- Tanzania
- Namibia
- Democratic Republic of Congo
- South Africa
- Gabon (VBKom Projects was also involved in a due diligence for the Gabon Ministry of Mines on a manganese deposit just outside of Franceville during 2013)
- Botswana

SADC aside, VBKom intends to penetrate the West African region in 2016/2017 with the opening of an office in Accra, Ghana.

In support of this, the company is aggressively marketing and exhibiting into West Africa and is trying to establish the brand for its core competencies.

Our philosophy

VBKom Projects acknowledges that for life and business to be rewarding and fulfilling, it needs to know its reason for existence, operate within its value system and execute in its “strength zone”.

“We operate under the paradigm that trust and respect must be earned, that opportunity favours the prepared, and that success only comes with daily application and persistent hard work. We appreciate and welcome staff diversity and encourage staff to subscribe to a life-long process of personal development and self-actualisation, because we know it overflows into passion, energy, self-motivation and self-esteem. As a result the company embraces a joint developmental partnership with all its staff and encourages them to grow and participate in extramural company programmes and industry professional bodies,” says VBKom Projects MD, Eduan Pieterse.

VBKom Projects approaches all its projects and engagements with the following paradigms:

- appreciate and respect client organisational culture;
- understand project context and strategic positioning;
- correctly size the project management effort in relation to the project size;
- fall in with company processes and procedures;
- operational efficiency;
- pro-active mindset;
- solution focused thinking;
- constraint and milestone driven;
- resource conscious and cost sensitive;
- clear and unambiguous communication;

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## Previous Clients & Projects

VBKom Projects has been operating for the past five years (since 2009) and has delivered various mining project management, risk management and simulation services to the following clients:

<table>
<thead>
<tr>
<th>Client</th>
<th>Year</th>
<th>Engagement period</th>
<th>Services rendered</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mincom</td>
<td>2009</td>
<td>two months</td>
<td>High level desktop risk assessment, Qualitative risk assessment facilitation, Quantitative risk assessment: Capacity estimate simulation, Schedule simulation, Forthrightly risk reporting and support, Project support and administration</td>
</tr>
<tr>
<td>Delta Mining Consolidated</td>
<td>2010</td>
<td>six months</td>
<td></td>
</tr>
<tr>
<td>PrepQuip</td>
<td>2010</td>
<td>one month</td>
<td>Risk advisory, Quantitative risk assessment: Capital estimate simulation, Qualitative risk assessment facilitation, Quantitative risk assessment</td>
</tr>
<tr>
<td>ThyssenKrupp PDNA Engineering</td>
<td>2011</td>
<td>one month</td>
<td></td>
</tr>
<tr>
<td>Aquila Steel (SA)</td>
<td>2011</td>
<td>10 months</td>
<td>Forthrightly risk reporting and support, Project support and administration and schedule management and reporting</td>
</tr>
<tr>
<td>Kumba Iron Ore (SPP project)</td>
<td>2011</td>
<td>eight months</td>
<td>Qualitative risk assessment facilitation, Project management support, coordination and administration (2009 - 2014)</td>
</tr>
<tr>
<td>Kumba Iron Ore (Phoenix project)</td>
<td>2011 &amp; 2012</td>
<td>18 months</td>
<td>Qualitative risk assessment, Schedule simulation, Project support and administration, Options analysis</td>
</tr>
<tr>
<td>Delta Mining Consolidated (Wetlands project)</td>
<td>2011</td>
<td>three months</td>
<td>Qualitative risk assessment facilitation, Project support and administration, Options analysis</td>
</tr>
<tr>
<td>Eurasian Natural Resource Corporation</td>
<td>2011</td>
<td>four months</td>
<td>Qualitative risk assessment, Project support and administration, Options analysis, External examiner – post-graduate risk management, Guest lecturer – risk management</td>
</tr>
<tr>
<td>University of Pretoria</td>
<td>2010</td>
<td>four months in total over the three years</td>
<td>External examiner – post-graduate risk management, Guest lecturer – risk management, Qualitative risk assessment facilitation, Project support and administration, Options analysis</td>
</tr>
<tr>
<td>Kumba Iron Ore (SEP18 process plant)</td>
<td>2011 &amp; 2012</td>
<td>20 months</td>
<td>Qualitative risk assessment facilitation, Hazard and operability technical studies, Risk and process simulation</td>
</tr>
<tr>
<td>Husab Uranium project (haul truck selection)</td>
<td>2012</td>
<td>three months</td>
<td>Risk and process simulation, Options analysis</td>
</tr>
<tr>
<td>Taung Gold (Evandar 6 Shaft BFS)</td>
<td>2013 &amp; 2014</td>
<td>four months</td>
<td>Qualitative risk assessment facilitation, HRRA safety risk assessment, Comprehensive risk reporting</td>
</tr>
<tr>
<td>Asia Minerals</td>
<td>2014</td>
<td>one month</td>
<td>Stochastic risk-based financial modelling, Options analysis, Operational fleet simulation</td>
</tr>
<tr>
<td>BHP Billiton (Wessels mine central block feasibility)</td>
<td>2013 -2014</td>
<td>six months</td>
<td>Qualitative and quantitative risk services to various sishen &amp; kumba projects: K1053 - slimes dam legs and simulation projects, K1194 - Sishen in-pit crush, K0111 - jig discard beneficiation, K1351 - new Sishen warehouse project, K1286 - export pump station &amp; pipeline, K0690 - construction of new scrap yard, K1361 - refurbishment of reclaimers Hazop, K1024 - Sishen clean water separation, K1616 - Sishen groundwater dam, K0143 &amp; K0144 - modular plants</td>
</tr>
<tr>
<td>Kumba Iron Ore</td>
<td>2012, 2013 &amp; 2014</td>
<td>on-going master contract for all risk services</td>
<td>Options analysis, Operational fleet simulation, Capital Estimate Simulation, Schedule Simulation</td>
</tr>
<tr>
<td>Kumba Iron Ore (Dingleton Resettlement project)</td>
<td>2014 -2016 (still active)</td>
<td>12 months</td>
<td>Full implementation risk services: Capital Estimate Simulation, Schedule Simulation, Qualitative Risk Assessments, Monthly Board Risk Reporting</td>
</tr>
<tr>
<td>ArceolorMittal SA (COZA project)</td>
<td>2014</td>
<td>one month</td>
<td>Stochastic risk-based financial modelling</td>
</tr>
</tbody>
</table>

### Our Profession

VBKom Projects respects and values the project management profession. Its mission is not to dilute the industry with sub-standard services and under-qualified resources, but rather enhance it with professional service as delivered by suitably qualified and accredited personnel.

VBKom Projects is committed to adding value to its clients and their projects through innovative, practical and trustworthy project management services and solutions.

### Company Values

- professionalism and dependability;
- being contextually relevant;
- authenticity;
- having a can do attitude;
- quality and value to our clients;
- teamwork; and
- balance and growth.

### Decision Support Services

Option analysis in capital intensive projects in the mining industry is always going to be a challenging aspect for project managers. Business cases are commonly used as the tool in most cases to differentiate the expected value of the options. The amount of uncertainty in the business case results are however often not very clear. This may lead to decisions favouring options with a lot of uncertainty, rather than options with much more certainty, but a slightly worse business case. Where uncertainties in business case elements are too high, the options are in many cases piloted at great cost.

VBKom Projects provides two classes / suites of decision support services, namely:
- Risk-based decision support, and
- Simulation-based decision support.

Both of the above classes have the potential to eliminate high piloting/implementation costs by firstly simulating the real scenario at a much cheaper price. The first class of decision support, namely risk-based, makes use of Monte Carlo simulations to iterate thousands of potential outcomes and provide a statistical basis for the baseline scenario. In light of the risk distribution and based on corporate risk appetite or risk policies, the baseline position can be adjusted.
accordingly by the provision of a statistically calculated contingency or factor. This has the effect of moving the baseline confidence percentile into the acceptable range of statistical certainty.

This technique is most often applied to project capital budgets, estimates, schedules deadlines and Investment NPVs, but it has also recently been applied in more technical areas such as capacity overflow determination and product specification breaches.

Graphs 1 and 2 illustrate the outcomes from such an exercise.

The second class of decision support makes use of process simulation. With process simulation the business processes are defined and simulated as a continuous or batch operation in a simulated real time environment. This service allows customers to fully understand the effect that system constraints will have on the outcome of their projects, be they Greenfields or Brownfields projects.

The factors that must be considered for integration with peripheral systems are highlighted, and design and process logic as well as assumptions can be tested with ease at a very low cost compared to physically building pilot plants and testing multiple different scenarios.

VBKom Projects makes use of Simio for simulation. Simio has an object orientated architecture that allows it to develop simulation models much more quickly than legacy tools did in the past. It also has an integrated 3D functionality that makes the models easy to understand.
and follow. The new technology therefore makes option analysis with simulation much easier to deploy and more useful in current day projects.

Typical mining options that can be evaluated through process simulation are:
- heavy mining equipment fleet size options
- route optimisation
- mineral processing
- cost optimisation (full truck loads)
- inventory location and volume optimisation (stockpile, spares, fuel)
- Water balance management.

Applying changes early in a project is always much more affordable than making costly modifications later when rework of finished work will be required. It therefore makes sense to rather dedicate more effort during the conceptual and pre-feasibility phases of projects when option analysis is done.

Applying the above mentioned simulation techniques are tools that can assist your company in making better decisions during this phase of your projects.

What an MD does in their personal time reveals a lot about their potential as a leader. Pieterse’s reading material speaks volumes. “I am a firm believer in constant improvement and follow a reading plan to grow my mind.” In 2014 Pieterse read some of the following:

How Full Is Your Bucket? (Rath, Tom)
- The One Minute Manager Meets the Monkey (Blanchard, Ken; William Oncken)
- The 7 Habits of Highly Effective People (Covey, Stephen R.)
- The One Minute Manager (Blanchard, Ken; Spencer Johnson)
- The Purpose-Driven Life (Warren, Rick), The Energy Bus (Gordon, Jon)
- As a Man Thinketh (Allen, James; Anne M. Will)
- Now, Discover Your Strengths (Buckingham, Marcus)
- Half Time (Buford, Bob)
- Losing My Virginity (Branson, Richard)
- The 15 Invaluable Laws of Growth (John Maxwell)
- First, Break All the Rules (Buckingham, Marcus; Coffman)
- Ordering Your Private World (Gordon MacDonald)
For all your Mining Project Management, Risk & Simulation needs

VBKOM Projects is a professional and specialist Project and Risk Management service provider for the Mining, Industrial and capital intensive industries.

We assist our clients on a number of Decision- & Management support fronts:

- Risk Management Services (Qualitative & Quantitative)
- Technical Risk & Hazard Studies (HAZOP 1-6)
- Mineral Asset- & Project Financial Modelling
- Operational Readiness
- Front End-Loading PM Support
- Process Simulation
- Scheduling & Project Control
- Contract Management (FIDIC & NEC)

Should you wish to engage VBKom Projects, feel free to contact Eduan Pieterse:
The company enjoys a unique position as a truly African company, thanks to its early entrance into various countries on the continent when it first started some 31 years ago. And today, with more than three decades of experience working outside of South Africa, the company boasts a track record and footprint encompassing multiple different commodities (gold, diamonds, base metals, tin and REEs, precious metals, bulk commodities, aggregates, etc.) around 30 African countries.

“It was our early entrance onto the continent that gave us a leading edge in terms of experience and familiarity. The company was started during a period (1983) when South African mining houses employed consultants internally, “forcing us to look beyond the border for work. Today, we recognise this blessing and are comfortable working in remote and less familiar territories.” This has undoubtedly contributed to The MSA Group’s growing success.

“Today we remain actively involved in between 12 and 15 African countries every year and execute between 150 and 200 projects per year,” says Scott. While the company may have a global presence with representation on five continents, including the Middle East, it considers itself an African specialist.

“Our company is comprised of the largest group of independent geologists in Africa and extensive engineering, environmental and mineral economics skills. Our extensive experience combined with our reputation and activities in Anglophone and Francophone African countries is testament to our home base African position,” states Scott.

The company has been ISO 9001 Certified for Quality for four years and recently achieved OHSAS 18001 Certification for Health and Safety which highlights its commitment to safe operational excellence in foreign countries. In addition, it was awarded the third place in the Deloitte 2014 ‘Best Company to Work For’ survey for the second year running which is proof of the fact that the company places great value in its staff – who Scott describes as “the best people in the sector offering the best value proposition”.

“We also pride ourselves on the fact that over 90% of our work stems from repeat business and referrals,” he continues. The MSA Group has a long list of repeat clients which include Rio Tinto and BHP Billiton – for whom MSA has worked for over 20 years – Anglo American, Maaden (the Saudi Arabia state-owned diversified mining company); Blackthorn Resources (which merged with Intrepid); Chinese copper giant MMG; De Beers; Debswana; Exxaro, Vedanta, Ivanhoe and many others.

Its affiliation with Blackthorn Resources for example best illustrates the relationship and confidence it likes to establish with its clients. The company has been involved in the Kitumba project which has been running for eight years – effectively highlighting the dynamic partnership between the companies.

Scott, a self-confessed African-optimist, believes that the continent has a plethora of opportunities in terms of mining and mining-related infrastructure waiting for development, pending investment. “We have the skills, experience, equipment and a rand exchange rate which makes us price competitive and able to deliver safe, value adding services across the continent.”
The MSA Group - leading, specialist consultants to the African and global mining industry.
TACKLING AND CONQUERING AFRICA

Happy birthday SENET!

2015 represents a milestone achievement for engineering company SENET – marking 25 years of delivering full-scale operating process plants and materials handling facilities to the African mining sector.

SENET is currently one of a very select group of genuinely independent South African engineering companies still operating in the country, and on the continent; a fact which cements its position as an elite regional service provider within its fields of engineering expertise.

Solid business philosophy and foundation

SENET has excelled during the industry’s upturns and more importantly, during the downturns - a notable achievement largely due to the original foundations upon which it was established and the principles by which it continues to operate today.

“We pride ourselves on our integrity and our commitment to provide flexible, tailor-made solutions for our clients. Our success stems from our founding members’ insight to undertake project work in Africa,” says SENET business development director, Darren Naylor. This strategy has paid off over the years and consequently SENET is recognised as an African process and metallurgical expert developing close relationships and providing customised solutions for the industry. Its sustainability and future growth is undoubtedly secured thanks to this model, especially in light of Africa’s untapped resources and the world’s drive to mine them.

“When you have been building plants in remote places for 25 years you gain an understanding of all the elements that make a project work, and this is where and how SENET has truly excelled.”

“Our vast experience in Africa has proved that no two ore bodies are quite the same geologically; therefore our approach has been to cater for our clients’ specific requirements – we do not apply a one-size-fits-all philosophy to projects. We understand the project risks, and know how to manage them and adapt accordingly. We have also developed a reputation for assisting clients with both financial and technical challenges,” Naylor continues.

In the end, SENET’s success can be attributed to its knowledge, expertise, experience and that personal touch which fosters good working relationships with clients. Furthermore, both of its founding members (Neil
Senior and Jim Hollywood) remain active in the operation of the business – a key factor in the company’s ongoing relationships.

**We know Africa**

SENET’s 25-year project list and track record are extensive – the company has undertaken over 400 different studies and projects in Africa since its establishment.

“Our geographic footprint is widely spread across the continent, and includes many highly remote countries such as Eritrea into which other engineering firms and contractors have been reluctant to venture.

“This is a company strength which also sets us apart from the competition. It’s what we do,” Naylor emphasises.

In addition to providing a core team of construction management personnel working with local labour (sourced by labour brokers), in many instances and as necessitated by the project specific demands, SENET also procures and provides the construction tools and equipment on behalf of its clients. These are then used not only in the construction phase but also remain on site for the ongoing operation of the plant. “This self-construct aspect of our model is still a differentiator.”

Another critical element that ensures African project success is an in-depth understanding of its project sites – this is evident in SENET’s ability to work while abiding by legislation and showing an appreciation for local culture and customs.

“We have developed and continue to nurture the relationships we have established with all the key stakeholders throughout Africa and, simply put, we have become very good at it.”

**Repetition speaks volumes**

Nothing bears testament to excellent project delivery like a client’s repeat business, especially considering that the mining sector is recognised for

SENET continues to specialise in materials handling overland conveyors

SENET has developed a competitive edge through its proprietary stacking equipment
its loyalty. "We have become a preferred copper specialist for one of the world’s largest international mining companies, which proves our competence and success in this area," Naylor highlights.

SENET finds itself in a fortunate position with expertise, skills and proprietary technology best suited to two commodities which are seen as fundamental to the world economy – copper and gold. "We are in fact leading the way forward with these two metals, thanks to our long track record in extractive metallurgy, including technologies such as solvent extraction (SX) and electro-winning (EW) process technology for copper, carbon-in-leach (CIL) and carbon-in-pulp (CIP) for gold and more specifically heap leach technologies – where our proprietary heap leach stacking, and agglomeration equipment is contributing towards cost-effective processing solutions for new gold and copper projects."

Not only are these engineering solutions tried and tested, but they have received SENET’s on-going enhancements, with their growing dominance in the gold and copper markets now being lauded.

"To date, we have designed and installed seven SX facilities and ten EW tankhouses in the DRC alone," says proposals manager Mpho Nkgodi.

**Expertise evolution and expansion**

SENET is extending its expertise into areas which are becoming increasingly important for mining companies, such as refractory ore processing methods: specifically the internationally recognised pressure oxidation as well as bacterial oxidation methods.

"We have expert consultant collaboration agreements in place to offer these specialised services more comprehensively going forward," Naylor indicates.

And while Africa remains SENET’s primary focus area for business generation, the company has started looking beyond the continent’s borders into North America, South America and even the Middle East.

"Our philosophy has always been and remains centred on controlled and sustainable growth through the provision of tailor-made solutions to our clients," Naylor concludes.

### Founding Members and MD

#### Jim Hollywood – Chairman

Hollywood has a BSc (1st Class Hons) Mechanical Engineering Degree from Strathclyde University in the United Kingdom and is a registered professional engineer. Hollywood has in excess of 40 years of post-graduate experience in the engineering sector, specialising in project and company management for the design and construction of materials handling and mineral processing plants. Hollywood is a founding member of SENET and operated as Joint MD until 2013.

#### Neil Senior – Deputy Chairman

Senior has an MSc Mechanical Engineering degree from Cranfield University in the United Kingdom and is a registered professional engineer. Senior has in excess of 42 years of experience in the mining and mining project engineering industry, having dealt with multiple commodities. Senior is a founding member of SENET and operated as Joint MD until 2013.

#### Hugo Swart – MD

Swart has a B.Eng. degree in Mechanical Engineering from the University of Pretoria and boasts more than 20 years post-graduate experience in the mining and processing plant sectors. Swart fosters excellent working relationships, and has been with SENET for more than twelve years, having served as both project manager and corporate sponsor on many of SENET’s most important projects. Swart has been the MD of SENET since the beginning of 2013.
Excellence in EPCM for over 25 Years

Hydrometallurgy Expertise

Bulk Materials Handling and Conveyor Expertise

Heap Leach Expertise

Scoping Studies

Prefeasibility Studies

Feasibility Studies

Engineering

Procurement and Logistics

Construction Management

Commissioning

25 Year Jubilee

Committed to Excellence

Senet

Minerals Beneficiation Expertise: Gold, Copper and Base Metals

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MINING ELITES IN AFRICA 2015 125
A specialist metallurgical, sampling and laboratory equipment manufacturer and supplier, Mineral Innovative Technologies (MIT) prides itself on being a young, forward-thinking company, constantly striving for innovation and the improvement of traditional sample preparation and laboratory equipment.

That is why in addition to its distribution facilities in Johannesburg and Rustenburg, it will launch a new venture in 2015 in Western Australia where the company will replicate its successful formula in order to penetrate the Australasian market.

Laboratory dust and fume extraction systems

Sample preparation can be a very messy environment, with operator health and sample contamination at risk. Custom designs are done to ensure maximum efficiency as every laboratory is different. They are ergonomically laid out to suit the sample flow and laboratory process. This allows a clean and tidy work area reducing possible risks associated with the tasks performed within a laboratory.

Examples of areas where dust pollution can occur are during the crushing, milling, splitting, screening and cleaning phases. This is where design of extraction systems and dust enclosures are fitted and are custom designed to match any particular brand of equipment you may already have on site. Where housings or enclosures are required to fit over existing equipment, the splitter or crusher is placed under negative pressure to ensure optimal containment of the dust. This is then connected to the main extraction piping to ensure dust is removed efficiently.

Dust filter systems are put in place with replaceable filter media and are inexpensive and easy to maintain.

Acid and chemical environments are a serious health and safety risk with environmental hazards; extra care must be taken when dealing with these areas. When acids and chemicals are used in certain analytical processes, systems need to be in place to ensure the above concerns are mitigated. Whether you are digesting in a fume cabinet or simply decanting or storing, these areas need to be under extraction to eliminate risks.
Extraction for analytical instruments are designed to fit the individual requirements of OEM manufacturers and can be installed on site – e.g., ICP, fusion and AA instruments. During digestion and decanting, fume extraction cabinets are recommended and the furniture to suit the process must be carefully considered. For example, polypropylene work surfaces for areas of high acid usage or Trespa tops for the more aesthetically pleasing and hard wearing environments. MIT is equipped to offer a full variety of innovative solutions for any dust, fume or furniture requirements from design, manufacture, installation and servicing to maximise the productivity and safety of your laboratory.

"We realise that putting a face to a name is extremely important for developing long term relationships."

The company is committed to face-to-face relationships and travels to cross-border customers on a regular basis.

“We realise that putting a face to a name is extremely important for developing long term relationships. This has been and will remain a cornerstone of our growth and high level of customer service,” says MIT co-founder Mark Armstrong.

MIT’s core products are locally manufactured in South Africa, which offers it a competitive advantage by ensuring faster delivery times.
Spares are kept in warehouse to facilitate quick breakdown responses and local production also contributes to job creation. “The major benefit to manufacturing locally is that MIT has full control over quality and manufacturing standards.”

As a result, its locally-made filter presses, cascade splitters, sieve shakers and furnaces are particularly robust and built to last in the harsh African environment.

MIT is privileged to supply several global mining corporations’ African operations. “Many of these customers have knocked on our door as a result of word of mouth. This has been due to MIT’s policy of providing a high quality personalised service at competitive price,” says Armstrong. “We are rapidly expanding into new territories while maintaining satisfied repeat customers, most of which are located in southern, central or western Africa, but we are able to service the entire continent and beyond.”

MIT’s head office and warehouse in Johannesburg is strategically located close to international distribution facilities. This reduces transport time and cost into the various parts of Africa. “We have excellent relations with various freight forwarders and can therefore provide air, sea or road freight options depending on the goods and final location.”

MIT recently completed full laboratory furniture and extraction installations for a titanium minerals mine in Mozambique and for a copper mine in Lubumbashi within the Democratic Republic of Congo (DRC). It handled the entire project from design, to the supply of materials, through to installation. The sites are now serviced by its skilled team when necessary. Plans are underway to replicate the installation in other sites in the DRC.

The most efficient, cost-effective and versatile heating elements on the market

EREMA silicon carbide (SiC) heating elements are manufactured by TOKAI Konetsu Kogyo (TKK) – the world’s largest manufacturer of SiC heating elements. TKK have been manufacturing EREMA SiC heating elements since 1936 and are dedicated to continuous product improvement and customer satisfaction and focus on energy-saving and environment-friendly products to provide high quality results.

EREMA silicon carbide electric heating elements are manufactured from high purity SiC grains and are designed to maximise performance at high temperature use, operating in the range between 500 and 1 650 °C and in a wide spectrum of thermal processing furnaces or kilns as a radiant heat source.

As the most efficient, cost-effective and versatile heating element on the market, EREMA silicon carbide elements are used in many types of industrial furnaces within the ferrous and non-ferrous metal heat treatment processes.

New EREMA Eco heater

The EREMA Eco heater elements use less power than conventional elements, and the resulting cost savings can exceed the purchase price of the heating elements. The typical payback period for an EREMA Eco heater can be as little as 12 months depending on the application and condition of the furnace. The unique element terminal design of the EREMA Eco heater reduces the heat lost from the furnace.

“Reduced losses mean lower electricity consumption, which saves you money – it is as simple as that. And reducing power not only cuts the electricity bill, but is also beneficial to the environment, reducing your carbon footprint by helping to lower the emission of greenhouse gases.”

EREMA Eco heater elements are interchangeable with conventional silicon carbide elements – no capital costs, no need for new power supply or furnace modifications. In tests carried out under steady-state conditions, the heater elements required 4-6% less power than conventional silicon carbide elements to maintain a constant furnace temperature of 1 200 °C.

MIT has teamed up with TKK’s Italian affiliated company Tokai Carbon Italia as the sole distributor of the elements in Africa.
Cascade Splitters

We design and manufacture Rotary Splitters from as small as 100g up to 2Ton+ capacity.

Systems include:
- Vibratory feeders and controllers
- Feed Hoppers
- Clutch system for safety purposes
- Conveyor feeders for bigger systems.

Splitting Ranges:
- 6 Way
- 10 Way
- 12 Way

Collection Vessels:
- Stainless and Mild Steel Drums
- Glass Test Tubes
- Stainless Steel Cups
- Plastic Drums.

Filter Presses

- High quality materials, 300 WA, EN8, certified m/s and certified stainless steel 304 and 3CR12
- The tubes for the pots are all certified to minimum pressure of 20 bar, some four times higher than manufacturer specified pressure
- All filter presses come standard with pressure relief valves (max 5 bar)

Sizes Available (Standard and Swing Barrel):
- 6.2lt - 150mm diameter
- 16.4lt - 250mm diameter
- 10.7lt - 200mm diameter
- 23.4lt - 300mm diameter

Sieve Shakers

We manufacture our own range of electromagnetic sieve shakers locally. With a powerful but quiet operation with a 30 or 60 minute timer, spares in stock and repairs are done locally.

Consumables

We offer and stock a wide range of Laboratory Consumables such as Filter Paper, Glassware, Plastic Ware, Test Sieves, Crucibles and more.
AEL Mining Services’ continuous investment into explosive technology research and development (R&D) has delivered great success to the mining sector, with innovative blasting equipment demonstrating improved production output, enhanced safety, cost cutting and top quality performance.

Today, the JSE-listed AECI Group member (in South Africa) offers solutions to suit almost every application – from small to massive operations. It has become recognised as a leading developer, producer and supplier of commercial explosives, initiating systems and blasting services for mining, quarrying and construction markets in Africa and Indonesia.

It is also the largest supplier of explosives technology and initiating systems in Africa with operations in South Africa, Egypt, Ghana, Mali, Tanzania, Ethiopia, Zambia, the Democratic Republic of Congo, Zimbabwe and Botswana. Internationally, AEL is represented in Indonesia, South America and in many parts of Europe, making it a truly global company.

Essential to the business

AEL strongly believes that R&D is an integral component of the company’s service offering and as a result invests 3% of its annual revenue into the department to explore innovations and offer field and technical support on all new and existing technologies. The result is pioneering world-firsts such as the first commercial pyrotechnic spray drying plant, which provides all the delay powders that the company needs for its new multi-million rand automated assembly plant.

Cutting-edge research is a driving and on-going focus while also offering field and plant support on all new and existing developed technologies. AEL’s highly skilled team also ensures that the group maintains a firm grasp on the anticipated changes and developments in the world of explosives.

In combination

Coupled with its R&D, AEL’s vast range of products and solutions, equipment and technical resources have made the company an acknowledged leader which provides sector solutions in South Africa, African regions and international businesses.

The company offers the latest generation products and service offerings for blasting operations which include electronic detonators, centralised blasting systems, shock tube systems, boosters, detonator cords, capped fuse, igniter cord and blasting accessories.
Wealth Unearthed

Our diverse range of robust electronic delay detonators are designed to cope with the most challenging mining environments

Advancing, constantly evolving and defining the future of electronic initiation technology in the global mining industry

AEL Mining Services
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The Platform, 1 Platinum Drive, Longmeadow Business Estate
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www.aelminingservices.com
Get your hands on Africa’s
superior safety solutions

FIBREGLASS FOR AFRICA

Vital Engineering features a new, versatile range of fibreglass products for harsh mining and corrosive conditions.

ROUGH CONDITIONS, remote locations and a harsh climate epitomise the mining sector in Africa. The demand is for hard-wearing, versatile materials, designed for optimum safety. Vital Engineering has responded to this industry necessity with its large range of quality non-slip floor gratings, stair treads, expanded metals and safety hand railings in a range of materials, including galvanised steel, stainless steel and aluminium.

Not only has the company introduced moulded fibreglass gratings to the market, but is finding the demand for this material growing, particularly within the mining and water treatment sectors as it caters directly to the sector’s ‘rough and tough’ requirements, predominantly in Africa.

“The response to our fibreglass range has been very positive, and we are seeing many mining and mining contracting companies now specifying Vitagrid for their floor gratings,” notes Chris Spacey, export executive at Vital Engineering.

The fibreglass gratings are manufactured with continuous glass fibre strands interwoven in both directions with thermosetting resins. As an alternative to steel and stainless steel, the benefits of fibreglass are many and varied, especially in a mining plant, or corrosive environment context, according to Spacey.

“Advantages of Vitagrid gratings include the fact that the weight is half that of steel gratings, which makes for much easier handling and installation. Fibreglass is also fire retardant, non-conductive, non-slip, with a quartz grit top surface, and is virtually maintenance-free. It is also anti-corrosive, making fibreglass a highly viable alternative to steel in the acid environment which often characterises many corrosive areas in diverse industries, including mining,” says Spacey.

Vital Engineering has been servicing the South African industry since 1939, with an established reputation for service and quality products under the brand names of Vitagrid and Maclock. The company supplies the petrochemical, power generation and structural engineering industries; as well as a number of Australian and Canadian mining companies operating beyond our borders. These include projects in Mozambique, Malawi, Zimbabwe, Zambia, Democratic Republic of Congo, Ghana, Burkina Faso, Tanzania, Kenya, Rwanda, Namibia and Botswana.

“We are constantly developing new products for challenging environments, identifying the most cost-effective and practical solutions for our clients in developing industrialised countries, with safety as our number one consideration. We have supplied in excess of 10 000 t of product over the past five years alone to the African mining industry, including gold, coal, uranium, copper and cobalt,” says Spacey.

“Another major advantage which Vital Engineering brings to the market is our ‘cost of installation’ philosophy, which is extremely economical, and with little or no down-time on site. This is as a result of pre-trial layouts prior to shipping, no re-work at high day-work costs, and first-time fitment, apart from other additional value-adds,” notes Spacey.

In addition, fibreglass – unlike steel – does not have any intrinsic after-market value, and therefore is not subject to the risk of theft, according to Spacey.

“Fibreglass, because it requires little or no maintenance and is unlikely to be stolen, offers industry a hard-working and lower maintenance product, which reduces replacement and maintenance cycles considerably. We are confident that our fibreglass range will enjoy continued uptake because it answers to all the demands and challenges of the existing African mining environment.”

Do not just be floored – think Vital safety

Resolute in its approach of putting quality and safety considerations ahead of price advantage, Vital Engineering is passionate in its practice of using local skills and products in support of the South African economy, despite the trend of companies seeking lower prices from suppliers overseas.

“South African steel prices are currently disproportionately higher than most international markets, and this is a major concern for fabricators. However, Vital Engineering is competitive in our field of expertise, having kept our operations ‘lean and mean’ during previous volatile economic cycles,” says Dodds Pringle, MD of Vital Engineering.

Despite the fact that input costs can be as much as 20% higher than competitors overseas – given escalating...
“Vital Engineering has over 70 years’ experience in supplying products to the mining industry in over 20 countries throughout the African continent.”

Our in-house export department keeps us up-to-date with international pricing trends, and we constantly endeavour to improve our fabrication costs to retain export markets,” says Pringle. “We believe that the quality and ‘value-add’ that we offer our clients leads to exceptionally low ‘cost of installation’. We have also mastered the art of revisions ‘on the fly’ – as is often necessary in construction. Our input materials, while of a higher cost, are standard 350WA material which offers greater strength than those in a commercial grade material.”

In addition to fibreglass, Vital Engineering manufactures in steel, maintaining that both materials offer a competitive advantage that is project cost-driven. While steel offers more strength than synthetic products, fibreglass offers a lower serviceable product which reduces the maintenance cycle considerably, according to Pringle.

“Because steel is stronger, less steelwork is required in the supports of the steel gratings than its synthetic counterparts. In addition, it is a relatively ‘green’ product in that it can be recycled,” Pringle points out.

Tough economic conditions and an intensified focus on safety issues on many production sites has meant that Vital Engineering is continuously seeking ways in which to offer its clients improved value for money without compromising on quality. The company has spent a considerable time on research and development (R&D) as a result.

One of the company’s latest offerings is its ‘Econotread’ stair tread. This offers clients a saving of up to 10% in mass, and therefore in price. The range also offers more superior front-loading than is offered by conventional stair treads, eliminating the need to replace bent or dished stair treads on site – which can be a very costly and time consuming exercise.

“We have also increased the thickness of our side plates to 6 mm, to retain the rigidity and strength of the treads under load,” notes Pringle. “This has made a marked difference, considering the number of treads on a typical construction site which no longer need replacing.”

Despite the rising input costs of steel manufacture in South Africa, Vital Engineering remains committed to sustainability in the industry by refusing to compromise on a quality output, and retaining safety as its focus.

The company is proud to be the first gratings, hand railing and expanded metal manufacturer to obtain an international ISO 9001 design accreditation, and to have held this certification for over 19 years.

“As leaders in this industry, we are seeing a decline in local project investment, and this has obvious roll-on effects on our construction clients, and ultimately the industry in general,” he continues.

“We have also noted a few smaller manufacturers entering the market, which is concerning because lower quality material is being used to fabricate these products.

“If buyers of these products are looking to price advantage rather than quality and safety, this can have disastrous results and can lead to massive insurance claims.”

Lower grade products can also have a springy or ‘trampoline’ effect when installed which can cause safety issues, according to Pringle. In addition, certain imports are not subject to the same stringent inspection criteria as domestic products.

“At the end of the day, our clients can be assured that Vital Engineering will continue to strive to find the most economic solutions which deliver optimum quality and value in the long term. This is our commitment to the market,” Pringle concludes.
VITAGRID
THE LEADING MANUFACTURER IN GRATING, STAIRTREADS, MESH, EXPANDED METAL AND HANDRAIL SYSTEMS.
SERVICING AFRICA AND BEYOND WITH QUALITY - SERVICE - SAFETY - COMMITMENT.

VITAL ENGINEERING & ANGUS MCLEOD

Since 1939 Angus McLeod and Vital Engineering have established a reputation for quality and service. Our brand names of Vitagrid and Maclock have become synonymous with versatility, quality and service. Manufacture of all our gratings, stairtreads, handrails and now also our new expanded metal products is strictly controlled. We are able to cater for standard panels, stairtreads and handrails in addition to offering a cut-to-size and tailoring service. Meeting and surpassing customer needs are our goals!

Tel +27 (0) 11 698 8500 Fax +27 (0) 86 743 3869 Website www.vitagrid.com Email sales@grottings.co.za
As part of the Nacala Corridor Railway Project, Kwikspace completed a full turnkey mobile camp along Section 2 at KM22, near Moatize – its first camp of this kind along this section of the railway. This comes after the completion of a 750 person camp in Nacala in February 2014, having been contracted by a large international mining company. One of the largest recent mining and construction projects to take place, the development of the Nacala Corridor Railway involves the construction of new railway sections, the refurbishment of existing sections and the inclusion of a new coal terminal. On completion, it will extend from Tete through Malawi to Nacala. "The completion of this railway project will allow economic growth not only in Mozambique, but it will also provide new business opportunities for neighbouring landlocked country Malawi. It is exciting to be contributors to the progress of projects of this magnitude," explains director of business development for Kwikspace Modular Buildings in Africa, Nick Alexander.

The construction of the mobile camp along the railway was carried out for Kwikspace’s client, Vale, and included the installation and leasing of infrastructure as well as the maintenance of utilities. Kwikspace was contracted to supply mobile units, with furniture and equipment to support remote living and operations. The benefit of these buildings for railway and road construction projects is that they can be moved as the work progresses. This minimises disruption and keeps costs lower.

Kwikspace’s scope of work also included recreation and dining facilities, walkways, security fencing, generators, a fuelling station, as well as water storage and a sewerage treatment system. In addition, the delivery of diesel for the generators and water for the staff was handled by Kwikspace.

The company is currently focusing on developing its rental fleets in the Nampula and Cabo Delgado provinces to support clients with this beneficial rentals model. Modular buildings offer a wide range of benefits, including, but not limited to, the fact that structures can be sited on land with geotechnical conditions unsuitable for brick and mortar; they are easily transported to site, including remote locations; and they are completed in a significantly shorter time period than brick and mortar structures.

"The completion of this railway project will allow economic growth not only in Mozambique, but it will also provide new business opportunities for neighbouring landlocked country Malawi."
Need space in a hurry?

We’ll Accommodate You! Whether it’s in Cape Town or Cradock - Mozambique or Morocco, we have a speedy solution for your company’s accommodation needs and with over 40 years experience supplying Offices, Accommodation Camps, Classrooms, Schools, Dormitories, Clinics and Kitchens you can count on our expertise. Rented or Purchased - Mobile or Panelised, Kwikspace is your dependable choice when you need it fast!
Donaldson Filtration Systems has been a driving force of innovative filtration technology on the African continent for the past 50 years. Today it has an extensive and well-established distribution footprint in Africa that includes Namibia, Mauritius, Zambia, Madagascar, Botswana, Sierra Leone, Mozambique, Swaziland, Tanzania, Malawi, Kenya, Angola, Zimbabwe, Ghana, Ethiopia and Nigeria.

“The African continent requires filtration solutions which will protect and enhance human working environments on one hand and extend the operating life of vehicles, machinery and equipment on the other,” states Rob Simpson, MD of Donaldson South Africa.

Donaldson Filtration Systems (Donaldson) provides complete filtration solutions to the mining, transport, construction and agricultural sectors. The company was formed as far back as 1915 in the United States. The company adopts a total systems approach, an important factor when the vast range of vehicles and applications within the mining sector are considered. The filtration systems in modern mobile mining equipment are complex and specialised filtration is used to ensure optimum protection within the operating environment. The company has a product range that covers air, fuel, lube and hydraulic filters.

Its engine product technology protects equipment, reduces maintenance costs and increases equipment uptime. It uses advanced technologies such as Ultra-Web, nanofiber media for air filtration, Synteq media for lube and coolant, and Synteq XP for fuel filtration. These Donaldson proprietary media technologies stop more contaminant than standard cellulose filters.

The industrial hydraulics division has a full line of filters that protect machinery and components in hundreds of applications in factories or on heavy-duty mobile equipment. Contamination in fuel or lubricating oil can rapidly wear away at expensive components ultimately causing catastrophic failure, higher fuel or oil consumption, and greater emissions – leading to downtime and higher operating costs.

Clean fuel and lubricant solutions assist where extreme variances in temperature give rise to water and dirt contamination during storage of fuel and lubricants. The company has developed bulk liquid fuel filtration solutions well suited to African conditions.

In addition, Donaldson develops turnkey dust collection and ambient air filtration systems for mines. These systems collect the dust fumes and mist generated by all mining and industrial processes. Dust and mist contaminants have to be reduced to enhance air quality. These collection systems provide protection for people, equipment and the environment.

Guaranteeing products to meet almost any requirement, from industrial to engine and various specialised industries!
For the past 50 years, Donaldson has provided filtration solutions across Africa in some of the harshest conditions. Our leading edge lube, fuel, coolant and industrial air filter ranges have delivered competitive coverage, superior service and reduced downtime for a number of mining applications. Whether it be dump trucks, excavators, loaders, dust and fume control or service parts.

For the next 50 years and beyond, Donaldson will continue to provide innovative filtration technology to support the demanding requirements across the African continent and to drive enhanced productivity and manufacturing efficiency.
The Development Initiative

CLEARING THE WAY FOR PEOPLE & BUSINESS

Explosive Detections and Mine Detection Dogs

Remote Logistics Services

Manual Clearance

Mechanically Assisted Clearance

Mine Risk Education

TDI conducts commercial landmine clearance & Explosive Remnants of War clearance solutions in inaccessible and hostile locations across Africa and the Middle East.

Contact us for immediate or future requirements:
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TDI has worked extensively across Africa & the Middle East & is currently engaged on projects in Kuwait, Sudan, South Sudan & Mali.

The Development Initiative

The Development Initiative
CLEARING THE WAY FOR PEOPLE & BUSINESS

Explosive Detections and Mine Detection Dogs

EOD Consultancy

Remote Logistics Services

Integrating Mine Clearance Solutions

Battle Area Clearance

Manual Clearance

Mechanically Assisted Clearance

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SHOWROOM
LONG OR repeated exposure to sounds at or above 85 decibels can cause permanent hearing loss. While it may pose a significant threat in the mining world, it certainly doesn’t have to!

Noise-induced hearing loss can be caused by a one-time exposure to an intense impulse sound, such as an explosion, or by continuous exposure to loud sounds over an extended period of time – in a mine for example. Generally it can be assumed that the louder the sound, the shorter the time period before noise-induced hearing loss will occur.

Generally it can be assumed that the louder the sound, the shorter the time period before noise-induced hearing loss will occur.
H.A.S.S. Industrial (Pty) Ltd has been developing, manufacturing and distributing custom-made hearing protection devices since 1992.

Made individually to fit each ear, our products are:
- Comfortable & Durable
- Value for Money
- Hygienic & Easy to Clean

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Your partner in hearing protection solutions.
It is no secret that the nature of the mining industry, with its hazardous conditions, long hours and remote locations where workers are away from their families, creates a climate that is ripe for high rates of alcohol abuse.

BY RHYS EVANS, DIRECTOR, ALCO-SAFE

**Policing a zero-tolerance policy**

This hazardous combination, with intoxicated personnel operating in dangerous environments, puts workers and their colleagues at risk, as well as creating additional liability for mining companies themselves.

This makes fast, high-quality and reliable breath alcohol detectors essential equipment for any mine in order to prevent workers from even being able to enter the mine while under the influence of alcohol.

Whilst the Operational Health and Safety Act (OHSA) specifies a zero tolerance approach to alcohol in the workplace, intoxication in the workplace remains a major source of liability for organisations in many instances. Naturally, the dangers presented by intoxicated employees in environments such as mining are very real. Testing every employee as they enter the workplace can be a time-consuming process however that is often the source of dissention among workers. This old-fashioned technique is undoubtedly not really a viable solution.

**Mandatory testing now possible**

Traditional breathalyser technology typically requires a health and safety officer to attach a mouthpiece to the device, which the subject must make physical contact with and blow a long sample of breath. The mouthpiece must be changed for every person tested, for hygiene reasons, which significantly slows the process.

Modern day breathalysers ban alcohol abuse

The latest generation of electronic breath alcohol detectors, such as those supplied by ALCO-Safe, are fast, accurate and non-invasive, making mandatory testing upon entry into a mine a real possibility. They even allow for liquids to be tested using the same device, so that workers cannot sneak alcohol onto a mine in juice, soft drink or water bottles.

Rapid test solutions do not require physical contact between the subject and the device, and use a pressure sensor that only requires a very small breath sample to deliver results.

These devices deliver a simple ‘pass or fail’ result, which is much faster than giving a specific alcohol level. An electro-chemical fuel cell creates a chemical reaction resulting in an electric charge in the presence of alcohol. This ensures greater accuracy compared to other methods, which react to other chemicals such as acetone and menthol, delivering false positives that could result in false accusations. In addition, passive mode can be used to draw air samples either from uncooperative workers or from liquids suspected of containing alcohol.
Specialists in Substance Abuse Management and Distributors of Analytical Equipment for Alcohol and other Drug Detection. We supply Instruments for all situations include high speed testers capable of testing high volumes of people at site entrance/exit points and portable instruments with digital readouts for use at remote sites which provide immediate printed evidence.

**BREATH ALCOHOL TESTING**

Stronger, faster, easier to use and more durable than ever. Saving time and reducing risk. AlcoBlow® Rapid Test requires the smallest breath sample possible giving it the ability to sample first time every time. The test result is indicated by coloured lights within seconds.

**LION ALCOLMETER® 600**

- Touch screen display system to
  - Select operating modes, preventing language barriers
  - Allow data logging so that relevant details such as Names, Surnames and ID numbers of the test subject can be saved to each breath test.
  - GPS function (optional) Provides the location of every breath test.

**LION ALCOLMETER® 500P**

The LION ALCOLMETER® 500 and its printer are both housed in a compact and sturdy carry case. It can also be purchased and used on its own i.e. without the printer and other items.

**DRUG TESTING**

**The Alere® DDS2 Drug Detection System**

- From a SALIVA sample it provides:
  - A digital readout
  - Multiple printouts
  - Tests up to 6 drugs within 5 mins.
  - Can store 10000 tests in memory
  - Zero chance for operator error
  - Increased THC sensitivity

**ORATECT®**

Oral Fluid Drug Screen Device is a simple one-step test for the detection of drugs of abuse in oral fluid.

**URINE TESTING**

Test accurately for between 1-10 drugs in a matter of minutes.

For more information
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A quantum leap

IN POLYETHYLENE PIPE WELDING

Following three years of research and development in conjunction with Bosch Rexroth, the PolyForce630 Series 2 Automatic polyethylene pipe welding machine available from Worldpoly will become widely regarded as a world-leading product.

THE MACHINE’S automation represents a significant technological advancement that reduces weld failure and halves welding time.

NO MORE ROOM FOR ERRORS

ExcelPlas Poly Pipe Testing Australia, an internationally recognized NATA registered laboratory, has confirmed welds using the PolyForce630 are up to 9% stronger than the original pipe. Dr John Scheirs, principal consultant of ExcelPlas confirms: “PolyForce630’s automated features remove a significant number of operator variables that can lead to weld failure by less advanced machines.”

The PolyForce630 Series 2 Automatic is one of the premium machines from Worldpoly’s Australian engineered and manufactured range. The PolyForce630 high

and low pressure machine exceeds the most demanding expectations with remarkable welding capacity; particularly for its superior quality control, automated operational consistency, data logging capability, rugged construction – and of greatest significance – its ability to halve welding time by using the ISO SHP method, while reducing failures compared to its competition.

“We understand the need for efficiencies particularly in the mining and gas sectors, and have provided major operational and technical breakthroughs in the field of polyethylene pipe welding,” states Rob Hall, CEO of Worldpoly Australia. The PolyForce630 Series 2 Automatic is suitable for any application and is available in three models including trench, wheeled all-terrain and track.

FEATURES OF THE MACHINE

• Automatic operation
• 50% reduction in welding time
• Data logging up to 2,000 welds
• Removal of operator variables, increasing weld quality and consistency
• No more forced or unforced errors
• PLC control of temperature, time and pressure for the entire operation through intuitive controls
• Hydraulic operation of facing tool, heating plates, pipe lifting, clamps and locking. No requirement for extra lifting equipment
• Operator safety through the control system and the operation of clamp locking
• Bosch Rexroth hydraulics
• Tracked model contains a 1,500 rpm low-noise 69 dB diesel generator with dual controls and two-speed motion.
VBKom Projects offers a specific set of specialised financial modelling tools guaranteed to deliver the best solution to develop your project – and it has a mining track record to prove it.

**Approach and timelines**

VBKom Project’s typical approach adopted for a financial modelling undertaking, entails:

- **Model scoping and definition** A kick-off meeting ensures that client expectations are clearly understood and the VBKom Projects financial modelling resource is introduced to the different discipline leads which will be engaged during the study. The various technical disciplines are consulted, and the needs from management determined, in order to compile the model’s requirement specification.

- **Build a concept model** The concept financial model is compiled to determine the fact base required to develop the final model.

- **Verify and validate the model and its assumptions** The base model figures and assumptions are verified and validated to ensure that stakeholders will be confident in the outputs.

- **Model different study options** Once the base model is signed off, the different study options can be set up for comparison. The associated risks will be incorporated in this step and the next typical outputs can be provided to show the probability of outcomes and sensitivity of cost elements.

- **Analyse and interrogate the model outputs** The outputs from the various options are provided in a summarised format where it can be compared.

- **Refine and update model with proposed changes** Changes from the interrogation step are incorporated into the model for re-running and re-evaluation.

- **Documentation and reporting** The final results are documented and presented.

VBKom Projects believes in and possesses the five essential characteristics necessary to plan, execute and deliver a successful mineral asset evaluation and financial modelling project and believes in:

- **the ability to address and accommodate a wide range of technical and economic drivers / variables**;
- **the belief that although the principles stay the same, each project is unique and requires a tailored financial model (i.e. not a cookie cutter approach)**;
- **possessing the right software to analyse both deterministic and probabilistic scenarios**;
- **the competency to (i) deliver the model, (ii) intelligently analyse the model outcomes, and (iii) facilitate technical dialogue in order to optimise the project/model**; and
- **possessing the ability to package the results in simple, graphical portfolios in support of ‘to-the-point’ decision making**.

**Multivariate modelling**

A proper mineral asset financial model needs to include a number of diverse variables:

- macro-economic drivers (e.g. exchange rates, commodity price lines, inflation, discount rates);
- tax regime and state mining royalties (refined or unrefined);
- rehabilitation/closure funding obligations;
- technical OPEX and CAPEX commitments (up-front and sustaining over the LoM);
- product size and quality considerations, as well as the premiums/discounts to be expected;
- marketing commissions and logistics costs (e.g. freight and port costs); as well as
- carbon taxes to be paid and/or green credits to be gained.

**Tailored model construction**

VBKom Projects follows a consultative approach...
modelling process

in tailoring its financial models to suit the unique needs of the client and host project. Project stakeholders’ needs are continuously tested and model expectations are validated throughout the project life-cycle, specifically (i) model depth, (ii) width and (iii) operating flexibility (i.e. static or dynamic model).

Our two-phase process is open and suited for conceptual, pre-feasibility study or bankable feasibility studies.

Industry leading software

V8Kom Projects employs the industry leading decision suite of analytical software tools provided by the Palisade Corporation, namely: @ Risk, PrecisionTree and TopRank.

Dynamic and analytical capability

V8Kom Projects’ application of probabilistic modelling techniques allows clients to dynamically incorporate risk and uncertainty into their financial models.

This capability delivers a range of potential solution outcomes and allows clients to make more informed decisions based on a richer set of risk-adjusted numbers. These techniques are employed in application areas such as real options analysis, discounted cash flow analysis and value-at-risk calculations. (Graph 1)

Visual decision support

The software employed by V8Kom Projects in its financial modelling applications enable it to deliver a portfolio of bespoke visual outputs, ranging from simplistic pie charts and waterfall graphs through to involved regression curves, scatter plots and tornado graphs. Typical application examples are the visual outputs pertaining to:

• product grades, qualities and revenue;
• probable production levels and forecasted cash-flow ranges;
• cost analysis and dynamic cost decompositions over time;
• assured versus probable analyses; and
• NPV sensitivities.

The various visual artefacts aid decision-makers to intuitively differentiate and address the core characteristics & economic drivers of their projects. (Graph 2)

\[\text{THE DECISION TREE} \]

\[\text{\texttt{GRAPH 1}} \]

\[\text{\texttt{GRAPH 2}} \]
FAMILIAR CHALLENGE

The effectiveness of any bulk material handling process depends on constant material flow throughout the system. Hang-ups in storage systems and accumulations in process vessels choke material flow, creating bottlenecks that result in costly reductions of equipment efficiency and process performance. Any build-up of material in hoppers, silos, chutes or loading staiths can also create blockages which can ultimately halt flow entirely and bring the entire system to a complete standstill. As labour-intensive clearing takes place, maintenance costs rise and profits fall.

THE WRONG SOLUTION

The main problem with this accumulation is that it usually goes unnoticed until the process outflow is reduced to little or no material.

A common method of attempting to loosen accumulated material is physical agitation in the vicinity of blockage by manually hammering on the outside of the chute or silo. Unfortunately, this causes dimples in the steel, which eventually leads to even more blockage by providing a rough surface to catch dust and bits of material.

THE RIGHT SOLUTION

A properly-installed series of air cannons can prevent build-up from occurring, helping to avoid the huge costs of plant downtime for cleaning and the associated safety risks to maintenance personnel who must enter confined spaces to evacuate the material.

At the centre of an air cannon design is a special fast-acting valve which discharges a blast of air that travels down a pipe and through an engineered nozzle which directs the blast in a specific pattern onto the area prone to buildup, literally blowing the material back into the process flow to prevent it from accumulating. This external valve style offers a confirmed and consistent history of efficient performance in difficult applications.

TECHNO-FABULOUS

The new family of positive-action valves from Martin Engineering produces about twice the blast force output of the valve generation introduced a decade ago, while using about half the compressed air volume. Today’s fast-acting valves can release the tank volume in less than 300 milliseconds, creating a high-magnitude force at the exit nozzle, which is installed through the wall of the vessel or duct.

Typically, one air cannon can keep 1.5 to 2 m² of chute or vessel wall free of accumulation. Air cannons with an air volume of 50 litres have shown good results on a variety of different materials and can be installed at varying heights around the chute, hopper, silo or loading staith to address a specific build-up pattern.

Martin Engineering South Africa has done a number of successful installations across sub-Saharan Africa, particularly in Zambia, Kenya, Mozambique, Botswana and Tanzania. The company offers a full line of air cannon technologies, representing both established designs and the latest leading edge innovations in advanced valve engineering, as well as hybrid models, multiple-valve and multi-port designs.

Since 1974, Martin air cannons have been used around the world to prevent buildups and improve material flow.
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