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Regal Rexnord and BMG's Premium Services for bottling conveyors maintain production while managing costs.

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Engineering the Lesotho Highlands Water Project

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Peter Middleton

COMMENT

The fuels industry and a global crisis

At the time of writing, the US had just delivered a 14-point, one-page memorandum that, if accepted by Iran, would have formally ended the US-Iran war. Discussions were to follow to unblock shipping through the Strait of Hormuz, lift US sanctions on Iran and curb Iran's nuclear programme.

On this optimism, the oil price 'plunged', with Brent crude again falling to below \$100 a barrel, while global share prices 'leapt'. "We will close this very soon. We are getting close," the source was quoted as saying in a Reuters article by Ariba Shahid, Steve Holland and Alexander Cornwell. But all this, says Trump, after having paused his two-day-old Project Freedom to escort merchant ships through the Strait of Hormuz: "is dependent on Iran agreeing to give what has been agreed to".

The war has resulted in chaos across the Middle East, with Iran's closure of the Strait of Hormuz and attacks on infrastructure across the region throttling supplies of crude oil and refined petrochemical products from the region. Thousands of merchant and container ships, along with over 20 000 sailors, remain stranded.

While initial hopes were that the war would be over within weeks, economic problems are now mounting: soaring petrol, diesel and fertiliser prices, and, due to severe shortages of Jet A-1 fuel, cancelled flights causing travel disruption not seen since the Covid pandemic.

The cost of fertiliser – which depends on by-products of oil refining, such as urea and ammonia – is rising sharply, hurting farmers and driving up global food prices. Most notably, though, shipping costs for imports and exports have soared, not only due to fuel price increases but also due to step-changes in risk-mitigation and insurance costs.

And even if this latest 14-point plan ends the war, the impact on the global economy is likely to be long-term. Destroyed refinery infrastructure will have to be rebuilt, as will global oil and shipping networks.

As Warren Patterson, the Head of Commodities and Energy Strategy at the Dutch bank, ING, points out: "With the march of globalisation and just-in-time supply chains, global trade in goods and services has swelled from 42% of world GDP in 1980 to more than 60% by the mid-2000s. But an interdependent world, in an age of rising conflict and geopolitical tensions, is a riskier one, and no basis for a sustainable economic model," he says.

In response, he suggests 'nearshoring' and 'friendshoring', terms now used by multinational companies striving to redirect supply chains towards politically

aligned and neighbouring countries to bolster their resilience. The results of this war, says Patterson, along with several shipping-related incidents in recent years, have "caused fragmentation of the global economy that could add permanent additional costs, stoking inflation in the short term, while weighing on growth in the long term".

With regard to South Africa, a recent South African Chamber of Commerce and Industry Business Confidence Index showed a slight decline from February to March 2026, with further downward pressure expected for May. This is off the back of a "fortunate position" thanks to an exceptional increase in business confidence late last year, which, to some extent, was mitigating the impact of the Iran conflict.

Food inflation in South African shops is not yet a problem, due to local surpluses of agricultural products, most notably maize. Farmer's margins are under pressure, though, particularly for exporters, who face the double whammy of massive increases in shipping costs and increased fertiliser costs from now on.

On the positive side for our fuel security, Sasol, which produces petrol, diesel and, very importantly, jet fuel, is looking healthy, with its share price more than doubling since the start of the conflict. Production performance at its Secunda CTL and Natref refineries in the first quarter of 2026 increased by 9% compared to the same period in 2025. In response to the war in Iran, production is being increased by a further 10% to 15% to meet expected demand.

At this critical time for the global oil industry, the South African Fuels Industry will come together at the Sandton Convention Centre for the 2026 Fuels Industry Imbizo, with transformation in sharp focus. From 10 to 11 June, under the theme Embracing the Future of Energy Mobility, this year's conference will focus on the industry's transition towards a diversified energy mix, spanning conventional fuels to rapidly emerging alternatives.

Accelerating the transition of global and local energy ecosystems is now a global imperative. This conference offers an ideal opportunity to explore how South Africa can reposition its fuel offerings for a sustainable, efficient and low-carbon future.

Inside this magazine, you will find opportunities to register for and attend the Imbizo if you want to be part of developing the strategic direction needed to survive and thrive amid the fast-changing logistical, technological, environmental and policy environments currently shaping our fuel industry and our world.



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Predictive maintenance and expert support for the bottling industry

BMG's Power Transmission division is now offering the food and beverage sector access to Regal Rexnord's Premium Services package, developed to improve production line efficiency and minimise costly downtime in demanding manufacturing environments.

BMG's Regal Rexnord's Premium Services programme provides glass, bottling and beverage manufacturers with expert audits, predictive maintenance capabilities and comprehensive on-site training to optimise conveyor system performance. This proactive approach helps facilities maintain continuous operations while reducing unexpected equipment failures that can halt production lines.

"Our Premium Services package represents a significant advancement in how we support our food and beverage customers," explains Carlo Beukes, Business Unit Manager of BMG's Power Transmission division. "By combining predictive maintenance with expert technical support and easy access to replacement parts, we're helping manufacturers protect their production schedules and improve overall equipment effectiveness.

"Regal Rexnord's Premium Services align perfectly with BMG's commitment to providing comprehensive solutions that go beyond simply supplying equipment. Our customers in the food, beverage and glass manufacturing sectors face intense pressure to maintain production schedules while managing costs. Through our Premium Services offering, we deliver predictive maintenance strategies, expert technical audits and training that transform how our customers approach equipment management.

"The Regal Rexnord Data Portal integration means our customers can identify and order the exact components they require quickly and accurately, reducing inventory carrying costs, while ensuring they have critical parts available when required."

In a recent project at a bottling plant in the Cape, BMG's Power Transmission specialists worked alongside Regal Rexnord engineers to assess the plant's Glass Line 1 conveyor system. The inspection found several belts with surface wear, module breakages and chain elongation above the recommended limits. The BMG team advised the immediate replacement of critical items, along with further recommendations to standardise chain types, install wear shoes on return tracks, and

use rubberised rollers to prevent top-surface damage.

"All findings were uploaded to the Rexnord Connect Portal, an online platform that provides a real-time dashboard of conveyor assets. This portal allows maintenance managers to view every chain and sprocket on each line, track wear data and schedule interventions based on measured performance rather than fixed intervals," notes Beukes.

A comprehensive conveying portfolio

BMG's comprehensive Regal Rexnord portfolio for the beverage industry includes integrated hot- and cold-end conveying solutions specifically engineered for the demanding conditions of glass and container manufacturing. The company provides a full range of product conveying systems, complemented by an expanding portfolio of powertrain solutions.

The Regal Rexnord product range features TableTop™ chains with precision-engineered steel-and-plastic construction that deliver excellent flatness and surface finish, ensuring efficient product handling, reduced container tipping and extended operational life. MatTop™ belts designed for enhanced container stability and reduced product damage are also available,

helping manufacturers maintain product integrity and minimise waste during the conveying process.

The Dynamic Transfer System (DTS) incorporated into the design of these chains enables the smooth and reliable transfer of delicate or unstable containers, minimising breakage and ensuring consistent line performance. Superior chain-sprocket interaction is achieved through their optimised engagement design, which extends chain life and reduces maintenance downtime. These features improve overall equipment efficiency while lowering operational costs.

Solutions for abrasive environments

For glass container manufacturing applications where abrasion resistance is critical, BMG recommends Rexnord BWX material, a specially formulated solution engineered specifically for chains exposed to glass shards, sand, dirt and other harsh particles. BWX material can extend chain wear life by up to five times, compared to standard acetal materials, delivering superior Total Cost of Ownership (TCO) in high-wear environments.

BWX is available from BMG in multiple chain types, including MatTop and TableTop configurations, as well as side-flexing chains for curved conveyor



BMG's Power Transmission division is now offering the food and beverage sector access to Regal Rexnord's Premium Services package, developed to improve production line efficiency and minimise costly downtime in demanding manufacturing environments.

sections. The polyamide-based material offers high wear resistance with minimal dust generation, making it suitable for demanding loads and speeds in highly abrasive, dry applications, with glass-contact temperatures up to 85 °C.

BMG's key products for hot-end and cold-end applications in glass manufacturing facilities include the Rexnord 7005 Series MatTop Chain, the Rexnord 1005 Series MatTop Chain, and the Rexnord 1055 Series, a high-strength plastic TableTop chain designed for heavy-duty conveying.

The Rexnord 820/880 Series provides smooth, low-friction conveying ideal for handling delicate glass containers. At the same time, the Rexnord XLBP1005 Series delivers the lowest backline pressure when conveying cartons or trays of glass containers. The Cambridge Compound Balanced (CB5) metal belt system features thicker wires that provide high strength, a



Rexnord Connect Smart Tags provide instant access to vital product data with a single scan.

smoother surface and improved tracking and stability. In addition, the Cambridge DiaCrimp (DCF) design reduces belt stretch by approximately 90%.

BMG's collaboration with Regal Rexnord offers integrated, world-class solutions that combine predictive analytics, on-site inspections and continuous digital reporting for bottling operations throughout the region. Regal Rexnord power transmission components, en-



Through their Premium Services offering, BMG and Regal Rexnord deliver predictive maintenance strategies, expert technical audits and training that transform how customers in the food and beverages industries approach equipment management.

hanced by the Premium Services package, are available through BMG's Power Transmission division for food, beverage and glass manufacturing customers throughout Africa.

<https://bmgworld.net/>

Local assembly and stock holding boost industrial drive solutions

BMG has strengthened its industrial drive solutions offering with the introduction of locally assembled and stocked Nord MAXXDRIVE XC industrial gear units, a development designed to improve availability, reduce lead times and support high-torque applications in Africa.

The MAXXDRIVE XC series forms part of BMG's range of large industrial gear units, engineered by NORD DRIVESYSTEMS for demanding applications where durability, high load capacity and operational reliability are essential.

"To introduce our expanded Nord offering, BMG recently hosted a series of MAXXDRIVE roadshows in Cape Town, Durban and Johannesburg, providing industry professionals with an opportunity to explore the advanced technology and diverse applications," says Barry Stoltz, BMG's Regional Manager for gears in the Electro-Mechanical division. "Our events showcased the capabilities of the MAXXDRIVE range and highlighted the advantages of BMG's local assembly and stock availability. These industrial gear units are available in both parallel-shaft and right-angle configurations, offering flexibility for a wide range of installations. The design supports very high ratios and can be combined with other NORD gear technologies to extend capability in heavy-duty drive systems.

"BMG and NORD DRIVESYSTEMS have maintained a long-standing partnership since 1996, working together to expand the availability of geared motor solutions across Africa. This collaboration has steadily

grown the presence of Nord products in local industries through BMG's extensive distribution network, engineering support and service capabilities.

"The MAXXDRIVE XC range builds on this partnership by combining global engineering expertise with local assembly capability. BMG has invested in specialised tooling, training and stock holding to support the local assembly of these industrial gear units, ensuring faster delivery and greater responsiveness to customer requirements."

Industrial gear units in the MAXXDRIVE range are designed with case-carburised, precision-finished gears and high-quality roller bearings, ensuring extended operating life under heavy loads.

Optimised internal geometries and accurate shaft alignment contribute to high load-bearing capacity, low operating noise and reliable lubrication performance in demanding operating environments.

A critical feature of the design is Nord's modular Unicase housing concept. Unlike traditional split housings, the one-piece structure ensures accurate alignment and rigidity, improving gear-tooth contact and enhancing operational reliability. This configuration also simplifies assembly and maintenance procedures while maintaining precise tolerances across the gear unit.

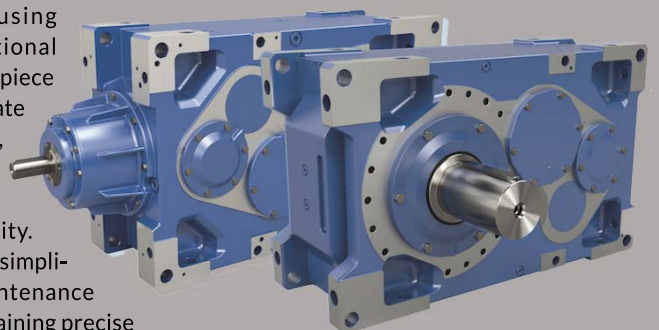
For customers, this design translates into improved serviceability and reduced

downtime. The assembly process is significantly faster than with conventional designs, enabling quicker turnaround during maintenance or repairs. This system also ensures continuous production operations in many industries, including mining, cement, materials handling and processing.

BMG's local stock holding of MAXXDRIVE XC units further strengthens supply reliability. By maintaining key sizes and configurations within its inventory and assembling units locally, the company can respond rapidly to customer requirements and provide industrial gear units suited to specific applications.

This product range complements BMG's extensive portfolio of industrial gear technologies, expanding the options available to engineers and plant operators seeking robust solutions for conveyors, crushers, mixers and other heavy-duty systems.

<https://bmgworld.net/>



BMG has introduced locally assembled Nord MAXXDRIVE XC industrial gear units to its offering.

Fuel management: a strategic priority for commercial fleets

South Africans have felt the impact of fuel price increases once again. While there may be occasional relief in the months ahead, the bigger picture is clear. Fuel price volatility is something businesses will need to manage actively for the foreseeable future.



Andisiwe Nikelo: CEO of WesBank Fleet Management and Leasing



Linda Musonda: FNB Product Head: Sustainable Finance



Avhaphani Tshifularo: CEO of the Fuels Industry Association of South Africa

For commercial operators, a fuel price increase is not just a cost line item. It is a structural pressure that directly affects margins, operational efficiency and long-term planning. From a fleet management and leasing perspective, the conversation is shifting. Businesses are moving from simply absorbing fuel increases to actively managing them.

“Fuel price increases are often seen as a short-term shock, but in reality, they reflect deeper global dynamics that South Africa has very little control over,” says Andisiwe Nikelo, CEO of WesBank Fleet Management and Leasing. “For commercial fleets, that means fuel can no longer be treated as a variable cost alone. It needs to be managed as a strategic risk.”

What is really driving the fuel price

At the core of the fuel price is the Basic Fuel Price, largely determined by international factors such as global oil prices, shipping costs and the rand-dollar exchange rate. Because South Africa imports most of its fuel, it remains highly exposed to global disruptions.

“Ongoing geopolitical tensions have disrupted global oil supply, and instead of stabilising after the initial shock, prices have remained elevated and unpredictable,” says Avhaphani Tshifularo, CEO of the Fuels Industry Association of South Africa. “For a country like South Africa, which is heavily reliant on fuel imports, this creates ongoing vulnerability to international market shifts.” Currency weakness adds further pressure. Even when global oil prices soften, a weaker rand can limit any local relief. “Even in periods where global oil prices decline, a depreciating rand can keep domestic fuel

costs high,” Tshifularo adds. On top of this, regulated costs such as the General Fuel Levy, the Road Accident Fund levy, and the Carbon Tax continue to shape the final price. “People often assume fuel prices are purely about oil,” Nikelo explains. “But for businesses, especially those running fleets, there are multiple layers to the price and very few of them are within their control.”

From cost pressure to operational risk

For commercial fleets, fuel volatility is no longer just about higher monthly spend. It is becoming an operational risk that affects pricing, delivery timelines and customer commitments. “Fuel price instability is no longer occasional. It has become a continuous, systemic risk that businesses need to manage actively,” says Tshifularo.

South Africa’s reliance on imported fuel, combined with limited strategic reserves and ongoing exchange rate pressure, means this volatility is likely to persist. Geopolitical instability continues to compound the issue. “Conflicts such as the Russia-Ukraine war and tensions involving Iran can disrupt global oil supply and drive price volatility,” he says. “At the same time, exchange rate fluctuations and global supply decisions add further uncertainty.” At the same time, inefficiencies in how fuel is distributed locally can create additional pressure, particularly when demand spikes or supply chains are constrained. “In many cases, shortages are not due to a lack of fuel, but rather constraints in how efficiently it can be distributed when demand increases suddenly,” Tshifularo notes.

“This is where businesses need to shift their mindset,” Nikelo continues. “You cannot

control the price of fuel, but you can control how efficiently you use it.”

Why fleet management matters more than ever

In a high-cost, high-volatility environment, fleet management is one of the most effective ways to control fuel spend, yet it remains underutilised by many businesses. Fleet Management and Leasing is not just about financing vehicles. It is about giving businesses the tools, data and insights to run their fleets more efficiently.

Key practices that are making a measurable difference include:

- Route optimisation using telematics and data to reduce unnecessary mileage and improve delivery efficiency.
- Managing driver behaviour such as speeding, harsh acceleration and idling.
- Choosing the right vehicles for the job.
- Keeping vehicles well-maintained.
- Monitoring fuel usage to identify inefficiencies or misuse.

For many businesses, these are practical changes that can deliver real savings without major disruption. “Visibility is critical. Once you understand how fuel is being used across your fleet, you can start making smarter decisions that reduce waste and improve efficiency,” Nikelo says.

The growing role of electrification

Electrification is starting to enter the conversation for commercial fleets, even though adoption in South Africa remains in its early stages. Electric vehicles reduce reliance on fuel, helping businesses limit their exposure to ongoing price increases. That said, the shift needs to be practical. For example, electric

vehicles may be better suited to urban routes where distances are predictable, and charging is more accessible. Looking at the total cost of ownership, including fuel savings, maintenance and lifecycle costs, gives a more accurate picture than focusing only on the purchase price. “Electrification is not a silver bullet, but it is part of the long-term solution,” she says. “For some fleets, even a partial shift can start to reduce exposure to fuel price risk.”

The knock-on effect across the economy

Fuel costs continue to affect the broader economy, particularly in sectors that rely heavily on transport and logistics. Diesel remains a critical input for industries such as mining, manufacturing and freight.

As costs increase, they move through the value chain, contributing to higher prices overall. For commercial operators, managing fuel efficiently is not just about protecting margins, but about staying competitive.

There is also a role for industry and policy in improving how the system functions. In the short term, this is less about building new infrastructure and more about making better use of what already exists.

“Improving coordination across storage and distribution, as well as better visibility of available fuel, can significantly reduce



In a high-cost, high-volatility environment, fleet management is one of the most effective ways to control fuel spend.

pressure during periods of volatility,” says Tshifularo. “In many cases, the challenge is not supply, but how effectively that supply is managed and moved.” Practical solutions, such as repurposing existing infrastructure and ensuring the reliable operation of pipelines and terminals, can help ease pressure without requiring major new investment.

Fuel price pressure is unlikely to ease in a meaningful way any time soon. For businesses, the focus needs to shift from reacting to managing. Fleet Management and Leasing provides a practical way to do this by enabling smarter, more efficient operations. “While we cannot control global oil prices, we can control how we respond

to them,” Nikelo concludes. “For businesses, that response starts with understanding their fleet and using that insight to operate more efficiently every day.”

WesBank’s offering

WesBank, a division of FirstRand Bank Limited, is the leading provider of innovative vehicle and asset solutions. An international company, WesBank offers retail and corporate solutions including vehicle finance, full maintenance leases, asset-based finance, fleet management leasing, value-added products and personal credit solutions.

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TotalEnergies: Seven decades dedicated to South Africa's energy future

This piece from TotalEnergies, a silver sponsor of the 2026 Fuels Industry Imbizo, outlines the contributions the company has made and continues to make to South Africa's energy sector.

When TotalEnergies was founded on 11 December 1954, no one could have foreseen the critical role this company would play in strengthening South Africa's economy. Less than a year after the first TotalEnergies service station sold petrol in March 1955, seven more service stations were completed in the Johannesburg and Pretoria regions. The commissioning of a Durban terminal in 1957 and the Cape Town terminal and branch in 1960 soon followed.

The company's leadership clearly articulated the importance of corporate social investment (CSI) early on, and some long-standing partnerships in agriculture, human development and clean energy solutions have spanned decades.

The year 1971 was significant for both the company and the country, with the development of the NATREF refinery, South Africa's

only inland crude oil refinery, marking a pronounced step forward in local refinery capacity. Simultaneously, TotalEnergies operations also evolved, becoming a fully integrated company with exploration, refining, storage and distribution of a comprehensive range of petroleum products. TotalEnergies opened a lubricating oil refinery in Durban, founded subsidiary companies in neighbouring territories, and saw the first coal export from the Ermelo Mines development.

Captured in the ethos, 'Better together', advancing transformation is one of TotalEnergies' top long-term priorities, both from within and outside of the company. As an employer, the company has been awarded the Top Employers certification for four consecutive years, highlighting its commitment to a positive work environment and career development. In 2019, TotalEnergies proudly achieved a Level 1 B-BBEE status,

reflecting its continued commitment to inclusive growth and social value creation.

TotalEnergies has also supported enterprise development, being the first industry leader to bring fuel service stations to previously disadvantaged areas, and prioritising local community involvement through its retail and distribution models.

To further contribute to an energy-secure future, TotalEnergies is developing a 700-MW portfolio of solar projects. This includes the Prieska solar power plant, the Sasol-Air Liquide agreement to supply 260 MW of renewable energy capacity, and a 216 MW solar power plant with 500 MWh of battery storage.

TotalEnergies looks forward to continuing to play a critical role in SA's energy landscape.

<https://totalenergies.com/south-africa>

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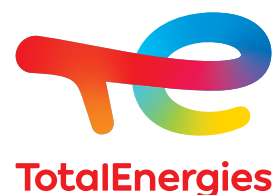
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bpSA: Improving safety in SA's fuel industry

Co-operation with partners and regulators will improve safety in SA's fuels industry, says Liesl Esau, HSE&C Senior Manager at bp Southern Africa (bpSA), a Silver Sponsor of the Fuel Industry Imbizo 2026.

South Africa has world-class safety and environmental legislation, but workable solutions are needed to apply it to complex businesses such as fuel import, transport and supply. Moving fuel from port to pump, whether by pipeline or truck, requires the greatest attention to safety and the environment.

Accidents involving the transport and handling of petrol and diesel can cause fatalities and costly property damage. The product, the equipment, the processing and the people handling it must all follow very strict procedures and aim to exceed minimum regulatory requirements.

The main acts in South Africa that govern safety standards for handling fuel are the Occupational Health and Safety Act (OHS Act) and its Regulations, overseen by the Department of Employment and Labour; and the National Environmental Management Act, overseen by the Department of Forestry,

Fisheries and the Environment. All this legislation covers safety, health, the environment and sustainability. There are also relevant industry standards.

For fuel retailers and franchisees, complying with regulations entails selecting partners with the right mindset and preparing them to operate the fuel stations with an adequate understanding of the potential risks and the correct way to manage them. Training and information-sharing ensure compliance and encourage franchisees to learn how to apply regulations to a fuel station and to seek assistance and share any concerns.

A similar approach is needed for the outsourced companies that transport fuel. They should be able to demonstrate that their management systems will ensure safe operations.

But safety goes beyond systems. Contractors need to demonstrate that every driver or technician understands what is expected of them and operates safely.




Liesl Esau, HSE&C Senior Manager at bp Southern Africa (bpSA).

“We at bpSA invest significant resources to ensure that our stakeholders – whether contractors, franchisees, or staff – comply with all safety regulations. While South Africa can be proud of its world-class legislation on safety and the environment, more robust and uniform enforcement would help to raise compliance across the industry,” Liesl Esau concludes.

bpSA is a Silver Sponsor of the Fuel Industry Imbizo 2026, taking place from 10-11 June at the Sandton Convention Centre in Johannesburg.

https://www.bp.com/en_za/



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- Assistance with application procedures and required documents
- Information on regulatory compliance and licensing objectives
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- Advice on small business participation in the petroleum sector
- Clarification on appeal and decision-making processes



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Soliflo is a customer-centric, solutions-driven company operating in sales, supply and service to the oil, petroleum and gas industries, as well as other industries.

The Soliflo name has long been synonymous with supplying industry-leading global-brand equipment and components, as well as engineering and delivering fully packaged solutions in sub-Saharan Africa. This includes storage tanks and terminals, highly specialised bulk liquid control, tanker loading/off-loading systems, vapour recovery systems and an extensive portfolio of related products and services.

Soliflo's head office is in Johannesburg, South Africa, and the company's reach extends to all major local hubs countrywide, across borders and globally. Soliflo is ISO 9001:2015 and ISO/TS 29001:2020 Quality Management certified and B-BBEE Level 2 accredited.

The extensive product and service portfolio includes: instrumentation & flow control, loading arms, fall-pre-

vention equipment, industrial hoses, grounding/earthing devices, additive systems, mobile gravity meters, break-away couplings, dry-break couplings, pumps, tanker grounding, overfill prevention systems, preset controllers and tank truck equipment.

Soliflo is actively involved in supplying petroleum retail site solutions, offering a range of products and services, including vapour recovery, flowmeters, mobile gravity devices, automatic tank gauging and tank monitoring systems, as well as other specialised equipment critical to the operation of sustainable and profitable petroleum retail operations.

Industries served include: petrochemical, oil, gas, retail fuel, chemicals, cryogenics, energy, pharmaceuticals, cementation, food & beverage, aviation, mining, agrichemicals and fertilisers.

Service and support excellence, both pre- and post-purchase, is essential and integral to Soliflo's service, repair and refurbishment portfolio. In addition to mobile product installation and technical teams, Soliflo has on-site aftermarket service, repair and maintenance facilities staffed by skilled technicians. Teams attend to the needs of customers based in South Africa and in SADC, EAC and COMESA countries.

Soliflo technicians undergo extensive training by international principals and are authorised to undertake specialised installation and service projects on their behalf. Recent examples of these include the assembly, installation and commissioning of marine loading arms in Vietnam and the cleaning, servicing and refurbishing of meters before reinstallation and testing.

Soliflo has a particular focus on loading arms, which have been core to the company's activities since the start. Irrespective of the original manufacturer, the company offers service, repair and refurbishment services for all types of loading arms, with restoration to optimal condition, guaranteed.

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Multotec's cyclone specialists, Blane Pillai, applications engineer, Ernst Bekker, process specialist for cyclones and Erick Herbst, applications manager.

Tailings management starts with the right cyclone

Multotec's cyclone specialists, Blane Pillai, Ernst Bekker and Erick Herbst discuss the use of cyclones for tailings management and the importance of matching each cyclone choice to the specific onsite factors that influence their performance.

management.

No two TSFs are the same; each requires a tailored cyclone solution. "Tailings deposition is far more complex than people think, which is where correctly specified cyclones make the difference," explains Ernst Bekker, process specialist for cyclones at Multotec.

"When chosen and applied correctly, cyclones are more than just classification devices. They directly impact how efficiently tailings are deposited in a TSF, the stability of the TSF structure, and the effectiveness of water recovery for reuse in the plant. This means that the right cyclone can transform tailings management from a costly necessity into a driver of best practice standards for sustainable tailings management."

Selecting the appropriate cyclone for tailings management is therefore not a one-size-fits-all exercise, and several factors must be weighed carefully.

Durability: Harsh operating conditions, abrasive material and considerable pressure spikes during start-up demand equipment that lasts. Multotec's GV Cyclones were introduced after earlier polyurethane units frequently failed on TSFs due to fluctuating start-up pressures. Multotec engineered a spin-cast steel shell with a 12 mm bonded rubber lining to combine strength with longevity, while keeping the weight manageable.

Cyclones designed with wear-resistant lin-

ings, durable composite construction materials and simplified maintenance requirements not only extend service life but also reduce downtime and operating costs.

Erick Herbst, applications manager at Multotec, says, "cyclones may look simple, but we have put a lot of thought into durability, usability and maintenance because these are the factors that determine long-term performance in harsh tailings environments."

Ease of handling: A lightweight cyclone is faster to install and easier to move around on-site, facilitating quick modifications, upgrades and ore replacements without downtime. This is particularly important in tailings-dam environments, where cyclone relocation is done by hand. A 250 mm cyclone size has emerged as the most economical compromise, small enough to be easily handled, but large enough to reduce the number of units needed. A lightweight cyclone also requires a smaller tailings contractor team for operation and maintenance.

The quick-release screw spigot couplings on Multotec's GV Cyclones allow for easy spigot changeouts, which is vital because spigot wear directly affects underflow density, wall stability, and overall TSF safety.

Flexibility: The ability to alter the combination of the cone angle, spigot and vortex finder of a cyclone to meet the specific operational parameters, material characteristics

Tailings management is a significant challenge for the mining industry and is under greater scrutiny than ever, as global industry standards call for safer, more sustainable practices. The rising demand for minerals and metals means that modern mines must raise throughput, control costs, and reduce their environmental footprint, all while responsibly managing their Tailings Storage Facilities (TSFs). Meeting these demands starts with a technology that is often overlooked but essential: the cyclone.

Mining companies carry a long-term responsibility to manage tailings and waste material left behind after ore is processed and valuable minerals and metals extracted, from operation through to closure and even post-closure. This management is critical for preventing catastrophic failures, protecting human safety, and minimising environmental impacts.

Responsibly managed TSFs are characterised by knowledgeable mine owners and tailings contractors who implement good engineering practices and use technologies that support safety, compliance, and efficiency. While several factors influence cyclone selection, choosing the right one is crucial to ensuring efficient, cost-effective, and environmentally responsible tailings



Their lightweight, durable design, simple spigot change system, and adaptable components make Multotec's GV Cyclones an operator-friendly and technically reliable solution for tailings dams.

and TSF requirements ensures fit-for-purpose equipment for tailings management applications. This equipment flexibility considers evolving project needs throughout the life of the TSF.

Process efficiency: Cyclones with optimised geometries ensure the optimal volumetric split between overflow and underflow is achieved to match the required TSF rise rate. This supports faster tailings deposition and stable TSF wall construction while maximising throughput without compromising process reliability. Operators can achieve the necessary balance of coarse fraction to the wall and fines to the centre, improving drainage and enabling more reliable water recovery with Multotec's GV Cyclones.

Environmental impact: Modern cyclone designs enhance water recovery from tailings and improve tailings drying by ensuring that drier, coarser material reports to the wall, stabilising the TSF, while ensuring that finer, more liquid material reports to the central decant structures. This is especially critical because finer ore grinds, now increasingly common due to lower ore grades, reduce the natural supply of coarse material needed to construct the TSF wall.

By improving water recovery and stability of TSFs, Multotec's GV Cyclones mitigate both environmental and safety risks and help reduce the overall footprint of storage facilities. This is increasingly important in water-scarce regions, where responsible resource use is not only an environmental imperative but also a regulatory and operational one.

Equipment optimisation: Safe and responsible tailings management requires a collaborative knowledge-sharing approach between equipment suppliers, the mine owner, and the tailings contractor. Accurate sampling is critical, as poor sampling can lead to biased results and incorrect recommendations. Multotec can mitigate this by directly assisting with on-site test work.

Herbst adds, "Our value lies in being on

site, testing equipment under real conditions, and making sure clients have a cyclone they can trust."

"This ensures ongoing optimisation of cyclone performance, consistent efficiency through capacity and flowrate refinement depending on feed conditions, and cost-effectiveness by improving the cost per ton over the life of tailings deposition."

Blane Pillai, Applications Engineer at Multotec, says no two tailings dams are the same and cyclone selection, therefore, cannot be a copy-and-paste exercise. "Each site has different feed conditions and operating practices, which is why on-site testing is essential and is used to ensure that solutions are not only technically correct but also practical."

Multotec also provides training and support to help close knowledge gaps among operators, thereby reducing risks associated with TSF mismanagement.

Prioritising these considerations in cyclone selection allows mines to fine-tune their tailings strategies to achieve both operational and sustainability targets where above-ground tailings deposition in a TSF is the only option.

GV Cyclones: enablers of responsible tailings management

Modern, fit-for-purpose cyclones enable tailings contractors and operators to better manage deposition rates, enhance water recovery, and minimise risk, directly supporting compliance with the Global Industry Standard on Tailings Management, which sets the benchmark for safe management and the goal of zero harm.

Multotec's GV Cyclones reflect lessons learned from industry challenges, failures of polyurethane units, heavy steel units that were too difficult to handle, and operator frustration with hard-to-change spigots. The lightweight yet durable design, simple spigot-change system, and adaptable components make the GV Cyclones both operator-friendly and technically reliable.

Placing cyclones at the core of a mine's tailings management strategy is not optional but essential. While tailings management will always demand effective governance and good engineering practices, having the right cyclone is a small but powerful tool that supports continual improvement in TSF management.

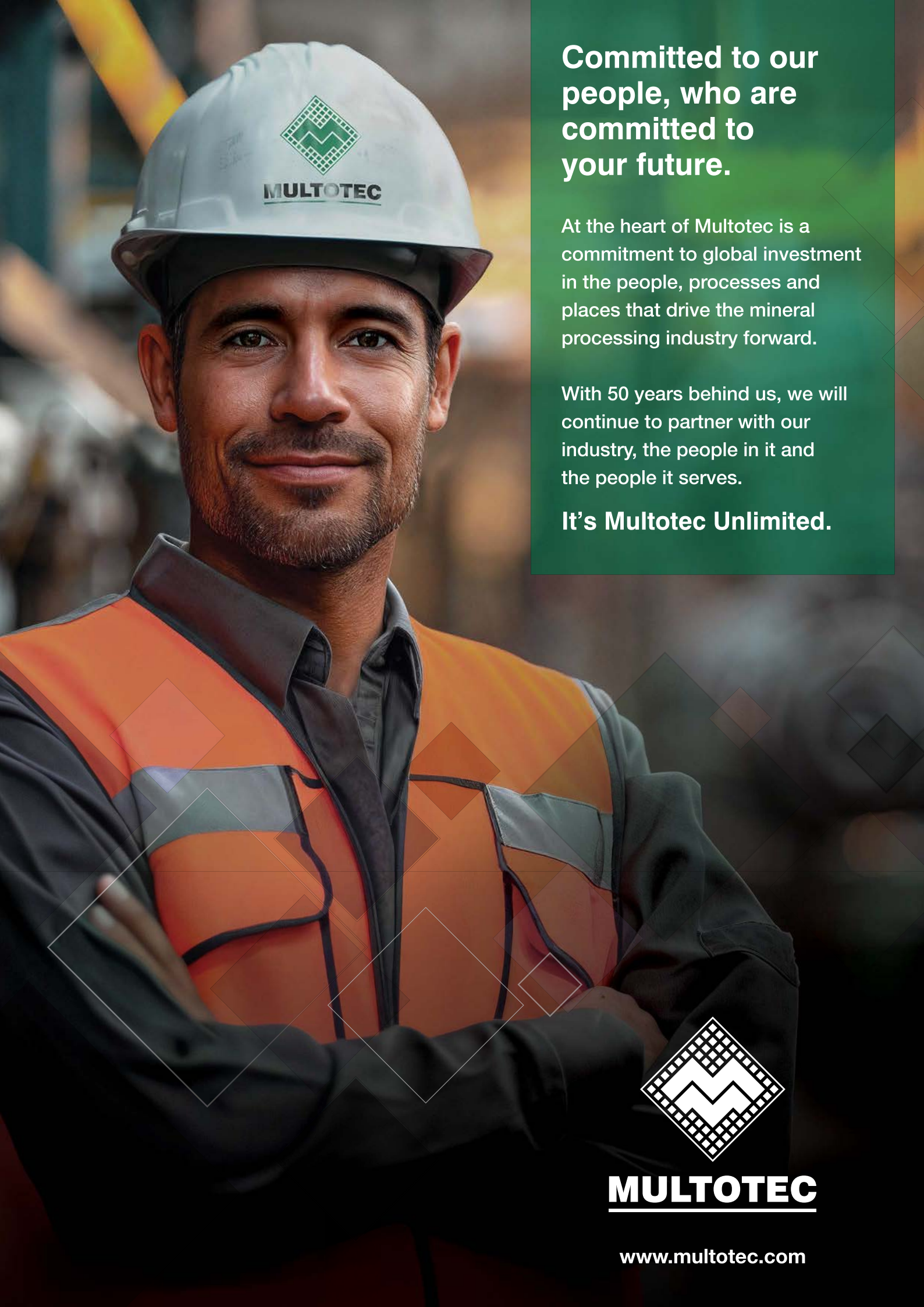
<https://www.multotec.com/sa>



Prioritising the cyclone selection choice allows mines to fine-tune their tailings strategies to achieve both operational and sustainability targets.



Multotec's GV Cyclones offer proven tailings management performance.

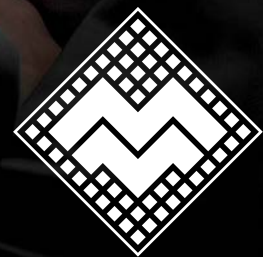


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Pierre Bekker, Director, and Jacques Maritz, National Sales and Service Manager of Quyn International Outsourcing.

In the petrochemical industry, shutdowns are high-stakes operations that play a vital role in maintaining plant performance, safety, and compliance. These planned production pauses allow teams to carry out essential maintenance, inspect equipment, upgrade systems, and ensure adherence to environmental and safety standards. A well-executed shutdown helps prevent unplanned outages, minimises costly downtime, and keeps operations running efficiently long after production resumes. It is also a strategic opportunity to enhance processes, eliminate hidden risks, and strengthen the reliability of critical systems.

In South Africa, shutdowns must comply with stringent labour and safety regulations under the Labour Relations Act, the Basic Conditions of Employment Act, and the Occupational Health and Safety Act. Every worker, temporary or permanent, must meet strict legal, safety, and certification standards before entering the site, and managing this level of compliance across large, fast-moving shutdown teams can be complex.

This is where Temporary Employment Services (TES) providers come in, offering the systems, structures and expertise needed to help organisations stay compliant, streamline contractor onboarding and maintain workforce flexibility without compromising safety or governance.

Strengthening operational resilience for petrochemical shutdowns

Director Pierre Bekker and National Sales and Service Manager Jacques Maritz of Quyn International Outsourcing highlight the strategic advantage for Petrochemical plants of using reputable temporary employment services (TES) providers to minimise downtime and efficiently meet tight shutdown schedules.

Skill gaps and high-risk work

Shutdowns in the petrochemical industry demand precision, speed and specialised skills. Yet, one of the biggest challenges companies face is having enough qualified people to complete every task safely and on time. Many plants lack the in-house expertise required for highly technical shutdown work, such as reactor overhauls, pressure-vessel inspections, and hazardous-chemical handling. These activities require certified, medically fit and legally compliant personnel in accordance with South African labour and safety laws.

At the same time, shutdown schedules are tight. Every hour of downtime carries significant financial implications, so delays or rework can quickly erode profits. Skill shortages and uneven workforce quality increase the risk of accidents, safety breaches and equipment failures once operations resume.

Bringing in temporary workers can ease the pressure, but only if they meet the strict safety and competency standards set out by legislation. This is where TES providers add real value, by supplying pre-vetted, compliant and technically skilled workers who help petrochemical companies maintain both productivity and legal compliance during shutdowns.

The strategic advantage

Given the intense time pressure and specialist demands of petrochemical shutdowns, partnering with a TES provider has become a strategic advantage. TES partners give companies immediate access to pre-vetted, certified and experienced workers, such as welders, fitters, electricians, and safety officers, who meet all South African labour and safety compliance requirements. This ensures shutdown activities are carried out safely, efficiently and within legal parameters.

Engaging a TES provider early in the shutdown planning process also streamlines workforce management. It enables better forecasting of skills requirements, faster onboarding and smoother integration of temporary staff into site-specific safety and operational systems. TES partners handle the full administrative load, covering HR, payroll and compliance with employment legislation, so plant managers can focus on meeting technical milestones rather

than managing paperwork.

Most importantly, TES partnerships provide the flexibility petrochemical companies need during unpredictable shutdown cycles. Workforce numbers can scale up or down as project demands change, reducing overtime costs and preventing fatigue among permanent staff. Experienced TES workers often bring valuable lessons from other industrial projects, contributing to improved safety performance, productivity and process optimisation across the shutdown.

TES partnerships deliver measurable value at every stage of a shutdown. By matching the right skills to each task, companies improve worker skills, reduce errors and minimise costly rework. Managing temporary labour through a TES provider also brings predictability to short-term labour costs while maintaining full compliance with South African labour and safety regulations. This reduces administrative and legal risk, freeing plant leaders to focus on achieving technical milestones and safety objectives.

With externally managed HR, onboarding and compliance, shutdowns become more structured and efficient. Teams can make better operational decisions, safety outcomes improve, and the overall project becomes far less reactive. What was once a stressful, unpredictable process becomes a well-coordinated exercise in precision and accountability.

The greatest advantage of a TES partnership lies in the shift that it empowers from reactive maintenance to proactive operational resilience. By securing a pipeline of skilled, compliant and readily deployable workers, companies can plan with confidence and respond faster to unexpected challenges. Over time, this creates a sustainable model for efficiency and continuous improvement, where shutdowns are no longer disruptions but opportunities to strengthen long-term performance.

For South Africa's petrochemical sector, partnering with the right TES provider means more than just filling skill gaps. It's about ensuring every shutdown is completed safely, on schedule, and within budget; while building the resilience and reliability needed to stay competitive in a demanding, high-risk industry.

<https://quyn.co.za/>

Cooling tower bleed control

Cooling towers rely on evaporation to remove heat, but this process also concentrates dissolved solids in the system. Left unmanaged, this buildup can lead to scaling, corrosion and fouling, reducing efficiency and increasing maintenance costs.

“Without proper bleed control, dissolved solids accumulate over time and start to impact system performance,” says Anelia Hough, water treatment consultant at Allmech. “That’s why maintaining the right water balance is critical.”

Bleed, or blowdown, is the process of removing a portion of high-TDS (total dissolved solids) water from the system and replacing it with fresh make-up water. This helps keep dissolved solids within acceptable limits and supports the effectiveness of chemical treatment programmes. Hough says there are two main ways to manage this process:

- A time-based system, which uses a timer to open a valve at set intervals, discharging a portion of water regardless of actual water

quality. “It’s a simple, reliable approach that doesn’t rely on probes or controllers,” Hough explains.

- A conductivity-controlled system, which measures the water’s conductivity as a proxy for TDS. When levels exceed a set threshold, the system automatically opens the bleed valve. “This allows for more precise control, because the system responds to real conditions rather than fixed intervals,” Hough says.

Each approach has clear trade-offs in terms of cost, control and complexity. Time-based systems are easy to install and operate, with lower upfront costs and fewer components. However, because they do not respond to real-time water conditions, they can be less efficient and may result in unnecessary water loss.

Conductivity-controlled systems require

a higher initial investment and ongoing probe maintenance, including cleaning and calibration. In return, they offer tighter control over TDS levels, which, with proper maintenance, can reduce water and chemical use over time.

“The right solution depends on your operating environment,” says Hough. Time-based systems are typically suited to smaller installations or sites where water quality is stable and predictable. They also make sense where simplicity and low maintenance are priorities. Conductivity-controlled systems are better suited to larger or more complex operations, particularly where water sources vary or tighter control is required.

“In some cases, a more advanced system is essential,” says Hough. “But in others, a simpler setup is not only sufficient, but it’s also more practical and cost-effective.”

Hough says that valve performance plays a critical role in efficiency and reliability. Most time-based systems use solenoid valves, which offer fast, precise actuation but can be sensitive to fouling and wear, particularly in harsher water conditions. Regular maintenance and seal replacement are often required.

Allmech recommends ceramic ball valves for certain time-based bleed applications. “They are designed for durability,” she says. Their wear-resistant components perform reliably even in abrasive or poor-quality water, with minimal maintenance over time. While actuation may be slower, the trade-off is longer service life, no water hammer and greater resilience.

Incorrect bleed settings can create their own problems. “Over-bleeding wastes water and chemicals, while under-bleeding allows dissolved solids to build up, increasing the risk of scaling, fouling and corrosion,” says Hough. “Even with a simple time-based system, you still need regular monitoring,” Hough notes. “Routine testing and periodic adjustments are essential to keep the system within safe limits.”

Ultimately, there is no one-size-fits-all solution. The choice between time-based and conductivity-controlled bleed systems depends on factors such as system size, water quality variability, budget and maintenance capacity. Hough suggests consulting with an experienced service provider for an objective assessment and recommendations.

“With the right approach, operators can protect their equipment, reduce operating costs and ensure long-term system performance,” she concludes.

<https://www.allmech.co.za/>



Bleed, or blowdown, is the process of removing a portion of high-TDS (total dissolved solids) water from the system and replacing it with fresh make-up water.

Safer, faster and smarter process solutions

Bongela Mining & Industrial Services is redefining maintenance, safety, and efficiency in SA's platinum, gold and industrial sectors.

Established in 2009 as a silo cleaning operation, today, Bongela partners with leading mining houses as well as clients in the cement and industrial processing sectors to deliver high-risk cleaning, inspection, and rehabilitation services that reduce downtime and improve operational performance. "At its core, Bongela is about solving real operational challenges on-site," says CEO Raymond Graham.

By developing safer, faster cleaning methods, we have been able to reduce turnaround times while improving safety outcomes significantly," he says.

Bongela's origins lie in safe and efficient cleaning of silos and processing infrastructure. Traditional methods were labour-intensive, slow and often hazardous, exposing workers to risks such as engulfment and structural collapse. By introducing specialised techniques and systems, Bongela reduced cleaning times from a week to as little as one to two days, while minimising risk. This ability to accelerate maintenance cycles without compromising safety has become a defining feature of the company's

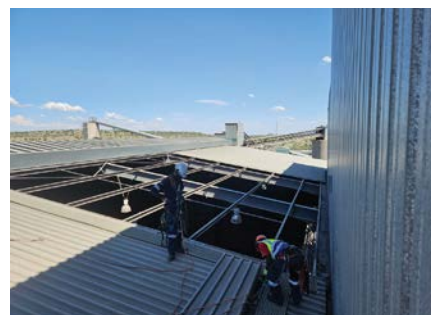
value proposition.

Bongela's now provides integrated process cleaning and maintenance solutions, with capabilities that extend across both dry and wet sections on mines and a wide range of processing environments.

The company has also developed strong capabilities in hydro-mining and material recovery, using high-pressure and ultra-high-pressure water-jetting systems to reprocess accumulated material in process control dams, for example, returning valuable resources to production. This approach enhances efficiency and aligns with more resource-conscious and sustainable operating practices.

Complementing these services is a growing focus on structural integrity and long-term asset performance. Bongela conducts detailed structural inspection & maintenance management (SIMM) inspections, produces defect reports and undertakes concrete rehabilitation work, including high-strength linings, helping clients extend asset life and improve maintenance planning.

Operating in high-risk environments,



Bongela employs a highly specialised workforce, including rope-access technicians and process-cleaning specialists.

Bongela places safety and compliance at the centre of its offering. "Our approach is always safety-first," says Graham. "We design our methods to eliminate unnecessary exposure, reduce manpower in confined spaces, and ensure that every job is executed with the highest level of control."

Bongela's expansion into industrial, cement and petrochemical sectors reflects a deliberate strategy to diversify its client base while applying its specialised expertise in new environments. "As we look to grow the business in a sustainable and controlled way, we are investing in robotics and advanced technologies that can further enhance safety and efficiency, particularly in hazardous environments," concludes Graham.

<https://bongela.co.za/>

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Louis Kotze, Executive for the Generator Sets Division of WEG Africa.

WEG Africa: the generator customisation specialist

Louis Kotze, Executive for WEG Africa's Generator Sets Division, highlights the value of partnering with a generator customisation specialist to get the right generator solution for a specific need and its operating environment.

A manufacturing plant needs a steady-state generator set to power sensitive CNC machines with stable, clean power. A mine requires generators that operate underground in confined spaces while meeting safety, emission, and noise requirements. Construction site generators need to be rugged, hold enough fuel for ongoing activities, and be transportable to support a range of different equipment as the site progresses.

The challenge for each is to get the right generator solution. It is rare for a standard generator set to meet such specific requirements, which is where generator customisation steps in. This process requires coordinating specifications from several stakeholders, says Louis Kotze, Executive of WEG Africa's Generator Sets Division.

"Selecting a generator set depends on factors that come from different people. The site's electrical engineer focuses on areas such as load requirements, total output and reliability. At the same time, procurement managers are interested in cost-related issues and emissions regulations, and project managers want to know that the generators will support their project goals rather than hinder them. Each party knows what they expect from a generator. What they don't have time for is to work out all the details."

Customisation needs the right partner

The generator marketplace has a wide array of ratings and standards. A generator set can range from a straightforward off-the-shelf model to more elaborate equipment and configurations, including synchronised units for large-scale power generation and careful integration with site equipment and infrastructure. An experienced generator provider collects these details and collates a site's multiple requirements.

Typical customisation options include the generator's power output capacity, fuel type, noise reduction, control system, and size. Balancing these against budget, performance, and environmental expectations is complex, which is why the value of an experienced customiser shouldn't be underestimated.

For instance, a remote mining site requires

generators to support emergency dewatering operations. These generators need to be hardy yet mobile, hold enough fuel for long-term operations, provide remote monitoring features and be easy to refuel. They need to be cost-effective, and the customised units must be delivered quickly.

Such a project has several competing requirements that can undermine the generator set's value and performance. The generators might be too cumbersome to move as the dewatering operations shift focus. They might use the wrong fuel or require frequent maintenance due to dust and moisture damage.

It is the generator customiser's job to understand such issues, says Kotze. "We conduct assessments to understand factors like environmental and operating conditions, which we might get from the client or by visiting the site. We gather detailed information on power demands, peak loads, and the equipment that the generators will power. We try to speak to all the stakeholders. Customising generators is our second priority. Understanding the project's requirements from different angles is our first," he says.

How to select a customisation provider

Customising a generator requires more than technical skills. To evaluate a generator provider's customisation service, start by looking at their track record. What is their experience with similar projects, and what references and case studies do they provide? Are they asking

the right questions, showing they understand the specific characteristics of a project and its sector?

Their approach to assessments is as important. Are they thorough? Do they gather and incorporate technical and timeline requirements? Do they have the capacity to adapt responsively and provide additional services, such as maintenance?

Certifications and standards are crucial, as they define quality, safety and performance. The most fundamental is ISO 8528 for generator sets. Also look for standards such as ISO 9001 (quality management), ISO 14001 (environmental management), and ISO 3046 (combustion engine management). Others include adherence to health & safety, testing and sector-specific standards, such as food safety considerations at a food and beverage manufacturer.

Focus on the team behind the customisation to ensure a site gets the right generator sets, says Kotze.

"Engineers and managers on sites know what they want. What they need is someone who can connect the dots for them quickly yet professionally. Selecting and customising a generator solution requires skill. But what is often neglected is understanding the customer's goals and how customisation will achieve them. When deciding on a generator provider, that's where the real value comes from."

<https://www.weg.net/institutional/ZA/en/>



Left: Typical customisation options for a customised WEG generator set include the generator's power output capacity, fuel type, noise reduction, control system, and size. Right: To support emergency dewatering operations for a remote mining operation, the customised WEG generators were built to be hardy yet mobile, to hold enough fuel for long-term operations, to provide remote monitoring features, and to be easy to refuel.

M&C revitalises 15 kV natural gas power alternators

Mike Chamberlain, Marketing Executive at Marthinus & Coutts (M&C), highlights the company's success in developing a unique, proprietary process for revitalising the windings of large alternator stators affected by partial discharge, which has now been applied to over 35 machines.

Marthinus & Coutts (M&C), a division of ACTOM, is a leading entity in the engineering and manufacturing sector, specialising in high-quality services that offer solutions across diverse industries, including power generation, mining, petrochemicals, and manufacturing. With a strong focus on innovation and reliability, the business has established a reputation for delivering customised solutions that boost operational efficiency and performance. Their expertise covers a range of services, including repairs, maintenance, and the manufacture of specialised equipment.

Committed to safety and sustainability, M&C aims to meet its clients' changing needs while rehabilitating and extending the lifespans of critical motors and generators.

Revitalising alternators

Over several years, M&C has refined the technique and process of treating windings of large alternator stators affected by partial discharge. Initially, these treatments and overhauls were carried out in the workshop, but due to high transportation costs and cross-border complications, M&C developed teams and equipment to perform this work onsite.

In 2023, following initial inspections and tests of a customer's alternator, M&C found that the windings showed excessive partial discharge. The anti-corona layers on many line-end coils – and those nearby – were severely eroded, leading to complete slot-length erosion in several cases. This led to numerous magnetic slot wedges becoming dislodged and scattered within the machines, posing a risk of catastrophic damage. In one instance, the stator failed due to a loose wedge piece impacting the stator winding, causing a main insulation failure and a large arc hole in the stator slot.

Following this work, according to Mike Chamberlain, Marketing Executive at M&C, in 2024, the customer requested that M&C complete stator winding rehabilitation work on another 17 identical generators and address any issues they might encounter during the alternator overhaul and stator

winding rehabilitation. "Our M&C team has been working on this project since 2024, and we have completed the refurbishment of 14 units so far, each taking about 48 days.

Two factors make this a unique and proprietary M&C process:

- First, it is a new, original procedure devised by M&C engineers and the technical team, in collaboration with international insulation specialists and the owners of the machines involved. "It uses existing materials, but in a manner that has not, to our knowledge, been applied previously," notes Chamberlain.
- The second factor is that the method has now been successfully applied to over 35 machines. The technique has also been validated, as each stator has completed a full one-minute, high-potential voltage test at 23 kV RMS (root mean square), demonstrating the process's effectiveness. "To provide perspective, every stator coil is subjected to 23 000 V RMS to earth to verify the insulation's integrity after

treatment. Partial Discharge tests have also been carried out on many units, both before and after applying the treatment," he points out.

Developing the process was an achievement in itself, and executing this treatment on site was also a notable accomplishment under the guidance of M&C's Field Service Manager, Owen Killian.

M&C has also gained the advantage of implementing the procedure many times, so they can now be considered specialists.

Furthermore, M&C has also completely rewound one stator that failed before the insulation treatment could be applied. Due to the winding configuration and the high-rated voltage of 15 kV, this was an achievement in itself.

"Through this project, we have again successfully demonstrated our ability to design innovative solutions that enhance reliability and prolong the lifespan of customers' electrical rotating machines under tight time constraints," concludes Mike Chamberlain.

<https://www.mandc.co.za>



Marthinus & Coutts (M&C) is completing alternator overhauls and stator-winding rehabilitation on 17 identical alternators for gas-powered energy generation.

Control systems, remote monitoring and skills drive efficiency gains

The convergence of specialist skills and advanced technology is proving pivotal across industry – a trend underscored by two recent projects completed by boiler operations and maintenance expert Associated Energy Services (AES) in the food manufacturing sector.



Remote monitoring system (RMS) platforms allow operations management to monitor performance, investigate anomalies and conduct detailed root cause analyses

“Consistently collecting and interpreting data is critical to optimising efficiency and productivity when operating and maintaining boilers. Remote monitoring systems (RMS) are integral to ensuring effective management and safety.

AES adds value by identifying and pre-empting problematic scenarios: applying a dynamic blend of control systems, remote monitoring and human skills, we not only prevent downtime but improve operational efficiencies and contain costs – while complementing and supporting complex production systems,” explains AES Commercial Director, Dennis Williams.

A tale of two projects

The first project involves a longstanding food processing client whose outdated boiler control system had become costly to maintain. AES was tasked with upgrading the system while retaining some existing equipment.

“The plan was to upgrade one boiler, and then, after proof of concept, to update the other two. However, the year-end shutdown saw our client decide to do all three at once, giving AES an extremely tight timeline. We managed to do it, even though there was some commissioning and fine-tuning in the months following the start-up,” says AES Projects Director, Gavin Evezard.

A key feature of the upgraded system was the implementation of load balancing across the three boilers, ensuring that no single boiler carried a disproportionate share of the load.

The second project, undertaken for a new food-sector client, involved installing a fully customised control and RMS solution. The system

included a web-based interface that enabled real-time monitoring, data analysis and performance tracking.

“Although the system is based on our core control ethos, the client had very specific requirements. We therefore customised it to meet their needs by incorporating different operating modes. At different times and in different sections of the plant, they have varying steam pressure requirements. We catered for all of that,” Evezard continues.

Supply chain constraints were also a challenge, requiring AES to rethink its approach to in-factory assembly and testing, focusing rather on on-site completion: “We had to get the standing boiler control system done so we could restart it, as the operating boiler was developing problems. The aim was to give our client the redundancy on steam that they needed. We had to optimise our planning to complete the project as soon as possible. We managed to get that equipment up and running quickly, to minimise any delays.”

From data to decision-making

Both projects highlight the growing importance of data-driven decision-making. RMS platforms allow operations management to monitor performance, investigate anomalies and conduct detailed root cause analyses, considering aspects such as fuel consumption, emissions and ensuring the right steam supply at the right pressure.

“When there are issues on the plant, we have all the data recorded on our RMS and can go back to see exactly what happened. We can do proper root cause analysis and thereby prevent any future incident or issue,” Evezard notes.

During the second project, AES incorporated additional metrics tailored to the client’s operational needs, including comparable fuel consumption rates and boiler performance indicators under manual and automatic operating modes.

Evezard emphasises that such customisation is essential in South Africa, where many industrial boilers are old: “There is a large fleet of boilers that are between 30 and 60 years old. Original equipment manufacturers may no longer have the software available to diagnose or solve problems, and many operate offshore, making it expensive to bring them to

South Africa. Our systems are in-house. We have the teams and skills – and the keys. We can diagnose and fix problems, getting boilers operational again, and mitigating the risk and cost of downtime.”

Critical human factor

Despite advances in automation and control technology, both Williams and Evezard emphasise that human expertise remains indispensable. “Unfortunately, with solid fuel boilers specifically, a degree of operator input is needed. The control system can only do so much, but at the end of the day, a human needs to do some checks and set up the boiler in line with production facility requirements,” Evezard emphasises.

Williams concurs, particularly regarding fuel quality and safety: “If you make things too hands-off, essential safety aspects may not be addressed. Consistent human oversight mitigates the risk associated with combustion and steam vessels under pressure.”

Long-term value

Beyond immediate production efficiency gains, AES sees the two project examples cited as catalysts for longer-term partnerships. Williams notes that for AES, more than 75% of boiler upgrade projects evolve into ongoing service relationships: “The entire project becomes a proof of concept for the way forward,” he remarks.

Measurement is central to this value proposition: “When you have a measurable objective available, you can show the client what you are seeing in their plant and explain how you can assist. This provides tremendous value and also builds a relationship,” Evezard adds.

Furthermore, the enhanced visibility afforded by AES’s RMS and control systems is often transformative for clients. “Often, they do not fully appreciate that the delivery of steam in their facility is actually a combination of converting fuel into useful steam, reticulating and using that steam. Our RMS and control systems allow clients to actually see what is happening and understand the value of managing the boiler house and steam generation in the way in which AES does,” Williams concludes.

<https://www.aes-africa.com/>

Atlas Copco's portable power charge

Atlas Copco Power Technique is standing at the forefront of power innovation, offering advanced generator technology and adaptable, versatile solutions designed to meet the current and evolving operational needs of both mining and industrial customers.

Southern Africa's industrial and mining growth is powering a sharp rise in demand for dependable portable energy. With sustainability and compliance at the forefront, businesses are seeking solutions that balance efficiency with environmental responsibility.

Riaan Burke, Business Development Manager at Atlas Copco Power Technique, highlights a growing shift toward prime power applications and large-scale industrial use. "The market is unmistakably shifting towards higher efficiency solutions, with prime power now a central focus, particularly for the mining and manufacturing sectors. While diesel generators will remain a cornerstone of industrial power for the foreseeable future, we are ready for the

next wave of innovation with our advanced battery and energy storage systems (ESS), complemented by cutting-edge hybrid technologies, that are rapidly gaining traction and reshaping the market.

"The trajectory of mining and industry is clear, with efficiency and sustainability increasingly shaping purchasing decisions. While diesel generators remain the dominant choice, ESS and hybrid solutions are gaining momentum as more viable, efficient and sustainable alternatives," says Burke.

He further notes that the Southern African market continues to show steady growth in mining-related generator demand, particularly in the 380-1 450 kVA range, as infrastructure projects and new mining applications fuel expansion across

the continent. "We are seeing sustained investment in power solutions for new mine developments, reinforcing the critical need for reliable, high-performance generators."

With extensive experience in the generator industry, Atlas Copco Power Technique's highly skilled and respected team plays a strategic role in guiding customers to the right power solutions, ensuring optimal operational performance tailored to their unique applications. The team's deep understanding of industry demands enables them to perfectly align businesses with generators that meet immediate power requirements while supporting long-term efficiency and reliability.

This tailored approach is embodied in Atlas Copco's diverse generator portfolio, which delivers scalable solutions from 20-1 450 kVA and is engineered and purpose-built to seamlessly manage high starting motor currents that meet the tough applications typically found in mining and large-scale manufacturing.

"We are positioned for the future, ready to support and empower customers on their dynamic green journey, keeping in step with their adoption of new technologies and their transition to electric or hybrid machines," concludes Riaan Burke.

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DAF: a new era for strategic water treatment

Xylem Africa has launched a new dissolved air flotation (DAF) water treatment solution. This compact and convenient industrial wastewater pre-treatment system is now available in South Africa for permanent and rental use, backed by expert skills and customisation options.

In a recent event hosted at Xylem Africa's headquarters in Kempton Park, Johannesburg, Xylem Africa unveiled its dissolved air flotation (DAF) water treatment equipment and services, which offers reliable wastewater treatment to key sectors such as mining, municipalities, agriculture, aquaculture, food & beverage, paper & pulp, chemical manufacturers and pharmaceutical companies.

DAF is a critical pre-treatment and solids-separation system within broader wastewater treatment systems. It can operate as a stand-alone solids-separation step or complement downstream biological filtration or reuse systems to help achieve site-specific compliance and reuse objectives. The compact and modular design enables deployment in constricted and crowded sites. Xylem also offers excellent DAF rental options for smaller and seasonal projects.

"We are very excited to bring cutting-edge DAF solutions to our local customers. Xylem has introduced our DAF solutions to several other markets, where they have become a big hit among companies of various sizes. They appreciate the logistical benefits of DAF's compact designs and convenient deployment, supported by our expert technicians. South African organisations in the private and public sectors can now also leverage DAF to expand their choices for water treatment and recycling," says Chetan Mistry, Strategy and Marketing Manager at Xylem WSS (AMETI).

Xylem's DAF systems use Hellbender™ pumps to release microscopic air bubbles into wastewater, which, following appropriate coagulation and flocculation, attach to suspended and destabilised colloidal particles, enabling their separation from the water phase and their floatation to the surface, from where they can be skimmed away.

The DAF technique efficiently removes total suspended solids (TSS), fats, oils, and greases (FOG), and particulate-associated biochemical oxygen demand (BOD) from wastewater streams. These systems offer an effective solution for a wide range of applications, including:

- Thickening of biosolids.
- Product recovery from wastewater.
- Treatment of industrial wastewater to meet site discharge limits.
- Polishing of biological treatment effluent (algae and phosphorus removal).
- Pretreatment to reduce loading on downstream biological treatment systems.
- Clarification of biosolids downstream of



The compact and efficient DAF water clarification system is available for permanent and rental use, backed by expert skills and customisation options.



DAF water treatment efficiently removes total suspended solids (TSS); fats, oils, and greases (FOG); and particulate-associated biochemical oxygen demand (BOD) from wastewater streams.

aerobic and anaerobic treatment.

- Removal of fats, oils and greases (FOG).
- Temporary treatment of biosolids during harvest seasons.
- Removal of metals and fines.
- Recovery of proteins from slaughterhouse wastewater.

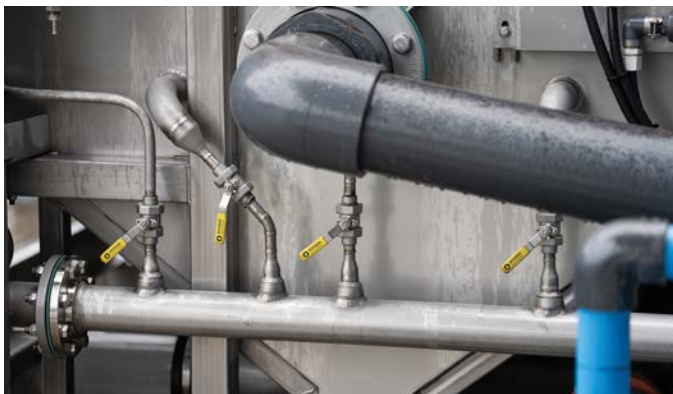
DAF systems are also remarkably compact, often requiring significantly less footprint and depth than conventional sedimentation tanks, depending on design and loading rates. Its combination of convenient sizes and broad applications makes it attractive to numerous industries that clean water for reuse, extract materials from water or prepare water for compliant discharge into the environment.

Bringing DAF's advantages to Africa

Xylem's DAF solutions and services enable more producers to manage wastewater strategically without excessive investment in wastewater infrastructure.

As part of a phased and modular treatment strategy, DAF is often deployed as an entry point into integrated wastewater and reuse solutions, enabling future expansion with biological treatment, filtration and advanced polishing technologies.

Xylem's DAF units provide efficient wastewater pre-treatment and solids separation, with three DAF models in the Xylem RT DAF series: the RT-50, RT-100, and RT-240, which offer flow rates from 100 to 1 000 GPM. Key



Left: The system is delivered with all components, including mixer tanks, weir tanks, pumps, conveyors, catwalks and accessories. **Right:** Lead field engineer and DAF Champion for Xylem Africa, Ruan Nel, presents at the launch of Xylem's new dissolved air flotation (DAF) water treatment solution.

features include:

- Superior, clog-free performance: The system delivers superior performance without plate packs, which can foul, collapse or clog, thereby increasing operational uptime.
- The robust, space-saving design features a rugged, heavy-gauge stainless-steel tank (available in 304 or 316 SST) that will not flex, while the tank's rectangular profile ensures maximum space utilisation.
- Ease of installation: The complete, skid-mounted design means no field assembly is required, simplifying installation.
- Efficient whitewater system: The system uses an industry-leading and HELLBENDER® whitewater system to create very small air bubbles, making the system both efficient and simple to operate.
- Integrated and automated: A large internal float hopper eliminates the need for an external float tank. The system also features an automated float hopper and settled solids auger.
- Optimised chemical mixing: An integral flocculation tube is equipped with three chemical injection ports, designed for optimal mixing of coagulants and flocculants.
- Reliability: Built with quality drive and pump components for long-term reliability.

“From running pilots and proofs of concept for wastewater management plans to enhancing the efficiency of established treatment systems and upgrading to cutting-edge treatment methodologies, Xylem Africa and DAF help

South African industries and municipalities solve water for all.

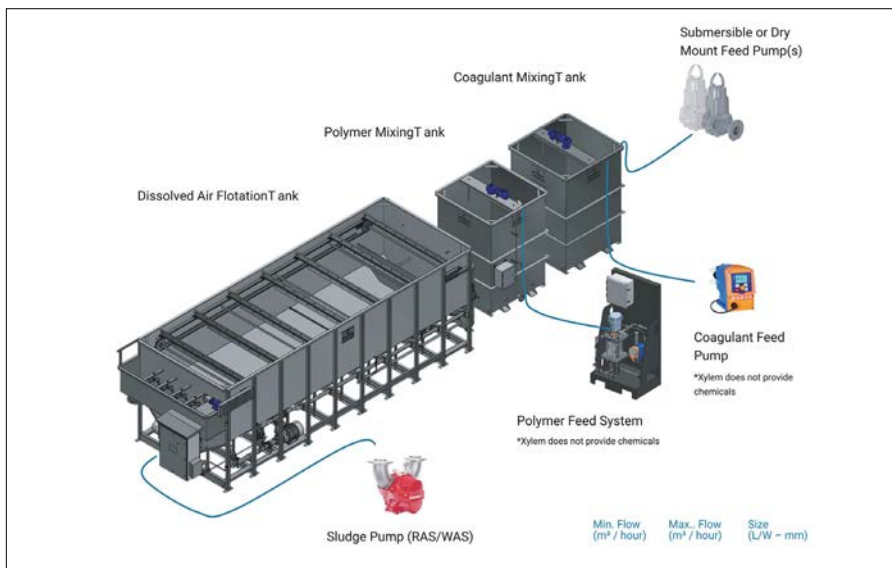
“Xylem Africa and its partners can deliver permanent and rental DAF solutions, calibrated to a customer's specific requirements and operations,” says Mistry.

Xylem's expert staff and experienced partners customise each solution as required. “We deliver and manage components such as mixer tanks, weir tanks, pumps and conveyors, as well as catwalks and accessories. Our skilled technicians can support on-site staff or run the process on behalf of our customers,” Mistry notes.

Water is humanity's most essential resource. As water stress and costs increase, organisations are intensifying their strategies to ensure supply and compliance. For many, though, this prospect was out of reach due to the cost and cumbersome ownership requirements of industrialised water treatment options.

Backed by Xylem's engineering expertise and service capabilities, dissolved air flotation offers flexible, resilient options for wastewater pretreatment and reuse within integrated water management strategies.

<https://www.xylem.com/en-za/>



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Supporting smarter conservation for SA's Metros

With limited new water sources available, metros are being forced to prioritise conservation, efficiency and real time monitoring to stretch existing supplies. This is where VEGA's advanced instrumentation plays a critical role.

South Africa entered Water Week with a stark reminder: the country is running out of water. As a semi arid nation with 98% of its available water resources already allocated, the margin for error is shrinking fast. Climate change, rapid urbanisation, ageing infrastructure, and escalating demand are placing unprecedented pressure on water boards and metropolitan municipalities. To build resilience, South Africa must accelerate the adoption of smarter, data driven water management strategies, and this is where VEGA's advanced instrumentation plays a critical role.

A system under strain

South Africa's water scarcity is structural, not seasonal. Rainfall is highly variable, with the east receiving significantly more precipitation than the arid west. This uneven distribution places enormous pressure on inter basin transfers and storage systems.

Compounding the challenge is the deterioration of water infrastructure. Wetland degradation, siltation of dams, and declining yields from surface and groundwater systems are reducing the supply. At the same time, demand continues to rise due to population growth, economic expansion, and changing consumption patterns.

The Department of Water and Sanitation's (DWS) latest reporting highlights that water losses and inefficient use remain among the biggest threats to national water security. Non revenue water – lost through leaks, bursts, and metering inaccuracies – remains critically high in many municipalities.

Where the crisis is most visible is in South Africa's largest metros – Johannesburg, Tshwane, Ekurhuleni, Cape Town, eThekweni, Nelson Mandela Bay, and Mangaung – face unique but interconnected water challenges.

- Ageing infrastructure and high water losses in many metros are the result of operating with decades old pipelines, reservoirs and pump stations. Leaks and bursts are frequent, and without accurate level and pressure monitoring, early detection is difficult.
- Rapid urbanisation in cities such as Johannesburg and Cape Town continues to fuel rapid growth, making it impossible for infrastructure upgrades to keep pace with demand. This creates ever-increasing pressure on bulk water supply systems.
- Climate variability: If anything, Cape Town's 'Day Zero' crisis demonstrated how quickly a metro can reach the brink. Meanwhile, Gauteng

relies heavily on the Vaal River System, which is under increasing stress.

- Limited new water sources: With nearly all available water already allocated, metros are being forced to prioritise conservation, efficiency and real time monitoring to stretch existing supplies.

Conservation strategies for a thirsty nation

To ensure the long-term availability of water, metropolitan areas and water boards across South Africa are focusing on several strategic priorities. Reducing non-revenue water stands at the forefront, with accurate measurement playing a crucial role in identifying leaks, monitoring pressure zones, and effectively managing reservoir levels.

Enhancing real-time monitoring is another key focus, as continuous data on water flows, pressures and storage volumes enable proactive maintenance and a quicker response to system failures.

Additionally, optimising treatment and distribution processes is vital. By improving process control, municipalities can minimise waste, reduce energy use, and prevent excessive chemical use. Protecting strategic water source areas is also a high priority, given that these regions supply a significant portion of the country's water; thus, their careful monitoring and conservation are essential.

There is also a renewed emphasis on strengthening infrastructure investment. Public-sector spending on water infrastructure is on the rise once again, reflecting a renewed commitment to building resilience and securing sustainable water supplies for the future.

Instrumentation that protects every drop

VEGA's instrumentation is engineered for accuracy, reliability and long term performance, all qualities essential for water boards and municipalities facing mounting operational pressures.

- Smart level measurement for reservoirs and bulk storage: VEGA's radar sensors,

such as the VEGAPULS 6X, provide non contact, maintenance free level measurement unaffected by condensation, foam or temperature fluctuations. This ensures accurate reservoir monitoring, enabling better demand forecasting and reducing overflows.

- Pressure monitoring for leak detection and network stability: VEGABAR pressure transmitters help utilities maintain stable pressure zones. Sudden pressure drops or spikes can indicate leaks or bursts—early detection saves millions of litres.
- Optimised treatment plant performance: From sedimentation tanks to chemical dosing systems, VEGA's sensors support precise process control, reducing waste and improving treatment efficiency.
- Monitoring of strategic water source areas and dams: Long range radar technology enables safe, accurate monitoring of dam levels, river flows, and catchment behaviour, which is critical for drought planning and flood mitigation.
- Digital integration for smarter water management: VEGA's instruments integrate seamlessly with SCADA and IoT platforms, giving water boards real time visibility across their networks.

Technology as a cornerstone of water security

As South Africa confronts intensifying water scarcity, conservation is no longer optional; it is a national imperative. The country's metros and water boards need reliable, high precision data to manage every drop of water. VEGA's advanced level and pressure measurement technologies provide the accuracy, durability and intelligence required to build a more resilient water future.

During Water Week, the message was clear: saving water starts with knowing what water you have, and VEGA is ready to help South Africa measure what matters.

<https://www.vega.com/en-za>



From sedimentation tanks to chemical dosing systems, VEGA's sensors support precise process control, reducing waste and improving treatment efficiency.

Local pump stockholding redefines rapid dewatering

Local pump stockholding has become a critical advantage in responding to extreme weather and flooding, enabling rapid deployment of dewatering solutions when mining and infrastructure operations are under pressure. Integrated Pump Technology's managing director, Jordan Marsh, explains.



Left: Integrated Pump Technology enables immediate mobilisation of dewatering solutions through its local pump stockholding, ensuring rapid response.

Right: With substantial in-country inventory, Integrated Pump Technology enables mines to move quickly from site assessment to full pump deployment.

As climate volatility increases across southern Africa, the ability to deploy dewatering solutions rapidly has become a defining factor in how mining and infrastructure operations manage risk. Flooding events are no longer isolated anomalies; they are recurring disruptions that demand immediate, well-coordinated responses. In this environment, local pump stockholding is emerging as a critical operational advantage rather than a logistical convenience.

While many suppliers in the region offer dewatering equipment, the real differentiator lies in the ability to mobilise solutions immediately. This is where Integrated Pump Technology has built a distinct market position. By maintaining a substantial local stock of both electrical submersible pumps and diesel-driven pump units, the company can respond decisively when operations are under pressure due to sudden water ingress.

"In a flood or extreme rainfall event, time is the most critical factor," Jordan Marsh, Managing Director of Integrated Pump Technology, says. "Waiting weeks for equipment to be imported simply isn't an option when safety, production and infrastructure are at risk. Having the right pumps available locally allows us to move from assessment to deployment almost immediately."

Local stockholding enables more than speed alone. It also allows pumping systems to be selected and configured based on real site conditions rather than availability constraints. Integrated Pump Technology combines its inventory with application-specific technical expertise, ensuring that the chosen solution is fit for purpose, whether the requirement is high-head underground dewatering, open-pit flood recovery, or temporary infrastructure



By maintaining ready access to both electric submersible and diesel-driven units, Integrated Pump Technology reduces costly downtime during emergencies involving water ingress.

protection.

Electrical submersible pumps from Grindex play a central role in this strategy. Designed for continuous operation in abrasive and demanding environments, these pumps are commonly deployed in underground workings, sumps and confined areas where rapid installation and reliability are essential. Their off-the-shelf availability allows mines to stabilise conditions quickly and transition from emergency response to controlled water management.

Equally important are diesel-driven, self-priming pumps from Godwin, which remain indispensable where power supply is limited, unreliable or compromised during extreme weather events.

Integrated Pump Technology's in-house capability to engineer and assemble diesel pump

sets locally further strengthens its ability to deliver tailored solutions at short notice, even in remote or high-risk locations.

Beyond equipment, local stockholding and a strategically situated distributor network underpin effective aftermarket support and rapid response. With pumps, spares and technical expertise based within South Africa, Integrated Pump Technology can support installations, troubleshoot issues and scale capacity as conditions evolve.

"As weather-related disruptions become more frequent, dewatering has to be treated as a core operational discipline," Marsh concludes. "Local availability, technical insight and rapid deployment capability are what ultimately protect continuity, safety and productivity."

www.pump-technology.com

G-Chem Aquacare and Odyssee improve water treatment in hospitals



Xavier Labeille, export director for Odyssee Environnement and Adrian Estcourt, technical boiler specialist for G-Chem Aquacare.

A groundbreaking initiative called the FASEP ODYAFRICA Project, supported by the French government through the FASEP Programme (Fonds d'Études et d'Aide au Secteur Privé) and led by Odyssee Environnement, a French industrial water treatment company specialising in hydroethical, sustainable industrial water technology and chemistry solutions, is investing more than €500 000, approximately R9.6-million, to improve water treatment in Free State hospitals.

The project represents the first deployment of Odyssee Environnement's monitoring technologies in South Africa, combining the company's advanced water treatment solutions with strong local implementation partner G-Chem Aquacare, and institutional collaboration with the Free State public healthcare sector.

Local industrial boiler water treatment specialist, G-Chem Aquacare, is partnering with global specialists Odyssee Environnement to improve water, energy and carbon efficiency within Free State hospitals.

Local hospitals rely heavily on water-intensive systems, including cooling towers, steam boilers and heating infrastructure, which must be carefully managed. Without correct water treatment and monitoring, scale formation, corrosion and microbiological growth cause infrastructure failure: compromising hygiene, energy efficiency, water consumption, budgets and safety.

According to G-Chem Aquacare's CEO Shaun Golding, South African hospitals traditionally use manual monitoring and water treatment: "The Odyssee project is data-driven and automated. Specialised monitoring equipment, sensors and smart metering will track key metrics such as water consumption, steam production and system performance in real-time," Golding explains, adding that flow meters and other instrumentation feed data into a remote monitoring platform, allowing stakeholders to identify inefficiencies and optimise system operation.

After installation and commissioning, the project will begin with a six-month baseline period using traditional water-treatment chemistry. From December, this will transition to Odyssee film-forming amine (FFA) technology.

"FFA forms a protective molecular film

on internal system surfaces, improving heat transfer efficiency while significantly reducing corrosion, scaling and energy losses. During the remaining 18 months, the project team will demonstrate the benefits of the French film-forming technology in day-to-day hospital environments," Golding advises.

A partnership built on technical expertise

G-Chem Aquacare's relationship with Odyssee Environnement dates back to 2018. "From the very beginning, they demonstrated strong technical expertise, a high level of operational discipline, and a clear alignment with our hydroethical approach to water treatment. Together with their local knowledge and reliability, this made G-Chem Aquacare an obvious choice for this project," explains Xavier Labeille, Export Director of Odyssee Environnement.

Early groundwork for the current project began in 2023-2024, with a preliminary site survey at various Free State hospitals. A formal joint site visit by both the French and South African project teams followed in September 2025.

The choice of the healthcare sector was driven by Labeille: "This decision aligns with the FASEP programme requirements, which are dedicated to public sector projects. Hospitals represent a fully public, structured and accessible environment. In addition, Odyssee Environnement has strong operational experience within hospitals in France, making this sector both relevant and technically controlled for deploying advanced monitoring technologies and chemical solutions," he advises.

Golding explains that the Free State healthcare environment also presents a diverse mix of infrastructure and operational conditions. Initially, five hospitals were identified as potential participants. Detailed site inspections finally short-listed three, each representing a different operational scenario.

At the primary site, Universitas Academic Hospital in Bloemfontein, the full suite of monitoring and optimisation technologies will be installed across its



G-Chem Aquacare and Odyssee project team members on a Free State hospital site during the pre-selection visit in 2025.

boiler, cooling tower and closed-loop systems. This includes advanced sensors, specialised monitoring equipment and smart metering to demonstrate the technology's full capabilities.

The secondary site, Pelonomi hospital in Bloemfontein, will receive a streamlined version with fewer monitoring devices and a simplified equipment set-up. This will demonstrate that while advanced monitoring can enhance performance, significant improvements can still be achieved through the chemistry programme, particularly by applying the film-forming technology developed by Odyssee Environnement.

At the Central/Regional Laundry, the third site, the partners will focus on the laundry steam boiler system, which represents another important area of energy and water consumption within the healthcare sector.

G-Chem Aquacare: the local partner

As the local implementation, technical and operational partner, G-Chem Aquacare will play a vital role in the long-term success of the project. Responsibilities include on-site technical implementation of treatment programmes, system optimi-

sation and operational support, monitoring and performance validation, training of local maintenance teams and ongoing technical collaboration with Odyssee Environnement.

"We understand the operational realities within South African healthcare facilities. Through our local technical teams and service infrastructure, we can provide on-the-ground support, regular monitoring and rapid response," Golding observes.

The project emphasises knowledge transfer and capacity-building, ensuring that local teams are equipped to sustain improvements. G-Chem Aquacare will therefore liaise with hospital technical teams, engineers, facility managers and maintenance staff.

Training will focus on the correct operation of the monitoring equipment, the interpretation of system data, and the management of the water treatment programme. In addition, G-Chem Aquacare will provide ongoing technical support through regular site visits, performance reviews and remote monitoring of system data.

Scalable and sustainable

Labeille points out that this project dem-

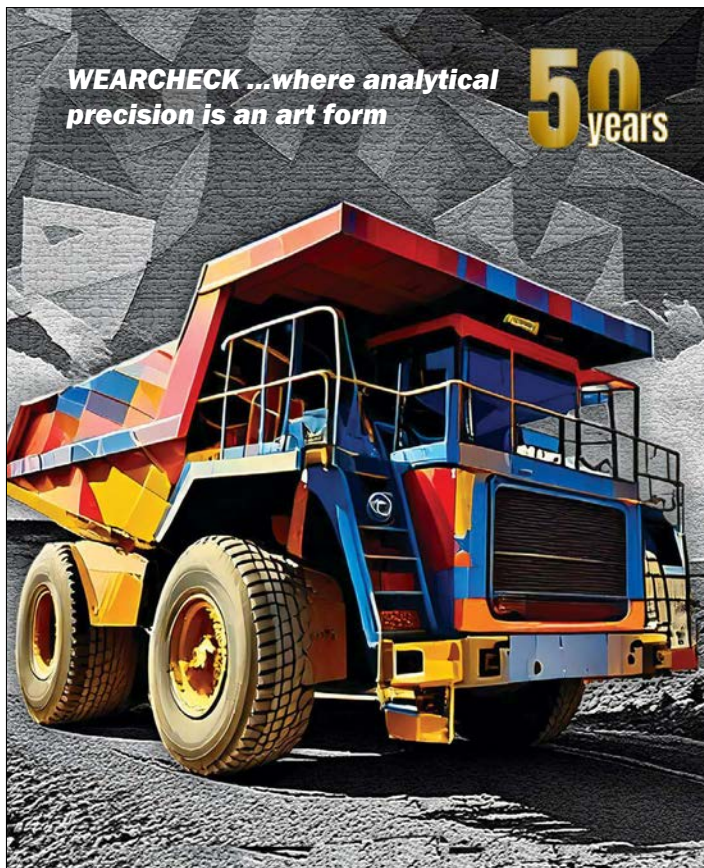
onstrates water, energy and environmental performance: "Our objective is to establish a replicable model that can be deployed across Africa's institutional and industrial infrastructure. The goal is to deliver measurable results and enable scalable, sustainable water management solutions," he says.

For Golding, the project reflects G-Chem Aquacare's ongoing commitment to partnering with global technology leaders: "We are proud to contribute to a project which not only improves operational performance but also supports the broader goals of environmental stewardship and responsible resource management," he notes.

Technical events and workshops hosted in collaboration with universities, energy management specialists and other industry stakeholders will share the project's objectives, progress and successes.

"We already consider G-Chem Aquacare as our strategic partner in South Africa. This project strengthens our collaboration and creates a solid foundation for further joint development across the public and industrial sectors," Labeille concludes.

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Oil Analysis and corrective action: an investment that pays



Shesby Chabaya, head of operations for WearCheck in Zimbabwe, investigates the reasons behind an organisation's inability to achieve cost savings from oil analysis and how to optimise their operational cost savings by responding promptly to the outcomes of oil analysis reports.

Many organisations conducting oil analysis face the challenge of maximising operational cost savings while under pressure to achieve full production and enhance shareholder value. Oil analysis provides a means to achieve the end goal – a positive payback and overall cost savings. However, this is not a given. An organisation may or may not achieve the intended benefits for several reasons, chief among them the failure to implement a sound corrective action strategy.

The oil-analysis cycle

To achieve financial savings, organisations must implement an effective oil analysis programme and conduct periodic audits to ensure processes are followed. This begins with regular, systematic oil sampling to generate data that support informed decision-making. The oil analysis or cost-savings cycle is iterative and can be detailed as shown in Figure 1:

When oil sampling is done on a regular and systematic basis, problems are identified and reported by the laboratory, equipment is scheduled for troubleshooting and investigation, and corrective action addressing the root cause is implemented, guided by the laboratory's response time. This results in performance improvements and cost savings. A check sample is taken to confirm improvement, and the process keeps repeating as machine operating hours increase.

Often, corrective action is taken, but the problem persists. The key is in addressing the root cause of the identified problem. The KPIs shown in Figure 2 can be utilised to track the effectiveness of corrective action taken or the lack thereof.

The Big Picture Principle

It is not enough to focus solely on reacting to individual oil sample results, even though this contributes immensely to overall cost savings. The big-picture principle must be applied on an ongoing basis, with the maintenance engi-

neer or manager taking a strategic approach. This entails examining the overall context; trending results month by month and year by year; and looking at long-term outcomes and indicators; prioritising critical issues; and focusing on solutions to identify fleet or plant problems, adaptability and sustainability.

Some of the key questions are:

- Is this problem affecting this component only or the entire fleet or plant?
- Is it affecting a specific make & model of plant equipment?
- Is it affecting how a plant operates in a specific operating environment?
- Is it affected by changes in load or intensity of operation?
- Is it affecting equipment operated by a specific operator?
- Are all operational systems adaptable and responsive to current needs or indicators?

WearCheck can assist customers in managing and optimising their oil analysis programmes through comprehensive KPI reports that distil key data such as severity trends, repeat problems, component or fleet-level problem patterns and data-quality issues into clear, actionable insights that assist with reliability improvement and root cause analysis. These tailored reports form part of WearCheck's management-support offering and are available as an optional service upon request.

What cost savings are NOT!

In a recent study, we examined a year's worth of oil analysis data across all components on a mobile plant for a company in the manufacturing industry. This included engines, transmissions, hydraulic systems and axles. The findings were as follows:

- 46% of the annual oil samples extracted triggered alarms (Ratio almost 1:2).
- 28% of the total annual problems or alarms were repeat issues.
- 1 in every 3 alarms represented a repeat problem.

One in every two oil sample results is an alarm, and the total number of alarms was 27% above the target set for the year. The percentage of repeat problems is significant,

indicating that it is the key driver of accumulated annual alarms/overall problematic oil samples. These statistics are unacceptable, and the programme can be described as uneconomical.

A recurring problem is a pointer to a slow response to alarms, or to the fact that the corrective action implemented did not address the root cause. Alternatively, it is simply indicative of the absence of corrective action. We decided to test this assertion further by examining the level of feedback, and the findings were as follows:

- The annual percentage of samples that resulted in feedback was 28%.
- The average number of days for feedback to be submitted following an analysis was 186 days, and in some cases, following reports requiring feedback, there were over 300 days without a response.

This clearly indicates a poor responsiveness to the alarms highlighted by oil analysis.

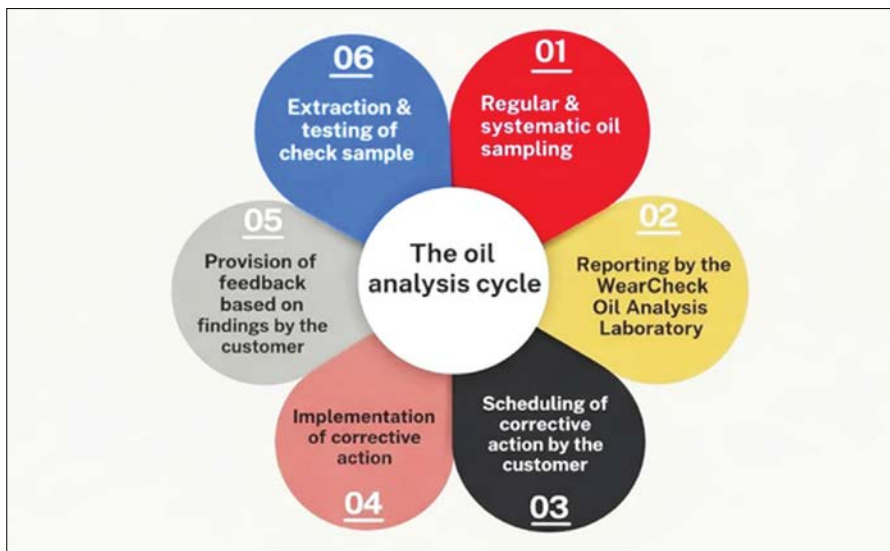
Given these findings, it is apparent that a large percentage of alarms went unresolved, resulting in fault repeats and potential cost savings lost. Identified problems continued to recur, exposing the fleet to the risk of catastrophic failure, a situation which would negatively impact productivity.

Sound corrective action at the heart

Just as a snowball rolling down a slope will pick up more snow on its way and grow bigger, a regular study of oil analysis data over two decades has revealed that small, identified problems, if not resolved early, will grow into much larger and more complex challenges over time. The identified problem keeps recurring and worsening, often to the point of component failure.

The longer one waits or procrastinates before addressing a problem, the higher the likelihood that it will not be addressed, exposing the plant to the risk of component failure, expensive repairs and lost production.

In a subsequent study, we examined whether there was a correlation among low feedback levels, fault repeats, component



The Oil Analysis Cycle begins with regular, systematic oil sampling that generates data to support informed decision-making.

failures, and component changes, among other factors. We discovered a direct link between changes in oil-wetted components and repeated faults in oil analysis. The components being repaired had a history of repeated contamination and wear issues.

There was also a common pattern observed with the third consecutive fault occurrences. In areas of high operational intensity, three out of four components with fault repeats either underwent a part change on the third occurrence or a complete component change.

In areas of low operational intensity, repeated part changes were common. Table 1 highlights this trend, showing the history from normal to severe status for a Fleet DO1 Transmission component. Borderline status in month three led to further deterioration in months four and five, with resultant component failure three months after the water-contamination problem was first discovered.

This aligns with this key principle: 'Oil analysis helps the most if you pick up a problem and address it at its onset'.

We also noticed that this phenomenon of excessive fault repeats was associated with over-expenditure. 'We have overshot our budget' was a common refrain during feedback sessions. Components end up running to failure, reminiscent of the Black Swan Effect, where unpredictable events are explained in hindsight, but with severe consequences that often affect an entire production line.

New equipment purchase costs were found to exceed US\$ 500,000 and, in some cases, running above US\$ 1 million, depending on machine type, brand, size, application and other factors. We realised that, by year five, substantial component changes that increased the average cost of equipment ownership meant the equipment was still not able to reach its full expected life.

The above scenario provides a compelling

case for every organisation that has decided to embark on an oil analysis programme to put in place and relentlessly enforce systems that enhance effectiveness and efficiency, guided by the vision to achieve cost savings.

Every alarm presents an opportunity to save. It therefore follows that if an organisation is to reap the benefits of investing in an oil analysis programme, a sound corrective-action strategy must be at the heart of the maintenance system.

What cost savings are: a forklift differential case study

To demonstrate what cost savings are available, we examined a case study from Delta Transport Services, the Transport and Logistics arm of Delta Corporation Limited, a leading beverage-manufacturing company in Southern Africa that has been implementing the oil analysis programme for the past twenty-five years:

A scheduled oil sample was extracted from a forklift differential. The WearCheck laboratory detected and urgently reported critical water contamination at 4.1%. The workshop responded quickly by replacing the defective breather. The results of the two subsequent oil tests showed that the issue had vanished, indicating that the problem's underlying cause had been identified and fixed. The history tracking report illustrates this improvement.

If the issue hadn't been resolved promptly, the organisation might have suffered a premature differential failure, costing it anywhere from US\$2 500 to US\$9 000 in repairs or component replacement expenses, not to mention the cost of lost productivity and downtime.

If this had been a CAT 797 mining dump truck, this same solution could have saved US\$100 000 on a differential overhaul. The team's good responsiveness significantly reduced the risk of failure, thereby improving forklift availability and reliability. This

approach has been utilised across the entire fleet at Delta Transport Services, resulting in significant cost savings and enabling Delta's forklifts to operate for 18-21 operational hours per day.

Delta Transport Services Technical Manager, Mr Tavonga Gwatidzo, had this to say: "Well done to the team for upholding systems and maintaining a good level of responsiveness to the alerts by WearCheck. The WearCheck tribology programme has assisted Delta Transport to maintain a reliable, healthy and highly productive fleet. We have achieved up to 30 000 forklift operational hours, exceeding the target of 18 000 hours. We believe that the effective implementation of the oil analysis and condition monitoring programme is contributing significantly to this level of success. Thank you to Team WearCheck for the partnership."

Kennedy Kashangura, Delta Transport Services National Operations Executive, added: "Our two key KPIs – oil sampling compliance and corrective action response rate – help us to maximise operational cost savings and keep productivity high. With an average fleet availability of 98.8%, we can deliver our products on time, ensuring high customer satisfaction. Our systems are standardised throughout all our operations around the country, with WearCheck at the heart of our maintenance systems."

In reality, time, resources and production pressure are always constraints. From WearCheck's perspective, feedback is critical. To ensure full team participation in the continuous improvement process and boost cost savings, we encourage the implementation of a four-pronged actions-and-feedback approach as follows:

- This is what I found as the root cause of the problem.
- This is what I did to address the root cause of the problem.
- These are the further challenges or risks I have observed.
- Given more time, this is what I would do.

Gaining maximum return on investment from a good condition monitoring programme requires leadership with a strong business culture, cultivating a positive work ethic and a winning mentality across the team, leading to ultimate cost savings.

Oil analysis is not an event; it is a process involving the accumulation of many tiny actions that can result in a Domino Effect – where one event triggers a chain of related events. Small, consistent corrective actions in oil analysis will lead to significant outcomes, including substantial cost savings and full asset utilisation.

These wins are evident in individual improvements that accumulate over time.

<https://www.wearcheck.co.za/>

Babcock delivers fast-tracked refinery boiler upgrade project

As South African refineries continue to modernise ageing infrastructure to improve environmental compliance and operational reliability, the ability to execute complex boiler modifications within constrained outage windows has become increasingly important.



Babcock recently completed a fast-tracked industrial boiler upgrade project at a major South African refinery.

Babcock recently completed a fast-tracked industrial boiler upgrade project at a major South African refinery, supporting the facility's broader programme to enhance plant performance and meet statutory emissions requirements. Despite the complexity created by overlapping project phases and a compressed delivery schedule, the project achieved mechanical completion and commissioning within the revised outage programme.

The project demonstrates Babcock's capability to execute technically complex retrofit work within operating refinery environments while maintaining strong safety performance and schedule certainty.

Supporting performance and environmental compliance

The upgrade was part of the operator's ongoing programme to enhance plant reliability and environmental compliance through targeted infrastructure upgrades.

The project required modification of an existing boiler to enable the full routing and treatment of the flue gas stream, ensuring compliance with statutory emission limits while improving plant utilisation.

According to Puvorn Pillay, Project

Manager at Babcock, the project represented a critical intervention to ensure both regulatory compliance and operational continuity within a live refinery environment. "Execution had to take place where safety, schedule certainty and operational integration were critical, requiring close coordination across engineering, procurement and construction teams," he explains.

Pillay led the project through engineering, procurement, construction and commissioning within this complex operating environment.

Complexity and fast-tracked delivery

The project was executed under a dual-contract structure, with detailed engineering awarded separately from procurement and construction. While commercially necessary, this created a fast-tracked execution environment in which engineering maturity, procurement placement and construction readiness progressed in parallel rather than sequentially.

"As a result, downstream activities were highly sensitive to design development, vendor inputs and approval cycles, introducing integration and delivery risks early in execution," says Pillay.

To address this, the project team focused on stabilising execution across initially misaligned interfaces. This required a shift from discipline-based progress measurement towards integrated delivery planning, ensuring engineering outputs were continuously evaluated against procurement and construction readiness rather than measured in isolation.

Adaptive execution

As engineering progressed, several critical work packages experienced delays due to evolving validation requirements and extended approval processes. Rather than allowing these challenges to impact outage readiness, the project team implemented an adaptive execution approach focused on maintaining delivery momentum.

"Given the aggressive overlap between engineering, procurement and construction phases, we had to adopt an iterative execution approach that allowed solutions to be developed dynamically. Strong integration between engineering, project management and construction teams was central to this," Pillay explains.

Construction sequencing was continuously reassessed, enabling progressive advancement of work fronts as materials became available. Piping, ducting and structural installations were executed in phases, while independent activities were accelerated to maintain productivity.

Coordination: critical to delivery

Close coordination between engineering, procurement, construction and subcontract teams played a key role in maintaining delivery certainty. Scenario planning and proactive risk management enabled the project team to maintain progress while preserving safety and quality standards within a congested refinery outage environment.

Stakeholder management also proved important. The evolving scope required disciplined change management while maintaining collaborative relationships with the client and operational teams.

By ensuring transparency in technical decision-making and aligning discussions with project outcomes, the team managed

scope growth without disrupting execution.

“Credit must go to the client for the collaborative approach adopted throughout execution. This was a critical success factor in a fast-tracked project where compressed timelines and parallel workstreams required rapid, joint decision-making,” says Pillay.

Despite early schedule pressures and execution complexity, the project achieved mechanical completion within the revised outage programme and progressed successfully through commissioning.

Safety performance remained a key focus throughout construction, with the project achieving:

- Zero Lost Time Injuries.
- Full compliance with refinery safety systems.
- Successful quality validation of all modifications.

The outcome reflects disciplined planning, strong coordination and adaptive execution under challenging delivery conditions.

Lessons from execution

According to Pillay, one of the key organ-

isational lessons from the project is the importance of focused integration management. “Projects executed under overlapping EPC structures require strong integration between engineering, procurement and construction planning from the outset,” he notes.

The project also reinforced the importance of aligning contracting strategies with execution realities and maintaining flexibility within delivery teams. “Beyond the immediate delivery results, this work strengthened our organisational capability in managing fast-tracked delivery environments and reinforced the importance of tightly linking engineering maturity to downstream execution readiness,” he adds.

The successful delivery of the project highlights Babcock’s capability to execute complex boiler modifications and retrofit work in live refinery environments. The project reflects the company’s broader capability in supporting industrial customers through lifecycle asset support, performance upgrades and environmental compliance improvements.



The project also reinforced the importance of aligning contracting strategies with execution realities and maintaining flexibility within delivery teams.

As refineries and petrochemical operators continue to modernise infrastructure to meet environmental and operational requirements, demand is expected to grow for engineering partners capable of executing complex brownfield modifications within operating plants.

Projects of this nature demonstrate the importance of integrated engineering execution, strong planning discipline and collaborative delivery models in achieving successful outcomes.

<https://www.babcock.co.za/>

Applying engineering discipline to restore milling plant reliability

Reliability of coal milling plants remains a critical determinant of performance in coal-fired steam generation facilities. However, many ageing installations continue to experience recurring failures driven by structural degradation, alignment deficiencies and historically reactive maintenance strategies.

Experience at Babcock demonstrates that engineering-led rehabilitation programmes can restore milling plant stability without the significant capital investment required for a full mill replacement.

When Babcock assumed long-term maintenance responsibility for a site’s large steam generation milling plants, baseline conditions included accumulated service backlogs, compromised system redundancy and maintenance programmes that had become largely reactive.

Operational data indicated frequent mill outages linked to high vibration levels, lubrication failures, pulverised fuel leakage and drivetrain failures. Engineering investigation showed that these failures were frequently symptoms rather than root causes.

Detailed inspections revealed several mechanical deficiencies contributing to recurring failures. Distorted gearbox baseplates, movement at holding-down bolts, inappropriate washer selection and the absence of epoxy resin locking all resulted in progressive misalignment during operation.

In addition, long-term oil and water contamination had reduced the stiffness of

certain concrete foundations, contributing to structural instability. Localised repair methods, including partial machining or grouting, were found to provide only temporary improvement.

To quantify mechanical conditions, Babcock applied advanced diagnostic methods, including 3D laser scanning and point cloud analysis.

These investigations identified several key contributors to instability:

- Non-level baseplates.
- Eccentric mill centre lines.
- Misaligned labyrinth seals.
- Inconsistent bolt configurations.
- Soft-foot conditions at gearbox interfaces.

These issues contributed directly to pulverised fuel leakage, hot primary air ingress and increased loading of couplings and bearings.

Engineering work focused on restoring the mill’s mechanical reference structure. Corrective actions included baseplate replacement, precision levelling, standardisation of holding-down interfaces and elimination of soft-foot conditions. Seal alignment corrections were also implemented to reduce PF leakage and thermal loading. All this corrective work was executed in accordance with OEM design requirements.

Following corrective engineering interventions, milling plant redundancy was restored, and vibration-related defects were

significantly reduced. Recurring gearbox, coupling and lubrication failures were largely eliminated, allowing maintenance execution to shift from reactive breakdown response toward planned maintenance programmes.

In addition to technical interventions, Babcock worked with plant personnel to transfer alignment capabilities, formalise preventive maintenance routines and improve spare component selection. This ensured that reliability improvements could be sustained within the plant’s own operational practices.

As many coal-fired power stations continue operating with ageing milling infrastructure, engineering-led rehabilitation programmes offer a practical alternative to full equipment replacement. Experience from these interventions shows that correcting structural and alignment deficiencies can significantly improve reliability while extending asset life.

<https://www.babcock.co.za/>



Experience at Babcock demonstrates that engineering-led rehabilitation programmes can restore milling plant stability without significant capital investment.

Ventilation and the electrification of underground mining

BBE's Russell Hattingh sees growing interest in using electric vehicles (EVs) in future underground mining: to meet increasingly stringent emissions requirements, improve efficiency and reduce ventilation demand. In this article, he highlights the need to thoroughly evaluate the benefits and consequences of transitioning to EV use.

“**A**cross the mining industry, the transition to electric vehicles (EVs) is becoming increasingly topical. While we are seeing growing interest on South African roads, there is similar interest towards EVs for underground mining, with trucks and load-haul dumpers (LHDs) being particularly interesting candidates to switch to electric drives,” begins Russell Hattingh.

“Interest in replacing diesel-powered equipment is driven largely by the potential health and cost benefits. With the increasing mechanisation of mining operations, the use of diesel-powered equipment has continued to grow. While diesel fleets offer many operational advantages, the products of combustion emitted from the exhaust present significant challenges. Diesel exhaust gases and diesel particulates, formed through the incomplete combustion of diesel fuel and commonly referred to as diesel particulate matter (DPM), pose a substantial health risk. Exposure to these emissions can result in overexposure to toxic gases and carcinogenic particulates, with long-term health implications.”

“Traditionally, exhaust gas fumes and particulates have been managed through dilution ventilation by increasing the air volumes supplied to the mine,” he explains.

To meet ever-tightening legislative requirements, underground miners using diesel

engines must invest in cleaner vehicles with higher Tier emission ratings and install diesel particulate filters (DPF) to keep combustion products out of the ventilation stream. They also now need to use higher-quality diesel with lower sulphur levels. “This shift is already happening, because mining companies care about the safety and long-term health of their workers,” says Hattingh.

“The bigger and more mechanised the operation becomes, the more mining owners need to care because, ultimately, it becomes material. Not only does it affect the health and productivity of underground miners, but it also requires more surface ventilation to handle dirtier air. If not captured or treated at the source, contaminants released into the mine ventilation system cannot be easily removed from the underground air stream. Instead, they must be diluted and exhausted from the mine, and the only way to do that is to increase ventilation levels,” he explains.

“More air means more shafts and tunnels and more fans. As more electricity is consumed, operational costs also increase, making the dilution approach an expensive solution for eliminating emissions. So the obvious first solution to look at is to improve the engines used underground, so they consume less fuel and produce less exhaust gas,” he argues.

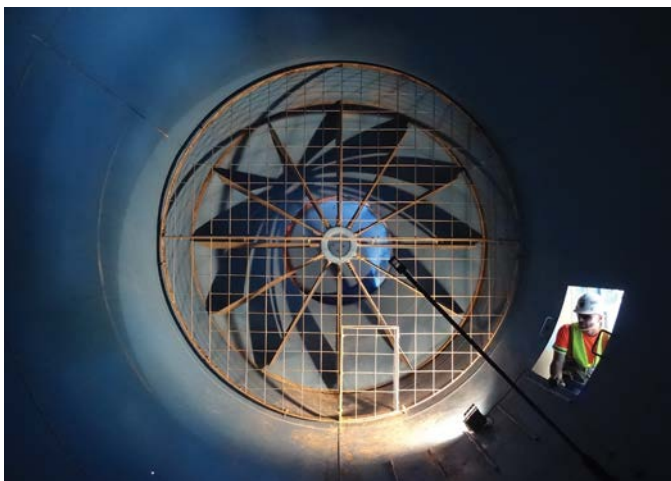
On transitioning to EVs, he says that a fleet



of underground mining machines is not a consumable that can easily be swapped out for a better option, though. “Investments typically target a 7 to 10-year life or, in lower-cost operations, longer. So long-term planning has to come into play when considering any switch, be it to more fuel and emissions-efficient engine options or phasing out all diesel vehicles as part of a long-term migration towards full electrification,” he tells MCA.

Challenges to electrification

Replacing an underground diesel fleet with electric vehicles is not a silver-bullet solution, Hattingh continues. “Electrification has its own issues. First off, an electric truck or LHD is still more expensive than a diesel equivalent. In addition, EVs need to be charged, so the charging infrastructure has to be carefully planned. You cannot bring these vehicles to the surface every evening to recharge them,



Left: Contaminants released into the mine ventilation system must be diluted and exhausted from the mine, and the only way to do that is to increase ventilation levels. **Right:** While EVs can reduce refrigeration demand compared with diesel fleets, the reduction is constrained by minimum air-velocity requirements, and the overall benefit depends strongly on the mining method.

so a dedicated charging station is needed underground. This requires additional electrical infrastructure with sufficient capacity to charge multiple vehicles simultaneously at the end of each shift.

“Additional batteries are also an option, which can speed up the turnaround time for charging a vehicle and reduce the number of EVs required. Either way, charging an EV is not nearly as quick as filling a diesel fuel tank. And while charging is getting faster, the faster the charge, the higher the heat rejection, which becomes a capacity factor for the ventilation system. The whole charging station has to be ventilated with careful consideration given to airflow management and exhaust air handling,” he says.

The potential risk associated with an EV battery fire must also be taken into account. Battery management systems monitor temperature and actively control charging rates to prevent overheating. A lot of time and effort has been put into these systems to prevent uncontrollable thermal runaway, which can occur if battery cells become critically overheated.

Once thermal runaway starts, however, it is extremely difficult to stop. “This causes a very high fire safety risk that has to be mitigated in underground EV battery charging stations. In the event of a battery fire at a

charging station, measures such as dedicated exhaust routes, compartmentalisation, suppression systems, or other emergency ventilation strategies are needed to prevent smoke and harmful gases from endangering miners.

“The large numbers of possibilities involved in mitigating these risks create engineering and infrastructure challenges, which all need to be factored into any evaluation of EV technology,” Russell Hattingh points out.

BBE transition evaluations

“What often drives these developments is legislation relating to DPM and NOx exposure, for example, and the drive to reduce these exposures is already underway in South Africa. The use of EVs has the potential to reduce many of these concerns. As a result, mine operators are working closely with OEMs to develop practical electric vehicle and battery charging solutions suited to the mining environment, to reduce significantly or potentially eliminate DPM and NOx exposure,” he continues.

In terms of direct operating costs, EVs are known to be more energy-efficient and generate less heat in the mine environment than diesel trucks and LHDs, so that long-term savings can be significant.

“Saving comes at a cost, though, largely in terms of the infrastructure changes required

and the capital investment in the EV fleet and the long-term cost equations obviously need to be favourable.

Ultimately, Hattingh believes that in time, this transition will definitely happen in some mines. Reducing exposure to mining personnel makes the underground environment safer and more comfortable. In addition, EVs can significantly reduce refrigeration demand compared with diesel fleets. However, the reduction in ventilation demand is often less pronounced because minimum air velocity requirements often govern airflow underground. As a result, the overall benefit depends strongly on the mining method. “This is particularly relevant in mechanised mining environments using large fleets of underground vehicles, typically where mining methods are used to mine thick ore body deposits.

“The benefit depends on many, many aspects, though, the mining method, how big the existing fleet is, dust loading, whether it's a greenfield or brownfield project, and much more.

“So, as one has to do with any displacement technology, we need to do our homework to see if it's worthwhile: in terms of cost benefits, miner safety, legislation, the environment and long-term mine sustainability,” concludes Russell Hattingh.

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Booyco HVAC systems drive safer, more productive operations

Brenton Spies of Booyco Engineering highlights the critical role of effective temperature control and air filtration in maintaining safe, comfortable cab environments for operators in construction, earthmoving and mining vehicles.



Brenton Spies, Managing Director of Booyco Engineering.

Maintaining safe and comfortable working conditions in the cabs of construction, earthmoving and mobile mining equipment is critical to both operator wellbeing and overall productivity. In demanding environments characterised by extreme temperatures, dust and airborne contaminants, effective climate control and air filtration systems are no longer optional; they are essential.

Booyco Engineering, a specialist in heating, ventilation and air conditioning (HVAC) systems for mobile equipment, continues to emphasise the importance of properly designed and maintained cab environments to support safe and efficient operations across industries.

Managing Director Brenton Spies explains that operators often spend long hours in machine cabs, exposed to fluctuating temperatures and harsh environmental conditions. "Without adequate temperature control, heat stress or excessive cold can impair concentration, increase fatigue and ultimately raise the risk of incidents on site," he says.

"Comfort in the cab directly affects operator performance," he continues. "When tempera-

tures are properly regulated, operators can remain focused and alert, which contributes to safer and more productive operations."

Equally important is the role of advanced air filtration. In industries such as mining and construction, airborne dust and particulates pose a significant health risk if not effectively managed. Poor air quality can lead to respiratory issues over time, reduce operators' overall working life, and cause long-term medical issues.

Booyco Engineering's HVAC systems are designed to address these challenges by maintaining optimal temperature ranges while continuously supplying clean, filtered air into the cab. By creating a pressurised environment, these systems help prevent dust ingress, protecting both the operator and sensitive onboard equipment.

Spies says that in addition to improving safety, well-maintained climate control systems can enhance equipment longevity. "Excessive heat and dust can negatively impact electronic components and control systems within the cab, leading to increased maintenance requirements and potential downtime."

As industries place greater emphasis on

health, safety and environmental standards, the expectations around operator working conditions continue to rise. Regulations and best practice guidelines are increasingly recognising the importance of air quality and temperature control in mobile equipment environments.

Booyco Engineering works closely with OEMs and end users to ensure that HVAC systems are fit for purpose, robust and capable of performing reliably in some of the harshest operating conditions. This includes solutions tailored for both surface and underground applications, where environmental challenges can differ significantly.

"Providing a controlled, clean and comfortable cab environment is not just about compliance: it is about protecting people and enabling them to perform at their best," Spies notes.

"By prioritising operator comfort through effective temperature control and air filtration, companies can reduce health risks, improve productivity and support safer operations across construction, earthmoving and mining sectors," he concludes.

<https://www.booyco.co.za/>



Left: From the factory floor to the field, every Booyco Engineering HVAC unit undergoes precision manufacturing and rigorous testing to ensure reliability.

Right: Engineered for extreme conditions, Booyco Engineering HVAC systems keep mining operations safe and productive, for both underground and on-surface applications.



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Wall-mount cooling for edge and small data rooms

Designed to run 24/7 in critical compute environments, the new Vertiv™ CoolPhase Wall delivers up to 60% greater airflow than traditional cooling systems.

Vertiv, a global leader in critical digital infrastructure, recently announced the launch of the Vertiv™ CoolPhase Wall, a space-saving, wall-mount cooling system designed for small IT spaces and edge environments. The system is designed to meet the needs of IT equipment, removing heat and enabling continuous operation while occupying zero floor space. Vertiv CoolPhase Wall is available now across Europe, the Middle East and Africa (EMEA).

As distributed computing becomes more critical to business operations, compact IT environments need high-quality thermal control designed for sensitive electronic systems. However, many are still using comfort cooling systems designed for human comfort rather than addressing the high sensible heat ratio (SHR) and higher airflow requirements of IT equipment. Vertiv CoolPhase Wall addresses this gap with a purpose-built system that provides the required SHR along with integrated monitoring and control capabilities

to protect equipment and enable 24/7 operational continuity.

Built for installation flexibility, the Vertiv CoolPhase Wall features a split system with an indoor wall-mounted cooling unit. The system delivers up to 60% more airflow than standard comfort cooling systems and leverages variable-speed compressors and fans to modulate cooling to match the heat load, improving energy efficiency and reducing operational costs.

Designed to handle thermal loads up to 11 kW, the Vertiv CoolPhase Wall is engineered to operate reliably in outdoor ambient temperatures ranging from -35 to 48 °C. The system features the Vertiv™ Liebert® iCOM™ operational control, which enables local configuration and supervision of key operating parameters. For extended visibility and remote access, the Vertiv CoolPhase Wall includes onboard remote communication capabilities that provide real-time alerts and operational status via a secure web interface.

The Vertiv™ CoolPhase Wall utilises R-32

Sam Bainborough,
EMEA vice
president of Vertiv's
Thermal Business
Unit.



refrigerant, a low-global warming potential (GWP) alternative that reduces environmental impact while maintaining thermal performance. This positions Vertiv ahead of evolving regulatory requirements, including the European Union's F-Gas regulations that restrict the use of high-GWP refrigerants. While many comfort cooling systems are still transitioning to lower-GWP options,

"As IT continues to expand into areas that were not originally intended for high-density electronics, the demand for adaptable and energy-efficient cooling solutions is increasing across EMEA," said Sam Bainborough, vice president, EMEA thermal business at Vertiv. "The Vertiv CoolPhase Wall continuous operations, enabling customers to maintain reliable, efficient thermal performance.

<https://www.vertiv.com/en-emea/>

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Photo: 56MWR surface refrigeration plant under construction, SA



Photo: 700kW Underground Fan Station



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Gauteng Foundry Training Centre revitalised

The Gauteng Foundry Training Centre (GFTC) – the only Quality Council for Trades and Occupations-accredited trade test facility and the only public facility in South Africa – is firing on all cylinders again after a period of scaling back some of its training endeavours due to post-COVID financial refocusing.

The GFTC was established in 2013 as a collaboration between the Gauteng Department of Economic Development; the South African Institute of Foundrymen; the Ekurhuleni East TVET College; the National Foundry Technology Network (NFTN); and the Department of Trade, Industry and Competition. It is administered by the CSIR (Council for Scientific and Industrial Research).

Training modules focus on pattern making, moulding and melting. These are crucial skills for the foundry sector, which is the backbone of the steel manufacturing industry. Sandy Majatladi, NFTN Manager, says, “Just looking at moulding, for example, it is the foundation of every casting process: if you get that wrong, the end cast product is compromised. Formalised and accredited skills in these areas that consider both the theory, including the processes, and the practical execution are an imperative to sound quality, competitive products.”

Errol Beling, Training Centre’s Head of the Occupational Programme, says the GFTC “maintains the standard as high as it should be, aligning with the general developmental and foundry needs of industry”.

All three focus areas have been accredited, and the Kwa Thema campus has seen 56 pattern makers, floor moulders and melters completing their training. They have been placed in companies for their work-based experience part of their training, and, since these are scarce skills, especially pattern making and moulding, most of the graduates have been absorbed into the industry.

While the Kwa Thema campus was selected as the venue for the GFTC due to its proximity to industries relying on foundries in Gauteng, course participants are sent by their companies for trade testing from as far as Cape Town, Port Elizabeth, Durban and Kimberley.

“We have had several people apply to do their recognition of prior learning (RPL) through the GFTC. They initially apply through the sector education and training authority for an RPL, who then refers them to us for a pre-assessment. If additional training is needed, we set that up for them. These are people who might have decades’ worth of practical foundry experience without formal training,” Beling continues.

He adds that age is not an issue. Young people start their training before employment, while the more established – the oldest participant thus far was 64 years old – polish their skills and benefit from the accreditation that, in turn, strengthens skills development, quality improvement and the competitiveness of the whole industry.

Industry support

Comments from Industry summarised the importance of skilled artisans and technicians in this field: “These trades are integral to South Africa’s economic drivers, particularly within the manufacturing and engineering sectors. Foundries form the foundation of numerous value chains, supplying essential castings for mining,

automotive and heavy-industry applications. Without skilled moulders, pattern makers and melters, the ability to produce accurate, high-quality castings diminishes, thus creating a ripple effect that weakens local manufacturing competitiveness and increases dependence on imports. The continuation of accredited apprenticeships and learnerships in these trades is essential for ensuring a future talent pipeline.”

These views are echoed by industry stakeholders, who emphasise that foundries play a critical role in job creation and occupy a unique position within the manufacturing sector. There is a continued demand for accredited training aligned with modern technologies and sustainable practices, with skills development seen as a key driver of



The inspection and finishing tables at the well-organised and modern Gauteng Foundry Technology College (GFTC).



Left: The GFTC's pattern-making shop: The college is introducing digitalisation, with employees moving from manual design to computer-aided design. **Middle:** A trainee doing sand preparation at the GFTC's foundry using a green sand mixer. **Right:** A motorised sieve shaker for sand testing and quality control.

employment and enterprise development across the value chain.

Just sign up

Majatladi explains that the reinvigoration and reinvestment in the GFTC are in response to the need for skilled artisans and technicians in these areas, as well as to positive feedback from companies that have either employed GFTC-trained apprentices or sent their employees for upskilling and accreditation.

The drive to train or upskill employees who are then also accredited and undergo an apprenticeship upon completion of their training is essential for the sustainability of the foundry sector, not to mention the benefit to the individuals, who leave the GFTC with proof of having gained vital formal skills.

"This is a service to foundries at no cost to them. Foundry managers just need to send their people for training to begin enjoying the many benefits of well-skilled artisans. We are also encouraging the youth to pursue careers in the foundry industry. It has been known as a dirty, dusty and risky career, but it is not anymore; technology has brought along many improvements."

What to look forward to

The GFTC is introducing digitalisation within the pattern-making field, where employees will move away from manual design to computer-aided design. "This will enable the foundries to align with state-of-the-art technologies that competitors are using globally. Business is moving faster, and for us to be efficient, we must align with industry norms. In addition to that, we're also adding foundry consumables knowledge, while ensuring that students receive relevant, adequate and practical training,

along with knowledge and familiarity with the personal protective equipment used during their practical work, which is critical for employee safety," Majatladi says.

"The foundries that are now in business are foundries with the right skills in place. Those are the foundries that have appointed highly skilled metallurgists, hence our drive for skills and upskilling of foundry employees across the foundry sector. Successful foundries appreciate the value of proper skills.

"As a result, our three-year focus starts with the right foundation. We are developing melters, moulders and pattern makers to ensure the basics are right from the start. The next phase will introduce machine learning, although we have already begun with some elements, to enable foundries to respond to and record real-time data. This is quite critical, especially in sectors such as automotive, where, when they encounter product-defect recalls, they can respond more quickly because production data is readily available, enabling problems to be eliminated faster and more accurately.

Research, development and innovation to aid rapid response are ongoing, with, among others, product simulation being introduced to identify potential defects in the casting, optimise the gating system, and cut costs by validating manufacturing feasibility before producing the actual part," continues Majatladi.

"We at the NFTN and the GFTC also understand that, for many foundries, their equipment is ageing and the cost of capital equipment is substantial. However, there are methods and processes in place that enable phased upgrades and integration.

"In addition, we are looking at helping foundries incorporate added value to castings. The majority of our foundries cast



Some of the GFTC's precision laboratory equipment: a Branson 1510 ultrasonic cleaner used to separate clay from sand grains in a sample, and an Ohaus Explorer precision balance for achieving an exact chemical composition of a melt.

and send the 'as-cast' product to the supplier or a third-tier supplier for machining. However, adding value to their own castings not only increases their product value but also eliminates defects and reduces turnaround times, because foundries can machine and inspect their products before releasing them from the facility. This also shortens lead times to market.

"We envision fully integrated production facilities with the necessary machining in place. This will be another big plus for localisation – keeping manufacturing in South Africa and not relying on imports, says Majatladi. "We expect this to snowball into employment creation because successful foundries are sure to have a consistent supply of orders to be filled," he concludes.

<https://www.foundry-planet.com/d/gftc-gauteng-foundry-training-center/>

Weir upgrades Eastern Cape heavy bay foundry



Coenie de Jager, Weir HBF manager of plant operations.



Alandré van Vuuren, Weir Integrated Supply Chain, director.

In the Eastern Cape port city of Gqeberha, Weir's Heavy Bay Foundry (HBF) is undergoing unprecedented expansion, establishing itself as a central manufacturing hub within the Group's global supply network.

The foundry produces large, high-performance cast components that are used in Weir's extensive range of pumps, screens

and crushers. Following major infrastructure and process upgrades, the facility has doubled its production capacity to meet rising demand from the global mining sector.

Coenie de Jager, Head of Operations at Weir HBF, notes that the foundry's installed capacity for heavy castings exceeding 500 kg has increased to 600 t, with further optimisation and investment expected to push this figure to as much as 1 000 t. "This expansion is driven by a series of targeted projects including casting pit extensions, melt shop upgrades and the integration of advanced pattern development systems," De Jager says. "Each of these initiatives is aimed at removing bottlenecks and enabling higher production throughput."

Weir HBF is among the few foundries in South Africa capable of producing exceptionally large castings up to 4x4 m. The installation of new four-tonne and six-tonne induction furnaces is currently in progress, with commissioning scheduled for early 2026. Complementing these are new heat-treatment furnaces, fettling booths and

automated grinding and paint booths, all nearing completion.

A major milestone in the foundry's evolution has been the acquisition of Xmecho Heavy Engineering, a fully equipped machining facility that significantly extends Weir HBF's capabilities. This addition allows the foundry to deliver a comprehensive end-to-end manufacturing solution. "We now machine components weighing up to 13 tonnes each, with hardness levels between 650 and 750 Brinell (HB) – a capability matched by very few facilities worldwide," De Jager says.

"By consolidating our operations into a vertically integrated manufacturing facility, we have gained full visibility and control over every stage of production," he says. "This allows us to strengthen delivery reliability and minimise dependence on external suppliers. With in-house capabilities spanning design, R&D, foundry, machining and assembly, supported by recent upgrades and process refinements, we are driving higher levels of efficiency, precision and



Weir HBF now has in-house capabilities spanning design, R&D, foundry and machining, driving higher levels of precision and quality.



Left: The new pattern development system enables Weir to serve a wider range of global markets. Right: The upgrades at Weir HBF enable faster turnaround times with exceptional, consistent quality.

product quality.

“The extension of the foundry’s casting pit has created additional space for casting-cooling, enabling higher production throughput,” De Jager explains. “At the same time, the melt shop is being upgraded with advanced technologies to support faster, more efficient melting cycles and reduce material transport times, while the new pattern development systems give us the flexibility to serve a wider range of global markets.”

He adds that alongside operational growth, sustainability remains a key focus.

“As we expand our capacity, we are also improving our environmental performance,” he says. “We are sourcing renewable power from regional solar and wind farms, wheeled through the Eskom grid and the Nelson Mandela Bay network.”

By mid-2026, one-third of Weir HBF’s total annual electricity consumption will be derived from renewable sources, with a target of 80% within the next five years. The facility is also advancing its circular economy initiatives by reclaiming and re-melting worn components from customers, significantly reducing waste and

resource use.

“The expansion also carries strong human-capital benefits,” De Jager continues. “It is creating new local employment opportunities, developing critical technical skills and reinforcing the regional supply chain.”

He adds that Weir HBF collaborates closely with the Nelson Mandela Bay Business Chamber to identify skilled tradespeople and participate in training and development programmes that uplift the local workforce.

www.global.weir



Upgrades at Weir HBF will increase casting capacity to 1 000 t/y while creating local employment and skills-development opportunities.

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30 MVA transformers for Botswana

LH Marthinusen (LHM), a division of ACTOM, is completing the manufacture of two 30 MVA transformers for a mining house in Botswana. The mine was facing several challenges with its existing power infrastructure, which was no longer able to meet the demands of increased production capacity and operational reliability.

Chris Thoka, Divisional Sales and Marketing Manager at LHM, explains that ageing equipment, coupled with the growing need for stable, high-capacity power to support critical mining operations, prompted the



LHM is about to deliver two 30 MVA transformers, engineered to handle high-voltage demand with exceptional reliability and efficiency, to a mining client in Botswana.

company to seek a more robust solution that could ensure uninterrupted performance and long-term efficiency.

“They conducted a competitive tender process to identify a supplier capable of meeting their stringent technical and operational requirements. LHM was ultimately selected after a comprehensive evaluation, a decision that reflects our strong reputation and proven expertise in delivering tailored, high-performance power solutions,” says Thoka.

“Our deep understanding of the unique operational challenges within the mining industry further strengthened the client’s confidence in our solution. Our ability to meet the required technical specifications, combined with our commitment to local support, after-sales service, and competitive pricing, positioned us as the preferred partner.”

The project required LHM to deliver two 30 MVA transformers, engineered to handle high-voltage demand with exceptional reliability and efficiency. The transformers needed to integrate seamlessly with the mine’s existing infrastructure, comply with stringent safety and environmental standards, and support long-term operational sustainability. In addition, the solution had to be delivered within a strict timeline to ensure alignment

with the company’s production targets.

“We are now in the final stages of manufacturing, with the transformers fully built and only a few minor tasks remaining before Factory Acceptance Testing (FAT). Our team is working closely with the mining house to ensure full alignment with their operational timelines,” says Thoka.

Initial site assessments and preparatory work have already begun, and the delivery and installation plan is scheduled to roll out in the coming weeks. While no significant challenges have arisen to date, LHM anticipates logistical complexities due to the site’s remote location.

“To mitigate this, we have implemented a robust supply chain protocol and are leveraging our local expertise to ensure smooth delivery and installation. Any future challenges will be managed through proactive communication and the support of our experienced project management team. At this stage, we do not foresee any issues that could impact the project’s successful completion,” he adds.

“Our sub-Saharan presence and deep industry expertise enable us to deliver tailored solutions that drive operational success while fostering long-term partnerships. We are proud to contribute to the growth and sustainability of the mining sector across the SADC region,” Thoka concludes.

<https://actom.co.za>

Knife-edge rollers for high-speed production

Polymer-component specialist manufacturer igus has developed a range of lubrication-free, long-life knife-edge rollers designed to improve product transfer between conveyor belts in high-speed production environments.

The company’s knife-edge rollers are specialised guide rollers for use at the transfer points between conveyor belts. They allow conveyor belts to wrap around a very small radius so that products can transfer smoothly from one belt to another with the smallest possible gap. This prevents snags and stops smaller items from dropping between conveyors.

Knife-edge rollers are commonly used in automated production lines, packaging equipment and food processing systems, where seamless and efficient product transfer is required for applications such as baked goods, packaged foods, small goods and sensitive electronics.

According to igus product specialist, Juan-Eric Davidtz, igus uses its world-renowned tribologically optimised polymer materials for the rollers, which deliver low-friction, lubrication-free operation while enabling extremely tight belt deflection. “Machine builders and conveyor

system designers rely on our knife-edge rollers to maintain consistent product flow while keeping conveyor layouts compact. The smaller the belt deflection radius, the smoother the transfer between conveyors, thereby improving production efficiency and reducing product losses.

“This is what sets igus knife-edge rollers apart, as our iglidur materials are engineered specifically for industrial motion applications and contain embedded solid lubricants. As a result, the rollers operate completely dry with no need for grease or oil lubrication,” he says.

Davidtz adds that the lubrication-free design prevents contamination, reduces maintenance and exponentially increases the longevity of the rollers, enabling them to be used in hygienically sensitive environments, such as pharmaceutical, engineering and food and beverage processing plants.

The igus knife-edge rollers are also tougher than steel alternatives. They offer higher wear resistance and lower friction, which allows them to operate smoothly in continuous-duty conveyor systems. Their polymer construction also provides good chemical resistance and corrosion pro-



Lubrication-free long-life knife-edge bearings are ideal for use at the transfer points between conveyor belts.

tection in chemical processes, while the lightweight design can reduce drive loads compared with conventional metal rollers.

With a broad selection of standard sizes and customised configurations, OEMs and machine builders can precisely match roller geometry and dimensions to their conveyor systems. “This is important in high-speed production environments where any reduction of downtime equates to improved profitability,” Davidtz concludes.

<https://www.igus.co.za/>



Metso opens new Cape Town Hub

Metso is expanding its global Bulk Material Handling (BMH) network by inaugurating a new regional hub in Cape Town, South Africa. The new centre delivers expanded engineering expertise and access to advanced automation technologies for bulk materials handling and port customers across the African region. The establishment of the hub marks another step in Metso's ongoing strategic journey to invest in bulk material-handling capabilities in key markets.

The Cape Town Hub strengthens Metso's leadership and deep customer connections across Southern Africa, supported by a strong and expanding installed base of Metso equipment. With a fully functioning, same-time-zone organisation, customers can expect faster technical support, quicker issue resolution, and greater alignment with operational needs.

Metso has been serving Transnet, South Africa's logistics infrastructure company responsible for the port, rail and pipeline network, for decades. "Bringing technical support closer to the operation is a practical step towards improving reliability and per-

formance, and this partnership with Metso enables us to do that in a more structured and sustainable way," says Jabu Mdaki, Chief Executive, Transnet Port Terminals.

"The African market is growing rapidly, and strengthening our regional presence is essential. Metso is well-recognised among the key companies in the region, reflecting our longstanding reputation and trusted partnerships within the local industry," says Ian Barnard, President, Africa Market Area, Metso.

A team of approximately 60 employees provides customers across Africa with comprehensive support covering lifecycle services, modernisations, and technical support. In addition to creating direct employment, Metso generates significant added value for the local economy by utilising the services of consultants, suppliers, and contractors.

The hub contributes to the development of regional industrial capabilities, particularly among young professionals, and supports skills growth across the local workforce. The investment strengthens the operating environment for Port Solutions in

South Africa and more broadly across the African region.

Backed by over a century of expertise and more than 8 000 bulk material handling installations globally, Metso stands at the forefront of the bulk material handling industry. This inauguration builds on Metso's global network and continued development for this industry, including the recent acquisition of MRA Automation to expand Metso's capabilities in advanced automation and digitalisation technologies. These capabilities will now be deployed in Africa, enabling customers to adopt digital tools that enhance reliability and optimise material handling performance.

Metso's bulk material handling offering includes railcar dumpers, apron feeders, belt feeders, conveyors, stackers, reclaimers, ship loaders and unloaders, cable belt conveyors, smart automation and more. Renowned by customers for its expertise in designing, supplying, and providing comprehensive products and services across the full lifecycle, Metso provides best-in-class solutions, purpose-built to address customers' evolving operational needs.

<https://www.metso.com/>

Werner Pumps invests in advanced machining



Werner Pumps' new 5-axis CNC machine enables highly precise machining of complex components from a single block of material in a single, integrated process.

Werner Pumps has expanded its manufacturing capability with the addition of a new 5-axis CNC machine, a strategic investment aimed at improving production efficiency, reducing reliance on imported components, and strengthening local engineering capacity.

MD Sebastian Werner says the move forms part of the company's broader commitment to building resilient, locally driven manufacturing systems in South Africa, particularly in sectors where long lead times and supply constraints can impact service delivery. "A 5-axis CNC machine enables highly precise machining of complex components from a single block of material in a single, integrated process," Werner explains.

For Werner Pumps, this capability addresses a longstanding industry challenge: sourcing specialised parts with long or unpredictable lead times. Normally, he says, some items would be very difficult to make without getting an engineering firm or an overseas company to supply the specialised components.

"We recognised that global supply pressures could increasingly affect the availability of critical components," says Werner. "Investing in advanced machining allows us to take greater control of our production and support not only our own operations but, where needed, broader industry requirements."

By bringing more machining work in-house,

Werner Pumps can progressively refine components during production, improving precision and ensuring that parts meet exact performance requirements. This shift is expected to deliver shorter lead times, reduced dependence on external suppliers, improved responsiveness to customer requirements and field repairs, greater flexibility to customise components for specific applications, and stronger quality control. The company also anticipates improved stock availability, reducing downtime for customers who rely on its equipment in demanding operational environments.

The investment is also expected to strengthen Werner Pumps' R&D capabilities. Faster turnaround times for component production mean that new designs and improvements can be tested and refined more quickly.

Beyond its operational benefits, the investment reflects a longer-term view on the importance of local manufacturing in South Africa. Werner Pumps believes that building in-country capability is essential not only for business resilience but also for economic growth and job creation.

"We see significant potential for South Africa to strengthen its manufacturing," Werner concludes. "By investing in local capability and making use of the skills and resources available here, businesses can play a meaningful role in supporting local industrial development and long-term sustainability."

<https://wernerpumps.com/>

Engineering the Senqu River Bridge and the Polihali Transfer Tunnel



Thabeli Ralebitso, CEO of Zutari Africa.

Multinational, buildings and infrastructure engineering consultancy Zutari has played a leading role in the design and construction supervision of the Senqu River Bridge, one of the most ambitious high-altitude infrastructure projects undertaken as part of the Lesotho Highlands Water Project (LHWP), Phase II. In addition, through its role in the Metsi a Senqu-Khubelu Consultants (MSKC) Joint Venture, Zutari is responsible for design and construction supervision of

Infrastructure engineering consultancy, Zutari, is contributing to some of the most technically complex components of the Lesotho Highlands Water Project (LHWP) Phase II: the 825 m bridge across the Senqu River, and the 34 km Polihali Transfer Tunnel beneath Lesotho's mountainous highlands.

the Polihali Transfer Tunnel.

These projects are being undertaken in the Kingdom of Lesotho by the Lesotho Highlands Development Authority (LHDA), the implementing and management authority of the LHWP, on behalf of the governments of Lesotho and South Africa.

The Senqu River Bridge

The Major Bridges Project, which includes the Senqu River Bridge, is being delivered by Zutari Lesotho, together with the Lesotho sub-consultant, White Life Consultants, and a black-owned South African sub-consultant, Leporogo Specialist Engineers. This reflects Zutari's collaborative engineering partnership and a long-standing commitment to infrastructure development in the Kingdom of Lesotho.

Spanning 825 m across the Senqu River valley, the bridge is the longest and highest in Lesotho, rising more than 90 m above the valley floor. Designed as an extradosed cable-stayed structure, the bridge has been engineered to withstand the extreme conditions of Lesotho's mountainous terrain while

ensuring uninterrupted connectivity along the national A1 route.

The new crossing forms part of a series of major bridges required to maintain road access once the future Polihali reservoir is filled. Sections of the existing A1 route will eventually be submerged as the dam reaches full capacity, making the Senqu Bridge a vital long-term replacement that safeguards regional mobility and economic activity.

The bridge was designed to address the complex environmental and geographic challenges associated with infrastructure development in Lesotho's highlands. Construction required foundations anchored on rock, as well as advanced construction techniques to navigate the steep valley terrain.

The deck was incrementally launched from both sides of the valley, with precast segments pushed outward until the two sections met at mid-span. This method allowed contractors to construct the bridge safely across the deep gorge while minimising environmental disturbance.

Work on the bridge continued throughout challenging mountain conditions, includ-



Photo Credit: WRES JV

The 825 m Senqu River Bridge spans the Senqu Valley at a height of over 90 m.

ing winter construction periods, requiring round-the-clock engineering supervision and close coordination between contractors, engineers and project authorities. Louis Joubert, Resident Engineer on the Senqu Bridge project, says the structure represents both technical ambition and long-term national value.

“The Senqu Bridge reflects the engineering ambition behind the LHWP. Beyond the technical achievement, these structures carry real legacy value for Lesotho. As the Highlands landscape evolves, the bridges being built today will stand as enduring symbols of infrastructure excellence and the long-term impact of the project for communities across the region,” notes Joubert.

Beyond its engineering significance, the Senqu Bridge will play a critical role in maintaining access to the north-eastern region of Lesotho, including the regional capital of Mokhotlong. Once the Polihali reservoir is impounded, the existing low-level crossings will be submerged, making the new bridge essential for maintaining this strategic national route.

The project also forms part of a broader infrastructure programme supporting the development of the LHWP Phase II, which is designed to enhance regional water security while generating long-term economic benefits for Lesotho.

Significant opportunities have also been provided for local engineers and technical professionals. Most of the supervision team on the bridge project consists of Basotho engineers and young professionals who have been mentored throughout the construction process. Through partnerships with the LHDA and other project stakeholders, the initiative helps build long-term engineering capacity in the country.

The Senqu Bridge is expected to become a landmark structure within Lesotho’s evolving infrastructure landscape. As the surrounding reservoir fills and the region’s development accelerates, the bridge will continue to serve as a critical transport link while supporting new economic and tourism opportunities.

The Polihali Transfer Tunnel

Zutari is also contributing to the LHWP Phase II through the design and construction supervision of the Polihali Transfer Tunnel. Stretching approximately 34 km beneath Lesotho’s mountainous highlands, this Tunnel forms a critical link between the Polihali and Katse reservoirs, strengthening the water transfer system that supports regional water and hydropower security.

The tunnel incorporates a sophisticated design comprising a five-metre-diameter, segmentally lined, hard-rock TBM-bored tunnel, intake works, and a gate shaft upstream of the new 165 m high Polihali Dam, as well



Hard-rock tunnel boring was used to create the 5 m diameter Polihali Transfer Tunnel.

as outlet works and a lake tap into the Katse Reservoir. Additional access tunnels and associated infrastructure support the system’s construction and future operation.

Unlike visible infrastructure such as bridges and dams, the Polihali Transfer Tunnel represents an engineering achievement largely hidden from view. Yet the underground system is among the most significant elements of the entire LHWP Phase II programme.

Freddie Laas, Project Manager for the MSKC Joint Venture overseeing the tunnel’s implementation, says the project requires a high level of coordination, planning and technical precision. “Delivering infrastructure at this scale requires careful coordination across engineering disciplines, contractors and project stakeholders to ensure that safety, quality and environmental stewardship remain central throughout the construction process.”

Laas adds that projects of this complexity extend beyond engineering alone. “Large-scale infrastructure programmes involve many moving parts, from geological conditions and environmental considerations to social and economic responsibilities. Successfully managing these elements is what ultimately ensures that the project delivers long-term value for both Lesotho and the broader region.”

Although largely invisible once completed, the Polihali Transfer Tunnel will play a vital role in the long-term operation of the LHWP, ensuring efficient transfer of water through the system while supporting the continued development of water infrastructure across Southern Africa.

As construction progresses on Phase II of the project, the tunnel stands as a powerful example of the engineering innovation and strategic collaboration required to deliver infrastructure on a truly regional scale.

Strengthening regional water security
The LHWP is a multi-phase bi-national

initiative between the Kingdom of Lesotho and the Republic of South Africa designed to harness the water resources of Lesotho’s highlands through a network of dams, tunnels and associated infrastructure. While the project supports water supply to South Africa’s economic hub, it also generates substantial economic benefits for Lesotho through royalties, infrastructure development and long-term employment opportunities.

Projects of this scale also create opportunities for collaboration between international engineering specialists and local professionals, contributing to skills development and long-term technical capacity within the region.

Zutari has been involved in infrastructure development in Lesotho for decades, supporting projects across water, transport and environmental sectors. The company’s participation in these projects forms part of its broader contribution to the LHWP programme and to infrastructure development across the region.

Tihabeli Ralebiso, CEO: Africa for Zutari, says projects like the Senqu Bridge and the Polihali Transfer Tunnel demonstrate how strategic infrastructure investment can deliver long-term value for both Lesotho and the broader region. “The LHWP stands as one of Africa’s most significant examples of infrastructure delivered through partnership and shared vision.”

“These projects reflect not only engineering excellence, but also the long-term impact that infrastructure investment can have in strengthening regional water security and hydro-electric power generation, enabling economic growth and supporting communities. Zutari is proud to contribute our expertise to projects that help shape sustainable futures for Lesotho and Southern Africa,” Ralebiso concludes:

<https://www.zutari.com>

Pump innovations in wastewater treatment

Darryl Macdougall, managing director of Verder Pumps South Africa, highlights how chemical dosing innovations can enable progress towards improved water security.

Untreated wastewater remains a major contributor to global water scarcity and environmental degradation. The World Health Organisation (WHO) estimates that 44% of household wastewater is not treated properly, while only 38% of industrial wastewater is safely treated before discharge. The result is widespread pollution of freshwater ecosystems, increasing pressure on already constrained water resources and growing risks to public health.

Yet wastewater is also an underutilised water resource. The United Nations Environment Programme (UNEP) reports that the untapped potential for wastewater reuse is around 320 billion m³ annually, more than 10 times the capacity currently produced by global desalination.

For engineers designing municipal and industrial treatment plants, pump selection plays a critical role in maintaining process stability, achieving precise chemical dosing and ensuring long-term operational reliability.

Chemical dosing is fundamental across multiple stages of wastewater treatment. Coagulants, flocculants, pH-correcting chemicals, and disinfectants must be introduced accurately to ensure efficient removal of contaminants and stable downstream processing.

During coagulation and flocculation, for example, chemicals such as ferric chloride, aluminium sulphate and polymer solutions are used to destabilise suspended particles and promote floc formation. Incorrect dosing directly impairs treatment performance: underdosing reduces contaminant removal efficiency, while overdosing increases sludge production and operating costs.

Accurate metering pumps are therefore essential to maintain consistent dosing under variable flow conditions.

Peristaltic dosing pumps offer particular advantages in these applications. In pumps such as the Verderflex Ds500 metering and dosing pump, the pumped chemical remains completely contained within the tube element, meaning it never comes into contact with the pump's mechanical components. This configuration improves reliability when handling aggressive chemicals such as sodium hypochlorite, acids, caustic solutions or ferric salts, while reducing corrosion and

maintenance requirements.

The Ds500 is designed for municipal and industrial dosing duties that require consistent, accurate flow control. Because the pumped fluid is isolated from the drive mechanism, the risk of seal failure or contamination is minimised, supporting reliable operation in continuous treatment processes.

The Verderflex Ds4F expands the cased-drive peristaltic range by combining the control capabilities of the Ds500 with multiple tube-element options. This allows engineers to configure the pump to suit different process conditions, including viscous polymer dosing, lime slurry injection for pH control or chemical transfer within treatment plants.

Wastewater treatment plants must manage a wide range of chemicals and operating conditions, requiring dosing systems that offer both flexibility and precision.

Pump ranges such as Microdos and ITC dosing systems provide a variety of technologies, including electromagnetic solenoid diaphragm pumps, peristaltic pumps and motor-driven piston or diaphragm metering pumps. These are used across numerous treatment stages, including coagulant dosing in clarification processes, polymer dosing for sludge thickening and dewatering, pH control using sodium hydroxide or sulphuric acid, nutrient dosing in biological treatment systems and disinfection dosing for final effluent treatment.

The ITC DOSmart series, for example, uses stepper motor technology to deliver high-precision chemical metering. With a turndown ratio of up to 1:3 000, the pumps can maintain accurate dosing across widely varying flow conditions – a key requirement in municipal treatment plants where influent flows fluctuate throughout the day.

These pumps also offer strong suction capability for handling viscous chemicals such as polymer solutions used in sludge treatment processes. With flow capacities of up to 60 litres per hour, they are well suited to applications including polymer preparation units supplying centrifuges, belt filter presses and dissolved air flotation systems.

Similarly, the ITC Dostec AC series provides motor-driven metering pumps



The peristaltic Verderflex Ds500 metering and dosing pump contains the pumped chemical within the tube element, ensuring it never comes into contact with the pump's mechanical components.

available in both diaphragm and piston configurations. These pumps support multiple operating modes, including manual control, analogue signal input, proportional dosing and batch dosing. This flexibility allows dosing to be directly linked to plant instrumentation such as flow meters, pH probes or turbidity sensors, enabling automated process control.

As treatment plants adopt increasingly digitalised operations, remote monitoring and predictive maintenance are becoming essential. The DOSmart and Dostec AC pump series can be integrated into the Cloud Manager App, allowing operators to monitor pump performance, operational parameters and dosing accuracy remotely. Through a centralised interface, plant operators can access real-time data, receive alerts and track equipment performance across multiple installations.

For utilities operating multiple sites or remote treatment facilities, this capability improves system oversight and allows early detection of operational issues, helping to reduce unplanned downtime and optimise maintenance schedules.

Wastewater treatment frequently involves pumping abrasive slurries, viscous chemicals and shear-sensitive fluids.

Verderflex peristaltic pumps are particularly well suited to these demanding applications. Their operating principle – compressing a reinforced hose to move fluid through the pump – ensures the pumped medium remains completely isolated from mechanical components. Advantages include reduced maintenance due to minimal wear components; improved containment; and gentle pumping of shear-sensitive polymer.

By enabling accurate chemical dosing, handling of difficult media and improved monitoring, modern pump technologies can transform wastewater into a valuable, reusable resource.

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