

WHAT'S WATT

December
2024



Featuring: ACTOM – enhancing South African Railway infrastructure

Your one-stop global energy solutions partner

ACTOM

SINCE 1903

Year-End Reflections and Future Outlook

In a world fraught with global macroeconomic challenges, high levels of public debt, political polarisation, and significant geopolitical shifts, we must strategically navigate these complexities and adapt swiftly to changing global dynamics.

The South African economy remains under pressure and faces many challenges. However, the ACTOM Group has navigated this exceptionally well, achieving outstanding results across our organisation. We have also made significant progress in addressing maintenance upgrades across our various factories, with substantial enhancements and introducing new technology and capacity expansion initiatives. We have made major progress in upgrading our Management Information systems across multiple Divisions.

Our health and safety performance is currently at an LTFIR of 0.56. I commend everybody for maintaining a safe working environment, which is our key priority.

People are our greatest investment, and ACTOM is steadfast in its commitment to enhancing training and development. This year, we have relocated our ACTOM Training Centre to our new and expanded facility in Driehoek. The investment in the ACTOM Training Centre is of major strategic importance not only to ACTOM but also to the country. This year, we have launched our ACTOM Academy, an ACTOM leadership program designed to develop talent within the Group. This initiative aims to create a leadership pool for succession planning and to ensure the long-term sustainability of our company.



ACTOM Executives at the Vanderbijlpark Race.

We have accelerated our wellness initiatives, focusing on promoting health and well-being among our employees and the broader community. This year, we successfully organised two ACTOM races, which have become significant events in our wellness calendar. The race held in Vanderbijlpark saw approximately 1100 runners participating. Such events encourage physical fitness and serve as a means of uniting people and fostering a sense of community. We recognise the role of sports in enhancing social cohesion and promoting a healthy lifestyle.

In South Africa, we have experienced a period of relative stability following the implementation of the Government of National Unity (GNU) structure. The seventh administration of our government has been functioning relatively well, and we have witnessed significant structural reforms under the auspices of Operation Vulindlela. This initiative has been instrumental in driving progress, particularly in the electricity, water, transport and communications sectors, setting the stage for accelerated GDP growth outcomes for the country.

We are witnessing a significant ramp-up in power generation build programs. I am also optimistic following the formation of the National

Transmission Company of South Africa (NTCSA), which effectively paves the way forward for the rollout and execution of the Transmission Development Plan. This development will bode well for ACTOM, increasing demand for our suite of products and creating major Engineering, Procurement, and Construction (EPC) opportunities.

Our advocacy efforts for localising products needed for various infrastructure projects in South Africa continue. This is fundamentally required to address unemployment and inequality in our country and stimulate GDP growth.

As we reflect on the past year, I would like to take this opportunity to thank all our staff for their hard work and dedication. Your commitment and perseverance have enabled us to navigate challenges and achieve our goals. I want to thank all employees who retired this year after many years of selfless service to ACTOM, welcome all new employees, and wish them well with their careers at ACTOM.

As the year draws to a close, I wish you all a Merry Christmas and a blessed New Year. May this festive season bring you and your loved ones joy, peace, and prosperity. Let us take this time to relax, recharge, and prepare for the year ahead with renewed energy and enthusiasm.

What's Inside

ACTOM – service offerings for railway infrastructure	Pg 3	MV Switchgear’s solution for GELPAG SIS panels	Pg 15
ACTOM at industrial exhibitions	Pg 6	Distribution Transformers offers 5MVA Transformers	Pg 16
ACTOM Training Centre relocated to Driehoek	Pg 7	R&M ready to deliver World-Class Traction Excellence	Pg 17
ACTOM HVE represented at the 2024 CIGRE	Pg 8	M&C rewinding synchronous generator stator motor	Pg 18
Wellness Week – Empowering your health journey	Pg 9	ACTOM Turbo Machines Vaal Mall Marathon success	Pg 19
PPP’s can revive South Africa’s infrastructure	Pg 10	Metalplus ISO 3834 Welding Quality Recognition	Pg 20
Optimizing Co-Generation Plants	Pg 11	Kgatlamping Primary School visited ACTOM	Pg 21
ACTOM HVE to supply products to Seriti Green	Pg 13	ACTOM Heritage Day celebrations	Pg 22
MV Switchgears 36kV RMV tested at SABS	Pg 14	ACTOM Electrical Products Annual Open Day	Pg 23

Cover: ACTOM, with its one-stop railway solution, has a rich history of servicing and completely overhauling South African railway locomotives.

ACTOM's service offerings to enhance the South African Railway infrastructure

Under the control of Transnet, South Africa has the most extensive rail network and infrastructure on the African continent, with 22,000 kilometres of rail track, 585 train stations, a fleet of 4,735 coaches and an overall staff complement of just over 18,000. Transnet, with a rich history dating back to the late 19th century, is vital in connecting cities, towns, and rural areas, facilitating the movement of goods and people across the country and playing an expansive role in the economic health of South Africa.

The South African Government's plan to spend R900 billion by 2027 on rail infrastructure has been beset by regulatory and organisational challenges, including cabling, rail and station infrastructure theft. Since 2017, Transnet has faced operational problems, mainly in the critical rail and port businesses, resulting from underinvestment in infrastructure and equipment. This has negatively impacted the country's leading transport and logistics firms, inevitably created problems regarding the exportation of commodities, and has had a negative trickle-down effect on the manufacturing and services sectors.

Inefficiencies in rail freight have resulted in delays, increased costs and reduced competitiveness for South African producers and exporters, ultimately affecting the country's productivity and economic growth. **Mervyn**

Naidoo, CEO, ACTOM said, "Freight rail is much lower than it used to be, negatively affecting the economy and adding a domino effect in job losses, manufacturing, and import and export funding."

Loaded trucks significantly damage national road infrastructure, and by improving efficiencies, Transnet will activate both upstream and downstream opportunities. Increased rail volumes will also lead to decreased road congestion, reduced road maintenance and fewer accidents.

"Mining companies that export commodities like coal, iron ore, and manganese are key drivers of the economy and will significantly benefit from improved efficiencies within the South African Railway Services. Increased tonnages in freight volumes will lead to increased revenues for both the mining companies and Transnet and contribute to accelerated GDP growth, more employment opportunities, alleviate poverty, reduce unemployment and aid in reducing the social burden on the state," Naidoo added.

Transporting coal to port by rail costs about R230 a tonne, but when trucked via road, these costs can quickly increase almost threefold to about R750 a tonne. Expanding the railway infrastructure can help South Africa grow its current 70 million tonnes of coal exports annually. Road freight is unsustainable for the transport of bulk export commodities such as coal and

iron ore.

Transnet's railway business recovery plan is a comprehensive strategy to restore South Africa's rail network's operational performance and freight volumes. In July 2024, the African Development Bank (AfDB) approved an R18.85 billion corporate loan, facilitating the first phase of Transnet's R152.8 billion five-year capital investment plan. "Transnet's funding from AfDB will enable them to expand and resuscitate existing infrastructure," Naidoo said.

The recovery plan addresses operational inefficiencies, particularly in the rail and port sectors, and restoring the rail network to its former glory. This will be achieved through infrastructure upgrades, equipment replacements, and process improvements. The plan also prioritises energy efficiency and railway reforms to reduce costs and enhance the overall sustainability of the rail network.

Key components of the plan include:

- Infrastructure upgrades to increase capacity and reduce congestion
- Equipment replacements to improve reliability and efficiency
- Process improvements to enhance customer service and reduce transit times
- Energy efficiency initiatives to reduce costs and environmental impact
- Railway reforms to promote competition and investment

The successful implementation of

To page 4



ACTOM Signalling provides a full turnkey solution along with a wide selection of products.

From page 3



Reid & Mitchell's Traction division is fully equipped to build, overhaul, upgrade and maintain diesel-electric locomotive components.

Transnet's railway business recovery plan is expected to significantly impact the South African economy, enhancing national logistics capabilities, driving sustainable economic growth, and creating jobs. Transnet aims to regain market share, improve customer satisfaction, and position itself as a competitive and efficient logistics player in the region.

Positive impacts:

- Improved efficiency: Upgrades to ports and rail infrastructure will increase cargo handling capacity, reduce congestion and dwell times, and make local businesses more competitive.
- Job creation: The recovery plan will lead to new job opportunities in construction, maintenance, and operations.
- Economic growth: Enhanced infrastructure will attract investments, stimulate trade, and boost economic growth.
- Increased competitiveness: Modernised infrastructure will enable local businesses to compete more effectively with international companies.

ACTOM offers a one-stop railway solution

ACTOM, a South African electrical engineering and manufacturing company, will benefit from Transnet's recovery plan and the African Development

Bank's (AfDB) funding to Transnet in several ways:

Increased demand for products:

Transnet's upgrades and expansion plans will require electrical infrastructure, such as transformers, switchgear, railway signalling equipment and cabling, which ACTOM manufactures and supplies. Due to a general lack of infrastructure maintenance, Transnet's Freight Rail line inefficiencies have led to a severe maintenance backlog with their 3000 Volt DC substations and 25,000- and 50,000 Volt AC substations. ACTOM is perfectly positioned to capitalise on a comprehensive refurbishment program of old transformers or build new ones to Transnet's specifications. "Regarding capacity expansion, equipment replacement poses many opportunities for ACTOM, such as transformer equipment, switchgear, high voltage equipment, and associated equipment that goes into these substations. So, the substation is just one infrastructure element, but the crucial component is the signalling system regulating traffic flow. ACTOM has supplied signalling systems to Transnet and Metrorail/PRASA for many years," said Naidoo.

Supply chain optimisation: With AfDB funding and the South African government focussing on localisation and development in South Africa,

Transnet will prioritise local procurement, which will favour ACTOM, with their one-stop solution, as they have a rich history of servicing and completely overhauling South African railway locomotives. Naidoo said: "Locomotives are quite robust but require a major overhaul every 10 – 12 years. We can completely overhaul the 40 – 50-year-old locomotives to the point where they will be good again for another decade".

Diesel-electric locomotives move goods safely and efficiently by generating their own electricity to power the traction motors and are not reliant on an electrical power supply. Diesel locos are thus more versatile than electric fleets as they do not suffer from operational disruptions due to power outages or overhead line copper theft. Reid & Mitchell, one of ACTOM's 34 operating units across Sub-Saharan Africa, offers manufacturing, refurbishing and upgrade options on a range of electrical rotating machines and auxiliary controls for these prime movers of our economy.

"Our Traction division is fully equipped with capabilities to build, overhaul, upgrade and maintain diesel-electric locomotive components (AC and DC). Our advanced refurbishment processes can significantly extend the life of the electrical rotating compo-

nents at a fraction of the cost of purchasing new units,” said **Mike Shaw**, Divisional CEO, Reid & Mitchell.

Partnership opportunities: ACTOM Transport, a business unit within the Engineering Projects and Contracts division, offers a comprehensive turnkey capability in railway automation, signalling and control systems, and traction equipment and components. Its partnership with international signalling equipment manufacturers offers a complete turnkey solution to the railway sector. It provides specialised depot assembly and test equipment such as wheel presses, bogie testing presses, various test equipment, and power supplies through its representation in Southern Africa of BBM and IRMIE Impianti of Italy, which ensures the latest adaptable technology offerings to support Transnet’s sustainability goals. “With our international partners, we can custom make any product, dependant on the client’s standards, and have it installed within the required lead times,” said **Leonard de Villiers**, General Manager, ACTOM Transport.

Shaw agrees, as Reid & Mitchell, too, has a long-standing partnership with various original equipment manufacturers (OEMs), specialising in repairing, refurbishing, and rebuilding locomotive rotating components.

Job creation and skills development: As ACTOM ramps production to meet increased demand, they create new job opportunities and develop skills in the local workforce. The LHM School of Engineering, a SETA-accredited training academy, has been preparing for the increase in traction transformer manufacturing for some time. “There has been an uptake in transformer manufacturing in the last few years, and we have had a considerable intake of students to train them as welders, armature winders, fitters & turners and electricians,” said **David Sullivan**, Divisional CEO, LH Marthinus.

With the increase in production, Sullivan hopes to offer these apprentices permanent positions within the ACTOM group. “The good news is that, hopefully, there will be permanent positions for these apprentices when they finish their qualification, and the first candidates from the increased intake will finish their four-year qualification at the end of next year,” Sullivan added.

Diversification opportunities: ACTOM has the facilities to diversify

its product offerings to meet new infrastructure needs. Many of ACTOM’s divisions have the capabilities to design bespoke equipment needed to meet the client’s specific standards. “Our client’s standards are usually well-written, and we ensure uniformity in the manufacturing of any of their products,” said Sullivan.

Shaw added: “We have the Reid & Mitchell Centre of Excellence, which becomes operational when we have big projects. We sport a team of experts that works like a well-oiled machine to finish the job within deadlines.”

According to **Frans Weygertze**, Project/Business Development Manager, ACTOM Transport Equipment & Projects (TEP) sees a broader product offering as a significant opportunity for collaboration with customers and suppliers in setting up various partnership agreements to enhance its portfolio in the future.

Improved competitiveness: While the Transnet loan will contribute to the broader South African economy, it will also aid their energy efficiency efforts, assist with infrastructure project preparation initiatives, and improve completeness.

ACTOM Static Power, a business within the Smart Technologies portfolio, specialises in designing and manufacturing AC and DC standby equipment for the industrial, telecoms, rail, and renewable energy markets. This includes thyristor-type chargers (Micro Process Controlled option),

industrial batteries, power supplies, industrial UPS, furnace control panels, AC/DC distribution boards, and battery-tripping units.

All their systems are designed and engineered to suit their purpose for local and export markets. Static Power’s success is a testimony to the quality of its products and services, and it has embarked on turnkey solutions for renewable energy and battery energy storage. **Richard von Moltke**, General Manager, Static Power, states, “ACTOM Static Power is almost unique. What gives us an edge is that we adapt to each site, customer, and project because no two projects are the same. Supplying a standard product does not work in the industry. Even though it’s all doing the same thing, each site is different and integrates into other components.”

Weygertze added, “Price, availability, and quality will be of the essence, and we are positive that we can market ourselves using local content and a social development framework in a tough microeconomic environment.”

ACTOM, with its local expertise and manufacturing, extensive range of standard and tailor-made products and services, international partnerships, and partner networks, offers a competitive complete solution to Transnet’s Railway and Port infrastructure needs. As such, it is perfectly positioned to capitalise on any opportunities that may and will be created through Transnet’s recapitalisation initiative.



Static Power offers turnkey and tailor-made products for renewable energy and battery storage solutions.

ACTOM actively showcases its product offering at industrial exhibitions

2024 marked a successful year for ACTOM in showcasing its products and services to the industry. They showcased their products and services at various events, including Electra Mining 2024, AMEU 2024, Africa Rail 2024, the Africa Energy Indaba 2024, and Enlit Africa 2024 - where they won the 2024 Best Stand Award.

ACTOM's presence at these expos demonstrates its commitment to showcasing its expertise in electrical engineering and its range of products and services, including power conver-

sion, electrical equipment, repairs and services, transmission and distribution, and smart technologies.

Some of the critical areas where ACTOM has been focusing include:

- Electrical Engineering: design, manufacturing, installation, and maintenance of electrical equipment;
- Power Systems: substation construction, renewable energy solutions, and electrical power systems;
- Transport Equipment: rolling stock equipment, parts, and maintenance services; and
- Energy Solutions: energy efficien-

cy solutions, power generation, and distribution.

ACTOM aims to strengthen its brand by participating in these industrial expos, connecting with prospective customers, and showcasing its innovative solutions.



ACTOM team in deep discussions at Electra Mining.



Nqobile Mthembu, Business Development Manager at ACTOM Signalling meeting delegates from the Africa Rail Exhibition.



ACTOM stand at the Africa Energy Indaba.

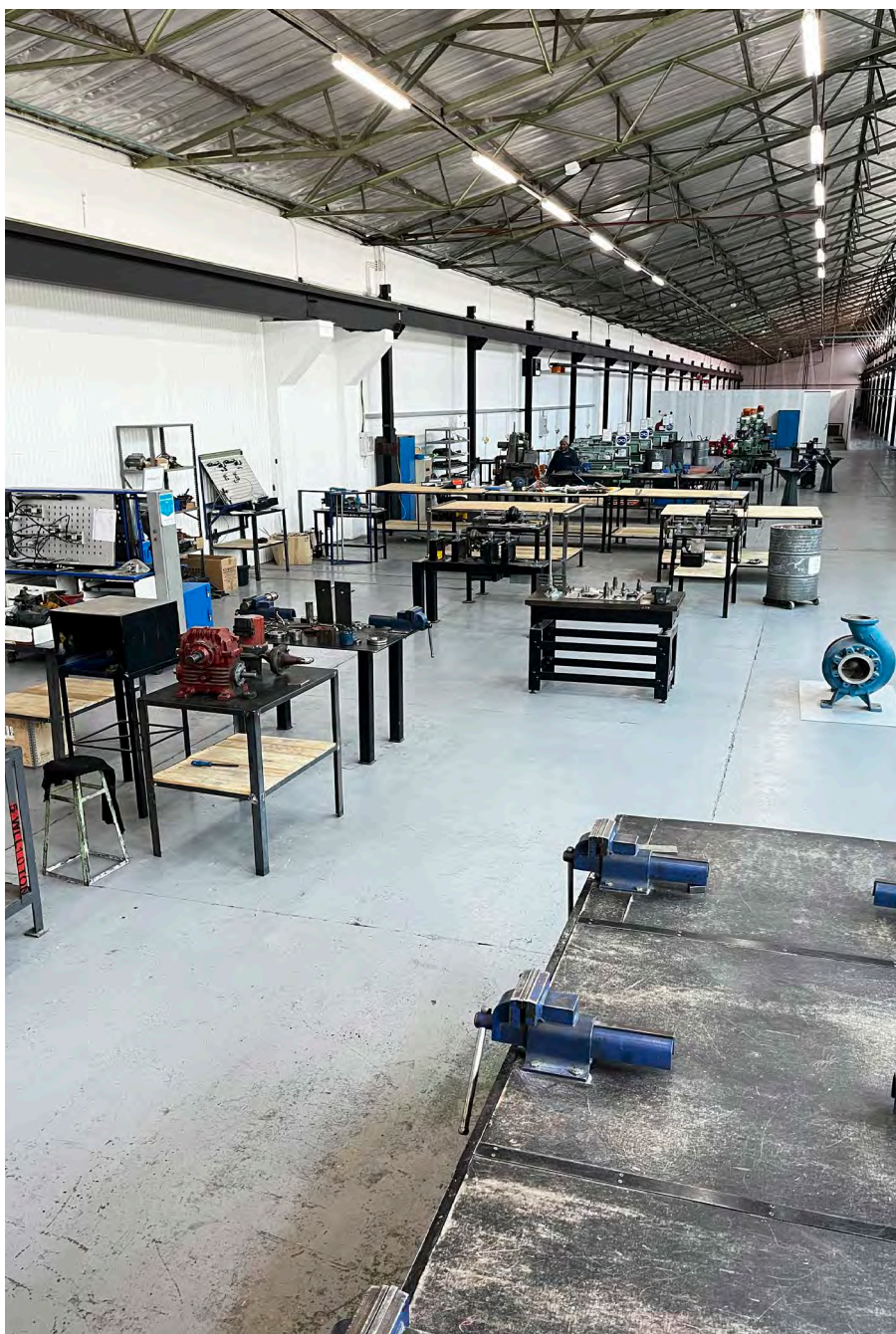
ACTOM Training Centre relocated to Driehoek and making significant strides

The plans for more extensive facilities began three years ago when I started working at the Training Centre. Believing in ourselves as a team was the core aspect of achieving great things, and more is yet to come.

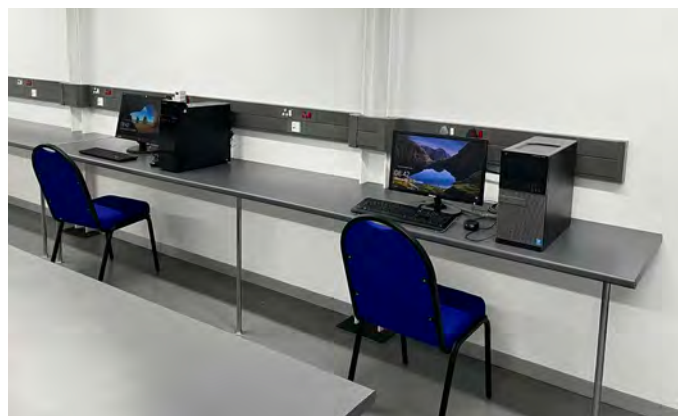
“Having a strong and dedicated team amplified where we are today,” said **Kobus Swanepoel**, ACTOM Training Centre Manager. Kobus believes that when you surround yourself with supportive staff willing to share your vision, you can create an environment where everyone can thrive. “We rise above challenges as a team, inspire one another and push ourselves beyond our boundaries. It’s about collaboration, trust, and a commitment to go big!” he added.

The new premises align perfectly with the New Occupational Qualifications, which became effective on 1 July 2024. The facility allows the Training Centre to meet the evolving standards and requirements of training and ensure that the training programs offered remain relevant. The added capacity and resources provide apprentices with comprehensive training needed to excel in their respective trades and adhere to the latest industry standards.

A bigger space allows the Training Centre to house 200 apprentices. However, the focus is more on quality rather than quantity. This enables the Training Centre trainers to emphasise extra attention to apprentices, which gives the apprentices a competitive advantage. There are diverse training environments, such as four classrooms and an e-learning classroom, to list a few. “The Training Centre will serve as a hub for community outreach, hosting events beneficial for the training to enhance our brand”, concluded Kobus.



The ACTOM Training Centre sports a state-of-the-art workshop.



The E-learning classroom, where you can attend courses independently.



The theoretical classroom provides training from industry experts.

ACTOM High Voltage Equipment represented at the 2024 CIGRE Paris Session

Mphumuzi Khoza (28), an Electrical Engineer at ACTOM High Voltage Equipment (HVE), participated in the CIGRE call for papers. In this call, several proposed preferential subjects are articulated for selection and research and then presented by authors.

The CIGRE Paris Session event was held in France from 24-30 August 2024. CIGRE conducts the premier global collaborative knowledge development and dissemination program biennially, incorporating considerable in-person gatherings alongside occasional remote cooperation, often involving the world's foremost specialists.

This curriculum concludes biennially with the premier global forum for power system knowledge, the Paris Session.

Mphumuzi's proposed research on optimising transformer insulation to better handle non-standard lightning impulses through the synopses was approved for further research and technical paper writing. It was then peer-reviewed by a pool of experts constituted by Study Committees and finally approved for presentation during poster sessions at the Paris session.

"Engaging in the call for papers program enhances knowledge and improves understanding of the related studies. My research was prompted by the global warming phenomenon, which appears to adversely affect electrical equipment due to vigorous lightning impulses that are induced on transformer insulation and lead to failures. The research sought the optimisation technique to produce resilient transformer insulation," Mphumuzi commented.

Mphumuzi attended the week-long CIGRE Paris session and presented his research work to several international experts during poster sessions. He is employed at ACTOM HVE, where he designs instrument transformers. His optimisation method has yet to be practically experimented with for further research.

"Further practical work is required to identify implementation methods that can increase the transformer insulation to withstand non-standard lightning impulses. However, the optimisation was tested through simulation and was shown to be effective," Mphumuzi added.

Sibusiso Duma, Engineering Manager at HVE, concluded: "As an em-



Mphumuzi Khoza, engaging with one of the experts during the poster session in Paris and standing by the presentation booth.

ployee of HVE, Mphumuzi works in the domain of CIGRE Study Committee A3, which looks after the technologies related to Transmission and Distribution Equipment. However, his research and paper demonstrate the synergies across the other domains of CIGRE

and the electrical industry, as his paper was accepted and presented in Study Committee A2, which looks after the technologies related to Transformers and Reactors. It also shows Mphumuzi's capability to "think outside the box."

Wellness Week – Empowering your health journey



ACTOM Knights staff used the opportunities offered during the wellness week to save themselves time, travelling, and medical costs.

The ACTOM Knights site's five divisions, MV Switchgear, High Voltage Equipment, Distribution Transformers, Protection & Control and Current Electric, held a successful annual wellness week from the 16th to the 20th of September 2024.

This was in partnership with the following service providers, providing various health screening services:

- Ekurhuleni Health Department with their partners (Wits HRI, Isibani, Sr Francis), who conducted Diabetic, Blood pressure and Cholesterol tests, HIV/AIDS testing and chest x-rays.
- Old Mutual assisted the staff by offering them free financial education, designed to equip them with the education, understanding, and tools they need to make sound financial decisions.
- Lancet Laboratory offered Prostate cancer tests (PSA) and pap smear tests.
- South African National Blood Service (SANBS) is an independent non-profit organisation where the staff donated blood.
- Bahle & Associates offered free Podiatric awareness, focusing on diagnosing, treating, and preventing conditions related to the foot, ankle, and lower extremities.
- Discovery Health offered screening and activating members' additional medical benefits.

These services were offered to all employees to create a positive and supportive workplace culture and improve work-life balance. The initiative was well received and supported by a large number of employees. The screening assisted in identifying undetected health issues, enabling the company

to implement preventative measures.

This successful wellness week was a collaboration between the Human Capital, Clinic and SHERQ departments in Knights and the support from the Executives and Management of the five divisions.



On the bed is Xikombiso Shibambu HC Manager, Distribution Transformers with SANBS employee. Standing from left is Lucy Mathipa, SHERQ Manager, MV Switchgear; Manana Molupe, HC Manager, SMART Technologies, Protection & Control; and Suzan Monare, Occupational Health Nurse Practitioner, ACTOM Clinic.

Public-private partnerships can revive South Africa's infrastructure, unlocking growth and prosperity

South Africa is currently facing several significant challenges, such as unreliable water and electricity supply and ageing transportation infrastructure. These have resulted in some municipalities needing more service delivery and being placed under administration.

One of the most crucial issues facing water boards and utilities across South Africa is ageing infrastructure, which needs to be replaced urgently as it is beginning to impact water supply. Despite a reduction in load shedding, the country still faces challenges with its distribution network. To protect outdated equipment and infrastructure, load reduction has been introduced in some areas that experience overload.

At the same time, Transnet's railway network has suffered significant theft and vandalism over the past few years, coupled with inadequate investment in rolling stock and infrastructure maintenance. This has decreased South Africa's railway transport capacity, shifting much freight to the country's road network.

These challenges have had a profound impact on the South African economy. They stifle growth, hamper investment, and exacerbate inequality, ultimately threatening the country's stability and future prosperity.

First-class service delivery

To remedy these challenges, Public-Private Partnerships (PPPs) must be encouraged to help the government fast-track its goals of creating robust infrastructure and first-class service delivery. PPPs can cover various sectors, such as transport, energy, and water, facilitating diverse projects and dem-



Public-Private Partnerships (PPPs) must be encouraged to help the government fast-track its goals.

onstrating successful collaborations. Private sector participation improves service quality and efficiency, bringing innovative solutions and maintaining high standards.

One specific benefit of PPPs for the government is the ability to access private funding quickly due to the relative lack of bureaucracy in allocating investments. PPPs can also unlock funding for local municipalities that lack the money to spend on required infrastructure upgrades.

This is because an increasing number of private-sector companies are becoming involved in the municipalities where they operate.

An example of a successful PPP of this nature is the Msunduzi Municipality, which encompasses the city of Pietermaritzburg. Hewlett Aluminium has assisted with repairs to the Umgeni Water infrastructure, critical in enhancing public services and infrastructure resilience. This collaboration improves access to essential

water services and demonstrates how effective partnerships can mobilise resources and expertise to address urgent infrastructure needs.

By leveraging private sector strengths, PPPs can thus help address infrastructure challenges, accelerate development and improve service delivery, fostering economic growth and a better quality of life in South Africa.

Implementation challenges

However, the implementation of PPPs in South Africa is challenging. In some instances, public sector resources might need to comprehend the PPP model fully or lack the political will to implement such partnerships, which could delay implementation.

One of the biggest challenges facing infrastructure development in South Africa is extortion by so-called "construction mafias", which could disrupt some projects. Fortunately, there are indications that the government is formulating an approach to tackle these issues.

For PPPs to succeed, both the private and public sectors need to be open to and embrace this form of partnership. PPPs should be viewed as a solution to some of South Africa's significant infrastructure challenges.

However, PPPs must also involve civil society. One significant shift that occurred with the advent of democracy 30 years ago is that everything related to infrastructure development has been left to the government, with civil society choosing not to get involved. Unfortunately, not all expectations have been met, and significant progress will only be made with the involvement of the private sector and civil society.



PPPs can unlock funding for local municipalities that lack the money to spend on required infrastructure upgrades. (Credit: pixabay.com)

Optimizing Co-Generation Plants: Quantifying audit-based recommendations for full operation

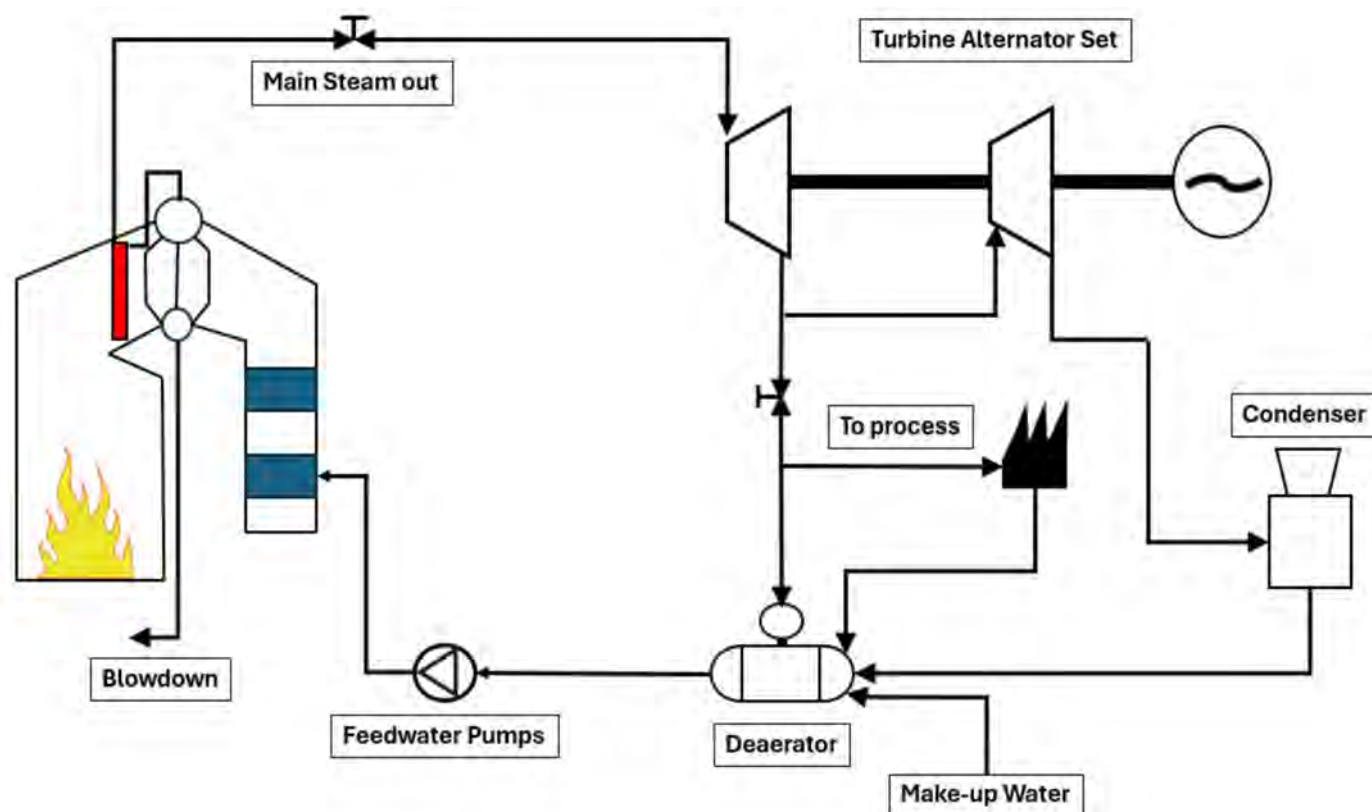


Figure 1: Heat and mass balance diagram of a typical co-generation plant.

Introduction

Co-generation plants are designed to deliver both electricity and useful heat, making them highly efficient systems. However, the performance of such plants can degrade over time due to equipment wear, changes in operational conditions, or inefficiencies in maintenance practices. In this context, regular visual inspections and operational audits are essential for identifying potential areas of improvement. Quantifying the recommendations that stem from these audits using numerical techniques can provide a roadmap for operators to prioritize maintenance efforts and implement cost-effective solutions.

This article focuses on the value of numerical modelling to translate the visual inspection and operational audit report findings into actionable improvements. This article highlights the results of a case study conducted at a sugar mill co-generation plant, operating in full condensing mode, where advanced numerical methods were used to evaluate the impact of specific recommendations on plant efficiency. The study highlights how quantifiable improvements in key performance metrics, such as the power-to-coal

ratio, can aid operators in making informed decisions about maintenance priorities.

The Role of Visual Inspections and Operational Audits

Visual inspections and operational audits provide valuable insights into the condition of critical components in co-generation plants. For instance, during an audit, factors such as superheater fouling, air preheater performance, and excess air levels in the furnace can be assessed. However, the challenge for plant operators lies in quantifying the potential benefits of addressing these issues and determining which maintenance actions will yield the most significant improvements in plant efficiency.

This is where numerical modelling becomes indispensable. By integrating data from audits with advanced process simulation tools, it becomes possible to quantify the impact of different maintenance actions on the overall plant performance. Numerical techniques allow for a detailed analysis of how operational changes, such as reducing excess air or improving heat exchanger performance, affect thermal efficiency and power generation.

Case Study: Sugar Mill Co-generation Plant - (Full condensing mode, zero process steam)

A recent study conducted at a co-generation plant provides a practical example of how numerical techniques can be used to quantify audit-based recommendations. The plant consists of two boilers, each with dedicated turbo-alternator set, that operate primarily on coal during the off-crop season and is bound by a power purchase agreement (PPA) with the national grid utility requiring the delivery of a specific efficiency target of 1.4 MWh per ton of coal burned. According to the PPA, in this instance, the coal is supplied to the sugar mill by the utility company.

The study leveraged numerical models to simulate the entire co-generation system, from the boilers to the turbines and condensers. Using actual plant data and the findings from a recent operational audit, the model was tuned to match current plant performance. Several key recommendations were tested in the model, revealing potential improvements in thermal efficiency and power output.

To page 12

From page 11

Quantified Recommendations and Results

Based on the operational audit, the following key areas were identified for improvement:

- **Superheater fouling and reinstatement:** The audit revealed that some superheater elements were blanked off or fouled, preventing the boiler from reaching its target steam temperature. Numerical modelling showed that reinstating these elements could raise the exit steam temperature to the desired 440°C, which would improve turbine efficiency and increase the power-to-coal ratio by approximately 2%.
- **Air Preheater optimisation:** The audit suggested that increasing the under-grate air temperature of the first boiler by using bleed steam from one of the turbines, could improve combustion efficiency. Numerical simulations confirmed that this modification could lead to a 1.5% improvement in the power-to-fuel ratio.
- **Excess air control:** Excess air was identified as a critical issue in both boilers. By reducing the final oxygen content in the flue gas through better excess air control, the numerical model indicated a further 2% increase in plant efficiency. Optimising the combustion air reduces the heat losses associated with unnecessary excess.

● **Condenser performance:** The study found that the plant's condenser was underperforming, leading to a higher turbine exhaust pressure resulting in a reduced power output. Numerical analysis suggested that improving the condenser's performance could boost the power-to-coal ratio by up to 15%, significantly improving the plant's ability to meet the PPA requirements.

Prioritizing Maintenance Based on Quantifiable Data

The ability to quantify the benefits of various recommendations gives plant operators a clear understanding of where to focus their maintenance efforts. In the case study, the combination of reinstating superheater elements, optimizing air preheating, and controlling excess air levels provided a cumulative efficiency improvement of nearly 5%. When condenser improvements were factored in, the overall plant efficiency could increase by as much as 15%, allowing the plant to meet its contractual efficiency targets.

This quantifiable approach also enables power plant operators/owners to justify and prioritise capital expenditures for maintenance projects. Instead of relying on qualitative assessments, power plant operators/owners can now demonstrate to their stakeholders, the potential return on investment by

showing the projected gains in power output and fuel efficiency based on numerical simulations.

Conclusion

In co-generation plants, visual inspections and operational audits are invaluable for identifying areas where performance improvements can be made. However, the ability to quantify the impact of these recommendations using numerical techniques is key to helping operators prioritize maintenance actions and optimize plant performance.

The case study at the sugar mill co-generation plant demonstrates how numerical modelling can translate audit findings into tangible improvements. By implementing targeted recommendations, the plant operators can increase the power-to-coal ratio, ensuring compliance with efficiency targets and improving overall plant financial viability.

This approach underscores the importance of coupling traditional inspection methods with advanced numerical analysis to make data-driven decisions in optimizing co-generation and power plants, especially when coal is used as a primary fuel source.

*By Dr Brad Rawlins
Mechanical R&D Engineer
John Thompson*



EFFICIENT ENERGY GENERATION AND SOLUTIONS

With John Thompson's Energy Management Solutions



Outsourcing Energy Contracts



Optimum Boiler Operation Regime



Energy Operating & Maintenance Contracts



Steam Utilisation & Feasibility Studies



CONTACT US



Your one-stop global energy solutions partner

ACTOM

SINCE 1903

ACTOM HVE on track to supply high-voltage equipment to Seriti Green's wind farm project



Umbila Emoyeni 900MW hybrid renewable energy facility will be the largest facility in South Africa. (Credit Mario Caruso, Unsplash)

ACTOM High Voltage Equipment (HVE) is currently manufacturing 400kV and 132kV High Voltage Primary equipment for the Umbila Emoyeni wind farm project, located between Bethal and Morgenzon in Mpumalanga.

Once completed, the Umbila Emoyeni 900MW hybrid renewable energy facility will be the largest facility in South Africa. Work is currently underway on phase 1 of the project, which will see 155MW commissioned by late 2025 or early 2026.

Seriti Green, the climate-change-mitigating subsidiary of coal mining company Seriti Resources, is developing the project. The wind farm forms part of an agreement that will see clean power wheeled through the national grid to meet the carbon neutrality aspirations of Seriti Resources.

ACTOM High Voltage Equipment Divisional CEO **Casbah Zwane** says the business is supplying high-voltage circuit breakers, disconnectors, instrument transformers, and line traps to the wind farm.

Grid connection

"We are on track with the equipment manufacturing for phase 1 of the project, which is set to be completed

by Q2 2025. Our scope of work is to supply high-voltage equipment that will be used for the grid connection of the wind farm. This is for both the ESKOM Main Transmission Substation, where the wind farm eventually connects to, and the ESKOM Distribution Substation, which is used for switching purposes, and we are essentially supplying most of the outdoor transmission and distribution equipment," says Zwane.

Once the project is completed, Seriti Resources will utilise 75% of the wind farm's output power to supply its coal mines. The company has yet to decide how the remaining 25% will be used. It is understood, however, that this amount of electricity could power up to about 265,000 South African households. By switching to renewables, the project is also set to cut Seriti Resources' carbon footprint significantly.

"As ACTOM, we are very proud to be associated with this project, given its environmental significance and the fact that it is likely to positively impact climate change. We are equally proud of the fact that it is a very important project in terms of South Africa's clean energy transition," says Zwane.

He notes that by supplying equip-

ment to the wind farm project, ACTOM is able to showcase its capabilities not only in South Africa but also beyond the country's borders.

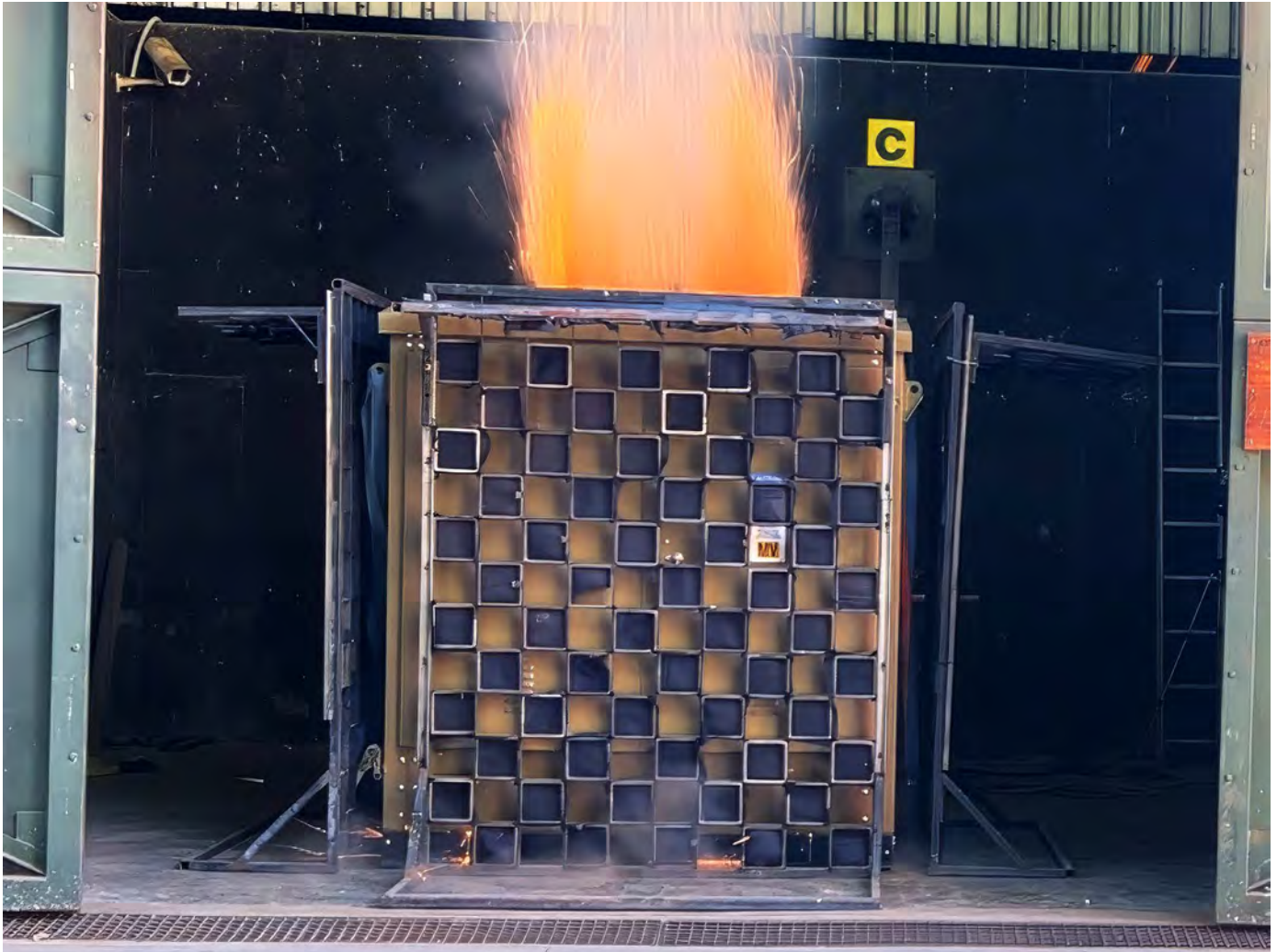
Engineering and technical skills

"The project enables ACTOM to expose its capabilities to the global markets, in terms of both our engineering and technical skills, and to demonstrate that we have the means and resources to supply projects of this scale. I expect that it will open other avenues for us going forward," says Zwane.

"We look forward to supporting Seriti and its stakeholders in phases of this project as it ramps up to 900MW. It is an excellent achievement for us to be part of this value chain and project that supports local manufacturing and supply."

Zwane adds that ACTOM will provide support for the wind farm beyond the life of the current project in the form of after-sales and technical support, which will be provided promptly and efficiently. This is because all the necessary skills and components are in-country and thus close to the project.

MV Switchgear's 36kV RMV outdoor enclosure and indoor arc cooler solution tested at SABS



The 36kV RMV outdoor enclosure is undergoing the internal arc test at SABS NETFA for accessibility 'B' (public protection).

ACTOM MV Switchgear successfully tested internal arc safety on their outdoor enclosure designed for the 36kV RMV ring main unit (RMU). The testing was done in June 2024 on the most common 3-way "LCL" non-extensible configuration, incorporating two ring switch-disconnectors and a circuit-breaker tee-off. The testing was conducted following IEC 62271-202, the international standard for prefabricated substations, to achieve an internal arc classification of IAC-AB 20 kA 0,5 s as prescribed in SANS 1874, the South African front-end standard for ring main units.

This required two tests to verify the enclosure's arc venting capability. The first test was conducted for accessibility "A" with the enclosure doors open to verify operator safety if an internal arc fault occurs when standing in front of the unit. The second test was conducted for accessibility "B" with the enclosure doors closed and cotton indicators placed on all sides of the

enclosure to verify the public's safety in the vicinity of the enclosure.

"The discontinuation of the Schneider FLUSARC 36 kV rated RMU presented the ideal opportunity for us to conduct the testing on the 36kV rated version of the popular 12/24kV RMV product range previously internal arc tested," said **Rhett Kelly**, MV Switchgear's Design & Development Manager, and added "36kV rated switchgear is predominantly used for renewable energy wind farm applications in South Africa. Shortly after completing the testing, we received the first 36kV outdoor unit order from a prominent mining company."

The results from the test conducted on the 3-way "LCL" outdoor enclosure can be transferred to other RMU configurations using the rules and guidance provided in IEC 62271-312 without further testing.

While at SABS NETFA, ACTOM MV Switchgear also tested internal arc on its pedestal and arc duct solution

developed for the indoor extensible RMV units. The tests were carried out following IEC 62271-200, successfully achieving an internal arc classification of IAC AFLR 20 kA 1 s.

As indoor units are only accessible to authorised personnel, only one test for accessibility "A" was required – with cotton indicators positioned at the front, lateral and rear sides of the switchgear with a mock-up room simulation.

"As the vertical arc duct incorporates an internal arc pressure relief device with arc 'coolers', we opted to test with a ceiling height of only 3m above the floor level. Furthermore, although SANS 1874 only requires a fault duration of 0,5s, we were fairly confident that we could achieve a full 1s test duration based on the design and experience gained from years of extensive internal arc testing," concluded Kelly.

MV Switchgear designs and supplies solution for GELPAG SIS panels for Irene Village Mall

Occasionally, customers approach ACTOM MV Switchgear for unique solutions required for specific applications. One such case was a request for a three-panel primary switchboard housed in an outdoor enclosure.

“The three-panel solution was needed for a changeover facility between the primary (11kV) supply and the incoming supply from a PV solar and battery energy storage system installed for the Irene Village Mall,” said **Rhett Kelly**, MV Switchgear’s Design & Development Manager.

Due to the 25kA system fault level, the high number of circuit-breaker operations, sophisticated protection relays and generator controllers required for this application, secondary MV switchgear was unsuitable. The compact size and fixed-pattern format of the solid dielectric insulated GELPAG switchgear made it the ideal choice for this application.

In near record time, MV Switchgear designed and manufactured an outdoor enclosure for three 1250A, 31.5kA GELPAG panels, each having a cable-side voltage transformer (VT) for voltage synchronisation. The design drew on the experience ACTOM has gained over the years in designing and testing outdoor enclosures for various types and sizes of MV switchgear. The switchboard was fully assembled and factory tested following IEC 62271-202 – the standard for prefabricated substations – which now includes prefabricated switchgear substations. The outdoor enclosure was despatched to the customer at the end of July.



Simon Mokgolo (Section 18 Production Manager) and Johan Jordaan (Technology Development Specialist) stand in front of the factory floor’s three-panel GELPAG outdoor enclosure assembly.

Proud supplier of
GELPAG SIS panels
to Irene Village Mall

MV SWITCHGEAR
A division of ACTOM (Pty) Ltd

Your one-stop global energy solutions partner

ACTOM

SINCE 1903



ACTOM Distribution Transformers now offers 5MVA Transformers and larger

ACTOM Distribution Transformers (ADT) has expanded its product range to include transformers rated from 5MVA to 10MVA (Class 1), with voltages up to and including 66kV. These small power transformers are offered with off-load and on-load tap changers.

The tap changer for the on-load option is from Maschinenfabrik Reinhausen (MR). **Mazwi Gordon Dubase**, ADT Manufacturing Manager, said, "For the smaller transformers, we use the MR ECOTAP, resulting in a more compact transformer."

ADT offers solutions for standard step-down transformers, generator step-up transformers, PV, VSD, and K-rated transformers, as well as dual secondary transformers. Customers can replace mineral oil (ONAN) with Ester fluids (KNAN), making the transformers more environmentally friendly. Losses can also be optimised to reduce the carbon footprint.

ADT's facility has large foil winding machines accommodating multiple foil sizes and widths. The large stacking tables enable the core and coils to be assembled easily, and they also have vast, automated vapour phase drying ovens that easily accommodate these fully assembled active parts. Its overhead crane capacity enables them to lift 30 Tons.

ADT's test facility is also equipped



From left: Daniel Godi, ADT Winder and Geoff Nedzamba, ADT Chief Quality Inspector winding a transformer coil.

for in-house testing. In addition to full routine testing, it offers temperature rise, Lightning Impulse, Partial Discharge, Sweep Frequency Response Analysis, and sound level measurement. ADT's in-house designs comply with international (IEC) and local specifications (SANS).

ADT has ventured into this segment with multiple requests from customers. Power Transformer manufacturers often overlook the size of transformers as they are seen as too small. Lead times also play a vital role. The power

demand has recently increased, so ADT positioned itself to fill the gap in this segment. "With our short lead times, competitive pricing and stringent quality control processes, we aim to satisfy the markets with our increased product offerings," said Mbenge.

ACTOM Distribution Transformers has the perfect range of transformers across the wide voltage spectrum. ADT's facility is ISO 9001:2015, ISO 14001:2015, ISO 45001:2018 and SANS accredited.



Sibusiso Ngobese, ADT Wireman preparing the active part of the transformer.

Reid & Mitchell is up to the challenge to deliver World-Class Traction Excellence

Reid & Mitchell's (R&M) Traction history goes back many years. The business was formerly owned by General Electric (GE) and supported GE products in SA. Around 50% of the older Transnet Diesel-Electric (DE) locomotives were made by GE, with the balance from Electro-Motive Diesel (EMD), all fitted with direct-current (DC) traction technology.

R&M had a licence agreement with GE for many years related to Traction, and directly repaired motors, generators, and alternators for customers, such as the (then) Spoornet, to GE standards.

The business was one of the Spoornet Centres of Excellence (CoE) for Traction rotatables, supporting the depots with the overhauls and heavy repairs of equipment, particularly 761 traction motors, 581 Generators, GTA11 and AR10/D14 Alternators, etc., as well as auxiliary equipment such as Auxiliary generators and cooling blowers.

Even though R&M had no technology link with EMD, as the CoE, the business also repaired EMD products, which internally were considered Other Original Equipment Manufacturer (OEM), with great success.

The R&M ties with GE have proven resilient over the years. When GE (now Wabtec) won orders for new AC Diesel Electric locos fleets, they approached R&M concerning the new AC traction motors as part of the locomotive localisation strategy. Although ultimately unsuccessful in the bid to build new



R&M Traction Department install AC Traction motors to locomotive wheelsets.

motors, R&M's sweet spot in after-market repairs proved to be a winner, and they developed processes along with Wabtec to repair the new GEB24 AC Traction motors and GGB type Alternators.

The development included investment in specialised equipment, and R&M currently perform repairs for Wabtec on all the new AC loco electrical rotating equipment.

In the past 5 years R&M's traction activities with the major railway operators reduced with the downturn in local freight operations, and other railway operators such as Botswana Railways,

also experiencing challenges.

In contrast to the decline in SoE work, the development of private traction companies, such as Traxtion (Sheltam) and Grindrod, has been very encouraging over the last few years. These companies have fleets operating in various countries and locations outside the local parastatal railway operations. The growth in this area is certain to expand once the third-party Access to Transnet infrastructure takes off to unlock the great potential of the South African rail network.

In addition, R&M has recently been pleased to see the return of some Transnet business, led by their Commutator manufacturing department, one of the last such facilities still standing in the local market after years of manufacturing decline, and are helping Transnet re-build some of their older, but maintainable, DC electric loco fleets, with the business standing ready to provide more assistance as needed as the fleets return to service.

Mike Shaw, Divisional CEO of Reid & Mitchell, said: "We see a very positive future for Traction, so much so that we are creating a new Traction Centre of Excellence at our Cason Road facility, with aspirations to deliver world-class overhauls and repairs in a dedicated facility based on our fundamentals of Safety and Quality. Customer satisfaction will be improved by greater efficiencies and quicker deliveries. Our R&M skilled resources are up to the challenge!"



R&M Generator department prepares a locomotive main generator field frame before re-assembly.

Marthinusen & Coutts rewinding of a 75MVA synchronous generator stator motor

Marthinusen & Coutts (M&C), a division of ACTOM (Pty) Ltd, is BEE accredited and offers full on- and off-site electromechanical services and repairs of power generation equipment, medium and low voltage AC and DC motors, transformers, and coil manufacture, as well as the full range of engineering, testing, diagnostics, balancing, and maintenance services.

July 2024 saw M&C complete a one-year project for Sasol to rewind a 75MVA BBC synchronous generator stator. According to **Dominik Krob**, Project Manager at M&C, "This type of generator, especially the generator windings, eventually reaches the end of life and needs to be rewound, which is where we come in.

So instead of replacing the entire machine with a new one, the customer decided to rewind this particular stator."

This generator is a critical component of a SASOL's power generation

system.

"There are several industrial manufacturing plants in South Africa, and the manufacturing industry has suffered severe losses during the load shedding period in our country. So, many of these manufacturers generate their power in-house to be independent of the grid," Krob added.

With M&C having close working relations with crucial parts suppliers, National Electric Coil, based in the United States, was the likely partner to assist in achieving the tight deadlines on this project.

NEC developed a unique system with individually Vacuum-Pressure-Impregnated (VPI) stator bars and coils, individually wrapped with the NECCOBond-E™ proven insulation system, and meeting every National and International Standard.

Complexity

While there are numerous stator bar and coil suppliers globally, their

quality is not guaranteed. Furthermore, quality issues often reveal themselves only after several years of operation, when it is too late to change suppliers or even claim damages from them.

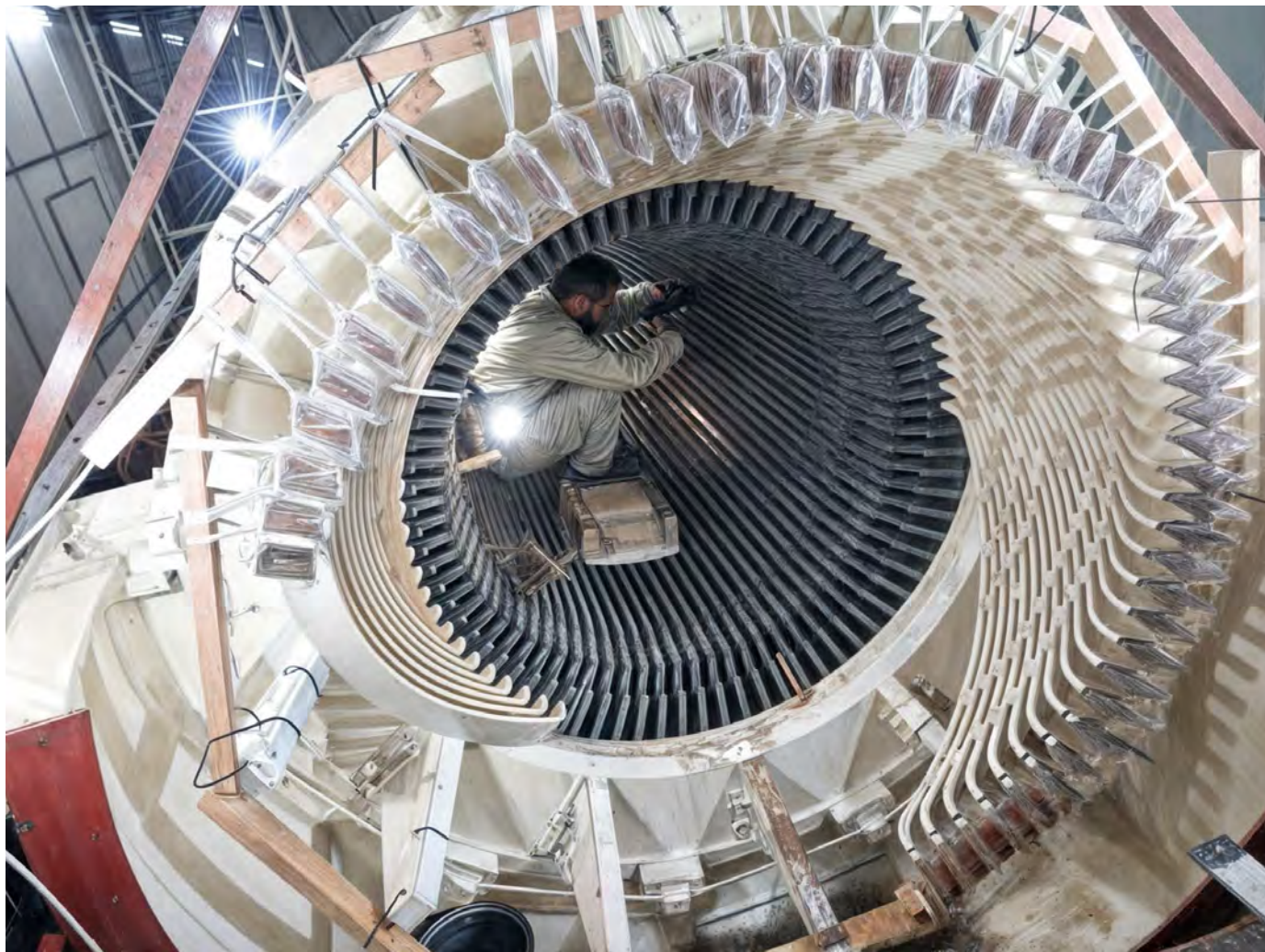
NEC is one of the very few suppliers that can manufacture individually VPI-stator bars world wide, and it has been doing so for decades, making it a very reliable and trustworthy technical choice.

Testing

M&C has its own testing capabilities in their factory, but this stator size requires exceptional (expensive and large) test equipment to perform the optimum tests and guarantee product quality.

For this purpose, M&C has partnerships with specialist local high-voltage test equipment service providers.

The HV Test and their 50kV resonant high-voltage test set are among them.



Sergio Bernardes, an M&C Winder busy fitting the bottom stator bars.

ACTOM Turbo Machines Vaal Mall Marathon was a huge success!



ACTOM Group CEO, Mervyn Naidoo ready to start the 2024 ACTOM Turbo Marathon.

ACTOM Turbo Machines (ATM) participated in the annual Vaal Mall Marathon on 26 October at the Vaal Mall in Vanderbijlpark. 2024 marks the 6th year of ATM's marathon, but with this year becoming the event's exclusive sponsor, it was renamed the 2024 ACTOM Turbo Marathon.

ACTOM is committed to its employees' overall wellness, encompassing more than just health and physical well-being. This commitment includes material, financial, psychological, social, cultural, environmental, and spiritual wellness. It is, therefore, no surprise that ACTOM Turbo Machines took on the role of main sponsor for this event. Several divisions within ACTOM joined in to support the wellness program. According to **Sylvester Makamu**, Group Human Capital Director, who also participated in the race, "For us, it is more than just a wellness day, and it is wonderful to see so many people entering the marathon, as the wellness of our employees is our top priority."

The marathon was open to the public and offered various running and walking distances: 32km, 21.1km, 10km, and a 5km race. It attracted approximately 1100 entries. **Danie Bloem**, Engineering Manager at ACTOM Turbo Machines, stated, "Last year, we had a total of 700 entries, and

the event is growing. As the event organiser from ACTOM's side, I look forward to growing the event. With all the different business units involved, it has turned into our biggest wellness day for the company, and this also assists in getting the word out to the public to grow the event."

Mike Shaw, Divisional CEO of Reid & Mitchell, who entered the 21km race, said: "This event was very well organised, and I want to thank ACTOM

Turbo Machines and the other ACTOM divisions for participating in this event because it is a lot of fun! I am very proud of my team for joining the marathon and bringing them together."

Mervyn Naidoo, ACTOM Group CEO, concluded, "It was a proud moment for me to see all the different divisions and business units participate in this event, and I see us taking this marathon nationwide in the near future!"



The ACTOM Turbo Marathon sported 1100 entries, the biggest turnout since it started 6 years ago.

Metalplus Gains ISO 3834 International Welding Quality Recognition

Metalplus specialises in welding repairs to large rotating equipment and diesel engine crankshafts. They are the pioneers of submerged arc welding in South Africa and have been executing this highly controlled welding process since 1973. They have successfully welded more than 25,000 shafts for all major industries and are continuously expanding their welding technologies and product range to execute the most diverse welding repairs.

The natural step toward the ISO 3834 International Welding Qualification has been on the cards for some time. ISO 3834 is a globally recognised

international standard establishing quality requirements for welding metallic materials. As Metalplus has been using strict ISO and ASME procedures for all their welding as a standard, the additional ISO 3834 qualification was reasonably straightforward as it integrates with their ISO 9001, 14001 and 45001 accreditations.

Metalplus have timed the new certification to align with the recertification of their other ISO specifications with the benefit of significant cost savings. **Roman Mornau**, Metalplus Divisional CEO, said, "Together with John Thompson and the BSCIC accreditation body, a gap analysis towards a

successful certification showed no significant changes, and we achieved certification of ISO 3834 without any findings in October 2024." This accreditation adds value to the commercial process by simplifying verification of their expert status in performing high-quality welding.

"Our Metalplus team is proud to receive such a well-recognised international quality standard for welding with relative ease, and we look forward to leveraging this new certification to enhance our services further and reach new markets," Roman concluded.



Deon Meyer, Welding Coordinator, Metalplus.

Kgatlamping Primary School visited ACTOM in Knights



Kgatlamping Primary School Gr7s are excited to visit the ACTOM Knights facilities with their teachers.

In August 2024, ACTOM High Voltage Equipment (HVE), in collaboration with ACTOM Distribution Transformers (ADT), hosted 120 7th-grade learners from Kgatlamping Primary School in Tembisa at its Knights factory in Germiston to enhance their STEM learning experience outside the classroom.

The learners were divided into three groups of forty each and accompanied by six teachers, two HC personnel, one Engineer, two Engineers In Training, and two SHEQ/Safety representatives, who visited ACTOM Knights from 13 to 15 August 2024.

The EITs gave the learners an over-

view presentation about ACTOM and its manufacturing capabilities, followed by a tour of the manufacturing process.

The EITs did a great job explaining to the children about the different careers ACTOM offers and what they need to study to enter the engineering field. This exposure benefited the children and energised the EITs when they saw the excitement on the children's faces.

"The children did not know what a transformer was; they called it 'danger' as that is the sign normally found on transformers. Once they realised what goes into the manufacturing of transformers, they were flabbergasted," said

Seja Kgwale, Human Capital Manager at ACTOM High Voltage Equipment.

After the visit to HVE, the children visited the facilities in the ADT division. "Our Engineering Department shared knowledge and educated the learners on the Distribution transformer products they are exposed to daily in their community without understanding the functions. It was a fulfilling experience to see how learners expressed an interest in our products by asking questions. We cannot wait for the next visit," said **Kombi Shibambu**, ADT.

After the factory tours, the children were treated to lunch and goody bags. The EITs then organised a competition with the children, asking questions about what they had seen during the day. Prizes were given to a learner who answered correctly. "It was a fun day, and I hope that by being introduced to the facilities, they learnt there is more to a career than being a businessman or an entrepreneur and that they understood that the world is their oyster when making a career choice," Kgwale said.

Mary Mtsweni, Principal of Kgatlamping Primary School, said, "The School Governing Body, Staff, and learners extend their appreciation to ACTOM for the warm and educational tour."

Kgwale added, "I would like to thank Engineering, SHEQ, and ADT for their support. Without it, the day wouldn't have been half as successful as it was."



The children were enthralled about what goes into building high voltage disconnectors and how they work.

Key appointments

Mazwi Gordon Dubase has been appointed Manufacturing Manager of ACTOM Distribution Transformers effective June 15, 2024.

Dirkie Meyer has been appointed DCM&G Sales and Service Manager of Reid & Mitchell effective September 1, 2024.

Thulani Ludidi has been appointed Divisional HC Manager of Reid & Mitchell effective September 1, 2024.

Manqoba Majoji has been ap-

pointed Contracts Engineer at ACTOM High Voltage Equipment effective August 2, 2024.

Sikhumbuzo Mtsweni has been appointed Contracts Engineer at ACTOM High Voltage Equipment effective August 19, 2024.

Wandile Zulu has been appointed Financial Controller at ACTOM High Voltage Equipment effective July 1, 2024.

Tholakele Khumalo has been ap-

pointed Quality Control Coordinator at ACTOM High Voltage Equipment effective October 21, 2024.

Sizwe Memela has been appointed HC Officer at ACTOM High Voltage Equipment effective October 21, 2024.

Bafana Nyandeni has been appointed Chief Engineer – Inspection & Test at ACTOM High Voltage Equipment effective November 1, 2024.



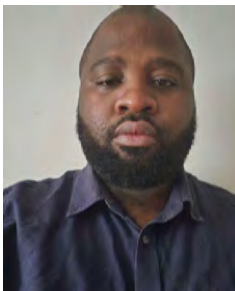
Mazwi Gordon Dubase



Dirkie Meyer



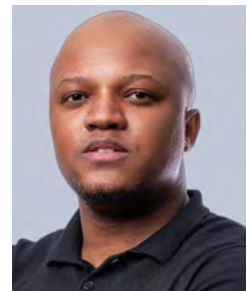
Thulani Ludidi



Manqoba Majoji



Sikhumbuzo Mtsweni



Wandile Zulu



Tholakele Khumalo



Sizwe Memela



Bafana Nyandeni

ACTOM Heritage Day celebrations

South African Heritage Day, observed on September 24th, is a joyous acknowledgement and celebration of our nation's diverse cultural heritage. This special day allows South Africans to reflect on and honour the rich cultural traditions that form the fabric of our society.

Heritage Day is celebrated in South Africa in ways as varied as the cultures it honours. Some individuals partake in vibrant cultural gatherings, includ-



ing festivals, concerts, and traditional dances. Others choose to explore museums and historical landmarks, delving into the stories and legacies of their ancestors. Many also opt to spend quality time with loved ones, sharing cherished narratives and upholding time-honoured customs.

With an approximately 8,000-strong workforce across all divisions, ACTOM's spirited and culturally adorned celebrations for Heritage Day were no secret. We thank all our staff for their dedication to fostering an atmosphere of celebration and mutual respect for each other's heritage.



Some of ACTOM's divisions celebrating Heritage Day include: Bottom of page 28 Engineering Projects & Contracts, (Left) Power Transformers, (Top) Reid & Mitchell, and (Bottom) Protection & Control.

Sparking Connections at ACTOM Electrical Products Pretoria's Annual Open Day!

On October 3rd, 2024, the buzz of innovation and camaraderie filled the air as ACTOM Electrical Products Pretoria Branch hosted its much-anticipated annual open day. With over 220 guests—including consulting engineers, electrical contractors, and suppliers—the event was a vibrant celebration of all things electrical!

As attendees mingled and networked, the show's star, the Gelpag panels, drew curious crowds eager to learn more. Questions flew around like sparks, with guests diving into the latest tech trends and insights. And if that wasn't electrifying enough, the spotlight also shone on the newest LED technology advancements, leaving everyone excited!

But it wasn't just all business. The day's festivities included a braai, where delicious aromas wafted through the air, inviting everyone to feast. And to top it off? Guests were treated to artisanal ice cream that added a sweet



Left: ACTOM Electrical Products hosted a successful open-day event. **Right:** From left: Nonkululeko Magwete, Landry Mokouna (prize winner) and Coert Snyder.

twist to the day, creating a perfect ending to a remarkable event.

And in a thrilling twist, Mr Landry Mokouna was the lucky winner of the gas braai lucky draw - adding an extra layer of excitement to the day!

From enlightening discussions to

delicious bites and thrilling giveaways, ACTOM's open day was more than just an exhibition; it truly celebrates the electrical industry and the connections that make it thrive. Here's to more events that spark inspiration and collaboration in the future!

LHM Mandela Day initiative – Part 1

July 2024 saw LH Marthinusen (LHM) come to the party in their efforts to support the global celebration of Mandela Day. The Nelson Mandela International Day is an annual international day in honour of Nelson Mandela, celebrated each year on 18 July, Mandela's birthday. The day was officially declared by the United Nations in November 2009, with the first UN Mandela Day held on 18 July 2010.

LHM management called on all staff to support their Mandela Day initiative by donating cash, non-perishable food items, clothing (new or old), toys, blankets, or books—and they did not disappoint.

The organisations that LHM is supporting are:

EPC primary school –located around the corner from LHM's Denver branch, cares for the educational needs of just under 200 children from Gr R - 7 in the Denver area and is not government-funded.

Kids Haven - There are two premises in Benoni: the "Centre," where the boys aged 12 and older are housed in Central Benoni town, and the "Village," which is in Mackenzie Park (Benoni). The Village consists of three houses where the boys younger than 12 and all the girls are housed. Kids Haven has around 250 children who are permanently housed, fed and clothed daily, including getting them to school and back.

El-Shammah Babies – A welfare organisation based in Germiston whose primary goal is to care for abandoned and unwanted babies.

On the day, a group of LHM Staff members rolled up their sleeves and put on hair nets to serve the needs of the children at the EPC primary school. According to **Charmaine Hall**, Divisional Human Capital Manager, LHM, "Our staff had the fantastic opportunity to see the joy and smiles they put on each little one's face, whether through serving them delicious soup, playing and laughing along with them, handing out our beautifully branded LHM winter hampers, or just hugging them."

The cash donations received for Mandela Day have been combined with LHM's Staff Community Fund and have been designated to assist Kids Haven in installing a Water Solution System at their Haven Care Centre; the centre currently cares for the needs



LHM staff gave up their time to serve soup in bowls and hand out fat cakes (vetkoek) to the school's children and staff. They also gave out gift bags with blankets, beanies, and scarves after meals.

of approximately 80 people per day. Thirty-six of these are children abused, women & families from the Ekurhuleni area that have been left destitute.

"A big thank you to everyone who volunteered their time and supported LHM's 2024 Mandela Day. A special thanks and appreciation need to go out to all LHM staff members & management because, through all the hard work each of you puts into this initiative, we can help the community in need around us. It was a special day to remember, and we sincerely hope

to continue such initiatives to support those less fortunate around us.

Therefore, we are calling this Part 1 because it is not over; we are still collecting and collating donations for the children and babies in need at Kids Haven, Ikhaya da Luz, and El-Shammah. Please continue to support the spirit of Mandela Day," Hall concluded.

"Giving is not just about making a Donation; it's about making a Difference."



The donations of clothes, tinned food, etc., collected from the LHM staff were taken to the Kids Haven donation centre, which is at the "Centre" where the boys are housed. From left: Moreka Gomez (Financial Manager); Charmaine Hall (HC Manager); Sam Mkgophah (CEO of Kids Haven), and James Courtenay (Maintenance Manager of Kids Haven).



MANUFACTURING



PROJECTS



SERVICE AND REPAIRS



MAINTENANCE

Key sectors served by ACTOM's equipment supply and solutions offering include:

Power Generation
Transmission
Distribution
Utilities

Healthcare
Industrial Processing
Mining
Oil & Gas

Paper & Pulp
Petro-chemical
Rail Transport
Signalling

Renewable Energy
Sugar
Textile
Water & Sanitation

ACTOM, offers a winning and balanced combination of manufacturing, service, repairs, maintenance, projects and distribution of electro-mechanical equipment through its 33 outlets throughout Sub-Saharan Africa.

Your one-stop global energy solutions partner

ACTOM

SINCE 1903

ACTOM businesses

POWER

John Thompson, Bellville: (021) 959-8400

John Thompson, Isando: (011) 392-0900

www.johnthompson.co.za

John Thompson is a leader in energy and environmental solutions through value engineering and innovation. We are firmly focussed on serving global and local markets and we offer the following products and services: design, engineering, manufacture, construction, repairs, maintenance, retrofit, installation and commissioning of industrial water-tube and packaged fire-tube boilers, and industrial air quality solutions including HVAC, bag filters, scrubbers and ESP systems. Our Boiler and Environmental business unit offers the following solutions for utility plants: maintenance, repairs and retrofit of utility plant boilers, ESP systems, FFP systems, mills, burners, ducting, HP piping and ancillary equipment - geared towards keeping large power plants operating optimally, as well as providing a plant and equipment hire solution for construction work.

John Thompson also provides outsourced steam via its Energy Management Solutions business unit. Our service further includes capacity and efficiency improvements to older boilers, supply of original equipment manufacturer (OEM) spares, reliability studies, metallurgical services and computational fluid design (CFD) modelling.

ENGINEERING PROJECTS & CONTRACTS

Industry: (011) 430-8700

ACTOM Industry, the group's Mine winder experts with modern power electronic drive, control and switchgear technology, providing turnkey solutions worldwide for specialised industrial rotating drive and power applications in mining, metals, paper and process industries. We manage projects from design to commission; inspect & maintain; provide emergency support; do repairs and we perform magnetic rope testing.

Contracting: (011) 430-8700

Contracting is the electrical and instrumentation business unit which provides turnkey solutions for electrical power and instrument & control systems in the mining and manufacturing industries as well as the public sectors.

Power Systems: (011) 430-8700

ACTOM Power Systems, the group's substation construction contractor, is ACTOM's systems integrator, responsible for turnkey projects for the electrical power, mining and manufacturing industries, as well as for public sector infrastructure. It specialises in Renewable balance of plant installations.

Transport: (011) 871-6600

Transport has three trading units:

ACTOM Signalling; design, manufacture, install and maintain railway signalling equipment and turnkey systems.

ACTOM Transport Equipment and Projects (TEP); a contractor and supplier of rolling stock equipment, parts, maintenance and specialised depot machinery and test equipment.

ARNOT Vibration Solutions (AVS); suppliers of anti-vibration products and engineered solutions to a wide range of industries, including rolling stock.

ACTOM Energy: (021) 510-2550

ACTOM Energy is a solutions business and in collaboration with various divisions within the ACTOM Group, provides electrical automation, power automation, protection and control, remote condition monitoring and fluid technologies (motion controls, hydraulic and pneumatic) system integration services across all sectors.

LH Marthinusen - Coastal

Durban: (031) 205-7211

Africa's leading maintenance partner for rotating machines - servicing traction, power generation, mining, utilities, oil & gas and general industry.

HIGH VOLTAGE EQUIPMENT

High Voltage Equipment: (011) 820-5111

High Voltage Equipment, is a designer, manufacturer, supplier and installer of high voltage equipment to power utilities, electricity generation, transmission and distribution industry, mining sector and contracting companies. Manufacturer of isolators, instrument transformers, outdoor circuit breakers and insulated phase busbars. Supplier of high voltage Gas Insulated Switchgear, Compact Hybrid Switchgear, surge arresters, substation and overhead line insulators. HVE specialises in the repairs, supply of spares and maintenance of high voltage equipment.

MEDIUM VOLTAGE SWITCHGEAR

MV Switchgear: (011) 820-5111

www.actomswitchgear.co.za

Leading manufacturer and supplier of air-insulated (AIS) and gas-insulated (GIS) switchgear for use up to 36kV. The product range consists of indoor switchgear, containerized switchgear solutions, compact substations for renewable energy applications, minisubs, free-standing outdoor kiosk ring main units and bulk metering units. The division also specializes in the repair and maintenance of electrical networks.

WPI Power Solutions: (011) 820-5111

24 Hour Emergency Service: (082) 801-3171

WPI specialises in the repair, installation, retrofitting and maintenance of electrical networks via MV Switchgear's After Sales department and WPI regional branch network that is technically well equipped and strategically placed close to the customer base. The department offers 24/7 customer support for substations, MV and LV switchgear and associated products.

Current Electric: (011) 822-2300

Current Electric designs, manufactures and supplies medium voltage current and voltage transformers to switchgear manufacturers and repairers, electrical distributors and a diverse range of end-users locally and internationally.

POWER TRANSFORMERS

Power Transformers: (011) 824-2810

Power Transformers designs, manufactures and supplies a wide range of power transformers from 2MVA to 315MVA up to 275kV to power utilities, renewables projects, electrical contractors, the mining sector, local authorities and industry locally and internationally.

DISTRIBUTION TRANSFORMERS

Distribution Transformers: (011) 820-5111

Distribution Transformers designs, manufactures and supplies distribution transformers ranging from single phase 16kVA to three phase 7MVA up to 44kV, can be Single or Dual MV or LV and NECRT's up to 44kV to power utilities, the mining sector, local authorities and industry, and renewable applications locally and internationally.

LH MARTHINUSEN

LH Marthinusen Johannesburg: (011) 615-6722

Cape Town: (021) 555-8600

www.lhm.co.za

LH Marthinusen repairs and refurbishes transformers, electric motors, alternators and industrial fans. Manufacture of electric motor components, insulation components and specialised transformers and motors. It also provides engineering services for its products to the mining, industrial and petrochemical sectors and local authorities, as well as for the export market.

REID & MITCHELL

Reid & Mitchell: (011) 914-9600

www.reidmitchell.co.za

Reid & Mitchell is a repairer and manufacturer of electrical equipment for open cast mining, steel, rail transportation and marine industries. Motors and generators for excavators, off-highway vehicles, locomotives, drilling and pumping applications. The division is also a specialist repairer of DC motors and generators, including rebuilds, rewinds and commutator manufacture.

Electrical Machines: (011) 899-1111

Electrical Machines supplies medium and low voltage motors, starters, gearboxes and speed reducers to the mining, industrial, processing and utilities markets.

Large Motors designs and manufactures medium voltage motors that include its reputable customised large UNIBOX series and its high specification MS4 totally enclosed fan-cooled (TEFC) cast-iron motors.

Laminations & Tooling manufactures laminated components and tooling for the electric motor manufacturing and repair industries.

Energy Namibia – Electrical Products: +264 (61) 423 150

Supplier of Electrical products throughout Namibia.

Namibia Armature Rewinders (NAR): +264 (64) 220 352

Repairer of electrical machines, hydraulics, boilers, transformers and switchgear throughout Namibia

MARTHINUSEN & COUTTS

Marthinusen & Coutts: (011) 607-1700

www.mandc.co.za

M&C repairs, maintains, services, and carries out specialised manufacture of HV, MV and LV, flameproof, DC and traction motors, transformers, generators, alternators and ancillary power generation equipment up to 373 MVA. M&C also provides a full range of 24/7 engineering on-site services and unique motor and generator management and maintenance solutions and programmes.

ACTOM TURBO MACHINES

ACTOM Turbo Machines: (016) 971-1550

www.actomturbomachines.co.za

ACTOM Turbo Machines is a mechanical turbo-machinery and high-speed rotating equipment service provider, for manufacturing, maintenance, overhauls, repairs, installations and commissioning of all types of steam and gas turbines, compressors, blowers, pumps, fans, gearboxes, centrifuges, as well as general fabrication and machining.

METALPLUS

Metalplus (011) 433-1880

www.metalplus.co.za

Metalplus has earned a reputation over many years in the petrochemical, power generation, machine repair, mining, and rail & transport industries, for its reliability, accuracy and speedy turnaround times in performing mechanical repairs that include submerged arc micro-welding, machining and grinding. Further to our multitude of shaft and crank shaft repairs our products extend to new shaft manufacturing, casing welding and stitching, hard facing, component manufacturing and specialised welding repairs.

ELECTRICAL EQUIPMENT

Electrical Products: (011) 878-3050

www.actomep.co.za

Electrical Products is ACTOM's trading and representation arm, with a national network of strategically located branches. The business unit supplies products produced by ACTOM divisions and other manufacturers, including cable, cable accessories, lighting equipment, heating and ventilation equipment, circuit breakers, distribution transformers, minisubs, protection and control equipment, electric motors, meters, fusegear and overhead line materials.

Satchwell: (021) 863-2035

Satchwell manufactures and supplies domestic and industrial heating elements, temperature controls, refrigeration components, solar water heating components and appliance spares to the domestic appliance manufacturing industry and the chemical, mining and construction industries, among others.

Genlux Lighting: (011) 825-3144

www.genluxlighting.co.za

Genlux Lighting is a leading designer and manufacturer of luminaires for roadway lighting, floodlighting, outdoor commercial lighting and industrial applications. It produces a wide range of high quality products in both HID and LED technologies.

ACTOM SMART TECHNOLOGIES

Protection & Control: (011) 820-5111

A market leader in the supply of protection, metering and low voltage solutions to the electrical industry. Our offering includes a comprehensive range of automation systems, protection relays, credit, smart and prepayment metering systems and hosted services as well as LV motor control centres and power DB's, variable speed drives (VSD's) and components and accessories.

ACTOM Kenya: Tel: +254 (0) 746 351-162 / 010 2020095

kenya.info@actom.co.za

The product offering includes the supply of transmission and distribution equipment including power transformers, distribution transformers, MV Switchgear, HV products and protection and metering equipment. Under the John Thompson business it also includes the sale of steam (biomass boiler, ancillary equipment).

Static Power: (011) 397-5316

Static Power specialise in the design and manufacture of AC and DC standby equipment for the Industrial, telecomms, rail and renewable energy markets including thyristor type chargers, (Micro Process Controlled option), industrial batteries, power supplies, industrial UPS's, furnace control panels, power distribution boards and battery tripping units. All systems are designed and engineered to suit their purpose for both the local and export markets. We offer specialized technical training to enhance practical and theoretical knowledge of our products. After Sales division to support and maintain installed equipment in the field.

COM 10: (011) 552-8368

COM10 is a local assembler and integrator of Alpha switchmode rectifiers, DC/DC Converters with sophisticated supervisory controllers, Lead Acid Batteries, stands, battery cubicles and power enclosures.

Alkaline Batteries: (011) 397-5326

Alkaline Batteries is the South African distributor for ALCAD and SAFT nickel cadmium and Lithium Ion batteries as well as the Intelli Connect battery monitoring systems for the industrial, telecoms, rail and re-newable energy markets. The local assembly plant on the East Rand includes a collecting point for spent nickel cadmium batteries for recycling. Services offered include Installation and Commissioning, Battery Sizing, Testing, Investigations, Maintenance and Repairs, Maintenance and Service Contracts, Discharge Tests and Training.

What's Watt is published by ACTOM (Pty) Ltd to inform staff, customers and other stakeholders of developments within the group.

Editorial contact: Minx Avrabos
Tel: 082 467 3962, editor@actom.co.za

Produced by: Jeroen Luyk, In Africa
082 951 5049, inafrica@saol.com

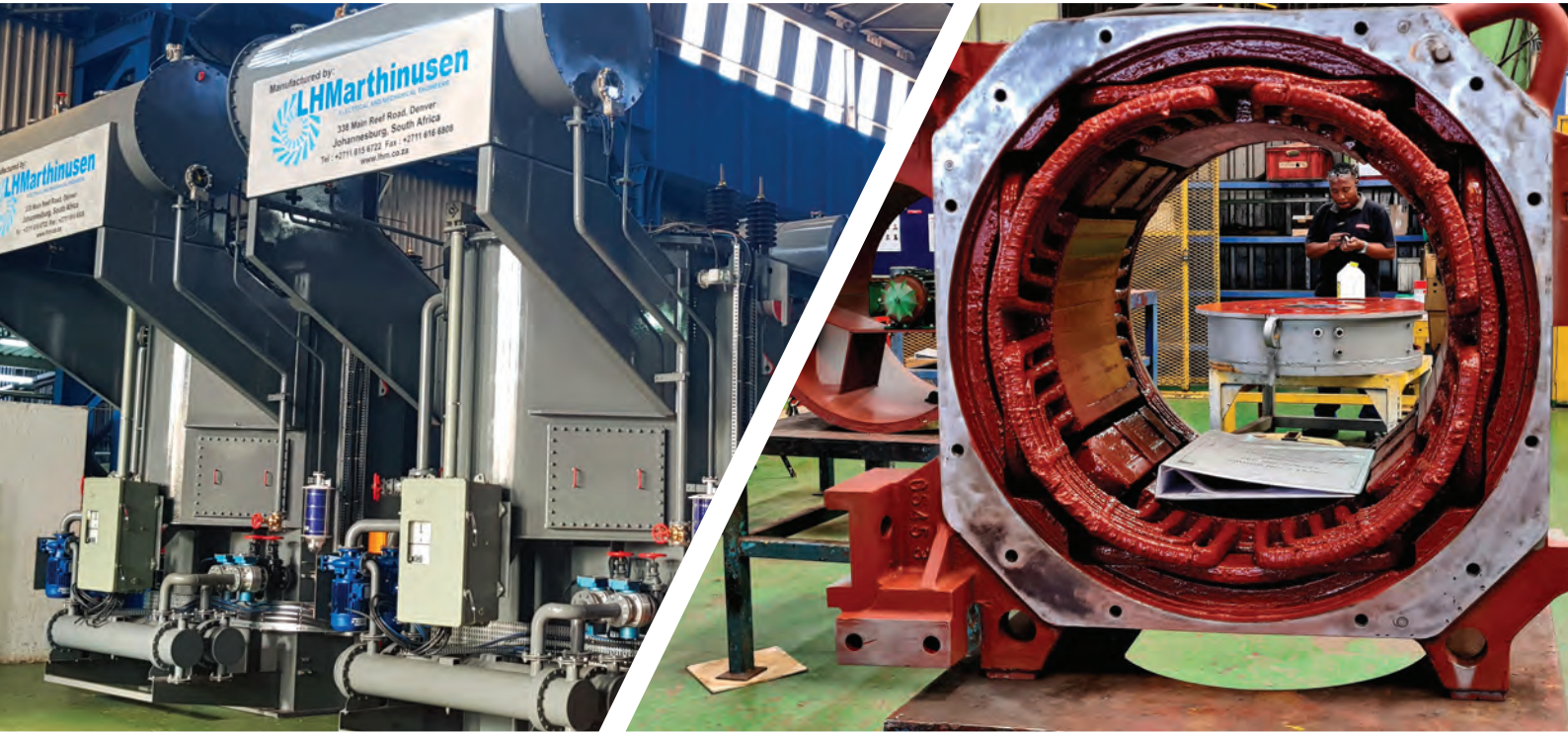
ACTOM contact:

Mamiki Matlawa, Tel: +27 (0)10 136-0200
mamiki.matlawa@actom.co.za

Disclaimer:

This publication is designed, compiled and produced on behalf of ACTOM (Pty) Ltd. Whilst the compilation and production of What's Watt is done with care and with every effort being made to avoid errors, ACTOM, its shareholders and staff do not accept responsibility for any errors or the consequences thereof.

Proud providers of electro-mechanical solutions for the rail sector



Your one-stop global energy solutions partner

ACTOM

SINCE 1903