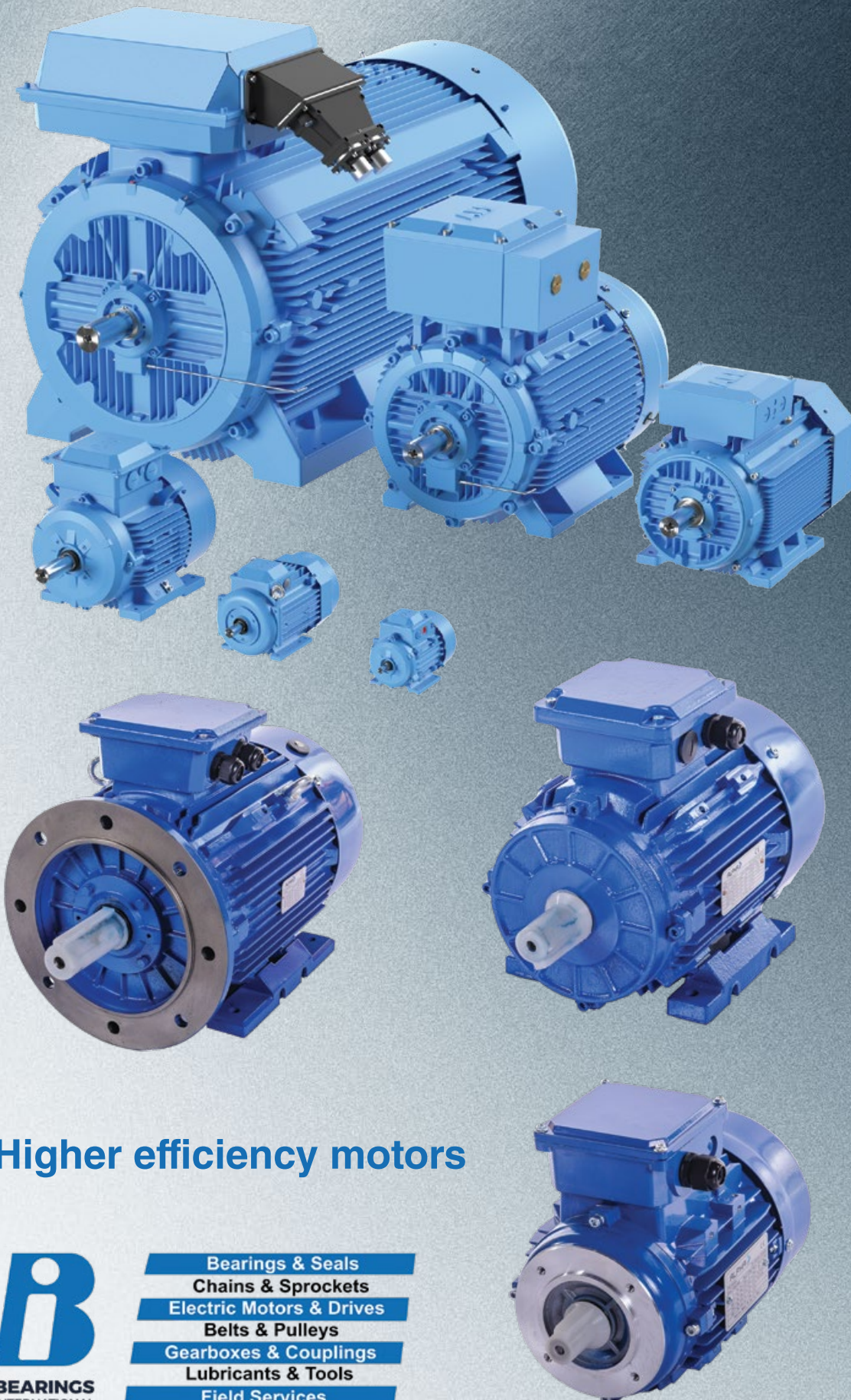


FEATURES:

- Control systems + automation
- Drives, motors + switchgear
- Sensors + switches
- Plant maintenance, test + measurement

05/2022



Higher efficiency motors



- Bearings & Seals
- Chains & Sprockets
- Electric Motors & Drives
- Belts & Pulleys
- Gearboxes & Couplings
- Lubricants & Tools
- Field Services

ELECTRICITY + CONTROL

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With electricity prices increasing rapidly, the justification for adopting more efficient motors becomes that much stronger. Higher-efficiency motors save costs over the longer term.
(Read more on page 3.)

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It's essential to keep learning

My previous comment featured a conversation around our energy environment and, based on the feedback I received, it is apparent that many people are considering their options with regard to securing their own energy future. But more than that: they are also thinking deeply about ensuring that we subscribe to a far more sustainable future with regard to our energy usage and its source.

Some of the feedback was profound, and I will focus on that in a forthcoming comment.

For now I welcome you to another new edition of *Electricity + Control* packed full of useful information on a variety of topics, including Control Systems and Automation; Drives, Motors and Switchgear; Sensors and Switches; Plant Maintenance, Test and Measurement. Clearly, these are all essential topics in the context of modern industry – and specifically as we work towards increased efficiency in each and every aspect of what we do.

I trust you will find the articles informative. Regarding the publishing of an article, authors and contributors often ask us what the focus or purpose of the article should be. They seem to face a general sense of, 'surely everyone knows about this'.

What is important to remember, as an author (and as a reader), is that technical magazines like *Electricity + Control* share information that may revise our understanding of specific fields or technologies, or alert us to new developments, new projects and particular applications.

We find ourselves in a rapidly developing technological age – often referred to as

the age of digital transformation – where new and innovative solutions are hitting the marketplace at an incredible pace.

It is essential that each of us is able to properly assess the benefit of any particular solution in our own environments. Each plant is different, and many have invested heavily in legacy systems. How we go about upgrading and improving each and every aspect of the process therefore requires a very astute appreciation of what those options are, and what the pitfalls of each may be.

There is of course a more fundamental reason for reading and writing articles in this magazine: we all need refreshers of even the most basic theory and understanding. Very quickly we become experts in a narrow field and perhaps lose sight of the broader issues. We need to correct for those blind spots.

Equally, we may be forced to become generalists (such is the nature of an environment where skills are not always easy to find) and in that case we need a refresher in the basics of some specialist aspects of our industry.

Either way – it remains essential never to stop learning. The more we learn the more we gain – and by extension, the better equipped we are to ensure that our plants, and allied systems and equipment, perform optimally.

Ian

Ian Jandrell

PrEng IntPE(SA), BSc(Eng) GDE PhD,
FSAAE FSAIEE SMIEEE



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Rising electricity price drives demand for higher-efficiency motors

With electricity prices increasing rapidly, the justification for adopting more efficient motors becomes that much stronger. To achieve this improved efficiency, such motors are designed to run cooler, which prolongs the insulation lifespan for added reliability. Although most First World and many local end-users specify higher-efficiency motors, the South African market still largely opts for cheaper IE1 motors, which are cheaper to buy but more expensive to run.

"In South Africa, the bulk of low voltage (LV) motor purchases are driven by price," says Bearings International (BI) Business Unit Leader: Motors and Drives, Stephen Bekker. He notes further that, on average, the initial capital outlay constitutes less than 5% of the cost of a motor over its lifespan. A small percentage goes to maintenance, while most of the running cost is in the electricity consumption. The payback is generally under two years, with the average motor lifespan of ten to 15 years or more translating into an eightfold saving on the initial capital outlay.

As a leading supplier of bearings and power transmission products in Southern Africa, BI is an ABB Channel Partner for low voltage motors.

"ABB is regarded as one of the largest motor manufacturers in the world, if not the largest. It provides premium products known worldwide for their reliability and design," highlights Bekker. BI provides comprehensive support for ABB LV motors, from sales to stock, technical support, application support and spares.

BI stocks the ABB IE1 and IE3 motor ranges, with IE4 and IE5 motors available ex-factory. The complete offering ranges from 0.55 kW to 355 kW and higher on request. However, BI also stocks and supplies the more cost-effective Alpha motor range in cast iron and aluminium, including single-phase motors.

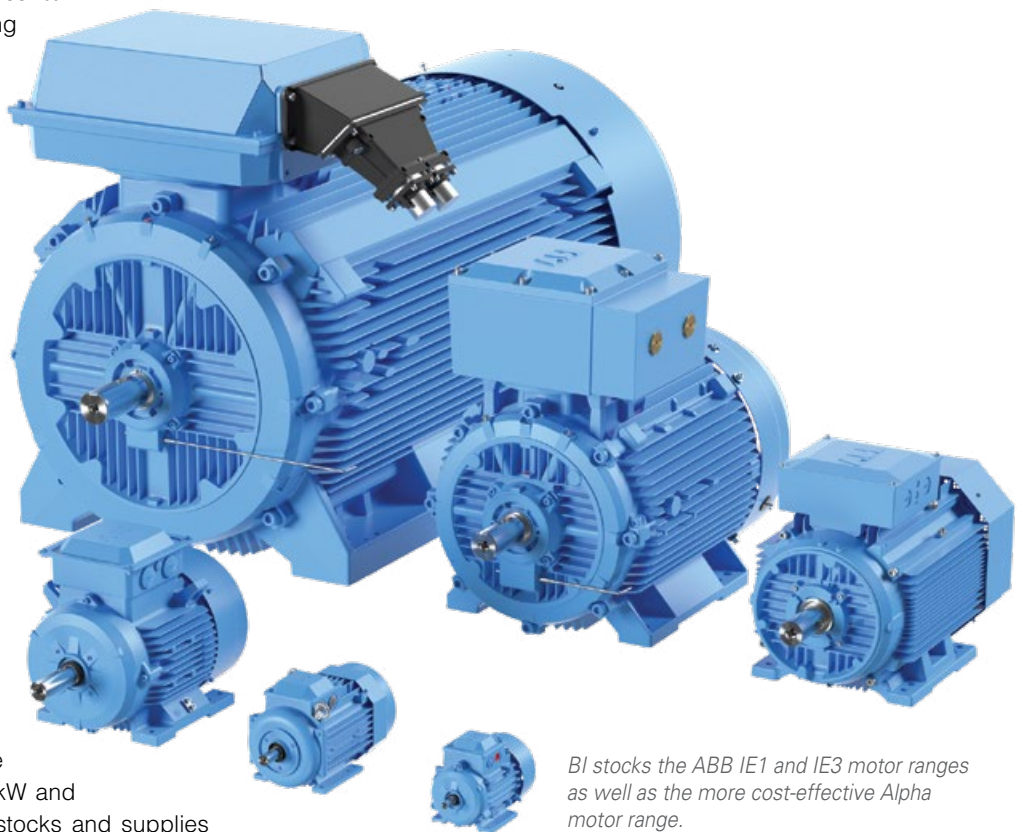
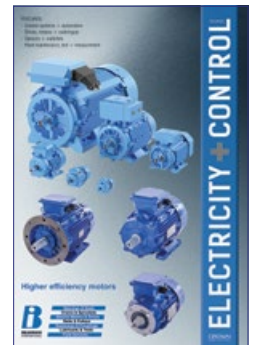
"We have found that ABB motors are installed in many countries across Africa, and our aim is to make the LV units more accessible in terms of end-user sales. We are seeing more demand in South Africa from OEMs and in project specifications," adds Bekker.

Locally, mining has always proven an important sector for BI. With high commodity prices and projects coming

back online after delays due to Covid-19, the mining industry is a key focus for BI going forward. Other growth sectors include the sugar, pulp and paper, food and beverage, and water and wastewater industries.

"ABB's extensive range enables us to offer high quality solutions to all industries," Bekker emphasises.

BI has grown its own Motors & Drives team from two resources to a team of five, with a sixth position still open. The team includes a Product Development Leader, two Business Development Leaders and an electric motor technical expert. "Our plan is to train up technical support within BI, as well offer customer training," he says. □



BI stocks the ABB IE1 and IE3 motor ranges as well as the more cost-effective Alpha motor range.

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Agile automation to support sustainable packaging

Sustainability in the packaging industry is one of the key aspects in fighting the problem of plastic waste, its environmental impacts and, in turn, climate change. The challenges this presents require flexible and powerful automation technology. Patricia Torres, Industry Marketing Manager Food and Commodities Solutions, Omron Industrial Automation Europe, here outlines some of the solutions the company offers.

In times of increasing efforts to support sustainability in industry, it is essential to find ways to develop more environmentally friendly packaging, conserve resources, and make use of smart and more efficient production lines. Holistic concepts are needed.

Take coffee capsules for example: users want a quick and easy way to prepare a fresh cup of coffee in the morning, but the popular disposable capsules represent a huge environmental burden. A more environmentally conscious consumer looks for coffee beans grown more sustainably or capsules produced in a more environmentally friendly way. Generally, people are more environmentally aware these days and they are looking for greener recyclable materials. Consequently, more sustainable manufacturing approaches are key.

There is no question that too much plastic is produced and disposed of worldwide. Plastic production has increased exponentially – from 2.3 million tonnes in 1950 to some 448 million tonnes in 2015, and this figure is expected to double again by 2050. Another problem is that plastics often contain additives to make them stronger, more flexible, and durable. However, many of the additives extend the life of the plastic products to the extent that when they become waste, some estimates indicate they could take at least 400 years to decompose. In this context, the packaging industry is one of the main contributors to this plastic glut, which urgently needs to be minimised. The industry faces the mammoth challenge of developing sustainable alternatives and minimising waste, and at the same time saving energy and using alternative energy sources.



To minimise plastic use in packaging, automation and robotics can assist manufacturers in adapting lines to handle new materials.

Key considerations for more sustainable packaging

- Reduce packaging material – not only in terms of virgin plastics content in primary packaging, but also in the amount of protective secondary and final packaging.
- Eliminate the need for single-use packaging; some strategies to address this issue start with increasing the use and scaling of reusable and refillable systems, or redesigning the package with alternative packaging materials that facilitate recycling, are biodegradable, compostable or have lower impact in the environment if they end up in the landfill.
- Packaging made from mono-materials is another approach attracting increasing interest in the packaging industry; they offer better recyclability but migrating to them can be a challenging process that requires strict process control. Often, packaging equipment needs to be adapted or customised to achieve an advanced form, fill and seal process that ensures the same package quality and performance.

All these efforts to realise more sustainable packaging, need to be accompanied by a collecting infrastructure that enables a waste-free or low-waste future as well as building behaviour change among consumers, industry, retailers, and the entire circular system.

New requirements for production facilities

Reducing the amount of plastic used in packaging, especially if it is virgin plastic, can be facilitated by shifting from rigid to flexible packaging. Thinner walls, smaller sizes, narrower seams, and lighter weights also contribute to reducing the amount of virgin plastic used in the primary container. In addition, the use of mono-materials, paper-based and biopolymers, and a higher proportion of recycled material in main packaging, protective and transport packaging (primary, secondary and final packaging) is helpful. These changes have implications for processes and technologies on the factory floor. For example, companies need to check the compatibility of their equipment and adjust settings if necessary. Lines need to be flexible to change over to new materials. Linking and managing new machine-to-machine



Changes in primary, secondary and final packaging have implications for processes and technologies on the factory floor.

information is required. The performance of the machines under the new conditions needs to be controlled and waste must be avoided as much as possible.

Ensure quality and safety

If more sustainable materials are used in packaging, the quality of the product remains critically important. Where manufacturing lines are changed to use more sustainable materials, typical problems with the primary packaging – like material jams or tears, poor quality seals, or incorrect labelling – need to be avoided. Materials may have different tear and puncture resistance, which calls for more precise control in package forming; shrink film made from recycled plastic has very different shrink properties compared to film made from virgin materials, demanding versatile but accurate shrinking temperature control.

There are other aspects to consider in secondary packaging. Reducing the melting points of adhesives when constructing and sealing cartons, implementing material reduction strategies, including use of lightweight corrugated materials, or repacking the contents of a pallet in cartons made from more sustainable cardboard or alternative materials are some of them. All these strategies to make packaging more sustainable require careful analysis to identify the point/s along the line that would need to be updated to ensure the quality and safety of the end product.

Automated manufacturing lines supported by robotics technology that can work flexibly with different materials play an important role here. Some examples highlight potential issues that companies should be aware of.

Film jamming

Thinner, recycled films are more sustainable, but can also tangle more quickly. Even slight changes in film thickness lead to uneven winding and unwinding and increase the tension on the film. Uneven tension, in turn, causes defects during pouch forming or sealing, such as curling, ripping, folding, or a sideways shifting or misalignment. Correct handling with maximum throughput and minimum film consumption is key to overall OEE (original equipment

At a glance

- The packaging industry is one of the main contributors to the overload of plastic used and disposed of worldwide.
- Using greener, recyclable materials, reducing packaging, eliminating single-use packaging and moving to mono-materials support sustainability.
- Efforts to realise more sustainable packaging need to be accompanied by a collecting infrastructure and overall behaviour change to create a circular system.

effectiveness). Therefore, if creases are forming in the seal, operators should check for machine errors that are contributing to the film not being fed correctly. Possible causes include misaligned rollers, different feeding devices, or stuck rollers that do not rotate freely. OMRON's Film Tension Control System provides synchronised control of tension, feed, and cut. This is complemented by (colour) mark detection for film compensation through motion control to ensure optimal unwinding of the roll. The OMRON Packaging Library offers a wide range of function blocks for film processing in VFFS (vertical form, fill and seal) machines.

Film sealing

Thinner film materials offer lower costs and improved aesthetics. However, these materials are more sensitive to heat and susceptible to burn through when used with traditional adhesives and sealing technologies. The sealing temperature therefore needs to be constantly and precisely controlled and automatically adjusted to avoid losing productivity or sealing defects that will increase rejects and waste. OMRON addresses this challenge with an AI-based temperature control algorithm synchronised with machine movement and sensor technology that can be placed closer to the sealing bar. Noise is compensated for by an automatic filter adjustment function.

Quality control of packaging and labelling

Re-closable packaging or pouches with nozzles are increasingly replacing rigid plastic containers. Flexible packaging with new elements such as re-sealable closures places different demands on packaging integrity and quality testing. Thinner films, bio-based materials, or those with a higher recycled content have different thermal, elongation, and puncture resistance profiles. These differences can lead to irregularities in the shape and edges during forming and cutting. More sustainable materials such as non-laminated or mono-materials also change shape and can reduce the fidelity or performance of label printing. Reading, checking, or verifying label information on packaging is difficult when the shape is inconsistent, or the print quality changes. OMRON addresses this with its High-Speed Inspection System. This simple and scalable system is suitable for multiple lines and transparent integration with robotic systems. It offers a multi-camera platform with a single controller for multiple-image capture at high speed to detect potential defects reliably. Advanced algorithms help to detect difficult-to-read characters, in variable light conditions and at high speeds.



Eliminating tapes, minimising adhesives and removing silicone strips increases recyclability of cardboard cartons.

New adhesives and gluing techniques

Eliminating tapes and minimising adhesives increases the recyclability of cartons. Removing the need for a silicone strip makes it 100% recyclable and biodegradable. To produce and seal cartons, companies are increasingly relying on the strategic and reduced application of adhesives. This requires a high level of precision and continuous quality control. With its automated visual inspection system, OMRON supports accurate detection of glue patterns. The high resolution and brightness settings allow low-contrast defects to be detected, even in the toughest light conditions or with difficult to detect materials.

Multi-material handling

Cardboard boxes made of recycled fibres have higher porosity and are more flexible. Using traditional machines or unpacking and repacking manually, the handling of boxes made of recycled cardboard without damaging them can be tricky. Traditional palletising solutions can be complicated to adapt and programme, they take up a lot of space and cannot be relocated to other parts of the plant when needed. Integrated collaborative robots (cobots) offer a solution, with dedicated grippers to handle a wide range of irregular shapes, porosity levels, and delicate objects safely.

OMRON offers comprehensive solutions for the automation of sustainable packaging lines that help companies become more efficient and greener, using their machines for new recyclable materials and ensuring product quality. Sysmac is an integrated automation platform that provides complete control and management of the automation plant. At the core of this platform, the Machine Controller series supports synchronous control of all machine devices and offers advanced features such as motion, robotics, and database connectivity. This multidisciplinary concept allows manufacturers and plant engineers to simplify the solution architecture, reduce programming effort and optimise productivity. □

For more information visit: www.industrial.omron.co.za

CONTROL SYSTEMS + AUTOMATION : PRODUCTS + SERVICES

Beyond circularity in process, automation and energy

Valmet, a leading global developer and supplier of process technologies, automation and services for the pulp, paper and energy industries, and headquartered in Espoo, Finland, is launching a new R&D and innovation project called Beyond Circularity. It is intended to improve Valmet's readiness to support the green transition in the customer industries it serves based on the company's technology vision 2030.

Through this project Valmet aims to further strengthen its R&D work to develop process technologies, automation and services in the use of renewable materials and recycled waste and side streams. In addition, it aims to further improve the energy efficiency of its process technologies and enable a shift towards the use of fossil-free energy in the production processes of its pulp and paper industry customers.

To achieve these aims, Valmet is building an ecosystem that will attract partners, universities, research institutes and customers to participate in making the green transition a reality within the pulp and paper industry. The ecosystem is expected to bring together more than 100 partners

in Finland by 2025. Valmet plans to invest EUR 40 million into the project during the upcoming four-year period to execute its technology vision and climate programme and generate growth. The project is partly funded by Business Finland and is part of the Veturi initiative, which invites international companies to solve some of society's most pressing challenges through increased research, development and innovation investments in Finland.

Janne Pynnönen, Vice President of Research and Development at Valmet says, "With the launch of Beyond Circularity, a new green transition ecosystem is to be built, which is intended to create value and growth for the participants, expand competencies to new areas and encourage best national and international partners in the field to join. At the core of the ecosystem is Valmet's unique triangle approach of technology, automation and services, enriched by the interdisciplinary knowhow of the partners. By building and developing this combination of knowledge, technologies and expertise among leading specialists in their respective fields, we can take forward the circular economy, autonomous mills and industrial services."

For more information visit: www.valmet.com

Valmet launches Beyond Circularity – building a technology ecosystem to boost the green transition.



E&I works at a new gold plant

Solid Wedge, a leading South African electrical and instrumentation solutions provider, is forging ahead with its work at a new gold plant to deliver the project on time and within budget. The company was awarded the contract for the supply and installation of electrical and instrumentation (E&I) works for the new gold plant in August last year and began work on the project in December 2021.

Lloyd Dzinotyiwei, MD of Solid Wedge, says because the project is critical to the client's expansion plans, it came with time and budget constraints. The company's record in executing projects of this nature therefore stood Solid Wedge in good stead during the tendering process.

"Our experience in previous similar jobs was key to the awarding of this project," says Dzinotyiwei. "This was complemented by our responsiveness to the client's enquiries during the tendering process, as well as our competitive pricing."

The scope of the project includes procurement of part of the E&I equipment and accessories; installation of procured and free-issued E&I equipment and accessories; commissioning of all E&I works and final project documentation and handover.

With a five-month timeline, the R8 million project is due for completion in May this year.

"The project will be delivered on budget and within the five-month timeframe in line with the contractual agreements. We are proud of the way we have managed to rise above challenges on this project. Our client has commended us for good workmanship," says Dzinotyiwei.

20 years of service excellence

In February 2022 Solid Wedge celebrated its 20th anniversary. Consistency of supply and service have been key to the company's success over the past two decades, through the 'boom and bust' cycles typically associated with its business environment.

Established in February 2002, Solid Wedge offers a wide range of electrical and instrumentation solutions through a comprehensive product and service portfolio. Over the years, the company has associated itself with well-known electrical equipment brands through agency or distributorship arrangements and system integration services.

With its flagship brands traditionally being Schneider Electric and Festo, Solid Wedge continues to research the market for new technologies and is careful to select ISO certified products that conform to South African National Standards and meet its customers' ever-changing needs.

It provides products and services, including technical backup and aftersales service, through its wide distribution network in South Africa and other SADC countries, with offices in Zimbabwe and Zambia as well.

"Key success factors for our business over the past 20 years have been the quality of products and the service we offer. As a business, we are recognised for maintaining high levels of integrity in all our engagements," says Dzinotyiwei. "Our ability to adapt to the changing market landscape and evolving trends has also been central to our success." He says the Internet of Things (IoT) and the Industrial IoT are changing the way businesses work and the operating environment.

Dzinotyiwei is proud of having grown the business to become an equal opportunity employer for a number of people, providing sustainable livelihoods to many families. He says the focus on quality of products and service – and continuing adaptation – will remain key to its growth.

For more information contact Solid Wedge.

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Visit: www.solid-wedge.com



Solid Wedge team members on site, installing electrical & instrumentation systems at the new gold plant.

Reliable and affordable machine vision camera

High bandwidth 10 GigE (10 Gigabit Ethernet) applications like fast-moving inspection lines and volumetric capture can put a lot of strain on host PCs – resulting in reliability issues (like dropped packets), high CPU usage, and high latency. The new Oryx 10 GigE camera + Myricom card bundle from Teledyne FLIR is a customised and affordable solution designed to deliver high reliability and high performance. The customised Myricom driver for Spinnaker SDK ensures image data is transferred to host PCs without dropped frames, and the built-in frame completion notification and packet resend feature further reduce latency and improve reliability (as demonstrated in FLIR tests). The custom driver devoted to handling data provided by the Myricom card also reduces CPU loads to a fraction of those used by typical setups. This is particularly useful in improving overall

reliability and performance of high-resolution multi-camera setups.

Key features

- Excellent performance at 10 GigE bandwidth
- Reduced latency and jitter for high performance applications
- Enables high resolution and high FPS multi-camera setups
- Built-in frame completion notifications and packet resend feature
- Reduces CPU usage significantly
- Bundled to deliver a good price to performance ratio.



The Oryx 10 GigE camera + Myricom card bundle is customised to deliver reliable high performance.

For more information visit: <https://www.flir.com/>

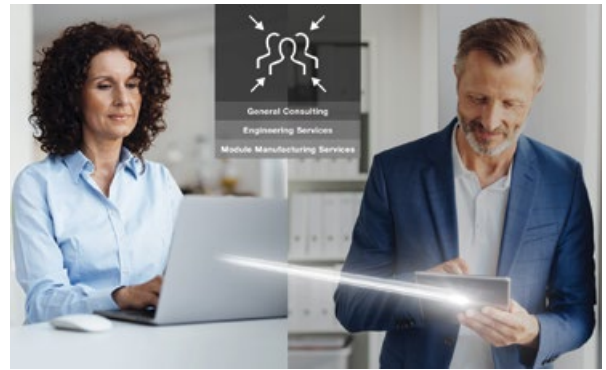
Services support for plant engineers

Solutions provider Eplan has introduced the Eplan Marketplace, an international platform that networks users of computer aided engineering (CAE) software and service providers – in engineering, control cabinet manufacturing, panel building and consulting, for example. Quick access to service providers in these Eplan environments enables project work to proceed, even in the event of resource issues.

Eplan Marketplace provides companies around the world with fast access to service providers in the fields that Eplan covers. On this platform, accessed via Eplan's website, people can search for providers that offer services related to Eplan applications.

Finding the right service provider

The objective is clear: "We want our customers around the world to be successful," says Eplan Senior Vice President



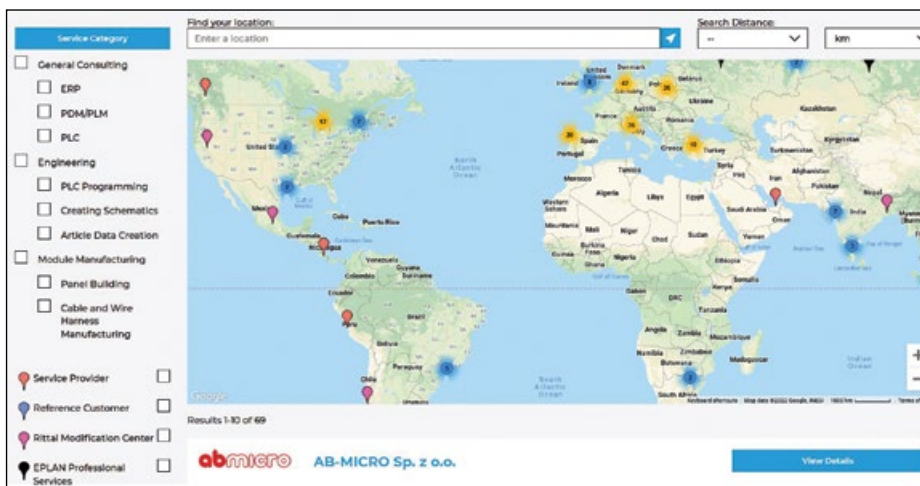
The Marketplace platform is designed to enable quick access to service providers in the Eplan environment, around the world.

Strategy & Corporate Program, Marco Litto. Day-to-day operations show that the project business faces many of its own hurdles with data preparation and integration, things companies sometimes cannot handle on their own. Often they also need personnel resources as support. So

this raises the question: Which provider in the field of CAE software, specifically in the Eplan environment, is suitable for this? Then the search begins, especially in larger countries where there is less coverage with Eplan expertise. Until now, Eplan Sales has assisted in establishing contact with companies. This search process will now be simplified with the Marketplace.

Quick access to international suppliers

The Eplan Marketplace is divided into three sectors. The Engineering Services sector includes services such as creating schematics, hardware design or setting up device data where companies may find what they are looking for to compensate for project bottlenecks, for example. The

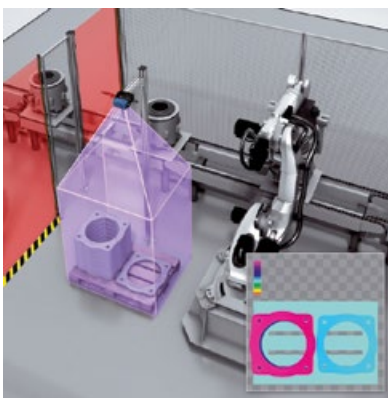


A map-based view makes it easy to find which suppliers can provide support in the international market environment.

3D machine vision camera

SICK Automation, a leading producer of sensor automation solutions, has introduced a 3D machine vision camera that facilitates automated management of products or goods in the factory or warehouse environment. The Visionary-S CX is designed to integrate with robotic handling systems (such as depalletisation or picking systems) or quality control solutions to enable the real-time identification, picking, and selection of goods accurately and quickly for optimised warehouse or production operations.

The Visionary-S CX is a rugged camera with the ability to 'see'



The Visionary-S CX 3D machine vision camera can 'see' colour and depth as well as dimensions, even in low ambient light.

both colour and depth, as well as dimensions, even in environments with low ambient light. This means it recognises items and objects reliably, so it can identify and select individual products in densely packed boxes, for example. It also features a high recording speed, making it effective in high-speed applications. It integrates easily into existing systems using system integration (SI) software, to enable prompt optimisation. The easily configurable input and output functionality make the Visionary-S CX versatile and flexible.

Robotic carton handling or quality control packaging systems have largely been limited by 2D technology. A robot could be programmed to pick or select an item that was positioned at specific coordinates on a pallet, a table, or conveyor belt. If the item was not in that precise location (or not positioned accurately, at the optimal height or depth) the system failed. "The Visionary-S CX in effect gives the robotic system the vision to identify target items and understand where these are," says Grant Joyce,

Module Manufacturing Service sector addresses services in control cabinet engineering, panel building, cabling assembly and wire harness creation. General Consulting includes service providers who advise joint customers in the fields of ERP, PLM or software development (PLC, visualisation, and similar). By searching for the software in use, type of services or country-specific region, users can filter which providers are suitable for which tasks. Contact to the companies can also be initiated directly through the platform.

Tested quality

Service providers can register via a website free of charge. The requirements for participating in the Eplan Marketplace are proven qualifications – for instance, an employee who has trained to become an Eplan Certified Engineer as well as an evaluation from at least one reference client. Eplan managers then validate the provider and qualifications and, after a successful check, the company is listed in the Marketplace. The listing as well as its use are also free of charge. Users can use the contact form to send an inquiry to the service provider. Services are then agreed to and invoiced outside the Marketplace. Feedback can be reported on the platform which can help other interested parties in choosing future service providers for their needs.

60 small and medium-sized enterprises are already listed in the Marketplace and Eplan is planning to expand the offerings. Companies with the corresponding expertise in the engineering environment around the world are encouraged to register for the Marketplace.

For more information contact EPLAN Software & Service.

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Email: Reyneke.J@eplan.co.za

Visit: www.eplan-software.com/eplan-marketplace

Managing Director, SICK Automation Southern Africa.

The Visionary-S CX solution was applied recently in the Belgium-based warehouse of a pharmaceutical company, where it optimised the depalletisation and picking of cartons, enabling the system to detect cartons at a rate of 2 000 per hour and depalletise them rapidly. As a result, the company was able to meet high demand for its products across Europe. "Through collaboration with our SI partners, we are able to build complete application solutions like this for customers in southern Africa," Joyce adds. Designed to deliver easy installation, programming and commissioning, the Visionary-S CX is also priced competitively for the local market.

For more information contact SICK Automation Southern Africa.

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Visit: <http://www.sickautomation.co.za/>

No cable technology advances machine flexibility

Beckhoff's innovative No Cable Technology (NCT) for the XTS intelligent transport system marks a quantum leap in terms of machine flexibility. Contactless power supply and synchronous real-time data communication enable individual XTS movers to become mobile handling and processing stations.

The modular XTS system has been expanded with NCT to include a special motor module as well as electronics that can be mounted on the movers. The hardware required for the transmission technology is fully integrated into the motor module, so the existing functionalities and compact setup are retained. No additional connections or supply lines are needed. The control of the hardware on the mover is fully implemented in TwinCAT. All established TwinCAT functionalities are available for simple project implementation.

For the first time, NCT makes it possible to process and check the quality of products on the mover while the process is running. Sufficient power and fast communication with the TwinCAT control system enable easy connection of sensors and actuators. The data communication is real-time capable and can synchronise system-wide events with μ s accuracy in connection with EtherCAT. This opens up new solution options for the user, especially in the areas of product handling, machining and measuring in parallel with product transport, as well as adapting production machines for rapidly changing production lots.

- Various motion sequences can be implemented on the mover itself, for example, to align a product.
- The mover becomes a mobile handling system with electromotive grippers, lifting magnets or vacuum suction cups that can pick up, transfer and deposit products.
- Heating or cooling of products can be done during transport, as can inline measurement.
- The integrated data communication enables, for example, unique mover, toolbox and product identification as well as state and process monitoring on individual movers.

For more information contact Beckhoff Automation.

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With new No Cable Technology, XTS movers can become mobile handling or processing stations, expanding XTS into a flexible multi-robot system.

Driving innovation for Dutch brewing company



Ferdie Fortuin,
Danfoss Drives
South Africa.

Ferdie Fortuin, Sales Manager – General Industry at Danfoss Drives South Africa

Which came first in the history of civilisation: bread making or beer brewing? For a long time scientists and scholars have argued about what caused our early ancestors to start farming and settling down, rather than continuing to roam as nomadic hunter-gatherers. Whatever the answer may be, one thing is certain: human beings have taken the brewing of alcohol very seriously for centuries.

For example, the famous German ‘Reinheitsgebot’, or ‘beer purity law’, is over 500 years old, and was originally introduced as a trade regulation law. Today it is praised as being an early food safety regulation^[1], possibly even the world’s oldest intact law to regulate beer contents^[2]. So, in the spirit and tradition of taking beer brewing and safety regulations seriously, Danfoss offers solutions for different processes in the brewing industry, where ‘control’ is a key word throughout – from mash to bottled product.

Danfoss has experience in breweries application systems worldwide. For example, its variable speed drives (VSDs) are suitable for all processing control and monitoring, no matter what the specific protocols might be. In addition, with its latest condition-based monitoring (CBM) technology, Danfoss can provide more information feedback from a single drive to assist with maintenance schedules within the breweries.

In a recent case, a brewing company in the Netherlands decided to embrace innovative drive technology from Danfoss to secure a more solid and sustainable future. The solution involved using Danfoss VLT® drives with integrated condition-based monitoring capabilities.

The challenge

With the European beer market expected to grow by 15.2% by 2025, the brewing company realised that, to meet demand, it needed its production line to deliver consistently reliable and excellent performance. However, prior to input



Danfoss has the required technologies, experience and application knowledge to serve the global brewing industry.

from Danfoss Drives, the brewery had faced costly and lengthy disruptions whenever a machine fault occurred. As is typical in breweries, operations take place in harsh, wet conditions and many applications contain concealed motors, making them difficult to access when issues arise.

Danfoss was tasked with helping the brewery to:

- Increase uptime
- Lower overheads
- Improve management of spare parts and stock

- Access new levels of machine data
- Boost application and system performance.

The solution

In August 2019, Danfoss Drives proposed that the brewery install VLT® drives with embedded intelligence, connectivity and sensor capabilities. Condition-based monitoring signals were then integrated into the brewery’s maintenance system via edge computing.

The brewery also received 4-20 mA vibration sensors from Hansford Sensors, and Danfoss provided additional support with project scoping, commissioning, and training, as well as hosting workshops to determine the best solution for the company’s needs.

The VLT® drives also support pre-existing communication interfaces and software such as fieldbus, local control panels, and VLT® Motion Control Tool MCT 10, so the brewery did not have to invest in a new parallel system as part of the upgrade.

The outcome

The VLT® Motion Control Tool MCT 10 plug-in brought a significant improvement, enabling seamless commissioning with consistent parameter settings. With the power to gather more critical application data in real time than previously, the brewery was able to optimise its production line and solve the challenges it had faced with consistent performance. In addition, Danfoss Drives’ digital expertise enabled the company subsequently to retrofit all the other drives in its facilities with condition-based monitoring functionality.

Edge computing in the drive ensures smart and simple CBM. At Danfoss, we have the required experience and specialised application knowledge to act as a competent and trustworthy partner for the global brewing industry. Danfoss aims to continue assisting the industry to achieve the highest standards of efficiency and quality control. □

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For more information visit: www.danfoss.co.za

Resource-efficient irrigation

Agriculture is an important growth sector and a key contributor to the South African economy, as it is for many other African countries. As a result of climate change, however, various regions are experiencing increasingly irregular rainfall and at decreasing levels. The owner of a dairy farm in South Africa was looking to establish a pump system to access ground water from wells and ensure a reliable and cost-effective water supply. The farm's owner commissioned the implementation of a suitable system from a family firm of electrical installation planners, Pienaar Elektries.

Pienaar Elektries specialises in agricultural operations, in areas such as irrigation, refrigeration, feed processing and solar power generation, among others. The planned irrigation system was to comprise two reservoirs at different heights. These were to be filled with water overnight, when energy costs are comparatively low, by a total of six underground well pumps. A transport pump is used to transfer water from the lower reservoir to the higher one. The height difference allows the sprinkler system to be operated using gravity alone during the day, making it particularly efficient. The same water supply system also provides drinking water for the farm animals and serves the dairy.

Key requirements of the project were cost efficiency and low energy consumption, and it needed to be reliable and easy to maintain.

Following a thorough planning and consultation process, Pienaar Elektries opted for a number of automation products from Delta, working with the diverse portfolio of powerful yet economic solutions.

User-friendly automation

Five low-energy Delta CP2000 frequency drives drive the six underground well pumps and ensure the water brought to the surface is transferred on to the higher tank. The CP models feature a PID controller (a proportional-integral-derivative controller) with feedback, which allows the water level in the tanks and boreholes to be monitored and corrected. This is done by alternating between the different pumps and continually monitoring the flow: if the borehole level falls below a minimum predetermined by the user, the PLC switches to the next borehole and prevents the pumps from being damaged.

The system makes use of various Delta DVP series programmable logic controllers (PLCs): three DVP04AD PLCs monitor the sensors in the boreholes and keep the water level above the predetermined minimum value. Five DVP16SP PLCs regulate the motors. One DVP12SE PLC monitors the water level in the top reservoir and the animal watering stations, and a further DVP controller manages the sprinkler installation. Two human-machine interfaces (HMIs) from the DOP-100 series are used to display all the processes in the system and show system information and warning indicators on a 7- or 15-inch touch screen. In-house software allows the time configuration and energy costs to be



The control system provides for an efficient water pumping and irrigation system.

monitored remotely. Users can also monitor the entire process via the DOP-100 virtual network computing (VNC) server.

Efficient energy and water usage

The team from Pienaar Elektries values Delta as a flexible partner that offers good service and a range of automation solutions that are easy to integrate. "In this project it was important to tailor the action of the individual pumps to each other, to manage use of the available water optimally and avoid damaging the pumps," explained Martien Heesterbeek, Delta Product Manager. "Our DVP series PLCs are ideal for this as they ensure fast communication with the CP motor drives and allow for the irrigation system to be controlled reliably."

The system is working well and supplies livestock and crops with sufficient water, even during periods of low rainfall. Paul Pienaar, owner of Pienaar Elektries said, "We are very happy with the efficient energy consumption of the low-cost pump and water storage solution. The HMI allows us to configure the system to pump water up only at night, keeping the energy costs low. Simple maintenance, monitoring and remote troubleshooting save us a lot of time and effort." □



A selection of Delta's automation solutions – including drives, PLCs and HMIs – were used in this project.

For more information visit: www.delta.com

Reliable motors for wastewater treatment plant

In a project to expand the treatment capacity of a wastewater treatment plant south of Johannesburg, water purification specialist PCI Africa installed more than 65 WEG motors to deliver optimal performance, reliability and energy efficiency.

With the addition of an extra module, the expanded wastewater treatment plant has the capacity to treat another 50 000 cubic metres of water each day. Ongoing urban migration and development in the area requires the region's wastewater treatment facilities to continue to increase their capacity.

Lebo Rathebe, Proposals Manager at PCI Africa says the mechanical portion of the contract included the inlet works, 25-metre diameter primary settling tanks (PSTs), a biological reactor, secondary settling tanks and dewatering facilities.

"We added a sixth module to the plant, which included the installation of two screw pumps to feed the PSTs, with four front rake screens and hydro-conveyors," Rathebe explains further. "The PSTs were fitted with 30-metre long half-bridges and two recycle pumps per tank."

He says the new module treats water using a three-stage process for the biological removal of nitrogen and phosphorous. Influent – the incoming stream to the plant – first enters an anaerobic reactor before reaching an anoxic reactor and finally an aerobic reactor.

"Recycle pumps transfer part of the stream from the anoxic reactor back to the anaerobic reactor, to preserve microbiological matter and keep the solution homogeneous," he says. "There are also recycle pumps to move some of the stream back from the aerobic reactor to the anoxic reactor."

Dillon Govender, Zest WEG's Sector Specialist for Public Sector Business Development, says the WEG W22 motors supplied to this project by Zest WEG, mainly power the numerous pumps on the site as well as the mixers and agitators.

The motors on the site range mainly from 30 kW to 90 kW flange-mounted units and also include pad foot-mounted motors from 1.5 kW to 37 kW.

"WEG motors are installed in all the major processes,



WEG motors in a de-gritting pump station.

from screening, de-gritting, primary settling biological nutrient removal reactors, secondary settling and waste sludge thickening through to dewatering," says Govender. "Our role in this project demonstrates our growing contribution in the wastewater sector in South Africa and on the continent generally."

In this project, WEG motors are also driving the pumps for return activated sludge and waste activated sludge.

Govender highlights the demanding nature of wastewater applications, given the high levels of corrosion that can occur if equipment is not suitably designed and manufactured.

"The Class H insulation on these WEG motors enhances their durability and lifespan, enabling them to withstand a higher temperature rise," he says. "In addition the contract specified the inclusion of anti-condensation heaters for all motors of 4 kW and above. Our motors on the site also boast paint plan 212P and IP66 ingress protection to help keep them free of moisture or dust."

With the rising cost of electricity, it was critical that the motors should run at high efficiencies to control the plant's operating costs. Zest WEG supplied its IE3 premium efficiency motors to meet the client's specifications and ensure the owner achieves the lowest cost of ownership. Govender notes that Zest WEG also offers IE4 motors, the next level of efficiency.

Rathebe emphasises the advantages of having Zest WEG supply almost all the motors on the project, saying this made life easier for the contractor and the end-user. "In terms of ongoing operation, the plant owner can economise on the spares it carries, and be assured of responsive after-sales support," he says. "As the contractor executing this project, it was easier for us to have one source of responsibility when dealing with the supplier."

Govender says the quality, robustness and efficiency of WEG motors means Zest WEG can offer a five-year guarantee, giving customers value for money and the peace of mind in knowing that operations will not be disrupted by unexpected stoppages.

For more information contact Zest WEG.

Visit: www.zestweg.com



A water recycling installation driven by WEG motors.

Refurbishment of winder motor for Northam Platinum

The South African market is increasingly recognising Marthinusen & Coutts' capabilities in the area of restoration and modernisation of old electrical equipment to 'as new' status. This capability is also associated with significant cost savings.

Northam Platinum recently acquired a used 4 300 kW winder dc motor to drive the hoist due to be installed in the new Number 3 Shaft for the Zondereinde Western Extension of the mine near Thabazimbi in Limpopo.

At the beginning of 2021 DRA, the consulting engineers for Zondereinde, contracted M&C to inspect and test the 37-year-old motor and drive shaft and perform any repairs that needed to be done. M&C was also commissioned, as part of the contract, to manufacture a number of key spare parts for the motor.

The work was performed at M&C's Large Motor repair facility in Benoni, which is equipped to handle very large rotating machinery, and was completed in mid-November 2021.

The motor's 42 t armature was found to be in good working order, and the frame's interpole coils and brushgear were partially refurbished and cleaned.

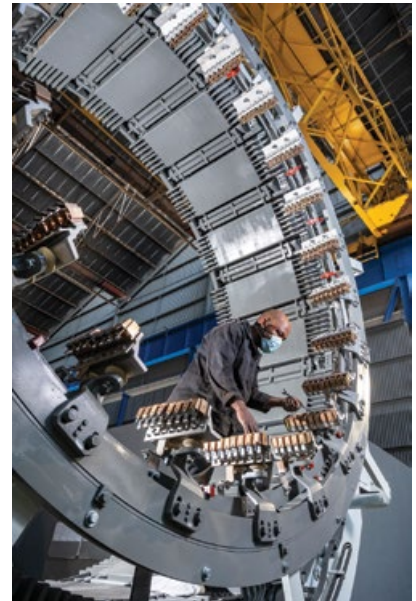
M&C applied reverse engineering methods to manufacture the spare parts for the motor, which comprised

three of each of field coils, interpoles and pole shoes, plus a full set of 24 damper bars – eight for each of the three spare pole shoes.

"The units were extremely complex to assess and it was a challenge to manufacture all the new spares and replacement parts required," said Rudi Els, General Manager of M&C's Power Generation & Large Motor repair facility.

"There were thousands of different parts, which required a great deal of attention to detail and specialist reverse engineering. It was also a major task to document and control the status of all these parts," he added.

The 38 t, 10.5 m long drive shaft was found to be in good order.



Winder Assistant, Donald Kolobe, aligns the brushgear of the 4 300 kW mine winder motor.

For more information contact Marthinusen & Coutts.

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The new app interface provides for easy drive commissioning, monitoring, diagnostics and support.

Plug-and-play drive with new app interface

Control Techniques, part of the Nidec group of companies, is launching a new member to the Commander family of drives and a revolutionary app named Marshal.

Commander S provides a solution for applications that require plug-and-play control convenience straight from the box. It is easy to install, easy to use, reliable and cost-effective.

Commander S is claimed as the first drive supplied with an app interface as a standard feature at no extra cost. Marshal changes the way the user interfaces with the drive, covering commissioning, monitoring, diagnostics and support.

Powered by NFC (near-field communication) technology, Marshal will serve as the user's drive expert in the field. The app allows power on/off commissioning, even when the drive is still in the box; cloning – parameters can be transferred from one drive to another; diagnostics – providing real-time diagnostics even when the drive is powered off and step-by-step instructions to help the user fix the problem and get the drive running again. The user can also easily share wiring diagrams and drive configurations as PDF files via email or WhatsApp or other messenger apps.

The robust click-on/off DIN rail mounting makes it easy for the end-user to install the drive, and the small footprint of Commander S plus side-by-side installation save cabinet space where this is at a premium. The terminal designations are laser printed for easy identification and offset angled terminals allow easy screw access and cable entry.

Marshal is the easiest and fastest way to communicate with Commander S. Available for Android and iOS, it enables drive set-up in only 60 seconds using NFC technology, as well as providing simple setup routines tailored to different applications. The FastStart menu, accessible via Marshal, provides assisted

commissioning, and only four key settings are needed to get the motor running.

Innovative manufacturing and the latest generation components are used in production of Commander S. A conformal coating process protects the drive against moisture, corrosion and dust to meet the long-term robustness and reliability standards for which Control Techniques is known. And it is supplied with a five-year warranty, as are all Control Techniques' general purpose drives.

Commander S is optimised for simple applications. To help reduce overall costs for the user, several essential features are built into the drive, such as intelligent fan control, on-board Modbus RTU, and an integrated C1 EMC filter. The new Commander S also meets the energy efficiency requirements set by the EU Ecodesign regulation.

The drive is available in three frame sizes with a power range of 0.18 kW to 4 kW (0.25 to 5 hp).

Anthony Pickering, President of Control Techniques, highlights the presence of NFC in daily life and how this technology introduces a different user experience in the market for general purpose drives.

"NFC is in all our lives; we use it to make payments at a shop, for example. We knew this was the technology to go for, and we've adapted it for Commander S. That is disruptive for the industry and changes the whole customer experience," Pickering said.

"Commander S offers the user fast installation and programming, gets the job done, and it's green! This colour takes us back to our heritage. In the early days of Control Techniques, we were known as the green drive company. As part of our ongoing development, we believe our heritage is important; what we take to the future is what we've learned in the past and making it green marks a recognition of that knowledge and development over the years."

For more information contact Control Techniques.

Email: controltechniques@mail.nidec.com

Visit: www.controltechniques.com

Transducer terminal blocks with push-in connection



The PTVME test-disconnect terminal blocks can be used in applications on the secondary wiring side of switching devices.

The PTVME test-disconnect terminal blocks from Phoenix Contact are an extension to the PTV portfolio. They can be used in all applications on the secondary wiring side of switching devices for transducers and signals.

The vertical push-in connection of the terminal blocks simplifies system upgrades. With their compact design, they require an overall width equal to that of screw terminal blocks. A nominal voltage of 1 000 V ensures increased safety. A screw-free disconnect slide is used to actuate the terminal

blocks quickly and easily. The switching state can be clearly identified. Because the test-disconnect terminal blocks have the conductor connection at the side, conductor cross-sections from 0.5 mm² to 6 mm² can be connected. Terminal blocks with integrated or optional test sockets are available. Phoenix Contact's CLIPLINE complete standard accessories can also be used with these terminal blocks.

For more information contact Phoenix Contact.

Visit: www.phoenixcontact.com/en-za/

Electrical panels and equipment at Sishen's Koketso project

JB Switchgear Solutions (Pty) Limited was recently awarded a contract on the Sishen Mine's Koketso project. The scope of work includes the design, manufacture, testing and supply of numerous remote I/O panels, power distribution panels, field junction boxes and drip covers.

The Sishen Mine is operated by Kumba Iron Ore and is situated near the town of Kathu in South Africa's Northern Cape. The mine represents one of the largest iron deposits in southern Africa and was first mined in 1953. Current processing technologies at the mine enable the treatment of A-Grade ore (haematite >58% Fe) through the Dense Media Separation (DMS) plant and B-Grade ore (haematite and lower grade ore types >48% Fe) through the Jig plant. C-Grade material (lower grade material containing 40% to 48% Fe) is stockpiled as waste.

Since 2014, Kumba has successfully implemented Ultra-High Dense Media Separation (UHDMS) technology at its operations, enabling the beneficiation of lower grade materials (<48% Fe). A UHDMS modular plant was constructed at Sishen in 2015 (in which the capacity was upgraded in 2018) to treat low grade Jig discards (~1.1 Mtpa product). A second plant was constructed at

Kolomela in 2017, to treat B-Grade run-of-mine material (~1 Mtpa product).

In 2015, Kumba initiated the Sishen Koketso Project to determine the optimal application of UHDMS technology at Sishen. The project involves the conversion of the current DMS plant to UHDMS technology, which would then be capable of processing 32.0 Mtpa of both 'A'- and 'C'-grade material, producing on average an additional 3.6 Mtpa over the LOM (Life of Mine) (2017 base case) from material previously classified as waste.

The project began in February this year and will be completed in May 2023.



JB Switchgear is working on electrical panels, field junction boxes and other equipment at Sishen's Koketso project.

For more information contact JB Switchgear Solutions.

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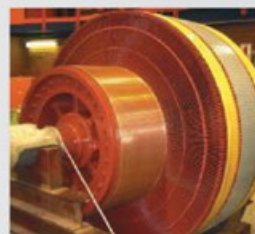
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New Johannesburg assembly line for industrial gear units

SEW-EURODRIVE's Generation X.e industrial gear units are soon to be assembled locally at the company's new 26 000 m² factory in Aeroton, Johannesburg.

Greg Perry, National Operations Manager for SEW-EURODRIVE in South Africa highlights a number of advantages that local assembly will bring to customers. "It has become necessary to increase local production capacities in order to cater for our growing customer base in markets across Africa," says Perry. "Our new SEW-EURODRIVE premises in Aeroton, Johannesburg, which will house our head office as well as assembly, warehousing and repair facilities, is nearing completion and we are currently laying out the assembly lines for geared motors and industrial gearboxes."

Geared motors, industrial gears (IGs), variable speed drives (VSDs), automated guided vehicle systems (AGVSs) and servo motors will all be assembled in the new factory, which will also have space to conduct repairs on SEW and non-SEW units.

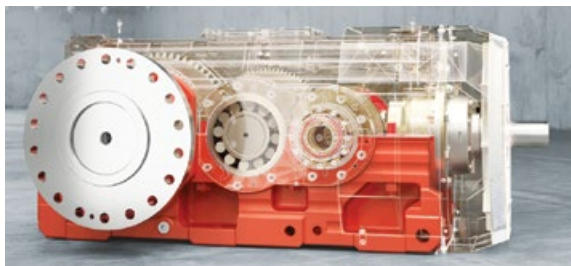
"The Johannesburg assembly lines for geared motors are designed to handle 7 000 units per month, and we are planning to build up to 100 IG units per month, doubling our current capacity. New spray booths and automated oil-filling stations are being installed to cater for these volumes.

"All local assembly of gearboxes, VSDs and servo motors is conducted in accordance with SEW-EURODRIVE's global quality standards and SEW South Africa is already certified by Germany's quality department. In addition, the company has ISO 9001 quality certification. The standardised assembly and logistics processes are now incorporated into SEW-EURODRIVE's SAP system, which will provide clearer traceability and visibility of all orders as they move through the assembly processes.

"We are starting to design the assembly flows for our X.e range, and we will be adding additional industrial gearboxes ranges over time. Initially, we will be assembling the Generation X.e Series in sizes from 120 to 250, which embraces nominal torque classes from 12.8 to 175 kNm," Perry says.

The Generation X.e Series

The latest generation SEW-EURODRIVE industrial gear units in the X.e Series incorporate a number of



The latest generation X.e series of industrial gear units is set to be assembled at SEW-EURODRIVE's new Johannesburg facility.

improvements, making them more robust, reliable, efficient and easier to maintain.

This modular series is designed to be custom-built to meet clients' specified needs. In particular it allows for significantly more possible torque/speed combinations and fine-size graduations. Additional modular features and options, such as motor adapters, backstops, various sealing and shaft systems and more, add to the ease of use and reliability of X.e Series systems.

Key applications of SEW-EURODRIVE's X.e industrial gear units across Africa are wide ranging.

- In conveyor drives, which are often required to operate in extremely dusty and very hot or cold conditions, the X.e IG units, particularly in the X180 and above sizes, offer excellent reliability due to new thermally optimised housings and the contact-free Taconite sealing system design.
- For hoists, which often include the rope drum and the motor on the same side of a parallel-shaft unit, the X.e hoist series offers an optimised selection of gear unit sizes, reduced gear unit weight and sufficient centre distances.
- For bucket elevators required to lift bulk materials, the drive needs to be operated at low speed during maintenance. X.e series bucket elevator drives are equipped with a directly mounted auxiliary drive to perform this function while the main motor is switched off.
- For agitator and aerator drives, X.e agitator gear units in the 22 to 90 kNm size range have extended bearing distances to absorb high radial and axial forces. In addition, due to their thermally optimised housings, these units can be used without external cooling, even in high performance agitation applications.

Perry also notes the use of the new X.e range in girth gear applications, where the new generation units have become the global standard for use with SEW-EURODRIVE's mill drive solution.

"When the new X.e assembly line is up and running at our factory in a few months' time, we expect our delivery times, from receiving an order to shipping to site, to be significantly reduced," Perry says. "We will also be in a better position to deliver complete drive systems to industry, including system components such as couplings, brakes and sensors, all of which can be pre-mounted on a baseplate, along with VSDs, soft starters, sensors and all the connectivity needed to link to a customer's control interface."



Greg Perry, National Operations Manager for SEW-EURODRIVE in South Africa.

**For more information contact SEW-EURODRIVE.
Visit: www.sew-eurodrive.co.za**

Reliable water level readings from remote areas

Prolonged periods of drought, sudden downpours or violent thunderstorms – all over the world once familiar weather patterns are becoming increasingly erratic and unpredictable. While this has a significant impact on the natural environment (and in some cases on people and property, as we have witnessed recently in South Africa), it also calls for innovative actions to be taken by affected municipalities. In Belgium, VEGA's compact radar level measuring instruments provide reliable readings for ecologically friendly water management.

When rivers suddenly overflow their banks, or drinking water becomes scarce, or a nature reserve struggles with a drought, water distribution strategies have to be rethought. In Belgium, this task is carried out by the Flanders Environment Agency VMM (*Vlaamse Milieumaatschappij*). Although the authority can do little to change the volatility of the weather, it does play a decisive role in a holistic water policy.

The environmental agency measures and monitors water quantity and quality, manages water systems and levies fees on water pollution and groundwater extraction. It also advises on environmental permits and supervises infrastructure planning, as well as the monitoring and supply of drinking water. For rivers or any other form of flowing water, VMM relies on IoT solutions and adopts an integrated approach focused on limiting the risk of flood damage and achieving a high ecological status.

VMM looks to ensure that no user or consumer in the complex system of water distribution is neglected. However, effective monitoring relies on accurate measurement.

User-friendly and low-maintenance

Initially, ultrasonic sensing was used to measure the water level in non-navigable streams, canals and rivers. The major drawback of this measuring method, especially outdoors, is that the sound propagation time depends on the temperature, which can result in considerable measurement errors due to temperature changes or solar radiation. Thick fog, wind and rain, as well as a build-up of dirt, also influence ultrasonic measurement. Even cobwebs can cause inaccurate readings: as they gather debris, they interfere with the measuring signal, resulting in an increase in the blocking distance, or dead band, typical of ultrasonic sensors. In addition, there were ongoing maintenance problems.

Radar sensors, by contrast, are unaffected by dirt, sunlight, fog, wind or rain. And they do not require mechanical protection from high floodwaters. For that reason, the decision was made, over 15 years ago, to change the type of sensor used and since then the agency has relied on radar technology from VEGA.

VMM first worked with the radar level sensor VEGAPULS 61 with PVDF antenna for several years,

and subsequently with VEGAPULS WL 61. In the course of the ongoing collaboration between VMM and VEGA, the agency especially appreciated the solution-oriented approach of the Schiltach-based company, as Johan Eylenbosch, hydrographer and electrical mechanic at VMM, notes: "Whenever a problem arose, the service and additional information provided by VEGA was helpful." This was confirmed again in the next project the agency undertook.

A real-time overview

Due to climate change, a new challenge arose. VMM needed to find a way to obtain a comprehensive overview of water levels at various locations at any time of day. The agency's intention was to build a fine-meshed network of real-time level measuring points. Important measuring points include,

To date, 50 VEGAPULS C 11 level measurement modules have been installed in five Belgian provinces, to monitor water levels continually.



At a glance

- In monitoring and managing water systems, the Flanders Environment Agency relies on IoT solutions within an integrated approach.
- Effective monitoring relies on accurate measurement and this is provided by VEGA radar sensors.
- With the latest installations extending across a network of waterways, measured values are sent to the VMM database on a regular basis, via a remote telemetry data logger.



VEGAPULS C 11 is housed in a small stainless steel housing, so it is well protected against vandalism and theft. Inset: All instruments are completely solar powered, so no further maintenance is required.

for example, smaller, non-navigable watercourses, where information is gathered to help mitigate water shortages or predict floods. Such measured values form the basis for taking more far-reaching decisions, to introduce local or regional water withdrawal prohibitions, for example. VMM was particularly focused on periods of prolonged drought, which had become common over recent years.

Somewhere in the middle of nowhere

In an effort to improve water management, VMM wanted to use smart IoT level sensors for continuous level measurement of rivers. Until then, setting up such measuring points had only been possible with considerable effort and expense. "To install a river level measuring point, the sensor, together with an adequate housing, sometimes had to be set up in the middle of nowhere and the necessary cables laid underground. We also needed special software to configure the system. And we had to collect, amalgamate and process the measurement data," says Eylenbosch, citing just a few of his concerns at the time.

When the new, compact, radar level transmitter VEGAPULS C 11 became available, it could address many of those problems at once. The instrument contains a newly developed radar microchip that was specially optimised for the requirements of level measurement, and its high level of integration makes it possible to build very compact sensors. The new VEGAPULS C 11 measures at a frequency of 80 GHz, which enables very good signal focusing. This allows better separation of measurement signals from interference signals – and measurement is thus much easier and more accurate than with other measuring methods, such as ultrasonics. The very small beam angle of only 8° is ideal

for the application, as Eylenbosch notes. "Some channels are very small and the narrow measuring beam makes it easier to install the sensor in tight spaces. For example, we can mount the sensor very close to the wall." With its encapsulated cable and protection class rating of IP66/68, the new radar sensor can be immersed in water in the event of a flood.

Measurement data around the clock

Every 15 minutes, the radar measurement is activated and the measured value sent to the VMM database via a remote telemetry data logger. "This makes it possible to gain better insight into our water supply and distribution reality and to calibrate our hydrological models," says Eylenbosch. Incidentally, any citizen can also access the data – the current readings can be viewed by anyone via the web service, www.waterinfo.be.

Once the decision was made, VMM procured 50 compact VEGAPULS C 11 radar level sensors and installed them with microcontrollers at various locations in five provinces. The exact location of each one is determined via a GPS module built into the data logger. "Most of the measuring points are located in open watercourses and are actually not problematic. So we could also have used ultrasonic or pressure sensors," says Eylenbosch. "But the simple installation of the radar sensors via Bluetooth and the high measuring accuracy of ± 5 mm, as well as the very reasonable price, tipped the scales in favour of radar measurement technology," he adds, clarifying the reasons for the decision.

"The instruments also have the advantage of being completely solar powered, which makes them easier to operate and maintain. So the significantly lower energy consumption of the new radar sensors was helpful to us in many respects."

He mentions another advantage in that the VEGAPULS C 11 fits into a small stainless steel housing. "This makes the entire measurement setup so inconspicuous that it is also protected against vandalism and theft."

Looking ahead

"We now have reliable, energy-efficient measurement 24 hours a day," says Eylenbosch. He expects there will be a need for additional measuring points in future. Expanding the sensor network is not a problem as new level measuring points can be put into operation quickly and easily at any time and integrated into the existing network. As soon as the level measurement module is installed, the instrument goes online automatically. The administrator only has to fill out a few fields in a digital activation form beforehand and all subsequent measurement data is then transferred automatically to the database in a continuous stream. This ensures the level data becomes quickly available on the data platform. □

For more information visit: www.vega.com/en-za

Pressure transmitters with IO-Link interface

Robust pressure transmitters from Turck's PT1000/2000 series are now also available with an IO-Link interface and two programmable switching outputs. As well as their ability to withstand shocks and changes in pressure and temperature, the sensors thus also offer all the benefits of digital communication, including enhanced diagnostics and flexible parameterisation.

For example, IO-Link enables users to monitor electrical short circuits, overpressures and underpressures, as well as values exceeding the maximum operating temperature. Other data for efficient condition monitoring can be supplied by an operating hours' counter, a maximum and minimum pressure memory and an overpressure meter.

The pressure transmitters can be operated with two switching outputs or with IO-Link communication and one additional switching output, as required. The switching outputs can be set for either PNP or NPN operation. This makes it possible to set the location of the switch points within the measuring range and their behaviour, to suit requirements.

Turck offers the compact pressure sensors with protection to IP67 and IP69K in two different designs. PT1000 series transmitters cover a measuring range from 0...1 bar to 0...40 bar and operate with a ceramic measuring cell. PT2000 series devices are provided with fully welded measuring cells for higher pressure ranges, from 0...1 000 bar. In both series, the pressure sensors offer users the benefit of a high measuring accuracy of $\pm 0.3\%$ FS BSL.

For more information contact Brandon Topham at Turck Banner.

Tel: + 27 (0)11 453 2468

Email: brandon.topham@turckbanner.co.za

Visit: www.turckbanner.co.za



The pressure sensors are available in two designs which cover different measuring ranges.



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The VOS-I universal code reader can be used in diverse applications.

Universal code reader for diverse applications

Sensors cover a wide range of sensing measures to provide the information plant operators need for optimal process control and automation. Camera-based code readers are used to detect and identify parts and workpieces and can be adapted flexibly to suit different tasks. The new VOS-I series code readers from Pepperl+Fuchs show what the top range of this technology can do.

The requirements for reading barcodes, Data Matrix codes, QR codes, and suchlike in automated production lines are much higher than those for the scanning of packaging at the supermarket checkout. Reading codes under industrial conditions is a real-time task, integrated into automated, fast, production, processing and transportation processes. Speed and reliability are priorities.

Numerous functions, diverse applications

The VOS-I series universal code readers are designed to read all common 1-D and 2-D codes, including DPM codes, securely. The fixed-installation vision sensors support large distance and sensing ranges, read codes on objects that move at speeds up to 4 m/s, and read very small codes. The readers also offer a wide range of intelligent functions that allow users to carry out diverse reading tasks. These functions include match code, multi-window and multi-code readings, output string formatting via scripts, and the scope to group together several VOS-I devices.

All device versions have a LAN connection for PROFINET IO, EtherNet/IP, Ethernet TCP/IP, a serial RS232 interface, and three freely configurable digital inputs/outputs to integrate the code readers into existing control and networking systems.

The new code readers are typically used in applications in the automotive industry, in the production of electronic assemblies, and in the logistics sector.

In the automotive industry, for example, DPM (Direct Part Marking) codes are often used. They are applied to metal surfaces of parts such as engine blocks, using

mechanical needles and laser light burning techniques. Reading a thinly needle-punched code can be difficult, so developers have created a special decoder for this application. It is supplemented by an electronic filter bank that prepares raw images to suit the needs of the user and enable reliable reading in future. This type of filter ensures that the thinly needle-punched modules are enlarged before the evaluation. With additional external lighting, the VOS-I can reliably read difficult DPM codes up to two metres away.

Reading small codes

In the production of printed circuit boards in the electronics industry, very small codes need to be detected, sometimes from several printed circuit boards simultaneously. As space is usually limited on printed circuit boards, very small lasered Data Matrix codes are often used in these applications. The VOS-I can decode Data Matrix codes with module sizes of only 0.1 mm and can perform multi-code readings. This allows up to 64 codes to be read at the same time in a single reading window, or more codes if several reading windows are used. The vision sensor can also read different code types simultaneously, so mixing different code symbols in the same application does not present a problem.

Reading multiple codes

Multi-code readings are often required in the logistics sector too, such as in detecting Odette IDs where data is distributed over a number of different codes in the labels used for standardised information exchange when delivering goods.

Another advantageous feature of VOS-I code readers used in logistics applications is that where boxes and packages are typically strung out in random order on conveyor belts – and the codes may be on any side – multiple VOS-I code readers can be logically interconnected to capture all the packaging codes at one time. One of the devices acts as the main device, collects the read results of the network, and works with the other devices to transmit this data to the higher-level plant control system.

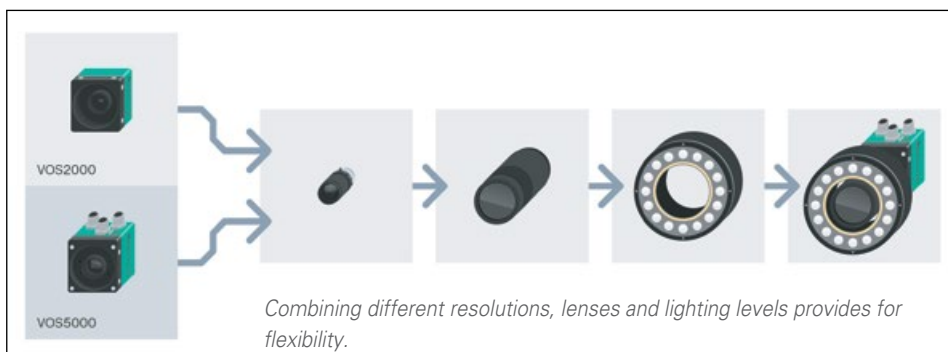
The new code readers from Pepperl+Fuchs include a number of other features which provide for: evaluating code quality, 'match code' reading, and offline optimisation for specific applications.

**For more information contact
Pepperl+Fuchs.**

Tel: +27 (0)87 985 0797

Email: info@za.pepperl-fuchs.com

Visit: www.pepperl-fuchs.co.za



Compact thermal profiling for coating-cure ovens

The Datapaq MonoPac2 system is designed specifically for monitoring coating-cure ovens used in the manufacture of aluminium bottles, aerosols and collapsible tubes by Monoblock processes. Using the MicroQ18 data logger in the TB0072 thermal barrier, together with Insight™ software, the system can monitor basket ovens (internal bake ovens, IBO) and pin ovens (outside bake ovens, OBO) used to cure internal and external tube coatings. The coating and curing temperatures, along with ramp, temperature reached and cooling cycles of the process need no longer be guess work as the logger monitors all these aspects in the process and supplies the quality control information required to meet the exacting standards of this industry.

The thermal barrier measures just 41 x 48 x 195 mm, making it 43% smaller in size than the previous product generation. The temperature profiling system can be used in lines with closely spaced pins (>45 mm) and with various product basket sizes. This engineering success is based primarily on the development of a new data logger with a minimal footprint. The new Datapaq MicroQ18 logger connects four thermocouples via micro-miniature sockets and logs up to 32 000 readings per channel, with an adjustable interval of 0.05 s or more. Its accuracy

of $\pm 0.5^{\circ}\text{C}$ positions it among the best available loggers.

Downloaded to a PC or notebook, the thermal profile can be reviewed with the Datapaq Insight software, which includes versatile visualisation, analysis and reporting functions. Manufacturers can thus optimise oven settings and ensure every product is processed for the specified time at the required temperature.

Regular monitoring is facilitated by the compact size and light weight of the system. Mounting brackets are available in different versions for quick and secure attachment in any line layout.

The Datapaq range of temperature profiling and Datalogger products is available locally from R&C Instrumentation.

For more information contact R&C Instrumentation.

Tel: +27 (0)11 608 1551

E-mail: info@randci.co.za

Visit: www.randci.co.za



The new Datapaq MicroQ18 logger has a minimal footprint.



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For more information, visit new.abb.com/low-voltage/

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What can sport teach us about MRO procurement?

Brian Andrew, Managing Director Sub-Sahara Africa, RS Components South Africa

Being an avid triathlete and sportsperson, I often find parallels between sport and business. For example, triathletes don't only train for the three main disciplines. They need to focus on the transitions as well, such as getting out of your wetsuit and onto your bike as quickly as possible.



Triathlete Brian Andrew, RS Components South Africa.

Have you ever tried getting out of a tight-fitting wetsuit after a long swim? It's something I am still working on, but it already shaves valuable time off the main events. It also points to a frugal way to gain an edge: instead of paying \$1 000 (about R14 500) to get my bike 100 grams lighter, I could easily lose another kilo or two by adjusting my diet. That weight reduction could cut valuable seconds from my bike time.

In business, this kind of saving is called a marginal gain. It has its roots in the Japanese term 'kaizen', meaning 'continuous improvement'. It's a philosophy that sees change, no matter how big or small, as for the better. This was suggested as the reason for the success of the British Cycling Team, according to the coach Dave Brailsford. He took the team, and British cycling as a whole, to some of the best results in the Olympics as well as the Tour de France.

In triathlon – and any other high-performance sport – the difference between winning and not can be a couple of seconds. Those transitions between swimming, biking and running are the thin wedges that widen the opportunity for victory. In business, particularly in manufacturing, marginal gains hold the same promise of staying ahead of the competition. This is most evident in MRO procurement.

MRO procurement creates the winning lead

Manufacturers make MRO purchases collectively – that is – Maintenance, Repair, Operations and Production purchases. These can be considered in two categories: direct and indirect goods.

Direct goods fall under Production. These form parts of a final product, such as the screen on a smartphone or the battery in a notebook. This definition can also include raw materials that go into the production process to create the final product. On average, direct goods account for 75% of the value of MRO purchases.

Indirect materials are part of MRO purchases. These are used in the process of manufacturing products. It might be solvent to clean machinery, a replacement switch on the production line, or a new screwdriver or light bulb on the factory floor. Even though such bits and pieces account for only a quarter of the value of MRO purchases, they total on average 80% of the transaction volume.

This makes the MRO part of the equation ripe for marginal gains. But many companies do not take advantage of

that. And that is because they don't distinguish the two at a price and discount level.

Find marginal gains with the right partner

Generally, commodities are easier to plan: you can anticipate production requirements and schedule demands. Like the main disciplines of a triathlon, you can apply a lot of forward-thinking. But when things are in a pinch – when you must change to cycling shoes or when a display breaks – you need to act quickly. In that scenario, price is not the driving concern. Overcoming the barrier is often done at any cost. Instead of losing a few kilograms, I buy a much more expensive bike. But did I really gain as much as I could have?

Indirect goods are unpredictable. In most cases, the product may not have been bought before, or it might have been purchased years earlier. That makes negotiating price a challenge. Why would a supplier commit to discounts and low prices without the customer committing to a certain volume or predictability in demand, which they cannot do? Yet if this synergy is not struck, many marginal gains stay out of reach.

MRO procurement should encompass a multi-stakeholder approach: a combination of strategies each delivering a small cost saving. Those marginal gains add up and could deliver up to a 35% cost saving. This requires a partner the purchaser can collaborate with to uncover such benefits.

The best supplier is not just one that can compete on price, but understands the importance of gains made through good delivery channels. For example, they can provide digital order platforms that staff can easily access for orders to be immediately fulfilled.

Not all suppliers can do this. It is important for suppliers to walk the road with the customer to help them realise marginal gains in the MRO space. This also respects the discipline of modern manufacturing. Just like triathlon transitions, it's important to respect the details and to be supportive in making manufacturing flexible. In this way, a supplier can contribute to customers' success. For MRO procurement, this should be an absolute requirement from the supplier partners chosen. □

For more information visit: za.rs-online.com

Field services – going beyond break and fix

Choene Ramotshela, Field Services Operation Director for Anglophone Africa at Schneider Electric



Choene Ramotshela,
Schneider Electric.

Through the cyclical demand on production and manufacturing, many industries, such as consumer packaged goods (CPG), use the low-demand time to shut down for maintenance and repairs. Conversely, CPG organisations also ramp up production during the holidays and around peak annual seasons like Easter or other religious or public holidays when the demand for consumer goods is high.

During these times, production, maintenance and technical teams must perform optimally as both low- and high-demand scenarios go beyond the norm of daily operations. In this regard, expert assistance can go a long way in supporting overstretched in-house teams, particularly when operations are restarted or reach peak capacity.

A valuable partnership

An outsourced field services team can fill an important gap, assisting organisations not only during emergencies but also at critical points – providing spares, additional technical support and 24/7 callout availability – and in aligning maintenance schedules with planned interventions when there is a contract in place. Such services support operations running at full steam or emerging from a shut down.

Moreover, an OEM field services team that includes certified engineers will have valuable insight into the equipment and has likely worked in similar scenarios across the various industries in which it operates. These teams provide problem-solving expertise that can save time as well as operational and manufacturing costs.

An outcomes-based evolution

Historically, field services has been a reactive industry. When an issue arises the maintenance or site manager will call for assistance and the field services team will repair or replace equipment or provide alternative solutions.

The move towards digital environments is becoming a major driving force behind field services. For example, most CPG organisations and other manufacturers generate an enormous amount of data. With this information, they can take steps to improve daily operations and prepare efficiently for increased production rates and maintenance periods.

Field services is then well positioned to meet these organisational needs by moving beyond traditional operations and maintenance to outcomes-based services.

An outcomes-based model entails servicing operational technology (OT) throughout the product lifecycle and using the resultant data to help organisations meet their goals.

Instead of calling on field services as problems arise, a company can partner with a services company to perform preventive maintenance, install connected products, mon-



Field services can assist in remotely monitoring connected assets, tracking the health and efficiency of electrical distribution equipment.

itor asset health, and make recommendations to optimise operations, including modernisation.

The move to digitisation

Digitisation is at the core of this outcomes-based model. At Schneider Electric we partnered with BASF to assist the organisation in achieving higher uptime and productivity at a substation in Texas in the US.

By remotely monitoring connected assets throughout the facility using the EcoStruxure Asset Advisor architecture, our services team has 24/7 visibility into the operational health and efficiency of the electrical distribution equipment. With this data, Schneider Electric provides BASF with customised advice and proactive recommendations to help prevent equipment failure and optimise maintenance strategies, and assist it in meeting its predetermined business goals.

Since the beginning of the partnership, BASF has met its intended outcomes, including decreasing the mean time to repair equipment by 15% and increasing the mean time between planned outages by 20%.

Field services is not just a break and fix solution; it can now provide proactive and preventive strategies to help industries such as CPG meet their manufacturing and production goals. □

For more information visit: www.se.com

Numerical analysis for boiler systems across industries

Steam generation and heat exchange expert Steinmüller Africa is extending its suite of process, mechanical and piping engineering services to a wider range of industries. The company's numerical analysis service, part of its process engineering offering for boilers and heat exchange equipment in power plants countrywide, can be used to analyse the fluid dynamic behaviour of almost any boiler system, heat exchanger or boiler auxiliary equipment accurately.

Steinmüller can assemble numerical models of any OEM-designed and built plants completely. It can carry out its numerical analysis service in utility, petrochemicals, paper and pulp, sugar, and nuclear industries.

Warwick Ham, Boiler Process Engineering Group Leader at Steinmüller Africa, says: "Specialised tools and equipment, our teams of engineers and technicians, and our 60 years of experience provide us with the expertise to take our solutions to these markets."

Benefits for clients

Ham says Steinmüller's investigative approach delivers value for money. "We begin by assessing the client's requirements and the nature of the problem. This gives us the information we need to make recommendations on the

numerical analysis tools to be used, and we always recommend against over-complicating the investigation. These are just two of the factors which keep costs down," he says.

Accurate geometry of every plant component, the plant's operating philosophy, and some of the operating data are required to build numerical models of any plant accurately, those designed by Steinmüller or by other OEMs. "Once the model is built, we investigate various scenarios to predict the operating characteristics under varying conditions. Often these operating conditions fall outside of the original design envelope," Ham says.

He adds that the systems modelling approach Steinmüller uses is continually being developed. "These ongoing developments help provide insight into the most cost-effective modifications for improved operating and maintenance practices, which provides us with a competitive advantage."

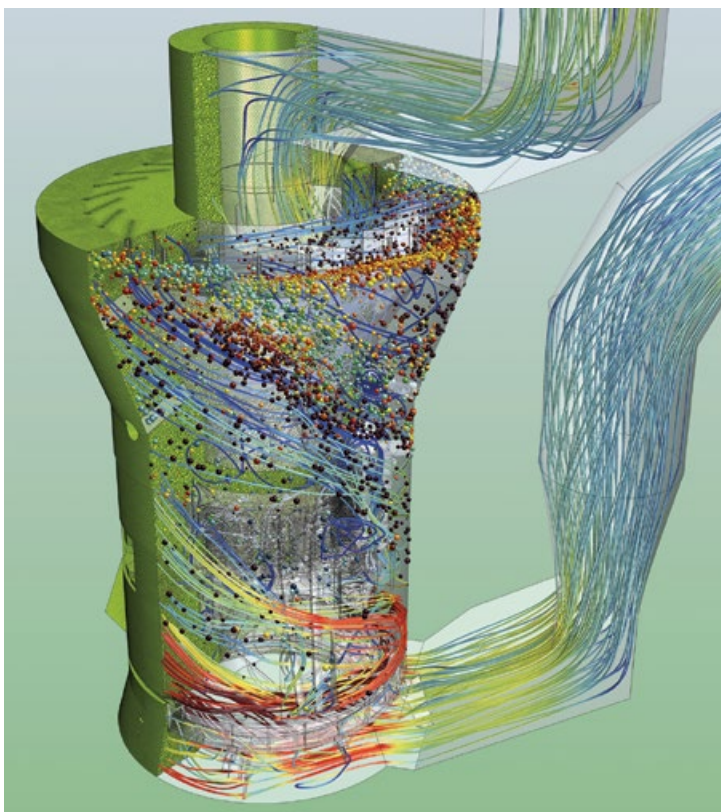
There are three main tools Steinmüller uses to execute its numerical analysis: the company's original Thermal Boiler Design Software, which is used in the design of most of the utility boilers currently in operation; Fluid Dynamic Numerical Analysis; and Computational Fluid Dynamic (CFD) Numerical Analysis. The company's engineers use these tools to analyse the chemical, fluid and heat transfer processes occurring in boilers and other heat exchange equipment accurately.

"Although our original boiler design program is still used, our full suite of numerical analysis tools has been expanded and modernised over the years," Ham notes.

Calculating capability

Using its full suite of tools the company can ascertain the heat transfer and fluid dynamic behaviour of working fluids, both air/flue gas and water/steam, within the boiler, piping and other componentry. Its Boiler Design Program determines a boiler's mass and energy balance by calculating the heat lost by the air-fuel combination within the furnace and absorbed by the water-steam flowing in the walls of the furnace. It also calculates the expected heat transfer throughout the various convective boiler parts downstream of the furnace, as well as the quantity of heat absorbed by the water and steam flowing through these boiler components.

Fluid Dynamic Numerical Analysis is then used to calculate the behaviour of the bulk flue gas flowing around the parallel pipes that form the boiler, as well as the water



A CFD model of a coal pulverising mill showing air flow streamlines (ribbons) coloured according to velocity and particles (scaled up for visibility).

or steam flowing inside these pipes. "This helps us predict the effects of the working fluids, the air, the flue gas, and the water-steam, as well as how they flow through obstructions, lose or gain pressure, change phase, or even pulsate," Ham explains.

CFD software for numerical analysis is used to calculate the intricate mass, energy, and fluid dynamic balance on a highly detailed scale including every point within the fluid volume. "These tools enable us to get around the practical difficulties of measuring critical parameters within the combustion zone at temperatures of about 1 600°C, or within the steam system at temperatures up to 572°C and pressures of 258 bar," Ham says.

Analysis for heat exchangers

"Although our numerical analysis offering is related mainly to boiler systems and associated auxiliary equipment, we can use these tools to analyse almost any heat exchanger or fluid dynamic equipment like fans, pumps, valves and dampers, for example." Ham says Steinmüller has performed mass and energy balance thermal modelling for diverse types of heat exchangers. These include fired and unfired boilers, water-to-steam heat exchangers, fluidised bed boilers, waste heat boilers, fans, air heaters, mills and electrostatic precipitators or fabric filters. "We have also engineered fluid dynamic models of the boiler water circulation system contained in evaporators, as well as large and complex piping systems, valves, and fans," he says.

In addition, Steinmüller recently conducted a CFD analysis of various power system subcomponents – combining these component models to form an entire boiler system, which included mills, burners, air heaters and electrostatic precipitators, which remove ash and dust from the flue gas.

More than six decades of refining its numerical analysis offering for boilers and ancillary equipment will serve the company



A CFD model of a boiler system including coal mills and pulverised fuel piping (foreground), burners and air ducting, furnace showing combustion flow paths and temperatures and downstream air heat exchangers (background).

– and its clients – well as it expands its industrial footprint. "Our numerical modelling helps develop performance improvements in the systems' various sub-components, which are combined into a single system model that assesses the overall benefits to the entire system," Ham says. "Our service has the potential to drive down operating and maintenance costs in any industry." □

For more information visit: www.steimmuller.bilfinger.com

Steinmüller Africa secures four-year Eskom contract

Steinmüller Africa, a specialist in the design and maintenance of power plants, has been awarded a four-year contract with Eskom, effective 1 January 2022, to provide maintenance and repair services for the Arnot, Camden, Duvha, Kriel, Majuba, Hendrina, Kendal, and Kusile Power Stations. This contract will retain 600 jobs and create about 2 400 new jobs.

Steinmüller Africa was the successful bidder, competing against several local and international companies. "We are immensely pleased to have secured this business with our largest customer. We have proven our expertise by fulfilling Eskom's stringent requirements," said Moso Bolofo, Director of the company.

Thirty percent of the contract value will support local businesses through subcontractors. Steinmüller Africa aims to empower EMEs (exempted micro enterprises in terms of the dtic's Codes of Good Practice for Black Economic Empowerment), QSEs (qualifying small enterprises), as well as businesses owned by youth and disabled people, by supporting their services – in accommodation, transport, and other fields.

The bulk of Steinmüller Africa's services will be carried out at the eight power station sites, with fabrication of some compo-



Steinmüller Africa Executive Directors (from left): Moso Bolofo, Bodo Haar and Mohamed Khan.

nents to be done at its 30 000 m² facility based in Pretoria. The company offers comprehensive expertise for boiler pressure parts, high temperature and pressure steam pipes, as well as in heat exchangers. Services include automated welding, pipe bending, pipe and tube manipulation, plant lifetime extension plans, and project management services.

Steinmüller Africa has been a service provider to Eskom for the maintenance and servicing of its power plants for almost 60 years. □

Drones make boiler inspection easier

The benefits of using advanced drone technology for inspecting boiler internals at a power station were clear when rope access specialist Skyriders Access Specialists recently undertook a project in the Nkangala district of Mpumalanga.

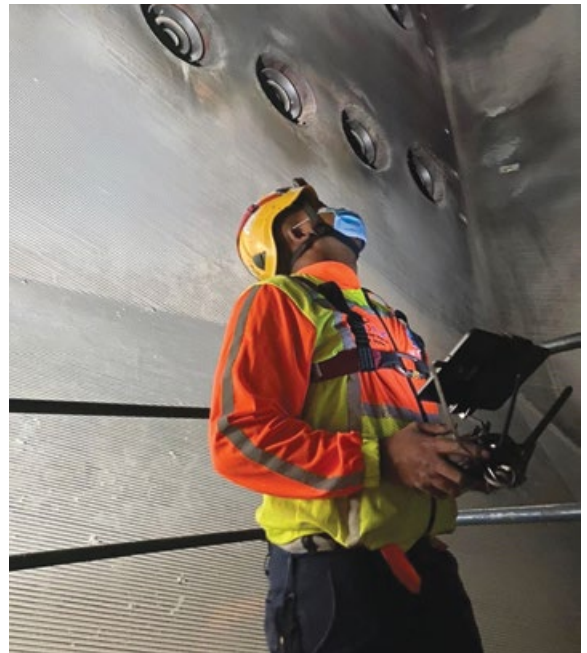
The Elios SkyEye drone demonstrated the accuracy and efficiency of the technology, and its safety aspects, as there is no need to erect expensive and cumbersome scaffolding to gain access to carry out a manual inspection.

“Our drone technology is specifically suited for visual inspection in indoor environments like the large coal-fired boilers and ducting at power stations,” says Skyriders Marketing Manager, Mike Zinn. He explains that generally, drones cannot use GPS tracking and stability when indoors. However, Elios SkyEye is collision-tolerant for flexible and highly accessible remote visual inspection.

The drone incorporates a full HD camera, a thermal camera, and an on-board LED lighting system with remotely adjustable intensity. This means an array of on-board tools is available for any lighting conditions. A wireless communications system with a live video feedback allows for the drone to be brought into usually inaccessible places, up to hundreds of metres beyond the line of sight.

The Elios ground station comprises a remote controller, a tablet and a purpose-designed ground-control application, providing the pilot with live data and an SD live video stream captured by the drone. All the information and controls are on hand for efficient and safe remote operation. In addition, the drone is dust- and splash-resistant and can operate in temperatures from 0°C up to 50°C.

“Our boiler inspection work has a huge amount of experience behind it and the seasoned piloting capabilities



Skyriders used its Elios SkyEye drone to inspect boiler internals at a power station in Mpumalanga.

of our drone team. The team takes the time needed to carry out a thorough inspection and deliver clean and stable footage. This gives us access to richly informative imagery, which we use as the basis of our inspection reports,” says Zinn.

Another key differentiator for Skyriders in the inspection and maintenance sector is that it has been issued with a Remote Operating Certificate (ROC) from the South African Civil Aviation Authority (SACAA). This means it is certified to deploy its drones outdoors within civil airspace, which enables it to extend the scope of its inspection services for clients significantly.

For more information visit: www.ropeaccess.co.za

High temperature infrared thermometer



The Fluke 572-2 high temperature infrared thermometer.

The Fluke 572-2 high temperature, infrared thermometer, which can be used in measuring extreme heat over long distances, is available from Comtest. Typical applications are in:

- Manufacturing – in repair and maintenance of motors and pumps, with data logging
- Electrical HVAC installations – in repair and maintenance of panels, fuses, circuit breakers, compressors, ducts and remote access vents
- Power utilities – in measurement of nodes between power transmission and distribution
- Metals – in maintenance and quality control where temperatures are monitored during the process
- Petrochemicals – in maintenance of the exterior of the kiln (temperature), monitoring the surface temperature of the reformer tubes.

The Fluke 572-2 measures temperatures between

-30°C and 900°C with ±1% accuracy. Measurements from further away are accurate with a 60:1 distance-to-spot ratio, with dual laser sighting for fast, accurate targeting. The device displays current temperature plus maximum, minimum, differential, and average temperature with adjustable emissivity and predefined emissivity tables.

It features a multiple language (user select) interface and is compatible with a standard K-type mini-connector thermocouple probe (KTC). The unit is supplied with a USB 2.0 computer interface cable, FlukeView® Forms documenting software and the standard Fluke two-year warranty.

For more information contact Comtest.

Tel: +27 (0)10 595 1821

Email: sales@comtest.co.za

Visit: www.comtest.co.za

Keep your maintenance teams up to date

The condition monitoring sector is constantly evolving, developing to incorporate innovation and boost efficiency. This makes ongoing training essential to keep the maintenance crew of any plant up to speed with technological advances in the industry.

WearCheck Technical Manager, Steven Lumley, who oversees the company's training programme, believes that companies where staff are not well trained in the latest maintenance techniques will be hampered by the diminishing effectiveness of their condition monitoring programmes.

Lumley says, "We urge companies across all industries to invest in training their staff to optimise their returns on investment in condition monitoring."

All WearCheck's courses, where they are presented face-to-face at a physical venue, are conducted in line with health regulations to ensure the safety of delegates and staff. Some courses are presented online.

The oil analysis and condition monitoring training courses are targeted at maintenance practitioners operating at various levels within an organisation. Delegates can earn valuable CPD (continuing professional development) points through many of the courses.

Customer training courses conducted by WearCheck mostly run over two to three to five days. Some include practical sessions or exams. Courses cover:

- Precision shaft alignment
- Precision balancing
- Vibration analysis ISO CAT I, II and III
- Asset Reliability Practitioner – advocate training (ARP-A),
- Asset Reliability Practitioner – engineer training (ARP-E)
- Asset Reliability Practitioner – leader training (ARP-L)
- Oil analysis 1 (Understanding oil and its analysis)



WearCheck training consultant Jan Backer (second from left) recently conducted oil analysis training courses in Klipspruit for delegates from Moolmans.

and 2 (Report interpretation) as well as a specialised two-day course on Wind turbine oil analysis.

WearCheck also offers a practical, half-day English/Zulu training course as well as customised training courses where these are requested. In addition it offers a six-month Asset Reliability Practitioner training programme which encompasses three courses

Courses are conducted at venues around country.

Mobius courses

Since 2015, WearCheck has also been an accredited training partner for the internationally-recognised Mobius Institute. All the Mobius courses are presented at various venues across Africa and most can be attended in person or online. WearCheck Mobius courses scheduled for 2022 include Vibration analysis CAT I, CAT II and CAT III, Precision balancing and Precision alignment.

All details on training courses and bookings can be checked directly or online.

For more information contact Michelle van Dyk at WearCheck.

Mobile: +27 (0)82 3813321

Email: training@wearcheck.co.za

Visit: www.wearcheck.co.za

Mechatronic flow meter to monitor high-pressure cleaning

In monitoring and documenting cleaning processes in high-pressure applications, the mechatronic measuring principle, which offers a fast response time, is the first choice. The mechatronic flow meter from ifm, with an integrated temperature sensor and versatile diagnostic functions via IO-Link, obviates the need for additional hardware and maintenance – and associated costs. The purpose-designed flow meter has a stainless steel housing which makes it suitable for high-pressure applications up to 200 bar, and resistant to standard cleaning agents.

All measured values can be transmitted to the controller in digital form, without any conversion losses, via IO-Link. Flow and temperature values can thus be easily documented for each cleaning process. The mechatronic measuring principle is characterised by a particularly fast response time, which allows for even short spray bursts during the high-pressure cleaning process to be

recorded precisely in terms of quantity.

A further advantage of the mechatronic flow meter is that no inlet or outlet pipe lengths are required. The sensor can be installed anywhere in the piping system as the measurements are unaffected by turbulence or air bubbles.

With IO-Link, monitoring of a high-pressure cleaning system, including documentation of the cleaning processes, can be implemented easily and quickly in diverse applications with minimal hardware costs. ifm offers all the required hardware and software components to provide the transparency required in strictly hygienic environments.

For more information contact ifm South Africa.

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Patrick Evans, CEO of
SLVA Cybersecurity

Ransomware reaches new levels

Once a niche criminal enterprise, ransomware has become big business, complete with R&D departments and sales and marketing divisions. Ransomware today is like a deeply layered onion, with attacks wreaking havoc in large enterprises in South Africa and around the globe.

Patrick Evans, CEO of SLVA Cybersecurity says it takes only two hours to determine whether a network's endpoint protection can

be circumvented and if the organisation has controls in place to stop the encryption and ransomware behaviour. "Understanding an organisation's current environment, and the likely costs of a ransomware attack, is crucial to making more informed decisions concerning security," Evans says.

The recent ransomware attack on TransUnion has raised concerns among many enterprises about their own potential security vulnerabilities. Irrespective of the amount of protection currently in place, ransomware has evolved into a complex and sophisticated form of organised crime.

"Although many people believe the victims of ransomware have not secured their networks, most organisations actually have made significant investments in information and cyber security. Features such as firewalls, endpoint protection, intrusion detection, patch management, and many others are all in place and form part of the organisation's layered defence," Evans explains.

In addition, large enterprises typically have teams of experts running security operations, governance and compliance programs and more than likely have a CISO playing a critical role as information security executive. "Most businesses today know that the weak link is the human element, which poses a significant risk to the safety of the overall company. Most have run security awareness programmes for well over a decade, to make their employees and contractors aware of the risks they create when clicking on a link in a document or having easily guessable passwords," he says.

Yet, with such extensive measures in place, the question as to how ransomware attacks happen remains. As with any organised crime unit, there is usually a syndicate at work. These syndicates involve experts who know their way around a complex digital world, and it is this complexity, with its multiple layers, that makes it easy for criminals to strike successfully.

In a typical IT environment, there are endpoints, servers, mobile devices, networks, multiple applications, cloud, and service providers. Every individual item develops vulnerabilities that attackers can use to gain access to the network, endpoint or server. There are also other vulnerabilities that need to be patched which, in itself, is a complex task. Evans says, "Today, it is virtually impossible to patch everything all the time, so patching needs to be prioritised, based on the likelihood and impact of an attack. This requires intelligence about what is actually happening

and needs to be collated and interpreted, with insights derived in real-time."

Legitimising the business of crime, as with organised crime, now includes ransomware. The organisations are often registered as legitimate businesses. "There is nothing subtle about the businesses; their CEOs conduct TV and radio interviews, and they operate blatantly in countries which have no intention of stopping the activities because they bring in tens of millions of dollars of revenue," says Evans.

He says this new, more organised form of ransomware – or ransomware 3.0 – kicked off in earnest in 2019. It is often referred to as 'double extortion' and is characterised by the theft of credentials, intellectual property and data, at the same time threatening public shaming and the organisation's employees and customers. "Threats to exfiltrate data if the ransom is not paid are 81% of the norm today, which is a worrying statistic."

In ransomware 3.0, criminals are organised into mission-focused businesses. There are developers of specialist attacks; access brokers who specialise in breaking into organisations and then selling that access; and Ransomware-as-a-Service providers who work with affiliates to identify targets and then share the profit with the affiliates after successful attacks. They even have public relations departments that issue press releases and respond publicly to crises. And they have crypto brokers and money launderers in the supply chain – in essence, a multilevel ecosystem of organised crime.

Ransomware 3.0 has also seen distributed denial of service attacks serving as a distraction or obfuscation of an attack, and the deployment of crypto-mining malware in a hybrid form of attack.

The way forward, says Evans, is to recognise ransomware as an advanced persistent threat or APT. "Attackers are playing a long game. Targets are tricked into letting an initial piece of malware in. And where an organisation is already a victim of a ransomware attack, attackers know multiple vulnerable entry points and may still have malicious code embedded in that environment masquerading as a benign process.

While it may be tempting to believe ransomware attacks are directed at large enterprises because they grab the lion's share of the headlines, Evans says, "All organisations, from the micro business to the parastatal, in any industry sector, are potential targets. Small to medium-sized organisations simply cannot absorb the financial loss following a ransomware attack."

While there is no silver bullet, Evans says there are proven ways to prevent a successful attack. "Efficient cyber security defences, including an effective last line of defence against ransomware, inside a fit-for-purpose budget remains the most sensible starting point."

For more information visit: <https://slva-cs.com>

Building technical skills in SA's wind energy sector

The Wind Turbine Service Training programme, an initiative of EIMS Africa's Portfolio Company, Cookhouse Wind Farm, and Suzlon, its Operations and Maintenance Contractor, is helping to build technical skills for South Africa's wind power sector. This skills-focused capacity building programme demonstrates leadership in the sector as well as the value of collaboration. Importantly too, the programme addresses localised youth unemployment.

As the sector gears up to bring over 14 GW of new wind power capacity online in the next decade, it will need some 1 700 skilled technicians to support this rapid growth. Furthermore, the programme reaches beyond the local market, as it is designed to meet global and local training qualifications criteria. In this way it is also creating an export skills base.

"At EIMS Africa our strategy is to invest in long-term, sustainable initiatives that will contribute to and drive the local economy. By sponsoring local youth and women on this programme, we are empowering and supporting local skills development and contributing to meaningful employment. We need to prepare the youth for the future and this is just one of the innovative, accredited training programmes in which the wind energy industry invests. We are proud to be part of this initiative and to have been a trailblazer among our peers," said Ryan Hammond, CEO of EIMS Africa and Cookhouse Wind Farm.

South Africa is not the only country that lacks the number of skilled artisans it needs and this shortfall is set to increase as the uptake of renewables accelerates around the globe. If South Africa is to build its national pool of artisans in the wind energy sector, skilled Wind Turbine Service Technicians are needed more than ever – and fast – to keep up with the targets set in the Integrated Resource Plan (IRP2019) and for the Just Energy Transition (JET). At present, the ratio between the number of Wind Turbine Service Technicians graduating annually and the number required if we are to keep to our targets, is still low, which indicates the demand and the impact that this training programme will continue to have into the future.

"We are contributing to developing our industry and the country's pool of talent as this technical training programme is pitched at an international standard (GWO) and aligned to the relevant national standards frameworks such as the Quality Council for Trades and Occupations (QCTO) and the National Qualifications Framework (NQF). It prepares the graduates to work anywhere in the world and rise to the challenge," said Hammond.

This joint youth development programme is directly benefiting local Eastern Cape youth, from the Cookhouse Wind Farm beneficiary communities and is implemented under the stewardship of the South African Renewable Energy Technology Centre (SARETEC). The youth receive training over a seven-month period (five months theory, two months on site), and the



The first group of eight wind turbine technicians graduated from the EIMS Africa/SARETEC training programme during quarter one of 2022.

programme deliberately aims to address the dire unemployment circumstances in this province. The first group of eight technicians graduated during quarter one of 2022 and plans are already under way for another cohort to attend the programme.

Mokgadi Modise, Director of SARETEC, the implementation partner for the training programme, says the local demand for skilled technicians is significant, as was demonstrated by the rapid uptake of all trained technicians from the programme's first cohort. "The recently graduated group, from February this year, were all employed by the time they graduated and ready for deployment at their respective wind farms," she said.

Being cognisant of the demand on the African continent and beyond, wherever wind energy projects are established, SARETEC's training programme addresses the need to overcome the logistics and high costs of sourcing maintenance expertise far from the projects.

For more information visit: <https://eimsafrica.com/>



Yuri Ramsamy,
ABB South
Africa.

Looking towards e-mobility in South Africa

Yuri Ramsamy, Product Marketing Specialist, ABB South Africa

Transportation is a major contributor to CO₂ emissions globally, accounting for about 24% of total emissions. Of this figure, more than 75% comes from road transportation, from cars, trucks and motorbikes. Surprisingly, the aviation sector accounts for only 11% of emissions, while passenger cars account for 60% of road transportation emissions globally.

Electric mobility (e-mobility), paired with renewable energy generation, stands to play a major role in significantly lowering global CO₂ emissions in the transportation sector. This will help us achieve global targets, and have a positive impact on the environment and our quality of life as a result of reduced air and noise pollution.

After a decade of rapid growth, the global stock of electric vehicles (EVs) reached the ten million mark in 2020, according to the International Energy Agency (IEA). This represented an astonishing 43% increase over 2019. In the same report the IEA noted that China had the largest fleet, then at 4.5 million electric cars, and Europe recorded the largest annual increase, reaching 3.2 million. Globally, governments spent US\$14 billion on direct purchase incentives and tax deductions for electric cars in 2020, a year-on-year increase of 25%.

In South Africa, the Department of Trade, Industry and Competition published a Green Paper entitled 'The South African Road to Production of Electric Vehicles' on 18 May 2021. It aims to establish a clear policy foundation to coordinate a long-term strategy to position South Africa at the forefront of advanced vehicle and vehicle component manufacturing, complemented by a consumption element. This would boost our competitiveness in the global market, transitioning from the internal combustion engine era into e-mobility solutions and technologies.

The issuing of the draft Green Paper followed the Minister of Trade, Industry and Competition, Ebrahim Patel, challenging major South African automotive manufacturers

in 2019 to assist to develop a roadmap for local EV production. The various workstreams of the automotive industry's Master Plan were launched shortly after that, including a focus on technology changes and deeper localisation. The draft Green Paper aims to provide a framework for the development of a comprehensive and long-term automotive industry transformation plan for new energy vehicles (NEVs), with a specific focus on the creation of a high-yielding business environment. This includes an appropriate fiscal and regulatory framework that will make South Africa a leading, highly competitive location for EV production, in Africa and globally.

Further focus areas include the development and investment in NEV component technology and expansion of the fledgling electric supply chain; reinvestment and support towards reskilling and upskilling of the workforce to ensure the right skills are available for the design, engineering and manufacturing of EVs and related components and systems; South Africa's transition towards cleaner fuel technologies available globally; and adoption of new and sustainable manufacturing processes to reduce greenhouse gas emissions and improve our environment significantly.

In a research note on the current EV market in South Africa, Old Mutual highlights that the current charging network is still very small, and that it will take a long time before there is widespread distribution of charging points. However, the larger issue is that a charging network is only as good as its power supply. More specifically, a large network of frequently used charge points needs a reliable industrial-strength power supply. Old Mutual notes: "Much would need to be done to ensure the national grid has the capacity to cope with the petrol-to-electric switch, and energy producers and government need to anticipate and prepare for higher energy demands."

It is readily apparent that the e-mobility market sector will require integrated charger and electrical infrastructure architectures that can be rapidly deployed. Here ABB engineers have developed electrification solutions for the transport of today and tomorrow. These range from smart transportation solutions, EV chargers for the home, electrified fleet depots, and opportunity charging for electric buses and trucks, to high-power chargers for future highway stations.

ABB's modular building block approach with integrated communication allows for scalable, repeatable designs for fast implementation in the rapidly developing EV market globally. One particular scalable solution to build depot charging infrastructure, for example, is its eFleet depot



In South Africa, the dtic issued a draft Green Paper in 2021 which aims to make the country a leading, competitive location for EV production, in Africa and globally.

solution. Here the combination of modular blocks provides the solution architecture that meets the needs of modern eBus depots. Another solution is seen in the roadside relocatable EcoFlex with integrated high-power chargers which is ideal for highway and public commercial parking. It allows for up to two 350 kW chargers in a relocatable enclosure: a 20-foot enclosure with up to four 175 kWHP cabinets, ac/dc, two 350 kW charge posts and an optional 50 kW dc fast charger.

The EV Site System (EVSS) provides integrated control and management between the chargers, electrical infrastructure and customer systems for seamless operation. The OPC UA protocol provides open communication and common interfaces. ABB chargers incorporate integrated systems for connection to customers' operating systems. EVSS allows for connection to other architectures (a battery energy storage system or a medium voltage feeder plus transformer) for easy transition to future needs.

A decade ago, the concept of full EV fleets was very much a vision. It is fast becoming a reality. ABB entered the EV charging market in 2010, launching its pioneering dc charger. Now, more than 14 000 ABB dc fast chargers are sold across more than 80 countries, from Peru to Rwanda. ABB is a global market leader in e-mobility charging solutions, with a strong market share in Europe, Asia Pacific and the US.

In 2013, it was the first company to develop countrywide networks of 50 kW chargers. This was paired with a cloud-based service for remote monitoring and servicing of chargers, which was a real game changer for connectivity, and now forms part of the ABB Ability™ ecosystem. More recently, in 2018, ABB was first-to-market with its liquid-cooled full 350 kW capable charging technology, which delivers higher power and charging speeds. Early 2020 saw the acquisition of Chinese EV charging provider Chargedot, giving ABB a stronger entry into the largest e-mobility market in the world and broadening its portfolio of dc and ac fast charging.

ABB offers a total EV charging solution from compact, high-quality ac wall-boxes and reliable dc fast-charging stations with robust connectivity, to on-demand electric bus-charging systems, with infrastructure solutions that meet the needs of the next generation of smarter mobility. In addition, ABB offers Connected



While the current EV market in South Africa is small, the prospect of widespread distribution of charging points can only be as good as the national power supply.

Services through its ABB Ability™ platform to allow charging station owners to monitor and configure charge points remotely, adapt business and pricing models over time, keep charging infrastructure up-to-date with the latest software, service the equipment efficiently and with minimal operational effort, increase charger uptime and the reliability of the charging network, and minimise investment in IT infrastructure and backend software.

The faster we transition to EVs, the bigger the change will be, and more stakeholders and OEMs will likely enter this burgeoning market. The automotive world will become part of the electrical world. In the past, these were two distinct industries, but in the next ten years we will see them coming together to deliver e-mobility and contribute to a cleaner environment.

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National Treasury launches Green Finance Taxonomy paper

Patrick Heron and Joon Chong, Webber Wentzel

On 1 April 2022, National Treasury (NT) launched South Africa's first Green Finance Taxonomy (GFT), which will help investors and financial institutions make more informed decisions on 'green' projects. The GFT is an official classification that defines a minimum set of assets, projects, and sectors as eligible to be defined as 'green' or environmentally friendly. The taxonomy also lists the standards that define economic activities as green.

The Green Taxonomy followed NT's publication in 2021 of the technical paper entitled *Financing a Sustainable Economy*, focusing on climate risks and the opportunities for the financial sector to make a positive contribution to green objectives and facilitate the transition to a low-carbon economy that is socially inclusive and sustainable.

Summarised below are the main points made by key speakers at the launch.

Climate change is recognised as the biggest threat the world faces today. In the wake of the Covid-19 pandemic, the rebuilding of society needs to be done in a sustainable and equitable manner. Investors and institutions are, therefore, becoming increasingly concerned about the environmental impact and sustainability of their investments. This has resulted in a shift in global finance and capital flows towards projects that are sustainable, and which embody Environmental, Social and Governance (ESG) principles. Examples of this trend mentioned in the meeting include:

- the JSE observing that sustainable finance is one of the fastest-growing forms of finance on the international stage
- the success of and significant increase in green bonds, especially on the African continent, which has resulted in a surge in the issuance of other types of sustainability-focused bonds, such as blue bonds, social bonds and gender bonds
- the rise in investment in sustainable equity.

The EU Sustainable Finance Taxonomy served as the foundation for the development of the GFT due to its technical content and how it has influenced the expectations of international investors. The focus of the first edition of the GFT is climate change, but it is intended that it will extend to further issues in future, such as issues concerning biodiversity and effective land use. The objectives of the GFT are to:

- serve as a future economy reference
- be a tool to drive change, and
- be a communication enabler.

These objectives have been established without requiring any trade-offs and the GFT is not intended to be a replacement for ESG management, due diligence practices and fiduciary duties or investment and finance strategies.

The GFT was described by the key speakers as being "incredibly important" for South Africa. It will be critical in



Patrick Heron (left) and Joon Chong (right), Webber Wentzel.

attracting future international investments and capital flows into the country and providing access to a deeper pool of liquidity at competitive prices. It will also provide a foundation on which the financial sector can develop financial instruments which will complement the GFT framework.

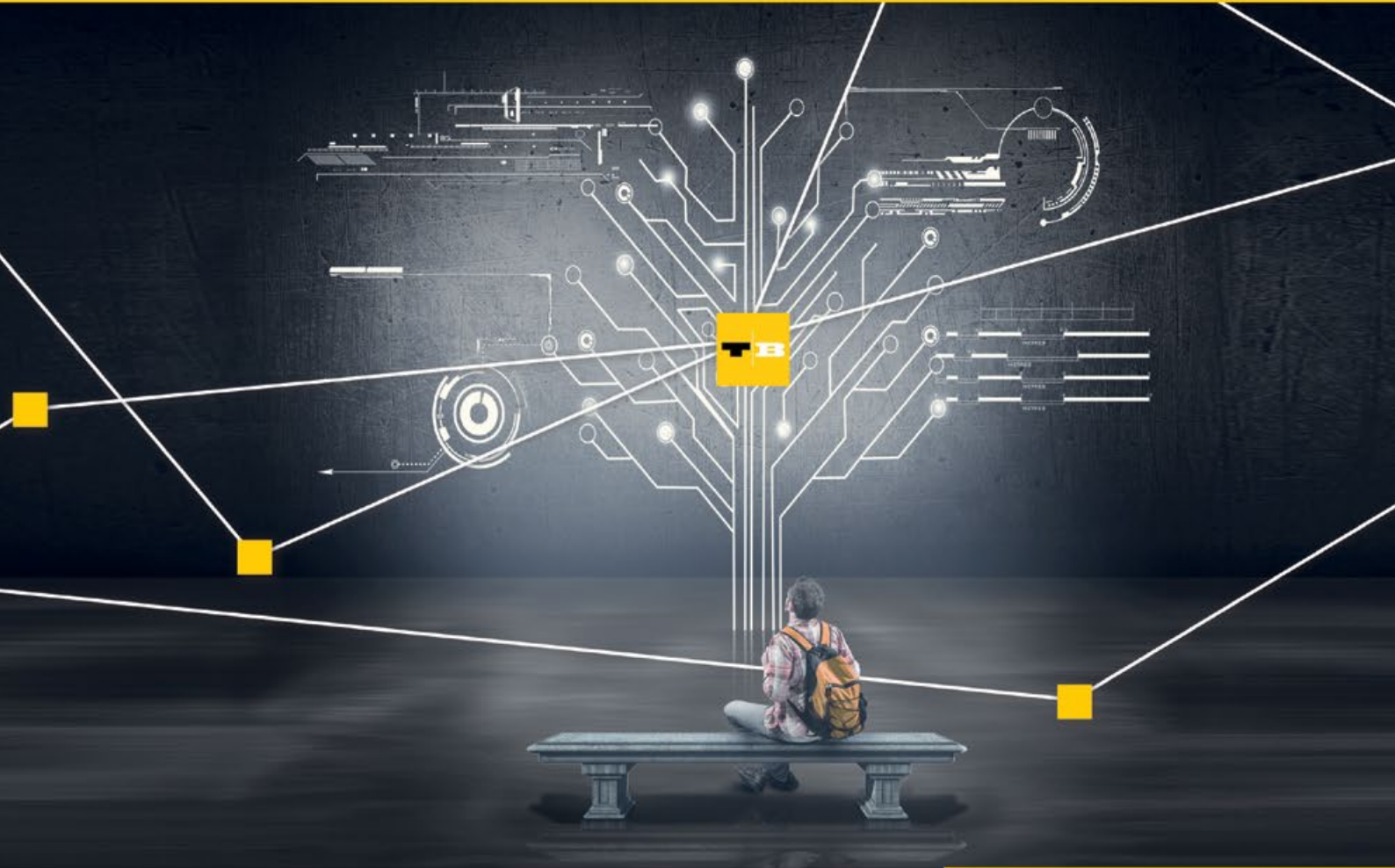
The GFT will furthermore be critical for promoting transparency and accountability in the market. It will allow investors, lenders, financial institutions and other participants in the financial sector to demonstrate their green credentials and practices and will provide participants in the financial sector with a standard against which they can test these credentials. The GFT will, therefore, serve as a robust bulwark against the risk of greenwashing and will help boost investor confidence and certainty by allowing investors to make more informed investment decisions.

The launch of the GFT represents an important step for South Africa towards a more sustainable future. It demonstrates that the country is committed to developing an economy that is environmentally sustainable and socially inclusive. The GFT, and its future iterations, will serve as a critical component in South Africa's transition in this regard.

For more information visit: www.webberwentzel.com

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