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Driving efficiency and sustainability

The new SU Puresonic flow meter from ifm has no moving parts inside the measuring tube and hence offers many advantages.
(Read more on page 3.)

Maintenance, or the lack of maintenance, speaks volumes

Welcome to the new year! May it be a wonderful year for you, your families, and your colleagues.

Let us never lose hope, nor the resilience that will continue to make our industry shine even when the days are dark. But some of those clouds are beginning to clear. And I do have a sense that we can make a real effort, in many ways, to continue to make those clouds clear!

Again, we have a magazine jampacked with information that will keep you informed as you settle into a goal-oriented year of progress. And, in part, it is that commitment to progress – just progress – that will see things continue to improve.

Having had the privilege to have spent quite some time travelling (and travelling many thousands of kilometres off the beaten track) in the past while, seeing this beautiful country, I am reminded how important it is to plan, schedule and actually execute maintenance.

Of course there will be budgetary constraints, and, in some cases, other resourcing challenges – but it is evident that if you slip up on regular maintenance it becomes hideously costly (in so many ways) to try and address serious failures after the fact.

One of the topics we address this month is plant maintenance, test and measurement. It is always a worry that when things become a bit tough, maintenance often suffers – we don't have the budget to deal with this, that or the next thing.

This leads to disaster. Compromising on maintenance simply cannot be contemplated.

Having said that, it also seems evident that in some very unfortunate cases, even when budget resources are available, maintenance does not take place. The consequences are so dire – and worse still, in the public space, are clear for all to see.

What is the effect of this? Whether in public spaces or on your plant, folk seeing the lack of maintenance will form a very quick impression of how you operate. And that impression will not be a good one.

There is another danger, and that is that people almost become accustomed to seeing your plant in a state of disrepair – and almost accept that as the norm.

This cannot be allowed as standard practice.

I have visited many sites in this part of the world and in other hemispheres – and the tone set by plant upkeep speaks volumes about the intention of the organisation. It is beyond my comprehension when I see an obvious lack of commitment to maintenance. The impression is appalling.

In this regard I also find myself recognising that in so many cases it proves difficult to get the areas surrounding and even serving your plant to be properly maintained and cared for. But be assured – when you cross the boundary into your plant folk must say 'now this is what we expect to see'!

So – let's make 2026 the year when we test, we measure, and we get the job done. Let it be the year when we inculcate an attitude of caring among all our staff. And a year where, no matter what we see around us, we ensure that in the spaces we control we are world class, we are competitive, and we provide the future that our staff deserve.

Enjoy the read!

Ian Jandrell

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CONTENTS

FEATURES

CONTROL SYSTEMS + AUTOMATION

4 Strategic upgrades beat mining obsolescence
Adrian van Wyk, Referro Systems

6 Open versus closed automation systems
Schneider Electric shares research findings

8 Products + services

DRIVES, MOTORS + SWITCHGEAR

11 Africa's world-class service provider for rotating equipment
Marthinusen & Coutts

13 How to maximise value from MEPS for electric motors
Fanie Steyn, WEG Africa

15 Products + services

PLANT MAINTENANCE, TEST + MEASUREMENT

16 Can AI fully understand machines?
Annemie Willer, WearCheck

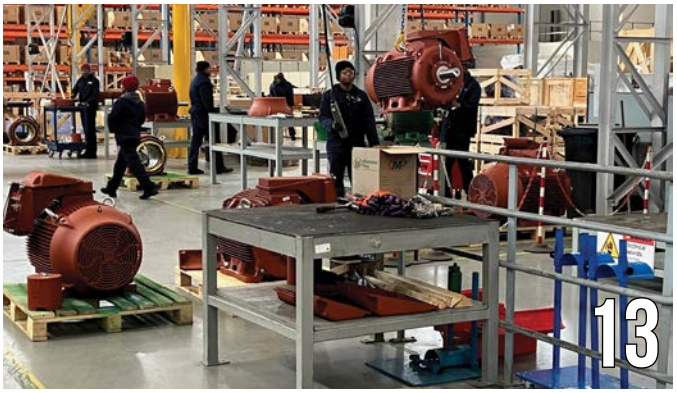
18 Managing emissions in on-site boilers
Dennis Williams, Associated Energy Services

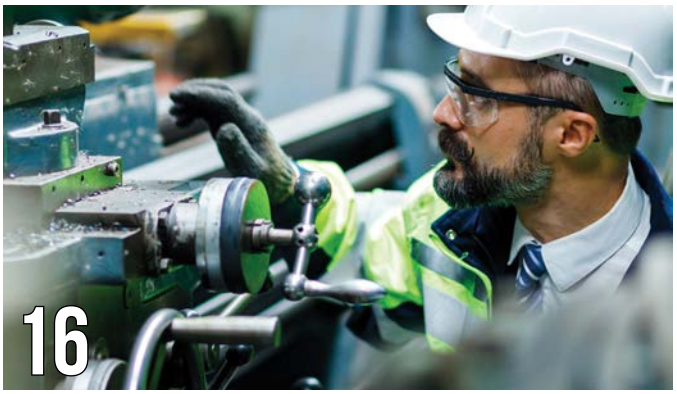
20 OEMs need a connected platform for services
Henk Wynjeterp, PRAGMA Europe

22 Reliable transformers – keeping data centres operational
Mawethu Ngubo, ACTOM T&D

23 Sensors provide critical flood warnings
Instrotech, for Senix

17 Products + services





REGULARS

1 Comment
Maintenance, or the lack of maintenance, speaks volumes

3 Cover article
Flow metering without disruption

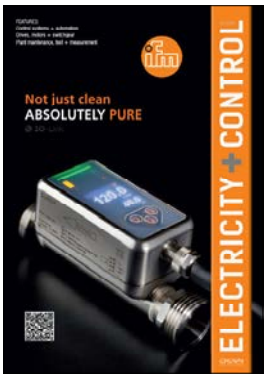
26 Cybersecurity
Cyber-enabled fraud has become a pervasive global threat
MDR: keeping a constant watch

28 Reskilling, upskilling + training
The future of work in the renewable energy economy
99 in demand jobs – TVET opens career pathways

30 Engineering the future
At the intersection of materials and quantum technology

31 Write @ the back
Africa's new powerlines – extending regional networks

Flow metering without disruption



Flow meters that involve moving parts are prone to errors and require a lot of maintenance. The new SU Puresonic flow meter from ifm has no moving parts inside the measuring tube and hence offers many advantages.

In applications where conventional flow meters are affected by components in the measuring pipe, the SU Puresonic is an ideal solution. A typical problem of flow meters that involve moving parts such as a paddle wheel, for example, is that the wheels can become porous and break (a risk that increases over the service life) or that a blockage occurs due to foreign bodies in the medium. What is more, components can be damaged during cleaning and cause the meters to malfunction. The SU Puresonic flow meter works with ultrasonic technology.

The ultrasonic transmitter and receiver are placed on the outside of the wall in such a way that the reflection occurs on the opposite inner side of the pipe. This means that no interfering structures are necessary inside the measuring pipe, which is made entirely of stainless steel. Another advantage: the sensor does not require any seals and ensures permanent tightness. The SU Puresonic is equipped with an operating status LED that can signal different status messages: for example, a deterioration of the signal quality due to air bubbles, particles or deposits, a failure of the electronics or the presence of a short circuit. In addition to green and red, the LED can light up blue, according to Namur NE107, to indicate a change in the process.

As the SU Puresonic flow meter consists of a stainless-steel pipe with no components built in or protruding into it, the customer's choice is simple. A time-consuming selection of the appropriate meter based on the wet parts, or the sealing materials depending on the process parameters, can be dispensed with.

The new flow meter is available in two sizes with process connections of 1" and 2"; the measuring ranges of the two models are 1...240 l/min and 5...1 000 l/min

About the ifm group of companies

Measuring, controlling and evaluating – when it comes to pioneering automation and digitalisation technology, the ifm group is the ideal partner. Since its foundation in 1969, ifm has developed, produced and sold sensors, controllers, software and systems for industrial automation and for SAP-based solutions for supply chain management and shopfloor integration worldwide. As one of the pioneers of Industry 4.0, ifm develops and implements consistent solutions to digitalise the entire value chain 'from sensor to ERP'. Today, the second-generation family-run ifm group has more than 8 100 employees and is one of the worldwide market leaders. The group combines the internationality and innovative strength of a growing group of companies with the flexibility and close customer contact of a medium-sized company.

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The new SU Puresonic flow meter from ifm offers many advantages.

Strategic upgrades beat obsolescence in mining operations

Mining operations are under constant pressure to maintain output while controlling costs. In this environment, operators face one persistent challenge: knowing when and how to upgrade aging systems before they become a liability. Adrian van Wyk, Managing Director, Referro Systems, says: "Striking the right balance through strategic system upgrades is the key to overcoming obsolescence and unlocking sustainable productivity gains."

For this mine, new solutions were engineered to replace legacy systems within the existing control centres, which meant redesign and downtime could be avoided.

Timely upgrades matter

Delay the decision too long, and outdated equipment drags down efficiency, safety, and profitability. Act too hastily, and production risks unnecessary disruption.

As downtime can translate into millions of rand lost and customer commitments hinge on consistent productivity, technology upgrades have become essential to sustaining operational excellence and supporting future-ready infrastructure for mining companies around the globe.

The value of partnerships

Van Wyk highlights the case of one of Referro's largest mining clients. "Our journey with this client began well before the client's 2006 automation initiative. Although not formally engaged in their initial programme, our early involvement and deep expertise played a pivotal role in shaping their decision to implement Rockwell Automation's Allen-Bradley control and motor-control platforms from the outset. Over time, our relationship has transformed – from providing front-line technical support to serving as a trusted advisor and strategic partner, guiding the customer's long-term automation strategy. This evolution highlights the value of enduring, collaborative partnerships: Referro plays a role in guiding their technology roadmap, ensuring innovation, resilience and forward-thinking is built into every stage of their continuing automation journey.

"Going forward we continue to provide hands-on support, in-depth technical input, and forward-looking advice to ensure the company remains at the forefront of process and automation innovation."

What drives the upgrade wave?

The most recent upgrade of the mine's control systems and motor control centres was motivated by several factors, primarily product obsolescence. For many mines, equipment installed over a decade ago has reached end-of-life, impacting the initially installed product lines and technologies, with manufacturers discontinuing spares and support, forcing mines to consider costly 'quick fixes' or risk unplanned downtime.

Beyond obsolescence, newer technologies offering faster processing, richer data capabilities, and more robust network protocols created an opportunity. Leveraging these advances through carefully planned upgrades is crucial to maintaining operational efficiency.

Seamless engineering

Van Wyk emphasises that one of the most complex aspects of any technology refresh is integrating new hardware and software with existing systems without disrupting ongoing production. "In this case, our engineering teams devised innovative solutions that allowed the replacement of legacy control networks, control

CPUs, variable speed drive platforms as well as intelligent motor protection devices within the existing motor control centres and platforms. This meant costly redesigns and downtime could be avoided.

"The devices were replaced with the latest networking solutions in Ethernet IP infrastructure, Allen-Bradley control logix CPUs, Powerflex 750 series variable speed drives and E300 intelligent motor protection devices, connected via Ethernet/IP networks. These upgrades enable faster communication, enhanced diagnostics and monitoring capabilities, as well as a streamlined spares inventory, delivering significant cost savings and operational resilience."

Performance gains

Although quantifying performance gains precisely is complex, the mine's results indicate success. Among the mining group's various mine sites, this retrofitted mine consistently ranks highest in throughput, demonstrating greater operational efficiency even compared to sister sites with similar geological profiles.

This highlights the value of proactive upgrades and the critical role that technology partners like Referro Systems can play in enabling such outcomes.

Dealing with obsolete infrastructure

The accelerating pace of technological evolution means mining operations need to think strategically about their automation infrastructure. Referro advises other mining companies that are grappling with ageing equipment to partner with global leaders in automation technology that offer extensive local expertise and a proven track record.

"It is important to implement upgrades through carefully planned, phased approaches that align with capital expenditure cycles and production requirements. Companies should avoid reactive quick fixes by proactively managing system lifecycles and anticipating end-of-life scenarios before they become operational crises."

Additionally, embracing new technologies such as Ethernet/IP networks, which offer faster speeds, richer real-time data, and cost-effective scalability, is essential for mining operations to maintain a future-ready infrastructure. Strategic technology partnerships and a disciplined upgrade approach support sustainable growth.

For mining companies facing the question of now or when to upgrade, van Wyk says, "The solution lies in detailed lifecycle management and working with technical specialists who understand obsolescence and have the insight into new technolgoes and the capability to provide seamless integration solutions."

This kind of approach supports operational continuity, enhances productivity, and controls costs, key priorities as market demands intensify and profit margins tighten.

Shaping mining's future

Van Wyk notes that as the mining sector deals with accelerated technological change and constant pressure to perform, success increasingly favours those leaders and organisations willing to invest in smart, strategic upgrades – not only the technology, but the mindsets and business models as well. Legacy systems and outmoded approaches can't keep pace with evolving operational, sustainability, and stakeholder demands in an intensely competitive marketplace.

The experience in the case of the mine cited illustrates what's possible: with the right technology partners, a clear vision for the future, and a commitment to seamless execution, mining companies can redefine the standards for productivity, safety, and resilience.

Strategic, well-timed upgrades ensure that when the next wave of challenges comes, the industry leaders are ready to take the next step.

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

Ultra-compact industrial PCs

Advances in CPU technology offering increased computing power have enabled Beckhoff to design ultra-compact industrial PCs.

Beckhoff's C60xx scalable series of ultra-compact industrial PCs combines high computing power in an extremely compact format with a wide range of options for installation in the control cabinet. A new Intel Atom® processor generation now provides more performance reserves in the devices, which cover low to high automation requirements.

With a new generation of processors, the C6015, C6017, and C6025 ultra-compact Industrial PCs can be used for more demanding computing tasks than before, while retaining their compact form factor. The fanless devices are designed in particular for control, visualisation, and communication – from complex automation and virtualisation to use as an edge device or HMI platform. All the PCs benefit from the new Intel Atom x7 CPU series, which offers up to eight processor cores and a 3.0 GHz clock frequency.

As the smallest device with dimensions of just 82 x 82 x 40 mm, the C6015 ultra-compact Industrial PC is ideal for highly compact applications, virtualisation, and IoT. The same applies to the

Beckhoff's C6015, C6017, and C6025 ultra-compact Industrial PCs make use of the latest developments in processor technology.

C6017 with an installation depth of 66 mm, which has an additional second board level for optional interfaces and integrated 1-second UPS. Measuring 82 x 127 x 47 mm, the C6025 can also be expanded to up to eight processor cores and used with high-performance SSDs and USB-C.

For more information visit: www.beckhoff.com

Open versus closed automation systems

New research conducted by global technology research firm Omdia and unveiled by Schneider Electric in November last year reveals that closed industrial automation systems are eroding competitiveness and costing mid-sized organisations, on average, 7.5% of their revenue.

Open, software-defined automation offers a scalable, future-ready solution that modernises legacy systems and strengthens industrial competitiveness.

The research highlights how these costs stem from operational inefficiencies, downtime, compliance retrofits, and delayed production, issues often masked by the perceived reliability of legacy automation systems. For large enterprises, losses average $45.18 million per year, while smaller manufacturers face steeper proportional impacts, losing up to 25% of annual revenue.

Traditional, hardware-defined automation systems, built for static environments, struggle to meet today's dynamic industrial demands. Their rigidity turns routine updates into costly technical projects and proprietary architectures limit data access, reducing visibility and responsiveness.

At the core of the challenge is hardware complexity. Most companies operate across two to 10+ distinct platforms, each with unique maintenance needs. This fragmentation drives vendor dependency; 30% of issues require specialised support, and this strains workforce efficiency due to the niche technical expertise required at a time when companies are facing workforce and skills shortages. Siloed systems also hinder predictive maintenance and the fast resolution of issues, leading to costly downtime and lost productivity. These inefficiencies scale across operations, limiting agility.

Key findings

- Hidden cost penalties: closed industrial systems cost mid-sized industrial companies 7.5% of revenue through downtime, inefficiencies, and compliance retrofits every year.
- Rigid infrastructure slows response: 77% of systems need physical updates; fragmented platforms increase complexity and delay action.
- Open, software-defined automation offers a way forward: by decoupling software from hardware it enables faster decisions, real-time insights, and competitive resilience.

The research underscores a need for transformation. Open, software-defined automation offers a scalable, future-ready solution that modernises legacy systems, accelerates ROI, and strengthens industrial competitiveness and resilience.

By decoupling software from hardware, manufacturers gain the flexibility to integrate multi-vendor systems, adapt quickly to market shifts, produce small batches efficiently, and close engineering skills gaps. Real-time data becomes actionable, driving smarter decisions, boosting productivity, and reducing costs at scale.

Schneider Electric customers are already realising these benefits. Many begin with pilot projects or asset-level trials, then expand to full-plant or multi-site deployments, unlocking full data ownership, improved quality control, and greater cost transparency, while protecting existing investments.

"This research echoes what our customers tell us every day: industrial systems need to adapt as fast as their markets," says Gwenaëlle Avice Huet, Executive Vice President, Industrial Automation, Schneider Electric. "It's particularly encouraging that smaller enterprises stand to gain the most in annual savings, which can be reinvested in innovation and growth. Open, software-defined automation is a proven solution that empowers industrial players of all sizes to build resilience, drive innovation, and thrive amid rapidly shifting consumer demands, regulatory pressure and market volatility."

Four critical cost areas, annually

- $6.1 million in operational agility and resilience losses Inflexible hardware systems hinder responsiveness to market shifts, as 77.4% require physical modifications for functionality updates, and multiple vendor platforms create integration complexity. Modification costs range from $25K to $50K per hour, rising to $250K/hour for $1 billion + companies.
- $2.28 million in optimisation and efficiency costs Maintenance burdens, downtime, and talent gaps grow as hardware complexity drives operational inefficiencies. Companies manage, on average, two to 10 different industrial systems; 29% deploy 10+ hardware platforms, each with unique management requirements.
- $1.2 million in preventable quality failure and costly data maintenance Proprietary systems create data silos and limit integration. Only 28% of companies access real-time insights; half report that 20 to 39% of critical data isn't available in real time.
- $1.7 million in sustainability and compliance costs Regulatory changes demand costly hardware retrofits, driving up compliance expenses.

Anna Ahrens, Principal analyst at Omdia, adds: "In response to mounting pressures, industrial leaders are deploying tactical solutions to sustain their core priorities for growth, competitiveness, and trust. In a world where product lifecycles shrink, supply chains fracture, and talent gaps widen, agility and flexibility are key to survival. Every quarter a business

By decoupling software from hardware, manufacturers gain the flexibility to integrate multi-vendor systems and adapt quickly to market shifts.

delays addressing the cost of closed automation ecosystems is another $1 million+ in lost value: money that could be reinvested in growth and innovation."

Methodology

The research, conducted by Omdia, included 10 C-suite interviews across industries (Oil & Gas, Food and Beverage, Water and Wastewater, Metals, Other Manufacturing), as well as a global quantitative survey with 320 participants in Energy and Chemicals, Manufacturing, Mining, Metals and Minerals, Warehousing and Water, Wastewater and Waste. The study was conducted in September/October 2025.

For more information visit: www.se.com

Sharing solutions for smart manufacturing

The manufacturing industry has always been resilient, but there's no denying that this moment feels especially challenging. Around the globe, organisations are navigating tighter margins, evolving supply chains, and difficult workforce realities. Teams are being asked to do more with less, while still maintaining quality, efficiency, and innovation. In many cases, roles are shifting as companies rethink how work gets done and where to focus limited resources.

What's becoming clear is that these challenges signal a long-term shift, not a temporary disruption.

Manufacturers that continue to invest in knowledge, skills, and smarter ways of working are better positioned to adapt and compete. Those that isolate or delay progress risk falling behind.

MESA International (the Manufacturing Enterprise Solutions Association) exists to help manufacturers navigate this kind of change by connecting professionals to proven best practices, peer insights, and practical guidance for smart manufacturing adoption.

For manufacturers feeling the pressure to adapt but not keen to navigate these challenges alone, MESA invites you to explore the MESA community.

MESA offers members the chance to learn from their peers about smart manufacturing solutions.

Global education online

MESA also runs a Global Education Programme (GEP) which helps manufacturers manage their digital transformation and grow their capabilities in Manufacturing Operations Management (MOM) and Manufacturing Execution Systems (MES), which have become foundational to operational excellence. MESA recognises that many manufacturers struggle with digital transformation initiatives, not due to technology but because teams lack a shared, standards-based understanding of how MOM systems should be designed, implemented, and sustained.

MESA training courses are designed to help manufacturers, solution providers, and consultants establish a common language and competency baseline for successful MOM programmes. Whether you are planning a new MES initiative, scaling smart manufacturing, or building internal capability across IT and Operations, MESA's GEP can help you reduce risk, improve outcomes, and accelerate value realisation.

For more information visit: www.mesa.org

Building an industrial AI operating system

Jensen Huang (right), founder and CEO of NVIDIA, and Roland Busch (left), President and CEO of Siemens AG, announce their partnership to build the industrial AI operating system.

Siemens and NVIDIA have announced a further expansion of their strategic partnership to bring artificial intelligence into the real world: together, the companies aim to develop industrial and physical AI solutions that will bring AI-driven innovation to every industry and industrial workflow. They aim to reinvent the industrial value chain – from design and engineering to manufacturing, production, operations and into supply chains – and in parallel, accelerate each other's operations.

The announcement was made at CES 2026 (the Consumer Electronics Show held annually in Las Vegas, Nevada, in the USA).

To support development, NVIDIA will provide AI infrastructure, simulation libraries, models, frameworks and blueprints, and Siemens will commit hundreds of industrial AI experts and leading hardware and software.

"Together, we are building the Industrial AI operating system – redefining how the physical world is designed, built, and run – to scale AI and create real-world impact," said Roland Busch, President and CEO of Siemens AG. "By combining NVIDIA's leadership in accelerated computing and AI platforms with Siemens' leading hardware, software, industrial AI and data, we're empowering customers to develop products faster with the most comprehensive digital twins, adapt production in real time, and accelerate technologies from chips to AI factories."

"Generative AI and accelerated computing have ignited a new industrial revolution, transforming digital twins from passive simulations into the active intelligence of the physical world," said Jensen Huang, founder and CEO of NVIDIA. "Our partnership with Siemens fuses the world's leading industrial software with NVIDIA's full-stack AI platform to close the gap between ideas and reality – empowering industries to simulate complex systems in software, then seamlessly automate and operate them in the physical world."

Accelerating the industrial lifecycle

Siemens and NVIDIA will work together to build AI-accelerated industrial solutions across the full lifecycle of products and production, enabling faster innovation, continuous optimisation, and more resilient, sustainable manufacturing. The companies aim to build the world's first fully AI-driven, adaptive manufacturing sites globally, starting in 2026 with the Siemens Electronics Factory in Erlangen, Germany, as the first blueprint.

Using an 'AI Brain' – powered by software-defined automation and industrial operations software combined with NVIDIA Omniverse libraries and NVIDIA AI infrastructure – factories can continuously analyse their digital twins, test improvements virtually, and turn validated insights into operational changes on the shopfloor.

This will enable faster, more reliable decision-making from design to deployment – raising productivity and reducing commissioning time and risk. The companies aim to scale these capabilities across key verticals and several customers are already evaluating some of the capabilities, including Foxconn, HD Hyundai, KION Group, and PepsiCo.

With the partnership expansion, Siemens will complete GPU acceleration across its simulation portfolio and expand support for NVIDIA CUDA-X libraries and AI physics models, enabling customers to run larger, more accurate simulations faster. Building on that foundation, the companies will advance towards generative simulation using NVIDIA PhysicsNeMo and open models to provide autonomous digital twins that deliver real-time engineering design and autonomous optimisation.

Shared innovation

Siemens and NVIDIA aim to advance each other's operations and portfolios by implementing technologies on their own systems before scaling them across industries. NVIDIA will assess Siemens offerings to streamline and optimise its own operations and offerings, and Siemens will assess its own workloads and collaborate with NVIDIA to accelerate them and integrate AI into Siemens' customer portfolio. In this way, Siemens and NVIDIA will also create proof points of value and scalability for customers.

For more information visit: https://www.siemens.com

Synchronised control for steel mesh handling system

Automation specialist *Hambi Maschinenbau,* part of *Terhoeven GmbH & Co KG*, has developed a world-first system that automates the cutting, handling, and stacking of heavy reinforcing steel mesh – a task that previously required up to six people to manage. By integrating Mitsubishi Electric's drive and control technologies connected via CC-Link IE TSN, Hambi has achieved millimetre-level precision and smooth synchronisation across motion, safety, and vision systems in a single, unified network.

Tackling a demanding manual process

In the production of reinforcing steel mesh, long lengths of wire are welded into large mats, which must then be cut to size and stacked for transport. This was a labour-intensive process requiring workers to lift, align, cut, and stack the heavy meshes. It was also considered a difficult task to automate, as the weight and flexibility of the mats means that even small deviations in alignment can cause major issues.

However, *Van Merksteijn International BV*, a leading steel processor, was determined to overcome these challenges. It asked Hambi to develop an automated solution that could detect and compensate for any alignment variations in real time.

The result was the ASA (automatic cutting system) – a six-metre-high, 40-metre-long machine that automates every stage

Continued on page 9

Adroit Technologies receives Data Innovation Award

Adroit Technologies last year won the Data Innovation Award at the Lumin 2025 ceremony, hosted by strategic platform partner OQLIS. This recognition underscores Adroit Technologies' leadership in data-driven innovation across the industrial and utilities sectors.

Central to the company's achievement are its cloud-based analytics and operational intelligence platform, Adroit Cloud, and the purpose-built software gateway, the Adroit Edge Gateway, which together enable secure, efficient integration of industrial plant data with advanced cloud analytics.

Commenting on the award, Johan Nieuwenhuizen, Sales Director and Co-CEO says: "This is a testament to our commitment to delivering real value through data innovation. With Adroit Cloud and the Adroit Edge Gateway, we are enabling our clients to access advanced insights that can deliver measurable improvements in efficiency, performance, and decision-making."

Hugo Pienaar, Digital Services Director, says: "The Data Innovation Award acknowledges Adroit Technologies' work in extending what's possible with the OQLIS platform through Adroit Cloud and its Edge Gateway. The Edge Gateway serves as a secure, lightweight bridge between on-premises industrial systems and cloud-based analytics, streamlining data acquisition and enabling real-time insights." More than simple data transfer, Adroit Technologies' implementation elevates the platform with modern visualisation and advanced analytics. The use of HTML override capabilities allows smarter, dynamic visualisation over traditional static layouts, making data more accessible, easier to interpret, and decision-ready.

Complementing this, Adroit Technologies has deployed machine-learning models and generative AI via the Lumin module to deliver powerful forecasting and operational insights, particularly in water-industry applications, where early customer engagements have demonstrated real value.

Johan-Nieuwenhuizen Sales Director and Co-CEO, Adroit Technologies.

With over 30 years of expertise, Adroit Technologies has established itself as a trusted provider of SCADA, HMI, IoT, and industrial-automation solutions worldwide. What began as SCADA and process-control software has evolved in recent years into a broader suite of digital transformation tools that address the growing demands of Industrial IoT, asset-management, and cloud analytics.

The Adroit Edge Gateway represents a progressive step in that evolution, enabling OT based communications to control or business systems, secure edge computing and real-time data transfer to the cloud, effectively turning legacy industrial systems into sources of actionable analytics and business intelligence.

Through the combination of edge computing, cloud analytics, and machine learning, industrial clients, especially in utilities, water management, manufacturing and resource-intensive sectors, can realistically expect to aggregate and visualise real-time data across distributed assets, forecast system demand or maintenance needs, and make data-driven operational and investment decisions. Doing so, they can gear their operations for future demands, integrating new IoT and AI capabilities without sacrificing the value of existing infrastructure.

For more information visit: https://adroitscada.com/#

Continued from page 8

of the process, from lifting the top mat in a stack to cutting and turning sections for compact stacking.

Precision through synchronisation

The system uses six grippers, each capable of independent three-axis movement. As the mesh bends under its own weight during lifting, the grippers must dynamically adjust their positions to maintain even tension and prevent deformation.

In total, 18 servo drives coordinate this movement, with additional drives handling transportation, turning, and stacking. Synchronisation between these drives, as well as with the image processing system and safety controls, is critical to ensure stability and precision.

That's why Hambi decided to link every part of the system – including servo drives, safety PLCs, frequency inverters, and controllers – via CC-Link IE TSN. The high-speed, deterministic communication provided by this open Ethernet standard allowed the team to achieve millimetre-level precision when gripping and positioning the steel mesh, even as it naturally bends and shifts during lifting. The technology's gigabit bandwidth also allows all system components to share a single unified network.

"Communication via CC-Link IE TSN is particularly important," explains Marc Orgassa, Managing Director of *Orgassa GmbH*, Hambi's long-term automation partner. "It allows us to ensure that the various system components and controllers are synchronised with the drives. This is a prerequisite, as image processing naturally requires the exact position of the grippers."

A world-first in mesh handling

Following two years of development, the ASA system was commissioned at Van Merksteijn's site in spring 2024. The solution achieves the precision, reliability, and productivity needed for large-scale reinforcing steel production.

John Browett, General Manager of the CC-Link Partner Association – Europe, says: "It's inspiring to see machine builders like Hambi using CC-Link IE TSN to solve such complex motion control challenges. The ability to combine different tasks on the high-speed open network demonstrates how this technology helps companies push automation performance further while keeping system design simple."

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

Hambi has developed a world-first system that automates the cutting, handling, and stacking of heavy reinforcing steel mesh.

CADENAS joins Eplan Partner Network

With a new partnership contract signed between CADENAS and Eplan, CADENAS is now the newest member of the Eplan Partner Network. CADENAS Managing Director Terry Jonen and Eplan Managing Director Haluk Menderes signed the technology partnership agreement at SPS Nuremberg, Germany in November last year. The stated goal of the cooperation is to expand the provision of technical device data via the Eplan Data Portal, which will be implemented using a direct interface between the Data Portal and the CADENAS platform 3Dfindit.

CADENAS is a leading software developer in the fields of strategic parts management and parts reduction (PARTsolutions) as well as electronic product catalogues (eCATALOGsolutions).

CADENAS' software solutions act as a link between component manufacturers, their products and the buyers. Some 70% of the top 50 manufacturers in demand by engineers, reportedly rely on eCATALOGsolutions from CADENAS as a CAD catalogue solution for their products. More than 10% of the 1 000 global players from Germany rely on PARTsolutions by CADENAS.

The technology partnership agreement signed with Eplan will make it easier for Eplan users to find the right device data.

"CADENAS is a strong partner who will help us extend the range of device data available on the Eplan Data Portal with additional, validated content," said Menderes. "For our customers, this cooperation is significant. The connectivity to the CADENAS device database expands our selection of device data with completely new, sometimes very complex configuration data – for instance for the energy sector," Menderes added.

CADENAS Managing Director Terry Jonen said: "With the planned connection of 3Dfindit to the Eplan Data Portal, we're making it easier for engineers to access precise, up-to-date product data and are thereby increasing the added value for our common customers."

Eplan Managing Director Haluk Menderes and CADENAS Managing Director Terry Jonen signed the new technology partnership agreement.

Comprehensive digital device data is indispensable for design engineers. It accelerates project planning, increases efficiency in engineering and supports greater data consistency. Through their partnership, the companies will be developing an interface to the CADENAS portal that users will be able to access via the Eplan Data Portal, that is, directly via the Eplan cloud. Eplan and CADENAS will work together to design the interface, and both companies will be engaging in continuing dialogue with component manufacturers.

The advantages for users

- Eplan users will benefit from a significantly expanded range of data on offer, especially for complex designs.
- Design engineers will have additional options when selecting device data.
- Data consistency throughout the engineering process also increases.

Following the signing of the agreement, the technical implementation is getting started. In the coming months, both partners will set up technical working groups to define the specific measures with a view to gradually expanding the cooperation. The goal is to deliver added value for common customers along the value chain.

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

Robust M12 power connectors for industrial applications

The new LÜTZE M12 Power connectors ensure reliability under harsh conditions.

Automation specialist LÜTZE, based in Germany, has introduced a new series of rugged M12 circular power connectors for field wiring. The new connectors have been developed for demanding industrial applications and offer high efficiency, reliability, and ease of installation – ideal for use in automation, control technology, and mechanical engineering.

The new LÜTZE M12 Power connectors have a durable housing made of nickel-plated brass, providing reliable protection against dust, moisture, and mechanical stress. With an IP65 protection rating and an operating temperature range from -40°C to +85°C, they can be used in harsh environmental conditions. The innovative push-in technology with spring connection enables simple, tool-free and intuitive installation, reducing assembly times by up to 30% – an efficient solution for modern control cabinet and machine construction.

High performance for a wide range of applications

The LÜTZE M12 Power connectors are designed for conductor cross-sections up to 2.5 mm^2 and cable diameters up to 13 mm. They ensure a secure and vibration-resistant connection with 360° shielding for reliable EMC protection. Both male and female straight connectors with L, T, K, and S coding are available for applications with dc 63 V / 12-16 A or ac 690 V / 12-16 A. Ferruled and solid wires can be terminated using the quick push-in technology, and stranded wires use the easy-to-open tabs for termination which are colour coded for easy identification.

The M12 Power connectors are ideal for applications in automation technology, mechanical and plant engineering, robotics, and power distribution. They combine robust design with easy handling – a well-engineered solution for reliable power transmission in industrial environments.

RS Components is a distributor for Friedrich Lütze GmbH products in South Africa.

For more information visit: www.luetze.com

Africa's world-class service provider for rotating equipment

Last year, **MechChem Africa**, *sister publication of* **Electricity + Control** *in the Crown Publications stable, visited the Cleveland facility of Marthinusen & Coutts, a division of ACTOM (Pty) Ltd, and spoke to Marketing Executive, Mike Chamberlain, about the business's comprehensive on- and off-site service, repair, remanufacturing and testing offering. We share the report here, with acknowledgements to* **MechChem Africa.**

Form-wound copper stator coils being installed for a motor at Marthinusen & Coutts' Cleveland facility.

Founded in 1954 by a group of recognised leaders in the repair and servicing of electric motors, Marthinusen & Coutts (M&C) has grown into a trusted service provider for the remanufacturing, repair and maintenance of rotating equipment, most notably for the rewinding of medium and low voltage ac and dc motors, generators, transformers and coils, along with advanced testing.

"We offer a full range of electrical and mechanical services across all industries. We have extensive capabilities in power generation and mechanical engineering from seven well-equipped repair workshops in Southern Africa that now employ almost 450 people," says Mike Chamberlain, the business's marketing executive.

As well as the 9 500 m^2 Cleveland workshop in Johannesburg, M&C has a 14 000 m^2 workshop in Benoni and a facility in Rustenburg. "We also operate through other ACTOM outlets across Africa, including in Kitwe, Zambia, GEC in Harare, Zimbabwe, and Namibian Armature Rewinders in Walvis Bay, among others," he says.

"In addition to being a leading repair business for all sizes of motors and generators, we have a sister division on the mechanical side, ACTOM Turbo Machines, for repairing and re-engineering turbines and all types of large rotating machines," he adds.

What makes M&C different?

First and foremost, M&C has an Africa-wide network of people with the skills and experience to manage complex projects on sites all over the continent, says Chamberlain. "We can quickly respond to customers' needs, be they on-site repairs and refurbishments of large motors or motor/generator rewinding and refurbishments at one of our facilities."

For very large machines, the Benoni facility includes a 140 t Wagner lathe that can accommodate a 40 t, 11 m workpiece with a swing of 3.2 m. "We have also invested in specialised equipment and tooling for coil retaining ring removal, and we have a 90 t crane capacity and 1 000 t hydraulic presses for very large salient pole coils used for hydro and synchronous generators. At our Cleveland operation, we have the best-equipped rotating electrical machines load test facility in Africa and a 32 t balancing machine.

"For windings, four insulation systems can be accommodated, along with three different vacuum pressure impregnation (VPI) systems for void-free insulation, which enhances the dielectric and mechanical strength of the windings and delivers improved thermal conductivity."

M&C's electro-mechanical testing facilities are the most comprehensive in Africa. "We offer full load testing of HV, LV and dc equipment, and on-site diagnostics, including electromagnetic core imperfection detection (ELCID) testing, turbine vibration analysis (TVA), partial discharge (PD) monitoring, and rotor flux analysis, among other testing services.

Continued on page 12

Continued from page 11

"We also have a very skilled and well-equipped field service team that offers 24-hour field service support for breakdowns and continuous improvement programmes for our customers," Chamberlain adds.

Notable projects

M&C installs, services and repairs gearless mill drives across the continent and has been involved in projects as far away as Panama and Indonesia. Chamberlain describes a recent installation of new GMDs at copper mines. One of its clients, a Perth-based mining client, has mines around the world, including in Kansanshi and Kalumbila, both in northern Zambia, and Minera, Panama. M&C was contracted to interconnect the electrical sub-assemblies for nine new ABB gearless mill drives for a copper project in Panama. This mine's life is estimated at more than 30 years, and it produces copper, gold and molybdenum, says Chamberlain, adding that M&C has become the preferred provider of GMD services to this mining house.

On the power generation side, he cites a success at the N'Zilo hydroelectric power station on a 26 MW, 18-pole stator rewind for a vertical ac synchronous generator, in a very remote and isolated location in the DRC.

"The stator's internal diameter was over five metres, so we had to repair it on site. Further complicating the work, the stator was lap-wound, which required a high level of expertise. We have the necessary equipment and skills to carry out such on-site repairs effectively, including in the DRC and elsewhere in Africa," Chamberlain says.

On the service side, he notes that M&C has held several long-standing maintenance contracts for independent power stations, including a hydropower station with 4×45 MW Siemens generators, and gas turbine-generator plants for electricity generation in the Western Cape, units that play a critical role in regulating maximum demand and meeting Cape Town's supply targets.

The reverse engineering approach

M&C's design team, led by Rob Melaia, is considered to be the top motor design team in Africa. "They check the winding design of every motor or generator we rewind, looking for ways to improve reliability and performance. Our engineering teams have the experience and ability to apply practical insights gained from years of repairing and analysing motors across various industries.

"They can make winding design improvements, using the latest technology and modern insulation materials, which enables motors to run cooler, more efficiently and potentially with increased output in terms of speed, torque or power.

"Most importantly, though, this reverse engineering approach enables us to engineer out known failure points of the rotating equipment entrusted to us, with a key focus on reducing heat generation and minimising the risks of insulation breakdown, which are the primary enemies of motor performance and longevity," says Chamberlain.

M&C also designs and manufactures specialised motors as and when required by customers.

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

For very large machines, the Benoni facility includes a 140 t Wagner lathe that can accommodate a 40 t, 11 m workpiece with a swing of 3.2 m.

Final assembly of a remanufactured motor.

M&C offers full load testing of HV, LV and dc equipment, and on-site diagnostics.

Fanie Steyn, Electric Motors, WEG Africa.

How to maximise value from MEPS for electric motors

In South Africa, the new Minimum Energy Performance Standards (MEPS) for electric motors that came into effect in mid-2025 require all low voltage IE1 and IE2 electric motors, which are widely used across industries – in heavy-duty cranes, pumps, conveyor belts, air conditioning and more – to be replaced by the more energy-efficient IE3 motors.

WEG Africa assembles a range of electric motors locally.

In the first global analysis of energy consumption and energy efficiency potential of electric motor-driven systems (EMDS), published by the International Energy Agency in 2011, *Energy Efficiency Policy Opportunities for Electric Motor-Driven Systems*[1], the IEA highlighted that electric motors and the systems they drive constitute the largest single energy end use and account for more than 40% of global electricity consumption. It pointed to the huge, untapped potential for energy efficiency in EMDS, stating then that around 25% of EMDS electricity use could be saved cost-effectively – and that would reduce total global electricity demand by about 10%.

As well as reducing electricity use, more efficient electric motors deliver significant cost savings, which is why many countries, including South Africa, have established Minimum Energy Performance Standards (MEPS) regulating the standards of electric motors.

In South Africa, the MEPS regulations require most three-phase low-voltage electric motors, with power ratings from 0.75 kW to 375 kW, to be replaced, as they fail, over time, by IE3 (or higher) rated motors.

Although the regulations allow motor operators to phase out older motors, IE3 motors are clearly more efficient and have lower maintenance needs (a further cost benefit). WEG advises businesses to start developing their replacement plans now.

"Yet, many businesses are unsure of the best approach to exploit the MEPS transition," says Fanie Steyn, LV & HV Executive of WEG Africa's Electric Motors division.

"The average mid-sized factory may run several dozen to a few hundred electric motors. Some are delaying replacements because they worry that this will draw attention and resources away from their main priorities. They would rather wait until a motor breaks and replace it then. But our view is that approach costs more: it leaves savings on the table and will lead to rushed preparations such as procurement training. Right now is the best time for businesses to start thinking about how MEPS affects them."

Preparing for MEPS doesn't mean replacing every motor. There are several ways to build towards a smooth transition and maximise the return on investment, which Steyn outlines below.

Conduct motor inventories

You can use MEPS to motivate a survey of your motor inventory for maintenance, redeployment, and replacement planning. MEPS doesn't require replacing current motors until they reach

the end of their lifespans – a survey will catalogue motors based on their expected lifespans to inform maintenance and replacement timelines.

Update procurement policies and procedures

Start updating your procurement policies and train procurement staff to support the MEPS transition. Vet motor suppliers to ensure they hold appropriate stock for replacements and can provide information on motor efficiency classes, performance tests, and warranty conditions to ensure quality and compliance. Provide training and update processes for procurement teams to support MEPS requirements and vendor assessments.

Focus on TCO

With a fit-for-purpose and well-maintained IE3 motor, businesses can recoup their investment costs within one to five years, or in some cases within months for continuously running motors. You are more likely to benefit from a lower total cost of ownership (TCO) when you replace an old motor with an IE3 model instead of repairing or rewiring it. Speak to efficiency experts and motor vendors to determine the best cost strategy.

Prioritise high-performance workloads

The sheer number of motors you rely on could overwhelm your best transition intentions. Manage this issue from the basis of creating motor inventories and then prioritising high-performance motors for first replacement. These are typically motors that run continuously, such as for HVAC systems, pumps, compressors, and escalators.

Use energy audits

Energy audits will identify motors with the highest operational cost. If you replace those first, they maximise short-term savings and you gain more mileage from less impactful motors. The combined savings can help fund a steady rollout of replacement motors. The top electric motor vendors have the experience and skills to help with energy audits.

Replace motors strategically

Apart from a few exceptions, all electric motors will eventually be replaced by IE3 standard or better models. Rather than wait until the last minute to replace motors, which is costly, inefficient, and disruptive, you can strategically retire motors and spread out your capital investments.

Selectively redeploy motors

While MEPS covers a wide range of motor uses, you can redeploy some IE1 and IE2 motors to less demanding applications.

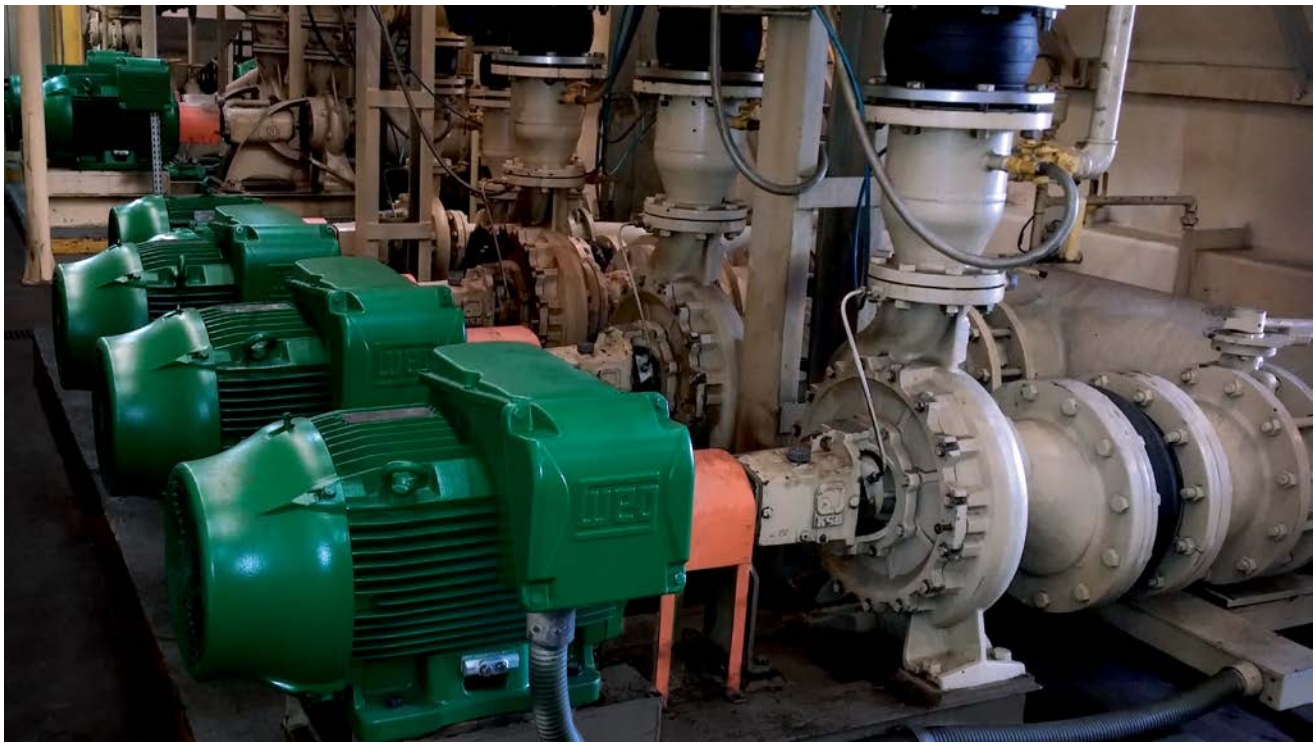
"My advice to electric motor operators is: Don't procrastinate! You either take advantage of the change, or it will force you to act. MEPS doesn't mean you must replace everything right now, so you can use this window to revisit your motor inventory and plan for maintenance and replacement. By taking a phased approach, you'll achieve compliance and proactively improve your overall motor management strategy," says Steyn.

Electric motor vendors like WEG Africa and their networks have the expertise and scope to discuss MEPS-related plans. Contact your trusted motor supplier and start a conversation about what will work best for your business.

Reference

[1] https://www.iea.org/reports/energy-efficiency-policy-opportunities-for-electric-motor-driven-systems

For more information visit: WEG Africa



WEG electric motors are widely used across various industry sectors.

IoT insights drive next generation predictive maintenance

As industries intensify their efforts to cut downtime, reduce maintenance costs and operate with greater energy efficiency, the ability to anticipate equipment issues before they occur has become essential. Predictive maintenance is now a core requirement for modern operations and SEW-EURODRIVE's DriveRadar® IoT Suite is part of this evolution.

The DriveRadar IoT Suite is enabling industries to shift from manual, reactive maintenance to intelligent monitoring, using integrated sensors, digital twins and real-time analytics to inform predictive maintenance and prevent equipment failures. Providing live asset visibility, automated alerts and mobile access to detailed performance data, the system helps plant operators to improve uptime significantly, reduce operating costs and enhance long-term drivetrain reliability.

Across sectors – ranging from mining and automotive to agriculture, ports, airports, and food and beverage production – reliable drivetrain performance is fundamental. Willem Strydom, Business Development Manager for Electronics at SEW-EURODRIVE, says the market is moving rapidly towards smarter asset intelligence. Customers increasingly want deeper, real-time insights into their operations and DriveRadar provides that with its intelligent sensors, edge devices and cloud-based analytics offering complete operational visibility.

Traditional maintenance practices such as manual plant surveys are proving inadequate in today's dynamic production environments. Werner Engelbrecht, Works Manager Mechatronics at SEW-EURODRIVE, notes these surveys often become quickly outdated as equipment is replaced or repaired. DriveRadar, by contrast, captures every new item added to the plant, offering a live, accurate and continuously updated asset overview. As plant layouts and equipment evolve, this real-time accuracy becomes essential for effective decision-making.

Beyond visibility

The benefits extend beyond visibility, with predictive capability at the heart of preventing failures. Engelbrecht says operators who respond to the system's insights can avoid catastrophic breakdowns. IoT driven insights into operating assets also reduce the need for personnel to conduct repetitive physical inspections, freeing human resources for more strategic maintenance work.

A key differentiator of DriveRadar is its reliance on SEW-EURODRIVE's integrated drivetrain ecosystem rather than third-party add-on sensors. Strydom highlights that the company's frequency inverters function as highly accurate, multi-function sensors. Each inverter measures time of operation, energy consumption, load and torque and detects vibrations or shocks – generating hundreds of measurements per device.

With additional motor sensors and advanced vibration sensors where required, DriveRadar collects data such as temperature, ambient conditions, oil levels and ageing indicators, load variations and vibration signatures extracted directly from motor harmonics.

All this information is combined to create a digital twin of each drivetrain. The digital twin uses AI-driven models to learn normal operating behaviour from the moment equipment is commissioned. Any deviation from this baseline is detected immediately, enabling early identification of bearing damage, prediction of brake lining life, forecasting of oil change intervals, detection of structural faults and identification of load inefficiencies. Importantly, the system is capable of monitoring non-SEW-EURODRIVE components as well, making it suitable for entire applications such as conveyors or pick-and-place machinery.

Accessibility is another major advantage. DriveRadar allows data to be stored in the SEW-EURODRIVE cloud, the customer's private cloud or local servers and can integrate with existing SCADA systems. Users can access full equipment data and generate reports from mobile devices, including in remote regions using GSM or SIM-based communication. This accessibility is particularly valued by maintenance teams who can identify issues immediately without physically walking the plant.

To support customers in adopting these advanced tools, SEW-EURODRIVE has invested extensively in training. The company now offers training either on site or at its Drive Academy in Johannesburg, to meet customers' needs.

Willem Strydom, Business Development Manager for Electronics at SEW-EURODRIVE.

Werner Engelbrecht, Works Manager Mechatronics at SEW-EURODRIVE.

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

The SEW-EURODRIVE DriveRadar® condition-monitoring interface provides clear, real-time visibility of drive system health.

Can AI fully understand machines?

Cutting-edge technology and solutions powered by artificial intelligence are embraced by specialist condition monitoring company, WearCheck, where the extreme accuracy of data used to assess and diagnose machine health is paramount. However, Annemie Willer, Manager of WearCheck's ARC (asset reliability care) division, warns that certain diagnostic responsibilities should not be assigned to AI tools without considering the need for human intervention and experience.

Annemie Willer, WearCheck.

We keep hearing worrying claims from industry stakeholders and customers, says Willer, that if you throw enough data from vibration, oil, thermography, process sensors, ultrasound, and AE (acoustic emission) measurement into an AI system, it'll somehow converge into a perfect picture of machine health, complete with the precise corrective action to take.

It's a nice idea. It sounds like the future. But I don't buy it, she says.

Willer continues. Importantly, this is not because I'm anti-technology – quite the opposite. I have worked in diagnostics long enough to see the value of every tool we have. But I have also been around long enough to know this: machines don't behave according to theory. And AI doesn't understand that.

For example, I often encounter the myth of 'convergence' – the idea that all condition monitoring technologies can fuse into one holistic truth, which assumes that machines behave in predictable, repeatable ways.

But they don't.

You can install ten pumps from the same OEM, running under the same process conditions, in the same plant, with the same lube, and still... they won't age the same. One might run clean for six years. Another might seize up in eight months. And no amount of sensor data is going to tell you why – not reliably.

This is because machines are not clones. They're flawed. They are manufactured to tolerance, not perfection. Machined surfaces differ microscopically, and assembly is never identical. And once you add human hands, production targets, rushed shutdowns, and midnight shift decisions into the mix – it's not easy to feed that into an algorithm!

It is important to take the real-world situation into account when assessing an asset. AI relies on data, but data only captures what the sensors see, not what the human maintaining the asset did when nobody was watching. It does not record the subtle looseness that a technician 'felt' but did not log. It does not register the fact that someone topped up with the wrong

In diagnosing machine health, Willer recognises the value of artificial intelligence technology but emphasises the importance of working with the insight afforded by seasoned engineers.

grease, or skipped torque checks, or ran a fan uncoupled for three minutes at startup.

No historian records that. And without that real-world information, AI is flying blind on the stuff that actually causes most failures.

I believe every condition monitoring technology has its place – and its limits. For example, vibration monitoring tells us about mechanical behaviour; oil analysis identifies lubricant condition and contamination; thermography picks up heat and load imbalance; AE and ultrasound testing give early warnings of friction, turbulence, or sparking; and process data provides the operating context, but not the root cause of failure.

These monitoring techniques and their test results don't converge neatly. They were not designed to do so. We don't combine them to get a 'better' truth – rather, they should be compared to demonstrate different perspectives. That's what makes condition monitoring powerful: it's a team effort, not a solo act.

Can we rely on AI?

Willer recognises that AI is useful, but not in the way the vendors keep claiming. It can spot changes over time. It can rank the risks, it can filter out noise and highlight anomalies – all of this is valuable.

Importantly, however, AI cannot know the history of every shaft and housing. It cannot understand why a lube change worked for one gearbox and not the next. It cannot interpret subtle mechanical behaviour that only a human technician would notice, and it cannot predict how different people on different shifts handle the same piece of equipment. In other words, AI can help one find where to look, but not what to do when you get there.

I have always told our customers that machines are messy, and that this is not a problem, it is simply the reality. Here's the truth: machines have personalities. Not literally, of course, but in how they wear, respond, and behave under pressure. And a lot of that has nothing to do with engineering design or process control. It has to do with maintenance history, human touch, and physical realities that no AI-powered model – however sophisticated – can learn.

The idea that AI will converge all technologies into one correct decision ignores this complexity. It reduces the craft of diagnostics to a logic problem, when it is part science, part art, and always tied to context.

Willer concludes: Let AI support us. Let it help us scale, see patterns, and work smarter. But let's stop pretending it can replace understanding – or diagnose machines like a seasoned engineer can. Because machines don't live in the cloud. They live in the real world. And in the real world, convergence isn't the goal. Clarity is.

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

Unifying O&M data to manage enterprise assets

Utilities need a reliable way to manage all kinds of specific O&M data without having to work through scattered files or disconnected systems. Doble PowerBase™ brings order out of chaos by centralising all equipment data and supporting documentation then automating exchanges between asset management, engineering, field operations, and compliance environments.

PowerBase tracks nameplate, settings, procedures, and workflows for standardised records that can be trusted. Through APIs, settings modules, an extensive set of parsers, and fully customisable forms and templates, PowerBase integrates seamlessly with commercial and in-house platforms as well as Doble RTS™, Protection Suite™, and PB Field™ applications.

With flexibility throughout, PowerBase ensures your settings of record, test and inspection data, and bottom-line results you depend on remain aligned and traceable – improving operational efficiency and strengthening compliance.

Key benefits

- Centralised repository with version control for all settings and documentation
- Automated data flow between engineering and field systems
- Universal interfacing and APIs for external system integration
- Extensive relay/device template library (SEL, GE, ABB, Siemens, and more)
- Streamlined O&M workflows and faster compliance reporting.

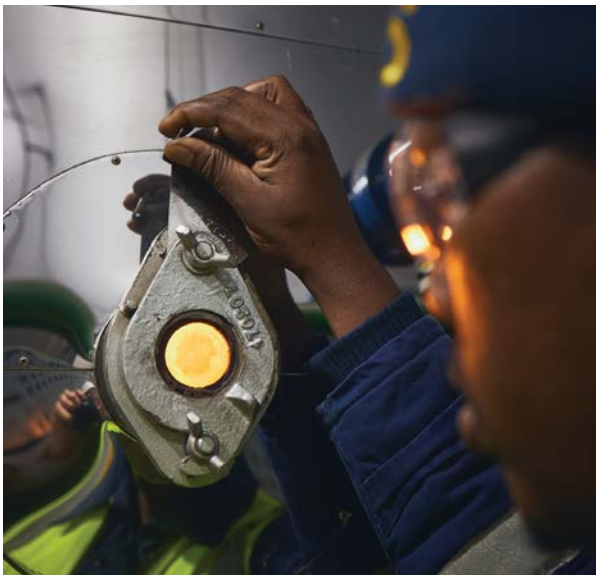
If you're looking for a solution to complex data management that drives better office and field processes, PowerBase provides the complete framework to support teams across your enterprise with 'source-of-truth' information that helps them work more effectively.

For more information visit: www.doble.com

Doble PowerBase is an Enterprise Asset & Test Management System.

Managing emissions in on-site boilers

Requirements to manage industrial emissions are shifting. Local manufacturers face rising carbon taxes and tightening restrictions from first-world economies. Dennis Williams, Commercial Director of steam and boiler operations and maintenance service provider Associated Energy Services, says, "The South African government aims to push towards global standards in this space – but it might be difficult for South African industries to carry the financial burden. AES can identify opportunities and provide the insights businesses need – for short-term benefits and to prepare for the future."



Combustion control is critical to reducing emissions.

A high efficiency multi-cyclone helps mitigate particulate emissions.

Williams adds that there has been a tightening of local regulations around combustion and boilers, affecting nitrous oxide (NO_x), sulphur oxide (SO_x) and particulate emissions. Legislation relating to Small Boilers as Controlled Emitters (part of South Africa's National Environmental Management Act: Air Quality Act, 2004) sets 10 megawatts of thermal input as the base threshold for the current limits.

Existing boilers have specific timeframes and emissions standards for compliance. New boilers have slightly lower emissions standards, and all affected boilers have to undertake annual isokinetic emissions tests.

As more stringent particulate emissions standards are typically the most difficult to achieve, many AES clients have upgraded the back-end of their plants, introducing various abatement technologies: "For new boilers, we have seen some uptake of alternative technologies such as bag filters. These come with specific operational and maintenance-related challenges and can be capital and operating cost-intensive. Other options – high-efficiency grit arresters, or high-efficiency multi-cyclones – are the preferred route on new plant and equipment," Williams says.

Emissions interventions

While equipment interventions can deal with particulate emissions (visibly smoking stacks and soot particles in the air), SO_x and NO_x emissions are usually combustion process related. Very high combustion temperatures can be controlled by adjusting the combustion settings, to achieve lower NO_x readings in the flue gas.

SO_x emissions can be managed by changing the fuel source. With coal, there should be less than 1% sulphur in the fuel composition. Users of heavy furnace oil (HFO) need to clean up their flue gas to address SO_x – as well as particulates. However, grit arresters which control particulates cannot address SO_x, NO_x or CO_2 emissions – and as HFO typically contains 3% sulphur, users have to convert to more expensive fuel oils with a lower sulphur content.

At present, Williams points out that there is no industrial-scale commercially viable mechanical or process intervention to mitigate carbon dioxide (CO_2) emissions. The only remedy is to use a 'greener' (lower carbon) fuel. For example, in natural gas, the hydrogen content is higher than in coal. Alternatively, there are renewable fuels – such as biomass – where the CO_2 emitted is viewed as being part of a circular carbon cycle.

Emissions management successes

AES has already assisted a number of companies to reduce their emissions.

In one case, a food producer needed to replace very old boiler plant, where fuel usage was high and particulate

emissions were concerning. New boilers with upgraded boiler control systems, including using variable speed drives on fans instead of mechanical dampers, improved overall efficiency and contributed to reducing the plant's carbon footprint.

"AES installed improved emissions abatement plant and high-efficiency, multi-cyclone grit arresters to reduce particulate emissions. Additional benefits included lower CO_2 emissions due to fuel savings, and an improved relationship with the surrounding community, due to reduced visible emissions and fallout from the plant," Williams highlights.

AES also assisted a tank terminal operator in the Durban harbour precinct, where stricter-than-usual emissions limits were in place within the polluted South Durban basin.

"We assisted with a complete turnkey project, working with the eThekwini Municipality's Department of Health. We did emissions modelling based on the boiler and emissions abatement plant selected. Installation of a coal-fired facility – rather than a boiler using HFO – was approved. This project also included the use of a bag filter, which we continue to operate," he adds.

These changes have contributed to improved operational efficiency as well as an improved carbon footprint for the company and lower SOx emissions.

Taking control of emissions

Although Williams estimates that these interventions can meet the required 40 to 50% in mandatory improvements, it is often difficult to measure this as few companies have equipment in place to monitor energy produced, combustion flue gases, CO_2, excess air or carbon in ash.

"More data, better analysis and control of equipment can have a positive impact. Measuring fuel usage is essential as, in South Africa, the current carbon tax for stationary combustion systems such as boilers is based on the quantity of fuel used. Every tonne not used, is a tonne not applied and a tax not paid."

Operations data systems are also helpful in indicating a need for proactive or reactive maintenance, which also impacts efficiency and emissions.

Striking a balance

Although AES first recommends the 'low-hanging fruit' of equipment optimisation and expert operational intervention to deliver targeted improvements, when requirements are beyond an asset's capabilities, it is time either to change existing equipment or to switch fuels.

Williams advises that companies need to balance compliance requirements with ensuring the capex and opex spend is warranted: "When a company is weighing up legal compliance and production objectives, we put forward a solution that is best aligned with both. However, a degree of foresight is also needed – to look at the full picture and consider the future implications. Often it makes sense to spend the money now rather than wait until the last minute," he says.

For more information visit: www.aes-africa.com

Digital solutions for mine shaft inspections

ABB participated in a specialist industry event – 'Shaft Inspections 4.0' – hosted last year by Dwyka Mining Services and Point.Laz, to showcase advances in automated visual and LiDAR (Laser imaging and ranging) scanning technology for mine shafts.

Attending this event was part of its ongoing commitment to delivering digital and AI-driven solutions that enhance infrastructure management across the mining sector.

"Shaft scanning is one of the initiatives we are looking into to expand our services to hoisting customers. We see great potential in this technology and more generally in providing digital and AI-driven solutions in the mining industry," says John Manuell, Global Business Unit Manager at ABB.

The specialist industry event brought together mining engineers, hoisting specialists, and inspection professionals to explore how traditional manual shaft inspections are being replaced by autonomous, drone-based, and data-driven technologies. These platforms can generate high-resolution structural models and reduce human exposure to hazardous underground environments.

"Our focus is on integrating autonomous inspection data into hoisting, safety and asset management systems, particularly in deep-level mining environments common in South Africa," says Henk Wiedemann, Hoisting Service Manager at ABB. "The industry's key challenge is no longer sensor capability, but the validation and operational use of data."

Alex Grenier, CEO of Point.Laz, says the technology was designed around real mining conditions. "Our system was built to create spatially repeatable datasets that allow engineering teams to track deformation, structural fatigue and water ingress over time, enabling a shift from reactive repairs to predictive, engineering-led interventions."

The Lazarus 3D scanning system.

Jamie van Schoor, CEO of Dwyka Mining Services, says the focus is on improving safety and operational efficiency. "By reducing exposure time and improving data quality, we allow highly skilled personnel to focus on diagnostics, planning and execution rather than high-risk time-limited inspection work."

Point.Laz demonstrated its Lazaruss 3D scanning system, designed to generate repeatable datasets that can be linked to digital maintenance platforms to enable condition-based maintenance and improve long-term asset planning.

ABB continues to invest in innovative inspection and automation technologies that support safer, more efficient and more sustainable mining operations. With decades of expertise in hoisting systems and electrification, the company aims to enable data-driven decision-making and improved asset performance for customers across the region.

For more information visit: www.abb.com

OEMs need a connected platform for services

In its last newsletter of 2025, PRAGMA included this perspective piece from Henk Wynjeterp – Regional Lead – Europe. Henk leads Pragma's OEM after-sales practice for food processing and packaging manufacturers.

Most OEMs (original equipment manufacturers) have embraced some form of after-sales services as a strategic growth priority. Moving from machine sales to advanced lifecycle services promises stronger customer relationships, predictable revenue, and competitive advantage[1]. But despite this 'servitisation' commitment, many OEMs find that effectively scaling services execution across geographies and equipment types is harder than expected.

Technology is seen as an enabler that allows the OEMs to define and deliver new digital services to their clients. These digital services, as well as traditional services, require connected information that supports workflows.

Our experience with OEM clients is that they face information management challenges that inhibit them from providing scalable traditional and digital services. In most cases, these challenges are not isolated. Data fragmentation leads to manual workarounds, which in turn are symptoms of a deeper structural gap: the absence of a digital backbone connecting systems and workflows.

Fragmented data

At the core of most challenges is incomplete or inconsistent data created over many years of operation and across multiple entities. Installed base records are often outdated, spare parts are not reliably linked to assets, and maintenance templates vary by region or even by technician. Without a trusted 'single source of truth', service teams struggle to plan effectively, accuracy suffers and quoting cycles slow down. Success depends on data stewardship, and master data quality is a primary success factor in any EAM (enterprise asset management) system. Our engagement with a leading OEM started 20 years ago on a foundational commitment to sort out master data first, and today, they are still harvesting the fruits of that commitment.

Manual execution

As a symptom of fragmented data, even after service contracts are signed, execution often depends on manual processes. Maintenance must be aligned with customer and machine parameters; field feedback happens in MS Office software or homegrown applications (often late and incomplete); invoicing for services requires spreadsheets and workarounds; and critical information is trapped in disconnected systems, requiring manual searches. The result is administrative overheads, and employees spend their time chasing data updates, validating maintenance feedback or correcting errors. This not only limits execution capacity but also makes it nearly impossible to deliver consistent, predictable service at scale.

The missing EAM system

OEMs have a good grasp of PLM (product lifecycle management), ERP (enterprise resource planning) and CRM (customer relationship management) systems. These systems primarily support manufacturing processes and are used by different specialist groups. Research and development teams use PLM, engineering or production teams use ERP, and sales teams use CRM. For Services, OEMs aim to use FSM (field service management) software alongside ERP or CRM systems.

The problem is that setting up an ERP for discrete manufacturing is very different to configuring for services. Quite often, there are multiple ERP systems due to different manufacturing sites from previous acquisitions. Furthermore, none of the systems is designed for risk-based maintenance task definition and management, which is the basis for service contract definition and execution. The result is that systems are stretched ineffectively to provide functionality they do not naturally have, creating a void between the asset register and work execution.

Building the digital platform

Scaling services requires a reliable digital backbone that connects information, systems and execution. Accurate asset data, standardised maintenance templates, and connected workflows are essential to turn services strategy into execution.

An enterprise asset management system provides this digital platform. It is designed to link asset registers with maintenance tasks and work orders, while seamlessly connecting with ERP, CRM, and FSM systems.

A digital service backbone connects data, systems and workflows.

With the right EAM system in place:

- data becomes accessible through a single source of truth
- service contract estimation and maintenance execution are automated
- growth becomes scalable and sustainable.

When information flows into execution, consistency stops relying on heroics and starts to scale. At Pragma, our On Key team has developed EAM software capabilities designed for OEMs to strengthen installed base management, service plan creation and performance management. If scaling your services is a priority, On Key[2] should form part of your digital services platform.

References

[1] McKinsey & Company June 2024 Report: https://www.mckinsey.com/industries/industrials-and-electronics/our-insights/why-aftermarket-and-service-are-vital-to-oems-and-how-to-excel
[2] On Key Product Suite: https://www.onkey.com/brochure/world-class-enterprise-asset-management-system-extended/

Pragma provides end-to-end enterprise asset management solutions that help organisations manage risk, improve performance and optimise lifecycle cost. It offers advisory and professional services, managed and outsourced asset management processes, asset performance management, enterprise software and capability development – allowing clients to choose support at a strategic, operational or fully outsourced level.

For more information visit: https://www.pragmaworld.net/

Many OEMs today offer some form of after-sales services – importantly, accurate asset master data is the starting point for an effective lifecycle services platform.

Smart monitoring of compressed air systems

The annual maintenance costs of a compressed air system can amount to 10% or more of the total cost of investment, a percentage that varies depending on the size and the type of system and compressors. The energy cost of a compressed air system accounts for between 70% and 80% of the total cost of investment, and energy that is lost due to inefficiencies of a non-optimised system can be as high as 30%.

To maximise savings and extend the lifespan of the system, CompAir introduced its Compressed Air Management Solution powered by Ecoplant, an intelligent, cloud-based system that represents the next level in operational management. This solution is an integral part of the company's enhanced ASSURE service programmes, which provide proactive maintenance, expedited service and comprehensive support – designed to maintain the health and reliability of equipment at every stage of its lifecycle.

Ecoplant Monitor is a monitoring software that improves the performance of the equipment and informs CompAir technicians of a potential risk as soon as it arises, so the team can proactively correct the issue. It provides for full cost control on lifetime energy and maintenance.

Ecoplant Monitor is immediately applicable to all systems equipped with compressors fitted with the iConn™ connected platform without any installation work required.

Data is transferred from iConn platforms to the software in the cloud. Ecoplant Monitor is activated, and customers are then able to access the simple, intuitive platform. This offers a range of benefits.

- Unified data visualisation: Access to all data relating to connected components. The system will be visible 24/7, with an unlimited and immediately downloadable system of historical trending data and statistics.
- Proactive insights: Immediate alarms, alerts, and insights enable customers to take early action and corrective measures before damage occurs. Ecoplant Monitor also provides predictive and prescriptive insights for risk, maintenance and energy savings, so it can guide customers towards optimal maintenance strategies for their compressors and dryers.
- Efficient troubleshooting: The AI-based analysis of compressors, dryers and system data enables quick and effective troubleshooting. Paired with the support of CompAir's ASSURE programme, resolving issues becomes simpler and faster, minimising downtime.
- Sustainability tracking: Ecoplant Monitor monitors the energy consumption and the carbon footprint of the compressed air system. These tools help customers track performance against sustainability goals, reinforcing the ASSURE programme's commitment to maintain and improve all operations.

CompAir has introduced its Ecoplant monitoring platform with an advanced option to optimise efficiencies in compressed air systems.

Optimising efficiencies

CompAir has also expanded its digital portfolio with Ecoplant Optimize, the next step in achieving greater efficiency and sustainability in compressed air systems. Following the successful implementation of Ecoplant Monitor, Optimize enables active performance improvement through advanced control and analysis features. Using dynamic control algorithms, it manages all the compressors, continuously adjusting the set point and selecting the optimal combination to ensure maximum efficiency.

Key functions include:

- Live energy dashboards
- Dynamic control algorithms
- Leak detection and system auditing
- Real-time verification of savings.

"Monitor is the starting point, Optimize is the next step," says Andrea Milla, Business Development Manager of Ecoplant. "By moving from monitoring to optimisation, customers can realise measurable improvements in energy efficiency, operational reliability, and CO_2 reduction."

For more information visit: www.compair.com/en/

Reliable transformers – keeping data centres operational

Data centres have become core to modern business and government operations. Because every transaction, every file and every critical system depends on uninterrupted power, downtime can lead to significant financial losses, reputational damage, and regulatory consequences. Here, Mawethu Ngubo, T&D Business Development Specialist at ACTOM T&D makes the point that the first step to maintaining power stability is ensuring transformer reliability.

Reliable, fit-for-purpose well-maintained transformers ensure steady power supply to keep data centres running smoothly.

The operational continuity of a data centre is directly linked to the performance of the transformers in the power network. Robust design, meticulous maintenance, and real-time monitoring are therefore essential for preventing failures and safeguarding critical infrastructure.

Without reliable transformers, data centres face a much higher risk of downtime. Transformers make sure that servers, storage, and networking equipment receive the right amount of power at all times. They also protect sensitive systems from surges, spikes, and other power disturbances that could damage equipment or cause outages. In busy, high-density data centres, even a small power fluctuation can quickly spread across racks of servers and disrupt operations.

The impact of this kind of disruption goes far beyond disrupted operations. Lost transactions, interrupted services, and damaged data can all carry serious financial and reputational costs. This is why transformer reliability needs to be recognised as a business priority. By keeping the power supply stable, reliable transformers prevent outages, keep operations running smoothly, and help data centres maintain the trust of their clients.

Common causes of transformer failure

Transformers may fail as a result of various causes, and each one can put a data centre at risk of costly downtime. One of the most common issues is overloading, which happens when a transformer is forced to carry more demand than it was designed to carry. This causes overheating and can lead to sudden failure. Insulation inside the transformer also wears out over time, especially in hot or humid conditions, which raises the risk of short circuits. Power surges and faults in the wider electrical system can cause immediate damage, while dust, poor airflow, or other environmental stresses make problems worse.

The best way to prevent these risks is to take a proactive approach. It starts with choosing transformers that are sized for current needs and allow for future growth. Once the transformers are in place, maintenance must go beyond surface checks. Regular testing, monitoring, and predictive tools can spot early signs of trouble before they develop into serious failures. By investing in routine condition checks and acting quickly on potential issues, operators can extend transformer life, reduce downtime, and keep data centres running smoothly.

Enhanced reliability

Modern transformer technology prioritises reliability and responsibility, offering robust solutions for various applications. Dry-type transformers are particularly well-suited for use in data centres data centres due to their minimal maintenance requirements, environmental friendliness, and inherent safety features like self-extinguishing insulation. For applications demanding higher efficiency, liquid-insulated transformers using fire-safe fluids provide comparable performance and can offer enhanced protection against overheating and fire hazards.

Alongside such design improvements, modern monitoring systems make it possible to track key performance indicators in real time, such as temperature, voltage, load levels, and insulation strength. By keeping a constant eye on these factors, operators can spot small issues early and take corrective action before they grow into costly failures. This approach makes safety and sustainability central to transformer operation, ensuring that data centres stay secure, efficient, and prepared for the future.

Reducing costs and ensuring operational continuity

Because the reliability of transformers is key to operational continuity for data centres, Implementing redundancy strategies, such as deploying multiple transformers or units with higher capacities, enables maintenance activities or unexpected failures to occur without disrupting critical operations. Furthermore, energy-efficient transformer designs offer a significant advantage as data centres expand, as they reduce power losses and decrease cooling demands.

Achieving long-term reliability calls for: stable power, safe and sustainable transformer design, and proactive maintenance with ongoing monitoring. Prioritising these three areas helps to keep data centres operational, protects client trust, and minimises the risk of costly downtime.

Although they are often operating behind the scenes, transformers have a profound impact on data centres. They keep servers running, data secure, and operations uninterrupted. Investing in safe, sustainable transformers, and maintaining them well, flips a potential vulnerability into a competitive edge. For data centres, reliability is much deeper than hardware – it is the foundation on which trust, uptime, and long-term success are built.

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

Sensors provide critical flood warnings

To create a sophisticated flood monitoring and forecasting system, the US State of Iowa's Flood Centre (IFC) uses more than 200 Senix ToughSonic 30 and ToughSonic 50 ultrasonic sensors to measure water levels in streams across the state. Data collected from the sensors is automatically sent to the Iowa Flood Information System (IFIS), where real-time information is integrated into an advanced hydrological model. System data and river stage hydrographs are shared with the public and emergency management officials.

The US state of Iowa has experienced floods in the past and the Iowa Flood Centre now uses a sophisticated flood monitoring and forecasting system with more than 200 Senix ToughSonic 30 and ToughSonic 50 ultrasonic sensors to measure water levels in streams across the state.

With easy online access to water-level data from sensors, Iowa residents and state agencies can get the reliable, real-time information they need to manage flooding in their areas. Instrotech, local representative for Senix sensors, shares this Senix application report, which is especially relevant for municipal authorities in areas recently impacted by severe flooding as a result of climate change.

Ultrasonic sensors chosen for reliability

The IFC needed a reliable, cost-effective way to obtain accurate, real-time stream-level readings. Project Engineer Daniel Ceynar decided to try Senix ultrasonic sensors because they had been used for years for water level measurement in the hydrology research labs at IIHR Hydroscience & Engineering at The University of Iowa. The University of Iowa has long been a world leader in hydrological research.

Senix ultrasonic sensors were selected because they are designed to integrate easily with other equipment, which included, in this case, the system's cellular modems, solar panels, on-board clock, and other components. The sensors were also chosen for their ruggedness, programmability, and Senix's excellent engineering support.

"Senix sensors and the Senix technical team have been key to the success of this project," Ceynar said, noting that the IFC and Senix worked closely together to design a special threaded collar for the ToughSonic 50 so it could be mounted to the IFC Stream Gauge enclosure using the same threading as the ToughSonic 30. That ToughSonic 50 Rear Mount model has since become a standard product for Senix.

The sensors are programmed to measure at intervals of five minutes to one hour, using a boxcar average of a preset number of individual measurements. The system sleeps until it's commanded to wake up to take measurement data and send it to the IFIS. Sensor data is provided via RS-485 serial communication.

The entire IFIS flood warning system depends on the ruggedness and reliability of the Senix ToughSonic sensors and the IFC system. The Senix sensors are potted in water-tight steel housings and operate over a humidity range of 0 to 100% at temperatures from -40 to +70°C.

After assembly in the IFC lab, each stream gauge is submerged for three days to verify its water-tightness. This testing has proven useful. In the field, numerous sensors have been submerged by flash flooding, and once the flood waters subsided, the sensors resumed sending accurate stream level data without requiring any repairs.

"Once installed, the IFC stream gauges are practically 100% maintenance-free," Ceynar said. "Most stream gauge sites have not been re-visited since they were installed."

Facilitating disaster management

The Senix ToughSonic sensors have provided the IFC and the people of Iowa with essential data for flood forecasting and managing the aftermath of flooding. "The system – including stream gauges and other Hydromet data – is routed through the IFIS where it is regularly used by all levels of government, law enforcement and the general public," Ceynar said. "We had first-hand experience working with our local emergency management coordinator during past floods, in 2013 and 2014, where we participated in the daily briefings using IFIS." The stream gauges identify where the flood crest is located and track it as it approaches sensitive roads, bridges, and towns.

Before the system was in place, it was common for emergency personnel to be dispatched to assess the flooding in threatened locations. But with stream gauges collecting data in real time, emergency responders can focus on helping people instead of tracking flood waters.

IFC is a model for the world

Ceynar and his colleagues have been contacted by officials from other states and from countries as far away as Australia. The Washington State Department of Transportation is also evaluating the stream gauges.

The State of Iowa is at the forefront of flood-control monitoring systems that enable everyone – from private landowners to emergency personnel – to make informed decisions during a flood event. "The IFC is the only flood centre in the US, and IFIS is the only system of its kind that we are aware of," Ceynar said. "We continue our efforts to create a National Flood Centre."

Senix is proud to work with innovative research and educational institutions, such as the University of Iowa, in the lab and in the field.

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

Voltage testing: a guide for safety and efficiency



From left: FLUKE T6-1000 PRO Electrical Tester Kit, Fluke T5-1000 Voltage, Continuity and Current Tester, Fluke 1AC II Non-Contact Voltage Tester.

Voltage testers are valuable tools for professionals who work with electrical systems. They are used to verify the presence or absence of voltage in electrical circuits, ensuring safety and efficiency in various tasks. This application note, shared by Comtest, local representative for Fluke, offers a guide on how to use a voltage tester effectively and which Fluke voltage testers can assist in different settings.

Voltage testers are available in various forms, including non-contact voltage testers, contact voltage testers, and multifunction testers. As a leading manufacturer of electronic test tools, Fluke offers a range of reliable and user-friendly voltage testers designed to meet different needs.

- Fluke T6-1000 PRO Electrical Tester: Measures voltage up to 1 000 volts ac and current up to 200 amps ac without contact, displays voltage and current measurements simultaneously, providing visual cues for continuity in noisy environments.
- Fluke T5-1000 Voltage, Continuity, and Current Tester: Can measure current without breaking a circuit due to its OpenJaw™ design. Automatically selects ac or dc measurement up to 1 000 volts.
- Fluke 1AC II Non-Contact Voltage Tester: Portable, non-contact voltage tester ideal for quick safety checks. Includes a continuous self-test feature and visual and audio cues during voltage detection. It can measure a range of currents from 90 to 1 000 volts ac.

Step by step

1. Safety first

Always wear appropriate personal protective equipment (PPE) such as gloves and safety glasses. PPE needs will vary depending on the environment you test in, so refer to OSHA and NFPA guidelines to keep yourself safe when working with circuits.

Ensure the voltage tester is in good working condition by performing a self-test if the device has this feature. If no self-test feature exists, be sure to inspect the device visually, test leads, and any accessories for signs of damage.

If no damage is present, test the voltage tester on a known voltage source or proving unit to make sure it measures properly.

2. Power off the circuit

Before using the tester, turn off the power to the circuit you are going to test at the main breaker panel.

3. Test for voltage

For non-contact voltage testers: Hold the tester close to the individual wire you want to test. The Fluke 1AC II will light up and beep if voltage is present.

For contact voltage testers: Touch the probes to the wires or terminals of the circuit. The Fluke T5-1000 and T6-1000 PRO will display the voltage reading on the screen.

4. Interpret the results

If no voltage is detected, it is safe to proceed with work on the circuit. However, if voltage is detected, further investigation is needed to ensure the circuit is safe to work on.

5. Verify continuity

Set the tester to continuity mode. Touch the probes to the two points of the circuit. A continuous circuit will cause the tester to beep or display a continuity indicator.

6. Record measurements

Note the voltage readings for documentation or further analysis. The Fluke T5-1000 and T6-1000 PRO feature a 'Hold' function to freeze the display if necessary.

Use cases for voltage testers

Fluke voltage testers can help test, troubleshoot, and maintain circuits in various settings. Here are a few typical applications with pointers to which testers to use in each scenario.

- Verifying power supply: Use the Fluke 1AC II to quickly check if an outlet or power source is live before plugging in devices or performing maintenance.
- Troubleshooting circuit breakers: The Fluke T6-1000 PRO can measure voltage and current simultaneously, helping identify faulty breakers or overloaded circuits.
- Testing light fixtures: Ensure light fixtures are properly connected by using the Fluke T5-1000 or T6-1000 PRO

Continued on page 25

Ageing power quality meters can create blind spots

Power quality meters are often treated as fit-and-forget devices, sitting quietly inside panels for decades and receiving little attention. As electrical environments evolve, many of these legacy instruments create blind spots. John Mitchell, Global Sales and Marketing Director at power quality specialist CP Automation, highlights that long-life assets can quickly become vulnerable when product support disappears.

For engineers still relying on discontinued and outdated power quality meters, the challenge is twofold: the hardware does not offer an upgrade path and modern electrical networks are becoming more complex. Consequently, users may soon be seeking guidance or a replacement, not just for high-end equipment, but for basic metering too.

One example is the ageing Dranetz 61000-series installations, a legacy family of power quality analysers commonly installed across industrial and utility sites. Form-factor constraints and obsolete components can limit replacement options for operators and engineers using this technology, unless they seek specialist support.

The risk with legacy equipment

Unlike equipment with a defined design life, such as variable speed drives (VSDs) or programmable logic controllers (PLCs), power quality meters sit in controlled environments and are rarely replaced unless a whole distribution panel is renewed. Panels can stay untouched for 20 years or more.

During that time, the wider ecosystem around the meter steadily moves on. Communications protocols change, monitoring software evolves and the original programming tools may no longer be supported. A meter may still appear to be functional, but it is no longer able to integrate with modern systems or capture the right data.

Today's electrical environments present a bigger challenge. Modern loads, such as EV chargers and active front-end (AFE) drives, produce complex waveforms, high harmonics and, in some cases, supraharmonics. In these applications, legacy meters might give the impression that everything is healthy simply because they're unable to measure certain network disturbances.

Retrofitting and replacing

The retrofit path is often straightforward. Many panel-mounted meters share the same 96 mm square cut-out, making like-for-like replacement simple.

For example, CP Automation's metering range supports all major communication protocols, allowing new analysers to slot into existing networks seamlessly, with minimal disruption. For sites that prefer an internal installation, DIN-rail options are available too.

Accuracy levels vary across the market, but the portfolio spans everything from basic meters to Class A analysers that can meet the strictest utility and billing requirements. This range allows operators to match the measurement capability to the application's criticality, deciding whether they require a simple energy meter or a high-end analyser that provides wider spectrum visibility.

Integration with platforms such as PQView is another advantage. Widely used by Distribution Network Operators for managing fleets of sites, PQView ensures that even large organisations can monitor hundreds of devices from a central point. More sophisticated meters can interface directly with this system, simplifying long-term management and reporting.

For more information visit: www.cpaltd.net.

Where legacy power quality meters have not kept up with evolving electrical systems, retrofits can be straightforward.

Continued from page 24

to measure the voltage at the fixture's terminals.

- Inspecting electrical panels: Use the Fluke T6-1000 PRO to safely measure voltage in electrical panels without making direct contact, reducing the risk of electric shocks.
- Checking outlet wiring: Verify that outlets are wired correctly by measuring voltage and continuity with the Fluke T5-1000.
- Maintaining industrial equipment: Regularly monitor the voltage and current of machinery with the Fluke T6-1000 PRO to ensure efficient operation and prevent downtime.
- Troubleshooting electrical issues: Electricians can use the Fluke 1AC II or T5-1000 to check for live wires when installing or repairing electrical fixtures.
- Testing automotive electrical circuits: Use the Fluke T5-1000 to diagnose electrical issues in vehicles by measuring voltage in various automotive circuits.
- Maintaining HVAC systems: Ensure HVAC systems are receiving the correct voltage and functioning correctly with the Fluke T6-1000 PRO.
- Complete safety inspections: Conduct regular safety inspections in commercial and industrial settings using the Fluke 1AC II to detect any live wires or faulty installations.

Conclusion

Voltage testers are essential tools for ensuring electrical safety and efficiency when testing current sources. By understanding how to use these devices and recognising their applications, you can enhance your electrical testing and troubleshooting capabilities. Fluke's range of voltage testers, including the Fluke T6-1000 PRO, T5-1000, and 1AC II, provides reliable and accurate measurements for various tasks. Whether you are verifying power supply, troubleshooting circuit breakers, or conducting safety inspections, these tools help you perform your work safely and efficiently.

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

Cyber-enabled fraud has become a pervasive global threat

According to the World Economic Forum's latest Global Cybersecurity Outlook, 94% of leaders expect AI to be the biggest force shaping cybersecurity in 2026.

Artificial intelligence, geopolitical fragmentation and a surge in cyber-enabled fraud are redefining the global cyber risk landscape at unprecedented speed. This is according to the World Economic Forum's *Global Cybersecurity Outlook 2026.*

The report, developed in collaboration with Accenture, highlights that cyber-enabled fraud has become a pervasive threat. This shift underscores the growing societal and economic impact of fraud as it spreads across regions and sectors. The report also showcases how AI is supercharging both offensive and defensive capabilities. Geopolitical fragmentation further compounds these risks, reshaping cybersecurity strategies and widening preparedness gaps across regions.

This year marks the fifth edition of the Global Cybersecurity Outlook series, which has traced a steady evolution from pandemic-driven digitalisation to today's increasingly complex cybersecurity landscape. The new findings point to a cyber landscape undergoing significant structural shifts, where cyber resilience can no longer be approached as a technical function alone but needs to be recognised as a strategic requirement that underpins economic stability, national resilience and public trust.

"As cyber risks become more interconnected and consequential, cyber-enabled fraud has emerged as one of the most disruptive forces in the digital economy, undermining trust, distorting markets and directly affecting people's lives," said Jeremy Jurgens, Managing Director, World Economic Forum. "The challenge for leaders is not just understanding the threat but acting collectively to stay ahead of it. Building meaningful cyber resilience will require coordinated action across governments, businesses and technology providers to protect trust and stability in an increasingly AI-driven world."

The gap between highly resilient organisations and those falling behind remains stark, with skills shortages and resource constraints amplifying systemic risk. Meanwhile, global supply chains have become more interconnected and opaque, turning third-party dependencies into systemic vulnerabilities. These dynamics are converging as inequalities in cyber capabilities are widening, leaving smaller organisations and emerging economies particularly exposed.

"The weaponisation of AI, persistent geopolitical friction and systemic supply chain risks are upending traditional cyber defences. For C-suite leaders, the imperative is clear: they must pivot from traditional cyber protection to cyber defence powered by advanced and agentic AI to be resilient against AI-driven threat actors," said Paolo Dal Cin, global lead, Accenture Cybersecurity. "True business resilience is built by fusing cyber strategy, operational continuity and foundational trust – enabling organisations to adapt swiftly to the dynamic threat landscape."

The report identifies key factors that will shape the evolving cyber landscape of 2026.

- AI is accelerating cybersecurity risks at unprecedented speed: AI-related vulnerabilities rose faster than any other category in 2025, with 87% of respondents reporting an increase. Data leaks linked to generative AI (34%) and advancing adversarial capabilities (29%) are among the leading concerns for 2026. 94% of leaders expect AI to be the most consequential force shaping cybersecurity in 2026. Organisations are responding, nearly doubling the share assessing AI security, from 37% to 64%.

Continued on page 27

MDR: keeping a constant watch

Most cyberattacks do not start with alarms blaring or systems going offline. They begin quietly with a compromised login, a subtle change in application behaviour or an attacker moving slowly through an environment looking for opportunity.

Global breach analysis shows that these early stages often go unnoticed for long periods, and the longer a threat remains hidden, the greater the eventual impact. The IBM *Cost of a Data Breach Report* confirms that extended detection times are directly linked to higher financial loss and deeper operational disruption.

Managed Detection and Response (MDR) serves to identify and stop these threats early. It is not another antivirus tool or alerting platform with a new label. It is a continuously delivered service provided by security professionals who monitor activity across systems, users and devices and respond when something does not look right.

Rather than relying on isolated alerts, MDR focuses on behaviour. It looks at how applications normally operate, how users typically access systems and how activity moves through an environment over time. When patterns change in a way that indicates real risk, the threat is investigated and addressed immediately.

J2 CEO, John Mc Loughlin says organisations using managed detection services reduce attacker dwell time and respond more effectively to incidents than those relying only on internal teams and automated tools. “At J2, MDR operates in the background, allowing businesses to continue working while security incidents are handled as they emerge.

J2 CEO John Mc Loughlin.

“The service works alongside existing IT teams and security tools, strengthening what is already in place rather than replacing it. There is no waiting for internal resources to interpret alerts and no unnecessary noise to slow decision making,” he adds.

The objective is simply to detect genuine threats early and stop them before they spread. This approach responds to how attacks operate and how effective security needs to function today.

“Cyber security does not have to be complex, and it should not interfere with day-to-day operations. For organisations looking for proactive, human-led protection that fits the way businesses work, Managed Detection and Response is a practical and effective starting point,” McLoughlin says.

For more information visit: https://j2mssp.com/

Continued from page 26

- Geopolitics is redefining the global cybersecurity threat landscape: 64% of organisations are now factoring geo-politically motivated attacks into their risk strategies and 91% of the largest enterprises are adjusting their cybersecurity posture accordingly. 31% of respondents expressed low confidence in their country’s ability to manage major cyber incidents. Confidence levels vary widely, from 84% in the Middle East and North Africa to 13% in Latin America and the Caribbean.
- Cyber-enabled fraud has become a pervasive global threat: A striking 73% of respondents were or knew someone directly affected in 2025 and CEOs now rank fraud and phishing ahead of ransomware as their top concerns.
- Supply chains remain a major systemic vulnerability: Among large companies, 65% cite third-party and supply chain risks as their greatest cyber resilience barrier, up from 54% last year. Concentration risk is also intensifying, with incidents at major cloud and internet service providers demonstrating how infrastructure-level failures can trigger widespread downstream impacts across interconnected digital ecosystems.
- Cyber inequity is widening across regions and sectors: Smaller organisations are twice as likely to report insufficient resilience compared to large firms. Regionally, the shortage of cybersecurity talent is most pronounced in Latin America and the Caribbean, with 65% of organisations reporting insufficient skills to achieve their security objectives, while 63% of organisations in sub-Saharan Africa face similar constraints.

“Developments in AI are reshaping multiple domains, including cybersecurity. When deployed responsibly, these technologies can strengthen cyber defences by supporting faster detection and response. But misused or poorly governed, they can introduce serious risks, from data leaks to cyberattacks,” said Josephine Teo, Minister for Digital Development and Information and Minister-in-Charge of Cybersecurity & Smart Nation Group, Singapore. “Governments therefore need a forward-looking and collaborative approach to ensure AI enhances cyber resilience while minimising risks that increasingly transcend borders.”

The report calls on leaders across sectors to move beyond isolated efforts and commit to raising the collective baseline by sharing intelligence, aligning standards and investing in the capabilities needed to ensure all organisations can benefit from a more secure and resilient digital environment.

The survey draws on insights from 804 global business leaders in 92 countries, including 105 CEOs, 316 chief information security officers and 123 other C-suite executives, including chief technology officers and chief risk officers.

For more information visit: www.weforum.org

The future of work in the renewable energy economy

Alicia Dean, Head of People and Group Services, SOLA Group

Alicia Dean, SOLA Group.

The renewable energy sector stepped up when legacy infrastructure was struggling to meet energy demand. Now, this sector is changing the nature of the industry in South Africa on multiple levels. From employment to innovation to global best practice, South Africa's renewable energy economy is transforming the industry. Yet, in terms of employment and skills development, the sector continues to grapple with some serious gaps.

The first is permanence. The industry has not fundamentally transformed net job creation, with only 6 000 permanent jobs created. The rest are temporary. Many people are involved in working on the initial construction phases of a project, but their skills are not translating into long-term roles.

Another challenge is how the country's exceptionally high unemployment rate is affecting how intelligent technologies can be adopted – automation and robotics that may make sense in other regions can't be replicated in South Africa without displacing people who rely on jobs for their livelihoods. There is a constant need to find the balance between the drive to evolve and advance, and ensuring people aren't left behind.

This dynamic has created a uniquely South African version of the clean energy transition. The industry continues to modernise, but in a way that supports employment and economic participation. In practice, this has widened the definition of what the renewable energy workforce looks like, bringing a different emphasis to roles and attributes that weren't essential a decade ago.

Specialised skills

The move towards large-scale renewable energy deployments has increased the demand for specialised skills, although many of these are not entirely new roles. They are extensions of existing roles that have been reimagined by the complexity of modern projects. As more solar, wind and battery plants move from development to operation, there's a growing need for asset managers, performance analysts, operations and maintenance specialists, and grid engineers – roles that ensure energy plants can operate optimally throughout their lifecycle.

The renewable energy sector relies on scarce skills in high-pressure delivery environments – a mix of technical expertise, curiosity and the willingness to take on complex challenges.

Digital technologies and cybersecurity skills

Cybersecurity is also an important issue. Modern energy plants rely on control and networking technologies that enable remote monitoring and data collection through digital interfaces, and that means protecting these systems is critical. Downtime or disruption can have serious financial and operational consequences. Therefore, cybersecurity training and expertise is increasingly associated with renewable energy. At the same time, the volume of data created by these intelligent systems has increased demand for people with data management and analytics skills who can support day-to-day decision-making. Their insights can fundamentally change how leadership perceives plant performance and operational risks as well as guide preventative and corrective maintenance.

An evolving electricity market

Looking to the future, the introduction of the South African Wholesale Electricity Market (SAWEM) is going to change the demand for talent more. Energy trading, day-ahead forecasting and financial modelling are already well-established careers in the UK and Europe but are relatively new locally. South Africa's move towards a more open electricity market will make these skills increasingly important, presenting an opportunity for skills transfer between the financial services and energy sectors.

Making a meaningful contribution

The renewable energy sector is also attracting experienced professionals from mining, oil and other heavy industries who are looking for work that carries more meaning. Many want to contribute to long-term energy security and climate resilience, and renewable energy offers a way to do that. Internal engagement data consistently shows that people working in the sector feel connected to the mission of building a cleaner, more stable future, although this is not their only motivation. The rapid change of pace in the sector is appealing for people who enjoy problem solving and rapid innovation.

Meeting the demand for specialised skills

This is where balance is key. The sector needs to build a long-term talent pipeline which recognises all parts of society, creating opportunities for skills development and career growth. Skills development often happens in shorter-term, community-based interventions aligned with project locations and partnerships with universities and TVET colleges. Internship and vacation-work opportunities help create exposure, but do not yet meet the scale of national demand for specialised renewable energy skills. The construction phases of utility-scale projects continue to offer the greatest number of short-term employment opportunities, while operations and maintenance roles create longer-term, though fewer, opportunities.

The sector relies on scarce skills in high-pressure delivery

Continued on Page 29

99 in-demand jobs – TVET opens career pathways

Congratulating the class of 2025 following the release of their matric results, the Kagiso Trust highlights – all-importantly – possible fast-track pathways to employment through technical and vocational education and training.

Kagiso Trust CEO Mankodi Moitse says the matriculants of 2025 have reached a key milestone. "Now comes the exciting part: choosing a pathway that aligns with your strengths, interests and the real opportunities available in our economy," she says.

The latest National List of Occupations in High Demand[1] from the Department of Higher Education and Training (DHET) reveals the striking reality that the economy is in need of skilled workers across many sectors.

Of the 350 occupations listed, 99 require certificates at National Qualifications Framework (NQF) levels 1 to 5. Some can be obtained within just one year of focused, practical training.

The business impact of unfilled jobs is severe. According to the DHET's XpatWeb 2025 Critical Skills Survey Report[2] 89% of businesses say critical skills vacancies are harming their operations and impacting stakeholders, leading to lost productivity, project delays and diminished innovation capacity.

The survey highlights that artisans represent nearly one in four of critical skills shortages, with 69% of these roles requiring NQF Level 4 or below.

"The report states that an ageing workforce, emigration and inexperience among new artisans are contributing to a 20-year skills gap, leaving South Africa without a strong pipeline of young, work-ready tradespeople," says Moitse.

In-demand occupations span the economy

The DHET's 99 occupations at NQF levels 1 to 5 are not obscure or niche jobs. They span major sectors of the economy.

Electricians top the list, alongside electrical line mechanics, instrumentation technicians, telecommunications technicians and the increasingly important solar installers who support the transition to renewable energy. As in the Electrical & electronics sector, occupations in high demand range through other accessible sectors.

Building & construction: Bricklayers, carpenters, joiners, plumbers and pipe fitters are all in demand as South Africa builds and maintains its infrastructure.

Engineering & manufacturing: From welders and boilermakers to millwrights and mechatronics technicians, these skilled artisans keep South Africa's industrial heartbeat strong. The list also includes toolmakers, fitters and turners, metal machinists and specialised roles such as riggers and patternmakers.

Automotive & transport: Mechanics, vehicle painters and vehicle body builders are all needed to keep the country moving.

Business & administration: Office administrators, personal assistants, bookkeepers, accounts clerks, payroll clerks, call centre agents and project administrators form the backbone of every organisation. This sector also includes purchasing officers, stock clerks and import-export administrators.

Sales & marketing, Hospitality & tourism, Healthcare & community services, Security & safety also show high levels of demand, as do Technical & specialised skills such geographic information systems technicians, camera operators, interior designers and statistical clerks – a relfection of the diversity of skills needed in South Africa.

Electricians top the National List of Occupations in High Demand, alongside electrical line mechanics, instrumentation technicians, telecommunications technicians and solar installers.

"These are careers with real growth potential," says Moitse. "An electrician can become an electrical contractor. A chef can open their own restaurant. A bookkeeper can become a financial manager. Technical and vocational education is a launching pad, opening career pathways across diverse sectors."

Immediate opportunities

There's also good news for learners who did not achieve the results they hoped for: the same government list includes 16 occupations that don't require formal qualifications, including waiters, hairdressers, receptionists, taxi drivers and forklift operators.

"These roles offer entry points into the workforce, with opportunities to gain experience and pursue further qualifications later," says Moitse.

"Everyone's journey is different. Some will start working immediately and study part-time. Others will invest a year in intensive vocational and technical training to fast-track their careers. All pathways are valid and lead to economic independence.

"Matric results open doors," says Moitse. "Then you have to walk through them – towards skills, employment and the future you want."

References:

[1] https://www.gov.za/sites/default/files/gcis_document/202404/50510gen2414.pdf
[2] https://www.xpatweb.com/2025-css-results/

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

Continued from Page 28

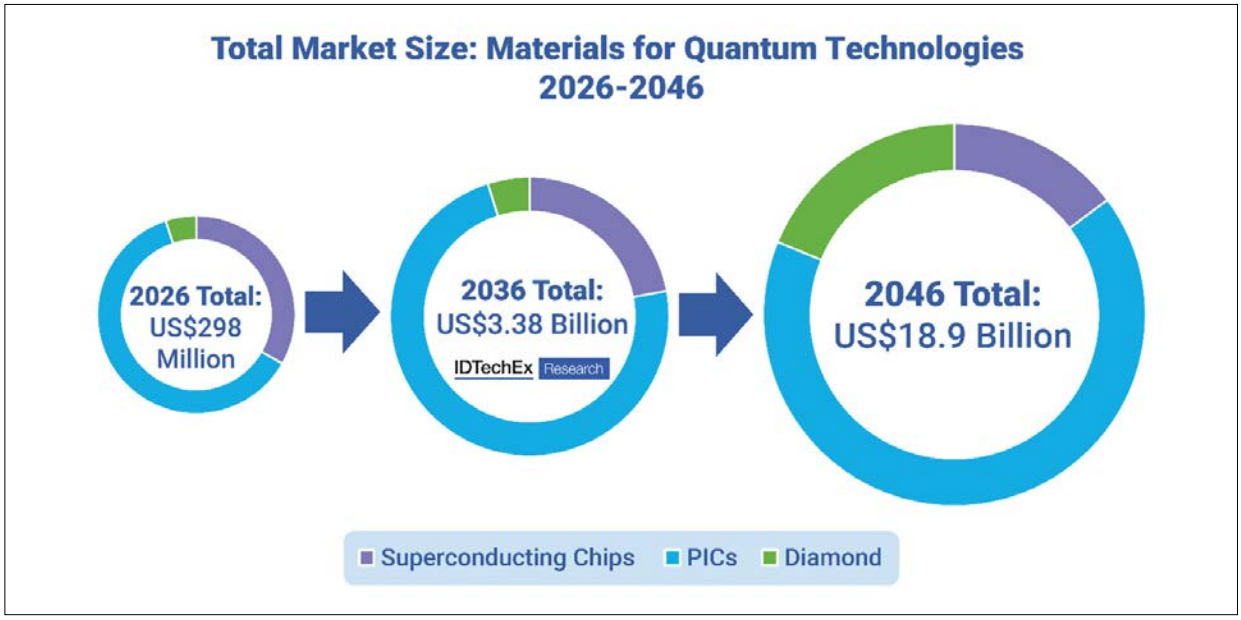
environments, and companies need to create workplaces where people can thrive. At SOLA, our values are embedded into the performance system so that how work is done carries equal weight to what is delivered. Much of the industry's strength lies in the mix of deep technical expertise alongside curiosity and the willingness to take on complex challenges.

The clean energy transition is creating new job categories and redefining old ones. It is expanding opportunities and demanding new skills, new mindsets and new forms of collaboration. It also calls for companies to prioritise skills development across South Africa. Right now, the door is open and there is plenty of opportunity.

For more information visit: https://solagroup.co.za/

A multi-billion dollar market – at the intersection of materials and quantum technology

Noah El Alami, Technology Analyst at IDTechEx



[Source: IDTechEx]

Total market size: materials for quantum technologies 2026 to 2046.

Quantum technologies, which encompass the markets for quantum computing, quantum sensing, and quantum communications, constitute currently one of the fastest growing deep-tech industries. However, the performance and commercial viability of these cutting-edge technologies are often held back by material defects, bulky components, or poor manufacturing scalability. The newly released IDTechEx report – *Materials for Quantum Technologies 2026-2046: Market, Trends, Players, Forecasts* – analyses the opportunities and emerging solutions in materials, components, and fabrication processes for the quantum industry, with 20-year forecasts informed by primary information from more than 30 company profiles. The total market opportunity for superconducting chips, PICs (photonic integrated circuits) and diamond for quantum technologies is anticipated to reach US$3.38 billion by 2036 and US$18.9 billion by 2046 with a total CAGR of 23.1% over the full forecast period.

Unlocking quantum advantage through materials

The appeal of quantum technologies lies in the promise of commercial 'quantum advantage'. This advantage can be the computation of classically intractable problems in quantum computing, unlocking magnitudes higher sensitivity with quantum sensors, or creating fundamentally secure cryptographic solutions in quantum communications. Quantum technology has emerged in the last decade from a largely theoretical background to an extensive range of products, business models, and a global distribution of players – from university spinouts to governments and international corporations.

In each case, the ability of quantum technologies to exceed the capabilities of their classical incumbents is reliant on advanced materials and fabrication processes.

For quantum computing, the microfabrication of 1000s of identical 'qubits' per chip is essential to unlocking scalable computing systems that can reach the capacity to tackle commercially relevant problems.

For quantum sensing, using materials that allow for reductions in size, weight, power, and cost (SWaP-C) per device is crucial to improving the commercial viability of products, allowing quantum sensors to enter new high-volume markets such as future mobility, healthcare, and aerospace.

For quantum communications, materials that allow for the low-loss transmission of quantum information over long distances are valuable for enterprise-scale quantum networks and cryptography solutions.

Three quantum markets, three key material platforms

In commercial and government strategies, and in IDTechEx's portfolio of reports on quantum technologies, the market is usually categorised by the three core product verticals: quantum computing, quantum sensing, and quantum communications. For a materials provider, it may instead be more informative to categorise quantum technologies by the physical 'platform' or quantum system on which they are built.

The three most important materials platforms for quantum technologies highlighted in the Materials for Quantum Technologies report are superconducting chips, photonic systems (including PICs), and nanomaterials (including a range of nanocarbons and artificial diamond).

Superconducting chips are microfabricated electrical circuits made of superconducting metals or compounds

Continued on page 31

Africa's new powerlines – extending regional networks

With the rising number of renewable energy projects increasing generation capacity in Africa, more extensive powerline connectivity aims to build regional power networks.

In line with this vision, Namibia and Angola are among those countries in Southern Africa that are using their respective competitive advantages in renewable energy sources. With its wind and solar resources, Namibia aims to produce low-carbon electricity and green hydrogen – opening the door to the production of green hot briquetted iron. In Angola, the proposed Baynes Hydropower Plant on the Kunene River plans to generate 600 MW of clean power.

To distribute this energy to mining complexes, industrial hubs and other demand points, a number of powerline projects are currently under way. According to Darryll Kilian, partner and principal environmental consultant at SRK Consulting (South Africa), these interconnectors will increase the potential for sharing energy across borders within the Southern African region.

From left: Darryl Kilian and Kavandren Moodley, both from SRK Consulting (South Africa).

Exporting power

"African countries are generating power for their own use, and many are looking to increase electricity sales across their borders," says Kilian. "An added advantage of extending this infrastructure is that it provides greater network resilience if there are temporary shortages caused by breakdowns or – in the case of hydropower – reduced generation due to drought."

To accelerate energy projects in the Southern African Development Community (SADC), the World Bank has invested almost US$30 million with the Southern African Power Pool (SAPP), Kilian notes.

Continued on page 32

Continued from page 31

which are deposited on semiconductor wafers. When cooled to cryogenic temperatures, these circuits exhibit macroscopic quantum properties with very little noise due to the low-temperature environment. Examples of commercialised quantum products built on superconducting chips are: SQUIDs (superconducting quantum interference devices), SNSPDs (superconducting nanowire single-photon detectors), and superconducting qubit quantum computers (qubits are quantum bits, the fundamental units of quantum information).

Photonic systems encompass a wide range of optics and photonic components for quantum technologies. One of the most exciting approaches in this field is the use of photonic integrated circuits (PICs), which can be used either for the manipulation of single photons as carriers of quantum information, or to miniaturise the optics needed to address atomic and spin systems. Photonics are central to quantum networking and photonic qubit quantum computing but are also gaining traction for trapped ion and neutral atom qubits as well as various types of quantum sensors.

Nanomaterials and diamond cover a range of materials such as CNTs (carbon nanotube devices), quantum dots, and 2D/2.5D materials. Artificial diamond with implanted point defects has recently gained traction as a material platform for developing both commercial quantum sensors and computers, showing potential as a robust and scalable material platform for quantum systems that can be operated at room temperature.

Market outlook

In each case, the different material platforms discussed stretch across the three quantum technology market verticals (computing, sensing, and communications), such that technologies and products across different market verticals can often benefit from the same material innovations and new foundry capabilities.

The groundbreaking Materials for Quantum Technologies report assesses the material opportunities in the quantum market verticals (computing, sensing, communications), and in each material platform (superconductors, photonics, nanomaterials). This multi-dimensional analysis highlights the intersections between different products, illuminating key materials opportunities in the quantum industry.

The report is supported by IDTechEx's extensive market research across the quantum technology market verticals, photonics, and advanced materials. The full report expands on the opportunities highlighted here, providing a detailed examination of the technical innovations, key players, market forces, and supply chain dynamics across superconductors, photonics, and nanomaterials for the quantum industry.

About the author

Noah El Alami is a Technology Analyst at UK-based market intelligence firm IDTechEx, focusing on quantum sensing technologies. He graduated from Oxford with a first-class degree in MPhys Physics, specialising in Condensed Matter Physics and Quantum Information Processing.

For more information visit: www.IDTechEx.com/

Continued from page 31

"SRK Consulting (South Africa) assisted the SAPP almost ten years ago to develop an Environmental and Social Management Framework (ESMF) – to facilitate the screening and assessment of priority power projects in line with lenders' safeguard requirements," said Kilian. "This has helped to progress their implementation across the sub-continent."

He cites projects such as the Mozambique–Malawi Interconnector which has reached financial close and where construction has begun, and both the Zambia–Tanzania Interconnector and the Angola–Namibia Interconnector which have completed feasibility studies and environmental assessments. Eleven other regional energy projects have also seen progress, with 18 preparatory studies completed on these schemes.

Progress in Angola

In-country projects currently being planned in Angola include the Gove-Chipindo-Cuvango-Jamba Transmission Line Project, for which SRK Consulting (South Africa) completed the environmental and social impact assessment (ESIA). Powered by the Gove hydroelectric power plant, the project involves the development of a new 220 kV high-voltage overhead transmission line, about 170 km in length, traversing the municipalities of Jamba, Cuvango and Chipindo. The project aims to strengthen the electrical transmission network and improve energy reliability across the Huila and Huambo Provinces.

Kavandren Moodley, principal environmental scientist at SRK Consulting (South Africa), led the ESIA and notes that such studies are critical for ensuring compliance with national and international standards, especially for lender-funded infrastructure projects.

"We conducted the ESIA in the context of the relevant Angolan laws and regulations, as well as international standards to which lenders required the project to be benchmarked," says Moodley. "These included the International Financial Corporation's Performance Standards, the Equator Principles, the Voluntary Principles on Security and Human Rights, and the International Labour Organisation's work-related standards."

Upfront risk assessment

Moodley adds that infrastructure projects of this scale typically involve substantial investment, making it essential to identify any potential environmental or social 'fatal flaws' as early as possible.

"Early detection of these risks gives developers sufficient time to review and adjust project plans, before significant resources are committed to detailed engineering," he explains.

An ESIA can highlight risks such as community displacement or biodiversity sensitivity, providing valuable input for strategic decisions on project layout and transmission line routing.

"Involving environmental and social practitioners at concept or pre-feasibility stage helps to avoid situations where the legally required ESIAs only reveal issues late in the process," he says. "Where redesigns are required at an advanced stage, this often delays projects and incurs considerable unplanned expenditure."

Moodley emphasises that lenders are increasingly attentive to risks relating to indigenous peoples, community vulnerability and biodiversity management.

"Where a powerline may present material risks, funders want assurance that these are systematically identified and mitigated," he says. "That is why environmental and social impact assessments are so important – and must actively inform the design and construction phases."

Kilian says the harnessing of renewable energy resources is a significant driver of sustainable, diversified and inclusive growth in Africa – as energy constraints have for many years been a serious brake on the continent's potential.

"The potential for sharing energy through the SAPP has been boosted in recent years by the development of renewable energy generation technologies," he says. "While a more stable power supply in any country will unlock foreign and local investment to build the economy and create jobs, the availability of cross-border powerlines creates the potential to export electricity for those countries that can generate more than they currently need."

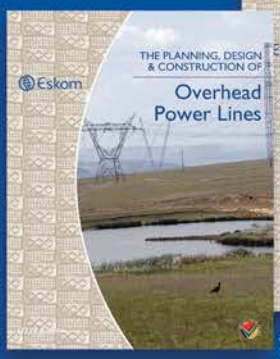
He adds that such powerline developments will also improve Southern Africa's resilience in the face of climate change, which is likely to impact the region significantly in coming years. Changing rainfall patterns, for example, are expected to increase the likelihood of drought in certain areas – which would reduce dam levels and undermine the reliability of hydropower schemes.

Increasing renewable energy generation across Africa is boosting potential for regional interconnections and shared power supply.

For more information visit www.srk.co.za

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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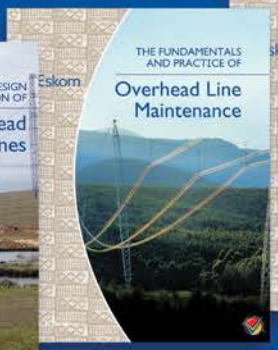

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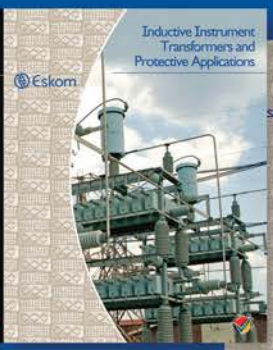

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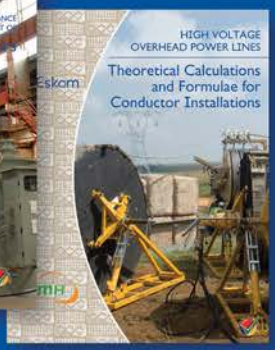

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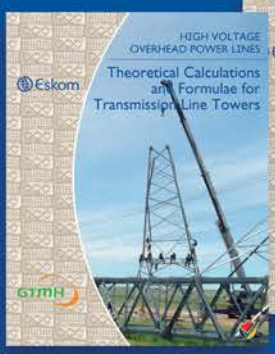

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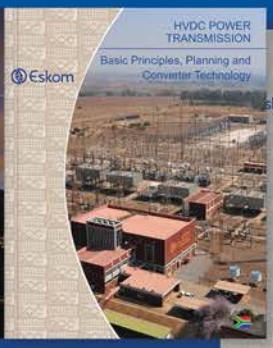

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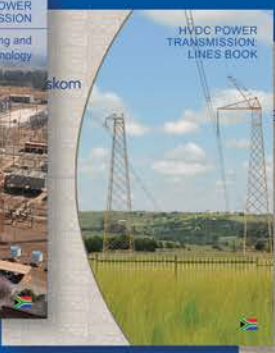

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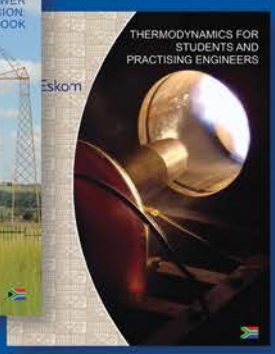

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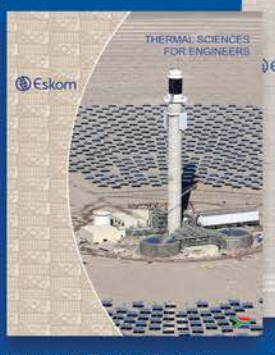

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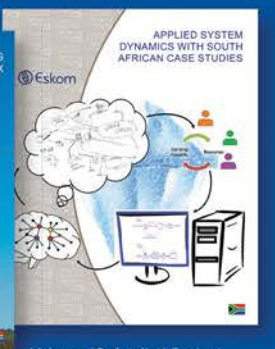

Volume 13: Applied System Dynamics with South African Case Studies

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.

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