FEATURES:

- Industry 4.0 + IIoT
- Energy management + the industrial environment
- Measurement + instrumentation
- Safety of plant, equipment + people

10/2020

ELECTRICITY+CONTROL

Optical and Magnetic Absolute Encoders

ATI Systems
Committed to Quality

POSITAL
FRABA

www.atisystems.co.za

CROWN PUBLICATIONS

Netilion, IIoT Ecosystem

From sensors to digital services

Key facts

- Netilion, Endress+Hauser's IIoT Ecosystem allows intelligent and networked applications to be realized around the Industrial Internet of Things
- We currently have four Netilion Services available with Analytics, Health, Library and Value as well as two Netilion Smart Systems with Surface Water and Aquaculture
- Data security is ensured by using the most modern standards and through audition by independent third-party certification bodies

Sign up for free and use this QR-code

Contact us:
011 262 8000
info.sc.za@endress.com
www.endress.com

Endress+Hauser
People for Process Automation

energy + information in industry

Fraba programmable rotary encoders, available from ATI Systems, combine high performance and rugged durability. *(Read more on page 3.)*

Maintenance matters

Much of industry is up and running again. Much of it will never again be the same.

I have been intrigued by recent reports of the sudden and urgent need for what seems to be best described as emergency maintenance in various contexts. To be frank, I have little doubt that maintenance has been lacking in a number of different sectors over not just the past few months – but possibly some years.

In many instances maintenance is one of the first 'cuts' to be made. Furthermore, one hears tell of the view that 'if it ain't broke, don't fix it' – and so on. All interesting and partly humorous.

But maintenance *per se* is not about fixing 'broken' stuff – it is about ensuring things continue to operate reliably, and as they are intended to.

This applies not only in the sectors of our economy that I imagine many of you are thinking about right now – but equally in all our industries. However, we do need to acknowledge that we have particular challenges in the infrastructure space: whether it is power generation, water distribution, road or rail – we are found wanting in several respects.

The warning we must take from this is that maintenance is critical in all spheres. Each industrial plant requires regular and planned maintenance. This is a crucial element of improving the way we operate, and carry on operating.

There are numerous examples where maintenance plans can equally be used to optimise processes, or introduce far more energy-efficient – or simply efficient – systems and components.

I have a sense that now is a good time to reflect on the following: either this economy nosedives completely, or we (as we have had to do so many times in the past) dust ourselves off and really hope the leadership of the nation has a clear insight into what is needed to grow the economy – in the sense of growing wealth, rather than simply continuing to spread the misery.

I subscribe to the view that we will lurch back from the edge, rise again, and renew our commitment to being a dynamic and inclusive economy.

So consider where you can improve maintenance right now – but also have a close look at efficiencies, new technologies – and planning the next steps to becoming even more competitive on the assumption that we get through this severe setback.

The economy, much like education, is simply too important to be left in the hands of politicians. Now is as good a time as any to take ownership of the future and to improve the way we operate.

Maintenance – and ensuing your plant is reliable – is a key component of that. Cutting expenditure is fully understood, but keep an eye on the face as we deal with the nose. Let us not also find ourselves shocked by sudden system failures and unscheduled or emergency maintenance.

Ian

Ian Jandrell

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

Editor: *Leigh Darroll*
Design & Layout: *Darryl James*
Advertising Manager: *Heidi Jandrell*
Circulation: *Karen Smith*
Editorial Technical Director: *Ian Jandrell*
Publisher: *Karen Grant*
Deputy Publisher: *Wilhelm du Plessis*

Audited circulation: Quarter 2 (April-June) 2020
Total print and e-editions: 6527

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/electricity-control*

CROSS PLATFORM CONTENT INTEGRATION:
* Electricity+Control Magazine * Online Edition
* Bi-monthly Newsletter * Website* LinkedIn

Publisher of the year 2018 (Trade Publications)

Electricity+Control is supported by

CONTENTS

FEATURES

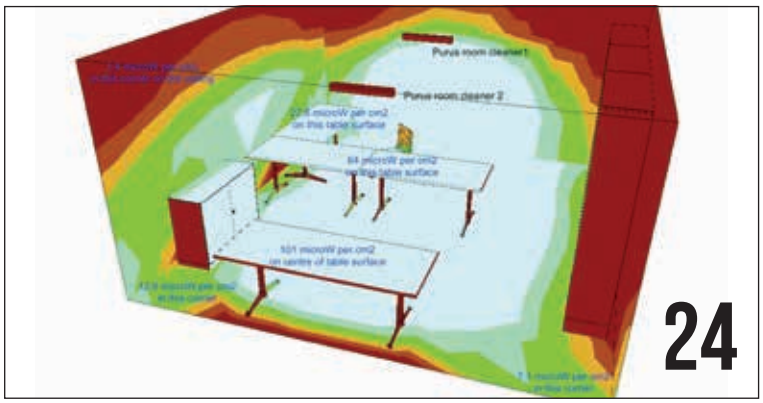
INDUSTRY 4.0 + IIOT

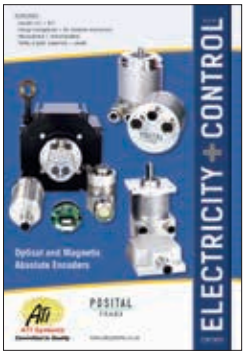
ENERGY MANAGEMENT + THE INDUSTRIAL ENVIRONMENT

MEASUREMENT + INSTRUMENTATION

SAFETY OF PLANT, EQUIPMENT + PEOPLE

REGULARS





Fraba programmable magnetic encoders

Incremental encoders are used in a wide range of motion and speed control applications, including all types of production machinery, material handling and mobile machinery. They generate an output signal each time the shaft rotates through a certain angle. The number of signals (pulses) per turn (PPR) defines the resolution of the encoder.

The Fraba programmable rotary encoders feature a unique combination of high performance and rugged durability. They are available in all the important shaft- and hollowshaft formats.

A new generation of electronic components elevate the new high performance magnetic encoders to the same level as optical encoders. Built around high-precision magnetic sensor technology, resolutions up to 16 384 pulses per turn are offered with excellent dynamic response. Fraba magnetic encoders feature industry-leading signal quality to ensure very reliable process control.

The magnetic technology gives a huge benefit to customers in terms of mechanical robustness compared to optical encoders. It can achieve a high shock rating of 300 g due to the contactless nature of the technology. Devices can be IP69K which makes them water- and dustproof.

Fraba encoders are small in size (36 mm OD) yet provide a resolution as high as 16 384 steps. Fraba has the smallest high resolution programmable encoders on the market, with a lot of features packed into a product that fits into the palm of your hand.

Fraba encoders are available in a large variety of mechanical configurations including, for example, with 36, 40, 48 and 58 mm flanges, and multiple shaft types in solid shaft and hollow shaft versions. Heavy duty shaft versions support a shaft load up to 180 n, and are available in aluminium and 316 stainless steel.

The pulses per revolution, pulse direction and output driver (TTL and Push-Pull) can be very easily set by using the Fraba UbiFast programming tool. Imagine replacing your complete stock of spare incremental encoders with a single device!

Fraba manufactures, in addition to incremental encoders, all important absolute encoder interface variants, inclinometers and cable extension position transducers.

ATI Systems carries a comprehensive range of Fraba encoders in stock. Staff at ATI will assist the client with the correct encoder for each application, be it a new application or a replacement device. Same day shipping is standard at ATI.

For more information contact ATI Systems.
Tel: +27 (0)11 383 8300
Email: wim@atisystems.co.za

From buffalo mozzarella to green energy

John Browett, General Manager, CLPA Europe

Maximising the use of agricultural by-products to reduce waste and improve sustainability has several positives, including reducing a business' environmental impact and creating a valuable profit opportunity. This is why Italian farm Roana invested in a biomass plant that uses livestock manure and other organic waste to generate energy.

To optimise its automation infrastructure, the farm required an advanced control network to monitor the anaerobic digestion process and maximise productivity. CC-Link IE Field provided the right solution, connecting a series of Mitsubishi Electric factory automation components with a flexible open industrial Ethernet solution delivering gigabit bandwidth.

Roana Zootechnical farm is in the countryside of Latina, Italy, and is home to about 1 100 water buffalo. Every day, the animals provide over three tonnes of milk, which is used to produce a celebrated buffalo mozzarella cheese. Along with product, the herd produces about 60 m^3 per day of useable livestock manure. Before this becomes fertiliser for Roana's agricultural fields, however, it can be used to produce bioenergy. The farm was interested in maximising the use of this by-product to have a positive impact on the environment and generate increased revenue for the business. Local renewable energy specialist ProgestAmbiente was chosen to build the green power plant.

Carmen Iemma, Co-owner of Roana, explains: "Roana has been interested in implementing a biomass plant for years. The project suggested by ProgestAmbiente was particularly appealing, as the company was able to tailor a solution that would address our commercial requirements and still fit with our existing operations and infrastructure."

Roana Zootechnical farm is in the countryside of Latina, Italy.

Roana's biomass power plant

The plant consists of scrapers and pipelines, collecting all the manure from the stables into a pre-treatment tank, which homogenises and equalises the material. This tank is connected to an anaerobic digester system equipped with submersible mixers. At this stage, different bacterial strains digest the biomass in an oxygen-free environment at temperatures similar to those in a buffalo's stomach. In this biochemical process, the bacteria break down complex organic substances, generating a methane-rich biogas.

The gas produced in the digester moves upwards, towards the dome, and is then directed to a gas treatment unit, where a thermal process helps to purify the gas, increasing the concentration of methane. The end product is sent to a gas-powered generator, which produces enough electricity to push power back to the grid.

The control of critical process parameters, such as temperature, gas pressure, in-feed rates and mixing within the digester, plays a crucial role in maximising the volume of methane produced and its purity. The sensitivity of the system and its coordination can make the difference between it being profitable or not, so responsive automation and network communications are key to the commercial success of the project.

Automation solutions

Michele Di Stefano, Project Manager at ProgestAmbiente, says, "One of the most important aspects for ProgestAmbiente is offering the best functional process equipment and operator tools, featuring state-of-the-art technologies and high reliability. In this case, we chose a combination of Mitsubishi Electric and CC-Link IE.

"We rely on Mitsubishi Electric's automation products and the CC-Link IE family of open industrial Ethernet technologies for our biogas production and water treatment

The farm invested in a biomass plant that uses livestock manure and other organic waste to generate energy.

projects. We believe the performance offered by these solutions is currently unmatched on the market."

To support Roana's biogas operations, CC-Link IE Field gigabit Ethernet connects a number of automation devices from Mitsubishi Electric to ensure high-performance communications. More precisely, the MAPS SCADA system is linked to a MELSEC Q series PLC. This is then connected to five inverters, from Mitsubishi Electric's energy-saving FR-F800 series, that regulate the functioning of all the electromechanical devices and components used in the process. As a result, operators have a comprehensive view of the entire plant and its processes in real time; they can adjust critical process parameters and develop predictive maintenance strategies.

Alberto Griffini, Product Manager at Mitsubishi Electric, comments, "Our main goal was to deliver a system that is highly functional and easy to use, maintain and expand. For example, as the plant develops and the volume of processed livestock manure increases, Roana could easily upgrade its system by installing a newer MELSEC iQ-R controller, which provides more advanced onboard features and supports a broader range of I/O modules. The networking solution is already very flexible and advanced so it effectively futureproofs the installation."

Network speed and openness

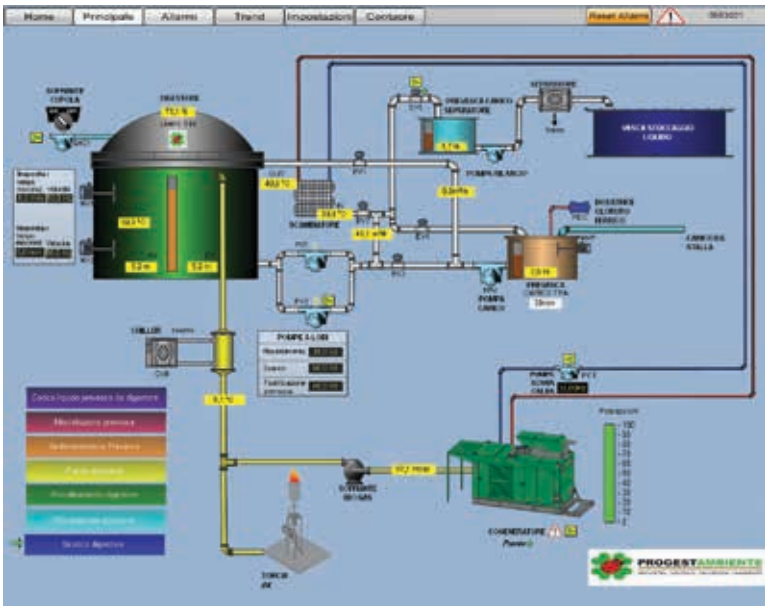
Key elements of CC-Link IE Field that helped implement the vision described by Griffini are the network technology's gigabit bandwidth and its openness. Di Stefano explains: "With CC-Link IE Field, Roana could leverage a high-speed system that provided the benefits of a fast response time as well as an infrastructure that can be easily modified and upgraded to address future needs."

By offering gigabit bandwidth, CC-Link technology can help processing plants, such as Roana, to make sure time-critical data is shared in a highly deterministic manner. CC-Link IE Field supports interconnectivity between 1 Gbit devices from multiple vendors so it allows the integrator to choose from more options.

Carmen Iemma says, "Using a reliable and responsive monitoring system and high-performance communications is particularly important for Roana, as it allows us to intervene promptly if anomalies are detected and so reduce downtime."

At a glance

- An advanced control and monitoring network was needed to optimise the automation of the new biomass energy generating plant at Roana.
- ProgestAmbiente chose a combination of Mitsubishi Electric automation components and CC-Link IE technologies.
- The networked automation system gives operators a comprehensive view of the plant and processes in real time.



The control system enables plant operators to maintain optimal operating conditions and maximise the amount of energy generated from agricultural waste.

By-product synergies

With the biomass power plant and its network infrastructure now operational, Roana can produce 2 400 kWh of electric energy every day. This is supplied to the national electrical grid, generating extra revenue of EUR 15 000 per month for Roana.

Iemma says, "We are very happy with the solution provided, as it clearly shows the benefits of shifting towards renewable energy and maximising by-product synergies. In particular, we appreciate the fact that the plant can manage itself autonomously, without requiring our staff to acquire new technical skills in order to control it. The system is intuitive and easy to use, helping all our operators to use it effectively."

Reducing the environmental impact of manufacturing and processing activities is a global priority and the CLPA is happy to play a role in helping businesses adopt more sustainable practices. By supporting Roana, the organisation can show how its open network technologies can address the needs of different industrial sectors. □

For more information visit: eu.cc-link.org

Making industrial data accessible

Siemens Digital Industries Software is leveraging the Mendix™ low-code application development platform to help customers across industries build contextual and customised solutions that enable data-driven decision-making processes.

With the general availability of Mendix Data Hub and new Mendix for Industrial Edge services, Siemens can help customers achieve an end-to-end view of their plants, factories, and systems and provide domain experts with actionable insights through solutions that have been developed with the right data from across the organisation. The Mendix platform extends the Xcelerator™ portfolio with the ability to build multi-experience apps and share data from any location, on any device, on any cloud or platform, enabling users to realise more quickly the benefits of digital transformation.

Derek Roos, Mendix CEO said, "Our vision is to offer our customers a technology to let them develop applications faster and more efficiently, and to extend Siemens' Xcelerator portfolio to help realise greater scalability and flexibility for our customers. As part of Siemens, we are expanding the Mendix platform to provide further value to our industrial customers by enabling them to access and use their data, be that on a factory floor, across systems of record, or in a field service context."

Data-driven decision-making on the factory floor

A key goal for digital transformation is factory automation, which can be slowed down by distance – both physical and organisational – between operational technology (OT) and organisations co-located at factory locations, and IT organisations housed at corporate headquarters. The new Mendix for Industrial Edge platform, introduced early September 2020, empowers factory operators to create custom applications on the Mendix low-code platform that run locally as Edge Apps, to collect data, have access to insights in near real-time and provide optimal user experience. The low-code platform is designed to overcome many of the complexities and expand the talent pool for IoT application development, further empowering OT leaders to address the most pressing issues in their environment with limited IT intervention. Business developers, domain engineers and plant operations staff can now create apps for Siemens Industrial Edge without programming skills. When combined with Siemens' MindSphere®, the industrial IoT as a service solution, and other Xcelerator cloud solutions, customers can quickly realise the benefits of a completely integrated edge to cloud experience.

The Mendix platform enables users to build apps more quickly and share data from any location, on any device.

Unlocking data from core systems

Disparate legacy systems containing data in various formats and heritage that supports complex physical models can challenge companies in providing developers and engineers secure access to the right data. To help organisations discover, understand, use, and curate data from across the enterprise, and employ it in software development, business intelligence, and other data-rich applications, Siemens introduced The Mendix Data Hub. In conjunction with the Mendix low-code development platform, the Data Hub can help organisations reduce application delivery time significantly, as developers no longer waste time searching for the right data, seeking the right data owner, minding API calls, and securing access to the data they need.

Initially, the Mendix Data Hub will connect to the most common industrial data sources, such as Teamcenter® software and SAP, with future releases expanding support for other common data services and databases, and industry-specific applications. The Data Hub can also be extended by eQ's eQube® Data-as-a-Service, as part of a newly expanded partnership between Siemens and eQ Technologic, with a rich set of over 60 smart connectors, providing support for industrial data and system integrations.

Siemens Digital Industries Software is driving transformation to enable a digital enterprise where engineering, manufacturing and electronics design meet tomorrow. The Xcelerator portfolio helps companies create and leverage digital twins that provide them with new insights, opportunities and levels of automation to drive innovation. □

For more information visit www.sw.siemens.com

New customer resource centre for electronics online

Mouser Electronics Inc., the authorised distributor with the widest selection of semiconductors and electronic components, has introduced its new Customer Resource Centre, which allows customers to take advantage of Mouser's online purchasing services and tools through a central hub containing everything customers need to optimise the purchasing process. Customers simply click the name of the tool they are looking for and view or request what they need.

From the new Customer Resource Centre, customers can access and learn how to view or track orders, request technical support and data sheets, or place orders via API or EDI through order automation. The easy-to-use hub helps Mouser customers quickly obtain more information for parts or any other assistance they require for purchasing.

Coby Kleinjan, Mouser's VP of Americas Customer Service and Sales, said, "Mouser continually assesses and improves its online resources to help buyers and engineers manage their product specifications and purchases. The new Customer Resource Centre on our website will help customers streamline the buying process as we strive to provide best-in-class service around the world."

The Customer Resource Centre houses a full suite of productivity tools from Mouser, including the FORTE intelligent BOM tool and the Price and Availability Assistant, as well as information on creating an account for easier online ordering.

Mouser Electronics is a Berkshire Hathaway company. As an authorised distributor of electronic components, it focuses on the rapid introduction of new products and technologies from its manufacturing partners for electronic design engineers and buyers, giving customers an edge and helping speed time to market. Over 800 semiconductor and electronic component manufacturers count on Mouser to help them introduce their products into the global marketplace. Customers can expect 100% certified, genuine products, fully traceable from each manufacturer.

The new Customer Resource Centre offers customers the services and tools they need to optimise the buying process.

For more information visit https://eu.mouser.com

Extracting value from factory floor data

As the implementation of Industry 4.0 and IIoT continues to grow, a huge amount of data becomes available: machine data, data from the production process and data relating to the manufactured product – Big Data from the factory floor.

Data is easily collected and stored, but in many cases the data pipeline stops there and little value is extracted from it. The data pipeline is often not completed in a way that enables the right people to gather value from it. This is a challenge. Just collecting and storing data is not enough to benefit the owner, or to monetise investments made in Industry 4.0 and IIoT infrastructure.

Getting maximum value out of the data and keeping an overview of data streams goes beyond standard statistical methods and tooling. Manual analysis and the creation of dashboards and reports can become complicated and they do not always show the right information at the right time, in the right way, to enable maintenance technicians, machine operators, or plant engineers to see at a glance what is going on and to be able to act on that. The routines implemented in a standard machine controller to observe the production process can detect current errors and problems but often not future problems, as the controllers might not be equipped to combine all available information and analyse it.

Most organisations are familiar with information technology (IT), but in the context of its relationship to operational technology (OT), IT refers to the application of network, storage, and compute resources to the generation, management, storage, and delivery of data throughout and between organisations.

OT related hardware and software is historically designed to do specific things: control heat, monitor mechanical performance, or trigger emergency shutoffs, for example. Typically, this is done through industrial control systems and supervisory control and data acquisition.

While IT and OT have historically functioned as separate aspects in most businesses, IT-OT convergence is changing that. Because IoT technology is taking assets not typically connected to the internet – such as assembly line machinery – and bringing them online, enterprises can now create new efficiencies by applying the intelligence of IT to the physical assets of OT systems.

The data mining process provides for valuable information to be extracted from multiple data streams.

Turning data into useful information is best done in collaboration between data scientists, who know how to tame the data, and domain experts in the manufacturing process, who know the story behind the data. Once data is transformed into information, solutions can be developed to deliver value from it.

Industrial data science is a fairly new discipline and there is no one-size-fits-all solution. Each application needs tailored data analysis and modelling to obtain the best results. Data scientists at Omron follow a standard approach, as shown in the figure above, to obtain the best project results and manage expectations. The approach is based on the CRISP-DM model (Cross-Industry Standard Process for Data Mining) which is widely used. This process provides for valuable information to be extracted from multiple data streams, analysed and presented in an accessible way.

For more information contact Omron Electronics.
Tel: +27 (0)11 579 2600
Email: info_sa@omron.com
Visit: www.industrial.omron.co.za

Clip-on indicator with Bluetooth and data logging

The new clip-on indicator monitors and logs process values in real time.

WIKA has introduced the new PR 4512 clip-on Bluetooth-enabled data logging and configuration tool for all PR 4000 and 9000 devices. This enables users to monitor live process values and diagnostic information on an iOS or Android device running the free PPS application – or to monitor these directly on the PR 4512 display.

The advanced data logging function includes time-stamped events using the built-in real-time clock. With its 100 MB onboard memory, the PR 4512 can log more than 2.75 million data points. For example, users can record 30 days of process data at one-second intervals. This makes it especially helpful for preventive maintenance.

Real-time process data can be analysed easily on-site by uploading it to an iOS or Android device. Off-site, users can view the data in .csv format for convenient analysis on a PC.

For more information contact WIKA Instruments
Tel: +27 (0)11 621 0000
Email: sales.za@wika.com
Visit: www.wika.co.za

Modicon M262 IIoT-ready controller

Schneider Electric, global specialist in the digital transformation of energy management and automation, has introduced the new Modicon M262 controller, IIoT-ready for logic and motion applications in the smart-machine era. It offers intuitive, scalable and reliable machine integration in the Industry 4.0 environment: machine to device, machine to human, machine to machine, machine to plant or machine directly to cloud.

The Modicon M262 Controller embeds cybersecurity features and encryption protocols to provide direct cloud connectivity and digital services via its two ready-to-work and independent embedded Ethernet ports.

Key benefits

- Connectivity: Up to 5 one-to-one independent Ethernet networks and cyber-secure cloud connectivity options for easy integration into the plant with open protocols, including OPC UA, PackML, and SQL, or to the cloud with MQTT, JSON or HTTPs requests (API).
- Efficiency: With 4 to 16 synchronised axes with scalable cycle time down to 1 ms and a 3 ns/inst processing speed independent from communication tasks, the Modicon M262 Controller responds to performance-demanding motion applications. It helps in simplifying machine architectures and field bus wiring, and with Machine Assistant (webserver technology), no software is needed to find devices on a network, or for commissioning and diagnostics.
- Flexibility: The Modicon M262 Controller also addresses logic application needs, as an 'all-in-one' motion controller, embedding all the features of Motion bus, encoder and touch probes. Safety can be modular or embedded. With the choice between optimised and performance I/O systems, the Modicon M262 Controller provides versatile architectures around EtherNet/IP and/or Sercos – all under one software application – Schneider Electric's EcoStruxure Machine Expert.
- Protection: With an embedded safety solution, the Modicon M262 Controller complies with the latest safety regulations up to SIL3. It offers embedded encrypted communication, network separation, Achilles certification and other cybersecurity features.

The new Modicon M262 Controller offers scalable and reliable machine integration in the Industry 4.0 environment.

The new controller is IIoT-ready, designed and delivered with intuitive direct cloud connectivity. No gateways are required. This enables OEMs to maximise profitability and optimise their time, from the design of applications to the commissioning of the machine.

Johannes von Aulock, Director of the Industrial Automation Business Unit at Schneider Electric South Africa, says, "With the world becoming more autonomous and connected the onus is on global technology companies like Schneider Electric to understand customers' requirements and develop innovative products that integrate into seamless solutions. With the launch of the M262 Schneider has done that, delivering an agile controller that is future adapted and meets the needs and requirements of machine builders, motion specialists and automation engineers, and using open protocols with cybersecurity embedded in its DNA. The applications for this unit are wide-ranging.

The Modicon M262 Controller is an integral part of Schneider Electric's EcoStruxureTM Machine, a complete architecture that brings powerful capabilities to smart machines. It can also be connected to EcoStruxure Machine Advisor, which allows OEMs to enable asset monitoring and predictive maintenance.

For more information contact Schneider Electric.
Email: za-enquiries@chneider-electric.com
Visit: www.se.com/za

Energy development in sub-Saharan Africa

Across Africa many countries are recognising that power supply systems need to evolve to incorporate more renewable energy, and energy management is becoming a priority.

Hitachi ABB Power Grids was officially established 1 July 2020 as a new global entity in the power sector. It sees the coming together of two long-established and reputable companies, each with their respective technology strengths and market reach. Leigh Darroll spoke to Malvin Naicker, newly appointed Managing Director for Hitachi ABB Power Grids - Sub-Saharan Africa, about the new company, its vision, and his mandate. He is responsible for the overall strategy for the region, driving sustainable and profitable growth.

A stronger, smarter, greener grid

Combining Hitachi's leading digital technologies and ABB's world-class power grid solutions, Hitachi ABB Power Grids aims to play an active role in the global transformation and decarbonisation of energy systems for a sustainable energy future. Its focus is on delivering intelligent solutions for a more dynamic and resilient grid, contributing to achieving the UN's Sustainable Development Goal 7 of affordable, reliable and sustainable energy for all.

Naicker took up the position of Managing Director, Hitachi ABB Power Grids - Sub-Saharan Africa, from 1 May 2020. Geographically, the Sub-Saharan jurisdiction for the company extends from East Africa, through central Africa and southern Africa and covers 21 countries. With South Africa as the lead country in this cluster, the head office for Sub-Saharan Africa is in Johannesburg. The company also has offices in Tanzania, the Democratic Republic of Congo (DRC) and Angola. It forms part of the global group's EMEA region. (The north and west of the continent form part of a separate cluster within the region).

The solar energy powered micro grid with battery bank installed on Robben Island meets all the island's energy needs.

In brief, Naicker says, his mandate is to grow the business across the Sub-Saharan region in a responsible and sustainable way.

Historically, Hitachi's expertise (in relation to energy) is in IT, data centres and digitalisation. ABB Power Grids' focus has been with utilities, large and medium industrial users, and more recently, data centres. Going forward, these sectors, as well as independent power producers, will remain core, alongside new opportunities emerging in other sectors through the new alliance.

"The vision is to accelerate the journey to deliver clean energy, enable flexible, efficient and reliable power grids and to support increased power supply across Sub-Saharan Africa," Naicker says.

"The number often quoted is 600 million people, in Africa, do not have access to electricity. This underscores the need for us to work closely with governments, utilities, independent power producers and industry. We need to understand existing legislation and constraints across different countries – as well as policies and regulations guiding development – and to influence this where we can. Our aim is to build a stronger more secure power grid that is greener, scalable and smart; to maximise efficiencies; and to increase access to power across the region – this in

Gas-insulated switchgear at Johannesburg's Sebenza substation.

At a glance

- Hitachi ABB Power Grids aims to play an active role in creating a sustainable energy future.
- For the Sub-Saharan cluster, the mandate is to grow the business across the region in a responsible and sustainable way.
- The vision is to accelerate the journey to deliver clean energy, enable flexible, efficient and reliable power grids, and support increased power supply across Sub-Saharan Africa.

itself will be a spur to the economic growth, enterprise and development that Africa needs."

While there is a clear drive globally to move away from fossil fuels to renewable sources of energy, Naicker notes that much of Africa still relies on fossil fuel-based power – including diesel generators. Increasingly however, countries are recognising that power supply systems need to evolve to incorporate more renewable energy, and energy management is becoming a priority. Grids need to become more flexible and smarter to accommodate distributed energy systems and deliver localised and regionalised generation and distribution, providing greater resilience.

"ABB's approach has always been to work in partnership with utilities and our industrial customers and this will continue now with Hitachi ABB Power Grids," Naicker says. He highlights that the company's solutions are technology agnostic – so they can integrate with diverse systems – and he says it has solutions now that can assist in easing the current power constraints in South Africa and regionally. These span:

- generation – in energy storage systems;
- transmission – a long-established expertise in high voltage direct current (HVDC) transmission over long distances, which is readily adaptable to carry power from remote solar or offshore wind farms, for example, to a regional or national grid;
- and distribution – with its intelligent energy management systems.

Core business units

Hitachi ABB Power Grids comprises four business units.

■ *Grid automation*

This unit provides solutions for the digitalisation of smart power grids, automation of distribution networks and smart digital substations. It is a leading supplier of power automation and communication systems, software and services, as well as solutions for predictive maintenance across a wide range of industries including utilities, renewables, transportation, oil & gas and mining, among others. With a history of combined operational technology (OT) and information technology (IT) the unit helps companies operate, maintain and support the lifecycle of mission critical assets, enabling customers to make decisions on day-to-day asset maintenance, workforce safety and productivity, as well as long-term strategic investments.

It also delivers 'grid edge' solutions (the e-mesh™ portfolio) which include energy storage and digital automation for energy optimisation and management, advanced control, and monitoring. These digital solutions help customers increase profitability by reducing energy costs, maximising renewable integration and lowering CO_2 emissions, as well as improving overall reliability in the system. Globally, the grid solutions business covers 500 MW and 200 projects.

Grid edge solutions manage hybrid energy systems – which might combine solar/wind/grid/battery storage/backup power supplies – to optimise use and costs, taking account of time of use tariffs, the availability of sun or wind energy, determining when to store power, and when to make it available most cost-effectively.

"With micro grids, for example," Naicker highlights, "we can island power for industry or users that are far from the main grid, or those that need more power than the national grid can supply and therefore require supplementary energy sources, and deliver it efficiently."

The Grid Automation business unit also handles all allied control switchgear, electrical support and supply of battery storage if required.

■ *Grid integration*

As the name implies, this business unit is where all products and services are considered together. It offers power consulting services, energy audits, training, assessment, power quality solutions, and the upgrading of infrastructure where required – as an overall solution – for new renewables plants, or distributed generation, for example. It serves industry as well as other sectors such as data centres, rail, marine and ports.

■ *High voltage products*

High voltage (HV) products have been at the core of Hitachi ABB Power Grids' leadership in innovation and technology. It holds over 120 years of expertise in HV transmission, critical in enhancing safety, reliability and efficiency of power networks while minimising environmental impact. The high voltage products business unit offers a wide range of products – up to 1 200 kV, the highest in the world. Its portfolio covers switchgear, circuit-breakers, power quality products, generator circuit-breakers, surge arresters, disconnectors, instrument transformers and high

voltage services. The latest innovations are in eco-efficient and digital technologies.

■ *Transformers*

The fourth business unit supplies a range of transformers, from small commercial transformers to large transformers for industry, utilities and increasingly, data centres.

Projects in Africa

Among other projects, the Sub-Saharan cluster is currently working on renewables projects in Zambia, retrofitting existing systems to increase capacity and set up digital smart management systems, and several electrification projects as well as transmission and distribution in the DRC. Naicker says a lot of energy generation in the DRC is still reliant on diesel and there are clear opportunities to move towards renewables.

In South Africa the company is working with power supply utilities at national and municipal levels, as well as IPPs and industry. An important focus is on scaling up digitalisation to optimise efficient energy management. It is also diversifying its reach to respond to wider industry needs, looking to e-mobility and smart cities, for example – all areas of expertise for Hitachi ABB Power Grids. Although Africa sometimes seems a long way from reaching such solutions, in Naicker's view a number of cities, countries – and potentially the whole continent – have the chance to leapfrog this journey (as happened with mobile phone technology). He considers some of the bigger metropolitan areas in South Africa and East Africa, Kinshasa in the DRC, and cities in Angola, where smart city management could become a reality in the near future.

The examples of successful projects and installations across the company's four business units are many. Here we present just a few.

Hitachi ABB Power Grids head office

Demonstrating its systems and equipment in application, Hitachi ABB Power Grids has its own grid-tied solar micro grid serving its head office and associated manufacturing facilities in Longmeadow Business Park, Johannesburg. The solution consists of a 1 MVA/380 kWh PowerStore, a battery-package and Microgrid Plus, the dedicated control system for micro grids, together with a 750 kW rooftop photovoltaic (PV) field. These were added to the existing backup supplied by diesel powered generators. The micro grid technology deployed at Longmeadow is fully containerised and pre-designed for this type of application.

Using renewable energy, this installation serves the power demand of the factory and offices even in the event of load shedding. It has full on- and off-grid functionalities and prioritises renewable energy before using the diesel generators. This contributes to reducing carbon emissions and reducing the operational cost of the industrial complex.

Robben Island

The company also installed the solar micro grid on Robben Island. With a peak capacity of 667 kW and 12 solar inverters converting dc to ac power, the micro grid delivers enough power to meet the needs of the island through the day and a battery bank supplies power for about seven hours after sunset. This installation freed Robben Island from its former reliance on problematic undersea cables carrying power from the national grid to the island. Naicker highlights that the micro grid system is scalable; it can be built to meet the power requirements of each customer.

Sebenza substation

The Sebenza substation in Johannesburg is one of the largest gas-insulated switchgear installations in Africa. It features 38 bays of 132 kV gas-insulated switchgear (GIS). The company also supplied 132 kV, 275 kV and 400 kV circuit breakers, surge arresters and point-on-wave controllers that remove electrical transients in the network.

The substation was built by Consolidated Power Projects (CONCO), completed early 2019, and is operated by Johannesburg's City Power. It plays a key role as the new interconnection point for the city's north eastern region and the national transmission grid. (See Electricity + Control *August 2019)*

Closing comments

In closing Naicker emphasises that Hitachi ABB Power Grids is very focused as a business on providing solutions for the Sub-Saharan region. Part of that is a commitment to people. "The company has a culture of embracing diversity, inclusiveness, and quality – globally," he says, "and a commitment to society, to quality of life and to the environment, all of which support economic value. And sustainable energy is essential to this," he adds. It comes down to the triple considerations of social, environmental and economic value. He highlights, for example, that at the beginning of August, mid-Covid-19 lockdown, the company on-boarded 11 graduates at its Johannesburg head office. They join the team in engineering, finance, communications, IT, HR, and supply chain management – bringing different skills to the business and ready to get involved in its skills development programmes. "People are a very important consideration in everything we do," Naicker says. □

For more information visit: http://hitachi-powergrids.com

Malvin Naicker has worked in the electrical power, discrete and process automation and electronics manufacturing industries.

He holds a National Diploma in Electrical Engineering from the Durban University of Technology (DUT) in South Africa, National Trade Tests in Instrumentation & Process Control and Electrical. Malvin has also completed a Management Excellence Program with the Gordon Institute of Business Science and has a Master's Degree in Business Administration from Aston University, UK.

Key energy trends for data centres

In 2017, a group of researchers estimated data centres, globally, could use 25% of the world's electricity by 2025[1]. This is more electricity than any country in the world, including the US. Thus far, this prediction is not materialising, which raises the question of how much energy and electricity data centres actually consume?

According to the International Energy Agency (IEA), the world's data centres consume around 200 Terawatt-hours (TWh) of energy annually, almost all of it electricity[2], accounting for about 1% of the world's electricity consumption. While this is much lower than the prediction, it still makes data centres a considerable consumer of energy.

However, the data centre industry has made significant progress in improving its energy efficiency. This has resulted in a plateau in data centre energy consumption over recent years. What is more, the industry has been able to achieve such a plateau while successfully meeting customers' increased need for services. Cummins, a global leader in power solutions with a portfolio of business units including design, manufacture, distribution and service, has noted three key energy trends emerging in the data centres sector.

Data centres offer significant opportunities for energy efficiency advances.

A focus on decarbonisation

Growing environmental consciousness is driving the lowering of carbon emissions and decarbonisation across most industries. In the process of consuming 200 TWh of electricity, data centres create a significant carbon footprint. This is because they commonly rely on the world's current power generation mix, which is still heavily fossil-fuel based.

Two of the most popular decarbonisation paths in the data centre industry are the direct use of renewable energy sources, and the use of renewable energy credits (RECs). These two approaches are expected to co-exist in the data centre industry's path towards decarbonisation.

Direct use of renewable energy sources

In this case, a data centre is fully or partially powered by renewable energy – geothermal, hydro, solar and/or wind energy, for example. While this is the more environmentally beneficial approach, it is also more challenging due to the intermittent nature of renewables. Data centre operators rely either on existing electricity markets or, in some cases, energy storage options to manage this challenge.

Use of renewable energy credits

In this case, data centre operators buy renewable energy and associated RECs. Where the renewable energy is produced in a location far away from the data centre, the operator sells the renewable energy back to the grid and uses RECs to offset its carbon footprint. This is a common approach across the data centre industry, and is partially what makes Google the largest corporate buyer of renewable energy in the world[3].

This approach is beneficial because it gives the renewable energy provider the customer commitment to invest in new projects, even if the renewable energy is not necessarily used directly by the data centre. In turn, this means that this approach delivers an increasing quantity of renewable energy to the grid for all to use. However, critics highlight that this approach does not directly reduce a data centre's carbon contribution.

Increasing on-site energy generation

Data centres commonly rely on the grid as the primary source of electricity. Although relying on the grid is convenient, the continued expansion of data centres could place extra strain on existing grid infrastructure, resulting in grid instability. In some regions, data centre growth and energy demands could outpace grid infrastructure capability and investment. To address these challenges, some data centre operators deploy on-site power generation.

Photovoltaic (PV) arrays, natural gas generator sets and fuel cells are common sources of on-site generated power. These distributed energy resources may operate connect-

On-site power generation including renewables enables the data centre operator to use power from cleaner sources when it is available.

ed to the utility grid or isolated from it (as an island operation) as a micro grid. Stationary energy storage may also be incorporated into a micro grid, enhancing the ability to operate in isolation from the utility.

On-site power generation allows a data centre operator to use power from cleaner sources when available and to supplement energy from other sources when the cleanest source is not sufficient. This feature of on-site generation supports advances towards sustainability goals, while maintaining reliable power service to the data centre.

Higher levels of energy efficiency

Data centres offer significant opportunities for energy efficiency and the industry has taken full advantage of these in recent years. Key opportunities can be considered in terms of IT infrastructure and non-IT infrastructure.

IT infrastructure

Historically, data centres have improved the energy efficiency of IT infrastructure through higher use of individual IT equipment and server virtualisation. Going forward, converged infrastructure (CI) and hyper-converged infrastructure (HCI) are expected to lead energy-efficiency gains in data centres.

CI's building blocks are made up of storage and compute functionalities physically combined in a turnkey product. HCI relies on software to combine compute, storage and networking functionalities. Both technologies, in different ways, deliver a more scalable architecture to assist with energy efficiency. Within a data centre using one or other of these technologies, fewer servers and less storage and network equipment are required to deliver the same computing output.

At a glance

- According to the IEA, the world's data centres consume around 200TWh of energy annually.
- However, the sector has made significant progress in improving its energy efficiency.
- Growing environmental consciousness is driving increased use of renewable energy, renewable energy credits, distributed energy systems, and further energy efficiency.

Non-IT infrastructure

Power usage effectiveness (PUE), the ratio of total energy used by the data centre to the energy used by computing equipment, is commonly used as an indicator of a data centre's energy efficiency. The industry average PUE improved from 2.5 in 2007 to 1.67 in 2019[4], a clear indication of the shrinking contribution of non-IT infrastructure – heating, cooling, lighting and others – in data centres' energy consumption.

Going forward, advances in cooling systems are expected to take centre stage in energy-efficiency gains in non-IT infrastructure. Natural cooling, where cool ambient air or chilled water from nearby resources are used to cool the facility, will impact the geographical locations of data centres. In addition, an increased prominence of liquid cooling technologies will impact data centre cooling system designs. In the interim, in terms of IT infrastructure, the growing need for IT equipment to operate at higher ambient temperatures will reduce the need for cooling per computing capacity.

It is anticipated that facility management and energy professionals will spearhead comprehensive energy-efficiency plans covering IT and non-IT infrastructure to stay ahead of their peers in energy-efficiency gains. □

References:

1 Lima, J. M. (December 12, 2017). Data Centres Of The World Will Consume 1/5 Of Earth's Power By 2025. Data – Economy. Retrieved from https://data-economy.com/.
2 Global data centre energy demand by data centre type. (January 7, 2020). International Energy Agency. Retrieved from https://www.iea.org/.
3 Pichai, S. (September 19, 2019). Our biggest renewable energy purchase ever. Google. Retrieved from https://www.blog.google/.
4 Lawrence, A. (May 2019). Is PUE actually going UP? Uptime Institute. Retrieved from https://journal.uptimeinstitute.com/.

For more information visit: www.cummins.com

NERSA approves procurement of new generation capacity

Eskom has noted that the National Energy Regulator of South Africa (Nersa) has concurred with the ministerial determination for the procurement of 11 813 MW of electricity generation infrastructure, as issued by the Minister of Mineral Resources and Energy in February 2020. This is part of the power infrastructure to be procured under the Integrated Resources Plan of 2019 (IRP2019) over the years to 2030.

"Given the current supply constraints, this additional generation capacity is urgently required, and will be an important contribution towards ending load shedding and ensuring energy security for the country," says Eskom CEO André de Ruyter.

Eskom is looking forward to collaborating with the Department of Mineral Resources and Energy (DMRE) and the IPP Office to enable an accelerated execution to bring additional capacity onto the grid in the shortest space of time possible.

Eskom is also pleased to note progress with the procurement of the 2 000 MW emergency power, which it hopes will start being connected to the national grid by December 2021. While the 2 000 MW emergency procurement is a step in the right direction, the national utility emphasises the immediate and urgent need to accelerate the procurement of at least 3 000 MW of further generation capacity to help ease the supply constraints the country is currently going through.

As Eskom has stated previously, enabling the emergency procurement of 5 000 MW additional generation capacity is critical to keep the lights on and help power the rebuilding of an economy decimated by the Covid-19 pandemic. Bringing in additional generation capacity will also help take the pressure off Eskom and create space for the maintenance of its ageing power stations while powering a growing economy.

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

Advancing grid management solutions

Emerson has announced its agreement to acquire Open Systems International Inc. (OSI Inc.), a leading provider of operations technology software that supports real-time management and optimisation across the smart grid. The acquisition is expected to close in early fiscal 2021, subject to various regulatory approvals and other customary closing conditions.

The acquisition broadens and complements Emerson's robust software portfolio and its ability to help customers in the global power industry, as well as other end markets, to transform and digitalise operations in order to incorporate renewable energy sources and improve energy efficiency and reliability.

Digitalisation is critical for the power industry to modernise and improve the reliability of the electricity grid. Incorporating clean and renewable energy sources, such as solar and wind, requires balancing the variable nature of renewable energy with the often bi-directional demands of the grid. By combining Emerson's domain expertise and leading technology in power generation with OSI Inc.'s complementary software and reach within the power transmission and distribution sectors, the acquisition will equip customers with the end-to-end ability to monitor, control and optimise real-time operations across the power enterprise through scalable, software-enabled automation and data management.

"An enormous change is under way as utilities globally are investing to digitalise the grid and adapt to rapidly evolving energy sources and new technologies that increase consumer choices," said Lal Karsanbhai, Executive President of Emerson's Automation Solutions business. "This acquisition will help the power industry maximise the opportunity to harness renewable energy sources and to accelerate the transformation to the smart power grid. Emerson now has the opportunity to be a leader in this fast-growing market with a complete software and technology offering."

Lal Karsanbhai, Executive President, Emerson Automation Solutions.

OSI Inc.'s advanced modular technology offers customers tailored solutions to meet their needs in power grid management and is scalable to other industries. Combining this technology with Emerson's Ovation control system, a market leader for power generation control, will provide utility customers with increased visibility into the current status of their power systems and enable them to optimise energy efficiency from generation to customer delivery – and contribute to the broader industry goal of minimising the carbon footprint.

Emerson's software and automation technologies are widely used in essential industries.

For more information contact Emerson Automation Solutions.
Email: emrsouthafrica@emerson.com
Visit: www.emerson.com

Hydrogen fuel cells at 1 Military Hospital

The Department of Science and Innovation (DSI) on 19th August 2020 unveiled seven hydrogen fuel cell systems which are being used as the primary power source for the field hospital established at 1 Military Hospital in Pretoria as part of the government's response to Covid-19.

The project is a public-private partnership between the DSI, the Department of Public Works and Infrastructure (DPWI), the Department of Defence (DoD), local companies Bambili Energy and HyPlat, and international companies PowerCell Sweden, Horizon Fuel Cell Technologies (Singapore) and Element 1 Corporation (United States). Further contributions, in the form of methanol and hydrogen fuel for the fuel cell units, were received from Air Products South Africa, Protea Chemicals and Sasol.

Bambili Energy focuses on the hydrogen economy, providing solutions to complement various forms of alternative energy, and is committed to commercialising intellectual property developed through the Hydrogen South Africa (HySA) programme.

The Covid-19 pandemic has highlighted the need to respond with speed and flexibility, particularly in providing high-care facilities for those who need them most. Containerised hydrogen fuel cells can be deployed at short notice to provide a clean source of energy, even when the need is only temporary.

The support provided to 1 Military Hospital will be complemented by hands-on training to ensure the skills required to operate and manage the fuel cell systems are institutionalised within government. The first two phases of training will focus on officials from the DoD and DPWI, and the third phase will involve unemployed TVET college graduates with N4 electrical and light and heavy current qualifications.

Hydrogen fuel cell technology is recognised globally for its potential to decarbonise the energy and transport sectors. Hydrogen fuel cells produce electricity by means of a chemical reaction, using hydrogen as the basic fuel together with platinum-based catalysts. They are

The DSI and partners recently unveiled the hydrogen fuel cell systems at the field hospital at 1 Military Hospital in Pretoria.

efficient, reliable, safe and quiet, ensuring a non-intrusive standby or primary power solution. Modular in nature, they can be deployed rapidly and scaled up easily as the need arises, and maintenance costs are relatively low.

Speaking at the launch, DSI Director-General, Dr Phil Mjwara said partnerships like this will enable government to take alternative energy sources to rural areas and contribute to growing the country's green economy. Mjwara said Bambili Energy is already working on an initiative to take hydrogen fuels cells to rural areas in the Eastern Cape and KwaZulu-Natal. "This is the start, and the idea is to roll out the project to various parts of South Africa," he said.

Bambili Energy CEO, Zanele Mavuso is excited about leading the deployment of the fuel cell systems to contribute to government's response to the Covid-19 pandemic. "This is also an opportunity to demonstrate the potential role alternative energy sources can play in our everyday lives, given South Africa's growing energy challenges," Mavuso added.

Among the further contributions received from other industrial companies, Sasol, with its experience in the production and handling of hydrogen which it uses to produce liquid fuels, fuel gas and chemicals, will donate 10 000 litres of methanol and 600 kg of hydrogen monthly until April 2021. This will help to power the field facility.

For more information visit: www.sanews.gov.za

Giles Fearn, Group Chief Executive, Petredec.

Foreign investment in LPG in SA

Petredec, one of the world's leading Liquefied Petroleum Gas (LPG) trading and shipping companies, recently launched its Petrefuel subsidiary in South Africa, following the acquisition of Empangeni-based fuels wholesaler, Jubane Petroleum. Petrefuel will operate in the country alongside Petregaz, South Africa's largest wholesaler and distributor of LPG in which Petredec is a majority shareholder.

As Petredec's second acquisition in the fuels sector within the past 12 months, Jubane links up with the former Oilco wholesale business, which joined the group in December 2019. The addition of Jubane strengthens Petredec's market presence, particularly with both Jubane and Oilco operating in the coastal KwaZulu-Natal (KZN) region, albeit with complementary customer bases. The combined Petrefuel business will distribute diesel, petroleum, paraffin and lubricants to customers operating in the transport, agricultural, retail, industrial and other commercial sectors across KZN.

Established by Estelle and David Morck in 1999, Jubane Petroleum employs more than 55 people who, along with the founders, will now operate under the Petrefuel banner as part of an expanded entity. The platform is also expected to provide the foundation for further expansion

Checking tariff structures can save energy costs

Tygue Theron, Commercial Head at Energy Partners Intelligence.

With over 900 different tariff options, the South African municipal tariff structure for grid-tied electricity is complicated and businesses often are not on the correct or best tariffs for their operations. Consequently, many are inadvertently paying significantly more in energy tariffs than they rightfully should. And with continuing annual tariff increases, businesses can benefit from reviewing their electricity bills and usage patterns as a first step towards cost savings in energy management.

Tygue Theron, Commercial Head at Energy Partners Intelligence – a division of Energy Partners and part of the PSG Group, says ensuring that a business is being billed correctly for electricity by its local municipality, Eskom or the landlord, can often lead to significant savings. A simple switch to the optimum tariff structure can save up to millions of rand a year.

"A detailed tariff analysis should be the first step in any organisation's energy management process," he says.

"The South African municipal tariff structure for grid-tied electricity is complicated, with over 900 different tariff options. In addition, Energy Partners anticipates a possible 25% increase in electricity charges for the 2021/22 financial year. What is certain, is that Eskom still needs a lot of capital, which it can source either through tariff increases or another equity injection. We expect a substantial portion of the state-owned entity's debt will become the end users' burden in the near future."

Theron says Energy Partners has witnessed multiple cases where local businesses have decreased their monthly electricity bills by as much as 15% by simply switching to the optimal tariff structure. "By building a comprehensive tariff database, we advise clients on which tariff structures are most suitable for the business, and through this consultative process often assist in saving millions on energy costs."

He notes that Energy Partners Intelligence has achieved up to R48 million in savings for some of its clients within the first year of switching to the correct municipal tariffs. "These savings recur every year, in effect, as tariffs increase. In addition, since we began providing this service, our clients have saved up to R12 million in total bill claims and up to R129 million in tenant bill recoveries."

Explaining the great number of different tariff structures, Theron says, "The 900+ different tariff types are applied according to the type of business that is using the power, the amount used and the time when the client's usage is at its peak. Most businesses are bearing the brunt of annual municipal tariff increases because they are often unaware that they are being billed according to the wrong tariff structure."

He says the various tariffs were put in place to encourage more conscientious energy use among businesses. "It is therefore not a matter of trying to get as much as possible out of businesses, it is actually a method to incentivise organisations to use power more responsibly. This is why, if one trusts a service provider to navigate this complex system, reducing energy spend can be fairly straightforward for a business."

For businesses that want to reassess their own energy costs, Theron advises: "The first step is to find out which tariff the company is on, and which alternative tariffs they can be switched to."

The next step is to see if there is any metered data for the business, so that comparative tariff costings can be simulated at the current consumption rate. Most big businesses have electricity meters which can provide invaluable information about how the site is using energy throughout the day or week.

"Instead of simply accepting the high monthly energy bill, businesses can look into the data provided by meters to see when and where there is an unnecessary waste of energy. For example, if air-conditioning runs for a whole building or facility through the weekend when the workforce is at home. The meter often reveals easy-to-implement savings opportunities to cut costs."

The final step is ongoing engagement with the municipality to make sure accounts are in good order and that the billing is calculated correctly. According to Theron, "Managing a large company's energy bills, identifying the right factors to motivate for billing claims and pushing municipalities to apply tariffs accurately is extremely time-consuming and requires specialised skills."

The Covid-19 lockdown and continuing constraints on operations are still causing significant decreases in profit margins for many businesses. This makes it all the more important to become as energy efficient as possible to save business costs. "Getting a business onto the optimal tariff structure is by far the most cost-effective and least disruptive way to start doing that," Theron says.

For more information contact Energy Partners.
Tel: +27 (0)21 941 5140
Email: intelligence@energypartners.co.za
Visit: www.energypartners.co.za

in the South African fuels market as Petredec looks to grow beyond KZN.

Speaking about the launch of Petrefuel in South Africa, Petredec Group CEO, Giles Fearn, said: "We welcome the Jubane team to the Petredec family and look forward to the successful integration of the business within our new Petrefuel division. We intend to build on the considerable success that Jubane has enjoyed to date and grow our footprint as part of a larger fuels distribution network, including LPG."

For more information contact Petredec
Email: giles@petredec.com
Visit: www.petredec.com

Extending access to electricity in Uganda

A new off-grid solar scheme agreed between ENGIE, through its Solar Home System company Fenix International, and the European Investment Bank, one of the world's largest financiers of renewable energy, will see more than a million people, small holders and entrepreneurs in remote villages across Uganda gain access to reliable and cheap electricity for the first time.

"Access to affordable and clean energy is important to fight poverty, create jobs and empower women and girls," said Ambroise Fayolle, European Investment Bank Vice President. "We are pleased to agree new support for scaling up off-grid solar deployment in East Africa under this new partnership with ENGIE. Providing access to electricity to people across Uganda it will enable them to power communications, provide light and make cooking easier. The scheme will also reduce the use of kerosene, charcoal and candles, helping families save money, reducing pollution and reducing the risk of accidents. Unlocking sustainable economic and social development through off-grid solar is key for Africa's future and the EIB is pleased to back this project in Uganda."

Yoven Moorooven, CEO of ENGIE Africa said, "We see the enormous potential of off-grid electrification as a way to bridge energy gaps across Africa, faster and more affordably. Every day families are able to access electricity for the first time using off-grid solar technology provided by ENGIE Africa. Our new partnership with the European Investment Bank in Uganda will allow Fenix to provide affordable PAYGO systems to millions of people in villages across the country. This will provide access to clean solar power and financial empowerment.

The new EIB-ENGIE initiative will deliver off-grid solar energy to 1.4 million people across Uganda.

"Providing access to energy in Africa is a huge undertaking but I firmly believe that universal access to energy is achievable in the foreseeable future, through smart investments in a combination of national grid extensions, solar home systems and mini-grids. With our off-grid platform, we are industrialising and scaling up the development of a wide range of decentralised solutions, with a sustainable business model. At present, ENGIE provides decentralised electricity to more than 4.5 million people in nine countries through solar home systems from Fenix and ENGIE Mobisol, as well as mini-grids from ENGIE PowerCorner."

The European Investment Bank has agreed to provide a USD12.5 million loan to support the deployment of 240 000 high-quality solar home systems in Uganda by Fenix International, a subsidiary of ENGIE.

For more information contact ENGIE Africa
Email: katja.damman@engie.com
Visit: www.engie-africa.com

Wind energy sector opens new opportunities

WEG's direct drive gearless wind turbine solution promotes higher energy efficiency.

Zest WEG has entered South Africa's wind energy industry, combining exciting turbine technology with its established local footprint.

The development of a direct drive, gearless wind turbine by its parent company WEG is a key factor in Zest WEG's plan to grow a client base among wind farm developers, says Alastair Gerrard, Integrated Solutions Executive at Zest WEG.

"With WEG's latest 4.2 MW wind turbine solution – which adds to its initial 2.1 MW unit – we see considerable scope for broadening our technology offering locally and into the rest of Africa," he says.

"With four decades as a local supplier, manufacturer and service provider in South Africa, Zest WEG has extensive market presence and knowledge on which to build. In particular, the company is well-placed to meet the local content requirements for participating in the wind energy segment.

"We have prepared the ground for developing local skills and supply chains in our contribution to wind energy projects," Gerrard adds. "Given our experience in South Africa, our products and solutions also meet the necessary regulations and standards, including grid code compliance, which is essential for projects that will feed power to the national utility."

The positive take-up of the WEG wind turbine – mainly in South America – is reflected by the 647 MW of capacity that it has contributed to the market in recent years; another 181 MW is in the pipeline.

Gerrard highlights the point that the turbine does not have a gearbox and this offers a number of benefits. "It means increased efficiency, less noise and weight, and less maintenance. The whole design is focused on efficiency and reliability, for maximum output and uptime."

The WEG turbine also includes the transformer in the nacelle, rather than at the tower base. This transformer steps up the 925 Volts generated by the alternator to 33 kV, reducing losses through more efficient energy transmission. There is then no need for a separate transformer and its associated infrastructure at ground level.

For more information contact Zest WEG Group.
Visit: www.zestweg.com

Radar level measurement in extreme environments

Jürgen Skowaisa, Product Manager Radar at VEGA Grieshaber KG

The production of cement is without doubt one of the most energy-intensive industrial processes. The use of alternative fuels and raw materials, primarily waste products, has long become part of the process to make it more economical as well as to conserve primary raw materials and fuel resources and reduce landfill volumes. At Cementos Molins, S.A. in Barcelona, Spain, heavy knives plough through a mass of shredded waste to be used as fuel in the production plant. One tonne per hour is handled in a large storage silo. The VEGAPULS 69 monitors the fill levels reliably.

The alternative fuels and raw materials (AFR) used include whole and shredded tyres, waste timber or mixtures of plastics, paper, compound materials or textiles with a calorific value similar to that of lignite. The value of old tyres is even comparable with coal. However, the use of these alternative fuels also has its pitfalls. They must be processed prior to use so that they do not influence the later production process and, above all, the quality of the end product. And level measurement in the AFR silo is not unaffected either. Just one example: if the alternative fuel is made from recycled Tetrapaks, the metal particles contained in the packaging can create interference signals due to flying metal foils.

An unusual agitator

Cementos Molins has been working with VEGA for twelve years and a number of VEGA sensors are already in use at the site, including pressure transmitters, capacitive measuring instruments and vibration limit switches. The company needed a special solution for the storage silo that contains the alternative fuels. The silo has a height of more than 20 m and a diameter of 9 m. About 35% of the fuel used in the plant for the production of cement comes from alternative fuels.

There is an unusual agitator on the inside floor of the silo with very sharp, vibrating knives which grind the waste continuously. Trucks arrive around the clock to fill the silo, unloading about one tonne of AFR material into it every hour. The challenge here is that the trucks loaded with waste must be completely emptied – and the capacity in the silo must therefore be sufficient to hold a complete truck load. The level measurement must provide protection against a risk of overfilling, and the empty warning is at least equally important.

Complete emptying would cause damage to the agitator. A reliable measuring process is therefore necessary to ensure continuous level measurement, 365 days a year, without interruption.

Challenges from the grinder

Conditions in the building materials industry are generally a little harsher than in many other sectors and in this cement factory, the owners faced particular challenges. First, the AFR materials differ and stick very easily. And further, when the silo is filled from the trucks, a gigantic cloud of dust is created which makes level measurement extremely difficult and often leads to heavy deposits on the sensor. During

At Cementos Molins, trucks deliver alternative fuels to the factory around the clock.

A large agitator with sharp knives ploughs its way through the mass of waste materials in the storage silo.

Despite the interference signals which could not be totally avoided, an almost exact level measurement is achieved with the VEGAPULS 69.

The fuels must be processed before firing so that a constant calorific value is achieved and the subsequent production processes run uniformly.

simultaneous stirring and chopping, a wave of material up to two metres high is pushed along in front of the agitator blades. The stirring itself also generates a cloud of dust in the container which never settles due to the vibrations. Hence, the cloud of dust influences the technology required and the measurements.

The previously installed 26 GHz radar sensor with horn antenna, supplied by another manufacturer, never worked trouble-free. The dust stuck to the horn antenna and caused false measured values. At a transmission frequency of only 26 GHz and with the constant vibrations caused by the dust cloud, a reliable signal was not possible. Moreover, metal particles from Tetrapaks in the AFR caused false signals in the sensor.

Focusing through the dust cloud

When VEGA launched the first radar level measuring instrument for bulk materials that operates with a frequency of 80 GHz about two years ago, the owners of Cementos Molins wanted to know more. The device offered more reliable operation because much higher focusing of the medium to be measured is possible. At that time, a few test measurements had already been made in comparably difficult measuring situations and the 80 GHz radar level measurement instrument had also succeeded in measuring media with poor reflection properties more accurately and easily. The high focusing helps better differentiation of the measuring signal from the interference signal in containers with a lot of installations. With a measuring range of up to 120 m at an accuracy of ±5 mm, the instrument has enough power even for unusual applications.

These seemed to be ideal advantages for the difficult measuring environment. The opening angle of the radiated radar energy, and therefore also the focusing, depend on two factors: the transmission frequency and the active antenna area. Much better focusing is achieved with a higher frequency and identical antenna size. The VEGAPULS 69 operates with a transmission frequency of 80 GHz and an antenna size of about 75 mm. This achieves an opening angle of only three degrees (3°). In a radar sensor with 26 GHz transmission frequency, the opening angle at the same antenna size is about 10°. The 80 GHz beam also bypasses installations or deposits on the container wall. This makes the measurement safer and more reliable.

The measuring instrument itself is made from the robust PEEK material which has a high temperature and chemical resistance. The lens antenna is insensitive to deposits and dirt and shows no signs of wear.

To simplify commissioning, an intelligent swivel holder was developed which aids in aligning the sensor quickly, easily and optimally. Another trick here is that to set the optimum angle of tilt for installation of the measuring device, a smartphone is simply placed on the device so that the sensor can be aligned quickly and optimally with an app.

No loss of transmission signal

The VEGAPULS 69 radar sensor has very good signal focusing and a high dynamic range. The 80 GHz penetrate the dense dust cloud effortlessly. The sensor has a purging air connection as standard and this can be cleaned quickly at any time so that any deposits are dealt with. Despite the interference signals, which could not be totally avoided due to the metal particles of the waste packaging, an almost exact level measurement is achieved.

A remote display is located at eye level on the silo so the service team does not have to climb onto the silo during maintenance. Using PLICSCOM, the service personnel have an overview of all the data at all times.

The service team's conclusion is: Very flexible and simple! The VEGAPULS 69 has been working trouble-free since being commissioned. Because Cementos Molins needed a quick solution, a trial measurement was dispensed with and the company relied on the functionality of the sensor. The confidence paid off – the VEGAPULS 69 with 80 GHz provides reliable measuring results around the clock even under extreme conditions, vibrations and heavy deposits. □

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

Rugged work phone with integrated thermal camera

The Cat® S62 Pro delivers functional design and rugged durability as well as high resolution FLIR Lepton® thermal imaging, which makes it ideal for use in tough work environments such as the engineering, mining, manufacturing, agricultural and wildlife sectors. Compared to its predecessor, it is 12% more compact and has a 10% bigger screen. It is faster, more powerful and especially tough.

With isotherm alarming, users can monitor a customised pre-set temperature range (between -20°C and +400°C) and add alarms for any point within that range. This is useful and time saving in monitoring machinery to reach a specified temperature, or screening for unusually elevated temperatures, among other applications.

Powered by the FLIR Lepton 3.5 and the new MyFLIR™ Pro app, the S62 Pro offers a four-fold increase in thermal pixels and an unmatched feature set in the included application. Users can access FLIR Systems' VividIR™ image processing, enhanced MSX® (Multi-Spectral Dynamic Imaging), and visible-to-thermal blending technologies which are integrated into the smartphone.

Users can also vary the intensity of MSX®, which overlays visual outline detail from the scene onto the thermal image, or use the new alpha blending feature to combine thermal detail with the visual image from the Sony dual-pixel camera. Together these upgrades deliver enhanced image quality and higher thermal resolution to provide greater context and understanding of the thermal image.

Tested to the demanding standards of Cat® phones, the S62 Pro surpasses an ingress protection rating of IP68 and US military standard, Mil Spec 810H. It has undergone repeated drop tests from 1.8 m onto steel, with multiple drops onto every side and corner, as well as extensive waterproof, dirt- and dust-proof, extreme temperature, and vibration and tumble tests.

It is hygienic too: it can be fully submerged and easily washed with soaps and disinfectants or cleaned with alcohol wipes, which makes it ideal for hygiene-conscious users, especially during the Covid-19 pandemic. The IP69 rating has recently been added, which includes the ability to withstand washing with high-pressure washers.

The S62 Pro's display has been upgraded to 5.7" FHD+ (18 x 9), and memory is 6 GB RAM and 128 GB ROM. It also features a faster Qualcomm chipset, Android™ 10, and an optimised long-life battery. The Cat® S62 Pro is enterprise ready.

The rugged Cat® S62 Pro delivers multiple functionalities including thermal imaging.

Key features

- Picks up heat and measures surface temperatures from a distance of up to 30 m
- Scalable and movable regions of interest with 'hottest' and 'coldest' indicators
- Horizontal field of vision is expanded to 57° to capture more of the scene
- A choice of 9 thermal colour palettes
- PDF reporting
- Powerful 4 000 mAh battery.
- 12 MP Sony dual pixel rear camera and 8 MP front camera
- Hardwearing, non-slip rubberised TPU back
- Bluetooth 5.0, NFC

The Cat S62 Pro smartphone is available from Cernotech, South African distributor of Cat phones.

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

Mechatronic flow sensors especially for oils

Different media require different sensor characteristics. With the new mechatronic flow sensor, designed especially for oils, ifm provides the optimum combination of accuracy, speed and adaptability to the application. This also increases economic efficiency. The sensors are specifically adjusted to oil for optimum measurement results. They can be used to measure volumetric flow quantities up to 200 l/min and with a pressure resistance up to 100 bar, no inlet and outlet pipe lengths are required. Measured values are transferred without conversion losses via IO-Link.

Due to a complex adjustment carried out in production and the use of oil-specific mechanical parts, the new sensors provide precise measured values for the selected oil curve. They incorporate integrated temperature measurement and compensation, another distinguishing feature. ifm also offers individually designed special units for particular oil viscosities.

For more information contact ifm SA.
Tel: +27 (0)12 450 0400
Email: info.za@ifm.com
Visit: www.ifm.com

Designed especially for oils the new flow sensors provide precise measured values for the selected oil curve.

Scientific Imaging Association of South Africa

In recent years, the rate of technological development and associated advance of equipment have increased rapidly in all scientific fields, including scientific imaging. The technology and equipment used in scientific imaging have become increasingly technical and complicated, and at the same time more accessible to scientists, engineers and general users. These two factors raise the difficulty in keeping abreast of developments in one's own area of expertise and in maintaining a functional understanding and awareness of related areas of technology. This led to the formation of the Scientific Imaging Association of South Africa (SIASA).

Initially focusing on high-speed imaging, SIASA's scope was soon broadened to include more scientific imaging disciplines after the potential benefits of such an organisation became evident. The main purpose of SIASA is to foster the development of the community within the South African scientific imaging field – which covers various disciplines. The objectives of SIASA are directed towards providing a networking platform for multidisciplinary practitioners to facilitate resource- and knowledge-sharing as well as professional development by way of partnerships, group meetings and regular seminars. The aim is to create a community where highly technical skills, techniques and hard won 'tips' and 'tricks' are shared and disseminated. A better appreciation and understanding of complementary and associated imaging disciplines and techniques can be developed and the growth of young engineers and scientists using this technology will be stimulated.

All individuals, work groups and institutions focusing on scientific imaging, and those using any form of scientific imaging as a tool to acquire data for their work, are invited to join the association. SIASA will provide a specialised function, focused on the tools used in investigative studies, complementary to the capabilities provided by other local organisations in this field. Where other organisations typically focus on outcomes and results in the field of study, SIASA's focus is more on the 'materials and methods' aspects, emphasising skills development in optimal experimental design, techniques, setup, execution and equipment use. Interested parties are encouraged to register their details in an expression of interest via email, or via the website. This is not a binding commitment – there are no registration or annual fees, and no obligations placed on parties expressing interest. The registration is simply to record details for future correspondence, gather data on fields of interest, and determine the interest in the association.

Imaging disciplines

Scientific Imaging, as supported by SIASA, can be described as the process of obtaining images within a scientific discipline for the purpose of data analysis by making use of, for example, photonic, acoustic, electron or computational energy using scientific instruments and techniques. The evolving scientific imaging field encompasses the disciplines outlined below, among others.

For more information contact SIASA.
Email: Webmaster@siasa.org.za
Visit: https://siasa.org.za

High-speed imaging	Ultraviolet	Schlieren
Motion analysis	Synthetic Aperture Radar	Differential Interference Contrast (DIC)
Digital Volume Correlation	Radiography	3D Scanning
Digital Image Correlation	Astronomical	Acoustic
Thermal/Infrared (IR)	Geospatial Information System (GIS)	Computed Tomography (CT)
Polarimetric	X-ray	Machine Vision
Multi/ Hyperspectral	Magnetic Resonance Imaging (MRI)	Electron microscopy (EM)

Measuring small signals in noisy environments

Comtest offers Microchip's MCP6V76/6U/7/9 Single, Dual and Quad 2MHz Zero-Drift Operational Amplifiers for measuring small signals with fewer errors. The zero-drift architecture enables low initial offset of only 25 µV (max) and offset drift of only 150 nV/°C (max), minimising measurement errors regardless of changing environmental conditions. The devices feature low power consumption while providing ample bandwidth. The Microchip family of operational amplifiers is ideal for use in electrically noisy, harsh and unpredictable operating environments.

Microchip's Zero-Drift Operational Amplifiers enable measurement of small signals accurately.

As a leading provider of test and measurement and communications equipment Comtest also carries the Microchip products and solutions.

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

Easy-to-use ultrasonic level transmitter

The new ultrasonic level transmitter from ABB – LST200 – is designed for industries with large installed bases of level measurement devices, particularly in water and wastewater treatment. With its modular design and intelligent algorithms, the LST200 is easy to install, commission and maintain and stable in use.

Commissioning is easy using a set-up menu that guides customers through configuration within a minute. Operating the LST200 is easy because the device has a blue backlight that makes it highly visible even in strong sunlight or darkness in locations such as lagoons and settling ponds. And maintaining the device is easy because it offers real-time echo waveform and diagnostic messaging for efficient troubleshooting.

A sophisticated algorithm enables the LST200 to detect and automatically compensate for any instability in the strength of the ultrasonic signal. This makes the instrument a good choice in process basins for aeration, chlorine contact, skimmer tanks, sedimentation and flotation thickeners where there can be unstable surface echo from foam or turbulence.

Noise filtering makes the LST200 useful in wet wells, lift stations and pumping stations because it is immune to noise from heavy equipment such as variable speed drives. Temperature compensation is another key feature, delivering reliable accuracy better than +/-3 mm or 0.25% of full span.

The ultrasonic level transmitter is submersible in water and can survive flooding. It has a waterproof rating of IP68. Made from polycarbonate, the non-contact instrument is resistant to process liquids such as mild acid and base, chloride and oxidiser, making the routine work for cleaning unnecessary. For open channel flow measurement, built-in equations and supporting software obviate the need for manual calculations, saving the user time and effort.

The new LST200 level transmitter is ideal for use in the water and wastewater treatment industry.

Jack Wang, Global Product Manager for Ultrasonic Level Transmitters at ABB, says: "LST200 will be useful in many industrial settings, particularly the water and wastewater sector, or the power and pulp and paper industries where potential applications include water storage measurement. With its modular design, user-friendly interface and built-in intelligence, it meets our customers' key requirements for ease of use and reliability when they are considering total costs on a device – from purchase, to installation and maintenance."

For more information visit: www.abb.com

Excellent performance in process moisture analysis

An independent report confirms the excellent measurement performance of Michell Instruments' OptiPEAK TDL600 process moisture analyser.

The assessment undertaken by *DBI Gas und Umwelttechnik* in Leipzig demonstrated that the OptiPEAK TDL600 from Michell Instruments offers stable, accurate and repeatable measurements of moisture in natural gas and is not affected by changes in background composition.

A total of 16 different experiments were carried out to test the TDL600's capabilities in a range of background gas compositions, comprising energy-rich H-group natural gas as well as pure methane. The evaluation involved different target levels of moisture and further testing to determine any influence from the addition of associated gas components: hydrogen, hydrogen-sulphide and methanol. Test conditions for the OptiPEAK TDL600 closely matched various process operating scenarios in gas processing and pipeline transmission.

Dr Rico Rockmann, author of the report commented, "Overall the Michell OptiPEAK TDL600 displays very stable values, without outliers or incorrect measurements."

A full copy of the report is available on request from Michell Instruments.

The OptiPEAK TDL600 uses the latest generation of tuneable diode laser spectroscopy sensors to detect trace moisture in natural gas, down to 1 ppmV. Because it uses a non-contact sensing technology it is resistant to contamination and produces fast, reliable results in challenging applications such as changing methane concentrations and sour gas. It has global hazardous area certifications and is available with a range of sampling options.

Michell Instruments is represented in South Africa by Instrotech.

The OptiPEAK TDL600 uses diode laser spectroscopy sensors to detect trace moisture in natural gas.

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

Using UV-C light for deep cleaning

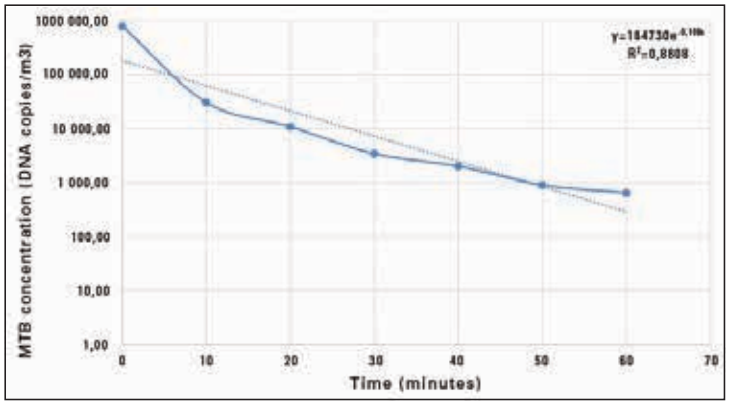
Described by some as 'lighting's next big thing', UV-C lighting has, in fact, been recognised for over a century. However, South African company Giantlight is extending its potential uses with the introduction of two new deep cleaning solutions: an air scrubber and a surface cleaner. This article was first published in* Electricity + Control's *sister title,* Lighting in Design*, written by Editor, Gregg Cocking.

In 1878, Arthur Downes and Thomas P. Blunt published a paper describing the sterilisation of bacteria exposed to short-wavelength light. Ultraviolet (UV) light has been a known mutagen at the cellular level for over 100 years.

UV light is electromagnetic radiation with wavelengths shorter than visible light but longer than X-rays. UV is categorised into several wavelength ranges, with short-wavelength UV (UV-C) considered 'germicidal UV'. Wavelengths between about 200 nm and 300 nm are strongly absorbed by nucleic acids. The absorbed energy can result in defects including pyrimidine dimers. These dimers can prevent replication or can prevent the expression of necessary proteins, resulting in the death or inactivation of the organism.

Germicidal UV (UV-G) for disinfection is most typically generated by a mercury-vapour lamp. Low-pressure mercury vapour has a strong emission line at 254 nm, which is within the range of wavelengths that demonstrate a strong disinfection effect. The optimal wavelengths for disinfection are close to 260 nm. This process is similar to the effect of longer wavelengths (UV-B) producing sunburn in humans. Microorganisms have less protection against UV and cannot survive prolonged exposure to it.

- Mercury-based lamps operating at low vapour pressure emit UV light at the 253.7 nm line.



MTB concentration decay curve when the pedestal-mount UV-C germicidal device was on. The solid line shows the decay of MTB concentration when the device was operational.
(All tests on the fittings were performed using the TB pathogen.)

- Ultraviolet light-emitting diode (UV-C LED) lamps emit UV light at selectable wavelengths between 255 and 280 nm.
- Pulsed-xenon lamps emit UV light across the entire UV spectrum with a peak emission near 230 nm.

Otto Horlacher of Giantlight explains the company's approach in developing the new products. "When we started in the field of horticultural lighting, there was a need to disinfect plant crops, which are susceptible to mould, spores and fungi. Most professional growers have a disinfecting mechanism and it is typically UV-C. So, having worked in the field – long before Covid-19 – we had an inside line and realised that UV-C was a viable mechanism for combatting the disease."

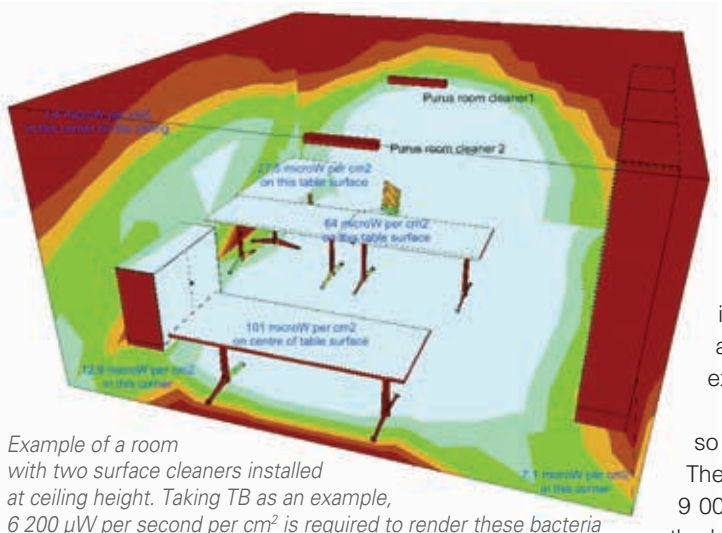
The company pivoted quickly and started generating products for its Jaeger range (German for hunter) during the first month of lockdown.

Fogging is one way used currently to disinfect a space and, although it does work to a degree, the downside to fogging includes the cost and the fact that the fog tends to linger in a space. The other method is to spray and rub surfaces by hand, but human nature dictates some spots are likely to be missed, and there is also the concern regarding transmission of bacteria through furniture, fabrics and electronics. These methods, unlike UV-C, are not repeatable, long-term solutions.

Two local solutions

"We have developed products that use UV-C to disinfect a given area or space in two ways: to clean the air and to clean surfaces," Horlacher says. "An air scrubber is essentially a device where UV-C lamps are enclosed within a chamber. The air is sucked in, blown over the chamber and extracted back out into the room. 'Dirty' air goes in, bacteria is killed, and clean, sterile air, is blown out. With an air scrubber, you protect all living organisms, other than pathogens that have been sucked in, as the UV-C is hidden inside the enclosed chamber."

The surface cleaner designed by Giantlight has to be operated in isolation. "However, it does have a safety passive infrared sensor which works in reverse," explains Horlacher. "When someone is in the room, it switches the



Example of a room with two surface cleaners installed at ceiling height. Taking TB as an example, 6 200 µW per second per cm² is required to render these bacteria inactive. At the lowest level achieved in the room – 1.4 µW in the top left ceiling corner – divide 6 200 by 1.4 = 4 428 seconds. Therefore, it would take 73 minutes to render any TB in the far top left corner of the ceiling inactive. Yet on the work surfaces – such as the main table in the centre of the room at 64 µW per second per cm² – TB would be rendered inactive in 1.6 minutes.

At a glance

- South African company Giantlight has developed new products that use UV-C light to disinfect a given area.
- UV-C light breaks down the DNA structure of organisms and needs to be handled with care.
- In industrial applications UV-C can be used to clean the air and surfaces of Corona virus pathogens – and many others.

light off, as opposed to the more familiar passive infrared, which senses movement or people and turns a light on."

A practical example of where this could be used would be in a public venue such as a cinema, where there are typically five shows a day. Horlacher says, "When staff come in to clean the venue between shows, they have about 10 minutes to do that and, in a schedule with 45 minutes between shows, having cleaned, the staff can walk out, close the door and hit the UV-C light switch. Within 15 minutes, every inch of the cinema is sterilised."

The company has stuck to old-fashioned tube technology as it has found that no LED product produces the same quantity of UV-C at the same price. For the fittings, because UV-C is very aggressive, glass filled plastic is used – using only specific types of plastic – and the rest of the casing is metallic. For the tubes, as normal glass has metal elements in it that filter out UV-C, quartz is used. Quartz glass allows UV-C to travel through it, but it is a lot more expensive.

The air scrubbers can be fitted with an hour meter so users can register how long the lamps have burnt. The lamps have an effective life of between 8 000 and 9 000 hours, so operators can measure accurately when the lamp needs to be changed to maintain the efficacy of the product as a germicidal unit.

The new products are supplied with new operational instructions and a warning sticker. The air scrubbers can be suspended or mounted on a tripod to be moved around.

Ultraviolet light explained

Ultraviolet light is split into UV-A, UV-B and UV-C.

- *UV-A measures between 315 and 400 nanometres. This causes mild tanning.*
- *UV-B measures between 200 and 315 nanometres. It is more aggressive and causes sunburn (which in excess will cause melanomas).*
- *UV-C is the killer – UV-C breaks down the DNA structure of an organism, and it does not allow the DNA to multiply. It measures from 100 to 280 nanometres. Most germicidal lamps produce 254 nanometres. "This is a dangerous product; extended exposure will cause a lot of problems," explains Horlacher. "You'll literally start to burn and develop conjunctivitis." Fortunately, the ozone layer filters out almost all UV-C – and a lot of UV-B, which is why it is critical that we look after the ozone layer.*

The characteristics of UV-C

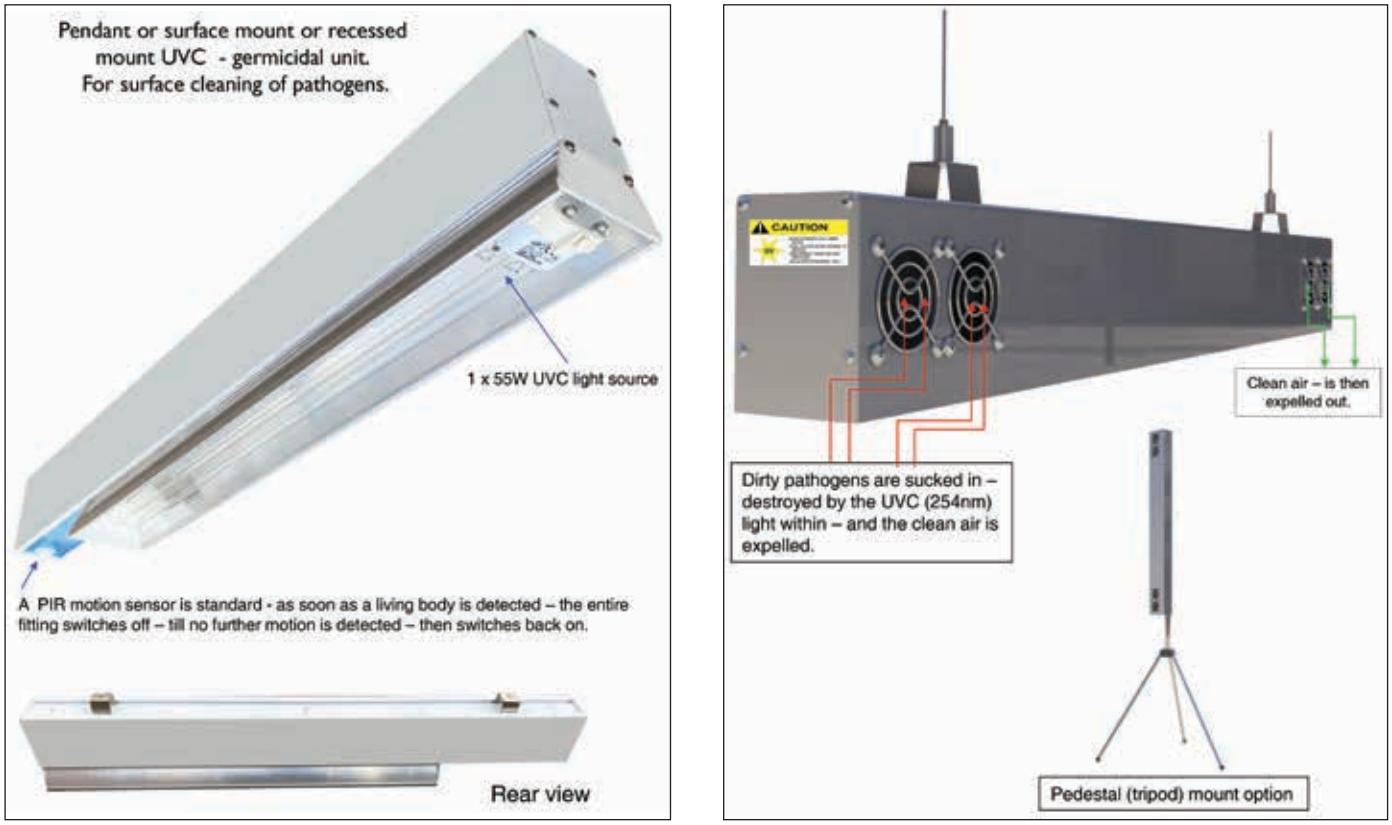
Giantlight began studying the waveform of UV-C and its characteristics and sought to draw parallels between it and lighting. "If it behaves in the same way as light, we asked ourselves, why can't we apply lighting principles to it?" Horlacher says. "The first thing we established is that UV-C decreases by the square of the distance, thus the inverse law applies, the same as with white light.

"We then asked ourselves, why can't we put a UV-C fixture in a photogoniometer, and instead of using a Lux meter use a UV-C meter and generate the entire photometric file to produce UV-C? We imported the UV-C file into Relux: now, clients can give us the room size, and we can position UV-C fixtures in the room and tell them exactly, to a decimal place, how much UV-C they will get at every point in the room.

"What we don't know about UV-C is reflection, so we take our results from the photogoniometer and when we go to Relux, we eliminate all reflection factors. We assume the room is painted matte black; the furniture is matte blank.

"We do this to be safe. Whatever results we get, we know that in real world applications, the results will be better, because reflection will come into play. If we state a light fitting will clean a particular room in eight minutes, that's the worst-case scenario.

"These products can be used in any public venues – schools, gyms, churches, casinos, cinemas, restaurants, hospitals – as well as in commercial and industrial premises. Operators can run air scrubbers during the day, and when everyone leaves, blitz the space for the calculated number of minutes with the surface disinfectant."



Giantlight has introduced new UV-C germicidal solutions for deep cleaning in public, commercial and industrial facilities: an air scrubber (with UV-C light enclosed) and UV-C light fittings.

The only downside of the products is that the UV-C will, over time, attack plastics and materials – much as UV light affects items left out in the sun – and the added cost of electricity.

The future for UV-C

"Even if we find a vaccine, I don't think any of us will ever again think the same way," says Horlacher. "The science is there, the public just needs to be educated about it. UV-C is a form of PPE, and from a commercial aspect, the maths works. Instead of having to close production for hours or days for a deep clean – which means a loss of revenue – UV-C can be used."

Testing credentials

As the current pandemic is a medical situation, the testing criteria and the measuring methodology is complex. "Both our air scrubbers have National Institute of Occupational Health (NIOH) test reports, which talk to their efficacy," says Horlacher. He notes that UV-G manufacturers need to submit products for testing in respect of:

- *NIOH – National Institute of Occupational Health*
- *SANS 60958 (general appliances)*
- *SANS 1706 (UV-G products specifically).*

Industrial applications

In manufacturing facilities, mines and other industrial applications UV-C can be used to clean the air and surfaces of Corona virus pathogens – and many other pathogens, moulds and spores. Horlacher says it is well recognised and, for example, has been used for more than 30 years to sterilise water in bottling plants, breweries and other facilities in the food and beverage sector.

Considering industrial spaces – such as manufacturing plants, assembly halls, warehouses – he explains that coverage for the air scrubbers is calculated by volume of the space to be treated.

Surface cleaners are directional and make use of the reflectivity of walls, floors, ceilings and room elements like tables and shelves to 'bounce' the UV-C rays all over the space. The smaller the area, the fewer UV-C products needed and the quicker the cleansing can be done. Each application requires thought and attention to particular factors, including occupancy and staff movement.

Giantlight already has UV-C installations at Anglo American Platinum mines in Polokwane and Rustenburg, as well as chemical industries and various entertainment facilities. □

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

Safety controllers with in-series diagnostics

The SC10 Series safety controllers from Turck Banner incorporate In-Series Diagnostics which provide easy access to device-level data that can be used to prevent potential problems and quickly correct issues that stop operations. Using an HMI or similar device, operations staff can view the status and location of each device and drill into the data to determine system health and performance. The system can also be configured to alert, direct and instruct staff when a critical event occurs to get equipment back up and running as soon as possible.

The combination of an intuitive user interface and In-Series Diagnostics makes it easy to design and troubleshoot complex safety systems. Drag-and-drop operation allows users to add devices and functionality to the system in just a few clicks. When the configuration has been tested and confirmed the software generates wiring diagrams to guide installation. Data collected from each device can be used to troubleshoot the entire system and identify errors prior to deployment.

Eliminating the time, hassle and expense of running designated cabling between each device and the control panel in order to collect diagnostic data, In-Series Diagnostics collects data using the same cables, connectors, adaptors, and inputs that connect each device to the SC10 safety controller. Users can easily add, move, or remove devices at any stage of a machine's lifecycle simply by updating the configuration in the software and implementing the changes indicated in the wiring diagram.

The export tag feature available with SC10, SC26, and XS26 Series safety controllers reduces the time required to name and configure functions in the PLC. Users simply select export in the industrial Ethernet interface of the safety controller, set the parameters, and save the file. Safety controller inputs, outputs, functions, and other variables will auto populate in the PLC once the file has been imported. This eliminates the need to recreate each line of information manually and ensures consistency between the devices.

SC10 Series safety controllers and up to 64 In-Series Diagnostic compatible devices achieve Category 4, PL e, or SIL CL 3 safety ratings. Outputs on each device are continuously monitored to detect any faults, including short circuits. This design eliminates the possibility of fault masking at any point in the system.

SC10 series safety controllers are typically used to provide safe stop and start functions on machines and equipment.

An In-Series Diagnostics safety system using SC10 safety controllers can be used to monitor a wide range of input devices. The systems are typically used to provide safe stop and start functions on machines and equipment with multiple safety devices and requiring two or more safety relays. These include the following, among others: assembly stations and robotics, conveying lines, packaging machines, pharmaceutical production equipment, food and beverage equipment, and test equipment.

In-Series Diagnostics safety systems can also be used in combination with SI-RF Series safety switches and other devices to solve a number of process applications, including machine rotation, indexing, tool identification and position verification.

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

Narrow protection for sensitive measurements

The Termitrab product family of overvoltage devices from Phoenix Contact has been extended with the new TTC-6P-4 protective device for sensitive four-conductor measurements.

With an overall width of just 6 mm, it reliably protects four signal wires against overvoltage. The new products with the four-conductor protective circuit can be used, for example, for precise temperature and weight measurements where the measured values may not be falsified by the cables.

With its visual monitoring functionality, the protective device can be integrated into remote signalling concepts easily and without the need for additional wiring or programming. The modular setup of protective plug and base element allows fast and tool-free replacement during maintenance work. During replacement, the measuring signal is not affected.

The protective device is available with push-in or screw connection technology. Termitrab is the complete product family from Phoenix Contact that features the narrowest surge protective devices for measurement and control technology.

The new Termitrab overvoltage protection device is just 6 mm wide.

For more information contact Phoenix Contact SA.
Tel: (0)11 801 8200, email: info@phoenixcontact.co.za
Visit: www.phoenixcontact.co.za

Switch from OHSAS 18001 to SANS/ISO 45001

The South African Bureau of Standards (SABS) notes that the international standard for Occupational Health and Safety (OHSAS) has been replaced with SANS/ISO 45001: Occupational Health and Safety Management System Standard. In a recent webinar, the SABS gave clients and interested parties an overview of the changes and the deadline to migrate from OHSAS 18001 to SANS/ISO 45001.

All organisations certified to OHSAS 18001 will have to migrate to ISO 45001 by September 2021. The deadline was initially set by the International Accreditation Forum (IAF) for March 2021 and has been extended to September 2021 as a result of delays experienced worldwide due to Covid-19.

"SANS/ISO 45001 is crucial for all organisations in South Africa as it provides the framework, processes and system for the management of all workplace hazards, health issues and incidents. The effective implementation of the performance based standard will reduce the number of fatalities and injuries in the workplace, and promote a healthier and happier workforce," says Sadhvir Bissoon, Standards Executive at the SABS.

Globally, 2.7 million workers die in workplaces and the International Labour Organisation estimates non-fatal work-related injuries/ illnesses at 340 million each year. The new SANS/ISO 45001 is more comprehensive than

the previous OHSAS standard and requires involvement by the whole organisation.

"While SANS/ISO 45001 is a voluntary standard, there are some references to the standard included in regulations that have been developed by the Department of Labour. Organisations certified to OHSAS 18001 should be aware that their certification will no longer be valid by September 2021. It is important to note that this standard does not replace regulatory requirements. However, implementation of the management system will enable an organisation to meet most regulations relevant to occupational health and safety," Bissoon advises.

SABS is assisting its certification clients to ensure the migration process is smooth and the deadline for migration is achieved. Training interventions to help prepare South African companies to meet the deadline will continue.

For more information contact the SABS.
Tel: +27 (0)12 428 6878,
Visit: www.sabs.co.za

Key differences between SANS/ISO 45001 and OHSAS 18001		
	SANS/ISO 45001	**OHSAS 18001**
Structure	Framework is easier to integrate with other management systems	Framework can be used as a standalone system
Management commitment	Management/leadership of the organisation has more responsibility to implement OH&S	OH&S management could implement the system
Employee involvement	Enables broader employee participation	Top down approach
Risk approach	Follows a preventative approach	Focuses on hazard control

Extensive range of lugs and ferrules

Pratley supplies high quality lugs and ferrules to complement its well-known range of cable termination products.

Pratley is well-known and respected in the electrical industry for its world-class cable termination products for normal and hazardous locations. To complement this product range, the company now also supplies an extensive range of lugs and ferrules.

Unlike many other lugs and ferrules available, the Pratley products are of an especially high quality and made of tin-plated copper. They are designed to meet the needs at the high end of the market.

Marketing Director Eldon Kruger notes, "It is now even more convenient for our customers to place orders for lugs and ferrules at the same times as they are ordering other Pratley electrical products."

The Pratley lugs and ferrules are competitively priced and supplied nationally and internationally for use in electrical installations in industrial and mining operations. They are manufactured from copper and tinned to prevent bi-metal corrosion.

The lugs and ferrules are typically used with stranded copper conductors. Pratley supplies a wide range that covers cable sizes from 1.5 mm^2 to 240 mm^2. The lug range also includes a selection of studs to cater for popular cable termination sizes.

The full cable termination product range from Pratley includes cable glands, junction boxes, Kwikblok® rail-mounted terminals and accessories, end connectors and sleeves, electrical tapes, cable retainers and clips, and lugs and ferrules. The range includes variants for use in hazardous locations – compliant with international IECex standards for Ex n, Ex e and Ex d explosion protected equipment.

For more information contact Pratley.
Tel: +27 (0)11 955 2190, email: sales@pratley.co.za
Visit: www.pratleyelectrical.com

Safe monitoring of gas in oil & gas industry

Workers in the oil & gas industry encounter a range of dangers in inherently risky environments. In particular, they are at risk of exposure to dangerous gases. Most common of these gases is hydrogen sulphide (H_2S). H_2S is a colourless gas, known by its characteristic rotten egg-like odour. Because it is a naturally occurring gas contained in many of the world's crude oils, it can be found in almost every aspect of the oil and gas production process. Every step, from exploration and drilling to refining, demands personal monitoring of this deadly gas.

Another dangerous gas often present in the oil & gas industry environments is sulphur dioxide (SO_2). This also is a colourless gas with a characteristic, irritating, pungent odour. In low concentrations, SO_2 can cause burning of the eyes, nose and respiratory tract, and high concentrations can cause death quite rapidly. This gas is released when burning fossil fuels, so processes that contain fuel-fired furnaces, FCC units, sulphur recovery units and flaring operations can produce high concentrations of sulphur dioxide.

The new Tango® TX1 single gas monitor with DualSense™ Technology can detect H_2S or SO_2 as well as carbon monoxide (CO), or nitrogen dioxide (NO_2). The development of the Tango was motivated by a study of more than 2.2 million iNet® data points and 25 000 gas detectors used in the field over a two-year period, which revealed the inability of many gas detection users to bump test their instruments adequately.

The Tango uses two identical sensors to detect the same gas. The two readings are processed through a proprietary algorithm and displayed as a single reading to the user. Workers in the oil & gas industry wearing the Tango are 85 times safer than they would be using any other single gas monitor available today, regardless of bump test frequency. With the sensor redundancy of DualSense Technology, users of the Tango do not have to worry whether or not the gas detector will keep them safe in the field.

The Tango is powered by one replaceable 2/3 AA lithium battery that will power it continuously for three years, even if the instrument is being used in the optional 'always on' mode. When the battery can no longer support instrument operations, it can be easily replaced to enable another three years of continuous operation. With a three-year instrument warranty, three-year CO and H_2S sensor warranty, and two-year SO_2 and NO_2 sensor warranty, the Tango is reportedly the most cost-effective instrument of its kind available.

In South Africa, Comtest, leading local distributor of test and measurement instrumentation to industry, represents Industrial Scientific (ISC) which is a leading global provider of gas monitoring solutions. Comtest assists customers to determine the appropriate Tango TX1 configuration for specific applications.

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

The sensor redundancy of DualSense Technology in the Tango TX1 makes it safer for users than any other single gas monitor.

Supporting public private partnerships in Africa

Representatives of the African Development Bank, governments, development finance institutions, the private sector and professional associations joined a September 8th workshop to discuss how the bank can strengthen support for public private partnerships and channel greater investment toward economic and social infrastructure. The event, Designing the African Development Bank's PPP Framework, was hosted virtually by the bank.

The workshop took place against the backdrop of the ongoing Covid-19 pandemic and the ensuing economic slowdown, which has sharpened an already urgent need for investment. From 2008 to 2018, five African countries accounted for more than 50% of all successful PPP activity on the continent: South Africa, Morocco, Nigeria, Egypt and Ghana. Several other countries have multiple PPPs in the pipeline – Burkina Faso has 20, and Botswana, 8.

In his opening remarks, African Development Bank Vice President, Solomon Quaynor said, "Before the Covid-19 pandemic, African infrastructure was already struggling to structure projects tailored for the private sector and at the same time achieving value for money for the public sector, including affordability for users. It is imperative that hybrid solutions such as PPPs be seen and promoted as a way of building back better, stronger, greener, by clawing back private capital to infrastructure while creating much needed fiscal room for governments to address multiple other demands, including building health systems' resilience."

The African Development Bank estimates Africa's infrastructure financing needs at up to US$170 billion a year by 2025, with an estimated financing gap of up to of US$68 to US$108 billion a year. PPPs are seen as a key element in narrowing this gap by drawing private sector investment into infrastructure, and the bank is playing a critical role in scaling up that effort.

Amadou Oumarou, Director for the bank's Infrastructure and Urban Development department presented several rationales for the bank's effort to develop a PPP framework, including its Ten-Year Strategy (2013-2022) and a recommendation from the bank's Independent Evaluation (IDEV) unit to scale up PPP interventions.

Webinar participants confirmed that they would like to see the African Development Bank play an expanded role in supporting PPP development in Africa by strengthening policy and regulatory frameworks, building government capacity, project structuring and advisory services, and the provision of financing instruments such de-risking, guarantees, credit enhancements and local currency financing.

"Countries need to learn from each other's achievements and mistakes. They need to have standard documents and checklists that will guide institutions through the PPP lifecycle," said Shoubhik Ganguly of Rebel Group International, which is working in partnership with the bank to develop the framework.

Mike Salawou, Division Manager, Infrastructure Partnerships, said, "Policy dialogue is something the bank places a high premium on, and that has proven to be very efficient in informing decision making."

"One of the challenges RMCs (regional member countries) face is selecting the right project for implementation; support should start from there, then going through to actual project preparation is made easier," said Michael Opagi, Division Manager for Sub-Saharan Africa, IFC.

Private sector representatives praised DFIs as indispensable in securing financing for PPP projects in Africa. One example of a successful PPP project cited during the workshop is the Kigali Bulk Water project, which received significant backing from the African Development Bank, the World Bank, as well as private sector players.

According to Phillipe Valahu, CEO, Private Infrastructure Development Group (PIDG), the Kigali Water project is a perfect example of having integrated support for a PPP project by using the three pillars proposed in the bank's PPP Framework. The project benefited from debt funding from PIDG alongside the African Development Bank which each provided $19 million of senior debt on commercial terms.

"The African Development Bank has unparalleled trust relationships with African governments, and we need to take advantage of that to speed up implementation of PPPs," Quaynor said in closing.

The African Development Bank is looking to facilitate public private partnerships to drive infrastructure development across the continent.

For more information visit: www.afdb.org

Industrial cybersecurity – hurdling the barriers

The recently released Kaspersky report titled *State of Industrial Cybersecurity in the Era of Digitalisation,* has revealed the main barriers found to inhibit or delay implementation of industrial cybersecurity projects. The most common obstacles include the inability to stop production (34%), and bureaucratic steps, such as a lengthy approval process (31%) and having too many decision-makers (23%). These barriers may become a critical point in light of Covid-19 because they can affect the implementation of pandemic-driven operational technology (OT) security initiatives.

The cybersecurity race doesn't slow down and every year many incidents, including high-profile attacks, hit industrial control systems (ICS). The pandemic lockdown introduced its own challenges, adding to the existing threat landscape. Industrial firms have had to adapt to new norms including remote work, overnight digitalisation and new hygiene requirements, as well as specific pandemic-driven threats such as a significant growth in phishing attacks. Organisations need to ensure their protection is up to date with these changes and there are no open doors for malicious actions in ICS networks.

The barriers noted above, however, are among those that organisations will need to overcome when implementing cybersecurity projects. Notably, most of them refer to bureaucratic rather than technical obstacles: the report indicates that 46% – almost half of organisations – face red tape delays. In addition to the most prevalent barriers – long approval times and numerous decision-makers – others include protracted supplier selection and purchasing processes as well as interference from other departments.

These barriers may become more critical in the current post-lockdown period. Again, almost half of the organisations surveyed (46%) expect to see changes in their OT security priorities as a result of the pandemic. These organisations will probably need to shift their security strategy on-the-fly and quickly implement new cybersecurity practices. While this can be challenging generally, due to the specific requirements of OT, the barriers for implementation can complicate and slow down the process more. Some organisations will need to overcome these difficulties within decreased OT security budgets (24%).

Georgy Shebuldaev, Head of Growth Centre at Kaspersky commented: "It's always more difficult to invest money and resources in projects without a clear return on investment, as with cybersecurity initiatives. And while cybersecurity for OT is still a developing area, the management barriers noted are quite natural. As a vendor, it is up to us to help customers eliminate these obstacles and simplify and speed up the implementation of protection measures. Our task here is to make ROI more transparent and showcase the risks for businesses, so customers can understand the benefits from the beginning and better justify them for approvals from management, or the board if needed."

To help industrial organisations accelerate the implementation of cybersecurity projects, Kaspersky suggests the following steps.

The infographic presents a summary view of some of the key findings from the survey.

If an organisation doesn't have enough experience and practice in complex ICS security projects, it's better to implement solutions step by step: start with building organisational processes and adopting basic cybersecurity measures such as security gateways and endpoint protection. Then move to more complex projects such as network monitoring, intrusion prevention and SIEM. Industrial standards, such as ISO or IEC guidelines, can help to organise methods and increase the speed of project execution.

Introduce a practice whereby all new OT systems are implemented with cybersecurity built-in. This should simplify further protection processes and give the OT security team the ability to test new protection tools on these parts of the infrastructure.

Enable education and training for all teams, including specific ICS security training for IT security and OT engineers, and awareness for all employees. This will help different teams understand their respective risks and responsibilities and increase the overall level of awareness about cybersecurity.

Choose a reliable cybersecurity solution for OT components and networks, and trusted partners for implementation. Kaspersky Industrial CyberSecurity solution includes dedicated protection for endpoints and network monitoring as well as ICS expert services and intelligence. The services enable cybersecurity assessment, incident response and obtaining the latest data about emerging threats and how to address them. The results of cybersecurity assessments may be helpful in justifying protection projects to the board.

For more information visit: https://ics.kaspersky.com

Analytics are key to industrial transformation

MESA International (Manufacturing Enterprise Solutions Association), the global industry association focused on manufacturing excellence, and LNS Research, a leading industrial research and advisory firm, have jointly released the latest biennial research study: *Analytics That Matter in 2020: A New World*. The downloadable eBook is the latest in the much anticipated series that LNS Research and MESA International first began publishing together more than a decade ago. The latest study reveals the critical correlation between analytics and successful industrial transformation.

Geared towards manufacturers across various industries, *Analytics That Matter in 2020* provides an updated look at where industrial organisations fall within analytics progress, showing there is still much more work to be done to achieve operational excellence. However, based on the biennial survey by LNS Research, the data also shows there has been a promising 52% increase in industrial companies with a formal analytics program.

The report's author, LNS Research Analyst Andrew Hughes, said while that is good news, obstacles remain. "The industry still has significant challenges. We have seen only a 39% increase in prescriptive capabilities – well behind the increases in diagnostic and predictive capabilities."

New to the 2020 report is the impact of Covid-19 on manufacturers and their transformation initiatives. In addition, the study reveals a number of key insights:

- How analytics are specifically tied to industrial transformation (IX)
- What types of analytics are being overlooked and why manufacturers need to refocus
- How Covid-19 is impacting the progress of analytics in industrial organisations
- The importance of data models and how to build the right ones
- What roles are key to analytics success and how to share information effectively to stakeholders within an organisation
- Why it's important not just to add more analytical tools into the mix.

Chris Monchinski, MESA Analytics Working Group Chair said, "This biennial study is used by MESA International members and manufacturing leadership across industries to build their operational strategies and improve their performance. Our latest report with LNS Research is an important resource in helping industrial organisations determine how they can better use their data to improve decision-making throughout the manufacturing process."

The study will be available for complimentary download for a limited time. The eBook, *Analytics That Matter in 2020: A New World*, can be accessed via the MESA website. Premium members of the association can also access the eBook in MESA's Resource Library.

LNS Research provides research and advisory services to organisations geared towards guiding and accelerating Industrial Transformation (IX) strategy and initiatives. The firm's research focuses on how digital technology drives IX across the value chain and offers insights into the people, processes, and technologies required for achieving operational excellence. LNS Research publications include quantitative research on trends and best practices, as well as solution selection guides. The company's expert research analysts work with industrial companies, including manufacturers in discrete, batch, and process industries, to minimise risks associated with alignment, time, and cost in industrial transformation, from assessing readiness through to solution selection and deployment. In this work it uses proven methodologies to drive convergence between IT and operations teams and to empower team leaders to achieve goals and time-to-value, quickly and confidently.
For more information, visit www.lnsresearch.com

MESA International is a global, not-for-profit community of manufacturers, producers, industry leaders and solution providers that are focused on improving operations management capabilities through the effective application of information technologies, IT-based solutions, and best practices. To accomplish this, the association:

- *Enables members to connect, contribute, cultivate understanding, and exchange strategies to drive operations excellence*
- *Collects, shares, and publishes best practices and guidance to drive greater productivity and the overall profitability of the manufacturing enterprise*
- *Educates the marketplace on manufacturing operations best practices through the MESA Global Education Program.*

Headquartered in the USA, MESA has representative offices globally including in South Africa.
For more information visit: www.mesa.org.

DIARY DATES – With almost all conferences and exhibitions being cancelled, rescheduled or staged virtually, as a result of the global coronavirus pandemic, *Electricity + Control* will reintroduce the column of Diary Dates as events are scheduled for the year ahead..

Your Global Automation Partner

TURCK | BANNER

All in Flow?
Flow Sensors for Industry 4.0

DESIGN AWARD 2019

COMPONENTS 1st place 2019 AUTOMATION AWARD

User-friendly: convenient parameterization with Quick-Teach, access to all parameters via IO-Link 1.1, variable data mapping and NPN/PNP auto-detection

Reliable: Error prevention through delta-flow monitoring, highest vibration and EMC resistance, protection classes IP6K6K/6K7/6K9K

Simple: intuitive operating concept via touch display, multicolor display with all-round visible switching point LEDs

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

www.turckbanner.co.za

RADAR
IS THE BETTER ULTRASONIC

Compact
80 GHz level sensor
with in-head display

All advantages of the radar technology:
www.vega.com/vegapuls