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ELECTRICITY + CONTROL

The Best Move – Safety First

Decentralized safety systems place personal protection close to the danger points and create levels of freedom for modular production

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FEATURES:

- Control systems + automation
- Drives, motors + switchgear
- Measurement + instrumentation
- Safety of plant, equipment + people

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energy + information in industry

For machine safety where companies are looking for flexibility and short commissioning times for price-sensitive applications, decentralized safety solutions with IP67 components offer the best options.
(Read more on p3.)

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*

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Safety at work

Welcome to 2023 – and welcome to another twelve copies of *Electricity + Control*. May this year be all that you, your family and your colleagues hope it to be.

My sense is that the year will be an exciting one, as is generally the case.

This January we cover a range of pertinent topics, including: Control systems + automation; Drives, motors + switchgear; Measurement + instrumentation; Safety of plant, equipment + people. We always welcome articles written by contributors who have information, knowledge and experience to share.

It is never easy to put 'pen to paper' (fingers to keyboard, lips to microphone) knowing that others will read what you write – and no doubt judge it in some way or another. But that is the nature of sharing what you have.

We record our deep appreciation to all the authors who previously have shared and – in advance – to those who will be sharing their knowledge through the pages (virtual and real) of this magazine this year. Thank you.

Obviously, all the topics featured in this edition are important, but let me focus on just one: safety of plant, equipment and people. Many of you may be 16.1 or 16.2 appointees (in terms of the Occupational Health and Safety Act, 1993), or perhaps in a GMR2(1) role (in terms of South Africa's General Machinery Regulations) and would then be fully aware of the legislative elements of this topic. However, the subject is broader than that, and rightly so.

The aspect I'd like to focus on briefly, is the implementation of best practice – in the broadest sense. We often find ourselves in an environment where compliance becomes the only focus. If not properly managed (and socialised), compliance can quickly become a tick-box exercise. This may be obvious, but I'd like you to reflect for a moment on the practice in your own place of work.

It is important to step back and consider what measures are in place to ensure the safety of people in the working environment.

Are the policies in place? They usually are. But try to confirm that the policies, in all cases, are being implemented correctly.

Most importantly – find out if all the people using the policies appreciate why they are in place.

One way to look at (for instance) a policy on behaviour during a dangerous event – is for those implementing the plan to know what the plan is based on – in other words, why are we doing what we are doing?

This may sound trite, but unless we know why boxes are being ticked, we are making little real contribution to improving safety.

So the first message of 2023 is: review your policies and practices on site – and decide whether it may be the right time to engage with everyone to ensure that safety policies and procedures are understood.

If that is the case, you will not even need to tick the boxes to ensure compliance! The tick-box exercise then simply becomes a meaningful record of what is being done – and you would know that what is being done is the right thing!

After all – policies are of little value unless they are correctly implemented.

Let's all do that!

Enjoy 2023!

Ian Jandrell

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

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REGULARS

The best move – safety first

For machine safety solutions there is no such thing as a one-fits-all solution. Depending on the size and application, centrally controlled installations, decentralized or those with passive safety are available. However, decentralized safety solutions with IP67 components are the best option for anyone looking for flexibility and short commissioning times for price-sensitive applications. For this, Turck Banner has the right safety portfolio for a wide range of application scenarios.

Machinery Directive 2006/42/EU requires every manufacturer to assess the risk of their products in order to ensure the safety of persons that come into contact with the machine. Manufacturers follow a three-step process to reduce the risk of danger caused by the machine to an acceptable residual risk. Risks, first of all, have to be minimised by design measures as much as possible. Residual risks must then be reduced through the implementation of technical protection measures. As a third step to reduce risk, the manufacturer is required to provide user information such as operating instructions, which must advise on the correct and proper handling of a product.

Decentralized safety systems place personal protection close to the danger points and Ethernet-based safety I/O modules guarantee personal protection directly at the machine module. This enables designers to shorten cycle times and create machines from autonomous units which are easier to expand and can be put into operation faster thanks to standalone tests.

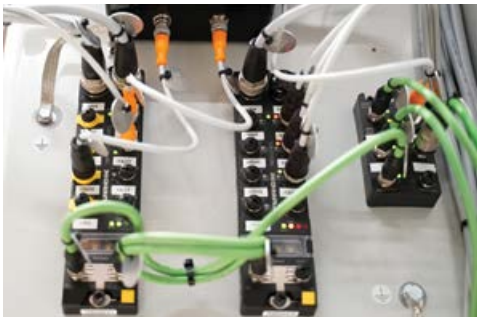
High-performance Ethernet-based safety communication connects all units. By distributing the safety logic in the field, non-affected applications remain productive even during an emergency stop of adjacent processes.

Benefits of decentralized safety

- Accelerated commissioning: Safety applications can be pre-programmed and comprehensively tested on the integrated safety controller of the I/O modules. This can be done by the manufacturer – before the machine is integrated into a complete plant. The elimination of control cabinets and the use of quick connectors reduce the amount of wiring required, shortening the commissioning time for the end customer.
- Simplified design: In applications with centralized safety control systems, long bus cycle times and concatenated messages can result in longer response times for the control system. These in turn require greater distances between the protective equipment and the sources of danger. Decentralized safety control systems ensure the shortest possible response times and allow new levels of design freedom.
- Flexibility in expanding machines: In centralized safety systems, machine expansions can require complex wiring or additional control cabinets. With decentralized, Ethernet-based safety technology, modular concepts can be consistently implemented without control cabinets. The modular principle makes the expansion of machines and plants considerably easier.
- Cost-effectiveness: Decentralized, passively designed safety concepts significantly reduce safety costs. Passive safety ensures the voltage of actuators is safely switched off in critical situations (or in the event of an emergency).

A decentralized safety solution installed.

The Turck Banner portfolio offers users a range of safety components – from safety sensors to mechanical switches to safety controllers.



This safety application is controlled by the TBPN (left) for testing in the factory. A Profisafe controller takes over the application in live operation at the plant. All actuators connected to the IO-Link master (centre) are safely disconnected by the TBSB Box (top).

For more information contact Turck Banner. Tel: +27 (0)11 453 2468, Email: sales@turckbanner.co.za, Visit: www.turckbanner.co.za

Trends shaping tomorrow's process industries

The current drivers of the world's process industries can be defined in three mega trends: sustainability, digital transformation and flexible manufacturing. That was the consensus of an eight-person panel discussion during the opening session at Rockwell Automation's Process Solutions User Group, the prelude to its annual Automation Fair held in Chicago, Illinois, in November last year.

"A key factor in all of this is that it is a journey," said Jim Winter, Rockwell Automation's Director of Global Process Business, emphasising that change won't be easy for many companies, and it will take a concerted effort to address all three trends. Another panellist, Kumar Sokka, Global Business Director for Digital at Rockwell Automation, said his business unit often describes the process of industrial digitalisation as "difficult digital" due to the commitment necessary.

Craig Resnick, Vice President of ARC Advisory Group, picked up on the theme and added that the common denominator in all three mega trends is that they all revolve around industrial workforce issues. Even as automation technology is used more and more to offset a lack of experienced workers, producers are seeking to increase productivity and control costs in the face of a fast-paced and ever-changing world where consumer demands shift often.

"You can almost look at the workforce and categorise it as to how it is affected by each of these trends," Resnick said. "When we talk about sustainability at the C-level, we spend a lot of time looking at things like net zero, the circular economy, and energy saving. When we're in the plant, it's about operational resilience.

"How do we compensate if there is another pandemic, or if we are cut off from the supply chain? Do we have a plan and tools that we can go to, to support sustainability?" Resnick continued, asking hypothetically: "Do we have the right tools and technology in place knowing we might not have a workforce that can support them?"

Resnick said digital transformation in a facility can help a workforce reach heights it is not yet prepared to reach. While the younger generations of workers may be the most technology-savvy, the right technology is needed to help those workers be more productive. "They might be great at Fortnite, but when you say something like 'cat cracker' they are completely lost," he said.

Regarding flexible manufacturing, Resnick added, manufacturers these days need to look at their supply chains from a real-time perspective and be prepared to shift gears at a moment's notice.

In planning digital transformation or a new digital plant, the plan needs to include redefined roles: the operator of yesterday is probably not the operator of tomorrow.

Sustainability front and centre

Pete Morell, Global OEM Industry Director, Sustainability and Process, at Rockwell Automation, picked up the discussion on sustainability, saying many new OEMs coming into the process industries, whether in energy or food processing, really understand their processes but don't always understand the automation involved. He said Rockwell's work with such customers is centred around driving consistency, which, he said, can ease the burden.

He noted too that many customers can't seem to hire enough workers to develop such consistency. "That's where we advocate the concept of 'connected workers'," he said, describing a plant where there is a central control room and workers can communicate and work in tandem.

John Steckler, Director, North American Process Automation at Archer Daniels Midland (ADM), a Chicago-based food processing corporation, said consumers around the world have made it clear that they expect the products they purchase to come from sustainable sources, produced by companies that share their values. "With our role in the food chain, we really have a responsibility to scale up our sustainability efforts to the ever-expanding needs of the global population," he said of his company.

To accomplish its sustainability goals, Steckler said the company focuses on its supply chain, which is made up of farmers. "We're helping to enrol over two million acres in regenerative agriculture for low-carbon intensity products," he said of his company's efforts. He outlined several other key initiatives such as the company's 'Strive 35' commitment, through which it aims to decrease its greenhouse gas emissions by 25% by 2035. "That commitment also includes targets for reduction in energy usage, water intensity and diverting waste from landfills," he added. "So, we are looking at scope 1, 2 and 3 emissions."

He said the company is also involved in projects and joint ventures for the production of bioplastics and sustainable aviation fuel. And he highlighted its 'Project Subway', which is a project to produce feedstock for renewable diesel fuel. For this, Steckler said ADM needs a highly automated plant in North Dakota, which it hopes to have in operation by next year's harvest, although he admitted the timeline is aggressive. Steckler said the process of automating the plant, while sustainable in scope, was "really about digital transformation in the form of a completely new plant."

He noted that ongoing workforce challenges needed to be considered, and that the plan for the new plant redefines roles, something he said is becoming increasingly necessary in today's world. "The operator of yesterday is probably not the operator of tomorrow," he said. "All roles in a plant might be different from what we would call traditional roles in plant production."

He pointed to the need for building more automated unit controls and added that considerations such as full plant production adjustments need to be based on demand or key performance indicators. "With less human interaction, normal processes change," he said.

Digital transformation

Getting started on the digital transformation journey is not easy. Sokka said, "Looking at the market, we see how everyone wants to figure out how to get into digital transformation and understand what the problems are to solve.

"At Rockwell Automation our aim is to bring all the hardware, software, domain expertise, services, and partner software technology together to deliver value," Sokka said, outlining Rockwell's approach to digital transformation. "Our main focus is 'fast value'.

"We work with customers to figure out what they can digitalise over six to eight weeks – and then how to scale the solution. This approach drives larger scale transformation," he said.

One industry that urgently needs to transform to digital functionalities but has struggled to find the right value is the oil and gas industry. Andrea Monte, Vice President, Digital Automation Solutions and Services at Sensia, an oil and gas technology company which brings together real-time control and IoT technology from Rockwell Automation and pairs it with software and analytics from oilfield services giant SLB (formerly Schlumberger), said the oil and gas industry faces three main obstacles to digital transformation.

First, he said the global nature of the oil and gas business means companies face very different operating conditions in different countries. "That makes standardising difficult." He added that the lifecycle of an oilfield is measured in decades, so automation technologies and digital architecture get outdated, even though they are still in use. This means it might not be practical to transform a plant. He also reiterated the key point raised by the panel and referred to the industry's 'great crew change'. "Ironically, this is a reason for digital transformation to step up in pace," he said. "There's an opportunity for digital technology to replace (or supplement) domain knowledge."

Flexible manufacturing

The driver behind flexible manufacturing is the consumer market. "Consumers are not only looking for sustainable products, they also want increased functionality," said Mark Massey, Global Electrical and Controls Manager at Primient, a manufacturer of food and industrial products from plant-based and renewable sources. "And they want all this in the brand and products they always purchase," he added. "This puts a lot of pressure on the manufacturing space to change production more frequently and get to quality standards more quickly."

In digitally driven automated plants, remote workers can communicate through a central control room or work in tandem.

This evolving demand means products need to move quickly from plant floor to end consumer, without increasing warehousing or tank space, and at the same time reducing working capital, he added.

"It has to be about everyone working together up and down the supply chain and requires stakeholders to think holistically about their businesses," Massey said. He added the trend towards flexible manufacturing offers the opportunity to revolutionise how companies manage their production. And importantly, it offers the opportunity to build smarter facilities.

Tim Shope, Vice President, Digital Transformation at Endress+Hauser, agreed, saying new plants will be built "very differently". Shope highlighted that flexible manufacturing needs to be taken into account when building plants because the possible lack of workforce in the future will require more automation and less direct human interaction. He cited new green hydrogen plants as examples of facilities coming online that will be more about the technology and less about how many people are needed to run it.

All the panellists agreed that flexible manufacturing has already arrived and is here to stay. "Flexible manufacturing is no longer a far-off wave, it has already hit," Massey said.

It goes hand-in-hand with the trends towards sustainability and digitalisation in defining the future of the process industries. □

As part of Rockwell Automation's annual Automation Fair, members of the Process Solutions User Group/PSUG, which involves diverse process automation customers, come together to discuss and explore best practices, emerging trends, innovative approaches and new technologies.

For more information visit: www.rockwellautomation.com

Joyce Moganedi, Power and Water Division at ABB.

SCADA systems for a smart, sustainable water sector

South Africa faces a potential water crisis, relying as it does on largely ageing infrastructure in water supply networks and wastewater treatment systems. As well as raising water quality issues this results in increasing pipe bursts and leakages amounting to some 41% non-revenue water. "There is clearly room for improvement, but only if the sector can adopt and embrace change," says Joyce Moganedi, Power and Water Local Division Sales Manager at ABB.

She says cutting-edge solutions can be deployed to ensure sustainable management of the complete water lifecycle. This would mitigate the impact of natural disasters such as drought and floods. And these solutions are centred on supervisory control and data acquisition (SCADA) systems.

SCADA is the most widely used automation system for water applications globally. In a world where every drop of water counts, water and wastewater plants play a critical role in bridging the gap between the growing demand for water and the scarcity of this precious resource. Alongside efficient infrastructure, automation and control technologies are at the core of the challenge.

ABB Ability™ Symphony® Plus SCADA can easily be adapted or engineered for a broad range of applications in the water and wastewater industry, handling automation and control in water distribution networks, water pumps and water transmission pipes, for example, as well as drinking water, water mains, pumping stations and wastewater treatment.

"The flexibility and scalability of SCADA makes it suitable for the full spectrum of clean power and water installations, in locally or remotely operated plants, fleets or networks," Moganedi says. "It allows for specific plant processes to be monitored, controlled and managed."

It provides visual oversight of operations and access to real-time information to monitor plant performance and flag any issues of concern. It also makes remote operations possible to boost efficiency and productivity. "Most importantly, it enables the plant or system operator to predict potential failures and deploy mitigating measures in good time, allowing for water services to manage their water infrastructure assets smartly," says Moganedi.

However, she says the uptake of SCADA systems in the water sector is hindered by a lack of project funding and slow implementation. And she highlights that, "Responsible and efficient water usage can only be achieved with the automation, electrification and digitalisation of South Africa's water plants to ensure safe, smart and sustainable management of the water cycle." Moganedi emphasises that only when plants are automated can responsible water use be implemented and managed effectively.

For more information visit: www.abb.com

More efficient resource-saving plastics processing

PC-based control offers the potential to maximise efficiency in machine processes, and high data transparency all the way to the cloud.

PC-based control, the PC- and EtherCAT-based control and drive technology from Beckhoff, offers the potential to make machines and systems for the plastics processing industry work more sustainably. The software is based on the TwinCAT 3 Plastic Framework, the TwinCAT Analytics data analysis solution, and TwinCAT OPC UA for communication according to the Euromap standard. On the hardware side, for example, EtherCAT Terminals for energy data acquisition and servomotor drives play an important role as an alternative to hydraulic solutions.

The TwinCAT 3 Plastic Framework enables seamless integration of hydraulic and electric drive technology, providing a modular and powerful control system for plastics processing machinery that minimises development work while retaining the tried-and-tested openness of the Beckhoff architecture. This means all prerequisites are in place to process plastics in a way that is as efficient and sustainable as possible; high-precision process control and end-to-end digitalisation help to save on resources.

The Plastic Framework brings together Beckhoff's many years of expertise in plastics and integrates important industry-specific control functions. These are complemented by a collection of industry-typical framework controls that can be integrated into the overall solution. Euromap/OPC UA can also be integrated with ease. The sample code included as standard for various plastics applications, such as injection moulding, blow moulding, and extrusion, simplifies project planning and programming.

Data transparency supports efficiency

As all common Euromap interfaces are supported, users can adopt a standardised approach to exchanging data – between individual machines and between machines and the higher-level MES (manufacturing execution system). In addition, process data can be aggregated synchronously with the machine cycle using the TwinCAT Analytics data analysis tool. All required information on the processing procedure and the machine state can be derived from this data to optimise production efficiency and energy consumption.

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In-house developed software improves demin process

The process of demineralisation removes dissolved solids (total dissolved solids or TDS) and mineral ions from feed water and process streams in diverse industrial applications. Demineralisation (demin) plants typically use ion exchange to offer near-total removal of ionic mineral contaminants. Allmech, a leading South African manufacturer of boilers and supplier of water treatment equipment, has been testing a new PLC system with software developed in-house, to run its ion exchange demin plant, and is seeing encouraging results.

"We've been testing the system for several months now, and we believe we have developed something that can help our customers with the water demineralisation process," says Lionel Maasdorp, MD at Allmech. "Water purification options depend on the customer's needs, but all else being equal, demin plants require a lower capital investment than reverse osmosis plants," he says.

Demin plants are used for various industrial and scientific purposes. These may range from laboratory applications and testing to the manufacturing of computer chips, to lead-acid batteries, cooling systems, high pressure boiler feed, laser cutting, steam irons and steam raising, pharmaceutical manufacturing, cosmetics, aquariums and fire extinguishers. Maasdorp says Allmech's customers that use demin plants are mainly in the food and beverage industries.

"A demin plant typically consists of two vessels: one containing cationic and the other containing anionic exchange resins," he says. "Raw water enters first through the cationic resin, where mineral contaminants are replaced by hydrogen ions. Then it flows through an anionic resin, where mineral contaminants are replaced by hydroxyl ions, which combine with the hydrogen ions to form pure water. A demin plant then needs to be regenerated with hydrochloric acid and sodium hydroxide when necessary, and typically at regular intervals."

With the new PLC and software, Allmech's demin plants are more easily customisable and can include plant monitoring functionalities.

The disadvantages of this type of system are that the caustic and acid mix required to regenerate the resin create a waste product that must be disposed of, and that the system cannot run indefinitely – it needs downtime for regeneration to take place.

"With our current setup, we can run the system for eight hours before it needs to regenerate," Maasdorp says. "Changing the volume of the resin used can allow for longer running times and higher deliverables of clean water. There is also less reject water than with a reverse osmosis plant."

He explains that there is a fair amount of flexibility in the configuration of a demineralisation system, to meet various process conditions and purity goals optimally. In designing the system, Maasdorp says consideration should be given to changeability of the feed water, the level of purity required, the system footprint, tolerance for ion leakage (in particular sodium and silica), and chemical feed requirements, among other factors.

With the addition of the new PLC, Allmech's demin plant is more easily customisable through the programming of the various inputs. It also offers alarm functionality to flag when water quality is not up to standard, which ensures the water is not needlessly dumped through backwashing, and it alerts the user to potential issues in the system.

Maasdorp highlights that control valves, which are demand-initiated controllers, enable demin plant units to be highly efficient. The control valves have five main functions: service, backwash, brine and slow rinse, brine refill and fast rinse. He adds that Allmech is the sole agent for Runxin water treatment system valves in South Africa. "We supply a full range of manual and automatic filter and softener valves. The valves are reliable, easily available, user friendly and cost-effective, and ideal for use in demineralisation plants," he says.

For more information contact Allmech.
Tel: +27 (0)11 849 2731
Email: lionelm@allmech.co.za
Visit: www.allmech.co.za.

Continued from page 6

With an extensive portfolio of I/O terminals, Beckhoff also integrates the measurement technology required for energy monitoring into its standard control technology. Modular measuring terminals are available for applications ranging from the measurement of temperature, power, current, and voltage to sophisticated mains or condition monitoring. The signals are sent to the control as raw data for further processing, meaning only one control is needed for automation and energy data acquisition. PC-based control simplifies the implementation process considerably, and retrofitting requires minimal effort.

Dynamic and high-precision servo drive technology from Beckhoff opens up further possibilities for saving energy and conserving resources in plastics processing. It also offers a number of valuable advantages over previous hydraulic solutions, including greater controllability and an increase in energy efficiency, as well as the complete elimination of hydraulic infrastructure in the machine or system. This is made possible by the AM8000 rotary servomotors, the AL8000 linear servomotors, and the new AA3000 electric cylinders.

For more information contact Beckhoff Automation.
Tel: +27 (0)11 795 2898, email: danep@beckhoff.co.za
Visit: www.beckhoff.com/en-za/

Real-time display for industrial systems

The Harmony P6 industrial personal computers with embedded software provide for improved visualisation and control.

Schneider Electric has announced the availability of its Harmony P6 iPC (industrial personal computer) range to its Anglophone Africa partner network.

The Harmony P6 industrial PC and software range is designed to improve industrial productivity and operational efficiency. It connects operational technology (OT) to IIoT, providing organisations with the networking and display capabilities required to gain the most from their digital transformation.

Sbo Chili, Industry Business: Offer Manager – IDHMI at Schneider Electric, says, "The Harmony P6 provides clearly presented, real-time performance information for industrial systems and offers the guidance staff need to improve performance and address problems before costly downtime occurs."

Key features of Harmony P6 include:

- Smart design and engineering – it is economical and designed to enable efficient implementation
- Workforce empowerment – the embedded software allows for improved visualisation and control
- Cybersecurity – end-to-end security, designed according to the IEC 62443 Cybersecurity Standard for Control Systems, is incorporated (plus associated security software, Achilles and McAfee and EcoStruxure Secure Connect Advisor for remote connections).

"Combined with Schneider Electric's EcoStruxure Automation Expert, the Harmony P6 also enables organisations to deploy the computing capabilities they require for those more calculation-intensive applications," Chili adds.

Sbo Chili, Schneider Electric.

Technical features

Harmony P6 is versatile and open to applications running Windows software at the edge: HMI, SCADA, IIoT Edge, engineering and maintenance tools, and thin clients. It offers excellent visualisation and control, with associated software enhancing the operator experience. It leverages crew reactivity for business maximisation with four high-performing Intel CPU cores for industry. The iPC allows for consistent operator workstations at the edge, with the modularity to make Box PCs, Panel PCs, and monitors that support optimum ergonomics in the working environment where the application is used.

A solution guide and TVDAs (Tested Validated Documented Architectures) allow for ease-of-selection, integration and maintenance of the software associated with Harmony P6, and provide a single contact window for technical support and repair.

Units are configured to order, with associated software selected via the online configurator.

"We've come a long way," says Chili. "Today's modern and modular communication offerings like the Harmony P6 are packed with the processing, display and computing power required in the digital transformation in industry."

For more information contact Schneider Electric.
Visit: www.se.com

Versatile rod-style electric actuators

Featuring three different screw technologies, AVENTICS™ Series SPRA rod-style electric actuators offer the versatility to meet demanding application requirements.

Emerson's new AVENTICS Series Servo Profile Advanced (SPRA) Electric Actuators introduces a line of precise and high-repeatability rod-style cylinders. Where usually only one electric actuator screw type is available on the market, the SPRA actuators offer three screw technologies. These include a precision ball screw, which provides high durability and accuracy for applications that need optimal quality or throughput; a cost-effective lead screw option; and roller screws for precision, speed and heavy loads.

The versatile range of rod-style cylinders allows users in the automotive, food and beverage, packaging and life sciences industries to configure electric actuators to meet specific application requirements, such as improved sustainability or efficiency, rather than settle for a standard approximation.

"With four sizes and multiple mounting options, the AVENTICS Series SPRA Electric Actuators are cost-effective, high-performance solutions that cover most machine automation applications," says Linda Schwartzen, Product Marketing Manager at Emerson's AVENTICS actuator business. "Compliance with the ISO 15552 standard includes a range of accessories and our online calculation tool and configurator support appropriate implementation to suit specific applications."

Interconnected online tools allow users to size and customise electric actuators directly, with no software installation or registration necessary. The configuration includes a direct download of CAD files, which comprises all elements of the configured solution, such as electric cylinder, accessories, mounting options and motor adapter.

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

Advancing network management with SNMP

Engineers can gain added insight into the health and performance of their networks and devices with Simple Network Management Protocol (SNMP). According to John Browett, General Manager at the CC-Link Partner Association (CLPA), its use is key to advancing industrial automation and Industrial Internet of Things (IIoT) applications, and it is now closer to becoming a reality, via future-oriented network technology.

Browett says SNMP has been widely used throughout information technology (IT) domains since its foundation in the 1980s. It sits on the application layer of the Open Systems Interconnection (OSI) model to support the management and monitoring of devices connected over Internet Protocol (IP) networks. These include Ethernet switches, as well as any device that supports IP or Transmission Control Protocol (TCP) communication, such as bridges, routers, access servers, computer hosts, hubs, printers and cameras. All these devices come with bundled SNMP agents.

He says the technology is used extensively as it collects key data that can help IT professionals be aware of the status of all managed devices and applications. In effect, every network component can be queried in real time to look at its performance metrics through management information base (MIB) files.

In addition, if thresholds for certain values are exceeded, system administrators can be alerted promptly, supporting quick troubleshooting and advanced productivity. Due to the recent advances in SNMP cybersecurity, the solution can also be used to streamline the configuration and modification of devices within a network.

Applying the benefits of SNMP to OT

While the IT world has been leveraging SNMP for decades, the operational technology (OT) domain has been lagging behind in the adoption of this solution, despite its capabilities and the opportunities it presents. Browett says as IIoT applications become increasingly important to drive a business's competitiveness, the paradigm needs to shift. Future-oriented communications will rely on converged architectures, where IT and OT data are transferred by the same infrastructure.

By being able to apply the SNMP protocol to converged networks, companies can continue to benefit from advanced management capabilities and rapid diagnostics for IT systems – as well as for OT communications. The ideal network therefore should be able to support the protocol.

More automation devices are beginning to offer SNMP ports, but industrial communications solutions for the shopfloor typically do not offer this function. The main reason for this relates to the protocol's previous potential for disruption of security, stability and determinism on these networks, which, critically, must be avoided. However, the latest advances in the field can resolve these issues. Firstly, the newest SNMPv3 introduces key elements that address the vulnerabilities of previous versions, for example, by means of an enhanced security system that authenticates messages and ensures their privacy. Simultaneously, Time-Sensitive Networking (TSN) is improving standard industrial Ethernet by enabling the transfer of multiple types of data traffic on a single cable while maintaining deterministic performance for time-critical OT communications.

Driving convergence and network management

Thus, there are tools at hand that can be used to create converged, SNMP-supported communications. As a network technology developed to enable the creation of forward-looking IIoT frameworks, CC-Link IE TSN is designed to offer convergence and SNMP functions.

This open industrial Ethernet solution features gigabit bandwidth and TSN functions, enabling the setup of data-driven, interconnected factories. In addition, compatibility with SNMP empowers users to collect device status information on industrial automation products, as well as other nodes. This makes it possible to improve network diagnostic capabilities and reduce system start-up times as well as the amount of time and effort spent on system administration and maintenance. With CC-Link IE TSN and its expanding range of certified products, companies can get the most out of enabling network technologies. This will help them take communications to the next level to drive up their productivity and competitiveness.

For more information contact CLPA Europe.
Email: john.browett@eu.cc-link.org
Visit: eu.cc-link.org

AS-Interface control cabinet modules

Actuator-Sensor Interface (AS-i) SmartLine modules from ifm are designed for use in control cabinets. With a slim, compact design, they also fit into control panels. The supplied cage clamps allow for simple, fast and efficient wiring. Double terminals help the user to loop through the power supply. The high current rating of the modules supports trouble-free operation.

The product range includes units with digital inputs and outputs and modules with analogue inputs.

Clearly visible LEDs display operation, function, switching status and fault indication, as applicable.

For more information contact ifm South Africa.
Tel: +27 (0)12 450 0400
Email: info.za@ifm.com, visit: www.ifm.com

Compact SmartLine AS-i modules from ifm can be used in control panels and cabinets.

New high-tech facility will support industry

Specialist in drive and control technologies, SEW-EURODRIVE South Africa, moved into its new state-of-the-art 26 000-m² headquarters complex in Aeroton, Johannesburg, during last year. The new complex more than triples the floor and factory space of its previous premises. It serves as a hub, enabling the company to service its customers across Africa efficiently.

Built and equipped at a cost of R200 million and modelled on SEW-EURODRIVE's showcase factory in Graben-Neudorf in Germany, the facility – which accommodates about 150 employees – makes extensive use of the latest technologies to network people, processes, services and data.

The investment reflects SEW-EURODRIVE's confidence in the future of South Africa and the African continent. The company notes that Africa is regarded as the world's next growth market. Home to 17% of the global population in 2019, it is expected to account for 26% by 2050, with an estimated US$16.2 trillion combined consumer and business spending.

Commenting on the investment, Raymond Obermeyer, Managing Director of SEW-EURODRIVE South Africa, says: "This is a bold step that demonstrates our commitment to being part of solving South Africa's problems and developing the economies of countries across Africa."

SEW-EURODRIVE currently services customers in 23 countries across the African continent from South Africa. "With the implementation of the African Continental Free Trade Area (AfCFTA) protocol, which came into effect in early 2021, and a push to grow manufacturing on the continent, we are expecting African markets to account for around 50% of our turnover within the next few years," says Obermeyer.

SEW-EURODRIVE South Africa moved into its new 26 000-m² headquarters complex south of Johannesburg, in 2022.

The new facility will play a pivotal role in enabling the company to service the burgeoning African market efficiently. It houses the group's African head office as well as an assembly plant for industrial gears and electric drives, expanded central warehousing and repair facilities. It also includes space dedicated to the assembly and repair of variable speed drives (VSDs), automated guided vehicles (AGVs) and servomotor technology. Within its workforce, SEW-EURODRIVE employs a number of mechanical, electrical and mechatronic engineers who provide support on customers' technical queries.

In addition, the new headquarters complex accommodates the Drive Academy, which delivers product awareness and maintenance training to customers. Online and virtual AR training and support is also now available, and this is aligned with the company's social development plans.

The expanded warehousing gives SEW-EURODRIVE the capacity to carry increased stock levels, which is a huge benefit given the problems that continue to affect the global supply chain. For the company's customers in Africa, it means their orders – for new equipment or spares – can be fulfilled with minimal delay.

"The new facility enables us to service our customers more efficiently, assisting them in reducing the high cost of unplanned downtime and in adhering to their scheduled maintenance programmes," Obermeyer adds. "Ensuring our customers' continued productivity has been the key driver behind the development of our new premises."

Over a three- to five-year period, SEW-EURODRIVE will incorporate further 4IR technologies, including automated assembly machines and guided vehicles, into the Aeroton factory at a cost of an additional R200 million.

"We are working hard to shape the factory of tomorrow with system solutions for Industry 4.0 and a focus on raising productivity and implementing smart maintenance – and at the same time providing an ergonomically supportive environment for the people working here," says Obermeyer.

Automated operations and shorter lead times

The company has used its own technology to automate operations at the Aeroton facility, with the main production

Above: The company's high-tech MOVI-C® all-in-one modular drive solution, launched at Electra Mining Africa in September last year, is now available to the African market.

Left: The new HQ complex serves as a hub, enabling SEW-EURODRIVE to service the burgeoning African market efficiently.

conveyor being based on the company's high-tech MOVI-C® all-in-one modular drive solution, which is now being introduced to the African market. It was launched officially at Electra Mining Africa, in September 2022, in Johannesburg.

MOVI-C® is a suite of products – which includes controllers (PLCs), variable speed drives, gear motors and servomotors – that automates drive applications, whether simple or complex.

The installation, which has resulted in a 40% productivity gain, includes the MOVIGEAR® mechatronic drive system. The MOVIGEAR® units, which combine an energy-efficient IE5 motor, gear unit and corresponding drive electronics in a single housing, control and drive the production conveyor. The modular nature of the installation means it can easily be extended in future should the need arise.

The assembly line for geared motors can accommodate 7 000 units per month and the assembly of industrial gear (IG) units is currently being ramped up to between 100 to 140 IG units per month, doubling current capacity. New spray booths and automated oil filling stations have been installed to cater for these volumes.

All local assembly is conducted in accordance with SEW-EURODRIVE's global quality standards, with the assembly of VSDs, servomotors and other sensitive equipment being conducted in an isolated clean area of the facility – with copper grounding and anti-static mats. The assembly and logistics processes are also now incorporated into SEW-EURODRIVE's SAP system, which provides for better traceability and visibility of all orders as they move through assembly processes.

Among the products to be produced at the new facility are the company's modular air-cooled condenser (MACC) drives, which have already seen strong sales in South Africa with two units having been installed recently in the Northern Cape and a further 24 units at a Limpopo site. Part of SEW-EURODRIVE's M-Series modular IG range, the MACC is a purpose-designed gearbox solution for driving the modern fan-based air-cooled condenser systems used in steam-driven power generation units.

SEW-EURODRIVE will stock a single casing size with multiple components and specific ratios, depending on which power station requires the drive. This modular approach will enable the new facility to custom assemble MACCs at a rate of two to three

The latest technologies are used in the new facility to network people, processes, services and data.

units a week, significantly cutting the long lead times typically associated with this kind of equipment.

Other products to be locally assembled include the New Generation X.e Series industrial gears; the P-series planetary industrial gears for high torque mining applications; with provision for short importation and commission lead times, mill drive solutions with power packs; electric motors; and the customised single-stage M1 range of speed reducers, which consists of 37 options for fine tuning a drive's output speed and torque.

Illustrating the benefits of the new Johannesburg facility, SEW-EURODRIVE expects to be able to assemble and test customised M1 units within two to three weeks from an order being placed. Previously the units had to be imported from overseas, with lead times of 16 to 20 weeks. □

For more information visit: www.sew-eurodrive.co.za

Floris Erasmus, Sales Specialist HV Motors at Zest WEG.

MV motors deliver reliability and better total cost

In many critical industrial and other applications, medium voltage (MV) electric motors can help mitigate operational risk. They offer high levels of reliability, longevity and low total cost of ownership.

Floris Erasmus, Sales Specialist HV Motors at Zest WEG, says MV electric motors offer the benefits of being purpose-designed and well protected. This makes them very reliable, and thus well suited for critical applications where the risk of failure-related disruption must be mitigated.

"Any motor application – from pumps and fans to crushers and conveyors – can present a critical risk if a significant portion of the whole operation relies on it," says Erasmus. "In these cases, it is often worth considering the MV motor option, in new projects or in instances where motors are being replaced."

Compared to low voltage (LV) electric motors, which are categorised generally at up to about 1 000 V, MV motors range from 1 000 V up to as high as 33 kV. In the South African market, the upper end of the MV range is usually 11 kV, he says.

Erasmus highlights too, that MV motors are generally not off-the-shelf, but are rather specially designed for the given application. They also differ from LV motors in their construction. The 'wire' used in the windings, for instance, is more like a rectangular bar. Normally covered with mica tape, they make up form-wound coils.

"The coils are individually wrapped with thicker insulation to accommodate the higher voltage," he adds. "There is only one turn in a slot, so there is no potential difference between turns; this means there is less chance of an inter-turn failure or short circuit between coils."

The new WEG W51 range is supplied standard with an oversize terminal box to allow for installation of a surge suppression device and easier installation of the electrical supply cable.

Another important differentiating factor in the winding of an MV motor is that it is done using vacuum pressure impregnation (VPI) and an epoxy resin. Applying the resin in a vacuum allows for all air and moisture to be removed. The absence of air allows the resin to flow more effectively into the spaces between the steel core and the copper winding. The incidence of air pockets in the slot of the stator is where many winding failures in motors begin.

"If the resin is not distributed effectively, this can undermine the mechanical strength of the winding," Erasmus says. "The epoxy resin used in MV motors is very strong compared to varnish."

He adds that the removal of moisture during the VPI process reduces the possibility of short circuits caused by water particles trapped inside the motor windings.

"Another benefit of MV motors is their low starting and operating current," Erasmus adds. "The kilowatt rating of a motor – the power it consumes – is a function of the voltage; by raising the voltage, the amperage drawn is reduced."

He points out that the starting current of a motor tends to be about six times higher than the operating current. By reducing the operating current, an MV motor helps to reduce the strain that high starting currents can place on the electrical system in a mine, plant or factory.

The MV option also has a distinct advantage when used with variable speed drives (VSDs). The transformers that are part of the MV motor installation ensure that no extra filters or add-ons are required to achieve near-perfect sine waves. He notes that MV VSDs are also better at disrupting harmonics in the electrical system.

Protection systems on MV motors are an important aspect of ensuring their longevity. Erasmus explains that the motors are normally electrically protected with a smart relay which is password-protected. This makes it difficult to bypass the overload systems that protect the motor, and prevents the motor from being started under fault conditions. Although this protection might slightly increase installation costs, it helps reduce total cost of ownership.

"With regard to Zest WEG's MV offering, WEG has recently launched its W51 range – which includes MV motors," he says. "This new range offers improved efficiencies and higher output to weight ratios, and the motors are suitable for use with VSDs."

They are available in a 315 to 450 frame which, with four-pole motors, translates to a range of 132 kW to 1 400 kW. The standard range reaches 6.6 kV but motors up to 11 kV can also be requested.

"The range includes motors for hazardous areas, where there may be gases which are susceptible to ignition," says Erasmus. □

For more information visit: www.zestweg.com

Partnership to support optimised electrical design

Siemens Smart Infrastructure and Eplan have agreed on a strategic partnership to strengthen their collaboration in software solutions for the industry and infrastructure market sectors. As part of this agreement, Siemens' Electrical Products business unit will join the Eplan Partner Network as a strategic partner. The objective is to coordinate the products of both companies in a more targeted way in order to offer optimised solutions for switchgear manufacturers and electrical planners. Sebastian Seitz, CEO of Eplan, and Andreas Matthé, CEO of Electrical Products at Siemens Smart Infrastructure, signed the agreement to this effect in September 2022.

"The overall goal of our collaboration is to create a plug and play structure for electrical planners. We want to open our tools bidirectionally, for both sides, and thus simplify and accelerate workflows," said Andreas Matthé.

Sebastian Seitz of Eplan emphasised the benefits for joint customers: "In switchgear construction, we can use Eplan Pro Panel to optimise processes and automate them to a greater extent. In addition, we will more specifically address the growing area of power distribution and work with Siemens to create end-to-end solutions for integrative, more efficient workflows."

The industry segment comprises offerings and products for control panel building, and the infrastructure segment includes switchgear construction for power distribution. In the industry sector, Siemens and Eplan will build on the cooperation they have developed over many years, to provide Eplan data across all configured Siemens products, for example. For the infrastructure market, Eplan and Siemens will jointly optimise and automate customer processes, for instance in the Sivacon and Alpha environment (power distribution systems) by integrating Simaris (planning tools) and the Eplan platform.

Both parties will contribute their expertise to the benefit of their joint customers, to enable more efficient workflows in switchgear construction and power distribution.

For more information contact Eplan Software & Service.
Visit: www.eplan.co.za

Siemens Smart Infrastructure, Electrical Products.
Visit: www.siemens.com/lowvoltage

Sebastian Seitz, CEO of Eplan, and Andreas Matthé, CEO of Electrical Products at Siemens Smart Infrastructure, signed the agreement.

Upfront challenges in general overhaul of 147 MVA generator

Marthinusen & Coutts (M&C) and ACTOM Turbo Machines have together successfully completed the general overhaul (GO) on one of Sasol's Secunda gas turbine driven 147 MVA (120 MW) generators.

Sasol uses a feed stream of natural gas piped from Mozambique to drive the two 147 MVA turbines and generators.

This recent major GO was performed after about 100 000 hours of runtime of the generator.

Mike Chamberlain, M&C's Marketing & Commercial Executive, who project managed the GO, said that in addition to the ACTOM bid being competitively priced, he believes the good track records both M&C and ACTOM Turbo have established independently with Sasol on various projects played an important part in its decision to award the general overhaul contract to them.

"Another factor in our favour is that M&C and ACTOM Turbo have successfully worked together on a substantial number of projects in the past," Chamberlain said.

M&C was appointed lead contractor on the GO for the 147 MVA generator and took direct responsibility for all the electrical work involved. ACTOM Turbo Machines was charged with the responsibility of executing all the mechanical work.

The core portion of the contract was carried out during a 34-day shutdown period late last year, when the generator's 34-ton, nine metre-long, one metre-diameter rotor was removed and transported to M&C's Benoni Power Generation workshop. Here the rotor's coil retaining rings were removed, the windings and overhangs were inspected and cleaned, and high-speed balancing of the rotor was performed, before it was returned to site for reinstallation.

"At the same time, testing and cleaning of the stator windings were carried out on site, and loose wedges were repaired. We also did in-situ Partial Discharge and Tan Delta testing, as well as end-winding resonance frequency tests on the 11 kV stator," Chamberlain said.

The GO procedures were completed with the reassembly of the generator on site and performance of a test run, which was witnessed by the client.

However, it was the upfront preparations during the 28-day lead-in period prior to the shutdown that presented a series of unexpected complications, which the teams had to solve before any of the general overhaul procedures could be carried out.

Special equipment was provided to remove the rotor out of the stator core: this was done on a sliding rig with trolleys running on a track to bring it out into a central position on the frame structure, from where it could be lifted by a 120-ton mobile crane, to be transported to the workshop.

The rotor threading frame structure, comprising three steel A-frame pedestals anchored onto concrete plinths, was intended to provide support to the rotor threading structure used to remove – and later re-install – the rotor.

Chamberlain noted: "As a precaution before starting the work, we assembled and checked the threading frame structure in our workshop. All the welds on the A-frame pedestals failed inspection and had to be rewelded.

"However, on site we found the structure did not fit, due to cable racks and electrical boxes being in the way, so the railway beam was cut away to clear these obstructions. We also had to weld on extensions to the railway track to make it the right length.

"Furthermore, the railway track was inadequate to support the weight of the rotor, so we had to increase its strength. A new, more stable coupling side trolley also had to be manufactured and the skid plate on which the sliding skid runs, needed to be modified to ensure proper protection of the stator windings during removal of the rotor."

Members of the ACTOM Turbo Machines team at work on removing the 147 MVA rotor from the stator.

Despite these upfront challenges, the contract was completed within the shutdown period with days to spare.

"In executing this large and complex contract, M&C and ACTOM Turbo have demonstrated again their ability to perform a full electro-mechanical service, giving the customer one point of contact for the entire project," Chamberlain said.

For more information contact Marthinusen & Coutts.
Tel: +27 (0)11 607 1700
Visit: www.mandc.co.za

ACTOM Turbo Machines.
Tel: +27 (0)16 971 1550
Visit: www.actomturbo.co.za

One small sensor makes a big difference

In the Dutch province of Limburg, the Grensmaas Consortium extracts about one hundred thousand tons of gravel every week – a quantity that entails a major logistical operation and requires a close watch on the fluctuating water levels of the Meuse River. With a single sensor, Hans van der Meer, Head of Production and Technical Services at the Grensmaas gravel extraction site, can monitor the water level and the risk of interruption to the gravel extraction process.

Van der Meer says, "One ton of gravel is equivalent to eleven full wheelbarrows. On an annual basis, we extract four and a half million tons of gravel at this site. And this gravel extraction is an important aspect of the Grensmaas project. It is the financial engine and one of the three pillars of the project. The process of gravel extraction for onward use means there are no costs for the taxpayer and, at the same time, we achieve a high level of water protection and the development of the natural environment," van der Meer explains.

Gravel extraction

It's a win-win-win solution. In 1993 and 1995, the province of Limburg witnessed two floods on the River Meuse, which caused damage amounting to some €200 million. Citizens demanded greater flood safety, but the cost of some €700 million was a stumbling block for years. That was until an agreement was reached with Consortium Grensmaas – a partnership of contractors, gravel producers, and Natuurmonumenten – the Dutch organisation for the conservation and development of nature. Both high-water safety and the development of the natural environment would be paid for with the proceeds from sand and gravel extracted along the Meuse. At the same time, the river has been given 350 hectares of extra space to allow excess water to drain off. That is the area of some 500 football fields. The stream bed was widened, banks were lowered, and dykes were raised.

The residents noticed the benefits immediately: after long periods of rain the water level rises less quickly and stays lower. The land in the south of Limburg now stays dry at the same water level as was seen in the 1993 and 1995 floods. And along the Meuse, a thousand hectares of 'new nature' are being created, which in time will attract cyclists and walkers, as studies have shown.

It is through the process of gravel extraction in the Grensmaas project that the consortium must recoup its investment of €700 million in providing flood protection and developing the natural environment. And that depends on the smooth running of the process logistics. Van der Meer notes, "All the minerals are transported by barge, and the

In the Grensmaas Project, one 26X digital level sensor provides all the information needed to monitor the fluctuating water levels.

Keller's 26X Hi-precision media-isolated piezo-resistive pressure sensor is encased in a robust, stainless steel housing incorporating a high quality cable gland. Typical applications are for the measurement of hydrostatic pressure, level for ground and surface water, and fill level in water and fuel tanks.

ships have to be able to come and go continuously. It is a constant challenge to be able to transport everything at the right time."

Toutvenant

The mix of sand and gravel excavated is called '*toutvenant*'. In the south of Limburg, it consists of 80% gravel and 20% sand. It is excavated with huge excavating machines and transported with specially designed trucks. "More to the north of the province, the *toutvenant* consists more of sand than gravel. That has to do with sediments from the time of the ice age," van der Meer says. The gravel is rinsed and sorted using a system of conveyor belts, sieving machines, washers, screw conveyors and so on. Each variation of gravel has its own designated destination, whether for use in asphalt or as decorative gravel.

Water levels in the Grensmaas fluctuate continually, depending on the weather. "There is also a big difference between summer and winter water levels. In summer, the average flow is about 40 cubic metres of water per second; in winter, it can be as much as 2 500 cubic metres. During the floods of 1993 and 1995, it was around 3 200 cubic metres per second," says van der Meer.

Monitoring the water levels

Due to the nature of the production process, progress is largely dependent on the water level in the Meuse. As well as changing through the seasons, the water level is affected by the operation of the locks. Van der Meer wanted to be able to monitor and record the water level consistently, for the benefit of the gravel production process and to communicate with *Rijkswaterstaat*.

"In the harbour, I have mounted a level sensor on a mooring post, and it communicates the water levels to the cloud via a LoRa network. This system from KELLER gives us up-to-date information about the water level which can be viewed on a dashboard in my office. KELLER's Martijn Smit helped us get the system up and running and with the data communicated by the sensor using KELLER's Kolibri cloud, we now have all the information we can obtain from that sensor."

And the information is important. If the water level is too low or too high, the process may come to a halt. "We had a sense that the water level fluctuated much more than the Directorate-General for Public Works and Water Management indicated, and that turned out to be true. Since we now have the ability to monitor it ourselves, we can also sound the alarm in good time."

The digital level sensor – Series 26X – not only measures the water level, but also the temperature of the water and the air. "We cannot produce if there is ice formation, so we also want to be aware of that risk as early as possible. Under normal circumstances, production here goes on for six days a week, 07h00-19h00. If we know this is going to change, we need to be able to respond as quickly as possible."

The Grensmaas

The Grensmaas is the unnavigable stretch of the Meuse, about 47 kilometres long, and since 1839 the border between Belgium and the Netherlands. In summer, the river is sometimes fordable, but during heavy rainfall it can swell to a great mass of water that in the past has caused floods. It is described as a capricious rain river.

The Grensmaas project covers a length of about 40 km along the river, between the city of Maastricht and the town of Roosteren. It has come to be recognised nationally and internationally for its communication and environmental management. The project will run until 2027. The commitments to providing flood protection and developing the natural environment have been realised as agreed. The province of Limburg has now asked the consortium to present a smart and cost-effective plan to manage high-water safety in the province over the longer term in view of climate change.

Instrotech represents Keller in South Africa and can provide more information on Keller's level sensors for flood control. □

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

Measuring water levels

Keller's senscorscans, also available locally from Instrotech, are used in diverse applications in the water and environmental sectors – to measure the sea depth, for example, and to monitor the water pressure at the bottom of dams, calculate flow quantities and regulate water levels.

Keller level sensors are also used to measure static and dynamic levels of water in wells, reliably and precisely. Level measurement is important as it provides information on the behaviour of the well and pumping equipment. Appropriate measurement and data analysis can inform preventive maintenance – where there is a deterioration of the grooved well casing, for instance. The greater the encrustation, the less water can enter the well, causing water levels to fall. This reduces the efficiency of the pumps, which in turn increases electricity costs.

Level measurement together with flow rate measurement also provides information on the status of the pumping equipment and its operational efficiency. These measurements make it possible to diagnose wear and tear on the equipment before it fails, and timely maintenance helps avoid high repair costs and follow-up expenditure.

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

Radar sensors ensure a clean solution

In another project in the Netherlands, Dutch Spiral, a company based in Groot-Ammers, offers an optimal solution to dealing with and disposing of the residual materials from wastewater treatment plants safely, cleanly and with minimal odour – using a container system and an integrated screw conveyor. Compact radar sensors from VEGA are used to monitor the levels inside the containers to ensure they are exchanged in good time.

In wastewater treatment, the main focus is of course on the end product – clean water. But many individual process steps are involved along the way. These produce various residual materials that have to be disposed of safely and efficiently. For example, the screenings, the sludge and the sand – how do you dispose of them?

The core product of the Dutch family-owned business Dutch Spiral is the shaftless screw conveyor. Dutch Spiral, together with the company Huber, also offers an ingenious solution for handling the residuals of wastewater treatment. This solution is used in almost every wastewater treatment plant in the Netherlands. It is basically a container that is filled automatically via an integrated screw conveyor. More than 230 such containers are currently in use in the Netherlands. Although there are other prefabricated, compact solutions on the market, these containers have the advantage that they can be adapted to the situation on any site.

Sludge, sand, wood – the residual materials from wastewater treatment plants demand a lot from the deployed sensors.

The new series of compact radar level sensors measures the level in the containers, without contact.

Automatic filling

Screenings, sand and sludge are further processed in the containers. The STC dewatering container was specially developed to transport dewatered sludge without contaminating the environment with unpleasant odours. Depending on the design size, the container can hold up to 30 cubic metres of sludge. The Dutch Spiral Screening Container RGC, on the other hand, was specially designed to transport the screenings.

A key advantage of both systems is that the filling process is completely automatic; the level of filling and frequency of transport, however, can be controlled remotely. The container is positioned and secured using placing ramps. It is filled via a chute or a screw conveyor. At the end and at the inlet of the container there is a gas spring-operated shut-off valve. The shut-off valve is equipped with a proximity switch that detects the position of the container and the open position of the slide. Below the collapse sleeve is Dutch Spiral's shaftless screw conveyor, which, in turn, is driven by a bevel gear.

Reliable stop

The filling level inside the container is monitored with the help of level measurement. And this is where sensors from VEGA come into play, delivering a reliable signal when the

VEGAPULS C 11 can be installed quickly and with minimal work.

level reaches 75% of the maximum. This leaves enough time to plan a change of containers.

Aart-Jan Brussee, Commercial Director at Dutch Spiral, says, "We have been working with VEGA for more than 16 years and have had good experiences with VEGASON, a measuring device that operates with ultrasound."

When VEGA launched its compact radar sensors, the company was very interested. "With the introduction of the new VEGAPULS series, radar technology suitable for our systems became affordable and we were then able to offer our customers an even better, more reliable solution for the same price. The decision to switch to the new sensors was therefore an easy one," says Brussee.

A smart radar solution

At the beginning of 2020, VEGA introduced its new compact series of radar level sensors to the market. The core of the new sensors is a radar microchip, developed by VEGA and specially optimised for the requirements of level measurement. The small chip design allows for the production of very compact sensors. And the standardised compact sensors are so inexpensive they can replace the previously used ultrasonic sensors in all applications. VEGAPULS Series C 11, C 21 and C 22 sensors have a fixed cable connection and are designed in protection class IP66/IP68.

As well as being unaffected by temperature fluctuations, gases, vacuum or pressure, radar sensors are, importantly, non-sensitive to soiling. These are all factors that often cause malfunctions in ultrasonic level gauges. Aart-Jan Brussee knows this well, but is still convinced of the measuring principle: "Non-contact measurement is simply ideal for our application. It's obvious that deposits on the sensor will make accurate measurement very difficult. Condensation, hydrogen sulphide and extreme mechanical loads caused by the screenings can create further impairments to effective measurement. However, these are all factors that make radar the technology of choice."

Continuous level measurement is also necessary in wastewater treatment systems because the process runs 24/7. Some may think the process is smooth and consistent, but that is not the case – the composition of the wastewater stream is not always the same, as the debris separated from the water shows. It consists of a variety of residual materials. Hence, precise level measurement is needed to signal, reliably, when the container needs to be emptied.

Sensors in the new VEGAPULS series are ideal for such an application because the sensors measure with a frequency of 80 GHz and thus focus their electromagnetic signals extremely well. The radar beam can be aimed at the measured medium with pinpoint accuracy. As a result, internal components or deposits on the walls of the container cannot generate interfering signals. This means that – in contrast to ultrasonic sensors – no false signal suppression is necessary. What is more, the measurement signals can be better separated from interfering scattered signals, and this makes the measuring process much easier and more accurate than it is with other measuring methods.

The fully encapsulated VEGAPULS C 11 sensor is now used in the containers. The sensor is simply mounted on top of the container, with the entire container volume in view – up to the top edge. This enables the operators of wastewater treatment facilities to react quickly in case of an abnormal event in the sewage network. Furthermore, the entire container volume can be fully used, as the new compact sensors measure up to the top edge with no blocking distance (dead band) – something not possible with ultrasonic sensors. To be on the safe side, every container is also fitted with a proximity switch that signals when the container is completely filled.

A reliable view from a distance

The new compact VEGAPULS series is suitable for a range of applications in the wastewater industry, not only for this particular container solution. The new sensor series, with its lower price, is an alternative to ultrasonic measurement systems and because of its high reliability and durability.

Brussee particularly appreciates that the sensor can be easily adjusted on site, wirelessly via Bluetooth, in combination with the VEGA Tools app on a smartphone or tablet. Parameterisation, display and diagnosis can be managed easily even from a distance. This makes working days easier in the industry's harsh environments and difficult-to-access measuring points. "Here you can see that VEGA focuses on practicality," says Brussee. "This approach is also ingrained in our DNA. It is based on established know-how and expertise. And it's one of the factors that differentiates the company from other manufacturers. VEGA also offers more in the way of support, and its employees know what they're talking about," Brussee adds.

Although the ultrasonic solution will remain in use on the older containers, Dutch Spiral plans to rely exclusively on the VEGAPULS C 11 compact radar series in the future. □

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

Staying safe in monitoring solar PV installations

Renewable energy is one of the fastest-growing markets globally. Recent trends indicate that solar photovoltaic (PV) installations have doubled within the past year and are expected to double again by 2030. Such rapid expansion is accelerating the search for ways to reduce risks associated with installing and commissioning PV systems – and a demand for accurate handheld devices that can be used to take reliable measurements safely in the installations.

Comtest, local representative for Fluke, says the world's first CAT III 1 500 V true-RMS solar clamp meter, the 393 FC, has been introduced to meet this need. Here, Comtest outlines how the clamp meter can be used by technicians to ensure they stay safe when installing, checking or maintaining PV panels and equipment.

In PV applications current is 'wild' and not limited by electronics. Choosing the correct solar testing equipment is therefore critical to ensure workers – and the PV system itself – are protected against a range of potential electrical hazards.

The Fluke 393 FC helps to protect technicians against the three main electrical hazards: shock or electrocution from energised conductors, arc faults that spark fires, and arc flash that leads to explosions. Control measures and best practices that can mitigate these risks are different when working with photovoltaic systems, compared to those that apply when working with any other kind of energy-generating resource. That's why it's important that multimeters, test leads and fuses are rated for the application being worked on.

The risk of electrocution

Shock or electrocution from energised conductors happens when current takes an unintended path through the human body – and it can have lethal results from as little as 50 milliamps (mA) hitting the heart. Electrical shocks are typically caused by faulty insulation of cables and wiring, damaged insulation of safety covers, or improper grounding. In a PV system, the main places such conditions exist are the combiner box, the equipment grounding conductor, the PV source and output circuit conductors.

Arc faults and arc flash

Electrical arc faults that spark fires are high-power discharges of electricity between two or more conductors, with the discharge causing heat that can lead to the deterioration or even burning of wiring insulation. PV systems are particularly vulnerable to arc faults caused by a disruption in conductor continuity, or by unexpected current between two conductors, often the result of a ground fault.

Arc flash is a phenomenon of large-scale PV arrays

The Fluke 393 FC clamp meter strengthens safety levels for technicians working on the installation, commissioning and maintenance of solar panels and PV systems.

A world first, the FLUKE 393 FC – a CAT III 1 500 V FC true-RMS Solar Clamp Meter.

that have medium to high voltage levels. It is only since large-scale solar energy systems have been created that arc flash has become a dc issue, which is why arc flash hazard risk analysis must now be carried out on dc systems over 120 V. The issue is particularly prevalent when fault-checking in energised combiner boxes, where PV source circuits are used in parallel to increase current, or when carrying out checks on medium to high voltage switchgear and transformers.

An arc flash happens when there is a significant level of energy available to an arc fault in dc and ac conductors. The flash emits hot gases and radiant energy that can be around 19 500°C (or four times the temperature of the surface of the sun). The most at-risk setups are residential inverters with input voltage up to 500 V and large-scale inverters with up to 1 500 V. It is essential to use a meter that is rated for the relevant measurement category, or CAT rating, as well as the application's voltage level. This is necessary to ensure the unit can cope with average voltage levels and high voltage spikes and transients that can produce shocks or cause an arc flash.

Switching to 1 500 V

Most major manufacturers of inverters and solar modules are moving from 1 000 V systems to 1 500 V for greater efficiency. For solar installations, overvoltage category CAT III 1 500 V systems are being used more widely and it is essential to use CAT III and CAT IV equipment for PV systems at high altitudes. At present, the Fluke 393 FC True-RMS Solar Clamp Meter is the only measurement instrument that matches the insulation demands of such CAT III environments.

The meter is designed specifically for use by PV installation technicians and maintenance specialists who work in high voltage dc environments. The clamp can measure up to 1 500 V dc, 1 000 V ac, dc power and current up to 999.9 A dc or ac through the thin jaw, which is ideal for the kind of cramped spaces found in combiner boxes or inverters. The clamp is supplied with a three-year warranty and is IP54 rated, making it well suited to work outdoors. It also includes an audio polarity indicator that helps to prevent accidental mis-wiring by ensuring PV panels are installed correctly.

Polarity functions and audible and visual polarity checks are crucial when commissioning a new site, at the level of the combiner box as well as the inverter. With a dc polarity check, it is easy to see if the polarity of strings has been reversed accidentally, and then to correct it, so preventing the risk of fire at the combiner box, damage to the equipment and danger to personnel.

The Fluke 393 FC true-RMS Solar Clamp Meter is supplied with Fluke Connect software, so all test results are logged and reported. Using only a phone, engineers can make and save measurements quickly, with the phone recording for 10 minutes and reporting readings to colleagues. Capable of measuring and recording over a period of up to two weeks, the safe, reliable and rugged meter is also equipped with an 18-inch iFlex flexible current probe for extended ac measurements up to 2 500 A. Test leads are also rated to CAT III 1 500 V dc.

Hans-Dieter Schuessele, Application and Technology Expert for EMEA at Fluke, said: "Safety is essential when commissioning and installing PV systems. The future of power needs tools that can keep technicians safe in harsh environments; risk is not an option and users literally have to trust the meter with their life.

"That's why the world's first CAT III 1 500 V true-RMS clamp meter has been designed to deliver enhanced protection for users working in challenging CAT III environments. It's essential to have a solid meter with multiple functions capable of operating at that rating; the solar industry needs a solution like this." □

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

Welding spark resistant connection technology

Turck Banner has increased the welding resistance of its TXO and TXY connector series. This ensures the TXO3701 and TXY3713 series cables meet the most rigorous requirements for use in welding applications.

In particular, the thickness of the cable jacket has been increased to provide greater resistance to welding sparks. The cables are also suitable for drag chain use and are highly flame-resistant. They meet the requirements of the North American UL FT2 standard as well as IEC 60332-1 and IEC 60332-2-2. As a result of these specification enhancements, the cables also meet the latest requirements of major automobile manufacturers for use in welding applications.

Turck Banner offers the PUR cables as 4- or 5-pin variants with straight or angled connectors, with or without LEDs. The user can choose between standard cable lengths for connection, or extension cables with M12 connectors. The cables are available in orange or yellow as standard and special lengths, custom jacket colours or cables with M8 connectors can also be provided on request.

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

A single standard safety induction model for mining

Jared Kangisser, CEO of KBC Health & Safety, suggests that a standard safety induction procedure could deliver significant savings in annual onboarding costs for mining houses.

Jared Kangisser, CEO of KBC Health & Safety.

Mining is one of the most dangerous industries in the world, so it is for good reason that there are strict health and safety protocols in the industry. Before starting work on any project for a mining company, any individual has to complete the required health and safety induction at each mining site. Given the high headcount for many contractors at any given site, this can become complicated, costly, and time-consuming. The requirement that the induction process be repeated for each returning individual – often across multiple sites on numerous occasions throughout the mine's lifecycle – becomes impractical. A single standard induction model that supports inter-company and intra-company movements and eliminates induction duplication can provide a solution – avoiding wasted time and recurring induction costs.

Repetitive procedures raise costs

Although the rationale behind the mining site safety induction requirement is sound in theory, in practice the process could be more efficient. As well as the Occupational Health and Safety Act, Section 10 of the Mine Health and Safety Act regulates all mining activities and places a requirement on the employer to train an individual on the latest health and safety standards that apply to the respective mining site. At each site the HSE team is empowered to run its own induction processes, as long as it ensures that it covers the correct health and safety training elements of the relevant legislative acts to be legally compliant. This includes elements of hazard identification and risk assessment on site and how each individual is to perform their job safely in that environment. Having to repeat this induction on arrival and return at every site takes a lot of time, resources, and money.

Unnecessary costs and delays

With each mine running its own induction programme, which can take between one and three days, it is hard to maintain efficiency when onboarding high numbers of workers and this causes bottlenecks. Internal induction resources are stretched thin – classroom, administrator and facilitator resources are limited, lead times get pushed out and in turn extend the time taken for workers to get onto site. There are direct and indirect cost implications for the mining house, but because these are not visible as a single line item on an income statement, mining companies don't always see the real cost impact of these delays. However, if, for example, a mining house takes on 2 000 contractors a year and it takes each contractor an extra two days to get onto site (at an assumed R1 000 per day cost per contractor) that amounts to an extra R4 million per year in safety training expenses due to bottlenecks and inefficiency.

Standardisation offers a solution

80% of the safety induction procedure is generic – to meet the legal requirements of the acts. This makes it ripe for standardisation. In the early 2000s, a unified induction and training centre was established in KwaZulu-Natal, involving six different mining houses. Across these six mining houses, about 10 000 mining contractors migrated between five or six mines for several years and, before standardisation, contractors would need to redo the induction each time they arrived and returned to a site.

By standardising the legally required content of the safety induction procedure into a world class induction programme, the mining houses made it possible for contractors to undergo a single induction and, on passing the assessment, they were issued with clearance valid for 12 months. This served for both inter-company and intra-company movement, and contractors would not be required to repeat the induction to access any of the sites that are party to the single standard induction model. Any other on-site and site-specific induction requirements are then significantly simplified and reduced, and efficiency

As well as improving efficiencies, a single standard safety induction procedure in mining would support the principle of achieving zero harm.

increases significantly. Induction then needs to be refreshed only on an annual basis. This presents substantial cost- and time-saving opportunities.

Standardisation as the foundation for zero harm

The creation of a single standard for safety induction has benefits beyond health and safety training efficiency. There is also the potential for alignment and standardisation of health and safety within an organisation or across multiple organisations, which would support the embedding of the critical message of zero harm across the industry. There is a tendency for contractors to think they are just there to do a job, and health and safety regulations only slow them down. In some cases, there may be a misalignment in respect of health and safety between contractors and the site they're working on, and this is an area of concern.

Saving money, saving lives

Could it be possible for every contracting company and every contracting employee to undergo the same induction based on the same principles, the same knowledge, and the same value system around safety, barring site-specific requirements? This is the real opportunity to achieve a culture of zero harm by effectively reducing fatal incidents. In turn it has the potential to deliver a positive impact for all stakeholders, including government, mining houses, unions and the wider mining communities. Furthermore, a single standard of safety provides a foundation for mutual benefits, not only from a cost-saving perspective, but also towards alignment. By centralising inductions, legal compliance becomes easier and through alignment, everyone is working at the same standard, towards the same safety goals.

In summary, by streamlining and unifying their induction processes, the mining houses that subscribe to a single standard of safety induction have, reportedly, collectively saved more than R1.5 billion in just over a decade. That's a cost saving worth pursuing, particularly as mining companies seek to do more, with less, without compromising on safety or quality. □

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

Safety considerations before installing rooftop solar

As South Africa looks for solutions to the country's electricity crisis, emphasis has been placed on the potential for businesses and households to invest in solar panels as a way of reducing the demand on the national power grid. While the drive towards harnessing solar power should be supported, Otto Botha, Managing Director at WACO, highlights key regulatory and legislative considerations that business owners and homeowners must take into account before investing in solar panels.

Building owners and homeowners should be aware that the installation of solar panels requires compliance with the relevant National Building Regulations, the Occupational Health and Safety (OHS) Act, and the Construction Regulations. These are the three main pieces of legislation applicable to the process. The installation of solar panels is deemed to be construction work, which means there are certain legal obligations on the contractor carrying out the work, as well as on the client – the building- or home- owner – that must be fulfilled.

Where solar panels are to be installed on the rooftop, most of the installation work will be undertaken at height. This places the responsibility with the building owner to appoint a contractor that has the necessary competencies, training and resources to carry out this type of work safely.

Working at height

Working at height also means the aspect of safety becomes a key consideration, with the OHS Act requiring people who work at height to be certified medically fit for this type of work. Additionally, the contractor must be able to prove that the workers he employs to do the work have undergone the required training for working at height and for installing solar panels, as well as ensure that safe access to the roof is provided, together with the required personal protective equipment (PPE), such as safety harnesses attached to hook points, or lifelines.

Otto Botha, Managing Director at WACO.

Furthermore, the building owner should consider that roofs often have no secure attachment points for workers to hook onto with their fall arrest equipment. This means a temporary system may need to be installed, and this must be done by a competent person – a qualified engineer with adequate training and experience – who must design the hook-on points or lifelines. This would be termed 'temporary works', typically done by engineers who assess and determine how attachment points can be installed.

Usually, the installation of solar panels requires the erection of some form of scaffolding, which triggers a few other requirements in terms of the Construction Regulations. A temporary works designer is required to ensure that the scaffold is erected to standard, specifically when it is a special scaffold that has to be designed, inspected, checked and signed off for safe use.

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Temporary works

Temporary works are undertaken to ensure that workers can get themselves and the equipment they are installing safely up and down the structure on which they are working. Where ordinary scaffolds are used, they are deemed to satisfy standard, which means they do not need an engineer to do a site-specific design or provide a drawing. However, when a scaffold is higher than 60 m or equipment is used in unconventional ways, an engineer must design, draw and sign off on the temporary structure.

For building owners or business owners looking to possible rooftop solar installations, the applicable regulations relating to safety may not have been considered upfront, but they are important, and non-compliance could be costly. In terms of the OHS Act, it is the legal responsibility of every employer to ensure the act is complied with by every person in their employ. This means the building owner or business owner must ensure the contractor and all employees are compliant with applicable legislation; failure to do this could make them – as well as the contractor – liable for substantial fines or potentially terms in prison.

Botha highlights that changes to the OHS Act are on the cards – and could provide for fines of up to R5 million or five years in prison for various contraventions, as well as the issuing of spot fines of R50 000 per contravention, applicable to both the client and contractor.

Business owners considering rooftop solar installations should be aware that this requires compliance with the relevant National Building Regulations, OHS Act, and Construction Regulations.

This makes it all the more important to use reputable contractors, who have been in business for at least two years and have a proven track record of solar rooftop installations. References should be provided and checked for legitimacy.

For more information contact WACO Africa.
Tel: +27 (0)11 842 4000
Email: info@wacoafrica.co.za
Visit: www.wacoafrica.co.za

Combined strengths in PPE, safety and hygiene products

RS Group plc, a global omni-channel provider of products and services, recently launched RS Safety Solutions as a new brand within the group. RS Safety Solutions brings together the existing RS personal protection equipment (PPE) capabilities with the operations of Needlers and Liscombe, both of which are based in the UK.

RS Group acquired Needlers (Needlers Limited) and Liscombe (John Liscombe Limited) in 2020 and 2021, respectively. Both businesses are leaders in their fields with Needlers largely serving the food processing industry with its PPE and hygiene products and Liscombe primarily operating in industrial sectors, where safety and personal protection is critical. This new union offers deep technical experience combining over 300 years of expertise in this field.

The formation of RS Safety Solutions will leverage their respective strengths to serve customers in the industrial and food processing sectors, addressing their requirements for PPE and safety and hygiene equipment. The unification also bolsters the potential for each of the operations and strengthens RS' position as a major player in the PPE market.

"Following the changing of our name from Electrocomponents to RS Group, this is the latest step on the journey to rebranding all the RS operations," said

With the acquisition of leading suppliers of industrial safety and PPE products, RS Group has established RS Safety Solutions.

Pete Malpas, President EMEA at RS. "By uniting these two growth businesses under RS Safety Solutions, we can deliver a strong offering in PPE, safety and hygiene products for new and existing customers, backed by the RS Group."

Mark Day, Managing Director at RS Safety Solutions said: "The launch of RS Safety Solutions is an exciting moment for us. Our existing customers will recognise that our combined operations are now part of one well-known brand. This will help to strengthen our product range and give us a truly global reach."

For more information contact RS Safety Solutions.
Visit: www.rs-safety.com

Versatile smart phones for Ex areas

The new Smart-Ex® 02 is the next generation of rugged, intrinsically safe smartphones for hazardous areas and harsh industrial environments from the Pepperl+Fuchs brand ecom. Developed completely in-house, the smartphone has a large five-inch display, an ergonomic design, advanced features, and optimised accessories, making digital applications mobile beyond company boundaries. Global frequency bands and certifications, together with a high-performance operating system, allow users a wide range of applications worldwide.

Used as a smartphone, PDA, scanner, or camera, the Smart-Ex 02 facilitates mobile workers' day-to-day activities anytime and anywhere. It opens up new possibilities for Industry 4.0 applications.

Key features

The Smart-Ex 02 is the first Android Enterprise recommended smartphone with ATEX/IECEx Zone 1/21, Division 1 approval. It is designed for use in harsh industrial environments and extended temperature ranges. The device features an ultra-rugged five-inch display and is supplied with powerful accessories and supported by a long-term service concept. As an LTE capable, unlocked, and SIM-free smartphone, it offers the flexibility for use around the world. It is equipped for high-performance with the Android 11 operating system and a powerful and replaceable 4 400 mAh battery.

The Smart-Ex 02's multi-touch display is made of tough impact- and scratch-resistant Gorilla Glass® 2. The high-resolution display is easy to use, whether the user is wearing dirty gloves or has wet hands. Even extended temperature ranges and direct sunlight do not affect its readability.

As a Google-certified device, the Smart-Ex 02 smartphone meets all requirements for industrial use and allows access to various apps for greater productivity, transparency, and safety. It will be the first ATEX/IECEx certified Zone 1 smartphone to meet the Android Enterprise Recommended standard. Programmable keys can be configured specifically to the user.

The intrinsically safe Smart-Ex 02 series was developed based on the market's current and future requirements. It supports 21 LTE frequency bands and comes with all relevant approvals and certifications for global use in harsh industrial environments and hazardous areas up to Zone 1/21, 2/22 and Division 1/2.

With a global network and more than 30 years of experience in explosion protection, Pepperl+Fuchs experts are always nearby and ready to support users with in-depth knowledge.

For more information contact Pepperl+Fuchs.
Tel: +27 (0)86 756 8741
Email: info@za.pepperl-fuchs.com
Visit: www.pepperl-fuchs.com/southafrica/en

Dekra bests its top safety score with 8th NOSCAR Award

Carina Kleinhans – Dekra Industrial's HSE Manager with the NOSCAR Award.

Showcasing its ongoing commitment to safety, which runs throughout the company, Dekra Industrial SA last year achieved its 8th annual NOSCAR safety award – the highest safety honour awarded by the National Occupational Safety Association (NOSA).

As part of its global parent company, Dekra Industrial in South Africa has played a major role in the fields of non-destructive testing (NDT) and inspection locally – serving a wide range of industry sectors – for many years.

Dekra Industrial's Health, Safety and Environment (HSE) Manager, Carina Kleinhans, comments: "This award reflects our ingrained ethos of 'living the safety culture' across our company, country, and around the clock. The recent NOSA ranking also marks our highest score to date, at 97.48 percent – indicating our consistent improvement compared to our original 2013 score of 92.28 percent."

Kleinhans adds that Dekra Industrial is committed to safety from management level through to each team member throughout its nationwide branches. "Every Dekra Industrial employee and contractor is encouraged to keep identifying areas for improvement and risk mitigation and management within the workplace. You could say that every branch and department is interlinked by our safety mindset and our management team operates an open-door policy to hear and attend to any areas of concern," she says.

Categories audited annually by NOSA include: leadership and worker participation; planning, support and operational; performance evaluation; improvement; safety; health; environmental; risk management; systems; compliance and effectiveness.

"In addition," says Kleinhans, "legislative requirements change from time to time, and we have to remain abreast of any new legislative development. For example, 2020 brought in new reporting factors relating to Covid. Dekra Industrial complied with all new requirements – and succeeded in improving its NOSA ranking with a higher score."

Managing Director, Johan Gerber adds: "These audited NOSA results are very pleasing and we are proud to have improved our results – from an already-high benchmark – and in line with our aim to be true 'heroes of safety'. I congratulate Carina and the HSE team – as well as each employee throughout the company."

For more information contact Dekra Industrial SA.
Visit: www.dekraindustrial.co.za

Surface mining safety embraces new technologies

Collision Avoidance Systems used in surface mining have been developed to embrace technologies like satellite positioning systems, radar and smart vision.

The continuing evolution of Collision Avoidance Systems (CAS) used to support safety in surface mining has embraced new technologies like satellite positioning systems, radar and smart vision. Leading CAS specialist, Booyco Electronics, also highlights the value of sensors and tracking technology. Capturing and processing more data in real time offers the potential for CAS to make surface mining even safer.

Putting safe distance between people and the mobile equipment used on surface mines – from off-road dump trucks to excavators and loaders – Collision Avoidance Systems have become integral to mining safety.

Anton Lourens, CEO of Booyco Electronics says years of intensive research and development underpin the success of CAS. This work has embraced various new and existing technologies, steadily raising the reliability and functionalities of CAS.

"Pioneering companies like Booyco Electronics – in this game for over 16 years – have taken advantage of developments in satellite positioning systems, for instance," says Lourens. "This has enabled us to achieve greater performance in collision algorithms.

"We also see potential in smart vision systems that allow intelligent perception of people, vehicles, objects and other risks. Wearable technology is another advance that allows us to enhance context and to distribute safety information readily. New technologies such as cutting-edge fatigue detection solutions are being embraced as well."

He says Industry 4.0 has brought levels of digitalisation and automation that could not be envisaged until recently. Consequently, Booyco Electronics has invested in software-based solutions, paving the way for increased flexibility to customise solutions for specific needs.

"This means our equipment can be improved and customised through the software elements rather than the hardware," he adds. "Functionality can thus be adapted more easily, and can be applied remotely through a wireless connection instead of requiring in-person attention on site."

Rapid developments in sensor and tracking technology are also delivering exciting opportunities to advance CAS capabilities. Integration is really the key to success in these endeavours, Lourens says. Digitalisation gives Booyco Electronics the ability to upload and analyse this data in real time, so it can be used to inform on-mine decisions and enhance safety strategies. More than this, CAS can also now contribute to emerging automated mine ecosystems.

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

Wider support for EMC CoCs for safe electronic equipment

The South African Bureau of Standards (SABS) recently announced that from 01 November 2022, manufacturers of non-telecommunication electronic and electrical equipment can apply for a SABS electromagnetic compatibility (EMC) certificate of compliance (CoC) by using any laboratory accredited by the International Laboratories Accreditation Cooperation (ILAC).

An EMC CoC is required for any non-telecommunication electronic product entering the South African market. The SABS has been providing SABS EMC CoCs since 2017, as mandated by the Independent Communications Authority of South Africa (ICASA). Over the years SABS EMC CoCs were offered only to manufacturers that had products tested at SABS affiliated laboratories (SABS A-Labs). The SABS A-Lab programme will continue, and manufacturers now have the additional option of having their products tested at any ILAC accredited laboratory.

Thabo Sepuru, Divisional Head of SABS Laboratories says, "A SABS EMC CoC can only be issued if a product has been tested and complies with the EMC standards that are referenced in the ICASA regulations. By introducing the new scheme, established manufacturers and new entrants will have more opportunities to participate in the industry as there are thousands of ILAC laboratories that can test to the standards referenced in the ICASA EMC list of regulatory standards."

Sepuru encourages ILAC accredited laboratories to join the SABS A-Lab programme so manufacturers can enjoy faster turnaround times and reduced certification fees. "The SABS A-Lab programme is a Type 3 quality assurance scheme, that allows the SABS to enter into agreements with accredited local and international laboratories based on the SABS conducting inspections or oversight visits to manufacturers, testing points and sampling of products as part of the continuous verification process. As most of the verification processes would be complete, the SABS can issue an EMC CoC in thirty (30) days for applications that have products tested at a SABS A-Lab, compared to a ninety (90) days turnaround time for applications that use test reports from an ILAC laboratory," says Sepuru.

Laboratories that are part of the SABS A-lab scheme pay an annual fee which includes audits and inspections by the SABS. Every application for a SABS EMC CoC will incur a maximum application fee of R16 000 or R17 000, depending on the laboratory used. The fee structure, the online application forms as well as additional information is available on the SABS website.

For more information contact the SABS.
Visit: www.sabs.co.za

Most electronic products contain and emit electromagnetic properties. To ensure the emissions are not harmful to people, animals, and the environment, the immunity and emissions need to be tested to verify that results comply with regulations and specifications contained in national and international standards.

Common consumer goods, electronic tools, as well as laptops, printers and satellite TV dishes, undergo EMC testing. Once products are tested successfully, a certificate of compliance (CoC) is issued, and this is a requirement for import and export purposes. Each country has differing requirements for the import and export of products and in South Africa, ICASA is the regulatory body for non-telecommunication electronic and electrical products.

Adjustable earth leakage protection relay

NewElec's GA Plus earth leakage relay provides earth leakage and earth fault protection to meet engineering designers' specifications. The unit is fitted with an integrated earth leakage test push button which is connected to the test winding on the Core Balance Current Transformer (CBCT) to enable the user to test the functionality of the GA Plus relay.

Supplied with configurable software, free-of-charge, the relay is fully adjustable via the rear-accessed RS232 interface, which allows for the reconfiguration of output trip relay options – such as Latched or Non-latching main trip contact, Fail-safe or Non-Fail-safe options and control supply voltages.

The ELX version of the GA Plus relay allows the user to replace other units where required, fitting into smaller panel door cut-outs.

GA Plus relays are available in sensitivities of 30 mA, 250 mA, 375 mA, 500 mA and 1 Amp and offer user-selectable IDMT curve or 100 ms instantaneous trip in the same relay.

Immune to harmonics, the relay can be used on VSDs or DOL starter applications with motors of up to 1 000 kW, with no nuisance trips, and the relay enclosures have a dust and Ingress protection rating of IP65.

Features include:

- Earth leakage protection
- Earth fault protection
- 110 V / 220 V ac or 380 V / 525 V ac supply
- Instantaneous or IDMT curve selection
- Latched 'contactor trip' C/O contact
- Harmonic suppression
- Adaptor plate to fit 71 x 94 mm cut-out
- Integrated earth leakage test push button
- User-programmable options.

For more information contact New Elec.
Email: info@newelec.co.za, visit: www.newelec.co.za

The GA Plus earth leakage protection relay is fully adjustable, supplied with software that allows for the reconfiguration of output trip relay options.

World class fire protection for new lubricants warehouse

Constructed as part of its Phase 1 expansion project, the new warehouse at FUCHS LUBRICANTS South Africa in Isando, Johannesburg, incorporates the latest technology and complies with stringent fire detection and prevention requirements.

"We are familiar with working in high-risk environments and were able to bring our expertise and experience to bear in this project," says ASP Fire CEO Michael van Niekerk, appointed as fire engineering consultant.

"It was a team effort and it went smoothly, considering all the constraints posed by Covid-19 at the time, on such large-scale projects. The team was highly professional and we formed good relationships with each other," van Niekerk comments.

The expansion was first mooted five years ago, with a project management team assembled in 2018 to set out the specifications for a planned new warehouse and blending plant. The decision by a neighbouring OEM to relocate to a new facility allowed FUCHS to acquire the adjacent site, adding impetus to the project. Board approval was received in April 2020 and construction began in June that year, with DRA Global as the main EPCM contractor.

"We had worked with DRA Global previously on our new grease plant and were fortunate to retain the same project manager for our latest expansion," says FUCHS LUBRICANTS South Africa's Managing Director Paul Deppe. Due to it being such a substantial investment, it was decided to split the expansion into two phases. With Phase 1 completed, planning is already well advanced for the next phase.

ILS was appointed as the warehouse consultant, and the building has advanced features such as wrapping of all products and 100% selectivity and batch control. The latest materials-handling equipment has been adopted, including narrow-aisle lift trucks stacking to 17 metres high. The warehouse management system is based on a fully integrated barcoding system using SAP.

The fire protection system is designed to the latest international best practice. The warehouse features 13-metre-high cast concrete tilt-up panels that provide a firewall between the warehouse and nearby production facilities. The use of these panels in this size is believed to be a first in South Africa.

ASP Fire worked closely with ILS to determine the height of the firewalls. "Based on radiation heat calculations we were able to advise how high the firewalls had to be to comply with the requirements," says van Niekerk. Safety distance calculations were carried out to ensure fire safety between the warehouse and a small adjacent storage area as well.

"An interesting aspect of international regulations is that they reference 'ignitable' substances, as opposed to only combustible or flammable substances," van Niekerk highlights. "This meant flashpoint requirements for specific types of liquids, as well as the type of container, had to be taken into account. The moment an ignitable liquid such as oil is stored in a plastic or glass container, it becomes a high-risk item, because plastic can melt or glass break. Steel is different because it maintains the structural integrity of the container."

ASP Fire was the fire engineer and ILS the warehouse consultant for the new FUCHS LUBRICANTS South Africa warehouse, a hazardous materials warehouse.

The firewalls had to comply with three main criteria: insulation, integrity and being able to deal structurally with the potential collapse of the internal racking system in the event of a fire incident. This meant the firewalls could not collapse or deform beyond specific requirements. A tilt-and-lift panel system was selected to ensure compliance.

"It was a complex, high-risk building and we needed to design a system to cater for a range of local and international requirements," van Niekerk notes. These included the international FM Global Property Loss Prevention Data Sheet 7-29, Ignitable Liquid storage in portable containers. The facility is also classified as a J1 high-risk storage and occupancy area in terms of the SANS 10400: Part T – Fire Protection.

"The biggest challenge was that, as a hazardous materials warehouse, it was automatically classified as high risk. The presence of combustible liquids made the fire protection requirements more onerous, including specific requirements for the building envelope," adds van Niekerk.

He highlights a further achievement in the plan and rational design compiled by ASP Fire in that the company managed to retain the existing pumps and tanks on site without a need to upscale these components. This resulted in a significant cost saving and faster project timeline.

For more information contact ASP Fire.
Visit: www.aspfire.co.za
Or FUCHS LUBRICANTS South Africa.
Visit: www.fuchs.com/za

Shifting trends in cyberattacks

Steve Flynn, Sales and Marketing Director, ESET Southern Africa.

ESET, a leading developer of IT security software and services, released its T2 2022 Threat Report towards the end of 2022, summarising key statistics from ESET detection systems and highlighting some key findings from its cybersecurity research.

The latest issue of the ESET Threat Report (covering May to August 2022) sheds light on the changes in ideologically motivated ransomware, Emotet activity, the most-used phishing lures, how the plummeting cryptocurrency exchange rates affected online threats, and the continuation of the 89% sharp decline of Remote Desktop Protocol (RDP) since the T1 2022 Threat Report. ESET analysts think these attacks continued to lose steam due to the Russia-Ukraine war, along with the post-Covid return to offices and overall improved security of corporate environments.

Even with declining numbers, Russian IP addresses continued to be responsible for the largest portion of RDP attacks. Steve Flynn, Sales and Marketing Director at ESET says, "In T1 2022, Russia was also the country that was most targeted by ransomware, with some of the attacks being politically or ideologically motivated by the war. However, ESET's T2 2022 Threat Report shows that this hacktivism wave has declined, and ransomware operators turned their attention towards the United States, China, and Israel."

ESET's T2 2022 Threat Report reveals changing patterns and new developments in cyber threats.

According to ESET telemetry, August was a vacation month for the operators of Emotet, the most influential downloader strain. The gang behind it also adapted to Microsoft's decision to disable VBA macros in documents originating from the internet and focused on campaigns based on 'weaponised' Microsoft Office files and LNK files.

The report also examines threats mostly impacting home users. ESET phishing feeds showed a sixfold increase in shipping-themed phishing lures, most often presenting the victims with fake DHL and USPS requests to verify shipping addresses. "In terms of threats directly affecting virtual and physical currencies, a web skimmer known as Magecart remains the leading threat going after online shoppers' credit card details. We also saw a twofold increase in cryptocurrency themed phishing lures and a rising number of cryptostealers," says Flynn.

In addition, the ESET T2 2022 Threat Report reviews the most important findings of ESET researchers. They uncovered a previously unknown macOS backdoor, and later attributed it to ScarCruft; discovered an updated version of the Sandworm APT group's ArguePatch malware loader; uncovered Lazarus payloads in trojanised apps; and analysed an instance of the Lazarus Operation In(ter)ception campaign targeting macOS devices while spearphishing in crypto-waters. ESET researchers also discovered buffer overflow vulnerabilities in Lenovo UEFI firmware and a new campaign using a fake Salesforce update as a lure.

As well as these findings, the report summarises the many presentations given by ESET researchers over recent months, and shares planned presentations for upcoming conferences.

In summary

- Politically motivated ransomware declined; operators turned their attention from Russia back to the usual targets such as the United States, China, and Israel.
- Emotet continued to be active, with detections seen mainly in Japan and Italy; according to ESET telemetry, its operators took time off in August.
- ESET phishing feeds showed a sixfold increase in shipping-themed phishing URLs, with the most commonly impersonated brands being USPS and DHL.
- Web skimmer known as Magecart constituted three-fourths of all banking malware detections, leaving far behind the other malware strains in the category.
- Cryptocurrency threats declined along with the price of bitcoin; however, the previously declining category of cryptostealers grew by almost 50%.

For more information visit: https://www.eset.com/za/

For more than 30 years, ESET® has been developing industry-leading IT security software and services to protect businesses, critical infrastructure and consumers worldwide from increasingly sophisticated digital threats. From endpoint and mobile security to endpoint detection and response, encryption and multifactor authentication, ESET's high-performing, easy-to-use solutions provide unobtrusive protection and monitoring 24/7, updating defences in real time to keep users safe and businesses running without interruption. Evolving threats require an evolving IT security company that enables the safe use of technology. This is backed by ESET's R&D centres worldwide, working in support of a secure shared future.

Addressing the skills need in the renewable energy sector

The renewable energy sector in South Africa is making strides in providing an alternative energy source to meet the country's electricity demand. However, the sector faces a challenge in the shortage of required skills in the industry. Finding a solution to this would mean providing numerous jobs to those wanting to follow a career in renewable energy.

The sector already provides thousands of jobs in South Africa, and many more are available, but the skills required for these jobs are either in short supply or the skills and qualifications required are available, but experience in the renewables industry is lacking. Additionally, there is a general shortage of skills in the science, engineering, mathematics and technology (STEM) fields in South Africa.

STEM students needed

The renewable energy industry needs electrical engineers, operations and maintenance managers and mechanical technicians. Skills in manufacturing, assembly and installation are also needed. Obviously, renewable energy plants also operate as businesses and require skills in sales, marketing, finance and general business operations as well.

Asante Phiri, Head of Operations & Maintenance Southern Africa at Enel Green Power South Africa (EGP RSA), says we need to encourage the youth to take up careers in STEM-related fields. He says students are still shying away from these subjects due to a perception that they are difficult subjects. He suggests that school outreach programmes would help young learners understand that although degrees in these fields are challenging, they can be achieved, and are necessary to follow careers in renewable energy and to take up the many and varied employment opportunities available.

Helping the youth become employable

Lizeka Dlepu, Head of Sustainability Southern Africa at EGP RSA, says the company is committed to encouraging young people to enter the renewable energy industry. Enel exposes learners from the communities in which it operates to the operations at the company's plants. Here, they see for themselves how the sites operate and how energy is produced.

The company has also found that some schools in its host communities do not offer maths and science as subjects. Learners can take the subject known as maths literacy, but this will not equip them to enter tertiary institutions to study engineering related subjects. In answer to this problem, EGP RSA provides schools in these communities with maths and science teachers, so learners have the opportunity to study towards STEM careers at tertiary level.

EGP RSA also offers bursaries to university students and provides financial support to young learners from FET colleges who are studying N3, N4 and N5 levels in mechanical or electrical engineering. This enables them to equip themselves with the learning and knowledge to take up careers in these fields and to apply for work opportunities at Enel's renewable energy plants.

Students who have studied to become artisans, such as technicians, electricians, mechanical fitters, and others, as well as those who have studied engineering as a science, are eligible to work at renewable energy plants. Students with qualifications in business related skills can also apply for work opportunities in renewable energy businesses.

Lizeka Dlepu, Head of Sustainability Southern Africa at EGP RSA.

As another contribution supporting employability, EGP RSA has funded bursaries for more than 40 students, with some having already graduated, and over 30 in the pipeline. On the technical side, in its host communities the company has trained local youth as wind turbine technicians and in basic rigging to increase the pool of young people with skills that enable them to enter the workforce.

EGP RSA has also begun funding learners at entry level – those who don't have a matric qualification but are interested in engineering can apply to the company's community development programme. This has been established to fund keen learners at N3 level.

In addition, EGP RSA has initiated a programme funding disadvantaged learners who have shown great potential and, if not assisted, could fall by the wayside. With support from EGP RSA, they are given the opportunity to attend private schools, to reach their potential and go on to study at university.

The Reskilling Lab

The Renewable Energy Solutions for Africa (RES4Africa) Foundation has instituted a programme called the Reskilling Lab, in which EGP RSA is participating together with other companies.

As South Africa transitions to a greater share of renewable energy in its energy mix, there is a critical need to reskill workers who have been employed in the country's long-established coal-fired power stations and many in the coal-mining sector that for decades has supplied coal to the power stations.

The Reskilling Lab aims to address this need, reskilling employees from the coal-based power plants value chain to be able to take up jobs within the renewable energy sector and the new value chain for the renewable energy industry. One of its objectives is to build training platforms that address the gap between the skills they currently have and the skills needed in the renewable energy industry.

The Reskilling Lab also looks at creating bases to make reskilling an asset for local communities, ensuring that they are financially sustainable and potentially scalable.

With financial aid, educational support, and skills development programmes, the skills gap in the renewable energy sector can be reduced and new job opportunities will become available to the many people unemployed in the country.

For more information visit:
www.enelgreenpower.com/countries/africa/south-africa

Innovators shortlisted for Africa Prize for engineering

A shortlist of 15 African entrepreneurs and their pioneering technologies have been selected for the 2023 Africa Prize for Engineering Innovation, founded by the Royal Academy of Engineering. The 2023 shortlist represents ten African countries, including for the first time Angola and Sierra Leone, and demonstrates the importance of engineering as an enabler of improved quality of life and economic development.

The innovations shortlisted in 2023 tackle challenges central to the United Nations Sustainable Development Goals, including quality education, clean water and sanitation, sustainable cities and communities, good health and wellbeing, and clean energy.

Launched in 2014, the Africa Prize is awarded annually by the Royal Academy of Engineering to ambitious African innovators creating local and scalable solutions to pan-African and international challenges. Those shortlisted for the Africa Prize benefit from a valuable package of support providing business incubation, mentoring, fundraising and communications. The package also includes access to the academy's global network of high profile and highly experienced engineers and business experts in the UK and Africa.

In mid-2023 four finalists will be chosen to pitch their innovations and business plans to the Africa Prize judges at an event in Accra, Ghana. The winner will receive £25 000, and three runners up will receive £10 000 each. An additional One-to-Watch award of £5 000 will be given to the most promising innovator.

This year's shortlisted innovators join the academy's 134-strong Africa Prize alumni network, which includes innovators who have achieved significant commercial success and social impact across the continent following their participation in the Africa Prize programme, such as 2022 winner Norah Magero, and her portable solar-powered fridge solution for transporting medicines.

Africa Prize alumni are projected to have an impact on more than three million people in the next five years and have already created 3 585 jobs – including 1 766 for women and 211 for people with disabilities. They have raised more the USD14 million in grants and equity funding, directly contributing to 12 of the UN Sustainable Development Goals.

The 2023 shortlist features several water-related innovations, including a real-time water quality monitoring and control system, an acid mine drainage solution to recycle contaminated water for human consumption, and a water management system to prevent excess borehole pumping and drying out of aquifers.

Energy and environmental solutions also feature strongly, with a power pack made with recycled laptop batteries to address unreliable power supply and extend access to energy at a micro level, converted motorbikes that run on batteries, an electric cargo bike with a battery-powered fridge to reduce post-harvest loss, a system to help prepare waste for recycling, a mobile machine to create interlocking compressed earth bricks, and an eco-friendly cooking stove that absorbs black carbon.

Additionally, several entrepreneurs shortlisted have pioneered solutions in health, safety and education, including a remote healthcare monitoring system that records and transmits patient data, a multi-strain probiotic to improve the gut health of chickens and reduce the need for antibiotics, a local rescue network connecting neighbours with the police, and a robotics learning tool for children.

Rebecca Enonchong FREng, Founder and CEO of AppsTech and Africa Prize judge, commented: "Climate change is impacting Africa more severely than other continents, with agricultural production, food security and water resources being compromised, compounded by a weak adaptive capacity. This year, 11 of our innovations are contributing directly to environmental sustainability."

Shortlisted innovations and entrepreneurs

- Affordable AMD solution, Boitumelo Nkatlo, South Africa – A technology to treat acid mine drainage using industrial waste to recycle contaminated water for human consumption.

[Photo credit: Brett Eloff]

[Photo credit: Brett Eloff]

Boitumelo Nkatlo is one of three South Africans among the candidates shortlisted for the prize. He has developed a system to treat acid mine drainage, using industrial waste to recycle contaminated water for human consumption.

[Photo credit: Brett Eloff]

[Photo credit: Brett Eloff]

Dr Deon Neveling, also from South Africa, has developed a host-specific multi-strain probiotic designed to promote gut health and prevent bacterial infections in chickens, reducing the need for antibiotics.

- Aquaset, Obed Zar, Ghana – A smart water management system that monitors water levels in boreholes and water tanks, regulating the rate at which water is pumped and preventing pump breakdowns and wasting of water.
- Arobot, Cristovão Cacombe, Angola – A robotics learning tool for children that must be assembled and programmed to perform specific tasks.
- Digital aquaponics, Flavien Kouatcha Simo, Cameroon – A portable fish farm that uses fish waste as a fertiliser to produce organic vegetables, enabling small-scale farmers to increase production.
- Electric mobility, Chukwuemeka Eze, Nigeria – An e-mobility service that converts gas-powered three-wheel motorbikes to run on batteries, saving up to 60% on running costs.
- FlexiGyn, Edmund Wessels, South Africa – A portable device enabling gynaecologists to diagnose and treat uterine health issues without anaesthetic.
- MEDBOX, Emmanuel Ofori Devi, Ghana – A healthcare monitoring system that records a patient's vital signs and transmits them to doctors who then provide remote medical advice.
- Multipurpose earth brick machine, Fikru Gebre Dikumbab, Ethiopia – A manually-operated portable machine to make interlocking compressed earth bricks using 90%-95% soil and 5%-10% cement.
- ProbiGal, Dr Deon Neveling, South Africa – A host-specific multi-strain probiotic designed to promote gut health and prevent bacterial infections in chickens, reducing the need for antibiotics.
- Smart green stove, Margaret Yainkain Mansaray, Sierra Leone – An efficient non-electric cooking device designed to reduce greenhouse gas emissions and health risks, slashing energy use by 70%.
- Smart water tech, Allen Chafa, Zimbabwe – A real-time water quality monitoring and control system to address water-borne diseases.
- ThinkBikes CoolMAX, Tolulope Olukokun, Nigeria – An electric cargo bike with a battery-powered fridge to help Nigeria's smallholder farmers get fresh food crops to market.
- WAGA power pack, Gibson Kawago, Tanzania – A power pack made with recycled laptop batteries to provide reliable and affordable power for electric bikes, power banks, solar lights, businesses and homes.
- Waste-to-Wealth enhancer, Cletus Ekpoh, Nigeria – A four-part recycling system to help informal waste collectors.
- YUNGA, Anatoli Kirigwajjo, Uganda – A local digital network connected through a physical device using the Internet of Things to provide security at a low cost in under-resourced areas.

For more information visit: www.raeng.org.uk/africaprize

[Photo credit: Paul Stremple]

[Photo credit: Paul Stremple]

Gibson Kawago from Tanzania has developed the WAGA power pack, made with recycled laptop batteries to provide affordable power for use at a micro level.

Rallying support for the Desert to Power initiative

The initiative to increase solar generation capacity across Africa's Sahel region to provide 250 million people with access to electricity for socio-economic development continues to attract financial support from around the world.

Launched in 2019 by the African Development Bank Group and its partners, the Desert to Power initiative is designed to make Africa a renewable energy powerhouse.

Desert to Power will develop and provide 10 gigawatts of solar energy by 2030 across 11 countries where 64% of the population lives without electricity – with consequences for education, health and business. The project will positively impact the countries of the Sahel region: Senegal, Nigeria, Mauritania, Mali, Burkina Faso, Niger, Chad, Sudan, Ethiopia, Djibouti and Eritrea.

At an event held during the 27th United Nations Climate Change Conference in Sharm El Sheikh, Egypt, in November last year, the Global Energy Alliance for People and Planet (GEAPP), represented by its Executive Director for Africa, Joseph Nganga, announced US$35 million in support of the Sustainable Energy Fund for Africa (SEFA) for the initiative.

SEFA is a special fund created to provide catalytic finance to unlock private sector investments in renewable energy.

Norway's Minister for International Development, Anne Beathe Tvinnereim, announced a contribution of 300 million Norwegian kroner (around US$29 million) from the Norwegian government to support SEFA.

The event – organised by the African Development Bank in the Africa Pavilion at COP27 and titled *Desert to Power – transforming the Sahel from fragility to resilience and prosperity* – brought together government ministers, development partners and private sector representatives to discuss how to further facilitate private sector investments in the Sahel. It provided an opportunity to present the Desert to Power programme to potential partners and to rally investors to support its implementation.

Addressing participants, including ministers from the Sahel region, African Development Bank President Dr Akinwumi Adesina emphasised the importance of electricity in ensuring security and reducing poverty.

"Desert to Power is a $20 billion initiative to deliver 10 000 megawatts of solar power. It will be the largest solar zone in the world and we therefore want to turn this into a real economic activity, that will generate productive energy to be used by the countries across the Sahel," Adesina said.

He added that the initiative has several components, including utility-scale solar generation, decentralised energy solutions, transmission and distribution, utility reform, and an efficient policy and regulatory environment to safeguard investments.

Adesina said the programme would contribute significantly to climate action by protecting the Great Green Wall against desertification and other climate change impacts.

He also referred to the US$1 billion Sahel G5 Financing Facility approved by the Bank's Board of Directors earlier this year which includes US$150 million in concessional resources from the Green Climate Fund as a key facility to help de-risk private sector solar projects.

The bank chief thanked the heads of state and ministers from the various host countries for supporting the initiative.

Minister Tvinnereim of Norway highlighted the role of renewable energy in sustainable development. "We need to make sure there is access to renewable energy and prevent fossil fuel emissions. To tackle the crisis in the region, we need the readiness of the governments of the region. We also need sustained access to renewable energy and the Desert to Power programme, developed by the African Development Bank, responds to these critical issues."

President Mohamed Bazoum of Niger addressed the event via video link, reiterating his government's support for the programme. The energy ministers of Mauritania and Niger, as well as senior representatives from key Desert to Power partners – including Power Africa, the Swedish International Development Agency, the European Commission, the International Renewable Energy Agency, the Green Climate Fund, ACWA Power and MASEN – reaffirmed their support for the initiative.

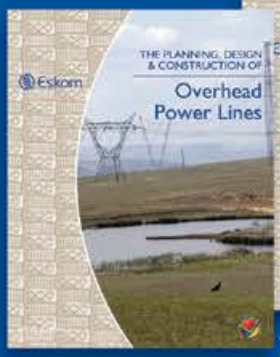
Nganga from the Global Energy Alliance said the alliance would also support the de-risking of investment made in the Desert to Power infrastructure as well as innovative solutions that would drive the programme to succeed.

For more information visit: www.afdb.org

At COP27 the African Development Bank rallied partners to support the Desert to Power initiative to bring energy access to the Sahel.

Eskom

The Eskom Power Series was conceived in response to the continuing worldwide loss of critical technical skills and experience. The aim of the series is to promote international best practice, including experience acrued by Eskom over the years, as a guide and legacy and to serve as a source of reliable, reputable and highly technical information.



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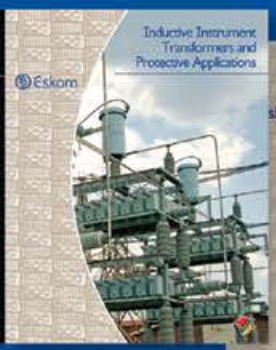

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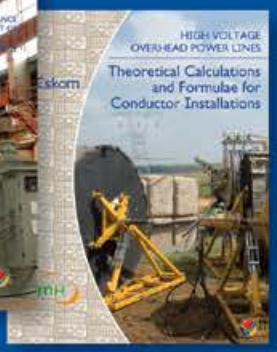

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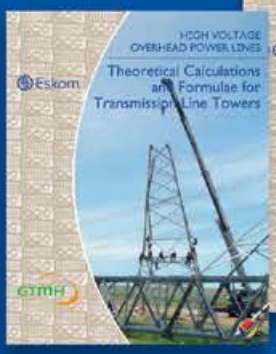

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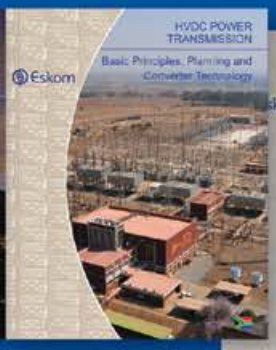

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Volume 9 (Part 2): HVDC Power Transmission: Lines Book

Volume 10: Thermodynamics for Students and Practising Engineers

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Volume 12: Basic Engineering Toolbox

Volume 13: Applied System Dynamics with South African Case Studies

The Eskom Leadership & Management Series was introduced by Eskom at the request of readers and stakeholders of the Power Series who felt that the series should be expanded to include non-technical topics. These topics are often not well understood by technical practitioners and can pose a risk to the sustainability of their businesses. To date, the Power Series team, with assistance from experts in the various fields, has produced two volumes.

Volume 1: Mentorship and Coaching

Volume 2: Winning with People ... Insights for Leaders and Organisations

Volume 1: Procurement Management Key Concepts and Practices

Based on the success of the Eskom Power Series and the Eskom Leadership & Management Series, the Professional Development Series was created. It aims at developing various professions within South Africa so that large state-owned enterprises and the private sector can grow and facilitate job creation in the country. Unlike the Power Series, both the Eskom Leadership & Management Series and the Professional Development Series have a broad readership, including those residing in the private sector, State Owned Companies (SOCs) and academic institutions.

Eskom has also published: GENERATION, TRANSMISSION AND DISTRIBUTION: A large Southern African utility. This is an introduction to the technology that has developed, over time, in response to growing demand in the electricity utility industry in South Africa. It provides a 'soft-landing' for those who need, or want, to engage with the technology in a large electricity utility.

Contact: Sanjeev Bisnath
Tel +27 11 629 5072 Email: sanjeev.bisnath@eskom.co.za

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