FEATURES:

- Control systems, automation + systems engineering
- Flow measurement + instrumentation
- Hazardous areas + safety
- Transformers + substations

Mechatronic Drive System: MOVIGEAR®
– the ideal solution for energy efficiency

SEW EURODRIVE

12/2019

www.electricityandcontrolmagazine.co.za

ELECTRICITY + CONTROL

CROWN PUBLICATIONS

A big THANK YOU

to all our customers for being part of
the journey and making it a memorable one!

info.za.sc@endress.com | www.endress.com | +27 11 262 8000

Endress+Hauser

People for Process Automation

SEW-EURODRIVE has supplied 64 MOVIGEAR® servo motors to a local OEM for a weighing conveyor system for a German company. *(Read more on page 9).*

Editor: *Leigh Darroll*
Design & Layout: *Adél JvR Bothma*
Advertising Managers: *Helen Couvaras*
Heidi Jandrell
Circulation: *Karen Smith*
Editorial Technical Director: *Ian Jandrell*
Publisher: *Karen Grant*
Deputy Publisher: *Wilhelm du Plessis*

Circulation

Circulation: Quarter 3 (Jul – Sep) 2019
Total print circulation: 4 857

Publisher of the year 2018
(Trade Publications)

Contact

Published monthly by: *Crown Publications (Pty) Ltd*
Cnr Theunis and Sovereign Sts,
Bedford Gardens
PO Box 140, Bedfordview 2008
Printed by: *Tandym Print*

Telephone: *+27 (0) 11 622 4770*
E-mail: *e-mail: ec@crown.co.za*
admin@crown.co.za
Website: *www.crown.co.za*
www.electricityandcontrolmagazine.co.za

Electricity+Control is supported by

A time for reflection

Here we are at the end of the year – again!

It has been a year of highs and lows – many of the lows can be attributed to well-paid professional administrators, managers and politicians; while many of the highs can be attributed to a handful of youngsters who have the capacity to see beyond the current impasse that has our economy by the throat.

Reckon you can figure that out?

For instance, I heard a relatively well-known sports coach, just the other day, give a synopsis of how to ensure that the sport rises to heights never yet achieved; and to do that in the context of this horribly unequal society. And listening to the fellow, I realised he was absolutely correct.

Then I reflected for a moment on Basic Education – where we have the cash and much of the infrastructure – and yet, for decades, have seemingly been unable to figure out the level of detail that a sports coach can get sorted in a matter of months.

What are we missing? What are the impediments?

Well, I think it has become quite clear: what this country lacks, in bucketloads (at so many levels), is real leadership.

Leadership is not noisy and couched in spectacle; leadership is seldom simply populist; leadership is robust, informed, and decisive.

Wouldn't it be nice to move into the new year with that capacity to take us forward?

What is astounding to me is how so many organisations have been paralysed by the inability of lawmakers to get their heads around the needs of the country for long enough to develop, and begin to implement, useful policies.

As I write, I cannot but wonder why, as regards Eskom (the absolute key to our future economic development – whether we like it or not, and whether we build solar farms and wind farms or not), we find ourselves in the position where, notwithstanding the word of the highest office in the land, we have a delay on the table.

I will not suggest the reasons, but there are many I can think of and they are real, and require careful consideration and attention. What is perplexing is why this emerges – as do so many things – as a surprise to many of us, and to many in the international community. The tragedy, of course, is the number of people who look me in the eye and ask why I would be surprised to hear there is a delay. What an indictment of the way our nation is viewed …

The year has seen progress in many areas, but I worry that our industry has the sense of being stuck in the headlights – unable to move, unable to imagine a future, and unable to succeed despite the best intentions.

My wish for the next year is that in spite of the lack of help from lawmakers, we step up, we lead, and we win.

I also wish you and your families all the very best for the Festive Season. May it be safe; may it be a time of reflection; and may we remind ourselves that we have the good fortune of being in a nation that has everything going for it. Now, we need to get the folk holding the brake lever to step aside and let the train roll.

Thanks go to our editor, Leigh Darroll, our advertising staff Helen Couvaras and Heidi Jandrell, our artist, Adél JvR Bothma, and our publisher and deputy, Karen Grant and Wilhelm du Plessis. Thanks to the team for continuing to ensure that *Electricity+Control* provides the best information to help you find the best solution to your plant challenges.

To that team: looking around, I see many of the publishers in the business-to-business space closing their doors. This is a tragic reflection on the economy – and much of that relates to what I have said. Thank you all for being there – and leading. It is appreciated not just by me, but by our readers and advertisers.

Ian

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

CONTENTS

FEATURES

REGULARS

INVESTING IN AFRICAN MINING INDABA

Reserve your spot & save up to £596
Early bird rate ends 24 November

3 - 6 February 2020 | Cape Town, South Africa

HEAR FIRST-HAND FROM AN UNPRECEDENTED LINE UP OF PAN-AFRICAN MINISTERS, MINING CEOS AND GLOBAL INVESTORS

TOP SPEAKERS CONFIRMED SO FAR INCLUDE:

Hon. Gwede Mantashe
Minister of Energy & Mineral Resources
Republic of South Africa

Hon. Lelenta Hawa Baba Ba
Minister of Mines & Petroleum
Mali

Hon. Gesler E. Murray
Minister of Mines & Petroleum
Ethiopia

Hon. Samuel Urkato
Vice President Exploration
Shell Upstream

Robert Friedland
Founder & Executive Co-Chairman
Ivanhoe Mines

Peter Major
Head of Mining
Mergence Corporate Solutions

Caroline Donally
Managing Director
Denham Capital

Mark Bristow
President & CEO
Barrick Gold Corporation

Sébastien de Montessus
CEO & President
Endeavour Mining

Clive Govender
CEO & Founder
CGC Consulting

Mark Cutifani
Chief Executive
AngloAmerican

Neil Hume
Resources Editor
Financial Times

See the full list at www.miningindaba.com

#MiningIndaba2020

Want to increase your brand exposure?
Start the conversation today with Fred Noce:
fred.noce@miningindaba.com

Plug and produce modules are **transforming automation**

AT A GLANCE

- In a modular automation setup, the production process comprises a series of individual modules each delivering an application-specific service. Pre-automated intelligent modules are then orchestrated by a modular enabled process control system – a shift away from the typical supervising process control system.
- The intelligent modules can be added, arranged and adapted to the production requirements and the process control system controls the interaction of the modular units.

Driven by changes in consumer demand, manufacturers are looking for more agile ways to automate their processes. The answer lies with modular-enabled automation which provides the catalyst for integrating the Internet of Things and Industry 4.0. Gero Lustig, Global Business Manager Pharmaceuticals and Life Sciences at ABB explains.

As the world evolves at a colossal pace, consumers are demanding new styles of products, bespoke to an individual's needs and often with same-day delivery. Customised food menus or personalised medicines, down to batch size one, are some examples demanding short production runs or multi-product facilities to operate with small batch sizes. This impacts across many industries, from pharmaceutical, biotech and fine chemicals to food & beverages, textiles, printing & packaging and the marine industry.

Meeting these demands with large-scale automation techniques is no longer practical. Such systems are set up for long production runs and take considerable time, effort and expense to change over to a new product type. They lack the speed, flexibility and efficiency demanded by this new world.

Modular automation

Enter modular automation: a plug and produce concept that provides a flexible and super-efficient way to change production, right down to batch size one. In a modular automation setup, the production comprises a series of individual modules. Each of these modules delivers services that are described in real-life, application-specific terms such as filtering, temperature control, filling and recycling.

Modular automation introduces a plug and produce concept that provides the flexibility and efficiency for quick-change short-run and customised production – in pharmaceuticals, food and beverages and other industries.

Several pre-automated, intelligent modules are then orchestrated by a modular-enabled process control system, such as the ABB Ability™ System 800xA. The services are made available to the orchestration system by interpreting a module type package (MTP) (see below) through ABB's Modular Orchestration Builder.

This is a big shift away from the traditional approach, where modules offer abstract signals, valves or vessels, out of which the user then must create their own services, controlling them by a supervising process control system.

Modular automation, therefore, is independent of any process automation technology. Regardless of whether you use a variable speed drive from one manufacturer, a valve from another supplier, and a controller from a third company, everything is described as a service.

Module type packages

The module layer contains several intelligent units that deliver these services which are described within a module type package (MTP). The MTP is not hardware or software nor an interface. It is, in principle, a document. Today XML (xtended markup language) is used, which is human and machine readable. Thus, the services become available to the superseding automation system. The MTP includes information on the human-machine interface (HMI), communication and supervisory control services. In future more components such as history, diagnostics and archiving will be added.

The real disruptive concept brought by modular automation, is that the end-user now has more choice. They are less dependent on the currently installed automation technology and can turn to their original equipment manufacturer (OEM) and demand all modules are equipped with controllers from their preferred supplier. In the past, this might have caused extra effort for the OEM, but

now, with modular automation, it is easier to apply automation, with the code being created automatically, just by interpreting the MTP.

This is readily achieved by using the MTP builder engineering tool (such as ABB's Module Builder) which reads the MTP and generates code for supported commercial-off-the-shelf (COTS) process controllers, with minimum impact on the overall engineering.

The intelligent modules can be added, arranged and adapted to the production requirements and included within an existing process control system. The process control system becomes an orchestration portal that controls the interaction of all modular units by simply dragging and dropping modules into the system. The MTP is then read by the orchestration builder which, in turn, generates everything needed in the modular-enabled process control system to run the modular plant.

The process engineer or automation expert no longer needs to provide detailed know-how of the installed automation technology. Knowing which services are needed, the parameters and modes of operation is enough to build the full sequence of steps for the related production by dragging and dropping the services.

Upscaling is more manageable, as entire pre-tested control sub-system programs can be connected to the production. This is much quicker than writing a new code from scratch. OPC UA is the standard of choice, providing a cyber secure and efficient communication.

Building blocks

Modular-enabled automation introduces unrivalled flexibility by providing a building block approach, whereby the blocks can be numbered up or down to meet the production demand. This enables process lines to up- or downscale on-demand, reducing time to market and lowering costs.

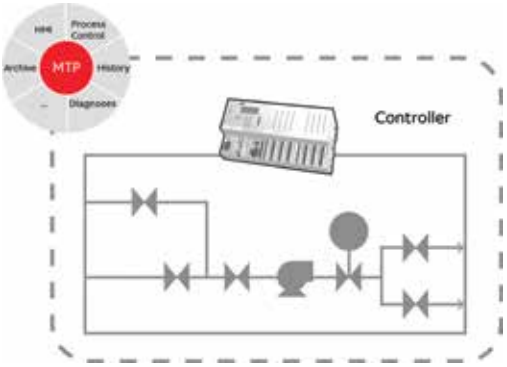
It makes each segment of the production process more manageable, more flexible and more efficient to run. It can quickly provide unlimited granular customisation, where each product can be fully tailored to the customer's preferences, instantly manufactured and dispatched from the same automated product line, one after another.

Standardisation

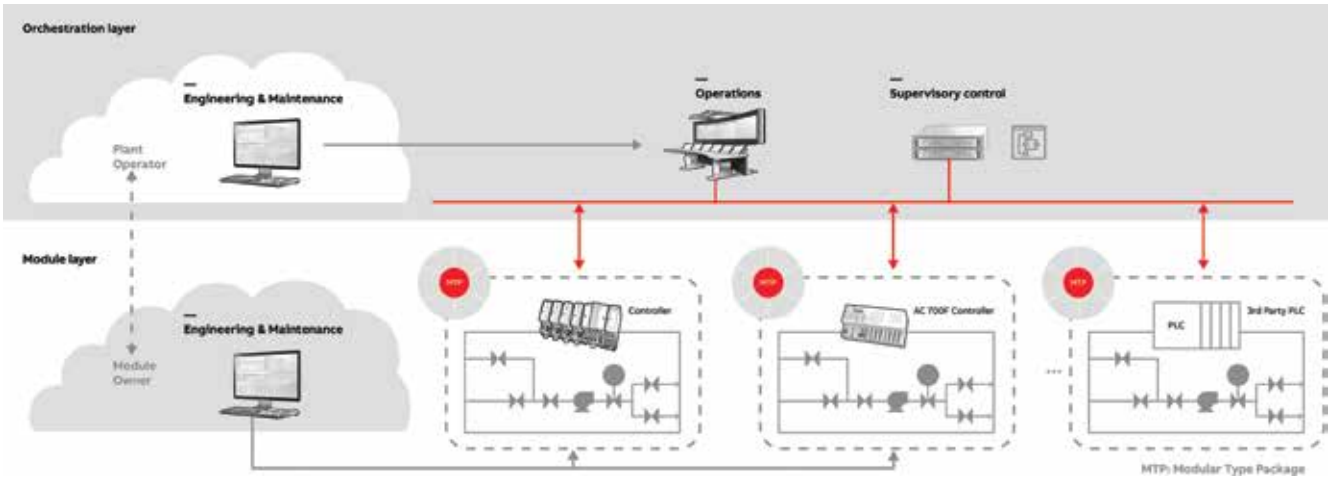
MTPs have gained national (VDI/VDE/Namur 2658) and recently international standardisation (IEC) approvals. This standardisation creates the framework to link the module layer and orchestration system. At the same time, any module can be plugged into any automation system that is modular enabled, like ABB's System 800xA. Thus, the modular automation concept can be smoothly introduced within existing automation environments.

Bringing it all together

The skill is in bringing these smart modules together in a simple and easy-to-build manner. ABB is a frontrunner in offering a full scope of



MTP is a new way of defining the description for process technology system modules. Information that needs to be integrated into the automation system is stored In this module description. The MTP comprises: alarm management, HMI, process control, history, safety & security and maintenance diagnosis.



Modularisation of process automation systems simplifies plant level engineering, making production more flexible, and can improve a company's overall competitiveness.

modular automation, from controllers for the modules through to the engineering tools and the ability to orchestrate the entire process.

By reducing the non-standard interfaces, modular-enabled automation brings lower design and engineering costs, less risk and improved scheduling. Integrating an intelligent module into the orchestration system takes hours, rather than the days it takes using a conventional approach of integrating package units and skids.

Among the beneficiaries are package unit/skid manufacturers, plant engineers, operators and manufacturers of the automation engineering components. Plant life cycle costs are lowered, because extensions or conversions can be considered as far more cost-favourable and quicker options.

Applying modular automation brings faster time-to-market, quicker arrangement of production equipment, nearly zero automation engineering to copy and adapt the production line and much less capital expenditure.

In addition, customer-specific product adaptations can be rapidly and flexibly implemented by swapping modules, aligning the cost of batch size one production with that of mass-produced products. This is good news for industries like food and beverages, where recipes and ingredients frequently change, yet homogenisation and end quality are essential. Here, a modular approach lets food processors add, remove or change recipes from a function library, with minimal production interruption.

Skids/ modules that are not needed for a particular production cycle can be halted to allow for maintenance, such as machine cleaning, without having to shut down the entire process. This is ideal for industries such as medical supplies, where regular washdowns are essential to prevent contamination. Faulty modules can easily be exchanged, regardless of the technology within the module as long as the described services remain the same.

The end-user can now focus on their core business of producing goods while finding suitable partners to supply modules. The end-user does not need to specify the internal design of the module, and instead can specify the tasks they require – say, a reactor that can cool or heat to specified temperatures – and the module provider will deliver. Buying modules that are pre-made and pre-tested and only need to be integrated with a plant ensures a faster time to market. Third parties could maintain modules or new business models could see module builders market their modules using a leasing model, depending on the campaign.

ABB is a pioneering technology leader with a comprehensive offering for digital industries. With a history of innovation spanning more than 130 years, ABB is today a leader in digital industries with four customer-focused, globally leading businesses: Electrification, Industrial Automation, Motion, and Robotics & Discrete Automation, supported by its common ABB Ability™ digital platform. ABB's market leading Power Grids business will be divested to Hitachi in 2020. ABB operates in more than 100 countries with about 147 000 employees.

Gero Lustig started his career with ABB in 1994 and has held positions in Sales, Product Management, Technology Management and Business Development for Process Control Systems. Over this time he was located in Mannheim and Frankfurt, Germany as well as for several years in Cleveland, Ohio, USA, being responsible for markets in AsiaPacific, Europe, China, Middle East and the Americas. From mid-2017 Gero has been the Segment Manager for Pharmaceuticals and Life Sciences in the Industrial Automation Business of ABB. Gero graduated from the Technical University of Hannover, Germany with a Masters degree in Electrical Engineering, Measurement and Control.

Gero Lustig, Global Business Manager, Pharmaceuticals and Life sciences, ABB.

In a modular automation setup, several pre-automated intelligent modules are orchestrated via a modular-enabled process control system.

Automation & energy management at Namibia Breweries Limited

Namibia Breweries Limited won the Best Operational Implementation Award this year, presented by IS³ – Industry Software Solutions & Support – at its 2019 customerX-Change User Conference. Leigh Darroll spoke to Clarise Rautenbach, Head of Marketing at IS³, about the criteria that informed the award and gathered some comments from the automation team at Namibia Breweries Limited on the company's automation journey.

AT A GLANCE

- NBL uses Wonderware Historian to track energy information alongside production data to calculate an efficiency ratio for different areas of the plant and identify areas for improvement
- NBL began its automation journey some 10 years ago and has seen advances in production efficiencies and quality control as well as its brewing systems administration.

The Best Operational Implementation Award was presented specifically for the energy-saving project that Namibia Breweries Limited (NBL) had implemented using AVEVA's Wonderware Historian. Rautenbach says the team at NBL demonstrated how they were able to use the Wonderware Historian software to gain better insight into energy usage and energy spend in the plant and gain a quick return on the investment.

"They scored best in terms of time-to-value," she says, "that is, they were able to implement the solution and gain insights into their operations in a very short space of time. In addition, they demonstrated the adoption of the new technology and implementation of the solution particularly well, and it was all done in-house."

Rautenbach adds that within its portfolio IS³ has products that can further assist NBL in process optimisation and improving asset maintenance.

Andre Engelbrecht, Manager: Industrial Control Systems at NBL, says the company started on its digitalisation journey 10 years ago. "We realised that information is everything," he says. "You need information for every decision. So we started building this platform using the Wonderware software. The automation team has grown – from one at the start, there are now five of us."

Renaldo du Pisani, Lead Electrical at NBL, who took the lead in implementing the energy-saving project, says he first began working at NBL as a bursary student and when he started as a full-time employee, about five years ago, he had no idea what the Wonderware software was capable of. "It gives us new ways of working," he says, "and it makes our lives easier. We can collect and analyse data from all over the plant and figure out how we can improve processes to achieve greater efficiencies and, over the longer term, support the company's sustainability."

The energy-saving project was a specific focus. He says NBL already had Wonderware Historian installed on site and could therefore record process information. "We used Software Toolbox's Top Server to draw information from the energy meters, which are located all over the site, and all this information is recorded using Wonderware Historian.

"We can then assess all the energy information together, analyse it, and identify areas or time periods of high energy usage, as well as other electricity factors, trends and variances. We can track this analysis to the historical production data that we have for different areas of the plant and then calculate an efficiency ratio per area. From

NBL has achieved significant energy savings by monitoring energy usage across the plant to identify where efficiencies could be improved and production output increased at the same time.

Stainless steel vats in the production plant at Namibia Breweries Limited.

The old mixer at NBL. The company embarked on its automation journey about 10 years ago.

Wonderware® Historian is a high-performance process historian capable of capturing and storing huge volumes of data generated from today's industrial facilities. Historian easily retrieves and securely delivers information to desktop or mobile devices, enabling organisations to analyse processes anywhere at any time.

Wonderware Historian is claimed to be the first large volume plant data historian to unite a high-speed data acquisition and storage system with a traditional relational database management system, facilitating access to plant data using open database standards.

- A complete and accurate operational history provides a foundation for faster troubleshooting and easier discovery of high-value process improvement opportunities.
- Flexible and scalable implementation options reduce IT costs and accelerate the return on investment of the system. High availability and disaster recovery options help ensure business continuity.
- Comprehensive reporting and data analysis options enable more team members to gain value from process history and having access to data enhances collaboration.

Wonderware Historian combines advanced data storage and compression techniques with an industry-standard query interface to ensure open access to all process, alarm and event data, enabling faster, more informed decisions while keeping the team fully informed on operational performance.

Historian is offered in a number of configurations to meet the needs of different industrial facilities, from a single site to a multi-facility global enterprise.

Data analysis and reporting

Being able to use data is just as important as storing it. The software provides many ways to access and visualise process data. The package includes, for example, a desktop tool for viewing data trends and basic reports; an information server which displays the data in many ways via convenient web delivery; a browser for quick data queries and trending; and a business analytics program providing powerful self-service process analysis capabilities. There is also an easy-to-use reporting application to create production or regulatory compliance reports and for mobile workers, it delivers plant data to smart phones or tablets.

IS³, as a software distributor, is the only distributor globally that offers the complete AVEVA software portfolio. Based in Johannesburg the company serves the southern African market reaching across South Africa and to neighbouring states.

that basis we could identify where improvements could be made – quickly and easily – to achieve maximum savings."

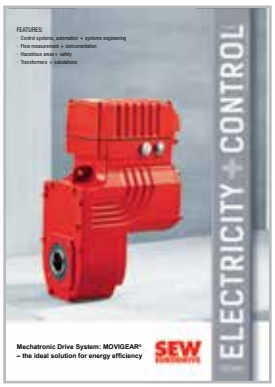
Du Pisani highlights that in implementing a programme like this, it's important to work with your colleagues on the plant. "The process engineers, for example, know and understand the process much better than you do," he says, "so it's important to consult with them on the data, possible changes and potential savings. You need to show them the energy consumption and efficiency data, good or bad, and demonstrate that increasing efficiency can decrease costs of production and increase production output at the same time. Both need to work together. If we can increase productivity and reduce electricity costs, we all win."

Johan Mouton, Automation Engineer at NBL, says a key advantage of the Wonderware software is that it enables the team to look at processes historically and in real time. "This enables us to better understand the process and to change it where that may be necessary – to improve efficiencies and create a sustainable business."

Christian Müller, Head of Brewing, says when he started at NBL no automated trend tracking or analysis was in use. "The Wonderware software enables us to collect and archive data and establish trends. This is especially helpful in quality control," he says. "It helps us maintain consistently high product quality."

The Wonderware software is also used in production administration systems. Marilyn Khairabes, Brewing Systems Administrator, says, "Previously, everything used to be done manually – manual reports, manual analysis. The software has made many administrative and reporting processes much simpler, more efficient and faster – and it has been empowering for the administration team."

Images: Namibia Breweries Limited



64 MOVIGEAR® units for German food and beverage project

Leading drive and automation specialist SEW-EURODRIVE (Pty) Ltd. has supplied 64 MOVIGEAR® geared servo motors from its Cape Town branch to a major local original equipment manufacturer (OEM) based in Paarl, H.G. Molenaar, for a weighing conveyor system which it designed, manufactured and supplied to a German-based company – a leader in the frozen fish and vegetable packing sector.

The system comprises a central conveyor fed by eight smaller weighing conveyors, each containing the various frozen-food products to be mixed according to specification. Each conveyor has a separate loadcell to determine the exact weight of the component products. The overall speed, precision and quality of the entire process is controlled by a master PLC.

Paul Strzalkowski from SEW-EURODRIVE began the design of the project with engineers from H.G. Molenaar in December 2017 and secured the initial order in March 2018. The project was completed in February this year.

The MOVIGEAR® solution was ideal for this application due to its 200:1 speed range, as well as the fact that the units are designed specifically for the strict hygiene requirements of the food and beverage industry. They have no sharp edges or corners where bacteria can accumulate, and a special H200 protective coating was added to the surface of the MOVIGEAR® to protect against all types of chemical cleaning agents used in cleaning of the plant.

Strzalkowski, who heads up Mechatronic Sales at the Cape Town branch, says, "The gearbox and motor are a single sealed unit, together with all the electronic controls." This equates to a significant saving in terms of the panel size required.

"Panel space was a definite consideration with this project," Strzalkowski adds. "This meant there was no space for centralised, bulky speed controllers. The compact modularity of the MOVIGEAR® units was ideal."

Another feature is on-board input/output controls which interact directly with the MOVIGEAR® electronics, so there was no additional wiring required to the master PLC. All control is via the SBUS protocol directly from the master PLC and daisy-chained to the drives themselves.

A further consideration was that the turnkey solution provided by SEW-EURODRIVE had to contend with a temperature range from -25°C to 25°C. A special oil for food and beverage applications was also required to protect against any harm that could be caused in the unlikely event of any leaks developing.

While the food and beverage MOVIGEAR® unit is a standard product, the economies of scale of this project meant that the order was sourced from Germany. Strzalkowski highlights that the Cape Town branch is fully equipped to assemble the units locally and supplies them to a range of industries and applications in southern Africa.

On the feedback received to date, Strzalkowski says the client is particularly happy with the commissioning, due to the considerable saving on wiring installation, cost and time. "The big surprise for the end-user has been that the energy consumed while all the drives are running is at least 50% lower than anticipated."

Strzalkowski concludes: "This is a flagship project that demonstrates the flexibility and cost-saving benefits of the MOVIGEAR® solution."

SEW-EURODRIVE supplied its MOVIGEAR® servo motors to OEM H.G. Molenaar in Paarl for a weighing conveyor system, for a German based company in the food and beverage industry.

For more information contact SEW-EURODRIVE (Pty) Ltd. Tel: +27 (0)11 248 7000 or visit: www.sew-eurodrive.co.za

Industry steps forward to support skills training

Automation training rig for Coca-Cola Beverages Africa

Supporting Coca-Cola Beverages Africa's (CCBA's) vision of advancing digitalisation, Siemens Digital Industries South Africa has provided a Totally Integrated Automation training rig to the group's Embakasi plant in Nairobi, Kenya

The training rig is complete with Siemens Totally Integrated Automation (TIA) portfolio and will serve a key role in training apprentices, trainees and employees to understand the current and future value of automation in food & beverage manufacturing plant operations. It will be used to prepare engineers and technicians to gain full value from the latest automation solutions and develop them to carry out the technical aspects related to the migration and management of Siemens S7-1500 PLCs, HMIs, servo drives and other automation equipment.

The rig was configured and supplied together with International Energy Technik (IET), a local Kenyan company and a Siemens Partner.

Eric Nyakundi, Electrical Engineer at CCBA's Embakasi plant, says, "This perfectly fits into our business goals and overall strategy of growing and developing engineering capacity in our manufacturing facilities and advancing asset care. Most of our control systems are based on Siemens products so there will be a direct transfer of skills and knowledge acquired in training to our manufacturing facilities."

Nyakundi adds, "The automation teams, the machine specialists, the electrical artisans and the apprentices at CCBA will be trained on this rig. These teams are responsible for supporting the manufacturing facilities in realising the company's business goals in manufacturing."

"The soft drinks market is characterised by frequently changing and often short-lived trends. Soft drinks manufacturers must always be able to adapt their production rapidly to new requirements – and to work efficiently and produce optimal quality. Digitalisation gives them the flexibility they need to accomplish this, while also boosting energy efficiency," says Ralf Leinen, Senior Vice President for Siemens Digital Industries, Southern and Eastern Africa. "Siemens and CCBA have a longstanding successful partnership in Africa. Digital Industries is proud to have contributed towards a fully automated solution that can assist with engineering skills."

Siemens also created a 3D point cloud scan of the entire plant. This data can be used with Siemens NX platform tool to analyse and plan projects. This is another step closer to digitalisation, where engineering time can be reduced – in turn reducing time to market. Automation products showcased in the rig help in collecting the necessary data of process and packaging lines, which can add valuable information in the NX tool for further analysis.

Sabine Dall'Omo, Siemens CEO, Southern and Eastern Africa, says, "Ongoing education and training have a positive effect for both business and society. At Siemens we believe in investing in the long-term and creating value for our customers and the societies we operate in. We will continuously support CCBA's vision in shaping their digital future."

For more information visit: www.siemens.com

The Siemens automation training rig supplied to CCBA's Embakasi facility will serve a key role in training.

Accredited training courses on automation products

The Bloemfontein branch of ElectroMechanica (EM), established in July 2019, has a fully equipped training facility, focusing mainly on automation products such as programmable logic controllers (PLCs), human-machine interfaces (HMIs) and servo drives.

With its inaugural training session already completed successfully, Branch Manager Anton Nortje says it aims to conduct one major training session monthly, with ad hoc training provided as and when needed.

EM, established in 1984, is a specialised importer and wholesale distributor of high-end industrial electrical products, motor control switchgear and electronic automation products. It offers its clients state-of-the-art products, sourced from leading local and international brands, all complying with recognised international safety standards and performance specifications.

ElectroMechanica has a fully equipped training facility at its Bloemfontein branch, providing training on automation products such as PLCs and servo drives.

EM aims to empower customers with the know-how to best use the products they acquire and to optimise them for maximum benefit. The training it provides is accredited in terms of Continuous Professional Development (CPD).

"A major advantage of the training is that it exposes our customers to our broader offering and makes them aware of capabilities and synergies that they may previously have been unaware of," says Nortje. "Customers know they can approach us for customised solutions to specific requirements." He adds that training is a critical focus for EM. "Training is knowledge, and we pride ourselves on our capability and service in this regard."

The Bloemfontein branch also serves to bring EM closer to its customers in the region.

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

Tech teaching benches for training colleges

Energy management and automation specialist, Schneider Electric South Africa and Amtec Techniquip, a leading provider of locally manufactured educational equipment, recently signed a Memorandum of Understanding (MOU) which will see the organisations collaborating in providing a range of practical training equipment to education institutions.

As a result of the MOU, Schneider Electric South Africa will now be able to provide locally manufactured didactic benches, as Amtec Techniquip will incorporate Schneider Electric components into its locally manufactured benches which are delivered to education institutions in southern Africa.

This is a major step forward in providing high-quality training equipment with local content. Didactic benches bridge the gap between theory and practice and form a critical part of the practical component for vocational training around the globe.

The collaboration also underscores Schneider Electric's ongoing commitment to providing world-class equipment to local education institutions. The locally manufactured didactic benches will, for example, be used at the F'SASEC (French South African Schneider Electric Education Centre) network partners across the country and at Schneider Electric partners and customers in southern Africa.

Zanelle Dalglish, Head of Sustainable Development and Academy for Anglophone Africa, at Schneider Electric South Africa, comments: "Our MOU with Amtec Techniquip is an important step towards providing access to high-quality education and re-emphasises Schneider Electric's support of local businesses and content. Amtec Techniquip manufactures high-quality innovative equipment which made them the perfect fit for our training solutions."

Jeff Forté, Director of Amtec Techniquip, says, "By using Schneider Electric components and working together on our training solutions we aim to offer our shared customer base a range of quality equipment that meets international standards.

The F'SASEC network recently launched a second practical training laboratory at Sedibeng TVET College (Sebokeng campus) in Vanderbijlpark, Vaal Triangle. The laboratory incorporates state-of-the-art Schneider Electric equipment donated largely by the Schneider Electric Foundation. To date, the Schneider Electric Foundation and Schneider Electric South Africa have donated almost R30 million worth of training equipment to the F'SASEC network.

The new training laboratory was officially opened at the F'SASEC Electrical Artisan Acceleration Day. The event was attended by dignitaries from the French Embassy in South Africa, the Department of Higher Education and Training (DHET), Vaal University of Technology (VUT), College of Cape Town (CCT), Sedibeng TVET College, the Electrical Contractors Association (ECA) as well as members of industry and Schneider Electric South Africa.

The F'SASEC at Sedibeng TVET College, established in March 2016 and inaugurated in April 2017, currently trains students from disadvantaged socio-economic backgrounds. It has a team of mainly women lecturers with a focus on women's empowerment. The second training laboratory will strengthen the college's training efforts. Its electrical artisan programme is aimed at narrowing the practical technical skills gap – with an emphasis on digitalisation and industry automation – and preparing potentially skilled artisans for the workplace or entrepreneurship.

Commenting on the F'SASEC network, Pierre de Villiers, Chief Education Specialist: Curriculum Development and Support (TVET Colleges) at the DHET, said: "This partnership with Schneider Electric and the Embassy of France is very important to us. Practical training forms such an important part of equipping artisans with skills to gain employment."

The F'SASEC network spans six prominent South African tertiary education providers: Vaal University of Technology (VUT), University of Johannesburg (UJ), Cape Peninsula University of Technology (CPUT), Sedibeng TVET College, College of Cape Town (CCT) and Eastcape Midlands College (EMC). The network has also expanded beyond South Africa's borders to include an agreement with Don Bosco in Mozambique where two training laboratories are supported by the Schneider Electric Foundation and Schneider Electric South Africa.

For more information visit: www.se.com

Training for electrical artisans

JB Switchgear Solutions (Pty) Limited invested in an artisan training programme for a number of its staff, selecting those who had the necessary tertiary qualifications for the programme.

After an intense training schedule, the candidates were successful in obtaining their trade test qualifications as electricians. The programme was run in partnership with service provider SAJ Competency Centre in Wadeville.

JBSS is proud to be involved in this initiative to uplift the skills of its staff, enabling them to improve their livelihoods, and giving back to the manufacturing industry.

JBSS plans to continue such programmes to see further candidates obtaining their qualifications and artisan status.

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

From left: Linas Precious Mdhluli; Paseka Jeff Khoeli; Johan Basson, MD, JB Switchgear Solutions; Lerato Joy Mothibe; Makgang Georginah Kgaditsi; and Gordon van der Merwe, Governance Manager, JB Switchgear Solutions.

Multi-monitor controllers for next gen video walls

Matrox® Graphics Inc. has announced that its QuadHead2Go™ multi-monitor controllers are now available. Supplied in appliance and PCI Express® card form factors, QuadHead2Go units simplify large-scale video wall installations by supporting any source, any size and any configuration. The units can drive four displays from one signal, offering an easy path to next-generation video walls.

The new multi-monitor controllers feature a modular architecture that provides complete video wall scalability and flexibility – powering video walls of any type and size and delivering high image quality across high-impact configurations. OEMs, system integrators and AV installers can use the included Matrox PowerWall™ software to configure the latest large-scale video walls.

QuadHead2Go controllers capture a single video signal – of up to 4Kp60 and 8K x 8K – for display across up to four screens, at resolutions up to 1920 x 1200 per output. The input content can be from any source – such as professional graphics cards and integrated GPUs, digital signage players, laptops, and others – and displays can be arranged in classic rectangular 2x2, 2x1, 3x1, 4x1, 1x2, 1x3, or 1x4 setups, or various other configurations. Multiple QuadHead2Go units can be used together to build ultra-large video walls under any operating system, including Microsoft® Windows® 10 and Linux®.

QuadHead2Go guarantees out-of-the-box plug-and-play when using the default 2x2 landscape configuration, without having to install software or connect to a video source. On-device buttons on the appliance enable users to cycle through pre-set configurations to select and set the display layout, access a pre-saved image to set up display positions, and fine-tune bezel-displaced pixels. The controllers also include high-bandwidth digital content protection (HDCP) support for playback of protected audio and video content from HDCP-compliant devices.

Matrox PowerWall is an advanced, yet easy-to-use management software that allows users to customise configurations and control the display outputs independently, either offline or online. The Matrox QuadHead2Go REST API is also available for integrators and developers looking to create custom functions and applications.

"Matrox QuadHead2Go is a another example of how Matrox continues to innovate and equip OEMs, system installers, and professional users worldwide with leading-edge capabilities while simplifying the deployment process," said Fadhl Al-Bayaty, Business Development Manager, Matrox Graphics. "Packaged in small-form-factor, low-power, and user-friendly appliance and card options, QuadHead2Go enables seamless and imaginative video wall designs for a variety of applications including digital signage, control rooms, broadcast and more."

Matrox Graphics, headquartered in Montreal, Canada, is a global manufacturer of reliable, high-quality ASICs, boards, appliances and software, backed by in-house design expertise and dedicated customer support.

For more information contact Matrox Graphics, visit: www.matrox.com/graphics

QuadHead2Go multi-monitor controllers simplify large-scale video wall installations and enable full scalability and flexibility.

Cabinet dome protects communication components

With the new CU8210-M001 cabinet dome from Beckhoff Automation, the USB port of an industrial PC can be fed out of the control cabinet and still be well protected. This allows for reliable and powerful wireless connections to the control computer, without having to use attenuation-prone antenna cables. When combined with the appropriate CU8210-D00x USB 2.0 sticks from Beckhoff, available for WLAN or 4G mobile communication, the cabinet domes support efficient and globally usable wireless solutions for PC-based control technology.

The cabinet dome is designed to house industrial WLAN and mobile communication components and complies with IP 66 protection rating in the installed state. The components inside the dome housing, such as the USB 2.0 sticks for wireless communication, are protected against physical contact, dust, spray water and water jets. The dome can therefore be mounted in the panel of the control cabinet, or directly on the machine, or on top of the control cabinet. The material used, which is suitable for radio applications, has high stability and impact resistance and offers a high level of protection against accidental or deliberate damage. Locking the dome in place from the inside of the control cabinet provides additional security, ensuring it cannot be removed from the outside.

The cabinet dome measures 54 x 100 x 54 mm, has a USB 2.0 socket type A and is designed for operating temperatures from -40 to +60°C. Increasing the dome placement options for the industrial PC and the respective application, different versions offer the choice of USB cables in lengths of 1, 3 or 5 metres.

Digitalisation at Dangote Cement plants to boost performance

GE and Africa's leading cement producer Dangote Cement Plc have signed an agreement to deploy GE's Asset Performance Management (APM) digital solution to improve power supply efficiency, enhance plant performance and reduce unplanned downtime at its two cement plants in Obajana and Ibese in Nigeria. The project includes extending the current service agreement for an additional 50 000 operating hours for the seven GE LM6000PC aero-derivative gas turbines installed at the sites. GE's total plant solutions will improve efficiency and reliability – essential to continuous operations and the plants' business strategy.

Ravi Sood, Operations Director, Dangote Cement, said, "Power supply is a key input and a major cost in our manufacturing process. Operational performance is crucial to our cement plants' overall productivity, directly affecting end products. Being at the forefront of cement production in Africa, we believe extending our services agreement with GE and the introduction of digital solutions will allow us to improve efficiencies, anticipate further reductions in unplanned downtime and become more self-sufficient in power production."

APM leverages cutting-edge technology to monitor the performance of power generation assets to reduce downtime, avoid turbine damage and remotely predict and resolve issues. APM sensors will be installed on the seven aero-derivative turbines and on their associated generators and gearboxes, to predict and diagnose issues more accurately before they occur.

"Energy infrastructure is getting smarter and digital solutions allow the shift from traditional calendar-based repairs to predictive maintenance as well as increasing power asset availability and reliability," said Elisee Sezan, CEO for GE's Gas Power businesses in sub–Saharan Africa. "We are proud to continue our 13-year collaboration with Dangote Cement, to help them support Nigeria and other African countries towards achieving self-reliance and self-sufficiency in some of the world's basic commodities."

The agreement underscores GE's commitment to work collaboratively with its customers using the APM software to optimise the performance of customers' assets, increase reliability and availability, minimise costs and reduce operational risks. Earlier this year, GE announced the first digital solutions order in sub-Saharan Africa to upgrade Azito's gas turbine power plant in Ivory Coast, to improve power plant output, reliability, availability and operational performance.

GE Power is a world energy leader providing equipment, solutions and services across the energy value chain – from generation to consumption. It operates in more than 180 countries, developing and supplying technologies, software and equipment for power generation and transmission utilities.

Dangote Cement is Africa's leading cement producer with operations in 10 African countries, including Cameroon, Congo, Ethiopia, Ghana, Senegal, Sierra Leone, South Africa, Tanzania and Zambia. As a fully integrated quarry-to-customer producer it reported production capacity of up to 45.6 million tonnes per annum (Mta) across Africa at the end of 2017.

For more information visit: www.GEPower.com

GE's APM digital solution will improve plant performance and reduce unplanned downtime at Dangote Cement plants in Nigeria.

Beckhoff offers several WLAN and 4G/3G/2G USB sticks for wireless communication.

The WLAN sticks from the CU8210-D001 series provide high performance wireless communication and enable encrypted data exchange. The WLAN sticks are compatible with earlier and current WLAN standards and support 20, 40 and 80 MHz transmission bandwidths, with maximum data transfer rate at 433.3 Mbit/s (80 MHz). The WLAN USB 2.0 stick is available in two versions: for North America (FCC), and for Europe and other territories.

The 4G USB sticks from the CU8210-D004 series with GSM/UMTS/LTE modem can dial into a mobile communication network via a common SIM card. Industrial PCs that require a wireless connection over longer distances can thus be retrofitted to address those needs. LTE as well as the 2G, 3G and 4G bands are supported with a maximum data rate of 150 Mbit/s with LTE DL or 50 Mbit/s with UL. Three versions are available: for North America (FCC), for EMEA (Europe, Middle East, Africa), and for Asia/Australia.

For more information contact Beckhoff Automation. Tel: +27 (0)11 795 2898, or visit: www.beckhoff.co.za

IP 66 rated cabinet dome with covered USB 2.0 socket, type A, protects WLAN and mobile communication USB sticks.

Electromagnetic flow measurement in compact design

Whether in the life sciences or biotechnology industries, the food or chemical industries – global competition is always increasing. More companies are implementing process facilities in a very short time by following a modular principle. The production units and skids required for this include a variety of measurement and control technology devices fitted into a minimum of space. Customers therefore require more and more compact, space-saving devices without limitations on functionality. This also applies to electromagnetic flow measurement. The Promag 100 from Endress+Hauser was specially designed for such applications.

Promag 100 combines a decades-long proven sensor technology with ultra-compact transmitter electronics without compromise. As a multivariable flowmeter, the Promag 100 also opens up possibilities for optimal control and monitoring of individual process units, for example, in heating, cooling, distillation, fermentation (bioreactors), product filtration, phase separation or inline cleaning.

in addition to measuring volume flow, the Promag 100 can now also measure fluid conductivity as well as the fluid temperature. This makes it possible to monitor the process comprehensively and with high accuracy, around the clock.

Key features include:

- Accurate measurement and/or dosing of substance amounts
- Assured compliance with guidelines and regulations
- Reduced operating costs by means of proven, space-saving measuring devices.

Innovative measuring electronics

The miniaturised measuring electronics in ultra-compact format have the same functionality as a traditional device and include a web server for intuitive operator access – offering completely new service and commissioning options. These include, for example: simple access to measuring instruments and diagnostic data, on-site configuration of instrument functions without additional interfaces, or upload and download of configuration data for commissioning other identical measuring points. Permanent self-diagnostics (Heartbeat Technology™) and a service-friendly data storage concept (HistoROM) guarantee continuous safe operation.

The electronics housing is available in aluminum or stainless steel, as well as in an ultra-compact hygienic version with pre-configured plug connectors (M12x1).

Seamless system integration

Promag 100 is suitable for use in all industries. Seamless system integration via HART, Modbus RS485 or EtherNet/IP is straightforward, as is process connection with a variety of options, such as weld neck, hygienic clamp connections, couplings, threaded adapters or flanges. The wide range of approval types (Ex, EHEDG, 3A, ASME BPE, FDA, and others) ensures the highest level of safety in operation and compliance with specified regulations.

The Promag P 100 is suitable for use in all industries and the Promag H 100, shown here, is made of stainless steel, for use in the food and life science industries.

Industry-optimised sensors

All Promag 100 measuring devices are tested and certified on accredited, fully traceable calibration facilities (ISO/IEC 17025). This guarantees maximum measuring accuracy and repeatability, even in long-term operation.

Both the Promag H and the Promag P sensors are available with different equipment packages, so they can be matched optimally to the process conditions. The variants include corrosion-resistant linings made of PFA or PTFE, various measuring electrodes made of acid-resistant materials or SIP- and CIP-compatible seals for the Promag H.

Both Promag sensors offer all-in-one: full functionality where space is at a minimum, simultaneous measurement of multiple process variables, excellent and traceable accuracy (max. measured error: ±0.2%) and a long record of proven performance.

For more information contact Endress+Hauser.
Tel: +27 (0)11 262 8004
or visit: www.za.endress.com

Viscosity-compensated plastic flowmeter

Kobold's VKP plastic flowmeters, available from Instrotech, operate on a special suspended float principle with a cylindrical measuring tube and spring-loaded float with orifice.

The float in model VKP-3 has slots mounted onto the outside, which protect the instrument from soiling by 'capturing' dirt particles. The risk of the float jamming is thus considerably reduced and soiled liquids with a particle size up to 400 mm can be measured without difficulty.

In model VKP-2, the sharp-edged orifice in the float renders the instrument less sensitive to changes in viscosity.

Key specifications of the VKP flowmeters include the following.

- Measuring range: 2-20 … 20-100 l/min water, 1-18 …10-75 l/min oil
- Accuracy: +5% of full scale
- Pressure: maximum 16 bar
- Temperature: maximum 120 °C
- Connection: G1, 1" NPT PVC glue-in connection, inserts G1/2,G3/4 soldering connection 18mm, 22mm
- Material: polysulphone.

The VKP flowmeter finds application in lubricant circuits, domestic electrical installations, machine tools, solar energy systems, cooling circuits, welding machines, and pumps.

For more information contact Instrotech.
Tel: +27 (0)10 595 1831
email: sales@instrotech.co.za

Kobold's VKP viscosity-compensated flow meters are suitable for use in lubricant circuits and other applications.

New pressure sensors in modular fluid sensor series

Turck is launching the new pressure sensors of the PS+ Series. The robust sensors are the first products of a modular fluid sensor series that enables customers to provide reliable measuring instruments with intuitive operation. The sensor has already been recognised with an iF Design Award.

The PS+ pressure sensors are easy to commission and allow for overhead mounting as the sensor head has a rotation range of 340°. Once the sensor is connected, it automatically registers whether the controller or the bus module requires a PNP or NPN, current or voltage signal. A compatibility mode for integration into IO-Link systems is also provided.

The operator interface with capacitive touchpads and a bicolour display enables settings to be done quickly in plain text (in accordance with the Turck or VDMA standard), and is protected by a lock mechanism to prevent accidental operation.

The hermetically sealed keypad ensures greater resistance to dirt and liquids, so the sensors meet the requirements of ISO protection to IP6K7K, IP6K7 and IP6K9K. The PS+ Series is designed for pressure ranges up to 600 bar and is available with proven ceramic measuring cells (PS310) and metal measuring cells (PS510). The PS510 devices come with an overpressure resistance of up to seven times the nominal pressure. The sensors can optionally be fitted with peak pressure restrictors.

Turck will add temperature and current measuring devices to its new fluid sensor portfolio over the year ahead. As all the sensors are based on the same platform, they have a similar appearance and operating principles.

For more information contact
Brandon Topham at Turck Banner.
Tel: +27 (0)11 453 2468
email: brandon.topham@turckbanner.co.za

The new pressure sensors, which have already been recognised with an iF Design Award, are first in the line-up of the PS+ modular fluid sensor series from Turck Banner.

Flow measurement with Production 4.0 intelligence

At the recent Abu Dhabi International Petroleum Exhibition & Conference, multinational oilfield services company, Weatherford, introduced ForeSite® Flow, described as the first-ever flow-measurement solution driven by Production 4.0 intelligence.

ForeSite Flow is a full-range, non-nuclear multiphase flowmeter paired with Weatherford ForeSite intelligence. Built for production environments from heavy oil to wet gas, the technology provides precise flow measurements for any fluid mixture without separation. By removing bulky test separators from the wellsite and eliminating nuclear-source management typically associated with other inline multiphase flowmeters, ForeSite Flow reduces both capital and operating expenses while increasing well-test frequency and accuracy.

Flow data can be viewed remotely on any desktop or mobile device via intuitive dashboards that display real-time production rates and fluid properties to reveal true reservoir behaviour. High flow-measurement accuracy enables operators to access up-to-the-second data for wells with any gas-to-liquid ratio, and digitalisation capabilities automate well-test processes and validation.

Kyle Chapman, President of Production for Weatherford said, "Production 4.0 capabilities give us the power to drive more productivity while enhancing safety for our customers. By moving beyond legacy flow-measurement equipment, we have a direct window into reservoir behaviour, and we reduce HSE risk, enhance personnel efficiency, and significantly shrink capex and opex spend."

ForeSite Flow features:

- 70% less opex compared to conventional separators: it enhances personnel efficiency, reduces maintenance, and lowers inventory requirements
- 40% less capex compared to conventional separators: it reduces upfront costs, simplifies installation, and requires a smaller footprint
- Superior measurement accuracy: ForeSite Flow is proprietary multiphase technology that is unaffected by fluid chemistry, salinity or impurities, and is compatible with any flow regime
- Enhanced understanding at the wellhead: ForeSite Flow delivers continuous, real-time data with sub-second resolution for improved reservoir and production-management decisions.

Weatherford is one of the largest multinational oilfield service companies providing innovative solutions, technology and services to the oil and gas industry. The company operates in more than 80 countries and has a network of 620 locations, including manufacturing, service, research and development, and training facilities and employs more than 24 000 people.

For more information visit: www.weatherford.com

As well as supporting functional safety of the plant, safety sensors and switches can contribute to reducing downtime.

Sensors for functional safety and reduced downtime

Simon Davis, Product Marketing Manager Safety in Automation Infrastructure, Phoenix Contact Electronics GmbH

AT A GLANCE

- Harmonised standards have been created for safety sensors – setting out a common approach and defining proven methods for selection, installation, setup, and use of different types of sensors.
- With the migration of technology to the safety sensor level, the data made available can be used in a digitalisation strategy.

As a clear market trend, functional safety is playing an increasingly important role in industrial automation. Existing safety standards must keep pace with the emergence of new technologies to create a framework for their use in the safety-related parts of control systems. This is especially true for safety sensors.

Safety sensors and switches are used in machines and industrial applications in order to prevent personal injury and to protect machinery. This is achieved primarily by monitoring the position of safety equipment – such as access doors and hatches – and by detecting the presence of operators using optical or pressure-sensitive devices. Harmonised standards have been created for safety sensors, which set out a common approach and define proven methods for the selection, installation, setup, and use of the relevant product.

In the European Machinery Directive, information concerning safety sensors is described in detail in type B2 standards. Type B standards cover specific aspects of the safety of machinery or certain types of safety precautions that can be implemented for a wide range of categories of machinery. Their application creates a presumption of conformity with the essential health and safety requirements of the Machinery Directive, provided that a machine-specific type C standard or the risk assessment indicates that a technical solution set out in the type B standard is sufficient. Table 1 presents a list of type B standards for safety sensors. (The full list can be viewed on the homepage of the European Commission's Machinery Directive.)

Electrical interface properties

The type B standards cover many aspects of the specific sensor, including the operating principles, design aspects for protection against environmental influences, installation to minimise manipulation, and the electrical aspects. However, the type B standards do not include the properties of the electrical interface

Table 1: Type B standards for safety sensors

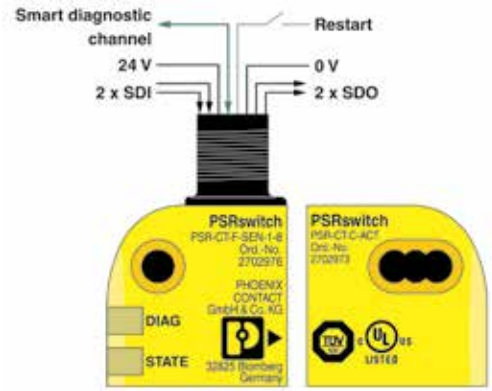
Standards	Title
DIN EN ISO 13850:2015	Safety of machinery - Emergency stop function - Principles for design (ISO 13850:2015)
DIN EN ISO 13855:2010	Safety of machinery - Positioning of safeguards with respect to the approach speeds of parts of the human body (ISO 13855:2010)
DIN EN ISO 13856-1:2013	Safety of machinery - Pressure-sensitive protective devices - Part 1: General principles for the design and testing of pressure-sensitive mats and pressure-sensitive floors (ISO 13856-1:2013)
DIN EN ISO 14119:2013	Safety of machinery - Interlocking devices associated with guards - Principles for design and selection (ISO 14119:2013)
DIN EN 61496-2:2013	Safety of machinery - Electro-sensitive protective equipment - Part 2: Particular requirements for equipment using active opto-electronic protective devices (AOPDs) (IEC 61496-2:2013)

between the sensor and monitoring logic, that is, the safety controller or safety relay. Due to the growing use of dynamic test pulses to achieve diagnostic coverage in accordance with DIN EN ISO 13849-1, problems can be encountered here concerning the electrical compatibility between a source (sensor) and sink (controller). Mismatching can lead to application problems and reduce the availability of the safety function long after validation has been completed.

The problem illustrated is now the topic of a position paper by the ZVEI (the German Electrical and Electronic Manufacturers' Association). The document is entitled 'Classification of Binary 24 V Interfaces – Functional Safety aspects covered by dynamic testing'. The paper explains four different interface types, which are listed in Table 2. This useful document aims to standardise the description of the electrical properties of the interface. In this way, the user should easily be able to achieve optimum compatibility between devices. Furthermore, manufacturers of safety components are encouraged to categorise the electrical properties of the interface and publish the results in respective product documentation.

Technological shift to the sensor level

Using technology to support the objectives of changing safety standards is another major trend that can be seen in safety sensors. A good example of this is RFID (radio frequency identification) transponder technology, which has its roots in military applications. The low-power transmitter (sensor) sends an electromagnetic signal to a receiver unit (actuator) containing a coded RFID antenna. After installing the sensor, the code integrated in the RFID chip is typically programmed using a teach-in process. If the sensor recognises the encrypted code, the safe outputs of the switch are activated and the machine can work. When used in vibrating machinery, this technology is much more robust than conventional reed contacts. It also reduces the possibility of manipulating the sensor, for example, where a magnet is applied to make it look like a door is closed.



With new technologies, modern sensors offer a wide range of functions in highly compact design.

With microprocessors requiring less space these days, it is easier to integrate 32-bit computing power into highly compact sensors. In addition to safe OSSD-clocked (output signal switching device) outputs, modern switches therefore now also feature safe digital inputs to support series connection or concatenation. Relocating the I/O device functionality from the control cabinet to the field device enables the electrical designer to reduce the amount of space required for the safety controller.

Table 2: 24 V binary interface classes covered by dynamic testing

Interface type	Maximum electrical resistance of connection cable	Maximum capacitive load of test pulse generation TG (cable*1 + input capacitance)	Example
A	100 Ω	20 nF *2	Magnetically operated position sensors and limit switches (Reed switches) on hydraulic and pneumatic cylinders.
B	100 Ω	20 nF *2	Interface type B is often used for position monitoring with sensors (source) from different manufacturers. Technologies (inductive / RFID / magnetic / photoelectric / etc.)
C	100 Ω	20 nF	Interface type C is used as an 'OSSD' output (output signal switching device) – e.g., safety outputs for light grids and proximity devices with defined behaviour under fault conditions in accordance with EN 60947-5-3, etc.
D	100 Ω	20 nF	Interface type D is primarily used for the safe switching of actuating elements such as contactors, motors, etc. and valves, or for complete shutdown of the operating voltage of electrical/electronic devices, modules, and equipment.

*1 E.g., 0.34 mm² cable, 5 wires: 60 Ω/km per single wire, 120 nF/km
*2 Serial connection to be taken into account.

Collecting event-related data

The migration of technology to the safety sensor level is not limited to the implementation of safety concepts. On the contrary, it is becoming increasingly clear that data available at sensor level can be used as part of a digitalisation strategy. By implementing a communication channel from the microprocessor-controlled sensor, standard data packets can be transmitted to an IoT gateway or compatible safety logic. This means that the user can automatically collect data regarding all types of sensor-related events while the machine or system is operating. The information is stored and evaluated with the aim of reducing or even preventing unnecessary downtime.

Looking back at the development of safety sensors over the past ten years, we see that when it comes to satisfying safety requirements it no longer comes down to just the mechanical design or correct installation. Over this period, the safety standards in force have changed fundamentally, which has led to the innovative use of technologies to meet the new requirements.

Digitalisation also places additional demands on network integration and communication, aspects that previously did not need to be considered when it came to safety sensors. The transmission of standard diagnostic information from the sensor to the controller and onwards from there to a cloud platform, is a clear trend that offers great potential for reducing system downtime.

First safety relay with integrated IO-Link device

For a long time, the function of safety relays was limited to shutting down hazardous movements. More advanced convenient functions, such as intelligent diagnostics, were only offered by systems of superior quality. In combination with the new PSRswitch RFID-coded safety switch, Phoenix Contact has introduced the first safety relay with integrated IO-Link device. This device is characterised by, among other things, its overall width of just 17.5 mm. Based on the serial connection capability of the PSRswitch, the new PSR-MC42 safety relay evaluates each individual door signal via a proprietary transmission protocol and prepares the data for IO-Link communication. This enables detailed information – such as 'door position', 'wait for reset', 'warning range' or 'I/O error' – to be assessed for each door switch.

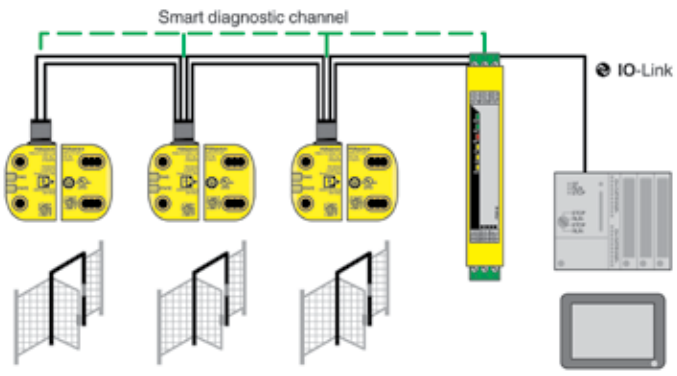
A maximum of 30 switches can be connected in series up to the highest safety level (PL e) using the PSRswitch system. Furthermore, the solution provides safety relay device information via IO-Link. Conversely, the IO-Link master can control or enable the drive in a non-safety-related way via the safety relay. The PSR-MC42 safety relay includes two independent sensor circuits, one of which can be used for the safety door cascade and the other for emergency stop shutdown, for example. The enabling paths available on the output side can be used to safely shut down loads up to 6 A.

References

Directive 2006/42/EC (Machinery Directive); Official Journal of the European Union L 157/24 of June 9, 2006 with corrected version in Official Journal L 76/35 of March 16, 2007

https://www.zvei.org/en/press-media/publications/classification-of-binary-24-v-interfaces-functional-safety-aspects-covered-by-dynamic-testing/

Simon Davis, Product Marketing Manager, Safety in Automation Infrastructure, Phoenix Contact Electronics.



Phoenix Contact has introduced the first safety relay with integrated IO-Link device in its new PSRswitch RFID-coded safety switch.

Safety sensors in construction machinery

Modern construction machinery is usually controlled and moved predominantly by hydraulic systems, which means that electronics and control technologies have played only a minor role in many applications. This is changing with safety-related aspects and driver-assist functions now coming into play.

Gerry Bryant, Managing Director of leading sensor specialist Countapulse Controls, says it has become obvious over time that the role of sensor technology will become increasingly important in construction equipment.

"Machinery deployed in these industry sectors is subjected to harsh operating conditions, including varying climatic conditions, long working hours and exposure to dust, dirt and liquids. This means the demand on sensors is often extreme, and requires robustness and a high degree of protection," he says.

Commenting on typical applications, Bryant says encoders are used for positioning, angular, speed and length measurements in construction machinery applications, and assume tasks that facilitate the driver's work and enhance productivity.

Examples include straight-to-the-point positioning of loads for hoisting equipment or restricting work zones to protect against collisions. Another example is where the devices are used in safety-relevant functions such as providing warning signals to the driver as soon as the machine enters a critical situation: for instance, where excessive loads could cause hoisting equipment, such as hoisting cranes and excavators, to tilt.

Agricultural and forestry machine applications use encoders to facilitate the automation of many applications, making work significantly easier and increasing productivity. This could include speed-controlled sowing in agriculture, through to automated measuring of tree trunks in forestry. Automated processes that increase productivity in agriculture are becoming more sophisticated using satellite-controlled systems.

Bryant says encoders used in construction equipment prove their capabilities under extremely harsh conditions by providing reliable feedback on positioning, excursion angles or speeds.

The Hengstler range of robust encoders, available from Countapulse Controls, has a proven track record in this industry sector. The devices are completely free from sliding contacts, ensuring high reliability and longevity.

Programmable absolute encoders do not require any re-adjustment, compared to similar technology products such as potentiometers which are adversely affected by temperature fluctuations and wear and tear. In addition, encoders offer full 360° scanning capability, facilitating accurate feedback over a full turn or several turns. Multi-turn versions make it possible to read the exact number of turns at any time, even after voltage drops or complete power failures.

Encoders used in these applications must meet the essential technical requirements, which include a high degree of protection, wide temperature range, high shock and vibration resistance, high resistance to water and humidity, as well as high load resistance of the shaft.

For more information contact Countapulse Controls.
Visit: www.countapulse.co.za

Technology and flexibility are key features of the Hengstler incremental and absolute rotary encoders, designed for harsh operating environments.

Hengstler encoders are available with common interfaces to enable open communication.

Safety light grids with integrated muting function

The new generation of safety light grids from ifm electronic ZA allow for muting mode without an external junction box or a muting relay being required as these are integrated into the receiving element. The supported muting versions are available as either crossbeam or parallel muting. Both versions allow transported material to be passed safely in or out, via the protected area. A status light, integrated into the receiver, indicates the operating status.

The muting arms can be installed directly on the light grid and are available in two versions: either with multi-beam sensors, similar to a miniature light grid, or pre-mounted with single-beam sensors. There are no longer any complex adjustments or installation configurations needed. The complete package provides for increased safety, configured to customers' requirements and is quick and easy to mount.

Safety light grids are typically used where hazardous areas need to be secured. They are optoelectronic devices with a transmitter and a receiver. The safety light grids from ifm conform to safety requirements for type 2/SIL 2 or type 4/SIL 3 standards. They are used, for example, to prevent access to hazardous areas or to monitor robot cells and production lines. For food and beverage applications, units with protective coverings and high protection ratings are available.

For more information contact ifm electronic ZA. Tel: +27 (0)12 450 0400, email: info.za@ifm.com

All in one safety light grids are typically used to prevent access to hazardous areas.

Connected safety portfolio includes gas monitors

Comtest – the local representative of Industrial Scientific, a global leader in gas detection – has expanded its connected safety portfolio to include cellular and WiFi capability in the Ventis® Pro5 Personal Gas Monitor and a satellite communication gateway to connect mobile workers in real time. For area gas monitoring, the Radius® BZ1 connects to the cloud via the RGX™ gateway, which is certified for Class 1 Division 2 and ATEX Zone 2 hazardous zones around the globe.

Personal and area monitors pass real-time data to iNet® Now software, allowing supervisors to see where workers are located and what hazards they are exposed to. The combination of real-time and historical data gives organisations the ability to increase productivity, address risky behavior, and improve safety practices in a range of applications – from mobile workers to in-plant monitoring and confined space entries.

With the ability to share alarms between monitors, the connected devices also improve team and site safety. Local alarm sharing allows for faster, more informed responses from nearby workers. In addition, the local network feature enables monitoring within confined spaces where traditional wireless devices have limited connectivity. Justin McElhattan, President of Industrial Scientific, said, "Our connected safety offerings focus on aligning people, devices, sensors, and data to help businesses achieve key outcomes: saving lives, saving time, and using resources more efficiently."

For more information contact Comtest.
Tel: +27 (0)10 595 1821, email: sales@comtest.co.za

Industrial Scientific's personal gas monitors now include cellular and WiFi capabilities which enable real-time communication, improving safety on site.

Electronic pressure gauges for EX areas

Instrotech supplies Keller's range of five intrinsically safe electronic pressure gauges which are suitable for use in areas subject to gas explosion risks (EX areas). The type approvals are compliant with the ATEX Explosion Protection Directive for explosive gases. The electronic design of the devices is trimmed to minimise energy consumption, so it is also possible to replace the batteries inside areas with explosion risks.

The simplest version, model ECO 1 Ei, offers high resolution and reproducibility for both measuring ranges (-1…30 bar and 0…300 bar), together with accuracy (typical) of 0.5% FS and an integrated min/max memory. The application range as per the ATEX directive is defined by identification markings Ex ia IIC T5 or T6.

Keller's type LEO 1 Ei and LEO 2 Ei electronic pressure gauges feature microprocessor-assisted compensation to ensure a very narrow total error band (including temperature errors) of <0.2% FS over the entire range of operating temperatures from 0...50°C. The zero point can be selected freely within the four measuring ranges between -1…3 bar and 0…700 bar. An automatic switch-off function guarantees energy efficiency. Both models feature sampling rates of 2 Hz and integrated min/max memories. The special feature of the LEO 1 Ei is its additional memory for peak values. In peak mode (as it is known), even extremely short-lived peak values for system pressure are registered with a sampling rate of 5 000 Hz. These values are often critical for the lifetimes of hydraulic plants. For both these pressure gauges, the application range as per the ATEX directive is defined by identification markings Ex ia IIC T5 or T6.

The Keller range of five intrinsically safe electronic pressure gauges, for use in areas subject to gas explosion.

Another electronic pressure gauge in this range, the LEO Record Ei, is equipped with an integrated data memory to record pressure and temperature progressions in the measuring medium. Outside of areas with explosion risks, the data can be transmitted via an RS485 interface to a PC, for evaluation with the Logger 4.X software (available free of charge). The LEO Record Ei can register pressures of up to 1 000 bar with a total error band of ±0.1% FS. With a capacitive sensor, this type is also available for very low measuring ranges starting from 30 mbar (±0.2% FS). The application range as per the ATEX directive is defined by identification marking Ex ia IIC T4.

Featuring accuracy of up to 0.01% FS, the LEX 1 Ei electronic pressure gauge is a reference and precision measuring instrument that has been specifically equipped with a 5-digit display for calibration and testing purposes. Pressure measurement ranges between -1 bar and 1 000 bar are available. The LEX 1 Ei also offers a min/max memory and a digital interface to generate PC protocols. The application range as per the ATEX directive is defined by identification marking Ex ia IIC T6.

Features shared by all Keller digital pressure gauges include simple parameterisation and operation with only two buttons. The pressure display can be shown in various physical units that can be selected freely.

For more information contact Instrotech.
Tel: +27 (0)10 595 1831, email sales@instrotech.co.za

Leading local technology in proximity detection

With mine safety legislation becoming progressively tighter, Booyco Electronics continues to ensure compliance with its proudly South African proximity detection system (PDS).

According to Pieter Janse van Rensburg, Booyco Electronics Area Manager for Mpumalanga, legislation coming into force in 2020 will mean the extended application of Level 9 safety standards. This level requires 'full intervention' from a PDS on trackless mining machines (TMMs) to avoid man and machine related incidents.

Booyco Electronics' PDS can facilitate such collision avoidance, with automatic slow-down and safe-stop of mining machines.

The system uses VLF antennae on a vehicle to create fields within a danger zone around the vehicle. The size of each field can be determined by the customer, to suit specific operating environments and address identified risks.

RFID tags installed on pedestrians' cap lamps alert them – through a light and sound alarm – when they enter this zone. The light changes colour from green to orange and then red, the closer the pedestrian is to the vehicle.

The vehicle also receives a warning from the PDS, with the operator being alerted that a pedestrian is in the proximity. If equipped and configured appropriately, the vehicle can also be automatically slowed down at a certain distance from the pedestrian, and similarly brought to a safe stop.

One of the most significant advantages of the Booyco Electronics PDS is that it can detect as many as seven TMMs and 20 pedestrians within one field, in the underground environment.

"Our technology prioritises the safety of the pedestrian in mines, whether underground or opencast," says Janse van Rensburg. "Our mission is to save lives and to ensure that every worker returns home safely every day."

The company's market leading systems are intrinsically safe, working on a clean 12 V power supply that will not ignite methane gas or coal dust. "Customers value the complete turnkey solution that Booyco Electronics can provide," says Janse van Rensburg.

"Our combined technology includes a very low frequency (VLF) signal that penetrates rock walls underground," he says. "This ensures that the pedestrian will still be warned of an approaching vehicle even if it is out of sight around a corner."

The PDS can be applied to older 'non-intelligent' machines on a mine as well as the newer, controller area network (CAN) bus enabled models.

"The data logging capacity can capture all information relating to the interactions between the pedestrians and vehicles, and between vehicles themselves," Janse van Rensburg says. "This provides the mine with a 'road map' to track how any incident occurs, making it easier to report and to improve practices."

The Booyco Electronics Asset Management System (BEAMS) gives mines the ability to extract useful data on risk areas. This can feed into focused training of staff for more effective safety behaviour.

With 13 years of experience in PDS, Booyco Electronics has supplied more than 5 000 sets of mining vehicle equipment around southern Africa and 50 000 pedestrian sets of equipment.

For further information contact Booyco Electronics.
Visit: www.booyco-electronics.com

Booyco Electronics continues to enable mine safety compliance with its proudly South African proximity detection system.

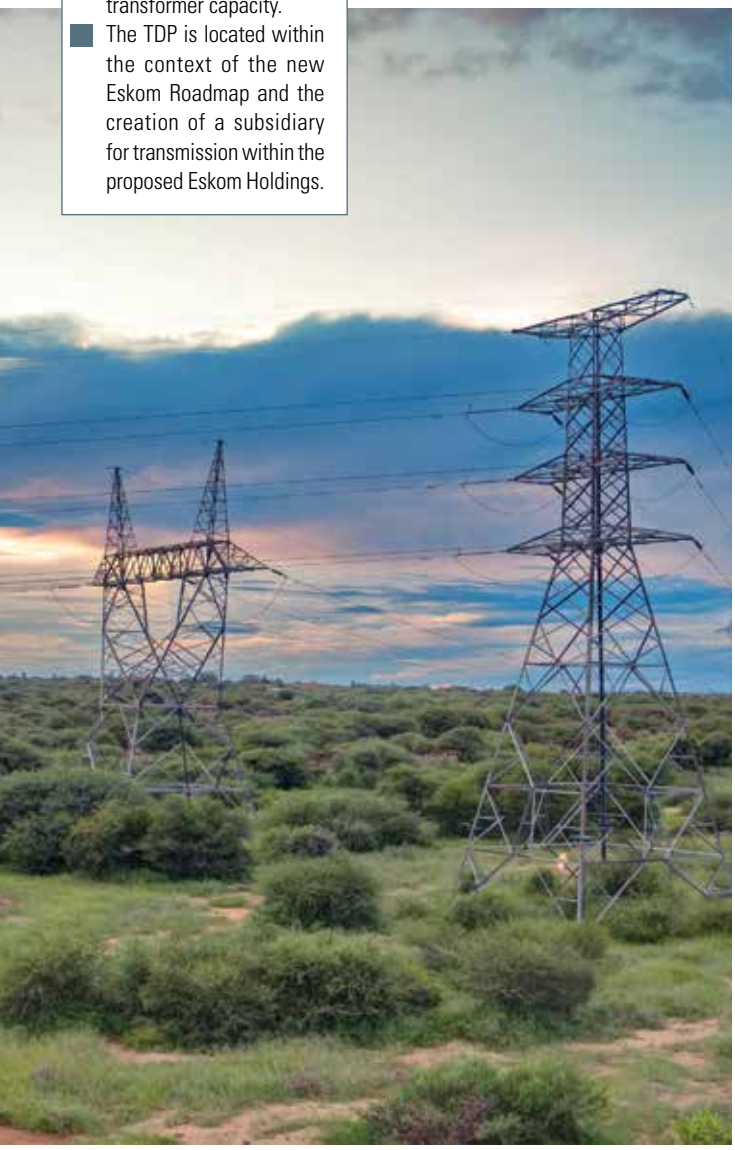
A RFID tag installed on pedestrians' cap lamps alerts them when they enter a danger zone.

Eskom shares its **Transmission Development** Plan 2020 to 2029

AT A GLANCE

- As part of the TDP 2020 to 2029, Eskom plans to increase its transmission infrastructure by about 4 800 km of extra high voltage transmission lines and 35 000 MVA of transformer capacity.
- The TDP is located within the context of the new Eskom Roadmap and the creation of a subsidiary for transmission within the proposed Eskom Holdings.

At the end of October 2019 Eskom shared its Transmission Development Plan (TDP) for the period 2020 to 2029 with various stakeholders at a public forum in Midrand. This is one of Eskom's Transmission Licence requirements, as issued by the National Energy Regulator of South Africa (Nersa), which requires Eskom to publish a TDP annually.



The presentation of the plan at a public forum is part of a consultative process where industry, various business sectors, local government and other infrastructure development partners, have the opportunity to influence the long-term development plan for the transmission system.

Segomoco Scheppers, Group Executive for Transmission said, "Some adjustments have been made to the TDP since its last publication in 2018. These include the re-phasing of capital investment in transmission projects to align with the project execution timelines associated with servitude acquisitions and current available funding."

Reporting on progress through 2019, Scheppers noted significant steps taken in the establishment of a transmission network to enable the successful connection of additional generation from Medupi and Kusile to the national grid. In addition, about 379 km of lines and 540 MVA of transformer capacity were successfully commissioned in the 2019 financial year.

A number of transmission substations and transformer capacity enhancement projects were commissioned in support of the Renewable Energy Independent Power Producer Procurement (REIPPP) Programme Bid Windows 1 to 3. This saw the number of connected projects increasing to 67, totalling 4 041 MW which was in operation by July 2019.

As part of the TDP for the period 2020 to 2029, Eskom plans to increase its transmission infrastructure by approximately 4 800 km of extra high voltage transmission lines and 35 000 MVA of transformer capacity over the next 10 years. This is part of Eskom's commitment to capital investment in infrastructure and compliance with the South African Grid Code, which sets out the essential requirements for a reliable and efficient transmission system.

Scheppers highlighted that the Transmission Development Plan is located within the context of the new Eskom Roadmap and the creation of a subsidiary for transmission within the proposed Eskom Holdings.

A **new roadmap** for Eskom

Minister of Public Enterprises Pravin Gordhan released the *Roadmap for Eskom in a Reformed Electricity Supply Industry* a few days before the TDP was presented and following the release in mid-October of South Africa's new Integrated Resource Plan (IRP 2019) by the Minister of Minerals & Energy Gwede Manatashe.

The new Roadmap for Eskom relates to President Cyril Ramaphosa's announcement in his State of the Nation address in February, that government planned to split Eskom into three operating divisions: Generation, Transmission and Distribution.

Prepared by DPE in consultation with industry experts and others, the new Roadmap for Eskom is a special paper which sets out the bold steps to be taken to fundamentally restructure Eskom and the electricity supply industry, to make it more efficient and more competitive, and to set Eskom on a new path of sustainability for the benefit of all South Africans for generations to come.

Briefing the media on the release of the special paper, Minister Gordhan reiterated that Eskom cannot remain as it is. "Energy is absolutely crucial to the economy, to businesses and to households in South Africa," he said. "The country needs reliable and affordable electricity."

Reinforcing the point that energy security is crucial for inclusive economic growth, the special paper also acknowledges that South Africa is blessed with an abundance of energy sources with which to drive economic growth and social development and benefit all its people.

The Executive Summary of the Eskom Roadmap identifies two critical factors to the utility's and the country's progress: as important as electricity supply security is pricing to promote the competitiveness of the SA economy and to bolster industrialisation. Electricity supply at the lowest possible cost is key to the country's industrialisation and job creation efforts as it will enable South Africa to compete more strongly in the global economy. Lowering the cost of electricity is also important in decreasing the general cost of living.

The summary cites specific factors as drivers for change in the energy sector that will shape the future of electricity supply in SA. These include:

- The transition from the existing dependence on fossil fuels to the mix of electricity energy sources as reflected in the IRP 2019;
- The restructuring of Eskom into Eskom Holdings, with three new subsidiaries: Generation, Transmission and Distribution;
- An intense focus on radically improving the current operations and eliminating inefficiencies in generation;
- A requirement for greater transparency in the governance of Eskom Holdings and the subsidiaries;
- A rigorous approach to cutting wasteful costs, optimising revenue and resolving the debt burden; and
- A just transition involving all stakeholders to ensure sustainable livelihoods for workers and communities.

IRP 2019 sets out the energy mix and generation capacity needed for the next 10 years, to 2029, and incorporates a significant commitment to the development of renewable energy sources and to systematically reduce carbon emissions from the power generation sector, even as coal remains the predominant energy supply source for the country.

Transmission

In terms of the planned restructuring of Eskom, the formation of a transmission entity under Eskom Holdings is intended to foster a competitive market and encourage the use of diverse sources of energy.

AT A GLANCE

- The new roadmap for Eskom reinforces the point that reliable and affordable electricity is crucial for inclusive economic growth in South Africa.
- Key drivers for change in the energy sector include, among others, the transition from the existing dependence on fossil fuels to the mix of electricity energy sources reflected in the IRP 2019, the restructuring of Eskom, and the need to ensure a just transition.

Generation

With regard to generation, consideration is being given to creating two or more generation subsidiaries to introduce intra-company competition and drive efficiencies. This will also include Eskom's participation in renewables.

Currently Eskom generates power from 15 or 16 power stations. Gordhan said, retaining its current fleet, it is envisaged that each power station will have a power purchase agreement – per plant – with the transmission subsidiary.

"What Eskom lacks as a monopoly is competition," Gordhan said. "As a result, we do not get the most effective pricing on the generation side of supply. The proposal that government will be exploring with Eskom is the creation of two or three clusters of coal-powered plants, with five or six power stations in each cluster. Each cluster will act as a business unit and that business must produce power as cost-effectively as possible so that businesses and consumers get the lowest possible price available." he said. "This kind of intra-company competition is good for business, spurring greater efficiencies, and it is good for consumers of electricity – as businesses, or households."

Distribution

The future distribution model will take into account municipalities' reliance on electricity as a significant source of revenue. However, the paper notes that many municipalities do not have the technical capacity to reticulate electricity, even though this is a constitutional mandate for municipalities.

The new Roadmap for Eskom identifies four key elements critical to resolving the utility's financial challenges: significantly improving operations; cutting costs; increasing revenue collection; and managing debt.

It says the utility has already initiated discussions with coal producers and participants in the renewables programme to reduce their burden on Eskom. Furthermore, there is an ongoing dialogue with labour and business to implement a just transition that can ensure minimal impact on communities and workers affected by the restructuring of Eskom. Partnerships between government, labour, civil society and business, as agreed to at NEDLAC through the Presidential Working Group on Jobs, will support the just transition.

The actionable steps set out in the roadmap to mitigate electricity supply risks and to put Eskom and the industry on a new path include the following:

- Immediately establish a transmission subsidiary within Eskom Holdings (this to be in place by 30th March 2020) and complete the current planning for the establishment of the generation subsidiaries;
- Eskom to appoint a new executive to drive the implementation of the transformational plan;
- Reinforce the existing Eskom transformation team with the necessary skills;
- Establish a separate Eskom transformation unit reporting directly to the Board;
- Strengthen the Board and appoint a new CEO (within the coming weeks, at the time of the release of the special paper);
- Radically improve operations, including maintenance of generation plant, through strict oversight and consequence management; and
- Introduce radical cost-saving initiatives including renegotiation of coal and IPP contracts.

The roadmap indicates that appropriate structures and processes are being put in place to ensure the effective implementation of the plan. This will demand higher levels of accountability and transparency from Eskom.

The minister said, while some specific deadlines are already in place, the reform process will be implemented over several years and will ensure that South Africa has an electricity supply system that enables it to compete in and respond to a rapidly evolving world.

For more information visit:
http://www.eskom.co.za or www.dpe.gov.za

Turnkey containerised substation for DRC mine

Innovative and fit-for-purpose design secured WEG Automation Africa, formerly Shaw Controls, the contract for a containerised substation and control room for a remote tin mine in the Democratic Republic of Congo.

According to Tyrone Willemse, Business Development Consultant - Projects and Contracts - at WEG Automation Africa, the isolated location of the mine and challenging logistics made the modular solution ideal. The substations are each housed in a six-metre-high cube container. A total of 14 units were supplied, comprising MV rooms and LV rooms.

Willemse says, "The units' dimensions and robustness had to allow for a long journey, including a very difficult 200 kilometre stretch of road to reach the mine site.

"Every part of the process plant has its own designated MCC that provides electrical power and control for areas including the primary crushing circuit, the plant feed, regrind mill, tailings thickener, and the product dewatering and handling circuits."

In addition to meeting safety compliance regulations, the design includes three-way locking systems, LED lighting, fire detection systems and a safety interlock to the fire system for air conditioners. Backup power supply is provided to all the exit lighting. To ensure easy cable entry, glanding plates were carefully located not to overlap with the container's support beams.

"Working closely with the engineering house, careful, upfront planning ensured nothing was overlooked," Willemse says. "In the design, full consideration was given to the placement of elements like platforms, walkways, doors, viewing windows and air conditioning units. We also took responsibility for the logistics of getting everything to site."

This turnkey solution demonstrates WEG Automation Africa's containerised substation design and engineering capability and its full local manufacturing capacity. Willemse highlights that this lifts it above other MCC manufacturers or assemblers. The containerised solution comes with a full data pack, quality control documentation and an operation and maintenance manual in accordance with ISO 9001.

"With our expertise, capacity and experience of working in Africa, we were able to reduce risk and turnaround time by tackling the entire contract in-house," Willemse says. "The way we work and our facilities enabled us to carry out extensive testing and cold commissioning and gave the mine peace of mind that the unit would function as required when it arrived on site."

For more information visit Zest WEG Group: www.zestweg.com

Electrical installation in the MCC 600 container. Every part of the process plant has its own designated MCC.

Marthinusen & Coutts invests in its Zambian facility

A new 435 m² machine shop workshop and transformer department at Marthinusen & Coutts' facility in Kitwe, Zambia, will further improve the quality and turnaround time of its services in the region.

Marthinusen & Coutts' facility in Kitwe, Zambia.

According to Marthinusen & Coutts Zambia General Manager Eugene Lottering, the commissioning of the machine shop workshop in January this year created significant space in the 1 700 m² main workshop, allowing for the investment in a transformer department.

"We now have a dedicated factory for machining work-pieces for the main shop," says Lottering. "The Marthinusen & Coutts head office in Johannesburg plays a key role in our operations, sending its machine shop foreman to provide training. This enables us to upgrade local Zambian machining skills on a continual basis."

The division's machine shop facility boasts five machining lathes, two milling machines and a submerged arc welding machine. It also has a 50-tonne horizontal press and rotor binding machine. All equipment operates under two 6.3-tonne jib cranes.

"Our transformer department has allowed us to enter the market in transformer repairs. The facility is equipped with a 20-tonne overhead crane to lift larger transformers," he says.

The facility is also equipped with a new coil machine, ratio tester, an oil purification machine and a dedicated oven.

New JVC to manufacture hollow core insulators in India

Grasim Industries Limited (Grasim) and Maschinenfabrik Reinhausen GmbH (MR) of Germany have formed a joint venture company (JVC) in India for the manufacture and sale of composite hollow core insulators (CHCI) to serve the power transmission and distribution industry globally. The JVC, Aditya Birla Power Composites Limited (ABPCL), will set up a state-of-the-art CHCI manufacturing plant at Halol, Gujarat, India.

ABPCL brings together Aditya Birla Insulators – a unit of Grasim and the third largest global porcelain insulator player – and Reinhausen Power Composites – a unit of MR and the second largest hollow composite insulator player globally – with over five decades of combined experience in the insulator industry.

The JVC will build a fully integrated composite hollow core insulators plant at Halol, bringing the latest technology for composite hollow insulators from Europe. It will serve the insulator requirements of Indian and global OEMs in the power equipment industry, helping them to enhance their product proposition for transmission and distribution utilities worldwide.

The fastest growing segment of insulators, composite hollow core insulators improve the performance and safety of power equipment. The new facility will be the first such large scale plant for this range of products in India and will be the largest such plant outside of China.

Mr Kalyan Ram Madabhushi, CEO - Global Chemicals and Group Business Head - Fertilisers and Insulators, Aditya Birla Group, says, "As an insulating solutions provider to the power industry for over 50 years, Grasim sees this venture as a natural next step and we are happy to partner with MR, the global quality leader in this segment. Through cutting-edge technology and world class manufacturing, this JV will offer high-end competitive, innovative and sustainable solutions to our customers globally, and it reaffirms our commitment to 'Make-in-India to serve the world'."

Dr Nicolas Maier-Scheubeck, CEO of the Reinhausen Group, says, "We look forward to expanding our presence in India, which is an attractive market and a very competitive location for manufacturing such a high quality product. We are delighted to partner with such a large and reputed group for this venture, sharing our focus on quality and customer performance."

For more information visit Maschinenfabrik Reinhausen www.reinhausen.com

Composite hollow core insulators for the highest mechanical and electrical requirements. (Photo Credit: RPC)

Marthinusen & Coutts, a division of ACTOM, has already successfully overhauled transformers for a number of opencast mines. Projects have included a 10 MVA unit, two 5 MVA units and a 3 MVA unit. Working in collaboration with M&C Johannesburg has ensured quality standards are maintained while local transformer repair skills are also being developed.

"We have established a Level 3 maintenance site services team to provide on-site electro-mechanical assistance to customers, including on-site repairs, maintenance and testing," Lottering adds.

Significant previous investments in the division's Kitwe workshop have included a 12-tonne balancing machine, a vacuum pressure impregnation (VPI) plant, burn-off and curing ovens, and a fan test column. There is also an ac and dc test facility equipped with power analyser, surge comparison tester, core flux tester and high voltage pressure tester.

"Our ongoing investment in the region enables us to provide customers with a one-stop electro-mechanical repair facility for alternators, generators, motors and transformers, as well as mechanical equipment," Lottering says. "This means shorter lead times and less transportation risk, while benefitting the Zambian economy."

For more information visit Marthinusen & Coutts: www.mandc.co.za

A new 435 m² machine shop workshop will further improve turnaround time.

Dry-type transformers move to mainstream

With local specialist Trafo Power Solutions installing a range of sizes across various sectors, the uptake of dry-type transformers in South Africa is now well beyond 'niche' applications.

David Claassen, Managing Director of Trafo Power Solutions says, "In recent months, we have been involved in projects ranging from small 50 kVA low voltage lighting transformers, up to 4.5 MVA medium voltage customised units. These have been installed in healthcare facilities, commercial buildings, education institutions, mines and data centres, as well as at solar energy plants."

Among its recent contracts, the company has supplied a number of lighting transformers. It has also provided outdoor instrument transformers to facilitate measurement of voltage on overhead lines. The cast-resin voltage transformers (VTs) typically have 33 kV, 22 kV and 11 kV primaries with 110 V secondaries, with between 50 VA and 500 VA burden.

"These are substantially lighter than their oil-cooled equivalents and are safer because of the absence of oil in their design," Claassen says.

In the mining sector, a recent contract involved the installation of 200 kVA dry-type transformers. For this corrosive environment a high ingress protection (IP) rating was applied. Claassen adds that a range of materials and paint can also be specified by the customer to provide for higher corrosion protection.

Data centres are a fast growing sector in the context of the country's digital economy, and Trafo Power Solutions supports this sector with its cast-resin transformers. The company recently delivered and cold-commissioned two 2 MVA units for a data centre in Cape Town.

"These facilities require the highest levels of reliability and protection for their electrical and electronic networks," Claassen says. "The windings and cores of our units were designed for a K factor of 13, given the high non-linear load. An electrostatic shield was also installed, along with surge protection of the highest order."

He adds that there was substantial time pressure to complete the contract, and Trafo Power Solutions' flexibility and responsiveness ensured on-time delivery.

At three small-scale solar plants, the company is providing three 800 kVA transformers which will step up power from 400 V to 22 kV. These applications involve a solar inverter for the 100% non-linear load, as well as an electrostatic shield between the primary and secondary windings.

Claassen emphasises that the business prides itself on the level of application engineering for each customer's specific requirements. "We understand what we are supplying and the risks faced by the customer and we design the solution accordingly," he says. "Industry is certainly showing faith that dry-type transformers can be applied in a growing range of applications."

For more information visit Trafo Power Solutions: www.trafo.co.za

David Claassen, Managing Director of Trafo Power Solutions, in front of a 10 MVA cast resin transformer, ideal for high power demands.

A specialised outdoor application transformer with special protection against water and solid objects.

Cast-resin transformers for Wits power upgrade

Trafo Power Solutions also recently supplied four purpose-designed dry-type transformers to the University of Witwatersrand (Wits) as part of the institution's electrical infrastructure upgrades on its Braamfontein and Parktown campuses.

Trafo Power Solutions Managing Director, David Claassen, says Wits decided to replace the original oil-cooled transformers with the dry-type, cast-resin transformers which are safer and more environmentally-friendly due to the absence of oil in the system.

"The high safety factor associated with dry-type transformers has an impact on flexibility and cost," says Claassen.

"They offer the user more flexibility in terms of where the units are installed, as they can be placed indoors, in basements or in other confined spaces for convenience. This also means the cost of building special infrastructure for outside installations – a requirement of oil-cooled transformers – can be avoided."

Claassen highlights that Trafo Power Solutions was closely involved in this project from the proposal stage, providing the necessary application engineering to ensure the appropriate design for the generator company responsible.

"As specialists in transformer technology, our expertise is not just in the product that we are installing but also in understanding the bigger picture – the infrastructure requirements as a whole," he says. "Any successful installation is a close collaboration between Trafo Power Solutions, the engineering company, the consultants and the contractors to ensure the final result is fit for purpose and serves the customer's need.

"With the growing installed base of dry-type transformers in the global marketplace, the price differential between this design and that of conventional transformers has become insignificant. This has opened the door for users to take advantage of the benefits of dry-type transformers," he says.

For more information contact Trafo Power Solutions. Visit: www.trafo.co.za

The intelligent utility of the future

For years, technology has promised to revolutionise the power sector. While smart grids have been implemented in many countries, devices within the Internet of Things (IoT) and digital control solutions are the enablers for the intelligent utility.

Dr Cathy Pickering, Solution Architect at FuseForward, says the intelligent utility of the future makes power generation, distribution and management more responsive to the needs of the communities it serves. The intelligent utility of the future will draw more power from smaller, more agile renewable energy sources.

"The utility of the future, the intelligent utility, will be made up of centralised, regional, community and home power plants. The addition and integration of a multitude of smaller plants will not only ensure that capacity grows alongside the development of the communities that need to be serviced, but that those communities will get more consistent and reliable power. The cost-saving potential for utilities is huge, from a distribution and a generation perspective," she explains.

"The intelligent utility can be thought of as two interconnected systems: Intelligent dynamic power generation and distribution systems, and a distributed cloud-based grid management system – both enabled by IoT. The IoT devices continually feed data into the cloud-based grid management system. This information can be analysed in real-time to provide automated control of the system. For example, predictive algorithms could be used to increase or decrease the power generated based on predicted demand."

While this vision might seem some time away from becoming a reality, Pickering says that the intelligent utility is already in development. "One of the research projects we are involved in has already established the effectiveness of the conceptual model, and is showing good results in dynamic control."

Working with academic institutions in Canada, FuseForward has set up the Intelligent Systems Research Network. The network involves professionals with an interest in the application of big data in various areas, and is actively working to develop intelligent IoT and big data solutions that bridge the gap between academia, industry and technology.

The network's current research activities cover various aspects of analytics for industrial campuses and building portfolios, including streaming data management, real-time facility analytics, and automated control. A current research project focuses on applying artificial intelligence (AI) and machine learning (ML) to energy management on a university campus in Canada, and the development of algorithms and AI integration for deep learning and integrating user behaviour.

"The research and predictive models developed so far have resulted in the decrease in the use of energy by the HVAC systems and 30% power savings on the university campus. The research involves calculating dynamic set points and providing dynamic control of the HVAC systems using machine learning methods," Pickering says.

"The smart campus research and the conceptual model being developed inform the intelligent utility research and its development. The outcome of the smart campus research will assist power utilities in getting started with the intelligent utility. The model requires that a distribution management system is overlaid on the power distribution grid. Further research is under way regarding methods to deal with the dynamic power supply, how to govern the distribution of power and optimise its usage."

She adds that over and above the technology, there are a number of other factors that need to be taken into consideration in the implementation of the intelligent utility, including regulatory and financial considerations. "As new technologies become more mainstream, and as an increasing percentage of power is generated from renewable sources, the benefits of the intelligent utility will far outweigh any potential challenges. The intelligence to predict demand and provision as required is a capability that utilities currently don't have, and that alone is enough to start the shift to the utility of the future," Pickering concludes.

FuseForward is an Advanced Technology Partner in the Amazon Web Services (AWS) Partner Network (APN) that provides secure cloud environments, AWS managed services, and technology solutions for public sector and enterprise customers. FuseForward serves customers around the globe through its offices in North America, Europe and South Africa.

For more information visit: www.fuseforward.com

Solar PV installation training

South Africa is regarded as having one of the best solar resources in the world. On average, most areas of the country get close to 3 000 hours of sunshine a year, which equates to about 4.5 to 6.5 kWh/m^2 of solar radiation a day that could be converted into electricity.

For businesses, harnessing this resource not only improves the bottom line by reducing electricity costs (where tariffs are expected to rise substantially), it also frees them from relying on the grid and harmful and expensive diesel power generation alternatives. As a result, they can reduce their carbon footprint and progress towards achieving corporate sustainability goals.

Dennis du Plooy, Electrical Consultant at Resolution Circle, says, "With regard to energy supply, companies that harness solar energy avoid the risk of struggling to operate or losing time and money during power outages. For a factory that works with machinery, a lot of money is lost when there is no electricity. So the cost of downtime often outweighs the cost of installing a solar PV system."

In the industrial sector, "businesses need to harness the maximum power supply during their productive hours – that is when everyone is at work," says du Plooy.

The main advantage of having a solar system is where the self-generated solar electricity is fed directly into the building or facility, especially during peak hours, rather than into the grid. Industry has realised just how economically viable solar is when it is supplied directly to the distribution board – and is available when people are at work during peak hours.

"The agile workforce of today is also allowing for this system, where outside of the sun's peak, people work remotely, and only get to the office when the sun is at its peak," he says.

"Companies investing in solar energy can also make use of intelligent energy management systems that will either store excess energy for use during off-peak hours or feed it back into the grid. If a business generates more electricity than it consumes, that excess can be fed back into the national energy supply system, and the business can earn credits from the city or municipality for this electricity."

As a technical training hub, Resolution Circle offers a solar PV installation short learning programme and is passionate about energy efficiency management. Electrical engineering students who are part of its P2 Work Integrated Learning Programme have implemented a project they dubbed #Sunny18 – in which they developed a grid-tied system that works with micro-inverters instead of string inverters, which are normally used in grid-tied systems. The system can be used as a power backup for an office space that is not connected to an uninterruptible power supply.

Resolution Circle is a University of Johannesburg (UJ) initiative, founded in 2012, and is funded by the National Skills Fund (NSF) and UJ. The company acts as a bridge between industry and communities by offering short learning programmes, workshop-based learning and experiential training programmes that are applicable to the ever-changing world of engineering, engineering technology and artisanship.

Its main focus for the past five years has been to provide technical training for National Diploma work-integrated students. More than 2 000 National Diploma in Engineering students from the country's universities of technology completed the P1 and P2 Work Integrated Learning (WIL) programme as part of their university curriculum at the Resolution Circle facilities.

Through its Super Solar School it offers workshop-based training on the design and installation of solar PV systems. In this regard it has trained over 300 electricians. The company recently started to design and install large solar PV systems and it won tenders to install just over 1 MW of solar PV systems in the Kruger National Park.

Resolution Circle also runs short learning programmes in CNC programming, fibre optics, Internet of Things (IoT), and PLC installation. Each of the courses is credit-bearing and geared towards the logbook and qualification criteria of the various institutions of learning that it serves. It also offers foundational and Work Integrated Learning (WIL) technical training for TVET students and pre-matriculants in traditional trades such as boiler making, electrical, carpentry and brick laying.

For more information visit:
http://www.resolutioncircle.co.za

As well as providing work integrated learning for technical students across a number of skills streams, Resolution Circle offers a short learning programme on solar PV installation.

Data management a prerequisite for analytics and security

Hemant Harie, Managing Director Gabsten Technologies

McKinsey predicts that by 2030, growth in global petrochemical demand may slow from the 3.6% seen over the past decade to between 2.0% and 3.0%. With this outlook, the McKinsey report further explains that as different trends come to bear on the sector, the industry will face a new set of challenges – one of these being the impact of digital and advanced analytics on operating models and markets. However, in highly regulated industries like petrochemicals, where large multinational corporations are subject to data laws from numerous countries in addition to this now apparent need for advanced analytics, effective data management is a complication all on its own. Meeting the increased demand for access to data, compliance and maximum uptime will be important in ensuring business operations are not disrupted. As 2030 approaches, rigorous processes must be followed and effective solutions implemented to ensure data management supports business decision making and, more importantly, business continuity.

In South Africa the petrochemical industry contributes about 5% of Gross Domestic Product (GDP) and accounts for 25% of national manufacturing sales. As in any other industry, data is leveraged extensively to sustain and grow these operations in an already challenged economy. Therefore, petrochemical organisations need to make a number of decisions around data management, including where the data resides and how long it is to be kept for, as well as what should be done with the data following its expiry. This firstly requires that the organisations know what data they have and where it is located, so that accurate data retention and storage strategies are implemented without risk to the business.

The sheer volume of data generated by various divisions of an organisation across geographies, as well as the requirement for compliance with a multitude of international laws, makes enterprise level data management tools essential. This is particularly important when data management is decentralised to individual country and branch operations.

With the added pressure of digitalisation and need for advanced data analytics, the amount of data being generated will continue to increase, and so too will the need for data management.

However, data management has two layers, specifically: data protection and data storage management. Data protection ensures that data is backed up and protected against threats like ransomware and can be recovered in the event of a loss or disaster. The storage management component is critical to control spiralling data costs. It simply is not possible to store everything forever. Capacity, cost and infrastructure all become extremely cumbersome and complex without data management. Archiving and storage management strategies need to be driven by the requirements of the business, and continue to adhere to regulatory requirements. While tools are readily available for cloud as an option, this needs to be carefully considered in terms of the full cost and return on investment, especially around data recovery and egress from the cloud.

Considering the complexities surrounding data management, having the right partner is essential. Inferior data management can lead to a false sense of security that data is protected and managed, when in reality businesses may be unaware of risks that exist. Experience is the best tool to understand what potential vulnerabilities may exist and how to counter them. However, it is just as important to ensure a partner is evolving with the IT industry and is an industry recognised expert in the type of storage solution and management options best suited to the business. Reputable providers will provide a full costing and scalability analysis so that organisations can make an informed choice about the best data management solution for them.

Without effective data management and protection, organisations in the petrochemical industry may fall victim to data loss. These organisations then wouldn't be able to analyse necessary information to sustain and strengthen their operations and outputs. With experts now seeing a change in operational performance, as companies boost yield, energy, and throughput, reduce downtime, and improve commercial margins by applying advanced analytics to operations, maintenance, and commercial processes – protecting and managing data is more important than ever.

Moreover, with the predicted decline in demand for petrochemicals, staying ahead of the game through sound analytics is imperative as we head towards 2030. Partnering with an experienced and evolutionary data management professional can help to mitigate these risks and ensure data is always available when and where it is needed.

For more information visit: http://www.gabsten.co.za/

Hemant Harie, MD, Gabsten Technologies.

Reference

McKinsey & Company, February 2018. https://www.mckinsey.com/industries/chemicals/our-insights/petrochemicals-2030-reinventing-the-way-to-win-in-a-changing-industry

Solar power for livestock feed from the bush

Amid extreme drought conditions in Namibia, farmers are forced to innovate to ensure the survival of their livestock. A recent study[1] shows that the production of animal feed from encroacher bush has transformational potential for agriculture in a country where 30 million hectares of farmland are affected by bush encroachment. Turning a threat into a valuable biomass resource, bush-based animal feed production has now become a viable option for Namibian farmers with new 'Bos-tot-Kos' methods and machinery.

The downside to this solution is that it is electricity-intensive, and that can be the stumbling block for farmers in remote locations with expensive and/or limited grid power supply. Solar energy company SolarSaver is providing a rent-to-own solution to address this. The company recently installed a 52 kWp off-grid solar PV system with 160 solar panels, batteries and a backup generator at Farm Otjomasso North (Bronkhorst), a cattle and sheep farm in Hochveld. The farm, located 50 kms from the nearest power line, now uses the off-grid solar system to power the Bos-tot-Kos machinery the farm installed to produce livestock feed from the bush.

Stefan Kleemann from SolarSaver says there is huge potential to provide farmers with solar power for this type of machinery and other needs in the most remote locations. "The energy we can harness from Namibia's abundant sunshine provides enough power for the machinery required. This significantly enhances the sustainability of farming operations in these areas," says Kleeman. "Solar installations enable remote farms like Farm Otjomasso North (Bronkhorst) to use the machinery they need at a much lower cost than diesel generators. For example, the off-grid solar battery system at Bronkhorst is operating at N$ 25 000 a month, while operating with diesel generators would cost close to double that."

Kleeman says transporting these complex off-grid systems to remote locations and ensuring they continue to operate most effectively can be a challenge, SolarSaver has therefore developed an innovative containerised solution to solve these problems. "The containerisation of the system on the farm is a very neat solution which allows the panels to operate at maximum capacity. Built-in air-conditioning ensures the temperature in the container is kept at 25 degrees for optimal performance of the equipment."

In terms of affordability, both Bos-tot-Kos and SolarSaver offer rental options to counteract the usually prohibitive capital costs associated with these systems. SolarSaver installs the solar photovoltaic system at no capital outlay for the farmer. "We offer clients solar solutions on a rent-to-own basis. Customised systems are designed and installed free-of-charge, and clients then only pay against the actual performance of the system, benefiting from the cheaper, greener power that is produced," says Kleeman. Importantly, SolarSaver also takes care of ongoing monitoring, maintenance and insurance. "With farmers facing major challenges, this at least offers a capex-free, hassle-free way to harness solar power," he says.

Bush encroachment hampers agricultural productivity and threatens the livelihoods of many Namibians. The shortage of grass for livestock is a direct consequence and is intensified in times of drought. Despite the negative impacts, the encroacher bush is a huge biomass resource, estimated at about 200 to 300 million tonnes. Measures used to combat bush encroachment create positive opportunities for the Namibian economy, such as the use of the resource for electricity generation and value chain development in other sectors. De-bushing therefore offers the potential to increase agricultural productivity, economic growth, employment and energy security, without competing with food production.

1 Report: Encroacher Bush to Animal Feed - Viability of Bush Based Feed Production in Namibia (2017) – A research project of the Ministry of Agriculture, Water and Forestry (MAWF), Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) and United Nations Development Programme (UNDP) – Sustainable Management of Namibia's Forested Lands Project (NAFOLA).

For more information visit SolarSaver: https://www.solar-saver.net/

The off-grid solar PV system installed together with batteries and backup generator at Farm Otjomasso North (Bronkhorst) in Hochveld, Namibia, enables it to power the Bos-tot-Kos machinery.

DIARY DATES

Investing in African Mining Indaba 2020

3-6 February 2020
Cape Town International Convention Centre
The next edition of the African Mining Indaba will look at key issues facing the African mining industry in 2020 and beyond: addressing mining's impacts on the environment, opportunities to alleviate South Africa's heavy unemployment levels, and the potential for automation and digitalisation in mining operations, among others.
Visit https://www.miningindaba.com

Africa Energy Indaba

3-4 March 2020
Cape Town International Convention Centre,
Catalysing investment and business opportunities – Africa Energy Indaba brings together the continent's energy leaders around an agenda that influences energy policy for Africa, backed by strategic partnerships with the World Energy Council, the South African National Energy Association and the NEPAD Planning and Coordinating Agency.
Visit: www.africaenergyindaba.com

Hannover Messe 2020

20-24 April 2020
Hannover, Germany
The world's leading industrial technology show will focus on key trends in industrial transformation: Industrie 4.0, industrial security, artificial intelligence, lightweight construction, logistics 4.0, platform economics, carbon-free production.
Visit: https://www.hannovermesse.de/home

PowerGen Africa 2020

Co-located with African Utility Week
12-14 May
Cape Town International Convention Centre
African Utility Week is Africa's meeting place for the power, energy and water value chain. PowerGen Africa adds to the focus on generation technologies, transmission, distribution and metering, as well as new technologies such as energy storage, mini and micro grids, IoT and ICT systems.
Visit: https://www.powergenafrica.com/

Machine Tools Africa 2020

12-15 May 2020
Expo Centre, Nasrec, Johannesburg
High performance machine tools. Endorsed by the Machine Tools Merchants' Association of South Africa (MTMA). ***Visit: https://www.machinetoolsafrica.co.za/***

Electra Mining Africa

7-11 September 2020
Expo Centre, Nasrec, Johannesburg
A shared exhibition platform for the African mining, industrial, construction and electrical sectors.
Visit: https://www.electramining.co.za/

Your Global Automation Partner

TURCK | BANNER

Brain Gain!
HMI Panels and Block I/Os with CODESYS 3 PLC

CODESYS

TX700: Modern HMI/PLC compact devices with capacitive multitouch and gesture control enabled

TBEN-L-PLC: Rugged CODESYS v3 PLC for intelligent control concepts without cabinet

PG-V3: Programmable modular I/O systems with PROFINET, EtherNet/IP and Modbus TCP slave

Turck Banner (Pty) Ltd
130 Boeing Road East, Bedfordview, South Africa
+27 11 453 2468
sales@turckbanner.co.za

www.turckbanner.co.za

SEW EURODRIVE

Quality. Innovation. Efficiency.

Gear units and motors from SEW-EURODRIVE (Pty) Ltd have always set the trend and established new standards in drive technology. For this reason, the quality label "made by SEW" has become a hallmark of quality in the drive industry. Market-orientated products developed and manufactured in-house, as well as uncompromising quality, are the cornerstones of our success.

SEW-EURODRIVE – Driving the world

SEW EURODRIVE

SEW-EURODRIVE (Pty) Ltd
Eurodrive House
Cnr. Adcock Ingram & Aerodrome
Roads, Aeroton Ext 2
Johannesburg
P.O. Box 90004
Bertsham 2013
Tel: +27 11 248 7000
Fax: +27 11 248 7289
– www.sew-eurodrive.co.za

Cape Town Branch
Tel: +27 21 528 7600

Durban Branch
Tel: +27 31 902 3815

Nelspruit Branch
Tel: +27 13 752 8007

Port Elizabeth Branch
Tel: +27 41 372 2244/6