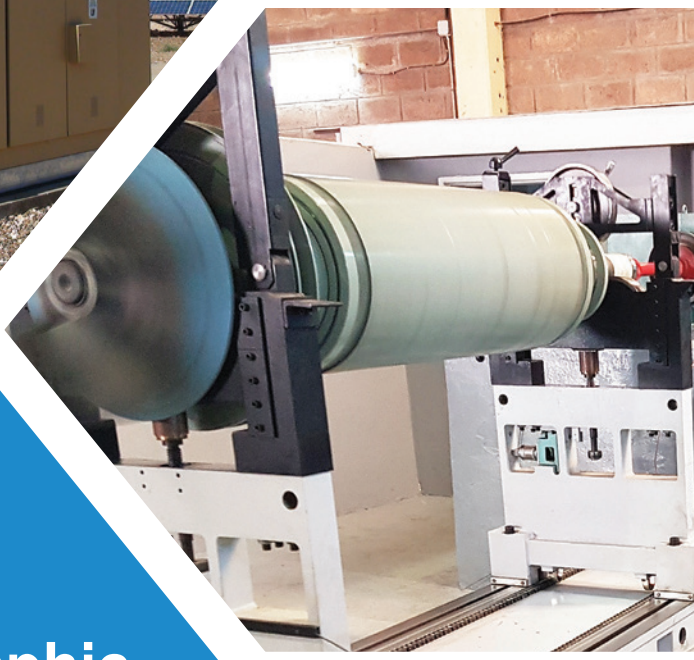
What's Watt

June 2019



Featuring: ACTOM's geographic diversification

ACTOM

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Better prospects for improved economic growth in SA following the Elections

The business environment has been challenging in South Africa and globally over the past six months and we expect a slowdown in global growth due to various factors, including Brexit and the recent trade war between the USA and China.

There has been a marked slowdown in capital projects and the manufacturing sector. The construction sector in particular has been hard hit, resulting in the business rescue and in certain instances even the closure of various prominent companies. However our business is fortunate in being very diversified and we have been further assisted by an increasing focus in the aftermarket maintenance and repairs, which has been key to sustainability through what has been a depressed capital cycle.

There was a marked slowdown in decision-making prior to the Elections, due to uncertainty about the outcome. However the Elections went off well, with most economists interpreting them as giving our State President the necessary political support to effect much-needed changes to stimulate economic growth. Furthermore his post-election cabinet appointments clearly reflect his determination to root out corruption in government.

We can now reasonably expect more positive steps to be taken to address the challenges facing us, ultimately resulting in improved economic growth. But the severity of the problems can't be underestimated. Various SOE's have deep structural problems which need urgent attention and it is to be hoped that the measures taken to correct them will create the environment that is so sorely needed to stimulate the industrial and manufacturing sectors.

We are optimistic that good governance will be restored with the changes taking place and set the way forward for recovery, which is expected to be a gradual process.

We are also pleased about government's increased commitment towards encouraging local manufacture, as has been evident through the designation of various product lines. In addition, government has acknowledged that private sector investment and partnerships are fundamental to the future of the economy.

Early this year ACTOM sold its Wilec division to a well-established black-owned industrial business in

pursuance of the group's strategy of focussing on our core businesses within the infrastructure industrial sectors. In so doing we also demonstrated our commitment to encouraging the development and advancement of black industrialists where merited.

Taking into account the extremely challenging conditions in which group businesses have had to operate over the past number of years, they have on the whole performed exceptionally well, especially when compared to their various competitors.

As part of our ongoing quest to improve and expand the range of our products and services, including adopting new technologies that offer better ways of meeting our customers' needs, the group is currently engaged in various exciting initiatives relating to renewable energy, energy storage and emission control systems and is also aggressively pursuing export opportunities through various partnerships globally.

I am pleased to report that we managed to achieve a commendable Disabling Injury Frequency Rate (DIFR) of 0.70 in the financial year to March 2019. I'm thankful to all of our staff for this and urge you to keep up the good work towards further improving our health and safety record.

Now that **Garth McEwan** has stepped down from his long-held position of Group Financial Director, I'd like to thank him for his invaluable contribution to ACTOM's success over the years. Garth has been succeeded by **Annamarie van Wyngaardt**. **Sylvester Makamu** has been appointed Group Human Resources Executive from May 1, 2019 and succeeds **Johann Ellis**. Garth and Johann have been pivotal in the creation of the group in its current form. I would like to wish Annamarie and Sylvester well in their new roles. I am also pleased to announce that both Garth and Johann will remain in the employ of the group in part time roles.

Mervyn Naidoo

What's Inside

***Cover**: Images illustrating some of the export work carried out by ACTOM divisions: Assembly and erection of watertube boilers and pre-boiler plant in Eastern Java by John Thompson, M&C Zambia's 12t balancing machine; and an installation of a 150MW turbine motor in Panama by ACTOM Turbo Machines.*

ACTOM's geographic diversification strategy

As the largest manufacturer, solution provider, repairer, maintainer and distributor of electro-mechanical equipment in Africa it is imperative for the ACTOM executive to regularly review the strategic direction of the group.

"From a group perspective one of our main strategies is to diversify geographically, taking our existing product range outside of South Africa. Currently our export revenue is 15% of our sales as a group and we see this market as an obvious business opportunity," explained **Mervyn Naidoo**, Group CEO.

Zambia is one of ACTOM's many success stories. Initially ACTOM bought a repair company in Zambia, and using this as a base, began supplying low voltage motors, later introducing medium voltage motors. ACTOM is now gearing up for transformer repairs and has also set up a separate mechanical repair workshop in its workshop in Kitwe, Zambia.

Similar success was reported with a joint venture in Angola. **David Sullivan**, Divisional CEO of LH Marthinusen, explained, "We successfully set up an after-sales service workshop in the north of Angola with an American company who does large intelligent valve refurbishment on the oil fields. They own the workshop, and we bring equipment and intellectual property to the partnership. The partnership has been beneficial in establishing representation there and we now have the opportunity to expand and sell some of the other ACTOM products."

ACTOM Electrical Products established itself as a distributor of electrical equipment in South Africa. As the business grew, it became necessary to expand their footprint outside of the South African borders with business taking off in Zimbabwe and Namibia.

"Our business in Zimbabwe was doing really well up until the recent economic crisis, but we are confident of an upturn in that market in the future. Our operation in Namibia is now well established and this experience has taught us the importance of community acceptance and finding the right staff, skills and location. Strategically I believe future opportunities for Electrical Products lie in Botswana, Malawi and Zambia but at this stage our priority will be Botswana," said **Rod Penaluna**, Divisional CEO of ACTOM Electrical Products.

"There is a great deal of opportunity to increase the sale of products and our service offering in the SADC countries in which we currently operate, but there is also great potential to expand into West and East Africa," added **Harry Browne**, ACTOM's Group Business Development Executive.

He went on to say that it is ACTOM's intention to establish business hubs in these regions with a focus on service and maintenance, "Our service and maintenance businesses, John Thompson Boilers, LH Marthinusen, Marthinusen & Coutts, WPI and Reid & Mitchell are best placed to lead such initiatives and to establish links with local businesses and partners requiring

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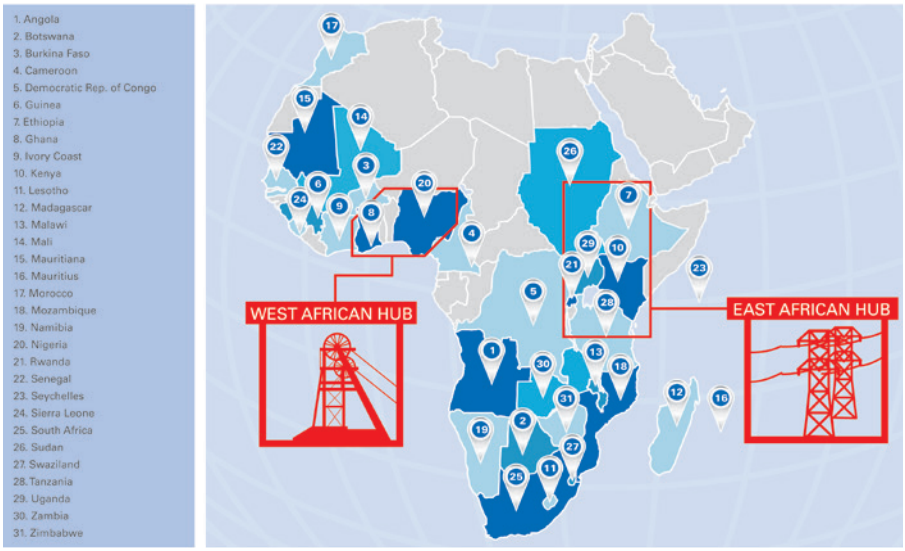

ACTOM's presence on the African continent. Illustration of the countries earmarked for inclusion in the regional hubs of East and West Africa.

From page 3

The newly erected machine shop at Marthinusen & Coutts, Kitwe Zambia.

our technology and expertise."

Countries that have been earmarked in West Africa include Ghana and Nigeria.

LH Marthinusen is taking the lead on creating a business hub in Ghana which will potentially form the industrial hub for the West African region. Many of the large gold mining companies are recapping their mines and are investing heavily. This will invariably lead to opportunities for ACTOM.

"We are close to concluding a deal in Ghana whereby we will rent a workshop from a well-established mining group in the area and provide much needed after sales service. We are already providing these services from South Africa, but it would make sense to have our feet on the ground, enabling us to train local people and ultimately start selling group products to the market," said David Sullivan.

John Thompson also has a keen interest in Ghana as **Martin Reck**, General Manager – Package Boilers, explained, "A large multi-national company in Ghana approached us because they were on the brink of shutting down due to the massive price hikes of oil in that country. Their only possible solution was to convert from oil to biomass. John Thompson was able to supply them with a 10-tonne biomass-fired boiler in record time. This was a modular packaged boiler with an air heater, an economiser, and a bag filter, as well as a modified stoker for burning biomass. We have since had a number of enquiries for similar projects in Ghana."

"We are also considering business in Nigeria and have been approached to partner with a company there to set up a repair business. This is still in the early stages of negotiations," mentioned Mervyn Naidoo.

According to Harry Browne, countries that look promising for establishing an East African hub include Uganda, Rwanda, Kenya, Tanzania and Ethiopia.

The reliable IT infrastructure and no-nonsense approach to business by government in Rwanda make it an attractive choice for business development. ACTOM has appointed agent representatives in both Rwanda and Burundi to further investigate opportunities in these areas.

Another country that is showing promising developments for ACTOM is Tanzania. A delegation from ACTOM met with a local company to investigate the possibility of the assembly of medium voltage switchgear that would be supplied in kit form.

However, the country that seems to generate the most interest among the ACTOM businesses and appears to be the first choice as the East African hub is Ethiopia. Again, the intention would be to stick to the group strategy of partnering with a local business, possibly for the service and maintenance of transformers and motors, but then also to establish a distribution hub for ACTOM products. A number of the ACTOM executives have made exploratory visits to Ethiopia and are excited about the prospects.

Madagascar also has exciting opportunities. A new government was recently appointed in Madagascar and a directive issued to the utility suppliers to sort out the electricity and water infrastructure within five years. Madagascar has a population of 25.5 million people of which only 14% have access to electricity. The country has coal mines, so the need for service and maintenance already exists. They are also looking at building a new coal mine and hydroelectric power station, all of which will need to be connected to the grid. ACTOM has signed a collaboration agreement with a local company and is looking forward to establishing business there.

"There are many business opportunities to grow both locally as well as into Africa and our approach is to identify businesses within the group

MV Switchgear's SBV4XE bolted and riveted housing assembly design is ideal for the export market because it can be shipped in a flat pack form and assembled at the destination.

who have strong links to other regions or countries and then to encourage them to become lead champions in those areas and to build platforms from which we sell our products and services," said Mervyn Naidoo.

Management agrees that success in expansion, particularly into Africa, lies in partnering with a local team who understands the business environment and has the right connections. The group strategy will continue along the lines of establishing local entities through partnerships and to empower local people through skills development. This will ultimately ensure the sustainability of these businesses. And, although ACTOM's focus is Africa, a number of the businesses continue to develop their footprint further afield based on their previous successes or promising new markets.

John-Paul Andre, Divisional CEO of John Thompson, detailed some of their export business, "As a business we aim to be global leaders in our field. In the past, we have very successfully done business in South America, supplying Colombia with package boilers as well as Mexico with the largest chain gate stoker in the world – we sold an equally large stoker in Brazil. We are currently involved in the installation of a boiler in Grenada and are busy developing our Australian market. In Asia we have just exceeded the supply of 600 package boilers as well as four industrial water boilers to that market."

A moving grate, delivered by John Thompson to PIASA based in Mexico, for for a 300-tonne per hour bio-mass boiler

"There is no doubt that there are business opportunities outside of the continent that need to be explored. Businesses like John Thompson have world class products and have done very well internationally and will continue to do so. Other opportunities for the group could include countries like Saudi Arabia where SMMEs are looking to team up with international players who have reputable products, experience and a proven track record, and are willing to embark on empowerment deals," said Harry Browne.

Opportunities also exist for business in the UAE, especially in Dubai with ACTOM having been approached by a company interested in products such as medium voltage switchgear, transformers and protection and control equipment for indoor sub-stations.

"Group strategy is continually reviewed and adapted, but I believe our approach to geographical diversification will definitely strengthen ACTOM," concluded **Mervyn Naidoo**.

ACTOM's Namibian businesses consolidated under ACTOM Energy Namibia

ACTOM consolidated its Namibian operations under the control of ACTOM Energy Namibia with effect from October 2018.

The two operations, Namibia Armature Rewinders (NAR) and Electrical Products Namibia (EPN), which formerly reported to the South Africa-based divisions ACTOM Energy and Electrical Products respectively, are now both constituted as subsidiary business units of ACTOM Energy Namibia.

NAR, based in Swakopmund, repairs electric rotating equipment in the main, while EPN, based in Windhoek, operates as a sales-and-service branch for Electrical Products.

Mervyn Naidoo, ACTOM's Group CEO, said the change consolidates the management and financial administration of the two business units under a single holding company, thereby enabling them to operate more efficiently and cost-effectively than previously.

"As part of this change, the Board of Directors of ACTOM Energy Namibia has been reconstituted, with **Craig Brown** appointed Chairman and **Patrick Gems** appointed Financial Executive," he said.

Mervyn added that the change is also aimed at enabling the Namibian operations to broaden their scope of business activities in the longer term to cater mainly to the electrical equipment and service requirements of the rail, mining and power sectors in Namibia. "With a number of new projects in these sectors getting under way or due to be launched, the potential exists for several ACTOM divisions to cater to their requirements. ACTOM Energy Namibia has an important role to play in preparing the way for the participation of the various divisions in these projects.

"Similar opportunities for ACTOM to grow its business in these sectors in Zimbabwe are in the offing. The group already enjoys a longstanding strong presence there via GEC Zimbabwe, in which it has a substantial shareholding," he added.

Craig Brown said: "ACTOM's strategy is to grow sales into Namibia, Zimbabwe and Botswana in the medium to long term.

"Currently the products and services we provide are quite narrow in comparison to what we have to offer. We aim to achieve better representation of all group products in these countries and get most of the divisions positioned to work more closely with the target sectors there."

NETFA and ACTOM sign cooperation agreement for testing of electrical equipment

The National Electricity Test Facility (NETFA), which is owned by the South African Bureau of Standards (SABS), and ACTOM have formalised a cooperation agreement for the testing of products from ACTOM's Transmission & Distribution (T&D) divisions in pursuit of a commercial relationship to underpin the delivery of quality testing of the locally manufactured products.

The agreement is aimed at improving cooperation and services offered by NETFA for all electrical products that are manufactured by the six T&D divisions.

The divisions manufacture and supply a comprehensive range of electrical infrastructural equipment which caters chiefly to clients in the public sector. They are High Voltage Equipment, Power Transformers, Distribution Transformers, MV Switchgear, Protection & Control and Current Electric.

The cooperation agreement, which was signed on March 18, 2019, is seen as a forerunner to a NETFA initiative which will see more frequent engagements with companies in the national electricity supply sector.

Currently NETFA meets most of the national industrial testing requirements and the cooperation agreement will ensure that all companies in the sector are kept appraised of NETFA's operational improvements to its testing systems and procedures.

Following the appointment of a new accounting authority, the SABS has adopted a greater customer-centric approach than it had in the past. The organisation has displayed a greater willingness to meet customers' testing requirements and has initiated a programme to respond promptly to customers' specific requirements regarding testing and queries.

Johan Louw of the SABS and Tembela Caza of ACTOM T&D shake hands after signing the cooperation agreement. Behind them are (from left) Lucas Monyai, General Manager of NETFA; Joseph Leotlela, GM Legal of the SABS; Casbah Zwane, Divisional CEO of High Voltage Equipment, and Martin Kelly, Divisional CEO of Medium Voltage & Protection.

Tembela Caza, ACTOM's Divisional CEO for T&D, said: "One of the most important points that NETFA conveyed to us in our discussions with them – which are now encapsulated in the signed agreement – is that they are totally customer-focussed and are ready and willing to tailor-make their methods to meet customers' specific testing requirements as far as possible."

Johan Louw, the SABS Executive: Laboratory Services Division, commented: "The demand for high, medium and low voltage electromechanical goods in Southern Africa continues to grow and NETFA is the primary facility on the continent that conducts tests on this range from ACTOM and of course others manufacturing similar and related equipment.

"We realise that success at NETFA is also success for the domestic market, so the opportunity to collaborate with a home-grown electrical equipment manufacturer made sense and we wanted to codify this relationship. These are large and complicated equipment items, so it is only through collaboration we can deepen the sophistication of our testing methodologies.

"This means better quality products being bought by the market and especially those in the public sector. In our book this means greater value for money and quality for the average citizen," he concluded.

Tembela added that the cooperation agreement was likely to be extended to other ACTOM divisions and business units in the future.

Wilec sold to black-empowered company MEI

Wilec has been sold to Gauteng-based Makarenge Electrical Industries (Pty) Ltd (MEI), a black-empowered company, with effect from February 1, 2019.

ACTOM's disposal of Wilec forms part of a group corporate strategy to focus on its core businesses within the electrical infrastructure industrial sector. The group adopted this strategy several years ago and has put it increasingly into effect in response to altered market conditions resulting mainly from the global economic downturn dating from 2008, along with other significant business challenges arising during the course of the past decade.

"Wilec is a key supplier of input materials required by several of ACTOM's manufacturing and repair businesses, but it is not considered integral to the group's main scope of operations, where the focus is on production, supply, repair and maintenance of complete electro-mechanical equipment," Group CEO **Mervyn Naidoo** explained.

He added that the transaction further demonstrates ACTOM's wholehearted commitment to government policy of encouraging development and advancement of black industrialists where merited.

MEI is majority owned by **Mr Nene Mathebula**, a professional electrical engineer and proven entrepreneur with a good track record.

"ACTOM will continue to support Wilec in the future, with existing supplier relationships between Wilec and the various ACTOM divisions and business units continuing as before," Mervyn stated.

Medium Voltage & Protection wins Chairman's Award for 2018/19

Medium Voltage & Protection has been named winner of the Chairman's Award for achieving the most outstanding results during the financial year to end-March 2019.

Acting Board Chairman **Andries Mthethwa** pointed out that the competition among the divisions was very tough this year and this made it very difficult to choose a winner. Joined by Group CEO **Mervyn Naidoo**, Andries thanked all the divisions for exceptional performance under very difficult economic conditions. "You are all winners!" he said.

Announcing the results of the eighth Chairman's Award competition at the group's Annual Review at the Birchwood Hotel in Boksburg on May 28, Andries said the Medium Voltage & Protection division had done exceptionally well under very difficult circumstances.

Its exceptional financial performance, with growth of EBIT (earnings before interest and tax) and free cash flow as a percentage of EBIT being the main criteria taken into account in assessing the performance of divisions and business units, was strongly supported by similarly strong results in terms of the other criteria that are considered in the competition, which include export orders and sales growth, B-BBEE level, risk management, lost time injury frequency rate (LTIFR) and environmental considerations .

Chairman's Award winners, accompanied by Mervyn Naidoo and Andries Mthethwa, are (seated, from left): Richard Botton of M&C; Martin Kelly of Medium Voltage & Protection, and Greg Smith of ACTOM Contracting. Back row, from left: Michael Henry of Power Transformers; Mike Shaw of R&M; Sello Tsoai of Genlux; Shiva Chetty of Electrical Products, and David Sullivan of LHM (Inland). Insert, Russel Warren (Top) and Dr Philip du Toit of John Thompson Industrial Water Tube Boilers.

Andries highly commended Medium Voltage & Protection and the other top-achieving divisions for attaining excellent results despite the continuing extremely tough economic environment in which they had to operate during the past year. He said this was particularly commendable in view of the poor results of ACTOM's main competitors.

ACTOM Turbo Machines, specially commended by ACTOM's top management for its innovation and drive and its consistently high standard of workmanship. Chris Bezuidenhout, the unit's General Manager, is seen above being congratulated by Andries Mthethwa, accompanied by (from left) Richard Botton, Divisional CEO of the M&C division, Mervyn Naidoo, and Group Financial Director Annamarie van Wyngaardt.

Medium Voltage & Protection previously won the Chairman's Award in 2016.

The group's two main repair sector divisions LH Marthinusen (Inland) and Marthinusen & Coutts were joint winners of the Runner-Up Award, while the recipients of Divisional Certificates of Excellence were Electrical Equipment, Reid & Mitchell and Power Transformers. Power Transformers has shown a great turnaround from a loss-making position in the previous year.

The top achievers among the business units which received the Business Unit Certificate of Excellence awards were Genlux Lighting, which excelled beyond expectations, ACTOM Contracting, John Thompson Industrial Watertube Boilers and Electrical Products.

The winner of the Chairman's Award for the best semi-technical article published in the What's Watt publication during 2018, now in its second year as part of the competition, was **Dr Philip du Toit**, Senior Development Engineer of John Thompson Industrial Watertube Boilers, for his article in the December 2018 issue of the publication, entitled "An Artificial Intelligence approach for combustion modelling applied to renewable energy generation".

New classrooms at Balmoral College boost intake of Grade R learners

Balmoral College has further expanded its capacity with the construction of five Grade R classrooms.

The provision of the spacious new classrooms at the end of last year has resulted in an increase in the number of Grade R learners at the school to 67 this year, compared with 44 last year.

"They are accommodated in three of the new classrooms, with much fewer learners per class than previously, when we had only one small classroom for all the Grade R learners. We are now able to limit the number of learners per class to 30 maximum to enable the teachers to give students more individual attention than previously," said **Cobus Matthee**, HOD of the school's Further Education & Training (FET) department.

"We have also expanded our Grade R learning programme to include the internationally recognised Letterland curriculum to add to the Caps curriculum already provided," he added.

One of the spacious new 56m² Grade R classrooms at Balmoral College.

Balmoral College, a leading school in the Ekurhuleni South District that consistently achieves excellent exam results in all classes right up to matric, is situated next door to ACTOM's Knights premises and is a longstanding beneficiary of the group's social responsibility programme.

In 2018 the school once again achieved outstanding results, which included a 100% matric pass rate for the 12th year in succession.

Matthee said the large-scale expansion of the Grade R classes is aimed at providing better schooling for learners from Grade R. "Up to now most of our Grade 1 learners have joined us after doing Grade R at other schools. Now we can do it ourselves, while the two new Grade R classrooms which are unoccupied at present provide for future growth," he explained.

Each of the new classrooms are roughly twice the size of the former Grade R classroom.

In addition, an extensive grassed playing area, including a jungle gym, has been provided exclusively for the Grade R learners.

"They will now be able to participate for the first time in our annual athletics and Eisteddfod events," Matthee commented.

Thanks to the latest expansion, the school now boasts a total of 1610 learners.


Grade R children wave as their teachers pose in front of the newly-installed jungle gym.

ACTOM wins Electrical Equipment Sector 'Top 500' award for third year running

ACTOM has won the Top Performer in the Electrical Equipment Sector award in South Africa's Top 500 Companies Awards for 2018.

It is the third year in succession the group has won this award in the tenth edition of the Top 500 competition for the best-managed companies in the country. The Awards, organised by Topco Media, publishers of the business-to-business publication Top 500, were presented in Johannesburg in March 2018.

The key criteria by which the five top performing companies in each of a total of 100 different sectors are selected each year are financial performance, empowerment, policy and commitment and alignment to government's mandate centred around skills development, CSI enterprise development and various other differentiators.

The assessment and selection of candidates for the Top 500 Companies Awards are done by Topco's research department in conjunction with the University of Cape Town's Development Policy Research Unit.

Utility communication technologist named SAIEE's 'Engineer of the Year' for 2018

The Engineer of the Year Award for 2018 was awarded to Pascal Motsoasele in recognition of his contributions towards promoting electrical science and its application in Southern Africa.

The award, which is sponsored every year by ACTOM, was announced and presented at the annual banquet of the SA Institute of Electrical Engineers (SAIEE) on October 26, 2018.

Mr Motsoasele is shown in the picture proudly displaying his award trophy and certificate, accompanied by **Greg Whyte** (left), MV Switchgear's Design & Development Manager, who presented the award on behalf of ACTOM, and SAIEE President **Dr Hendri Geldenhuys**.

Mr Motsoasele, who is a Consultant Automation Engineer at Rand Water, has more than 15 years' post-qualification experience in technology research, testing, development and demonstration in the electric utility industry. During the past two years he has specialised in automation asset management in the water utility industry.

The main focus of his career has been on research of utility communication technologies, testing technology products and conducting technical investigations.

He joined the SAIEE 19 years ago and serves on its Council and a number of committees.

T&D divisions host Open Day for customers

High Voltage Equipment's HyPact hybrid switchgear was the star attraction among the products on display in the open air exhibition that formed part of the Open Day.

The ACTOM High Voltage Equipment division supported by other Transmission & Distribution (T&D) divisions hosted an Open Day for customers at Knights in early-October 2018 to showcase and give presentations on some of their latest equipment offerings.

Customers in attendance at the Open Day on October 11 included senior managers, engineers and technicians from, among others, Eskom, Johannesburg's City Power, City of Tshwane, Ekurhuleni Municipality, Transnet Freight Rail, Trans Africa Projects and ELB Engineering Services.

T&D divisions and business units High Voltage Equipment, Distribution Transformers, MV Switchgear and Protection & Control shared an open air exhibition on the lawns at Knights to display some of their key products and also gave presentations to the visitors on their businesses and manufacturing operations.

ACTOM – developing our future

As a group, ACTOM is ideally placed to develop people, businesses and communities and has successfully done so for more than two decades.

Sylvester Makamu, Group Human Resources Executive reflected on ACTOM's development approach, "Our people are our most important assets, without them we would not exist. It is important for us to understand people's strengths and weaknesses and see how we can help them develop."

ACTOM's active approach to development is evident throughout the business.

Nene Mathebula is a black industrialist who started his electrical engineering career after obtaining an engineering degree from UCT in 1990. He furthered his studies with management and executive director qualifications and has vast experience in the electrical sector, both locally and abroad.

"I have always believed that this country needed an independent, world-class insulation and conductor facility. ACTOM has facilitated this through the sale of Wilec and has set me on the path to make this a reality," said Mathebula.

He went on to say that he is grateful for the approach ACTOM took in the Wilec transaction by getting somebody involved who knows the industry. He has big plans for the business which has the support of the Industrial Development Corporation of South Africa (IDC).

Sello Tsoai, General Manager at Genlux Lighting

Sello Tsoai started his career in lighting as a salesman with AEG, a company that was later sold to GE. An opportunity arose and Tsoai bought the lighting business from GE and opened a company called Badi Lighting which he ran for five years before merging with Genlux in 2006. Then in 2014, ACTOM bought Genlux and Sello joined the team.

"This industry is very exciting – light is quite simply science in action! It would have to be exciting or I would not have remained fascinated by it for the last 24 years," said Tsoai

On 1 May 2019, Sello Tsoai was appointed as General Manager of Genlux Lighting.

He went on to explain how he hopes to build the business by establishing relationships and offering a reliable product and service while never forgetting the importance of trustworthy partnerships.

He hopes that the launch of the LED floodlights later this year will be as successful as the 2018 launch of the LED streetlights and that Genlux will be in a position to extend its operation, providing more opportunity for employment and local product development.

"I am passionate about what I do and who wouldn't be if you were tasked with literally lighting up the world. I am looking forward to the opportunity of building a successful business. We live in a great country and it is up to us to make it work," concluded Tsoai.

Having worked in the electrical sector for many years, **Prince Ziqubu** joined, what was then known as, Alstom in 2006 as a marketing manager for the T&D division. In 2013 Ziqubu was offered a position in business development with ACTOM Electrical Products and was responsible for assisting emerging black owned companies under their B-BBEE code of conduct.

On 1 April 2019, he was promoted to Regional Manager for the Southern Gauteng and KZN regions.

Ziqubu explained that initially he

Nene Mathebula, Chief Executive Officer of Wilec

Prince Ziqubu, Regional Manager for Southern Gauteng and KZN at ACTOM Electrical Products

will split his time between the two regions and that his key focus would be on selling T&D products and products manufactured by ACTOM.

"I am excited about this new challenge and believe that an important role I need to fulfil is to develop a strong referral network consisting of engineers, procurement and project managers and consultants who have their ear to the ground and will ensure that we do not miss out on any opportunities," said Ziqubu.

Ziqubu believes that his more than 20 years of experience in the electrical engineering business, and the broad range of functions he has performed, has resulted in a good understanding of the elements within this business sector and stand him in good stead to achieve results.

Pulane Shabangu has always been ambitious and started studying electrical engineering at the Vaal University of Technology as soon as she left school. In order to obtain her formal qualification, she needed to complete a year of training which she did at Reid and Mitchell. Immediately after completing her training, Shabangu went back to full time study in order to receive her BTech degree. After completing her studies, she again approached ACTOM and secured a position with LHM where she worked for two years. She joined Transnet for three years before turning full circle and joining Reid and Mitchell again as a senior estimator, a position she held until she was promoted to Service Commercial Manager in 2017.

"The guidance and support I have received from ACTOM has meant so much to me. I met **Mervyn Naidoo** when he was interviewing people for bursaries and although I didn't need a bursary at the time, I just felt that if I could get my foot in the door and be given an opportunity, I would prove myself. Mervyn gave me that opportunity by arranging training for me at Reid and Mitchell and that inspired me to continue to develop and to grow into the person I am today," said Shabangu.

And she is still learning! Shabangu is currently studying for a Bachelor of Commerce in Business Management through UNISA and doing very well, having achieved three distinctions in her first year.

Shabangu spoke of how much she is learning in the commercial side of the business and how her divisional commercial executive, **Michael Hoaeane**, has become a mentor and role model to her.

"I couldn't do this without the wonderful support of my husband, **Lucky Shabangu** who works at Reid & Mitchell as the Workshop Expeditor. He is an important part of my success," said Shabangu.

When asked what the future holds for her, Shabangu admitted that she is torn between commercial and technical and will need to decide soon whether she will complete her masters in commerce or in electrical. At this stage she is focussed on her work and studies and will make this tough choice at the end of 2020 when she completes her degree. In the mean time she is keeping her options open and has joined the South African Institution of Electrical Engineers and is a candidate for ECSA – the Engineering Council of SA.

In conclusion Shabangu added, "I was recently able to tell my mother, who raised a family of five on her domestic worker's salary, that she can now rest, I can look after her. I have no words to explain my gratitude to ACTOM and to Mervyn and Michael for believing in me – I will do them proud."

Pulane Shabangu, Service Commercial Manager at Reid and Mitchell

John Thompson's Utility Boilers unit establishes welder training centres at Matimba and Tutuka

John Thompson's Utility Boilers & Environmental Solutions business unit recently established its own on-site welder training schools at Eskom's Matimba and Tutuka power stations to support its operations there.

The business unit, which has been engaged in ongoing boiler maintenance at Matimba and Tutuka for many years, has established a welding training centre at each of the two stations with the aim of both increasing the pace of welder training and to achieve more cost-effectively the high level of welding skills utility boiler-serve contracts require.

"Both of the welder training centres, which commenced operation in May this year, conform to the training standards of the International Institute of Welding, which is represented locally by the SA Institute of Welding (SAIW)," said **Fernando Machado**, the business unit's Welding Superintendent.

"Up to now we've sent our trainees to SAIW for training, but decided to set up our own training centres with the aim of increasing the pace of welder training and to more effectively achieve the high level of welding skills required."

A noteworthy feature of the training centres is that they are each equipped with a state-of-the-art welding simulator, which is used for training of new recruits. "The simulator simulates the actual welding procedures, with the trainee performing the moves as directed using a simulator welding torch on a simulator screen in front of him. The simulator provides feedback to the trainee on whether or not he is performing the work correctly," Fernando explained.

"The simulator training is a very efficient, speedy and focussed method of teaching trainees basic welding techniques. Not only does it accelerate the training process but it also provides trainees with most of the essential skills they need when they have to do real welding on the proper welding course. It also gives the trainers an opportunity to assess the capabilities of each of the trainees."

Each simulator can accommodate eight recruits at a time with each simulator course running for eight weeks. Those who complete the simulator course successfully are then enrolled onto the authentic hands-on welding course, in which they take about three years to qualify.

A recruit receives training in basic welding techniques in a simulator facility at one of John Thompson's newly-established on-site welder training schools.

Application of machine learning algorithms in boiler plant root cause analysis

Introduction

It is often difficult to determine the cause of upset or detrimental boiler conditions because the large number of boiler input and output parameters create a complex problem to troubleshoot.

Such was the case in this study, where a radiant superheater and internal desuperheater were retrofitted in an existing industrial watertube boiler at a South African sugar mill. After installation, the steam temperature in the new radiant superheater was consistently 35% higher than the design value. Excessive final steam temperatures can lead to thermal fatigue of the superheater material and therefore boiler downtime; continuous opening of the superheater vent valve, which leads to a reduced boiler efficiency; and tripping of the boiler or turbines due to excessive inlet steam temperatures.

It was suspected that the higher-than-expected steam temperatures could be attributed to combustion

dynamics, including the flame temperature and position of the flame in the furnace. However, this was difficult to model due to the sheer number of factors affecting combustion, the variances in these factors, and the degree to which these variances differed.

The objective was therefore to develop a predictive model to determine the cause(s) of the excessive final steam temperatures encountered. This was done by using three machine learning models and varying the combinations of boiler input parameters to predict the final steam temperature response.

Machine learning

Machine learning is a type of artificial intelligence (AI). It entails supplying an algorithm with a set of data that it uses to teach itself about the underlying relationships within the data. A well-trained machine learning algorithm is therefore able to make predictions or decisions without being explicitly programmed to perform the task.

In this root cause analysis, different machine learning models were compared, all of which have previously been used for various applications in the power-generation sector. These models are artificial neural networks, random forests and support vector regression. This article focuses on what is likely the most well-known and powerful method, namely neural networks.

An artificial neural network is a computing system inspired by the biological neural networks of the brain. It uses mathematical functions to simulate the working of the brain's neurons, including dendrites, axons and synapses, and can consist of anything from a single neuron up to tens or even hundreds of millions of neurons.

Boiler and fuel information

The boiler in this study has an evaporation rate of 140 tph and final steam conditions of 30 bar(g) and 400°C, whilst co-firing sugarcane bagasse and furfural residue. The boiler has a three-pass evaporator bank configuration, with a two-stage superheater with interstage attemperation by means of an integral indirect contact desuperheater. The primary superheater is screened and has a drainable horizontal configuration, and the secondary is a radiant pendant superheater.

It is noteworthy that furfural residue has about 10% higher calorific content than bagasse. Another big difference is found in the particle size of the fuels; the bulk density of furfural residue is three times higher than that of bagasse. As a result, a flame fueled by furfural residue burns higher in a boiler's furnace than would be the case with a bagasse-fueled flame.

From April to December 2016, data logs were collected for the boiler's steam temperature and flow, flue gas oxygen content, fuel feeder speeds, induced and forced draughts, over-fire air pressures, fuel density, and fuel moisture.

Although data on other parameters were collected, they were not utilised in the formulation of the learning models.

Findings

From the final steam temperature, boiler evaporation rate and flue gas oxygen data, some general trends were noted, but none that represented an obvious correlation between any one parameter and steam temperature. With regard to feeder speed vs. boiler load, a large variance in feeder speeds was found, from about 300 rpm to about 1 000 rpm when running at load. When looking at final steam temperature vs. boiler load, it was found that the temperature varies between about 390°C and 410°C for loads roughly between 80 and 140 tph – again, no obvious correlation between boiler load and steam temperature was found.

After training the neural network and performing sensitivity analysis on the AI model of the boiler by varying input parameters, it was determined that the factors with the greatest influence on steam temperature were fuel quality (particle size and moisture) and furnace draught.

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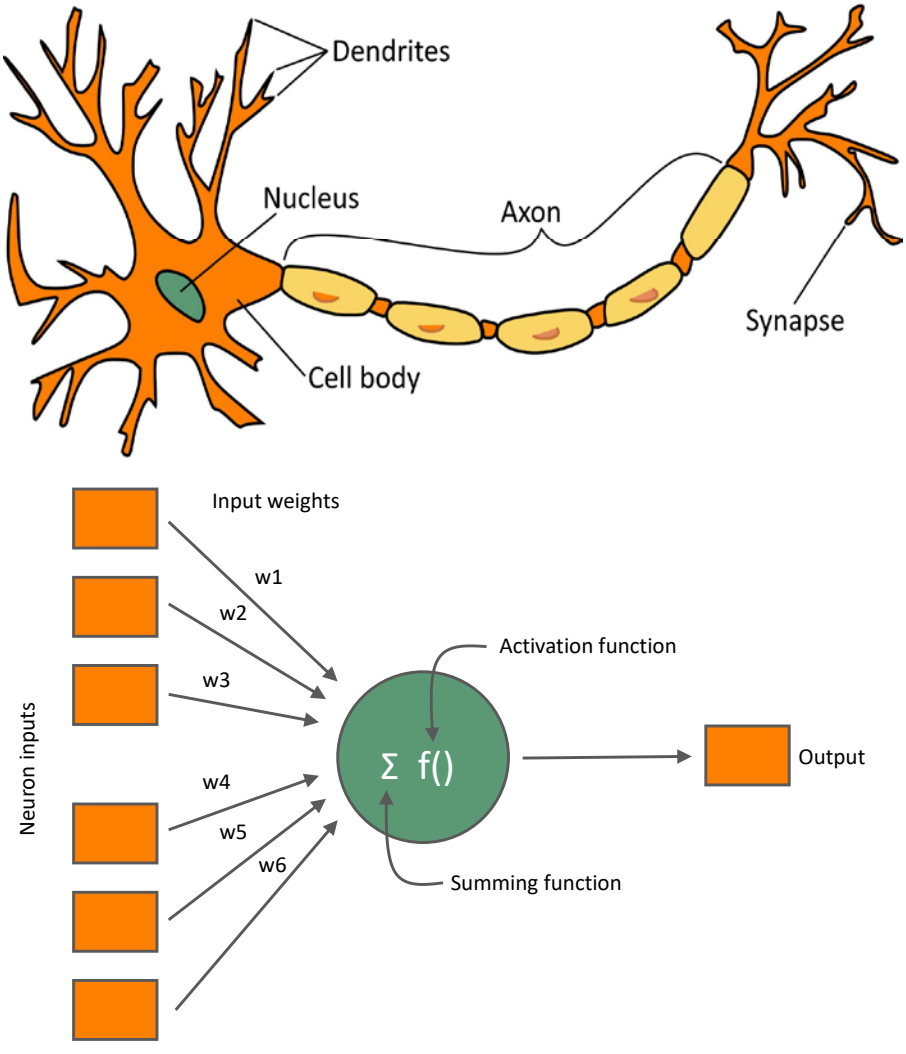

An artificial neuron as used in an artificial neural network and (top picture) a biological neuron on which the artificial neuron is modelled.

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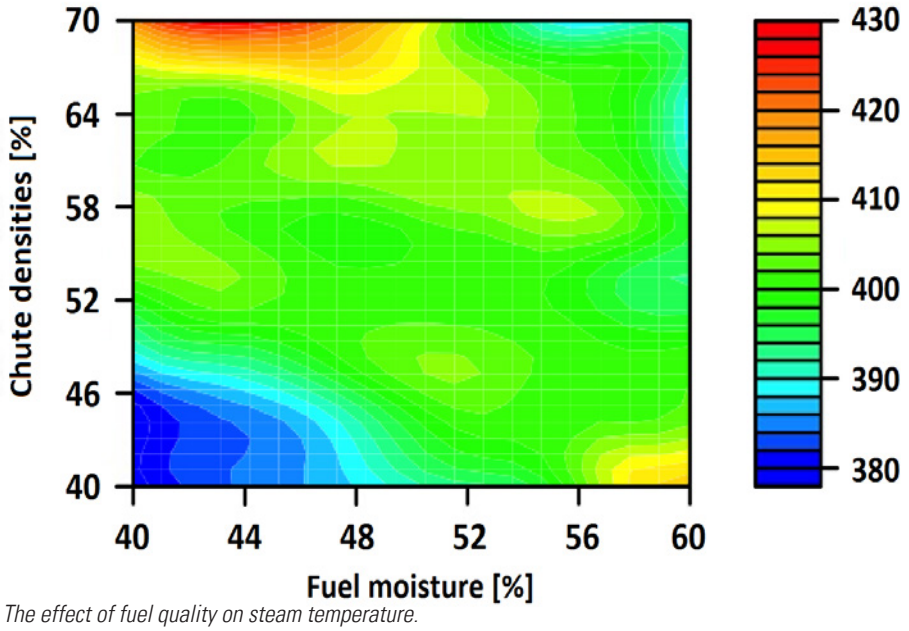

The effect of fuel quality on steam temperature.

With the trained neural network and keeping all inputs except fuel moisture and chute density fixed at nominal values, it was found that low fuel moistures (indicative of a large percentage of furfural residue) coupled with high chute density result in high steam temperatures. Conversely, low fuel moistures and low chute densities result in low temperatures.

To study the effect of furnace draught, all inputs were fixed on nominal values except forced draught (FD) damper position and chute density. It was found that high steam temperature resulted from a large FD fan damper position and high chute density, again indicative of a large portion of furfural residue.

When comparing steam temperatures calculated from inputs for test data with the actual steam temperatures experienced, the average error was found to be less than 1%, which, in this case, is less than 4°C.

The other two machine learning models utilised (random forests and support vector regression) came to the same conclusion as the neural network model.

Conclusion

Using machine learning techniques, an accurate model of the boiler with an error of less than 1% could be produced. This model was then used to complement existing modelling techniques to redesign the superheater in question to obtain the design final steam temperature.

Machine learning has no knowledge of how a boiler works or the underlying physics at play, i.e. it has no preconceived notions of which factors affect a boiler's operation. It can therefore objectively predict suspected correlations or detect correlations that were not previously considered.

As a snapshot of the boiler in 2016, this machine learning model can be used in future as a reference to detect gradual changes in the boiler's operation. This model furthermore opens up new opportunities for the predictive maintenance of industrial watertube boilers.

By Francois Marais
Senior Design Engineer
Industrial Watertube Boilers
John Thompson

ACTOM Electrical Machines exhibits at 2019 US scrap recycling industries expo

Electrical Machines participated again this year as an exhibitor at the annual convention and expo of the Institute of Scrap Recycling Industries' (ISRI) in the US.

The business unit, which has been the principal manufacturer and supplier of motors to the US metal shredders market for many years, shared a stand at the exhibition with its North American distributor and repair partner American Industrial Motor Service (AIMS).

The event, which is staged in a different US city in April each year, took place in Los Angeles on April 8, 9 & 10.

In attendance on Electrical Machines' stand were **Antonio Teixeira**, General Manager, and **Brian Lindsay**, Commercial Manager of the Power Conversion division.

Shredder motors are among the largest motors produced by ACTOM's Electrical Machines Business.

ACTOM Power Systems wins contract to extend Bredell substation in Kempton Park

ACTOM Power Systems recently won a contract to extend the 88/11kV Bredell substation in Kempton Park by the addition of a fourth transformer bay.

The contract was awarded by electrical engineering consultants Consolidated Power Engineering (CPE) on behalf of property development company Witfontein X28 Ontwikkeling as a "self-build" project, as the extension is mainly for the provision of additional power for a large new property development within the area served by the substation.

All the electrical equipment involved in the extension is being supplied by various ACTOM group divisions. These are High Voltage Equipment for the 88kV yard equipment, Power Transformers for the 88/11kV power transformer and Protection & Control for the protection scheme.

The contract, awarded in early-January this year, is scheduled for completion by mid-December.

ACTOM Power Transformers will again manufacture and supply an 88/11kV transformer for Bredell's new bay as it did previously for Bay 3, as shown in this picture.

ACTOM Signalling's well-proven railway yard automation system installed throughout SA

A railway yard automation system developed by Signalling now operates at 23 Transnet Freight Rail (TFR) shunting yards all around South Africa. It is by far the most extensively installed system of its kind in the country.

ACTOM Signalling was first approached by TFR in 2012 to develop an automated system to replace the long-standing mechanical system then in use at all its shunting yards. Contracts were subsequently awarded for the business unit to develop and provide the system and install it at 10 major TFR yards.

Then in 2015 TFR awarded Signalling a further contract to install the system at another 13 yards. This contract was completed at the end of March this year.

Workers complete a trench in preparation for installation of the yard automation system that ACTOM Signalling has installed at a number of Transnet Freight Rail yards nationwide.

"Our system has proven itself to be reliable and safe. It has significant advantages over the mechanical system it has replaced, the most important of these being greater reliability, greater ease of operation and vastly improved productivity," said **Peter Colborne**, Signalling's General Manager.

With the traditional mechanical system points sets have to be manually thrown by yard operators on the tracks. "Not only is this procedure fatiguing for the operator, who usually has to move several heavy tumblers in turn each time to set a route, but the system is unreliable.

A faulty change-over may go undetected, resulting in a derailment and involving a time-consuming and costly exercise to put right," Peter pointed out.

The main features of Signalling's automated system are:

- It has three tiers of control, comprising a central system enabling the Yard Master to monitor and control the entire yard remotely, a number of

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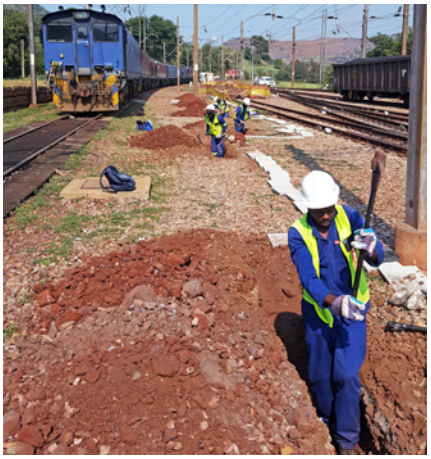
Local Control Panels (LCP's) for the use of yard operators to locally set routes and control points sets, and a track-side push-button system – as an alternative to an LCP – for operators to change individual points sets directly.

- In contrast to the traditional system, indicator lights warn both the train driver and yard operator whenever it is unsafe for a train to proceed in the unlikely event that a points set is incorrectly or faultily set.
- The system incorporates a data-logger to record all operations in the yard, as well as a remote diagnostics system whereby any faults and irregularities that may arise are identified, with ACTOM Signalling technicians on call to remotely provide technical support as required.



Trenching being done on the Thabazimbi yard site.

"Our system is a cost-effective solution and has significantly improved yard productivity while reducing the number of incidents," Peter stated.

He added that the mining, power generation and iron & steel manufacturing industries, among others, stand to benefit similarly from upgrading to Signalling's automated system, as in most cases their yard control requirements are identical to those of TFR.

The bulk of Metrorail shunting/staging yards continue to operate on the traditional mechanical yard control system.

The railway authorities have indicated that future Metrorail yard automation contracts are likely to require an enhanced system. "If this happens then such a system will incorporate more elements of a standard signalling system than our present automated system does," Peter remarked.

Electrical engineering student gains valuable practical experience during vac job at Signalling

Signalling readily agreed to provide practical training and experience to a Wits University Electrical Engineering student during the Christmas vac period at the end of last year when requested by the university.

The student, **Keren Buisson-Street**, 23, spent a total of 29 days with the business unit over December and January, during which she performed a series of challenging tasks in a new interlocking development project it was engaged in.

"It was fascinating and stimulating and not like anything I had done until then. It gave me the opportunity to put into practice for the first time a lot of what I've learned at varsity," Keren said.

Prior to commencing study for an Electrical Engineering degree last year she qualified in 2017 with a Bachelor of Engineering Science, Bio-medical Engineering degree.

She admitted that at the beginning of her job at Signalling she was "a bit overwhelmed" by the project, but Development Engineer **Leon Pienaar**, who was her main mentor and trainer, explained each of the various stages of the project in turn so that the work became easier for her to follow and apply as it progressed.

Keren was first set the task of designing a circuit to measure the current that flows through the signalling lamp, or lamp cluster, to detect if it is illuminated or not. "The circuit has to make provision for an upper and a lower limit, the requirement being that the detection mechanism has to produce a failsafe output," Leon explained.

She also had to write the Required Operational Capability (ROC) document for the detection system and was assigned to do research to come up with some ideas as to how to achieve the requirement as set out in the ROC. Then she had to design the circuit board to suit the requirement, after which Leon and his colleagues tested, fine-tuned and made modifications to the concept.

In addition to her involvement in the above development project, Keren was given practical experience using hand tools and mechanical experience operating a lathe and a milling machine.

"We also took her out to Crescent station near Potchefstroom to see the electronic interlocking system Signalling had developed and installed for Transnet Freight Rail in 2015 as an example of how the design work she carried out with us fits into the bigger picture," Leon explained.

"Keren did very well," he concluded. "She rapidly gained confidence with the work and we were impressed with her ability to understand what had to be done and the initiative she showed in coming up with solutions."

Keren Buisson-Street and Leon Pienaar at work on one of the projects Keren was set during her varsity vac job at Signalling.

New MV Switchgear systems pass tests at China's top electrical test facility

Two new systems developed by ACTOM MV Switchgear have been successfully tested at the reputable Xi'an High Voltage Apparatus Research Institute (XIHARI) in Xi'an, China.

MV Switchgear R&D team members **Greg Whyte**, Design & Development Manager, **Rhett Kelly**, Technology Development Specialist, and **Piet Ferreira**, Engineering Manager, were in attendance to witness the tests in April this year.

The first system tested at the test facility was an internal arc classified door design and pressure relief system developed for the GEC range of legacy STV vacuum contactors. The door and associated pressure relief devices are based on the tried-and-tested SBV4E switchgear.

"This is a retrofit system developed for performance of the STV vacuum contactors under internal arc fault conditions, as no provision was made for this when they were designed in the late-1960's," Greg explained.

The Internal arc test was carried out at 31.5kA for 0.2sec in accordance with requirements stipulated by a major customer.

The other item tested was a new SBV4XE 25kA 800A and 1250A circuit breaker that has been developed at MV Switchgear to conform to the latest edition of IEC 62271-100. The testing comprised the following two short-circuit performance type tests:

- Electrical endurance testing for rapid auto-reclose applications, in which the circuit breaker achieved a Class E2 rating.
- Short-circuit test duties required to prove the circuit breaker's performance for effectively earthed networks, as found typically in older distribution systems.

"The tests carried out at XIHARI on the new circuit breaker follow the earlier successful tests performed on this product at the KEMA electrical test centre in Holland in the middle of last year," said Rhett.

On that occasion a 25kA prototype of the newly developed circuit breaker mechanism was successfully tested for short-time withstand current and the complete series of basic short-circuit switching duties in accordance with IEC 62271-100, qualifying it for use on 11kV non-effectively earthed systems.

"The tests conducted at XIHARI completes the short-circuit performance type tests required for our 630mm wide 25kA SBV4XE circuit breaker," Rhett concluded.

Posing beside the SBV4XE 25kA 800A circuit breaker after completion of the tests on it at XIHARI in April are (from left) Greg Whyte; XIHARI Test Engineer Yanfeng Liu; Piet Ferreira, and Rhett Kelly.

Arc flash incidents and how best to neutralise them

Arc flash incidents are the most devastating type of faults that can occur in a power distribution system.

Every year fatalities and personal injuries occur that are attributable to arc flash incidents on LV distribution equipment, while arc flash faults also cause severe damage to equipment, resulting in extended power outages and costly and time-consuming repairs having to be undertaken to restore the equipment to service.

To limit the adverse effects of arc flash events it is essential that the incident energy be restricted. The incident energy is a measure of thermal energy at a working distance from an arc fault.

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PROTECTION	ARC DURATION	INCIDENT ENERGY	PPE REQUIREMENT	DAMAGE/OUTAGE
Conventional Relay	±400 ms	> 40 cal/cm³	Category 4	**Severe /** Days or Weeks
Arc flash Relay	50 - 80 ms (trip iniation <10 ms)	> 10 cal/cm³	Category 2	**High /** Days or Hours
Arc Quenching	5 ms	> 1 cal/cm³	Category 1	**Minimal /** Hours

This table shows the correlation between the ARC Protection technology used and the potential damage or outage risk.

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The unit of incident energy is cal/cm2. The working distance is the distance between the worker and the flash location. The most common distance for which incident energy is determined in tests is 45cm.

The incident energy is dependent on the available bolted fault current, the switchgear design, the distance of the operator or equipment from the arc fault and the duration of the arc fault.

Currently available arc protection technology is aimed at reducing the duration of an arc flash and thus reducing the incident energy. A state-of-the-art arc flash protection relay, such as the Arcteq AQ-100 range offered by ACTOM Protection & Control (P&C), can detect an arc flash incident within 2ms, whereupon it issues a trip command to a high-speed circuit breaker in less than 10ms.

In addition to this trip command time, a typical circuit breaker's operating time is > 50ms, resulting in a total clearing time of 4 to 6 cycles. Although this is a lot faster than standard busbar protection, it still allows the arc to cause significant equipment damage and poses safety risks to operators.

To overcome the limitation of the circuit breaker operating time, Arcteq has developed and introduced an LV arc-quenching device, the Arcteq AQ-1000, which when triggered creates a low impedance path for the fault current, dropping the system voltage and effectively extinguishing the arc within 5ms of arc detection. The total clearing time of the fault, tripping the circuit breaker, remains 4 to 6 cycles but without the presence of a physical arc.

The Arcteq AQ-1000, which operates in conjunction with Arcteq AQ-100 Arc protection relays, is a reliable ultra-fast device which typically limits incident energy levels to less than 1.2cal/cm^3. It is rated for a short circuit current of 100kA, making it suitable for the most demanding applications. In addition, it is fully reusable for multiple arc flash incidents, being the only reusable arc-quenching device that conforms to the IEC 60947 and UL 2748 standards. Applications the Arcteq AQ-1000 are suited for include:

- Critical load where an extended outage will be detrimental to plant operations
- Any distribution board where space constraints or operational limitations are detrimental to operator safety
- Distribution boards where a high fault level and operational constraints result in a higher than acceptable arc incident energy level
- Plant locations where the occurrence of an arc flash is particularly inadvisable, such as an underground substation

P&C was awarded its first order for Arcteq AQ-1000 LV arc-quenching devices recently, when Two Rivers Platinum Mine in Steelpoort, Limpopo Province, awarded it a contract to supply three arc- quenching solutions, consisting of AQ-100 arc flash equipment coupled with an AQ-1000 arc- quenching device for critical LV distribution boards to ensure the safety of the mine's electrical operators.

A similar MV arc-quenching solution, the AQ-2000, rated at 40kA, 11kV is available for MV switchgear.

A state-of-the-art arc flash protection relay, such as the Arcteq AQ-100 range offered by ACTOM Protection & Control (P&C), can detect an arc flash incident within 2ms, whereupon it issues a trip command to a high-speed circuit breaker in less than 10ms.

By Marius van Rensburg
Product Manager
ACTOM Protection & Control

LH Marthinusen performs rapid manufacture of furnace transformers for Impala Platinum

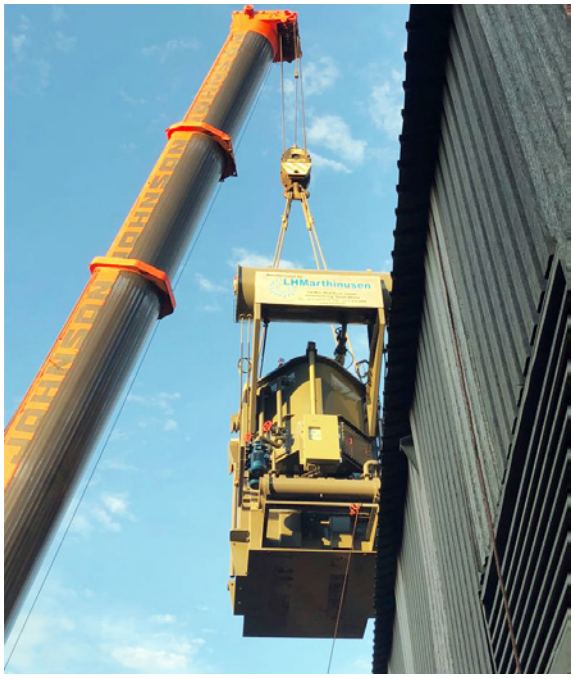
LH Marthinusen was the only contractor among several contenders – including leading international players – that accepted the challenge to manufacture two large furnace transformers for platinum producer Impala Platinum within 12 weeks.

Impala Platinum's Rustenburg smelter suffered a catastrophic failure in February 2018 when its furnace burnt down, destroying its three furnace transformers. The company immediately embarked on a rebuild of the furnace over the subsequent six months.

It also began a search for an OEM or contractor willing and capable of manufacturing transformers to replace two of the destroyed units on short delivery – with LHM's Transformer division alone agreeing to undertake the project. Impala had a spare original transformer to replace the third destroyed unit.

The client stipulated that the two new replacement units be designed and manufactured within 12 weeks – compared with the normal six months

to complete such a task. "It was a tough call, but we took it on as we have experience in achieving similar fast turn-rounds," commented **Wikus Williams**, LHM's Technical Executive – Transformer Division.



One of the two large furnace transformers LHM manufactured for Impala Platinum in only 10 weeks is hoisted into place in the mine's smelter plant.

The contract was awarded in early-August last year. The assigned team worked round the clock seven days a week to achieve the goal. They succeeded in doing so within 10 weeks – two weeks ahead of deadline!

The new transformers are substantially enhanced versions of the originals:

- They are 15,4MVA units – an upgrade in power from the 13,4MVA units they've replaced.
- The Kraft paper insulation used on the conductors in the original transformers was replaced by Nomex 410 insulation. This is a Class H product capable of withstanding much higher temperatures, thus considerably extending its ability to handle the more onerous load requirements of a furnace transformer.
- A specialised MIB box to control temperatures and current settings was installed in each of the new units to minimise the risk of the transformers catching fire. The original transformers had no fire-prevention equipment.

A major challenge was getting the required specialised German-made tap changers manufactured and supplied in time to meet the deadline.

Fortunately Wikus enjoys a long-standing relationship with the company concerned and had no trouble getting them to agree to fast-track their manufacture. "By working special shifts they produced and delivered them within eight weeks – against the three months it would normally take," Wikus said.

Raising the power of the new transformers to 15,4MVA enables Impala Platinum to increase the furnace's power to 46MW (from 40MW) at a later stage, when LHM is due to be assigned the task of upgrading the single original 13,4MVA transformer to the same power rating as the new ones.

Newly-launched Fan Service unit strengthens LHM's competitiveness

LH Marthinusen (LHM) has signed a service provider agreement with leading international fan manufacturers TLT-Turbo of Germany to provide repair services to its Southern African customers.

The exclusive agreement, which took effect on October 1, 2018, follows the decision by TLT-Turbo to close its local subsidiary TLT ACTOM – one of two fan companies it has had operating in the local market for the past four years

TLT ACTOM – in which ACTOM held a minority shareholding – is currently in the process of being wound down, while TLT-Turbo's other subsidiary, TLT-MechCal, remains in operation as a manufacturer and supplier of the OEM's fan systems in the local market.

"The primary purpose of the service provider agreement is to ensure that all existing and future customers of TLT-Turbo/TLT-MechCal are provided with ongoing reliable backup in terms of repairs and related services on their fan systems," said **David Sullivan**, LHM's Divisional CEO.

The fan repair services now offered by LHM by its newly-established Fan Service division complements the repair services on rotating machines LHM already provides via its well-established Large Rotating Machines division.

Some senior management and technical personnel formerly employed by TLT ACTOM have transferred to the new division to provide the core expertise.

"The establishment of a special fan repair service division at LHM brings into play important synergies between the two divisions to the advantage of both and strengthens our competitive edge in both areas," David stated.

"On the fan side this is greatly enhanced by the fact that the service provider agreement makes specific provision for LHM to consult TLT-Turbo and TLT Mechcal for technical guidance and advice when necessary, thus ensuring that world-class knowledge and assistance is available to it at all times."

Craig Johnston, General Manager of the new division and former head of TLT ACTOM, pointed out that one of the unit's key strengths is that it is the designated service provider for the large variable pitch axial induced draught fans manufactured and supplied by TLT-Turbo for Eskom's three "modern" power stations Majuba, Medupi and Kusile.

"Servicing of TLT-Turbo's existing fleet, especially in the power generation sector where it enjoys an excellent reputation, is the backbone to our business. This, combined with our technical links to TLT-Turbo and close working relationship with LHM's Large Rotating Machines division, with which we share many vital resources, provides a solid foundation for us to extend our reach into many other heavy industries, including the mining, mineral processing and petro-chemical sectors," he said.

LH Marthinusen selects skills development programme graduates to fill key commercial posts

LH Marthinusen's ongoing skills development programme has culminated in the appointment of six junior managers to new areas of responsibility.

Most of the new appointees have been on an individually designed development programme which LHM launched within the last two years to provide them with practical experience in a variety of management roles to augment their studies at universities and other formal training institutions.

The appointments, effective from June 1, are part of a strategy to strengthen the commercial management function at LHM.

"In the repair and service industry the commercial management function is the heart of the business, as it provides the vital link between sales and finance. Unlike businesses solely devoted to manufacture, in our business, teams of estimators are employed to assess costs and produce dozens of quotations for services and equipment on a daily basis. Their work also involves regular contact with customers," explained **David Sullivan**, LHM's Divisional CEO.

Due to the complexity of the work, LHM's management team decided to split the former overall commercial executive position into two – one for Transformers and the other for Motors. "An additional aspect of this is LHM's recent acquisition of TLT-Turbo, which adds another level of diversification and product knowledge to our business," David pointed out.

The new appointees in order of the photo are:

- **Shuveer Maharaj**, formerly Works Manager: Small Transformers, has been appointed General Manager Commercial: Transformers.
- **Silas Moabi**, formerly Foreman: Small Transformers, has been appointed Senior QC Officer.
- **Gladys Phora**, formerly Commercial Manager: ACTOM Wheels, has been appointed Commercial Manager: Motors.
- **Chris Thoka**, formerly Commercial Manager: Motors, has been appointed Business Development Manager.
- **Zunaid Miskin**, formerly Business Development Manager, has been appointed General Manager Commercial: Motors & Fan Service.
- **Johan Engelbrecht**, formerly Transformers Field Service Technician, has been appointed Works Manager: Small Transformers.

Reid & Mitchell qualifies as approved repairer for GE Transportation's AC traction equipment

Reid & Mitchell (R&M) has passed a rigorous approval process with leading diesel electric locomotive manufacturers and suppliers GE Transportation (GE), qualifying it as an approved supplier to repair its AC traction motors and alternators.

This follows GE's approval of the division in 2015 as a repairer of its DC traction equipment. The company subsequently awarded contracts to R&M in 2015 to repair 12 DC traction motors and four generators and awarded it a further contract in 2016 to repair 60 DC traction motors

Shortly after completion of these contracts, R&M underwent a further approval process for the repair of an upgraded version of GE's DC traction motors and was awarded a contract to repair six of these units, which it completed in March this year.

Willie Liebenberg, R&M's Technical Executive, said that prior to it being commissioned to repair the abovementioned GE equipment, R&M had already performed repairs over a number of years on DC traction equipment manufactured by other OEM's.

"We were therefore already familiar with DC equipment, so when the time came for us to prepare ourselves for tackling GE's DC equipment it was just a question of adjusting to their specific designs and requirements. But shifting to working with the more modern AC traction equipment was a different matter, as it involved having to learn from scratch about the technology and how it works," he said.

The division received further approval from GE as a repairer of DC traction motors in March this year and went through a separate approval process to qualify as an approved repairer of AC traction motors in May. Each approval process, as with the previous ones for the DC equipment, involved being assessed by Jesus Correa, Senior GE Remanufacturing Manager, in attendance at R&M's Benoni factory. The approval will include eight AC traction motors.

Following these approvals, GE

contracted the division to repair and assemble a further two AC alternators – each alternator being of a different size and configuration.

"These approvals for repair of GE's AC traction equipment are strategically a significant milestone for us because, in addition to moving us up the technology chain, they enable us to serve Transnet's repair requirements on its new AC fleet. It also means we are well positioned to carry out repairs to OEM standards for GE when the motors enter their heavy maintenance phases," Willie commented.

"There are a very large number of AC locomotives manufactured and supplied by GE operating throughout Africa. The demand for repair of this equipment is increasing steadily as the warranty periods that apply to it expire, so we can expect to get a regular flow of repair work coming through from now on," he added.

R&M factory personel (from left) Abram Moketse, Traction Assembly Supervisor; Katlego Moloko, Senior Technical Assistant; Innocent Nhlangothi, Operator Fitter; Jesus Correa, GE Transportation's Senior Remanufacturing Manager; Lesego Madumo, Operator Fitter; and Ian Mason, Senior Quality Supervisor.

M&C performs SA's largest stator rewind without a hitch

In the largest winding installation ever conducted in South Africa, Marthinusen & Coutts (M&C) has completed a major repair at Eskom's Ingula pumped storage hydro-electric plant in KwaZulu-Natal.

The contract involved the complete rewind of a 373MVA stator for one of the four 14-pole motor generators at Ingula. The 342MW unit is among the biggest in South Africa, with a core diameter measuring 5m, a core length of 3,2m and a rotor mass of 500 t.

"As the stator was located deep in the turbine floor, all the winding was required to be conducted on site," said **Richard Botton**, M&C's Divisional CEO.

"In this complicated repair, each replacement coil set was fitted, connected and brazed on-site from pre-manufactured and pre-packed components supplied by the OEM. The most painstaking process, conducted to the highest standards, was the resistive brazing on 1824 joints," he explained.

Prior to fitting the top bars of the stator of the Ingula motor generator, M&C artisans (from left) Jeandre Kruger, Sergio Bernardes and Njabulo Myeni carefully map the location of the bottom bars to ensure that top bars will be fitted correctly.

A 14-man M&C team carried out the work, completing it in November 2018 after 100 days.

Their extensive preparation included the establishment of training jigs at M&C's Cleveland, Johannesburg, facility, allowing customised training for all technicians involved in the mammoth project.

"We also conducted detailed testing, and refurbishment where necessary, of all winding equipment for use on site. This contributed to smooth and uninterrupted operations, making us self-sufficient in rolling out the contract," Richard commented.

The contract was successfully completed on time with all test criteria well within specification.

"The project showed M&C's world class capability. We could also contribute our specialised equipment and supply chain elements that often present a challenge to foreign service providers trying to conduct this kind of project work in South Africa," Richard concluded.

M&C's rewind of a 36MW compressor motor stator yields 'best ever' test results

Marthinusen & Coutts (M&C) recently provided a solution to an irregularity that occurred in the stator of a large 36MW compressor motor deployed at Sasol's Secunda plant.

The results of final tests conducted by an independent test authority on the stator after M&C had completed all the necessary repairs on it were found to be the best among many such tests conducted on similar equipment over a period of several decades.

Initially a Sasol maintenance team discovered during a routine inspection in January 2018 that the flux shield mountings on the stator were faulty, whereupon Sasol awarded M&C a contract to identify the cause of the irregularity and offer a remedy.

"We tested the stator winding, which we found to be fine, but confirmed that there was a defect in the flux shield and recommended that it be repaired, as there was a risk of it damaging the winding if left to continue operating in its existing condition. To repair the flux shield meant also having to remove the winding and perform a rewind on the stator," said **Rob Melaia**, M&C's Engineering & Technical Executive.

Sasol accepted M&C's recommendation and in August last year assigned it to perform the required repairs. "In addition to replacing the old bars with new bars purchased from a reputable coil manufacturer in the US, we did a very specific modification to repair the flux shield to prevent a recurrence of the defect in the future," Rob stated.

"On investigating the defect we found that the electrical current, instead of flowing only in the flux shield as it ought to have done to prevent the core from overheating, had started flowing in the mounting bolts, so causing wear by electrical arcing in the mounting holes and the mounting studs," he explained.

The solution M&C's repair team provided was to fit copper braid straps from several points on the flux shield to the stator body to reroute the current in such a way as to prevent a repeat of the damage as witnessed. To confirm the effectiveness of the solution M&C arranged to have the refurbished stator tested by local independent test authority HV Test.

Partial discharge and Tan Delta tests were conducted, being the recognised tests for determining the integrity and efficiency of medium voltage windings. The results were:

- A maximum partial discharge of below 250 PicoCoulombs (pC) at 120% of phase voltage.
- In the Tan Delta tests the dielectric dissipation factor was found to be 65 x 10^{-4} at 20% of phase voltage and 105 x 10^{-4} at 100% of phase voltage.

"These test results were the best ever to be achieved among the numerous machines on which HV Test has conducted tests of this kind!" Rob pointed out.

"We have every reason to be proud of this outcome as it says volumes about M&C's expertise in this field, both in terms of correctly detecting and diagnosing faults in a wide range of large rotating equipment, as well as providing the appropriate and most effective solutions for them," he concluded.

Specialist artisans Carlos Mabunda (left) and Sergio Bernardes fit slot wedges to the stator of the 36MW compressor motor.

ACTOM Turbo Machines performs emergency repairs on ArcelorMittal turbine generator

ACTOM Turbo Machines (ATM) again demonstrated its high level of expertise as a mechanical repairer when it performed emergency repairs on a 40MW turbine generator at ArcelorMittal's Vanderbijlpark works recently.

After the generator broke down in October 2018, resulting in failure of the bearings on the generator train, ATM was assigned to perform the required repairs within an extremely tight timeframe to have the generator back in operation by mid-December.

All four bearings and the rotor sealing elements were found to be damaged.

ACTOM Turbo Machines also discovered other damage which was unrelated to the October 2018 power failure. "The damage involved was a crack on the HP gland section of the main steam casing, while a second unforeseen irregularity was a malfunction in the starting oil pump," said **Danie Bloem**, ACTOM Turbo Machines' Project Manager on the contract.

"Various irregularities that we found – for example, an incorrect bolt clearance on one of the HP palms – indicated that the unforeseen damage was probably due to faulty installation," he commented.

"In addition to repairing the damaged bearings we also had to recondition a spare set of bearings that ArcelorMittal had in reserve. The sealing segments were replaced with new ones manufactured at our Sasolburg works," Danie said.

"With the crack in the main steam casing, the whole process from discovering the crack to repairing it took

ACTOM Turbo Machines technicians (from left) Louis Claasen, Jacques Zandberg and Dehan Meyer prepare to work on the 19t rotor of the 40MW turbine generator as a rigger guides it into position.

us five days, working round the clock. A high level of welding expertise was required here, as the casing is made of a special material."

The repair of the starting oil pump was performed in only two days. It necessitated manufacturing a new shaft and also included reconditioning of the mechanical seals.

On resuming operation the generator performance improved significantly. "This was confirmed by the vibrations that had previously been recorded compared with the vibrations we recorded when the machine resumed operation after completion of the repairs," Danie pointed out.

Electrical Products provides valuable service on renewable energy projects

The service that Electrical Products provides to ACTOM divisions and business units in taking overall responsibility for the supply chain management of renewable energy projects in which they are engaged, proves invaluable in enabling them to be as competitive as possible in this highly contested field.

"Supply chain management in the national Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) is a key factor in the mix because it helps to ensure that the complex requirements of the various projects are fully and timeously met," said **Mike Ullyett**, Electrical Products' Sales & Marketing Executive.

"It demands of us that we coordinate all the diverse activities involved in an orderly manner at all times, leaving the ACTOM divisions and business units responsible for manufacturing and supplying equipment for the renewables projects free to concentrate on their competencies," he pointed out.

These activities include, assisting various manufacturers and suppliers in the group to combine their tenders into a single coordinated package, monitoring the specifications and other parameters applicable to the goods to ensure they meet all requirements as stipulated, coordinating deliveries in accordance with project schedules, arranging shipping and transportation and checking that goods are in proper order upon delivery at site and handing them over to the project contractors.

Equipment and products supplied by Electrical Products via its REIPPPP Centre of Excellence in Bloemfontein mainly comprise equipment for the "balance of plant" portion of the projects. They include a range of ACTOM HV and MV equipment and cables & accessories.

Products and material supplied include not only equipment and material produced by the various ACTOM divisions and local companies outside the group, but also specialised products that are unobtainable locally and have to be procured from abroad.

"In all cases the ACTOM divisions supply equipment through us as the group's supply chain management contractor. In this capacity we act as gatekeeper between the manufacturers/suppliers and the EPCM contractors/technical consultants for the projects, who we keep informed on progress of all the processes" Mike stated.

In addition to cultivating good relationships with EPCM contractors and technical consultants, the Electrical Products team also maintains regular contact with the independent power producers (IPP's) and their shareholders.

The success of the value-added service Electrical Products provides on the renewables projects speaks for itself. "Since the REIPPPP programme was re-started in early-2018 we have successfully completed supply for nine renewable projects to date, the majority of which are solar PV projects and the rest wind farms," Mike pointed out.

Electrical Products, providing supply chain management services to the ACTOM group for electrical equipment, services and balance of plant for the REIPPPP

Genlux Lighting doubles production with help of black-owned SMME's

Genlux Lighting has more than doubled its production output since changing from vertically integrated production to a final assembly production system.

A key part of the strategy, which Genlux brought into effect four years ago, was to outsource a substantial portion of component manufacture to small, medium & micro enterprises (SMME's).

All of the SMME's, signed on during the past few years, are Ekurhuleni-based black-owned businesses, some of which were already going concerns when approached by Genlux, while others were set up with Genlux's help to provide the required services.

"The work performed by the SMME's is focussed on the manufacture of sub-assemblies and internal components for our roadway and floodlight products.

"The components include lenses, wire harness sets and device plates that house the control gear for HID lighting products," explained **Sello Tsoai**, Genlux's General Manager.

There are two key elements that Genlux focuses on with its SMME system: quality control and training of SMME's. "Without fine attention to these aspects, the system would not function," Sello pointed out.

Final assembly, testing and packaging operations are performed in Genlux's factory.

"Productivity has been greatly enhanced," commented **Tony Wilson**, Genlux's Operations Manager.

"All pre-assemblies are structured to maximise efficiency and speed up output.

"The sub-assemblies are assembled as products in their own right and fully checked for quality prior to final assembly.

"By having each set of sub-assemblies produced independently by dedicated groups of workers in each case ensures greater consistency and speed of production and a high standard of workmanship.

"With the previous system people were assembling luminaires from scratch, with each assembling up to 50 components a piece. This tended to lead to holdups in production, whereas now the sub-assemblies can be prepared and held in stock ready for the next production stage without risk of delays.

A technician employed by the SMME responsible for the sub-assembly of lighting products is seen above assembling the control gear trays for one of Genlux's luminaires.

A worker drilling and tapping components in the plant of the SMME that produces the aluminium bodies for Genlux's floodlights and streetlights.

"With the work split up into specialised sets, pre-assembly workers now assemble an average of around five components each. In addition, the sub-assemblies are more rigorously checked for quality than before, thanks to the more orderly way in which they are produced.

"All production processes, including quality control procedures and testing, are tracked by our system, making all actions fully traceable should any irregularities or problems arise," Tony concluded.

The four SMME's employ a total of 71 people, with the smallest having three employees and the largest employing 50 people.

Genlux earns B-BBEE points for its support of the black-owned and black women-owned companies. "We have helped create new jobs and enhance the skills of the companies' employees, in so doing also contributing towards the upliftment of Ekurhuleni's formerly disadvantaged communities." Sello commented.

This initiative, along with other interventions, has lifted Genlux from a non-compliant B-BBEE contributor to a Level 1 contributor.

Group introduces new format for School Tutoring Project

The Ekurhuleni School Tutoring Project sponsored by ACTOM has been taken to a new level.

A third school, Katlehong Tech based in Katlehong, has been added to the two schools already served by the extra Science and Maths tutoring project, the others being Buhlebuzile High School in Thokoza and Erasmus Monareng High School in Vosloorus.

At the same time a change to the existing tutoring model has been introduced to apply to the 25 learners from Katlehong Tech who have been selected to participate.

"Up to now the extra tutoring has been provided to Grade 11 & 12 learners. We have now introduced it in Grade 9 in the case of the Katlehong Tech learners because we believe that provision of extra tutoring from an earlier grade should prove more effective as they progress into the higher grades and prepare them better for an engineering-related career after leaving school than the present model does," said **Sylvester Makamu**, ACTOM's Group HR Executive.

Senior ACTOM executives and Katlehong Tech staff are shown above with the Grade 9 learners who have joined the Ekurhuleni School Tutoring Project.

The new model is being applied only to the 25 selected Grade 9 learners at Katlehong Tech at present. "We will extend it year-by-year as they move up into the higher grades, resulting eventually in the provision of extra tutoring from Grade 9 through to matric.

"We are treating this as a pilot project at this stage. About a year from now we will reevaluate and if it is proving successful we'll start applying it at the other two schools," he explained.

An official launch function to mark the entry of Katlehong Tech into the project and present the new tutoring model was held at ACTOM's Knights head office in early-April, when the learners were also taken on a tour of the factories on the site.

Variety of group products showcased at African Utility Week exhibition

ACTOM Transmission & Distribution was well represented in the exhibition forming part of African Utility Week at the Cape Town International Convention Centre in May.

The participating divisions and business units were High Voltage Equipment, MV Switchgear, Power Transformers, Distribution Transformers and Protection & Control.

MV Switchgear's display of its newly developed and tested SBV4XE 25kA 800A and 1250A circuit breaker and panel attracted lively interest among electrical consultants and representatives of power and rail utilities from across Africa attending the show.

The new circuit breaker, designed for use on 11kV effectively and non-effectively earthed systems, contains fewer parts, is less costly to produce and has less overall mechanism complexity than its predecessor, the SBV4E model.

High Voltage Equipment showcased its CTB36 outdoor 3-phase AC vacuum combo circuit breaker currently in use in Eskom MV distribution substations in place of the formerly supplied "Dogbox" breaker. It is maintenance free, fully composite and comes with a full on-board protection scheme.

Power Transformers had on display a 3D printed model of a 2,7MVA pad-mounted transformer designed for use on wind power generation plants. It utilises expandable radiators to cater for the expansion and contraction of oil in the main tank, thereby minimising stray gassing on the transformer. It also contains a DGPT2 relay as an oil level indicator, an alarm device for pressure relief, a temperature indicator and a gas detector.

The transformer exhibited by Distribution Transformers on the ACTOM exhibition stand was a demo model fitted with a Perspex wall to show the internal workings of a 16kVA 11kV/24kV amorphous core low loss transformer, which the division has developed and produced as an energy-saving environmentally-friendly alternative to the standard distribution unit.

Protection & Control placed the spotlight on its NovaTech OrionLX system, with its ability to integrate both protection relays and metering systems. This product is in line with the latest trends in the substation automation market, including web server capability and integrated HMI.

Product representatives at African Utility Week are Grace Mushaisano (second from left), Junior Proposals Engineer at High Voltage Equipment, and Noxolo Maphundu, Business Development Engineer at Power Transformers.

Key appointments

Annamarie van Wyngaardt has been appointed Group Financial Director with effect from April 1, 2019.

Angie Coffee-Heyneke has been appointed Group Company Secretary with effect from April 1, 2019.

Jaco Theunissen has been appointed Group Commercial & Legal Officer with effect from April 1, 2019.

Sylvester Makamu has been appointed Group HR Executive with effect from May 1, 2019.

Prince Ziqubu has been appointed Regional Manager of Electrical Products' Southern Gauteng and KwaZulu-Natal regions with effect from April 1, 2019.

Sello Tsoai has been appointed General Manager of Genlux Lighting with effect from May 1, 2019.

Roman Mornau has been appointed General Manager of ACTOM Turbo Machines with effect from February 1, 2019.

Alley Verhufen has been appointed Divisional HR & Training Manager for John Thompson with effect from March 1, 2019.

Gladstone Mbili has been appointed Business Development & Stakeholder Relationship Manager of John Thompson's Utility Boilers & Environmental Solutions business unit with effect from September 1, 2018.

Arno Muller has been appointed General Manager of Satchwell Controls with effect from April 1, 2019.

Chanelle Keyser has been appointed National Sales Manager of Satchwell Controls with effect from April 1, 2019.

Wilma Muller has been appointed Sales & Marketing Manager of the division with effect from April 1, 2019.

Noxolo Maphundu has been appointed Business Development Engineer of Power Transformers with effect from February 11, 2019.

Mohamed Alli has been appointed SHEQ Manager of Power Transformers with effect from April 1, 2019.

Lain Baptista has been appointed Industrial Solutions Specialist at Protection & Control with effect from January 7, 2019.

Lucy Mathipa has been appointed SHEQ Manager of MV Switchgear with effect from May 20, 2019.

Humbulani Mphaphuli has been appointed Quality Assurance Manager of MV Switchgear with effect from May 20, 2019.

Tony Mendes as been appointed General Manager of LH Marthinusen Durban with effect from April 1, 2019.

Herry Sibanyoni has been appointed Engineer & Design Specialist at Current Electric with effect from March 1, 2019.

Michael Ngwenya has been appointed Supervisor at Current Electric with effect from June 1, 2018.

Titus Chauke has been appointed Supervisor at Current Electric with effect from March 1, 2019.


Annamarie van Wyngaardt


Angie Coffee-Heyneke

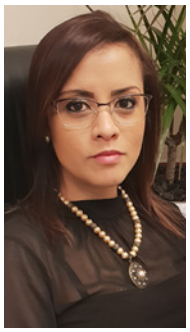

Jaco Theunissen


Sylvester Makamu


Prince Ziqubu


Sello Tsoai


Roman Mornau


Alley Verhufen


Gladstone Mbili


Arno Muller


Chanelle Keyser


Wilma Muller


Noxolo Maphundu


Mohamed Alli


Lain Baptista


Lucy Mathipa


Humbulani Mphaphuli


Tony Mendes


Herry Sibanyoni


Michael Ngwenya


Titus Chauke

Signalling's 2018 long-service awards

Barbara Swanepoel, Personal Assistant to Peter Colborne, General Manager of Signalling, was the longest-serving among 13 employees who received awards at Signalling's long-service awards presentation event for 2018.

Included among the presentations made by Peter on November 29 was an award to **Wayne Meyer**, Site Supervisor, who was selected the business unit's "Top Performer of the Year".

The other long-service awards recipients were:

40 years: Barbara Swanepoel

10 years: Frans Badenhorst, Dion Khoza, Peet Oosthuizen and Tina Mncube.

5 years: Ngiphiwe Nhleko, Slindile Matola, Tamzyn Price, Lilian Keele, Yolanda Janse van Rensburg, Jan Theron, Fanny Mnguni and Benedicta Tshunga.

Wayne Meyer with his "Top Performer of the Year" trophy (right) and long-service awards recipients (from left) Frans Badenhorst, Ngiphiwe Nhleko, Slindile Matola, Tamzyn Price, Lilian Keele, Yolanda Janse van Rensburg, Barbara Swanepoel, Dion Khoza, Tina Mncube, Jan Theron, Peet Oosthuizen and Fanny Mnguni.

Awards to P&C's longest serving employees

Reneith Moloi and Darshan Singh were the longest-serving employees at Protection & Control in 2017 and 2018.

Reneith, Relay Manufacturing Tester, had 35 years' service in 2018, while Darshan, Senior Applications Engineer, recorded 25 years' service in 2017.

A total of six employees received long-service certificates from General Manager **Faisal Hoosen** at the business unit's awards function held in mid-November last year. The other four were **Herbert Tukakgomo**, Estimator/Tendering Engineer, for 15 years' service, and **Charles Bongani Pooe**, Wireman; **Kevin Govender**, Financial Accountant, and **Lynette Strydom**, Sales Support, all for 15 years' service in 2017.

Faisal Hoosen (third from left) and Medium Voltage & Protection's Divisional CEO Martin Kelly (third from right) pose with P&C's long-service awards recipients (from left): Darshan Singh, Kevin Govender, Lynette Strydom, Reneith Moloi, Herbert Tukakgomo, and Charles Pooe.

Long-service awards presented at head office

Betty Britz, Secretary to Technical Training Manager Danie de Kock, and Jannie Lamprecht, former CEO of Appliance Components, were presented with long-service certificates at ACTOM's head office in March this year.

As seen in the accompanying pictures, Betty was presented with a 25-years' award by outgoing Group HR Executive **Johann Ellis**, while Jannie received an award from Group CEO **Mervyn Naidoo** for 31 years' service a few days prior to the end of his 20 years' tenure as CEO of Appliance Components, at which he continues to serve as a business consultant.

Distribution Transformers' long-service and retirement presentations for 2018

Seven Distribution Transformers staff-members retired at the end of last year after employment periods ranging from 10 to 42 years.

Divisional CEO **Alan Buchholtz** made presentations to the retirees at two long-service awards functions for 2018 held on November 9 and 16, when a total of 32 employees received 10 and 15 year long-service certificates.

The retirees were Core & Winding Prep **Abel Thela**, with 42 years' service; Production Manager **Daniel Macu** and Press Brake Operator **Petrus Motaung**, both with 38 years' service; Winder **Rose Mbatha**, 34 years, Nightshift Manager **Themba Moshweshwe**, 19 years; and Winder **Maria Gumbi** and Welder **Dikhapa Pitso**, both 10 years.

The recipients of long-service awards were:

15 years: IP Legoba, A Mthethwa and D Mambane.

10 years: BT Motloung, DB Maswanganyi, JP Ndlovu, SS Mkwanazi, SH Nkabinde, MJ Mofokeng, M Ndlovu, EM Mashinini, LM Molefe, NV Mfene, TD Gule, EV Masango, LJ Liebenberg, P Mnyakeni, JT Mawane, TJ Mambane, SF Mkwanazi, BF Mafeke, TE Thapedi, MP Nonyane, MM Kwapa, DC Mthethwa, SP Zwezwe, B Ziqubu, S Ngobese, S Mtetwa, K Nari, MC Opperman and DM Kgobe

Seen in the above pictures are the two groups of Distribution Transformers' long-serving staff and retirees who were presented with awards in November last year.

Shirley Chauke article correction

We supply below information relating to the article published in the December 2018 issue of What's Watt entitled "First black woman Executive Director appointed to ACTOM board".

In the last paragraph of the article, published on Pg 10 of that issue, we neglected to include some information about previous positions held by **Shirley Chauke**, the newly-appointed Executive Director.

The paragraph, as corrected, reads:

Senior posts Mrs Chauke has held previously include Customer Executive at Eskom, Key Customer Executive for City Power, Head of Procurement at Technip-coflexip Italy, a Europe-based international EPCM company, and Managing Director of EHR (Essener Hochdruck-Rohrleitungsbau), renamed KOG Piping Systems SA, which was acquired by Bilfinger, Germany.

ACTOM Knights soccer team again demonstrate their championship quality

Since 2017 when they re-established themselves in the East Rand Industrial Football League (ERIFL), the ACTOM Knights Football Club team have gone on to achieve further triumphs, the latest being winning a new competition launched by the League early this year.

During the period since we last reported on the team's achievements two years ago the League itself has gone through some changes, the main one being the demise of the Second Division, which in turn resulted in the Champ of Champs knockout competition also falling away, as it hinged on having the winners and runners-up in both divisions' league competitions competing against each other. Secondly, from last year the League's playing season was changed to coincide with the calendar year, running from January to November.

The ACTOM Knights team's first achievement in 2018 was winning top spot in the league championship. They also reached the final in the Top Eight competition to earn the Runners-Up trophy and they again showed themselves to be champs in winning the Industrial Knockout contest.

Then this year they further demonstrated what they're made of by

making it into the final on April 5 and beating Liebherr Africa 3-1 to win the new Community Shield Cup competition, which consists of an exciting combination of a league points system to start with, followed by a knockout competition leading into the final.

Distribution Transformers' Production Manager **Vuyani Bonoyi**, who is Secretary of the ACTOM Knights team – and is also, since the start of the 2018 season, Chairman of the ERIFL – commented: "Naturally we are very proud of our latest achievements. We know what hard work and commitment it takes to be successful, but we have a great spirit going in the team and that helps to keep us focussed!"

The ACTOM Knights team celebrate their win in the new Community Shield Cup.

Thrills and spills aplenty for ACTOM participants in 2019 Dusi canoe marathon

Loveday Zondi fights his way through rapids during Dusi 2019.

In February four ACTOM canoeists tested their skills in the Dusi in KwaZulu-Natal, South Africa's longest and toughest canoe marathon.

Three of the four are seasoned campaigners in this gruelling 124 km three-day event: **Loveday Zondi**, 34, Product Coordinator at Electrical Products, **Craig Johnston**, General Manager of LH Marthinusen's Fan Service division, and **Zonele Nzuza**, 29, SHE Assistant at Genlux Lighting.

The fourth ACTOM participant, **Mike Merry**, 57, Divisional Financial Executive for the Power Conversion division, made his Dusi debut partnering Craig in a K2, while Zonele and **Tim Baker**, 58, an experienced canoeist not employed at ACTOM, were K2 partners.

Officially this year's race was a singles (K1's) event, so among the ACTOM participants only Loveday took part as a serious contender for top honours. He has previously taken part in 15 Dusi's, including winning five gold medals to date.

However fortune didn't favour him this time round, as he suffered a stomach cramp on the first day, ending the day in 32nd position. He improved his position slightly over the next two days to finish in 26th place to earn silver, but this was far short of his hoped-for goal of being among the top 20 finishers.

He was also partly handicapped by being unable to do his normal intensive preparatory training during the months leading up to the event, due to having sustained a knee injury while taking part as an ACTOM team-member in the three-day ELB Extreme Road Challenge running and cycling race between Barberton in Mpumalanga and Phalaborwa in Limpopo Province in October last year.

Craig and Mike achieved 144th position out of the 261 K2's that completed the race and were 19th in the Grandmasters class.

Describing his experience as a Dusi novice, Mike, who has partnered Craig in a number of other races over the past five years, including three Fish River marathons, said: "It was a superb experience!

"In Dusi, as I was often reminded by fellow contestants, there's always a chance you won't finish. But we trained hard beforehand and finished the race, despite the fact that we put a hole in our boat on the second day. The main concern for me was the risk of getting sick from the poor water quality of the first two days, but luckily we managed to avoid that. The portages were tough on Day 2.

"What was really exhilarating for me was the scenery, the great support we got and the good atmosphere among the participants. I was especially struck by how many mothers and sons, fathers and daughters and couples of all shapes and sizes took part. All you need is some fitness and an adventurous spirit," Mike concluded.

ACTOM divisions and business units

POWER
John Thompson, Isando: (011) 392-0900
www.johnthompson.co.za
John Thompson designs, manufactures, installs and maintains industrial boilers and environmental equipment for local and international process steam and power generation applications. It also retrofits, services and maintains utility boilers and environmental equipment in the power generation market, as well as designing, supplying and installing dust control, product recovery and gas-cleaning equipment for the mining, mineral processing, cement, chemical, petrochemical and food industries.

POWER CONVERSION
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: (011) 899-1111
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: (011) 899-1111
Laminations & Tooling manufactures laminated components and tooling for the electric motor manufacturing and repair industries.

HVAC Systems, Durban: (031) 700-3286
HVAC Systems, Cape Town: (021) 981-0111
www.actom-hvac.co.za
HVAC Systems designs, supplies and installs industrial ventilation, heating and air-conditioning systems for the petrochemical, paper, pharmaceutical, mining, food, textile and various other industries.

Static Power: (011) 397-5316
Static Power Specialize in the design and manufacture of AC and DC standby equipment,including thyristor type battery chargers (Micro Process Controlled option), industrial batteries, power supplies, rectifiers, DC/DC converters, DC/AC inverters, furnace control panels, capacitor trip units, battery trip units, power distribution boards. All systems are designed and engineered to suit their purpose.

Alkaline Batteries: (011) 397-5326
Alkaline Batteries, is the South African Distributor for ALCAD and SAFT industrial nickel cadmium and Lithium Ion batteries for the industrial, telecoms, rail and renewable energy markets. Services offered; Installation, Commissioning, Battery Sizing, Testing, Training, Maintenance and Repairs.

COM 10: (011) 552-8368
COM10 is a local assembler and integrator of Alpha switchmode rectifiers, DC/DC Converters with sophisticated supervisory controllers, Haze Batteries, stands, battery cubicles and power enclosures.

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.

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. It manufactures, Isolators, instrument transformers, outdoor circuit breakers, isolated phase busbars. It also supplies generator circuit breakers, high voltage gas insulated switchgear, compact hybrid switchgear, surge arresters, substation and overhead line insulators. It also specializes on the repairs and maintenance of high voltage equipment.

MEDIUM VOLTAGE & PROTECTION
MV Switchgear: (011) 820-5111
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.

Protection & Control: (011) 820-5111
Protection & Control is a market leader in the supply of protection and metering solutions to the electrical industry. The offering includes a comprehensive range of automation systems, protection relays, credit, smart and prepayment metering systems and hosted services as well as LV panels, components and accessories.

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 to power utilities, 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 to power utilities, the mining sector, local authorities and industry locally and internationally.

LH MARTHINUSEN
LH Marthinusen: (011) 615-6722
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.

Metalplus: (011) 433-1880
www.metalplus.co.za
Metalplus is an expert mechanical facility. It has pioneered Submerged Arc Micro welding in South Africa. It's core competencies are machining of new shafts and repair, grinding and micro welding of all types of rotating equipment and other mechanical components, as well as the mechanical repairs of a wide range of electrical components (traction motor casings, electric motor casings, end/bearing caps, etc.).

MARTHINUSEN & COUTTS
Marthinusen & Coutts: (011) 607-1700
www.mandc.co.za
M&C 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 24/7engineering on-site services and unique motor and generator management and maintenance solutions and programmes.

ACTOM Turbo Machines: (016) 971-1550
www.actomturbo.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.

ELECTRICAL EQUIPMENT
www.actomep.co.za
Electrical Products: (011) 878-3050
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.

Appliance Components: (021) 863-2035
www.satchwell.co.za
Appliance Components 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 and employs a team of expert designers, with further technological support available from a leading international designer and manufacturer of luminaires.

ACTOM ENERGY
ACTOM Energy: (021) 511-9146
www.actomenergy.co.za
ACTOM Energy in collaboration with divisions within the ACTOM group, provides System Integrations and Turnkey Subsystems across all sectors.

hydron hydraulics: (021) 511-9146
www.hydron.co.za
hydron hydraulics designs and supplies hydraulic engineering systems and services to the offshore oil & gas sector internationally. Equipment it designs, supplies, assembles, refurbishes, repairs and installs includes high pressure power packs, ring main units, winches, cranes, ballast systems and drilling and under-sea equipment.

Electrowave Cape: (021) 510-2550
www.electrowavecape.co.za
Electrowave Cape designs, supplies and services electrical and electronic engineering systems for the marine and offshore industries locally and internationally. These include design and installation of power automation and drive systems, automation and instrumentation systems and generator control systems and refurbishment, repair, installation and maintenance services.

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Editorial contact: Julian Kraft, J Kraft Public Relations
Tel: (011) 472-6686, mwkraftj@mweb.co.za
Feature story editorial contact, Wendy Hardy
Tel: 083 230 0643, wendy@trendingideas.co.za

Produced by: Jeroen Luyk, In Africa
(011) 768-7050, inafrica@saol.com

ACTOM contact:
Andries Mthethwa, Tel: (011) 820-5111
andries.mthethwa@actom.co.za

ACTOM, establishing business hubs on the African continent, while continuing to grow, service and maintain existing business globally.

ACTOM

ACTOM (Pty) Ltd: 2 Magnet Road, Knights, 1413 | PO Box 13024, Knights, 1413
Tel: +27 (0) 11 820-5111 | Fax: +27 (0) 11 820-5044 | www.actom.co.za