wattnow

THE OFFICIAL PUBLICATION OF THE SOUTH AFRICAN INSTITUTE OF ELECTRICAL ENGINEERS

Celebrating Engineering Femininity

LIGHTNING

AUGUST 2024

SAIEE

CONTENTS

SAIEE @SAIEE SAIEE

Dear **watt**now reader

As we enter the lightning season, which usually occurs in the summer in South Africa, it is apt to dedicate this issue to lightning so you are prepared for any unexpected events. South Africa is well known for electrical storms and lightning. However beautiful this might be at times, it also presents a deadly and genuine threat to those caught in the open.

Our first feature article, written and compiled by the SAIEE Lightning Chapter, is "We are underestimating our lightning risk!". This article discusses that the Flash Density (N_g) metric, which measures the number of lightning flashes per square kilometre per year, has traditionally been the standard for evaluating the risk of lightning to buildings and infrastructure in a region. However, this method assumes only one ground strike point (GSP) per flash and does not account for possible multiple GSPs per flash. Read more on page 40.

Page 44 discusses "Voltage Transients," which occur daily. However, lightning damage can be minimised by installing the correct lightning conductors connected to natural ground to dissipate the voltages and current, reaching millions of volts.

As we all know, August is Women's Month, and with that in mind, I decided to share a few profiles of female engineers in this issue. Read it on page 50.

I wish every woman a day filled with love, joy, and recognition who continues to inspire, lead, and make a difference. You are truly remarkable.

The September issue features Mining, and the deadline is 12 August. Please send any articles/papers to me and earn CPD credits when your content is published.

Herewith the August issue, enjoy the read!

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Pascal Motsoasele
2024/5 SAIEE President

"Empowering the next generation of SAIEE members. Making it fashionable to be and remain a member of the SAIEE" That is my presidential theme, as presented during my inaugural address in March this year. It is encouraging to see several activities organised around it by the various Sections, Chapters and Regional Centres Part of the theme relates to our outreach to schools and promoting the uptake of STEM subjects, where our future members will come from.

E: president@saiee.org.za

I see a lot of activity from our structures, which are posted on social media. I would like to pay special homage to the KZN Centre for having organised their very first conference around leadership in engineering a month ago, which successfully drove the career pathing agenda.

I also see a lot of activity online from the Free State Centre and their vibrant Student Chapter at the Central University of Technology (CUT) around robotics and coding. As part of their Mandela Month activity, the Railway Chapter hosted a career day at a school in Daveyton on Friday, the 26th of July. They are forging partnerships with other players in the industry that could potentially drive the STEM message further. These are just a few examples of the kind of activity I am noticing, and it fills me with pride to see the members across our structure advertising their mettle, passion and resolve to rally behind the empowerment theme.

We need more of these kids to join the engineering fold. Thanks to the 4IR, menial tasks will be automated in the future, paving the way for more human-centric engineering careers: Let Artificial Intelligence and Machine Learning (AI & ML) algorithms do the routine tasks and let humans do the more meaningful and fulfilling work.

During the President's Invitation Lecture on the 18th of July, our keynote speaker, Ms Nomso Kana, mentioned some current infrastructure projects where 4IR technologies, such as 'human-in-the-loop AI systems', would be instrumental. What caught my attention, amongst other information she had shared on the day, was the Boegoebaai Hydrogen Plant that is currently under construction in the Northern Cape. She mentioned that the plant, once operational, will require approximately 8,500 workers, of which engineering practitioners would be upwards of 3,500 workers. She also gave a case study on a water treatment plant in the Free State that executed a project using broadband LTE, AI & ML to effect process efficiencies. Another case study she discussed is the Thyspunt Gen4 Nuclear Plant, currently being constructed in the Eastern Cape.

Bottom line: Skilled engineering practitioners are in demand—the world over, in fact! We are aware that South Africa is rapidly losing engineering practitioners as they are being attracted by overseas companies. International exposure is excellent for our members; hence, our strategy has always been to maintain closer relations with our international counterparts.

July has been a relatively cold month. As we usher in the Women's month of August, let us remember to promote engineering to the girl child. The August copy of the wattnow magazine profiles a few women making great strides in this heavily male-dominated industry; I encourage all our female Young Professionals and student chapters to read their profiles and be inspired.

To the Young Professionals and the Student Chapter members: You are the next leadership of this country's engineering. It is an opportune time for you to play the role that your status holds! wn

Yours in service of the Institute.

ACTOM CELEBRATES INTERNATIONAL WOMEN'S DAY 2024:

Fostering Women Entrepreneurs, Building Brighter Futures

ACTOM's innovative Women's Empowerment Programme, is transforming lives by providing skills and entrepreneurship training to young women from disadvantaged communities.

With ACTOM's ongoing support, this initiative has already led to the establishment of Izintombi Zodwa Trading, a sewing company created by three participants. These women are now empowered entrepreneurs, inspiring communities.

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KZN Centre Conference - Innovate to Elevate!

On June 26, 2024, the SAIEE KZN Centre hosted the SAIEE KZN Leadership Conference 2024 under the theme "Innovate to Elevate," which proved to be a pivotal event in engineering discourse. This gathering left participants inspired and equipped with insights crucial for driving change within their respective organizations and communities.

Front – seated from left: Veer Ramnarian, SAIEE Deputy President; Leanetse Matutoane, SAIEE CEO; Krystle Annamalai, SAIEE KZN Chairperson; Dr Mohammed Fayaz Khan, SAIEE KZN Vice Chairperson and Jay Kalichuran, KZN Past Chairman.
Back – from left: Shepherd Nkosi; Umeshan Pillay; Nishal Pranlall; Vikesh Punwassi; Sibahle Maphumulo; Omaira Jajbhay; Viroshnee Gounden; Maveshini Govender; Fanele Gina; Phumzile Mthembu; and Luendran Govender.

The conference focused on several key themes shaping the future of engineering and technology. These included Artificial Intelligence (AI), Innovation, Sustainability, Upskilling for the future, Digital Transformation, and effective Leadership.

Discussions and presentations under each theme underscored the importance of integrating these elements to navigate a future characterized by rapid technological advancements and increasing environmental responsibility. Special recognition is extended to keynote speaker Mr Nyimpini Mabunda and guest speakers Dr Mareli Botha, Professor Rangith Kuriakose, Mr Ashvir Harcharan, and Mr Keanu Damon. Their expertise and captivating presentations enriched the conference, offering valuable insights into their respective fields and inspiring attendees to embrace innovation and leadership.

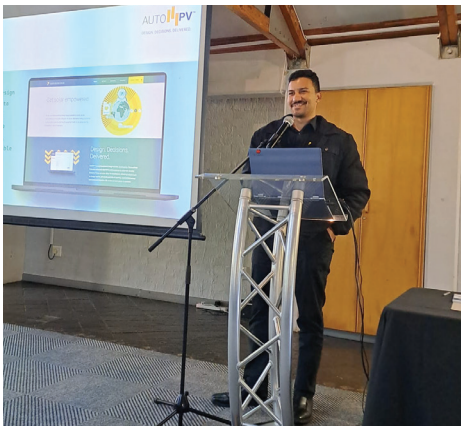
The success of the SAIEE KZN Leadership Conference 2024 can be attributed to the collaborative efforts of sponsors, speakers, and attendees. The support of sponsors such as eThekwini Transport Authority, Zutari, Cabstrut, Tongaat Main Electrical, Aberdare, Go Durban, Electrical Supplies Corporation, and Schneider Electric was instrumental in ensuring the event's success. Their contributions facilitated meaningful discussions and provided a platform for showcasing advancements in engineering practices. Furthermore, the meticulous management of the registration process by Rosemary and Viden deserves commendation, as their efforts ensured a seamless experience for all participants. The vibrant discussions and knowledge sharing among attendees further enhanced the conference's impact, fostering a collaborative environment conducive to learning and networking.

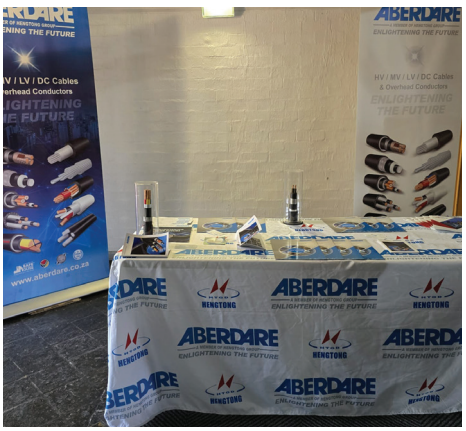
SAIEE
KWAZULU-NATAL CENTRE

INNOVATE TO ELEVATE

Engineering Leaders

SECURING THE FUTURE





As we reflect on the achievements and outcomes of the SAIEE KZN Leadership Conference 2024, it is evident that the insights gained will serve as a compass for future endeavours in engineering and technology. The emphasis on AI, Innovation, Sustainability, Upskilling, Digital Transformation, and effective Leadership will continue to guide efforts to achieve sustainable development goals and address global challenges. The SAIEE KZN Leadership Conference 2024 has set a benchmark for excellence in engineering discourse. It has empowered participants with the knowledge and inspiration to drive innovation, promote sustainability, and lead transformative change in their spheres of influence. This event is a testament to the collaborative spirit and commitment to advancing the frontiers of engineering excellence. wn

SAIEE says goodbye to Androzette Muller

On June 30, the South African Institute of Electrical Engineers came together to honour and bid farewell to Androzette Muller, a cherished and influential member of the institute.

Front seated: Prof Pat Naidoo, SAIEE Honorary Treasurer; Androzette Muller, Retiree; and Leanetse Matutoane, SAIEE CEO.
Back from left: Minx Avrabos, wattnow; Joanne Griffin, Finance; Letlhogonolo Molepo, Training Academy; Douglas Millar, Website Content Manager; Zanele Sibiya, Training Academy; Sibusiso Nyundu, IT Support; Unathi Mabeta, Finance; Thandolwethu Lefutso, Membership; Connie Makhalemele, Membership; and Gerda Geyer, Company Secretary.

Androzette dedicated over a decade of her career to serving as the head of the Financial Department, a role she took on in 2010. Throughout her 14-year tenure at the institute, Androzette made noteworthy contributions by implementing and refining various financial and quality control measures, significantly improving the efficiency and transparency of SAIEE's financial processes.

The day was filled with emotion for everyone present, but Prof Naidoo, SAIEE Honorary Treasurer, reassured Androzette by saying, "You are part of the family and will remain part of the family."

We wish Androzette all her future endeavours and hope that she will have the opportunity to relax and spend quality time with her grandchildren. wn

KZN Centre site visit

On June 27, 2024, the SAIEE KZN Centre committee and the SAIEE CEO, Leanetse Matutoane, paid a visit to ARTsolar, South Africa's leading solar panel manufacturer.

The visit provided a thorough understanding of ARTsolar's advanced production processes, innovative technologies, and strong commitment to quality.

ARTsolar's focus on supporting local industry and creating job opportunities deeply resonated with us, emphasizing the vital role of local businesses in the country's economic growth and energy independence. This visit further solidified our belief in the potential of renewable energy solutions to propel sustainable development in South Africa. wn

2024 SAIEE President's Invitational Lecture

From left: Leanetse Matutoane, SAIEE CEO; Prof Pitshou Bokoro, University of Johannesburg; Ms Nomso Kana, 2024 PIL Speaker; and Pascal Motsoasele, 2024 SAIEE President.

The South African Institute of Electrical Engineers hosted the President's Invitational Lecture on July 18th at SAIEE House in Observatory, Johannesburg.

This year's distinguished speaker, Ms Nomso Kana, a nuclear scientist by profession, was appointed in 2019 as one of the esteemed Commissioners for the Fourth Industrial Revolution (4IR) within the Presidency. Her extensive expertise extends beyond nuclear science, energy, policies, and connectivity into the dynamic arena of broadband infrastructure, where she leads her own company that focuses on advanced domain naming system training and cybersecurity.

Ms Kana's talk, "The Impact of 4IR Technologies on Engineering Practice", highlighted how the Fourth Industrial Revolution (4IR) has transformed engineering practice in South Africa with technologies like artificial intelligence, the Internet of Things, and big data analytics. Smart grids use advanced sensors and communication networks to optimise electricity distribution and reduce energy consumption. Digital twin modelling allows engineers to simulate different scenarios and optimise system performance. In a recent case study, a South African engineering firm successfully implemented 4IR technologies to enhance the efficiency of a water treatment plant.

Click here to watch the recording. wn

From left: Nomso Kana and Pascal Motsoasele.

From left: Sicelo Mabuza and Christinah Mohloki.

From left: Misheck Mdala and Andries Mthethwa.

COMTEST Introduces Ametek's Mi-BEAM SERIES

Ametek's Mi-BEAM SERIES, a high-performance, modular, bidirectional, regenerative programmable DC power system for application in battery simulation and testing (charge/discharge), electric powertrain testing, fuel cell testing and solar inverter testing.

COMTEST, the local representative of AMETEK Programmable Power, is pleased to announce the new Sorensen™ Modular Intelligent-Bidirectional Energy AMplified (Mi-BEAM) Series.

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The Mi-BEAM Series is the newest addition to the AMETEK Programmable Power portfolio of high-power testing solutions. It is designed to test today's complex, high-power electronics in various automotive, energy storage, industrial, and aerospace applications. This platform covers all test needs through the product life cycle, from advanced research and development (R&D) to design validation and production test requirements.

The Mi-BEAM Series features complete DC source and sink capabilities with power levels from 12 kW to 37 kW. It is fully scalable up to 1.2MW with parallel systems. The available 600V, 1,500V, and 2,000VDC voltage ranges in a 4U rack-height chassis provide full power up to 150A within a single system.

KEY FEATURES

- Complete solution – battery test, simulation & solar array simulator software included
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- Battery simulation & Battery testing (charge/discharge)
- Electric powertrain testing
- Fuel cell testing
- Solar inverter testing

Contact COMTEST for further information on the Mi-BEAM Series and how AMETEK's solutions can assist, on Email sales@comtest.co.za or visit www.comtest.co.za wn

Pratley Products a winner for on-the-go repairs at Dakar Rally participant

When Wessel Bosman drove across Africa in 2016 in a Ford F250, little did he realise he would end up stranded in a remote location and in extreme temperatures following a gasket head problem. Luckily, Wessel had Pratley Putty and Pratley Steel Quickset on hand which was ideal for making repairs under such arduous conditions.

Wessel is no stranger to such situations, having competed in the famous Dakar Rally four times. "I am not that good a rider, just crazy," he says modestly. As a Lesotho motorcycle racer of South African origin, he entered Dakar in 2015 after impressing the organisers by riding from Cape Town to Egypt to compete in the Pharoah's rally, where he placed tenth after 17,000 km of hard riding.

After retiring from the Dakar 2015 rally due to injuries, the Ford F250 was shipped to the Dakar Organisation headquarters in Paris, France, then moved to Italy by Wessel. Wessel then thought it a great adventure to drive it down through north, west, and mid-Africa, including the Congo, Angola, South Africa, and finally Lesotho, for a total of 21 countries.

"When embarking on an adventure or a rally, most people plan for any eventuality. However, a head gasket is not normally part of your planning," says Wessel. He adds that he always has Pratley Steel Quickset and Pratley Putty on hand, even on his bike. "These products can repair almost everything and allow you to reach your destination where you can replace an oil pipe, radiator, or a hole in the sump."

Wessel became stranded at the border post between Morocco and Mauritania when he discovered that the head gasket had developed a serious hole where the compression pushed the gasses into the water-cooling port. He used Pratley Steel Quickset to fill the steel ring in the gasket (the rings around the pistons), followed by Pratley Putty to block the damaged water port in the head cylinders and the port in the block.

The gasket was put back, and some Pratley Putty rolled into a cylindrical form and placed in the slot of the water port between the head and the block. "I then told my road assistant that we now had 25 minutes to fasten that head as good as we could to spread the Pratley Putty to counter any unforeseen omissions in my roadside repair job."

16,000 km later, Wessel concluded his journey at the AfriSki resort, having only encountered a single flat tyre during that extraordinary distance. This completed the adventure that had commenced 24,000 km and 84 days earlier when he left Italy for Southern Africa. Wessel, the founder of the AfriSki resort, laughingly said, "Yes, I had to rebuild the engine of the Ford F250, but now that Ford pushes the snow from the roads for the people to get to Afriski, all the towns and mines in Lesotho!"

Pratley Putty is a versatile epoxy putty that can be moulded and shaped to fill gaps, cracks, and holes. It cures to a hard, durable finish and adheres well to a variety of surfaces, including metal, explains Mark Bell, National Sales and Marketing Manager at Pratley Adhesives.

On the other hand, Pratley Steel is a high-strength adhesive designed specifically to bond metal surfaces. It creates a strong and durable bond that can withstand high temperatures and extreme conditions.

Preparation is important for the type of gasket head repair that Wessel and his team had to complete on the fly. Simply clean the damaged area thoroughly to remove any debris, oil, or grease. Also, ensure that the surface is dry before proceeding with the repair. Use Pratley Putty to fill in any cracks, holes, or gaps in the gasket head. Mould the putty to match the shape of the surrounding area and ensure that it is firmly pressed into place.

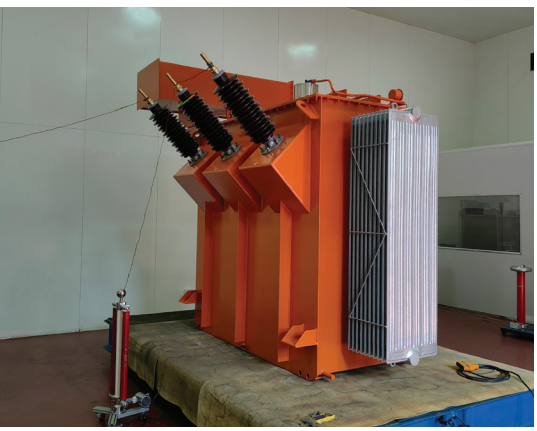
Curing time, which is temperature dependent, is important to allow it to harden for a specified amount of time. "After the repair is complete and the adhesives have fully cured, it is a good idea to test the gasket head to ensure that it is functioning properly and that the repair holds up under pressure," notes Mark.

Wessel is familiar with Pratley's products' famous reputation. Having travelled to over 80 countries to date, either via vehicle or motorbike, he has always carried Pratley Putty and Pratley Steel with him in case of any emergency. When Wessel returned the Ford 250 for manufacturer specification maintenance and repair, the technicians were so impressed by the effectiveness of Pratley Putty and Pratley Steel Quickset under such unique circumstances that they encouraged him to contact the company itself about his story.

"Our products are world-class and renowned in terms of performance and quality. Pratley Putty, in particular, is the only South African manufactured product to have gone to the Moon, so we were proud to learn about Wessel and his use of our products at the Dakar Rally," says Mark. As to his future plans, Wessel concludes: "You never know. Life is a journey that continues."

For more information about Pratley products, visit www.pratleyadhesives.com, or email sales@pratley.co.za for assistance.

ACTOM Distribution Transformers builds first 66kV transformer as it eyes expansion into more African markets



ACTOM Distribution Transformers has recently completed the manufacture of its first 66kV transformer and says it is ready to become the dominant force in the supply of HV small power transformers on the African continent.

Having previously manufactured a range of transformers up to 44kV voltage, the company was prompted to expand its manufacturing capabilities to 66kV transformers by customer demand, explains Lee Mbenge, Divisional CEO of ACTOM Distribution Transformers.

"Customers were aware of ACTOM's exceptionally short lead times, based on our ability to push out our smaller power transformers up to 10MVA fairly quickly. So, we started getting requests for the design and manufacture of 66kV transformers," says Mbenge.

"Historically, industry lead times for the manufacturing of these transformers is about six months to a year. We can complete these units in about 14 to 16 weeks. This is what customers want to take advantage of."

However, he warns that ACTOM Distribution Transformers' lead times are being impacted to some extent by the current market conditions in Europe where the company sources some of the material for its 66kV transformers. Major original equipment manufacturers (OEMs) in Europe cite material, equipment and skilled labour constraints as the main issues causing supply constraints and consequent increased lead times.

Lee explains that higher-voltage transformers are typically used in the electricity transmission and generation sector, whereas lower-voltage units are mainly used on the distribution side. He says that ACTOM Distribution Transformers' 44kV and 66kV units can be classified as either small power transformers or large distribution transformers.

Clean environment and top-quality materials

Commenting on the development and production of the 66kV transformer, he notes that manufacturing the higher voltage unit required a meticulously clean environment and top-quality materials.

"Quality control must be of the highest standard. Not only did we have to ensure that the environment is meticulously clean, but we also had to ensure that the coil-winding tension is adequate and sufficient," adds Mbenge.

"We also had to ensure that material used in the manufacturing process was inspected regularly to ensure that it conforms with standards and requirements."

He says that ACTOM Distribution Transformers did not have to upgrade or acquire any new equipment to manufacture the 66kV transformers, but it had to carefully check and maintain its machinery to ensure it was in the right condition to be able to manufacture the unit.

"We had to perform a lot of servicing of our equipment beforehand, but we

were able to use our existing facilities to manufacture the 66kV transformers. We are looking at upgrading our testing facilities as we are currently reliant on our sister companies to do type and special testing of the new units, We would like to conduct these tests in-house in future," says Mbenge.

TRAINING TEST TECHNICIANS

He adds that the company's current workforce possessed the necessary skills and expertise to manufacture the 66kV unit, and capabilities of test technicians were enhanced by providing training on the new test requirements, ensuring adherence to the safest test protocols possible.

Lee points out that the introduction of the 66kV transformer provides ACTOM Distribution Transformers with exposure to customers who are not aware of the company's manufacturing capabilities of this voltage range in transformers. This will ultimately pave the way for new projects and contracts in the energy sector.

"We are the new kid on the block in this voltage range and some customers might be sceptical about what we can do, so we still have to prove our worth and show that we've earned our stripes and are in this for the long haul," he says. As a 121-year-old company, Mbenge says ACTOM has become a reputable brand and intends to grow and expand its brand visibility to other African markets. wn

Q-KON Unveils New OneWeb Twoobii-LEO Flat-panel Terminals

In keeping with their ongoing commitment to innovation in the Smart Satellite Services and satellite connectivity spaces, Q-KON has now released new OneWeb Twoobii-LEO user terminals. Successfully demonstrated at a recent exclusive customer event in Midrand, South Africa, these flat-panel terminals further underscore the performance advantages of LEO connectivity in a South African and broader African context.

Developed specifically to meet the needs of end users who require a more resilient back-up to fibre connectivity, these two new flat-panel user terminals reflect Q-KON's focus on the needs of local enterprises.

By combining class-leading data download and upload speeds with the flexibility and affordability of pay-per-use (PPU) billing models, Q-KON has enhanced the applicability and utility of Smart Satellite Services to Africa.

This fusion of high data transfer rates and value distinguishes the high-performance, flagship flat-panel terminal and the smaller, mid-range, easy-to-install flat-panel terminal, both of which will be offered to end users as combined equipment and service bundles.

Operating on the global Eutelsat OneWeb network cements the position of these innovative solutions as ideal back-up options for enterprises that require rapid, always-on connectivity and immunity from terrestrial infrastructure challenges and outages.

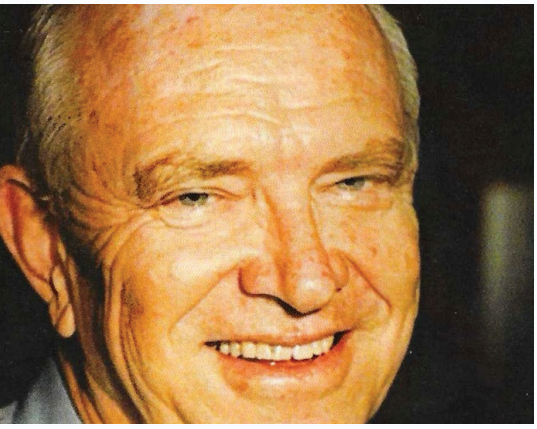
While the demonstrated speeds of the larger flat-panel antenna are impressive (100Mbps receive data rate and 20Mbps transmit data rate), raw performance has intentionally taken a backseat to reliability and the provision of best-effort service quality.

Q-KON plans to further enhance the reliability and dependability of satellite connectivity by enabling seamless integration of Twoobii-LEO Smart Satellite Services with fibre networks through the option of direct links to end-user core networks.

This additional innovation will be made possible by the fact that the Eutelsat OneWeb gateway infrastructure is located within South Africa, and possesses a dark fibre link to Teraco.

To learn more about Q-KON's Twoobii-LEO services and user terminals, click here. wn

We remember SAIEE Past President
Pierre Conrad Ballot



Pierre Conrad Ballot
1941 - 2024

PIERRE BALLOT was born and educated in Germiston and matriculated at the
Afrikaanse Hoërskool Germiston in 1958. On leaving school, he attended the South African Air Force Gymnasium for a year and qualified as a pilot in the SAAF at the end of that year.

From 1960 until 1963, Pierre studied electrical engineering at the University of the Witwatersrand, graduating with a B Sc Eng in electrical engineering in April 1964.
After a short period with the Eskom Eastern Transvaal Undertaking, Pierre joined the English Electric Company as a commissioning engineer in 1965 and remained with this organisation through various takeovers, name changes and mergers for 17 years.

During this time, he gained wide-ranging experience in the power and control aspects of electrical engineering on projects involving mine winders, steel mills, power distribution, blast furnaces, pumping installations, generation, gas turbines, protection, airport lighting, and railway electrification. His involvement progressed from site activities to overall design, execution, and management of electrical projects. On leaving, he attained the position of divisional manager in the GEC group company, GEC Engineering.

In 1983, Pierre joined consulting engineers GH Marais and Partners Inc. and continued his career in project-type work. Major projects on which he was a member of the project team were Ennerdale 88/11 kV substations and reticulation, power supplies for the Lesotho Highlands project, the Witspos mail sorting centre, Saldanha Steel, Hartley Platinum, the electrification of Soweto, and Waterval wastewater treatment plants.

Pierre has been a member of SRK-Turgis (Pty) Ltd, a company specialising in mining and engineering services, and with international associations through the SRK Consulting group of companies in Australia, Canada, Chile, China, the USA and the UK.

Pierre was a SAIEE Fellow and was inaugurated as the SAIEE President in 2003. He was a registered Professional Engineer and has a Government Certificate of Competency. In 1991, after part-time study, he was admitted to the Bachelor of Law degree program at the University of South Africa.

The SAIEE sends our heartfelt condolences to Mr Ballot's wife, Tersia, and their sons, Johan and Chris, and their families. wn

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LESEDI MARKETS

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- EP&C of the Balance of Plant for Eskom's four **Gas Turbine Power Stations** constructed in **Atlantis** and **Mossel Bay** in the Western Cape, South Africa.
- **Mechanical erection** of 14x150MW gas turbines for **Siemens** and associated turbine halls.
- Since **1990,** Lesedi has **successfully completed projects** across Africa, illustrating our **expertise.**

Mining

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- **30 years** of **upgrade** and **maintenance** projects at Eskom's Koeberg Nuclear Power Station in Cape Town, South Africa implementing over **200 safety** and **operational modifications.**
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Technology Products

- Lesedi has successfully concluded **agency agreements** for several **state of the art** products and services such as **CONCO System Inc.** and **Arkema (DMDS).**
- Lesedi performs **Mechanical Heat Exchanger** and **Condenser Tube Cleaning** as the African distributor for Conco Services LLC based in the USA. Conco has cleaned over **100 million condenser** and **heat exchanger tubes,** making it the number one condenser and heat exchanger performance company in the world.

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- Lesedi achieved **preferential bidding status** for **two biomass projects** for the South African **RIEPPP** (16.5MW - sugar cane & 5MW - wood chip.)
- Lesedi is the **local partner** for **Exosun** (single- axis tracking).
- More than **20 projects** under **development** in Africa.
- Our **global partner** has built over **100 bio- energy power plants,** totalling more than 2,650 MW.

Thermal

- Balance of Plant for Eskom's Medupi and Kusile Power Station, the **biggest dry-cooled power stations** in the **world.**
- **Turnkey Engineering** contracts for plant **life extension** and **major refurbishments** including:
  - **High frequency** power supplies
  - **Electrostatic** precipitator
  - **Ash handling** systems

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SAIEE remembers Anthony C Britten

Antony Christopher Britton
1947 - 2024

SAIEE Treasurer Prof Pat Naidoo, a young trainee under Anthony Britten's wings in 1983, shares his fond memories.

A C Britten was assigned as my supervisor for the ESC final-year undergraduate dissertation study at the University of Durban Westville. Together, we modelled the rural networks of the Northern Cape to study the radial voltage profiles primarily under pumping loads. We employed a novel approach to solving matrices using a Fortran IV algorithm on an early-generation punched card machine. The laboratory results achieved a good correlation with field measurements. This confirmed my pupilage with the ESC, and I joined the team at Rosherville. I was assigned to the Natal Undertaking for field work and professional engineer training. As a mentor, Mr Britten guided my 3-year SACPE registration to Pr.Eng.

Mr. Britten continued to guide my growth and development from EIT to AE to SE to Chief Engineer and then to Manager, Senior Manager, and Senior General Manager of the Transmission Group. Our bond grew stronger from the early days of 1983 to the later planning and feasibility study of the Inga to South Africa 800 kV EHVDC. We had long discussions on transient earth faults and continuously searched for zero defects.

In parallel with the ESC, Mr Britten guided my growth and development at SAIEE, from the early days of the High Voltage Co-Ordinating Committee towards the Award of Young Achiever and onto the duty of Office Bearer. In 2014, I was elected President of the SAIEE.

In 2014, John Gosling, Stan Bridgen and I met with Dr I C McRae at his Germiston retirement home. We returned McRae to SAIEE Council Chambers, and under his leadership, we collectively approached the administration of 2014 and called for the recovery of Eskom's thermal fleet of power stations. This landed me on the Board of Eskom and into the Chair of the Eskom Emergency and Build Recovery Board Sub Committee. From 2014 to 2018, I served as NED at Eskom. In 2016, 2017 and deep into 2018, the National Grid experienced zero load shedding and returned the OCGTs to standby mode. With mentors Dr I C McRae and A C Britten in the loop, I weathered the political storms of the administration.

Post my tenure at Eskom, A C Britten and I bid farewell to Dr McRae, and we both settled down to deep consultancy on long-distance transmission and recycling of existing AC for DC duty to possibly reverse the flow of the elections from the Cape to Mpumalanga and Gauteng. We managed many conversations online in parallel with the health challenges. His mind continuously pushed forward, and we continuously encouraged him to keep going, and all would be well.

A great mind, a caring engineer, a brilliant scientist, known and respected globally, Tony Britten made his mark on the ESC, at SAIEE, and on all of us.

His priceless contribution has made us all stronger to serve until the end continuously. Amen, praise Tony Britten, the best of the best of the ESC. wn

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SAIEE Student Membership Fees waived until 31 August 2024!

The South African Institute of Electrical Engineers (SAIEE) is always looking at novel ways to grow the institute and to ensure sustainability.

OUR GROWTH COMES IN TWO FORMS:

1. From new members who are already in the field, and

2. From organic conversion from student members to members/associates.

Any organisation worth its salt knows that the most significant contribution to an institute comes from converting its student members into members. Being an SAIEE student member costs R205, payable annually.

IS THIS COST REASONABLE OR NOT?

As students at Higher Education Institutions (HEI), which constitute South Africa as either a University, University of Technology or TVET College, we know that tuition fees are expensive. This was evidenced by the 2018 student strike at Wits University, which resulted in the government resolving to offer free education through the National Student Financial Aid Scheme (NSFAS) scheme.

Typically, any social club or grouping must register at the HEI to be recognised, and after that comes the hard slog of recruiting other like-minded individuals to join the cause. In our instance, Electrical Engineering students should get involved with the HEI student chapter.

To date, there has been a vexing question about what a reasonable amount to charge for student membership is.

The SAIEE has decided on the following:

1. The SAIEE Student Membership fees remain current and will remain the same for the next five years.
2. The SAIEE Student Membership fees will be waived until 31 August 2024.
3. The waiver in point 2 above is communicated to student members as a discount for the recommended period.

For more information on SAIEE Student Membership, feel free to contact our dependable Membership Team via the following details:

Connie Makhalemele
T: 011-487-9045 or email
connie@saiee.org.za

Thandolwethu Lefutso
T: 011-487-9050 or email
thando@saiee.org.za

Alternatively, navigate to the SAIEE website Membership pages for more information: bit.ly/JoinSAIEE

JOIN SAIEE

- the gateway for a successful career

Make a difference today - join us!

The South African Institute of Electrical Engineers (SAIEE), founded in 1909, strives to provide leadership to all its engineering practitioner members in becoming more effective in providing and enhancing the quality of life of all communities in Southern Africa.

AS A STUDENT, YOU ARE THE FUTURE.

Any engineering student signing up between 1 March and 31 August 2024 will receive free membership for the year. Apply now!

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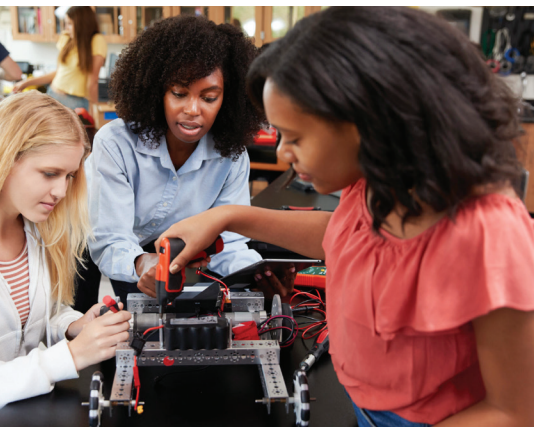
SAIEE

For more info, email Dudu Madondo - reception@saiee.org.za

From STEM to STEAM

- WHY SCHOOLS MUST INTEGRATE ART & SCIENCE TO EQUIP STUDENTS FOR THE FUTURE OF WORK



In today's rapidly evolving world, education must prepare students not only for the challenges of the present but also for the uncertainties of the future. The traditional STEM (Science, Technology, Engineering, and Mathematics) curriculum has been the cornerstone of scientific and technical education over the past decade.

However, there's a growing recognition that to thrive in a dynamic global landscape, students need more than just analytical skills—they need creativity, adaptability, and the ability to think divergently, an education expert says.

"STEAM education is an innovative approach that integrates the arts, represented by the "A" in STEAM, into the STEM framework," says Dumi Manganye, Academic Advisor: Data & EdTech at ADvTECH Schools.

"Integrating arts into the STEM framework ensures that students are exposed to holistic learning throughout their academic journey. By combining the sciences with the arts, STEAM education promotes a more holistic understanding of the world, recognising that creativity, aesthetics, and emotional intelligence are essential components of a well-rounded education," he says.

STEM alone tends to focus on "finding the right answer", whereas incorporating art encourages divergent thinking. Divergent exploration ensures the consideration of multiple solutions, embracing ambiguity, and thinking outside the box, says Manganye.

"When we integrate arts into the traditional STEM curriculum, we create an environment where students can innovate, experiment and invent. Whether it's designing a sustainable building, composing a musical piece, or creating a digital animation, the arts inspire novel approaches and imaginative solutions."

Manganye explains that STEAM education fosters problem-solving skills by encouraging students to tackle real-world challenges. Imagine a project where students design a solar-powered sculpture that not only generates energy but also captivates viewers with its aesthetics. Such interdisciplinary projects require collaboration, critical thinking, and an understanding of both technical and artistic principles.

Schools and educators therefore play a pivotal role in making STEAM a reality. ADvTECH Schools, such as Crawford International, Pinnacle Colleges, Trinityhouse, Niche schools and schools in the rest of Africa, have therefore sought to ensure their pioneering STEM offering integrates holistically into arts education.

"We achieve this by assigning projects that require both technical expertise and creative expression. Our assessments evaluate both convergent and divergent skills. Assessments shouldn't merely test knowledge; they should also gauge creativity, collaboration and originality," says Manganye.

"STEAM graduates possess a unique blend of skills—they can code, analyse data, and also communicate their findings through compelling visualisations or persuasive narratives. Whether they become engineers, designers, or entrepreneurs, they're better equipped to thrive in a world where boundaries between disciplines blur." wn

SAIEE Central Gauteng Centre spread joy for Mandela Day

This year's Mandela Day, National Transmission Company of South Africa Eskom Women Advancement (NTCSAEWAP), in collaboration with the South African Institute of Electrical Engineers Central Gauteng Centre (SAIEECGC) and Cigre Next Generation Network (CigreNGN), brought magic and joy to Assemblies of God College.

The school was established in 1996 to educate orphans and disadvantaged children from all the provinces. The school had a vandalised library, and all books were stolen during COVID.

In answering the call to make a positive difference this Mandela Day, NTCSA guardians, SAIEE CGC, and Cigre NGN members donated used/new books, buckets of paint, paintbrushes, and stationaries to the Assemblies of God College.

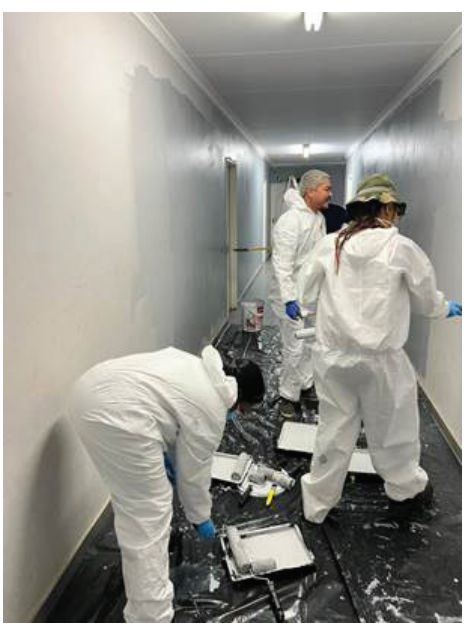
The volunteers from the abovementioned organisations rolled up their sleeves and cleaned the library, repainted the school, unpacked donated books from the boxes, and arranged them on the shelves.

We are honoured to make a difference in our community by empowering the next generation.

In the words of Tata Madiba, "Education is the most powerful weapon that you can use to contribute and make a difference", and " We can change the world and make it a better place. It is in your hands to make a difference."

Thank you to all the guardians who joined forces today. Let's make every day Mandela Day.

If you still want to donate used/new books, don't hesitate to contact NTCSA EWAP. wn



A collaborative effort enhancing robotics in schools

Mr Lucky Mokalusi (Chairperson, SAIEE Free State Centre) with scholars of Tlotlanang Combined School.

The Central University of Technology (CUT), Eskom Expo for Young Scientists, and the South African Institute of Electrical Engineers (SAIEE) are collaborating to offer robotics workshops to address the challenge of affordability, which hinders many schools' ability to acquire robotic kits and necessary training for Science, Technology, Engineering, and Mathematics (STEM) education. This initiative aims to provide mentorship to primary and secondary schools in the Free State.

A 3-day robotics workshop was conducted for Tlotlanang Combined School in Thaba Nchu, located in the Free State, where the learners were exposed to cutting-edge robotics technologies. The learners received certificates for successfully participating in the Robotics Workshop. These certificates were handed out by Mr Lucky Mokalusi (Chairperson of SAIEE Free State) and were signed and endorsed by Prof. Alfred Ngowi (DVC: Research, Innovation, and Engagement) from CUT.

The success of this workshop led to the extension of the training to Setjhaba se Maketse High School in Botshabelo, which has been selected to participate in the project in 2024 with ten learners. Continuous mentorship has been provided to the learners to ensure the sustainability of this intervention. This mentorship aims to encourage and guide the learners in undertaking scientific research projects for the Eskom Expo Regional Science Fair, scheduled at CUT on August 3, 2024.

The learners from both schools also visited the Science Park at CUT better to understand product development through 3D printing and laser cutting. Each group has been allocated a mentor to ensure they receive assistance designing a prototype to present at the science fair. This mentorship is conducted by students from the CUT Department of Electrical Engineering and the SAIEE Student Chapter, who possess Advanced Robotics training certificates. wn

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SAIEE Freestate Centre visited Thaba Nchu

On a bright and inspiring day, Moroka High School hosted a science exhibition for young learners and invited members of the South African Institute of Electrical Engineers (SAIEE) Freestate Centre (FSC). They came to view various science projects created by young and talented learners from different schools in Thaba Nchu. Regional finalists who participated in this District Expo are preparing for the Bloemfontein Expo by presenting their research to teachers and community leaders.

This event highlighted the innovative spirit and dedication of the students towards creating environmentally friendly solutions that not only address current ecological challenges but also aim to make everyday life easier.

A DISPLAY OF INGENUITY AND ENVIRONMENTAL AWARENESS

The RT Mokgopa Secondary School learners, Christian Diphoko Secondary School, and Moroka High School exhibited various projects, each reflecting their keen interest in science and their commitment to sustainability. These projects ranged from solar-powered devices and water purification systems to innovative recycling methods and energy-efficient machinery. The ingenuity displayed by the learners was impressive and a testament to the bright future of green technology and sustainable living.

As the FSC members toured the exhibition, they engaged with the students, asking insightful questions about their projects. The attending members, including Thabo Letooane, Kagisho Ramaphoko, Kholiwe Mbatha, Morakane Mohanoe, Sibongokuhle Matshabane, and Dimpho Makoatle, provided valuable feedback and encouragement to the learners. These interactions offered the students a unique opportunity to explain their concepts, methodologies, and the potential impact of their inventions. The discussions were lively, and the students' enthusiasm was palpable, making it clear that they are not just future engineers and scientists but also conscientious citizens aiming to make a difference.

HONOURING THE QUEEN AND ACKNOWLEDGING EXCELLENCE

After viewing the projects, a special moment was set aside to honour Queen KGOSI GABOILELWE MOROKA. The FSC members and the learners exhibiting that day gathered for a commemorative photograph with her. This gesture marked respect and recognition for her support and encouragement towards educational initiatives and sustainable development.

Following this, the event proceeded to the much-anticipated awards ceremony. Before the learners received their certificates and accolades, the Central University of Technology (CUT) SAIEE Student Chapter Chairperson, Thabo Letooane, delivered an inspiring speech.

He commended the students for their hard work, creativity, and commitment to environmental sustainability. His words of encouragement emphasised the importance of innovation in addressing global challenges and motivated the learners to continue their pursuit of scientific excellence.

CELEBRATING ACHIEVEMENT AND INSPIRING THE FUTURE

The award ceremony was a joyous occasion, celebrating the achievements of the young innovators. Each learner was called upon to receive their certificate, a recognition of their efforts and a symbol of their potential to contribute positively to society. The event concluded with a sense of accomplishment and a renewed commitment to nurturing the next generation of scientists and engineers.

The visit of the FSC members to the science exhibition was not just a celebration of the learners' projects but also an affirmation of the importance of education in fostering innovation and sustainability. It highlighted the role of organisations like SAIEE and Brilliant Innovative Minds (BIM) in supporting young talents and inspiring them to create a better, greener future.

This event will be remembered as a milestone in the learners' educational journey, thanks to Mr Tshegofatso Gontse Mokhoenyane, the CEO of BIM, and his team for inviting SAIEE to be part of such an innovative event and for guiding these young scientists to become the best of the best, encouraging them to dream big and work towards a more sustainable world. wn

Highlights from the ROS Training Workshop

First Prize: Thekiso Boqo and Selebogo Nakanyani.

Robotics has evolved significantly since its early industrial origins, where simple machines were used for repetitive tasks. Today, robots are integral to various industries, including agriculture, manufacturing, logistics, healthcare, and transport. In agriculture, robots assist with planting, harvesting, and fertilising, enhancing precision and efficiency. In manufacturing, they excel in assembly, packaging, and welding tasks with remarkable accuracy and speed.

In healthcare, robots support diagnostics, surgeries, and rehabilitation. Additionally, in logistics and transport, robots streamline operations in automated warehouses and distribution centres, improving order processing efficiency. This underscores the growing importance of robotics skills in the fourth industrial revolution.

The National Development Plan (NDP) aims for South Africa to have a diverse economy rooted in science, technology, and innovation (STI) by 2030. One of the NDP's key priorities is "improving the quality of education, skills development, and innovation." In line with this vision, the South African Institute of Electrical Engineers (SAIEE) has sponsored robotics training workshops at the Central University of Technology (CUT) since its inception.

The primary and advanced robotics training workshops held from July 3rd to 7th, 2023, were featured in the August 2023 issue of the wattnow magazine, while the advanced robotics training workshop from December 4th to 8th, 2023, was featured in the February 2024 issue. Mr. Lucky Mokalusi, Chairperson of the SAIEE Free State Chapter, successfully organised these workshops.

The ROS training workshop, held from June 18th to 22nd, 2024, at CUT, was organised by Mr Africa Dintwe with support from Mr Lucky Mokalusi.

This workshop attracted students from Electrical Engineering, Information Technology, and even one student from Design Studio Art. The first four days of the workshop focused on an introduction to ROS, robot components, the Linux environment, hardware and sensors, and robot navigation in unfamiliar environments. The final day featured a practical robot challenge called "The Maze."

THE MAZE CHALLENGE

On the fifth day, students participated in the Maze Challenge, where they formed teams to navigate their TurtleBots robots through a maze. The winning teams were awarded cash vouchers for their exceptional performance and for demonstrating their skills in an unknown environment.

CONCLUSION

These robotics training workshops address pressing social and economic needs by offering free training to students at CUT. Most students who have completed these workshops are now positively impacting their communities by mentoring primary and secondary schools as they prepare for an upcoming Science Fair.

Additionally, these workshops contribute to CUT's Vision 2030 by supporting two key pillars: "produce work-ready, entrepreneurial and holistic graduates" and "build strategic partnerships that contribute to achieving the University's goals." These workshops align with the institution's goal of producing industry-ready graduates to enhance innovation, problem-solving, technological literacy, and technical competence.

The basic and advanced robotics training workshops held from July 3rd to 7th, 2023.

They also establish valuable partnerships with educational institutions (Tshwane University of Technology, FH Aachen – University of Applied Sciences), industry sponsors (merSETA, Fablab), and non-profit organisations (National Electronic Media Institute of South Africa, Mokalusi Foundation), which support the program both financially and logistically. wn

Second Prize: Keitumetse Taukobong and Bulelwa Chikila.

Third Prize: Thabo Letooane and Silethokuhle Khumalo.

The advanced robotics training workshops from December 4th to 8th, 2023.

Robotic Operating Systems (ROS) training workshops held from June 18th to 22nd, 2024.

Universities in South Africa

It is only through education that people are able to improve themselves. One of the most important factors for escaping from poverty is education. The only way a society can continue to grow and prosper is through proper education at all levels.

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Our bursaries are for candidates who have completed a first-year study for a degree or diploma in Electrical, Electronic or Computer Engineering at an accredited South African tertiary institution.

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SAIEE

Our Purpose

To enhance the practice of electrical engineering in South Africa and the stature of our members through knowledge, networking, influence, education and communication.

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OPINION PIECE

Demand Response

– PUTTING THE POWER BACK IN YOUR HANDS

Demand Response (DR) has been available for quite some time, however, in light of South Africa's continued energy challenge, it stepped firmly into the limelight, enabling both consumers and businesses to gain some control over their power usage.

By Dwibin Thomas
Cluster Automation Leader
Schneider Electric

Fundamentally, it enables consumers and businesses to shape their energy consumption patterns; adjusting their energy consumption patterns in response to real-time demand and supply conditions. It has put the proverbial power back in the hands of the people, evolving from passive energy users to active participants.

In South Africa, Eskom launched the Demand Response and Distribution Demand Management Programme just over a year ago.

The programme followed the successful industrial Demand Response Programme, which is now in its 11th year.

The programme includes three elements: Distribution Demand Management Programmes (DDMPs), the Residential Load Management (RLM), Energy Efficiency and Load Management Programme all in effort to assist with the energy constraints challenges.

For example, the RLM aims to shift evening peak demand to standard and off-peak periods. This plays a key role in reducing the demand during Eskom's defined evening peak periods in residential households.

THE TECHNOLOGY BEHIND DR

The technology behind DR is mature and exciting. Smart load switches and advanced software ensure uninterrupted power during critical periods like load shedding when alternative energy sources such as solar are used.

For instance, during load shedding, the software can automatically reduce the power drawn from energy-hungry devices like pool pumps and geysers, safeguarding essential appliances from disruption.

Smart load switches play an important role by communicating with utility-end software, facilitating real-time control and adjustment of energy consumption. This seamless communication enhances energy management capabilities, allowing for efficient utilisation of resources and minimising wastage.

To further assist consumers, user-friendly portals offer monitoring and management of energy use in real-time. These portals provide insights into energy consumption patterns, identify cost-saving opportunities, and offer customisation options to align with individual preferences.

The advancements in DR technology continue to push the boundaries of energy management. One exciting development on the horizon is the integration of Artificial Intelligence (AI) and machine learning (ML) algorithms into DR systems.

These intelligent systems can analyse vast amounts of data in real-time, predicting energy demand patterns with unprecedented accuracy. By leveraging AI, DR solutions can anticipate peak demand periods more effectively, allowing for proactive energy adjustments and optimisation.

This predictive capability not only enhances energy efficiency but also maximises cost savings for consumers and businesses alike. As AI-driven DR becomes more prevalent, it promises to revolutionise how we manage energy consumption, paving the way for a more resilient and sustainable energy future.

As mentioned, Eskom has already rolled out successful DR programmes to industrial sites. From a commercial perspective, DR can reduce electricity costs by adjusting HVAC and lighting systems during peak hours. Similarly, industrial sites can participate by curtailing non-essential processes during high-demand periods, thereby optimising energy usage and reducing operational expenses.

DR offers a multitude of benefits for both consumers and businesses, taking charge of their energy consumption which lead to lowered energy costs, uninterrupted power supply whilst support grid stability. Moreover, by reducing peak demand, DR can lower the need for additional power generation, consequently reducing environmental impact and fostering a more sustainable and efficient energy ecosystem.

Schneider Electric has been actively involved in optimising distributed energy resources (DERs) with their Grid to Prosumer approach including DR, which manages the lifecycle of DERs and distributed loads across energy market needs, grid constraints, and prosumer priorities.

OPINION PIECE

Local Solar panel manufacturing

- A CATALYST FOR SUSTAINABLE ECONOMIC GROWTH

As South Africans – we are indeed a resilient bunch! We bounce back quickly and most often block off the source of our despair. But for how long can this continue? For how long can we pretend that unemployment is not a real problem? For how long can we remain optimistic about the recovery of our National Grid? How long can we look the other way while cheap, imported products are "dumped" in our country?

By Viren Gosai
General Manager
ArtSolar

We can commence the building process only after we get serious about addressing these issues. One such catalyst is local solar panel manufacturing! Why? Embracing local PV manufacturing contributes to sustainable energy production and serves as a catalyst for building robust and resilient economies. If we can make it within, we don't need to look outside!

In recent years, the push towards renewable energy has become increasingly vital in addressing climate change and energy security concerns. One key aspect of this transition is the development and support of local solar panel (photovoltaic—"PV") manufacturing and its related value chains.

The recent imposition of a 10% duty on fully imported solar panels has certainly created pandemonium amongst importers. The same importers who religiously propagated Community support and the general upliftment of our industry are now out in all sorts of battle paraphernalia, calling out the Government (who took the better part of five years to implement this) for this "heinously unreasonable" inconvenience they are about to experience.

Consider this: Solar panels are the cheapest they've ever been and now comprise less than 20% of the total cost of an installation, yet this seemingly insignificant effect has caused such an outcry. Why? The reason is simple: the importers now have to deal with the market's oversupply and are faced with eroding margins. This 10% will force them to break even if they continue their business model of not supporting local and only importing the cheapest available product.

So, importers are not happy! They claim that local panels are inferior and that we don't possess the tech to produce globally relevant panels. Yet they have never engaged with us, nor do they wish to. It's a bit of a conundrum for them, really! Beyond this, however, the duty is a great way to support and boost the local industry. Due to this protection, we are expecting new entrants and expanding the locally available value chain. What does this mean for patriotic South Africans?

REAL SUSTAINABLE LOCAL JOB CREATION AND TRUE ECONOMICDIVERSIFICATION

"Killing two birds with one stone" applies so aptly to our solution: Making local assists in supporting our National Grid and contributing to alleviating the massive unemployment we face! Real, skilled jobs are created across various sectors, from research and development to manufacturing, installation, and maintenance. This sector further supports diversifying the economy by contributing to various "feed-in" industries like component manufacturing and various support services industries, e.g., HVAC, SHEQ, logistics and professional consulting. These jobs provide income for workers and stimulate economic growth by circulating money within local communities. This is precisely what our country desperately needs!

GLOBAL TECHNOLOGY TRANSFER AND LOCAL INNOVATION

The global leaders in PV manufacturing are China, India, and the USA. The rest of us follow the trends and are totally dependent on the pricing of global supply chains. Due to the commodity-based nature of the products, price sensitivity becomes a colossal determinant in selection.

Hence, as South African manufacturers, we are dependent on global supply chains and strategic partnerships to comply with local Financial Institutions' constant need for a "Tier 1" solar panel. Incidentally, various new rating agencies using models such as the Altman Z-Score ratings are now being publicised to escalate the superiority of global brands.

All of which essentially seek to utilise historical financial results to determine the probability of future existence. Essentially, will these Companies be around to service the 30-year warranty? So, there is no indication of quality, responsible procurement, technical ability & impact on the environment. But to comply, we must! Hence, as local manufacturers, we painstakingly subject ourselves to various global audits to obtain international certifications, guaranteeing our product-making process carries the global brand.

It's not all bad, though. This process promotes global technology transfer and local innovation. As companies adapt to meet local demands, they drive improvements in production processes, leading to more efficient and cost-effective solar technologies. This not only enhances the country's technological capabilities but also positions it competitively in the global renewable energy market. So, local manufacturers CAN make a globally certified and relevant product!

BUILDING SOUTH AFRICA'S REAL COMMUNITY DEVELOPMENT

The benefits of local PV manufacturing extend to positive community development, ultimately enhancing national economic resilience. Creating real, sustainable job opportunities and supporting local education and training programs enhances the overall quality of life in communities and, in effect, our country as a whole. One job feeds at least four people in South Africa. Hence, a 340MW manufacturing plant can directly support 1100 people.

Furthermore, a thriving local PV manufacturing sector builds resilience to global supply chain disruptions, ensuring a stable and reliable source of renewable energy technology within the country. Moreover, local manufacturing aligns with environmental sustainability goals by reducing carbon emissions associated with transportation and promoting cleaner energy production.

If the global lockdowns have not opened our eyes, then nothing will! We need to build local industries and move away from global dependence. Africa needs African solutions, not pay for the rest of the world to take our resources in exchange for "hand-me-downs." We are

continues from page 35

doing it right now but in pockets across various sectors. We need to extend this patriotic passion to more Industries.

IS THERE HOPE?

Most certainly, there is hope! India has recently successfully revitalised its local PV manufacturing sector through targeted policy interventions, such as the Domestic Content Requirement (DCR) under the National Solar Mission.

India has witnessed significant growth in PV manufacturing capacity and job creation by mandating a percentage of locally sourced components for solar projects. The EU has also introduced robust local policies to promote domestic sourcing in renewable energy projects, including solar PV manufacturing.

These policies aim to strengthen local supply chains and support the growth of a competitive and sustainable clean energy sector within the EU. This is after many local PV manufacturers closed due to the oversupply of cheap imports, which made local manufacturing unsustainable.

The USA's Inflation Reduction Act (IRA) incentivises domestic production across industries, including renewable energy. Through tax incentives, subsidies, and regulatory reforms, the IRA stimulates economic activity and reduces reliance on imported goods, fostering domestic manufacturing capabilities.

So, three major global regions managed to rescue and resuscitate their local PV manufacturing sector. With our already world-leading localisation policies, South Africa has the heritage, but we have a problem with implementation.

We seem to ring-fence and enforce as and when! Policing compliance is another issue, as too often, faces are turned when conditions are suitable.

We need strict enforcement and further incentive programmes that cater to local sourcing of solar components, providing financial support for domestic manufacturers, and fostering collaboration between industry stakeholders. South Africa can strengthen its renewable energy value chain and enhance competitiveness.

If this fails, we have ourselves to blame! The evidence is there; we just need to stop bowing to the money and take a firm stance that Local Solar panel manufacturing is a catalyst for sustainable economic growth!

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How to manage resilient MRO Supply Chains

Brian Andrew
Managing Director, RS South Africa

Maintaining a resilient supply chain for Maintenance, Repair, and Operations (MRO) is crucial for businesses across various sectors.

In today's fast-changing and unpredictable world, maintaining a resilient supply chain for Maintenance, Repair, and Operations (MRO) is crucial for businesses across various sectors. The goal is not just to withstand disruptions but to adapt and thrive amidst them. Here RS South Africa MD Brian Andrew shares his top five tips on how to approach and manage MRO supply chains to ensure resilience against future shocks.

1. Focus on Trusted Suppliers
   Instead of diversifying your MRO supplier base extensively, rely on a core group of trusted suppliers that can guarantee delivery certainty. Build strong relationships with these suppliers to ensure stability and reliability in your supply chain.

2. Develop a Flexible Supply Chain
   When faced with pressure, it is essential to act quickly while considering the long-term consequences. A flexible supply chain and suppliers that can adapt to changing circumstances is key. This flexibility includes being prepared for potential increases in spending or the need to switch suppliers without significant disruptions.

3. Leverage Technology and Data
   Utilise eProcurement and Vendor Managed Inventory (VMI) solutions from a trusted and stable procurement partner. Effective planning requires visibility into what is being consumed, especially for companies with multiple plants. High-quality data is essential to maintain adequate inventory levels and ensuring supply chain resilience.

4. Engage in Sustainable and Ethical Procurement
   Cost reduction is important, but sustainable and ethical procurement practices are equally vital. Work with partners who share common goals and include sustainability programs in your procurement processes. This approach not only benefits the environment but also aligns with the values of company management, shareholders, and customers.

5. Plan for Continuity
   Continuity planning involves having a comprehensive action plan that includes compliance with policies, processes, and corporate governance. Ethical sourcing of raw materials should be a priority, and procurement departments should challenge the status quo by following ethical sourcing principles.

Supply chain resilience depends on the quality, reliability, and knowledge of suppliers. By working with the right MRO supplier, leveraging technology, and focusing on sustainable practices, businesses can better prepare for future disruptions and maintain a robust supply chain. wn

SOUTH AFRICA INTERNATIONAL INDUSTRIAL EXPO
& CHINA (SOUTH AFRICA) INTERNATIONAL TRADE EXPO

SOUTH AFRICA GOLDEN BRIDGE

3th South Africa International Industrial Expo & China (South Africa) International Trade Expo

Expo 1 , Sandton Convention Centre,Johannesburg, SA

19 - 21 Sept, 2024

Pre-Expo Match Meetings

Golden Bridge is holding industry specialized Pre-Expo Match Meetings before the physical expo which will assist clients and exhibitors to establish contact in advance and improve the efficiency of the business negotiation during the exhibition.

Display Center & Warehouse

Located in Midrand, Golden Bridge has set up a long-term display center and overseas warehouse in Inospace Business Park with highways and the Gautrain station within walking distance. Business people are able to check the samples of settled enterprises and negotiate with them at any time. It is conducive to shortening the delivery time of products and improving trade efficiency, and it does provide the visitors with convenience in trade links such as sample check and transportation.

Factory Visits in China

Golden Bridge Expo China team will connect business people on business trips in China with factories and assist with on-site factory visits and inspections according to the needs, so as to facilitate clients to choose trustworthy business partners.

TOGETHER, GROWING INDUSTRIES

We are underestimating our lightning risk!

The Flash Density (N_g) metric, which measures the number of lightning flashes per square kilometer per year, has traditionally been the standard for evaluating the risk of lightning to buildings and infrastructure in a region. This metric, defined by the IEC62305 standard [1], is crucial in assessing lightning risk and aims to estimate how often the ground in a specific area is struck by lightning each year.

By: Sanele T. Gcaba and Hugh G.P. Hunt

In South Africa, each lightning flash is identified using data from the South African Lightning Detection Network (SALDN), following the criteria set by the IEC 62858 standard [2]. This standard groups lightning strokes based on spatial and temporal factors. Specifically, strokes that occur within 1 second of the first stroke and within 10 kilometers of it, with successive strokes happening within 500 milliseconds, are considered part of the same lightning flash. Each flash is characterised by the date, time, location, and peak current of its initial stroke. However, this method assumes there is only one ground strike-point (GSP) per flash and does not account for possible multiple GSPs per flash.

On some of the most recent research, Poelman et al. compare ground truth observations for negative CG flashes from South Africa, Austria, Brazil, and the USA [3]. The results show a mean number of strokes per flash (multiplicity) of 3.67 and an average ground strike-point per flash of 1.56, this implies that ground strike points are typically 56% higher than the number of flashes. Table 1 below depicts different high-speed video studies that show that a single lightning flash typically has multiple GSPs and thus illustrating that the lightning flash density parameter may be underestimating the lightning risk.

The observation that using the flash density parameter (N_g) to estimate lightning risk might underestimate it, while stroke data tends to overestimate strike points, has led to proposals to adjust (N_g). This adjustment scales (N_g) to derive the ground strike-point density (N_{sg}) using the Equation 1 below.

$$N_{sg} = f \times N_g \quad (1)$$

Where f is proposed to be a scaling factor of 2, derived from the average number of GSPs per flash typically observed and documented in the literature, as evident in Table 1.

Study	Location	CG Flashes	Multiplicity	N(GSP)	Average (GSP/Flash)
Poelman et al. , Schumann et. al (2017 - 2018)	South Africa	490	3.8	626	1.29
Saba et al. (2006)	Southeastern Brasil	233	3.8	235 (for 138 flashes)	1.7
Valine et al.(1997)	Tucson, Arizona	386	2.8	558	1.45

Table 1: Literature findings on high-speed video observations of CG lightning [4].

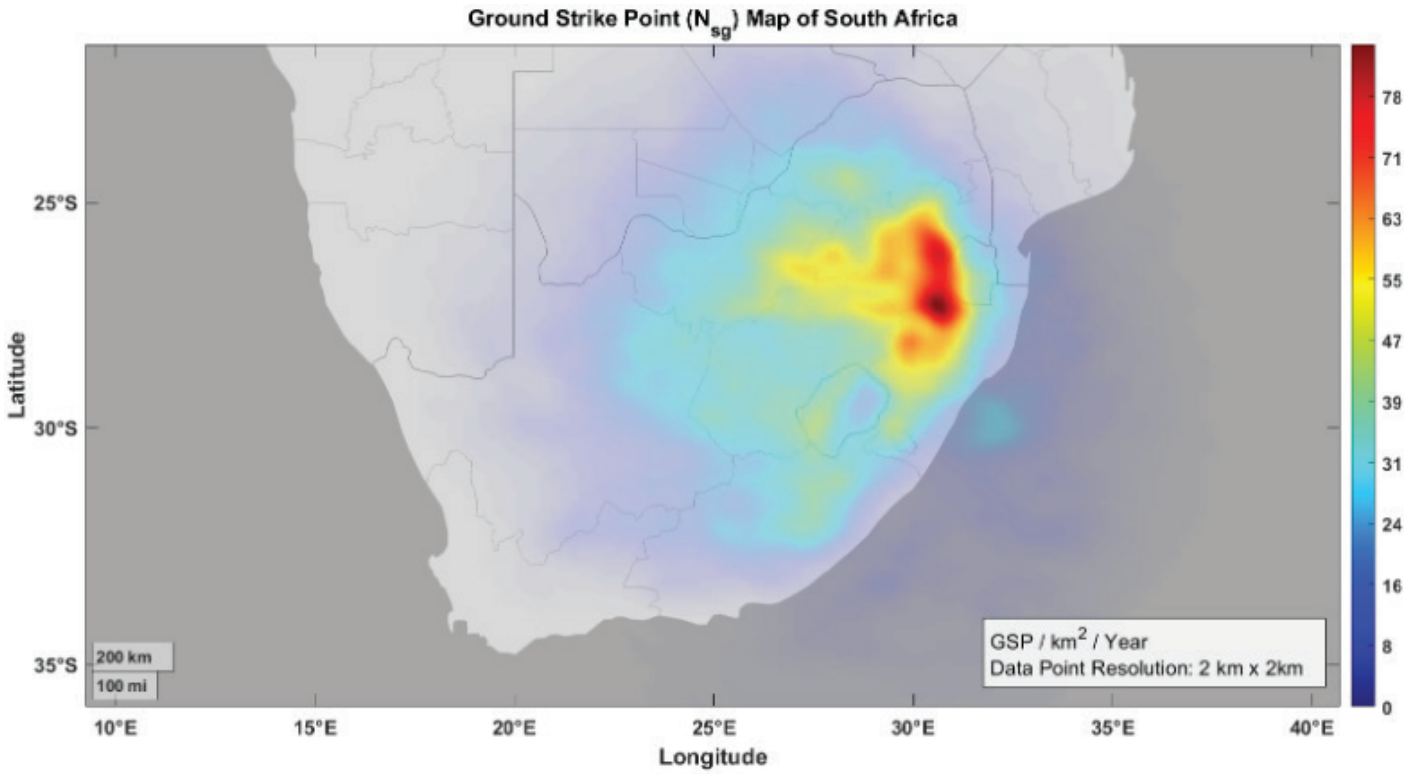

Fig 1a: The GSP Density Map of South Africa using a distance metric of 150 m and intersecting error ellipses.

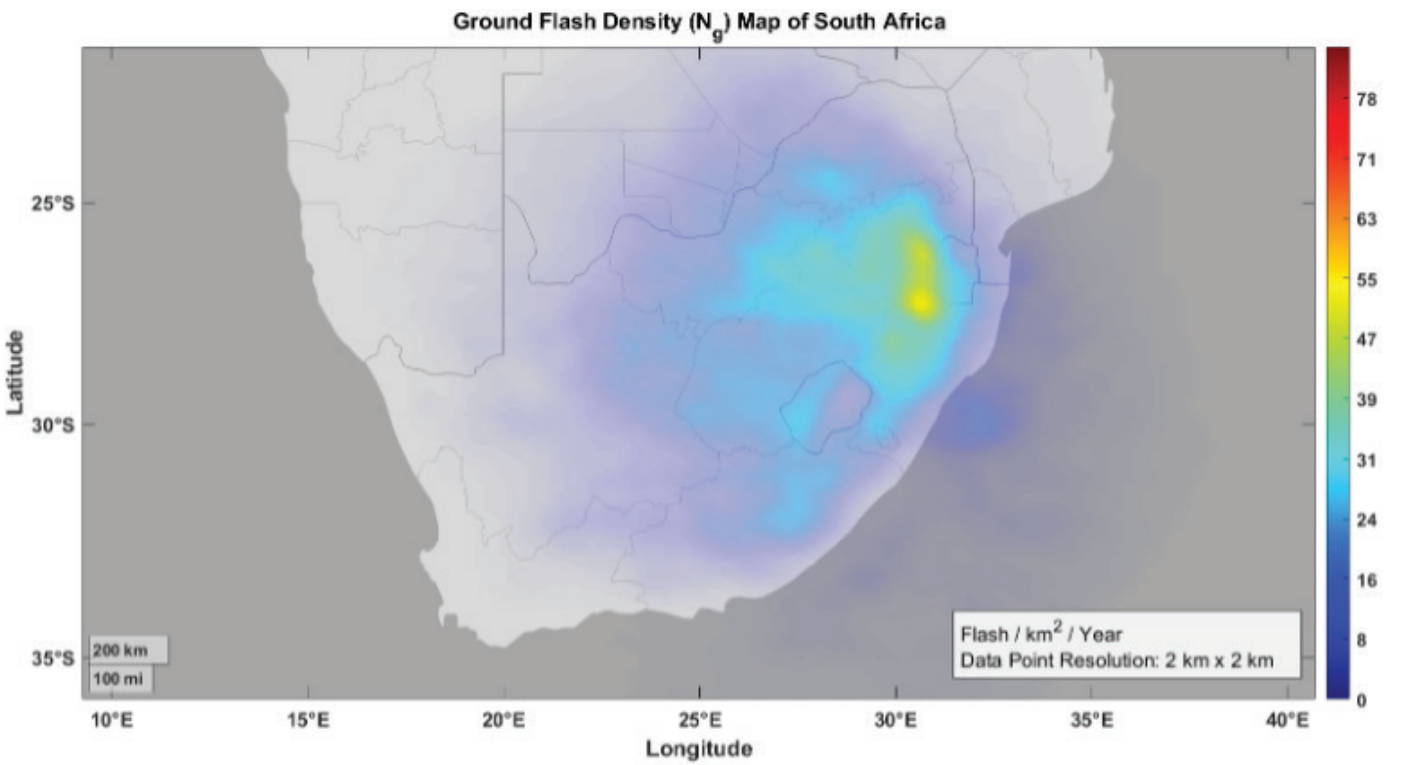

Fig 1b: (b) *The Flash Density Map of South Africa from the SALDN stroke data spatially temporally clustered into Flashes.*

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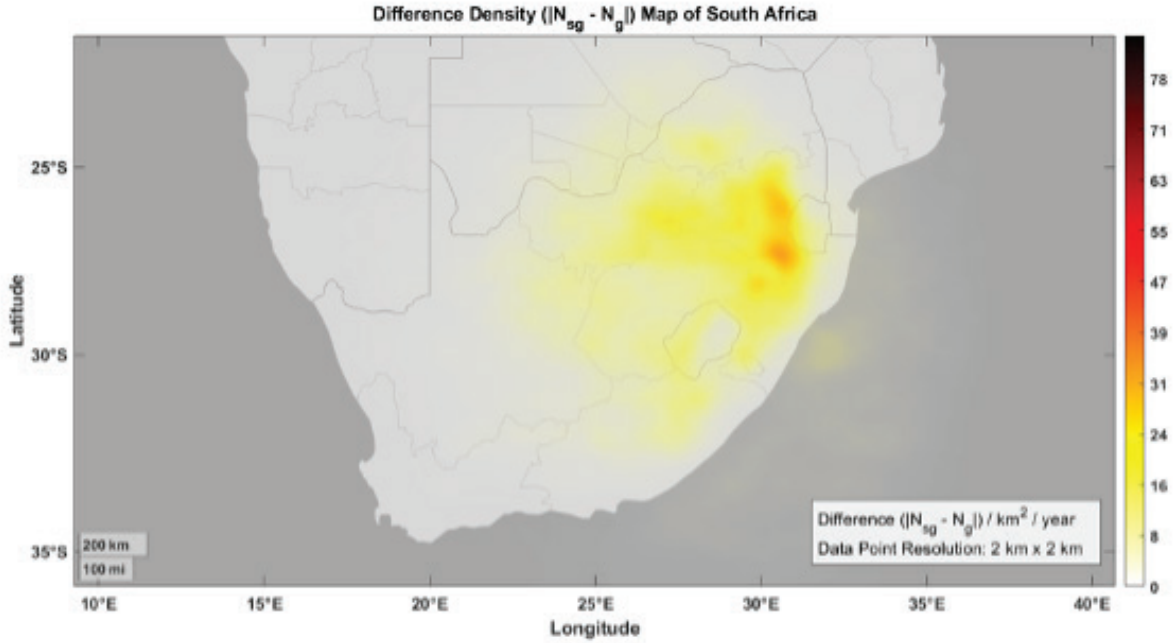

Fig 1b: The Flash Density Map of South Africa from the SALDN stroke data spatially temporally clustered into Flashes.

To evaluate the extent of underestimation in lightning risk when using the Ground Flash Density (GFD) parameter compared to the Ground Strike-Point (GSP) density parameter, we examined the South African Lightning Detection Network (SALDN) encompassing 9-years of SALDN lightning strokes detected and geolocated by the SAWS between July 2007 and July 2016. By applying GSP algorithms tested in studies such as that done by Poelman et al., we were able to compare the Flash Density to the Ground-Strike Point density (and the difference between them) [4].

Figure 1 illustrates the geographical difference between Ground Strike-Point (GSP) density and Ground Flash Density (GFD) over the 9-year period from July 2007 to July 2016. The difference density map in Figure 1(c) highlights notable variations in lightning density across South Africa, particularly in the central-eastern regions near the borders of KwaZulu-Natal, Free State, and Mpumalanga provinces.

Areas around the borders of Mpumalanga and KwaZulu-Natal, showing higher GFD in Figure 1(b) and higher GSP densities in Figure 1(a), and also exhibit increased difference density per square kilometer per year in Figure 1(c). The colour bar associated with the difference density map indicates that regions with no difference or very low difference are represented in white. As the density difference increases, the colours transition from yellow to light red, and finally to dark red, corresponding to increasing levels of difference between GSP density and GFD.

Overall, Figure 1(c) visually demonstrates that the difference between GSP density and GFD increases proportionally with the respective patterns of GSP and GFD densities across South Africa. This provides insights into how using GSP density can potentially provide a more accurate assessment of lightning risk compared to GFD density alone.

The results show a maximum difference of 32 ground contact points per square kilometre per year at the geographic location 27.2100°S, 30.4600°E in Mpumalanga. This means that on average, there are approximately 32 more GSPs per year than flashes in this region - which is in the order of 50 flashes per year and increases to 80 if we include the GSP contacts, approximately 1.5 times greater. A scaling factor of 2 would greatly overestimate the GSP density in this region. This location is 38 km south-west of Piet Retief, which has historically shown a high lightning density.

The greatest discrepancy between flash and GSP density occurs near the peaks of major mountain ranges, where altitudes range from 1800 meters to 2200 meters. The difference density plot clearly illustrates that the Ground Flash Density (GFD) parameter, and

consequently the GFD density map as a tool for depicting lightning risk, underestimates the actual lightning risk compared to the GSP density map. The extent of this underestimation is visually represented in Figure 1(c).

IN SUMMARY

In this study, a Ground Strike-Point (GSP) density map of South Africa was generated using a GSP clustering algorithm. The study aimed to compare the Ground Flash Density (GFD) parameter with the GSP density parameter to assess how much the GFD underestimates lightning risk.

The analysis utilised a 9-year dataset of SALDN lightning strokes detected and geolocated by the South African Weather Service (SAWS) from July 2007 to July 2016, mapped on a 2 km x 2 km grid of South Africa.

The findings consistently demonstrated that the GFD parameter underestimates lightning risk across the South African landscape, relative to patterns observed in GFD and GSP densities. The greatest underestimation, amounting to 32 per square kilometer per year, was observed in Mpumalanga. wn

THANKS

We would like to express our gratitude to DEHNAFRICA for their support of the Johannesburg Lightning Research Laboratory. Special thanks to the South African Weather Service (SAWS) for their invaluable support and for providing the SALDN data used in this paper.

We extend our appreciation to Morne Gijben and Michelle Hartslief for their assistance. The Johannesburg Lightning Research Laboratory receives support from the National Research Foundation of South Africa through the Thuthuka programme (Unique Application No.: TTK23030380641).

ABOUT THE AUTHORS:

SANELE T. GCABA is an electrical engineer currently serving as a system engineer at Gibela Rail Consortium. He obtained his MSc. Eng (Electrical and Information Engineering) from the University of the Witwatersrand, South Africa, and is pursuing his PhD in Engineering at the same institution. His research focuses on enhancing lightning risk estimation through Spatially Adaptive Scaling Factors.

HUGH G.P. HUNT is a Senior Lecturer in the School of Electrical and Information Engineering at the University of the Witwatersrand. He earned his PhD from the University of Witwatersrand, investigating the use of lightning location system data in forensic investigations. Dr. Hunt has extensive experience with the South African Lightning Detection Network and the RINDAT system in Brazil. He has authored over 35 research articles in the fields of lightning and high-voltage engineering. Currently, Dr Hunt leads the Johannesburg Lightning Research Laboratory.

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Voltage Transients

Voltage transients, commonly known as spikes or surges, are an everyday occurrence in South Africa and worldwide. They result from overvoltages in a circuit or a system.

By: Braam van Emmenis
Lightning Professional Practitioners Chairman

These transients or surges may come from inside or injected into a facility from outside. Transients caused by other equipment are usually caused by the discharge of stored energy in inductive components. Some examples are electrical motors, such as those used in elevators heating, air conditioning, refrigeration, or other inductive loads. Two different sources are arc welders and furnace igniters. These transients can cause considerable damage to equipment and electronics.

The transient causes damage to a device when the transient voltage exceeds the weakest exposed component's ability to withstand that voltage. Transients usually flow into equipment via electrical conductors, but other paths are common.

These paths include telephone lines, data-com lines, measurement and control lines, DC power buses and neutral and ground lines.

The predominant causes of voltage transients are:

- Switching
- Load shedding
- Lightning
- Short circuit fault

Switching occurs mainly in the heavy industry and agriculture. Switching off big motors, pumps, and so on results in a concise burst of overvoltage that can damage sensitive equipment.

Load shedding is one of our biggest problems today. In the year 2023, up to October, we already had more than 5540 outages. The come-back voltages are always higher than the working voltages and can go up to extremes of up to 1500 volts and even more. These voltages are high for only milliseconds and go hand-in-hand with higher-than-normal inrush currents. The current will draw the voltages back to normal. Although the period of these voltages is milliseconds, severe damages can be incurred.

INSURANCE IMPLICATIONS

Insurance companies are paying out vast amounts in claims arising from electrical damages. However, they increasingly reject claims based on improper installations of Surge Protection Devices (SPDs) and may scrap claims altogether.

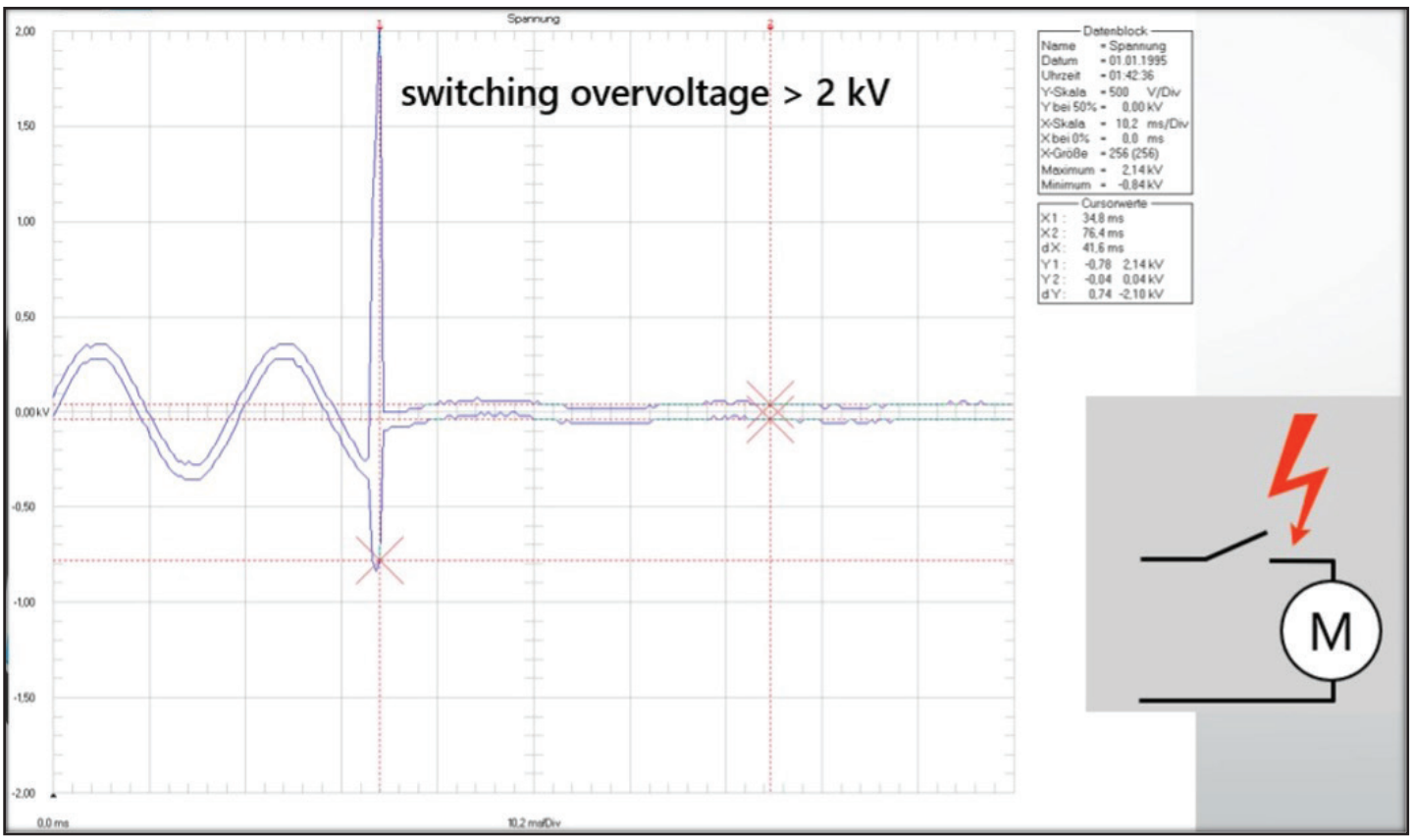
A recent letter received from my own insurance company stated that if the power outages exceed 8.5 hours, no damages claims will be entertained.

SPECIALISED LIGHTNING PROTECTION

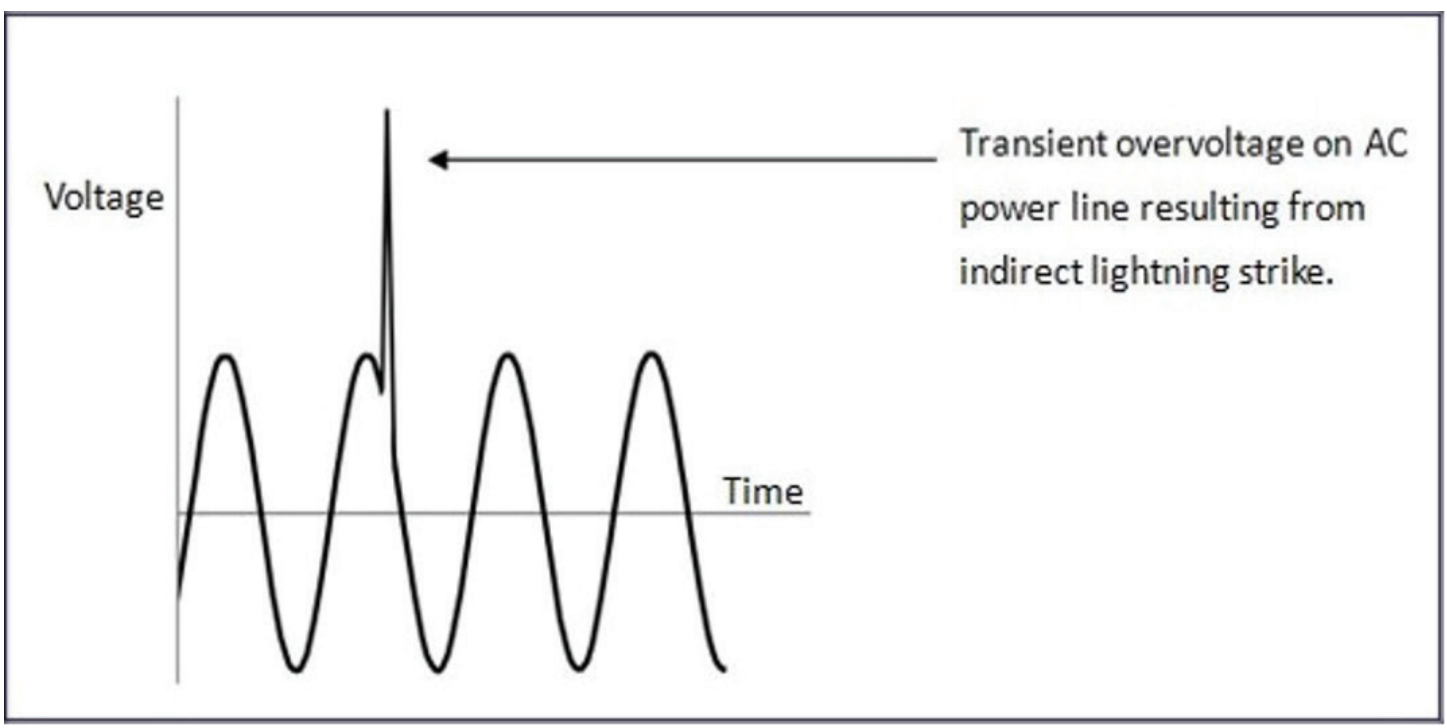
Lightning events are on the increase and are entirely out of human control.

Lightning damages can be minimised by installing the correct lightning conductors connected to natural ground to dissipate the voltages and current, which can reach millions of volts. Lightning specialists should do protection designs and installations.

Connecting high-quality SPDs is crucial; anything less could prove a very costly mistake down the line. Equipotential bonding of all extraneous metal parts is of the utmost importance and is widely neglected.



Switching off big motors, pumps, and so on results in a concise burst of overvoltage that can damage sensitive equipment.



A typical transient overvoltage

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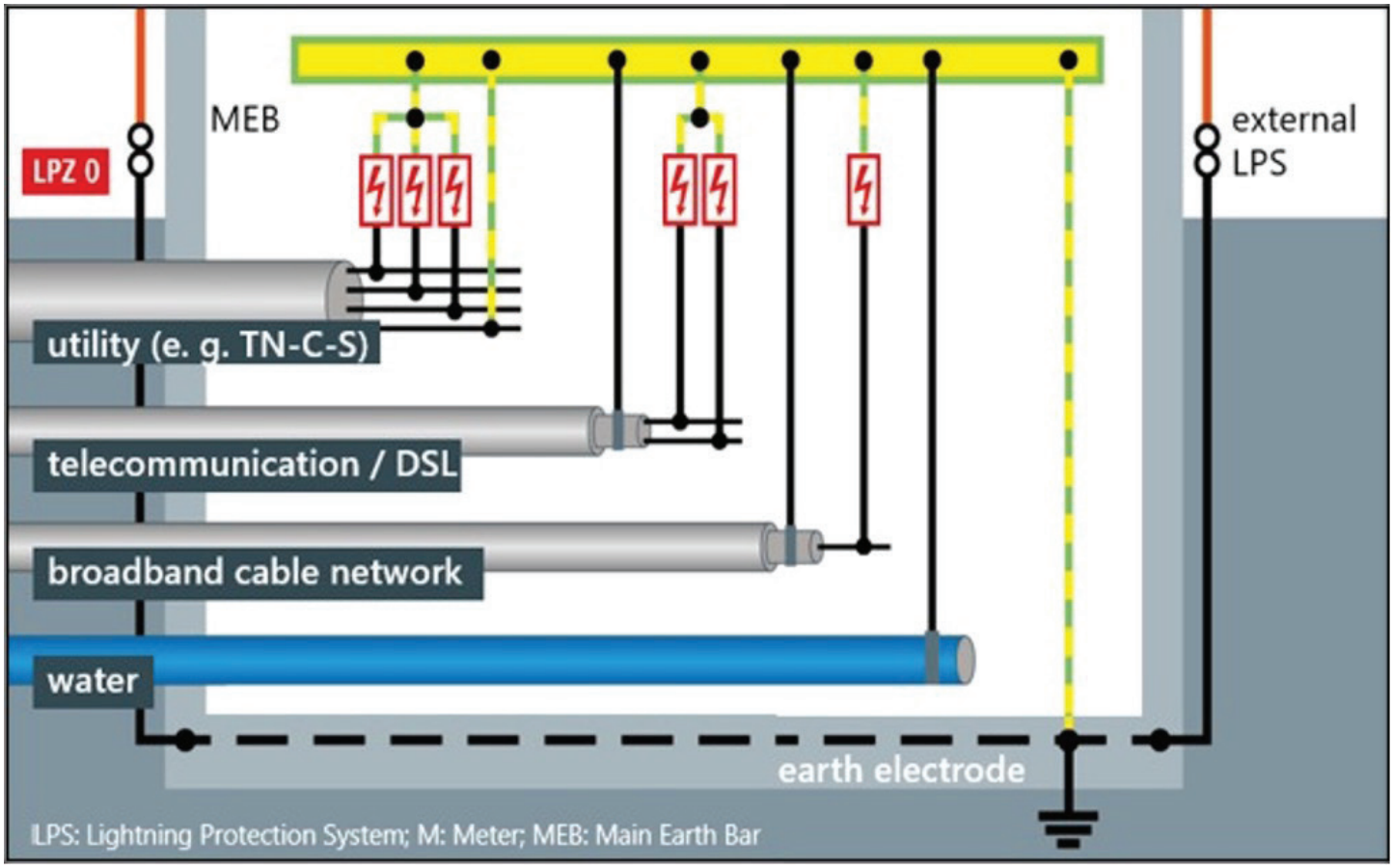
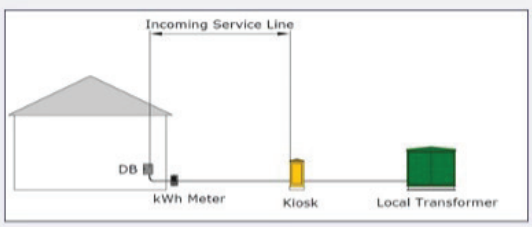


Diagram of Equipotential Bonding:
(key: LPS = Lightning Protection System | M = Meter | MEB = Main Earth Bar)

- **SANS 10142-1 | Electrical LV installation standard**

a) Simplified risk assessment has been proposed based on the incoming supply



b) The new results shows when a residential and a commercial property will be at risk

Surge protection requirements for RESIDENTIAL buildings

Lightning Flash Density (Ng)	RURAL ENVIRONMENT			SUBURBAN ENVIRONMENT			URBAN ENVIRONMENT		
	Incoming Service Line (l)	Type of SPD Required		Incoming Service Line (l)	Type of SPD Required		Incoming Service Line (l)	Type of SPD Required	
0 ≤ 5	> 43 m	Type 2	5 kA	> 64 m	Type 2	5 kA	> 638 m	Type 2	5 kA
>5 ≤ 12	> 21 m	Type 2	20 kA	> 26 m	Type 2	20 kA	> 255 m	Type 2	20 kA
> 12	> 13 m	Type 2	20 kA	> 13 m	Type 2	20 kA	> 134 m	Type 2	20 kA

Surge Protection Requirements for COMMERCIAL/INDUSTRIAL Buildings

Lightning Flash Density (Ng)	RURAL ENVIRONMENT			SUBURBAN ENVIRONMENT			URBAN ENVIRONMENT		
	Incoming Service Line (l)	Type of SPD Required		Incoming Service Line (l)	Type of SPD Required		Incoming Service Line (l)	Type of SPD Required	
0 ≤ 5	> 14 meter	Type 2	5 kA	> 21 meter	Type 2	5 kA	>213meter	Type 2	5 kA
>5 ≤ 12	> 7 meter	Type 2	20 kA	> 9 meter	Type 2	20 kA	> 85 meter	Type 2	20 kA
> 12	> 4 meter	Type 2	20 kA	> 4 meter	Type 2	20 kA	> 45 meter	Type 2	20 kA

SANS 10142-1 installation standard for electrical low voltage.
Click here to see the difference between an installation with SPDs and one without.

LP PRACTITIONERS

JOIN US

The Lightning Protection Practitioners (LPP) Association aims to assist and encourage all industry role players to understand and employ universally standards-based Lightning Protection Systems (LPS) supply, design, installation, and testing procedures while promoting industry best practices.

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SHIELDING THE INDUSTRY

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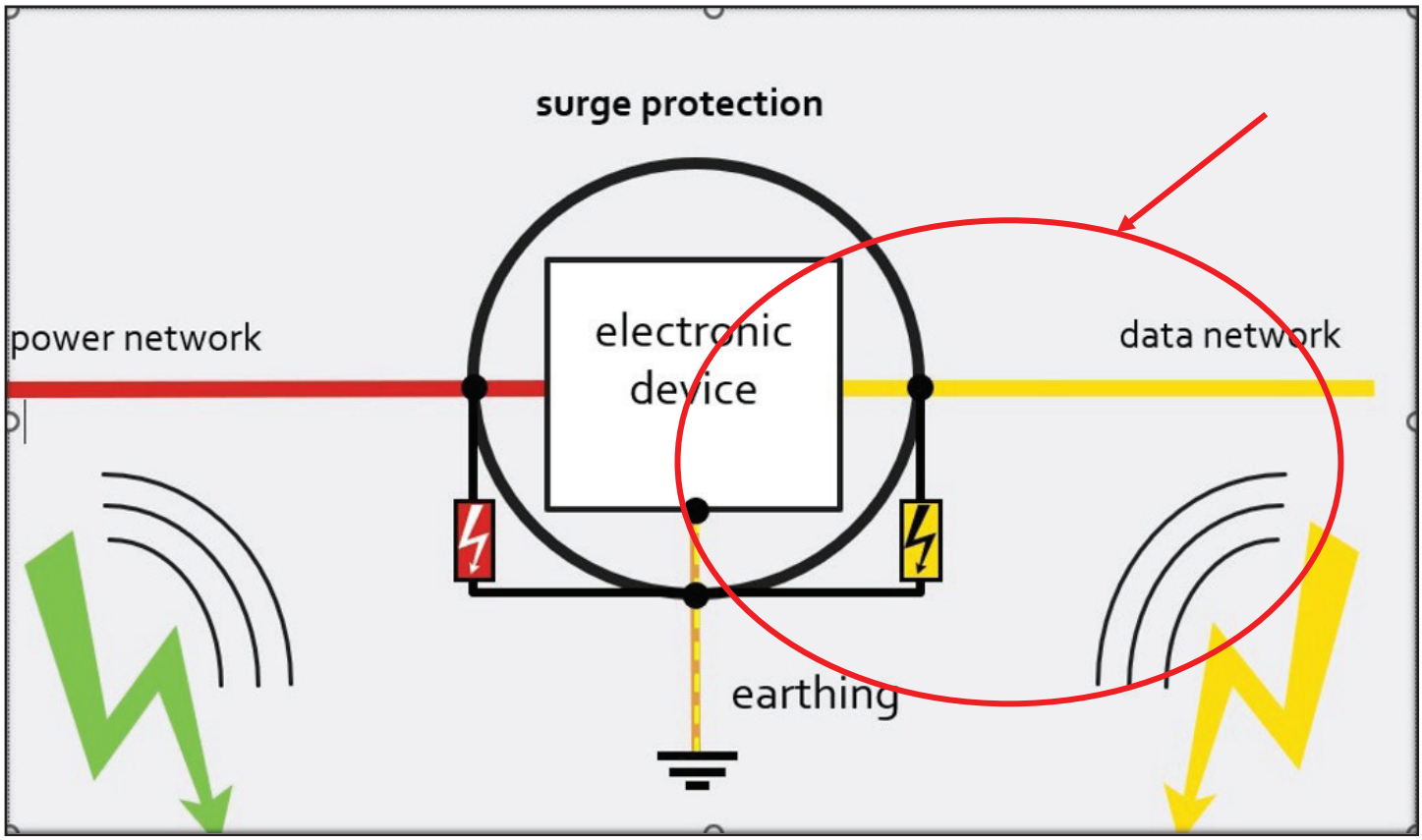

The surge protection segment installed for data network connections, encircled in Red, represents the most frequently neglected aspect of surge protection.

Short circuit faults create the same scenario as switching events. Correctly installing lightning protection SPDs, over and under-voltage protection relays, contactors, and switching delay timers can mitigate or minimise these occurrences. A Certificate of Compliance must be obtained for every precautionary measure installed.

SPDs should be selected according to the SANS code and a risk assessment.

The most overlooked issue in surge protection and the biggest mistake made during the design and installation of SPDs is the total exclusion of the data network or similar connections. Leaving the data, control, and signal connections unprotected is as good as doing nothing. These designs should only be done by specialists. The image above displays the most neglected part of surge protection for data network connections.

For more information, contact your local specialist or distributor or call Lightning Protection Associations for directions. wn

Sources used: DEHN, LPC and SANS 10142.3.1

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Celebrating Engineering Femininity

- WOMEN MAKING A DIFFERENCE IN THE ENGINEERING FRATERNITY

In 2023, men outnumbered women in the global engineering workforce 86.3% to 13.7%. While this percentage of women in engineering decreased from 14.88% in 2020, figures indicate a general increase in women employed in engineering worldwide over the years.

By: Minx Avrabos (PM, IAPW&E)
Managing Editor
wattnow magazine

One of the biggest misconceptions about women in engineering is that they cannot excel in a male-dominated industry. However, this could not be further from the truth.

Women have proven time and time again that they are more than capable of not only succeeding but also thriving in the field of engineering. With their unique perspectives and innovative thinking, women bring a fresh approach to problem-solving and design that can significantly benefit the industry.

Furthermore, women's presence in engineering helps promote diversity and inclusivity within the workplace. By fostering a more diverse workforce, companies can capitalize on a broader range of ideas and solutions, leading to greater innovation and success.

Additionally, having a diverse team of engineers allows for a more holistic approach to problem-solving, as different perspectives and experiences can lead to more comprehensive and practical solutions.

Women need to continue breaking down barriers and stereotypes in engineering.

By pursuing their passions and careers in engineering, women are proving their capabilities and paving the way for future generations of female engineers. Encouraging young girls to pursue STEM education and careers in engineering is crucial to creating a more balanced and diverse workforce in the future.

Women have a valuable role to play in engineering. Their unique perspectives and talents bring immense value to the industry, and their presence helps to promote diversity and inclusivity within the workplace.

By encouraging more women to pursue careers in engineering, we can create a more equitable and innovative industry for all.

The South African Institute of Electrical Engineers (SAIEE) is home to many talented and accomplished female members, proving that engineering femininity is something to be celebrated.

Their dedication, expertise, and contributions to the field remind us that engineering femininity is a force to be reckoned with. Let's continue celebrating and supporting women who are making a difference in engineering.

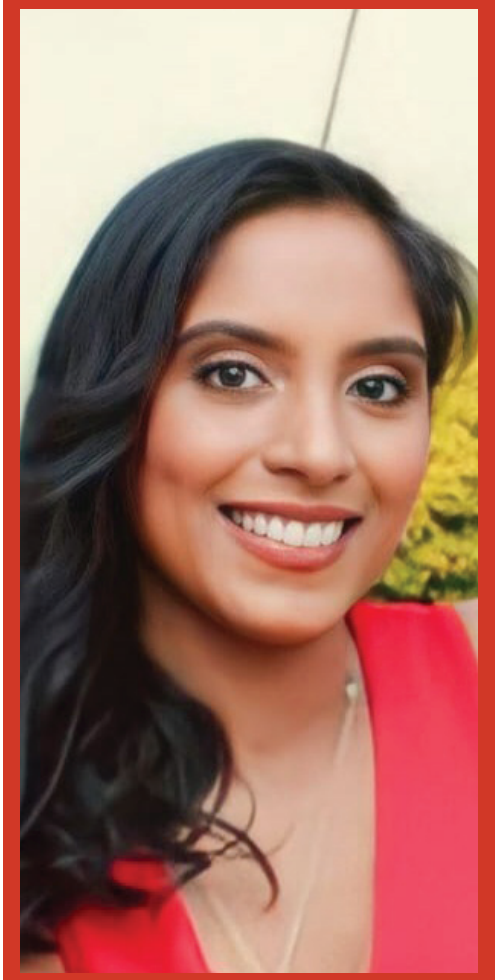
In celebration of Women's Month in August, I would like to showcase their talents and introduce you, our readers, to some of these magnificent SAIEE women.

I am honoured to share with you a few of the SAIEE female members and their achievements in alphabetical order...

NICHOLA ALLAN

Nichola Allan, BEng Hons Electrical and Electronic Engineer qualified in her native Northern Ireland. She worked in telecommunications before moving into electronic security and finally finding her niche in fire detection. A qualified fire detection designer, she is the owner and director of G2 Security, trading as G2 Fire, a distributor of fire detection equipment across Southern Africa. From its humble beginnings in 2005, the company now has three branches in SA, employs 20 people and represents some of the biggest brands in fire detection.

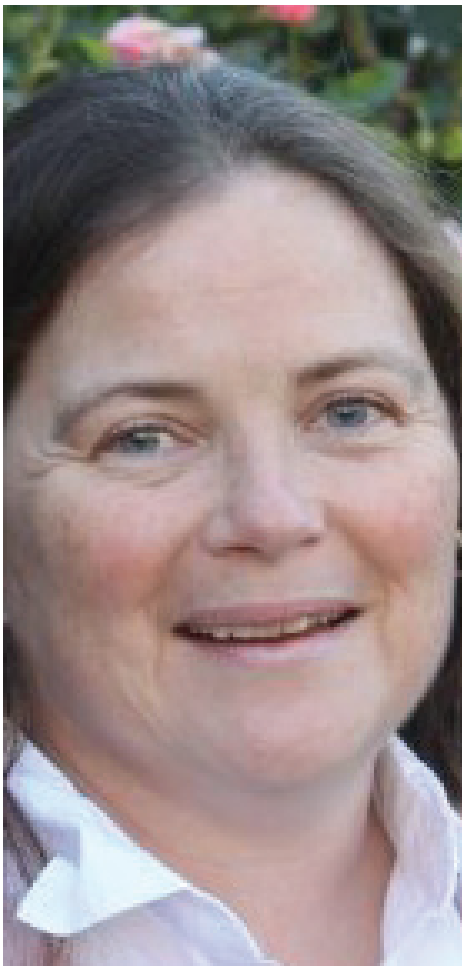
Passionate about education, Nichola joined SAQCC Fire in 2012 when they created their Detection and Gas Suppression division. Having taken on multiple roles in the volunteer committee, she has just completed her three-year term as the Executive Chairperson—the only female to hold the position in its 25 years.



KRYSTLE ANNAMALAI

Krystle Annamalai is employed by eThekwini Electricity MV/LV Operations as a Chief engineer and has served the organisation for the past 13 years with her involvement in various distribution automation projects and smart grid initiatives. Krystle holds a BSc. Electronic Engineering degree from the University of KwaZulu-Natal (UKZN) and graduated with a Master of Business Administration (MBA) degree from the University of Pretoria's Gordon Institute of Business Science (GIBS).

She is registered as a Professional Engineer with the Engineering Council of South Africa (ECSA) and an active member of Cigre, serving on the Cigre SA Women in Energy (WiE) Net Zero Initiative (NZI) workgroup dealing with climate change impacts on the energy sector. Krystle is the current Chairperson for the South African Institute of Electrical Engineers (SAIEE) KZN Centre.



JANE BUISSON-STREET

Jane Buission-Street, a Fellow of the SAIEE and the 2022 Honorary Vice President, became a member in 2006. She earned her NHD Elec Eng (H/C) degree at the University of Johannesburg, her BSc (Stats & Comp Sc) at UNISA and her MEng (Information Engineering) at Wits.

Jane started her career as a commissioning engineer with GEC. She switched to academia when she was one of two lecturers who started the School of Electrical Engineering at TUT's Nelspruit Campus. When she transferred to Johannesburg, she was appointed lecturer at the UJ School of Electrical Engineering's Technology Department.

Although medically retired, she serves on several SAIEE committees and is a moderator/external examiner for several tertiary institutions.

KEREN BUISSON-STREET

Keren studied Biomedical Engineering and Electrical Engineering at the University of the Witwatersrand. She became a SAIEE Student Member in 2018, following her mother, Jane Buisson-Street's example.

Keren worked as an intern for DNV from November 2022 until August 2023, when she was hired permanently as a Power Systems Analyst, where she prepares the preparation of designs, and specifications involved in the construction, maintenance and operation of systems. She participated as an "Owners Engineer" on a DRPC project in South Africa, which included preparing and evaluating the bid for the DRPC.

Keren has been involved in Grid Compliance Studies and she also has experience in DigSilent, PSCAD and AutoCAD.

REFILWE BUTHELEZI

Refilwe Buthelezi is a Professional Engineer (PrEng) championing the Operational Technology function of Rand Water.

She is a senior member of the South African Institute of Electrical Engineers (SAIEE) and a fellow of the South African Academy of Engineering (SAAE).

Refilwe serves on the Programme Steering Committee for the Infrastructure Technical Assistance Facility to Support Sustainable Development in South Africa.

Refilwe is a Non-Executive Director for the South African National Road Agency (SANRAL) and Transnet Limited. She is also the first female President of the Engineering Council of South Africa (ECSA) and the President-Elect of the Federation of African Engineering Organisations (FAEO).

PROF SUNETRA CHOWDHURY

Associate Professor Sunetra Chowdhury is NRF/DSI-Sasol Research Chair in Energy and Power Systems Modelling in the Electrical Engineering Department, University of Cape Town, South Africa.

She is an accomplished researcher in power and energy systems with 33 years of experience in academia and industry. Her research area includes power system operation, energy management and protection, grid integration of distributed generation, microgrids, hybrid renewable energy systems, energy storage, electric vehicle charging infrastructure and sustainable energy solutions for institutes of higher learning.

She is currently a Fellow of the SAIEE, a Senior Member of the IEEE, a Member of the IET(UK), a Member of CIGRE, and a Member of the SAEEC.

TSHEGO CORNELIUS

Tshego Cornelius is a BSc Electrical Engineering graduate from UCT and holds a Master's in Business Leadership (MBL) and the Certified Energy Manager (C.E.M) certification.

She has more than 14 years of working experience in the energy and mining industries. She is a registered professional engineer with the Engineering Council of South Africa (Pr. Eng, ECSA), a Council member and Senior Member of the South African Institute of Electrical Engineering (SAIEE), a Senior Member of the Institute of Electrical and Electronics Engineers (IEEE), and a member of the Institute of Energy Professionals Africa (IEPA) and Association of Energy Engineers (AEE) and a Certified Professional Director.

She received the 2024 SAIEE Women in Engineering Award in March 2024.

MARIE DAVISON

Marie Davison joined the SAIEE as a Student Member and became the first female SAIEE President in 1995.

From the end of 1968, when she completed her B Sc degree in Electrical Light Current from the (then) University of Natal to her early retirement from her ESKOM career spanning 1969 to 1995, she enjoyed a remarkably interesting, challenging, and enjoyable career.

The rapid change in electronic technology and the range of opportunities for extended educational development made available to her by ESKOM contributed to the adventure.

Marie actively served on the SAIEE Southern Cape committee, but now enjoys lunch and enthusiastically plays bridge in her retirement home in George.

NOMKHOSI DLAMINI

Nomkhosi Dlamini started her career as a technician-in-training at Lebone Consulting Engineering in 2021. She joined Dihlase Consulting Engineers in 2005 as a junior Technician. Her job was to design electrical layouts for building services and power distribution. In 2008, she joined Matla Consulting Engineers as a Design Technician and was part of the team involved in the Electrical design of King Shaka International Airport.

In 2010, she joined Eyethu Engineers as an Electrical Technician, and she was then promoted to Electrical Technologist in 2012 after obtaining a BTECH in Electrical Engineering. After receiving professional registration with ECSA in 2018, Eyethu appointed Ms. Dlamini as the technical manager of the electrical department. She has been involved in various aspects of electrical design and project management for building works and electrification projects.

SY GOURRAH

Sy Gourrah started her career as a consultant and was later appointed as the city electrical engineer for East London. With over 30 years of experience as an electrical engineer, she earned a Bachelor in Engineering (Electrical & Electronics), a Masters in Business Administration and a Government Certificate of Competency. Currently, she is the Senior General Manager for ACTOM Smart Technologies.

Sy was the first female AMEU President from 2008 to 2010 and served on the executive council from 2001 until 2011.

Sy, a SAIEE Fellow, has served on the council since 2012. She was the 2020 SAIEE President and chaired the Professional Development and Finance committees. She launched the SAIEE Women in Engineering Chapter, which strives to promote women's interests and champion empowerment programs.

MANTSIE HLAKUDI

Mantsie Hlakudi is a professionally registered (ECSA) and certificated (GCC) Electrical Engineer with over 12 years of experience in Distribution and Transmission, specialising in Specialised Plant Equipment Failure Investigations, Power lines Technical Performance, Renewable Power Plants, Transformers and reactors.

She is a Cigre A2 Study Committee member and the Cigre Utility Advisory Board Member. She is the SAIEE Central Gauteng Centre Chairperson and the National Transmission Company of South Africa Lead Champion of Eskom Women Advancement Programme. She is a passionate community servant who can motivate and inspire individuals to identify their potential to share their passion to serve others. Amongst many other accolades in her career, Mantsie won the SAIEE Women in Engineer award in 2023.

SHAFIEQA ISMAIL

Shafieqa Ismail runs one of South Africa's first independent female-owned electrical and electronics consulting engineering businesses. She graduated with a BSc in Electrical and Electronics Engineering from the University of Cape Town (UCT).

She is a Registered Professional Engineer with ECSA and a Registered Fire Detection Designer with the South African Qualification & Certification Committee for the Fire Industry (SAQCC).

Shafieqa worked for many years at one of the top engineering companies in Africa before started S Ismail Consulting Electrical Engineers CC (SICEE) in 2004.

She was part of the professional team that built Cape Town Stadium for the 2010 FIFA World Cup.

OMAIRA JAJBHAY

Omaira Jajbhay is an electrical engineer at Zutari, pursuing her MSc in Electrical Engineering. She has exceptional power system protection and solar power knowledge and has been involved in several local and international renewables and protection projects. She has also served as project manager and lead design engineer for the University of Cape Town's Solar PV project, amongst many other projects with key involvement roles.

Her achievements include international recognition in renewable energy, winning the BRICS 2023 Future Skills Challenge in the Renewable Energy Category, the SAIEE National Engineering Excellence Award 2023, the SAIEE KZN Centre Women in Engineering Award 2023, and merit achievements in university.

She is currently a CESA YPF KZN Representative.

DEVAKSHA MAHARAJ

Devaksha Maharaj is the Managing Director of Ikigai Engineering, a multi-faceted consultancy focusing on Management Consulting, Renewable Energy Technologies, Electrical Maintenance and Installation Services, and Training & Development.

She graduated with a BSc. (Hons) in Electrical Engineering from the University of KwaZulu Natal. She is professionally registered with ECSA and holds several certifications in energy from the Association of Energy Engineers and the Green Building Council of SA. Devaksha has extensive experience in the energy sector, serving on several panels, and has written several articles for online publications.

She serves with the Minister on the Gender Advisory Council and is active in the ESD panel.

EUNICE MAMABOLO

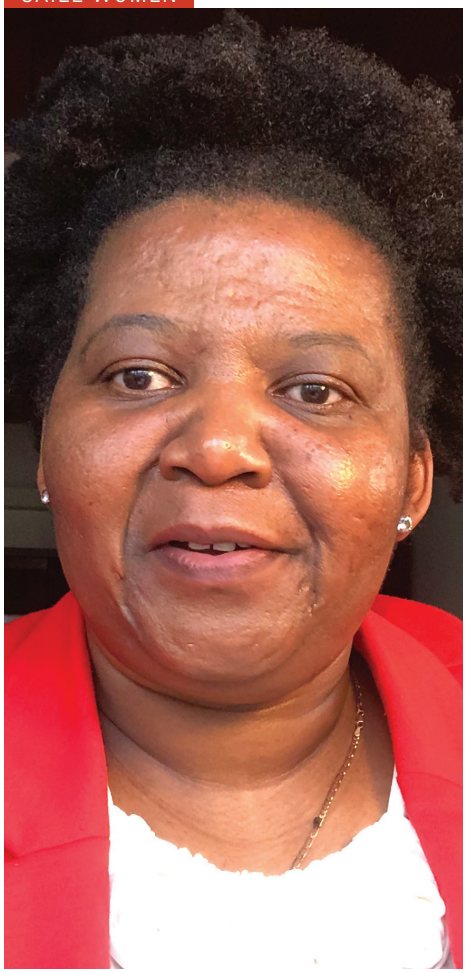
Eunice Mamabolo, a registered electrical engineering candidate with ECSA, possesses over 2 years of technical experience.

In 2022, she attained a BEng (Bachelor of Engineering) degree in Electrical Engineering from the University of Pretoria.

Recently completing her Engineer in Training program at ArcelorMittal, Eunice stands as one of the few female engineers contributing to the R27 billion Olifants Management Model program for the Lebalelo Water User Association.

She is currently pursuing a master's degree in Engineering Management.

She was awarded a Certificate of appreciation for active participation as a Mentor in the University of Pretoria Mentorship Programme 2023.



NOMTHANDAZO MPANDE

Nomthandazo Mpande is a social entrepreneur with a disability, a speaker, a co-author and an electrical engineering professional with over 20 years of experience.

She received the GCPIT Global Woman Business Leader award in 2021. She is a certified non-executive independent board member and chairperson of WeConnect International SA WBE Council, a board member of several non-profit organisations, a SAOGA economic development committee member, BRICS Business Council Energy & Green Economy work group member, and an IBASA business advisor advocating for Sustainable Development Goals (SDG).

She mentors entrepreneurs from previously disadvantaged communities and entrepreneurs with disabilities for economic inclusion.

ZUKISWA MPANA

Zukiswa Mpana is an Electrical Engineering Technician at Transnet National Port Authorities. She has a Master of Engineering (Electrical Systems), a Postgraduate Certificate in Renewable Energy Technologies from EIT, a B-Tech Diploma from DUT, and a Junior Management Program Certificate from Wits Business School. She is registered with ECSA as a Professional Engineering Technologist.

She has over 14 years of experience in electrical engineering design, testing, and construction, particularly within port and rail networks. She was involved in constructing a 50kV-AC Overhead Track Equipment Line that provided her hands-on experience in project management, site supervision, quality control, site inspections, coordination with other professionals and subcontractors, and adherence to safety regulations.

JASODA NAIDOO

Jasoda Naidoo became an SAIEE member eight years ago. She worked as an engineer at Eskom in South Africa for over ten years.

She recently emigrated to the United States of America and is now working as a Section Engineer at Exelon. She supervises a team of site engineers to ensure projects are finished on schedule.

She earned both her a BSc and MSc in Electrical Engineering degrees from the University of KwaZulu-Natal and she is a registered Professional Engineer with the Engineering Council of South Africa (ECSA).

Jasoda and her husband are currently searching for a new home. She is passionate about exploring new places and experiencing different cultures.

DR SYEDA NADIAH FATIMA NAHRI

Dr Nahri, an SAIEE member since 2017, received her bachelor's degree in Electronics and Communication Engineering from the Birla Institute of Technology (Mesra), International Centre Muscat (Oman) in 2011, followed by a Master of Science in Electrical Engineering from the National University of Singapore (NUS), Singapore in 2013.

She received her Doctor of Engineering (DEng) degree in Electrical Engineering from Tshwane University of Technology (TUT), Pretoria, in 2023. To pursue her research further, she is doing a Postdoctoral Research Fellowship in the Department of Electrical Engineering.

She is a part-time lecturer with the Department of Computer Systems Engineering at Tshwane University of Technology, Pretoria and have published various scientific articles.

THANDIWE NKAMBULE

Thandiwe Nkambule is currently the senior manager of asset creation at the Gemma Cluster in Eskom Distribution. She has more than 20 years of experience in engineering and has served in various capacities in the sector.

She holds an MBA from the University of Cape Town, an MEng (Electrical), and a BScEng (Electrical) from the University of the Witwatersrand. She is a registered Professional Engineer (PrEng) with ECSA.

She is a Fellow of the SAIEE and Sainsbury Management. She has won several awards, including the Keith Plowden Young Achiever of the Year Award.

Thandiwe served on the ECSA and SAIEE councils and the National Executive Committee of the National Society of Black Engineers (NSBE).

DR YU-CHIEH JESSIE YEN

Dr Yen is an academic at the University of the Witwatersrand, engaging in teaching, research and community activities. She holds a Bachelor of Science in Electrical Engineering (2008) from the University of the Witwatersrand, Johannesburg. She continued with postgraduate studies while having an academic post, receiving her Master of Science in Engineering (2012) and Doctor of Philosophy (2021) from the same institution. Her research interests include sustainable energy systems, load modelling and prediction, demand-side management and grid-interactive buildings.

She advocates for sustainable development, positioning herself in enabling roles to support access to energy, STEM education and policy. She has led a technical team to investigate the demand-side management opportunities on the power grid. wn

NOMSO KANA

- FROM NUCLEAR SCIENTIST TO ICT ENTREPRENEUR

In the bustling world of broadband infrastructure, where giants like Vumatel, Vodacom, Openserve and Telkom dominate the field, one woman is carving out her powerful niche: Nomso Kana. A maverick nuclear scientist turned enterprising trailblazer, Nomso is reshaping Africa's digital landscape through her visionary venture, Simsciex Technologies. Her story is not just about technology; it's about resilience, passion, and a vision for a connected Africa.

In the heart of a quaint rural village in the Eastern Cape, Nomso was affectionately dubbed the "Village Girl." But this title, far from confining her, ignited her drive for change. It wasn't a label; it was a challenge, urging her to break barriers and paint her vibrant narrative across the canvas of her community.

"I was fascinated by science after I watched Star Wars. From there, I became interested in spaceships and teleporting, even though I knew little about them. My parents, teachers at the time, recognised my aptitude for maths and science, which I have maintained to this date. They then supported me and helped me follow my dreams," says Nomso.

She went on to work in nuclear science, earning multiple awards for her excellence. Her devotion drove her to start Simsciex Technologies to address the continent's broadband infrastructure challenges.

Nomso explains, "The idea for this company came to me while I was working as a scientist in the lab. I recall physically transporting confidential reports between buildings, and it struck me as inefficient and potentially insecure. This experience highlighted the need for better technology solutions."

She continues, "I realised that having high-speed broadband on our campus would streamline our work and improve efficiency. That frustration with the limitations of our existing technology ultimately led me to explore the broadband access space and establish Simsciex."

Today, Simsciex Technologies is a growing provider of broad-band technologies. It offers a wide range of services such as bundled wifi packages, broadband infrastructure, insights and strategic business development solutions across the aviation, energy and Information and Communication Technology (ICT) Sectors, Information Technology (IT) support, hardware, security and training. But the road here wasn't easy.

"There were many challenges early on. The biggest one was discovering that the ecosystem is so monopolised. You must be smart in manoeuvring it even to get the first job. Our first job was deploying fibre for the City of Johannesburg. We were one of the small companies that did that, and we learned a lot," she says. As Nomso tried to live up to her mission to bridge the connectivity gap, she discovered even more challenges.

"I'm from rural areas, and my dream is for someone in a deep rural area anywhere on this continent to have the same internet speed as someone sitting in Sandton. The challenge with that, though, is that building this infrastructure is expensive. Our rural homes are spaced very far apart, meaning there are a lot of resources needed to connect everyone, but it's a mission we fight to realise each day," says Nomso.

Simsciex isn't just about delivering lightning-fast internet; it's about revolutionising how we connect and interact online. Their mission goes beyond mere connectivity, blending their services with the entertainment and educational tools people crave, such as video-on-demand and e-learning platforms.

Our work significantly impacts the economy," says Nomso, who also serves as a Presidential Commissioner for the Fourth Industrial Revolution. "Take Kenya, for example. 2009 Kenya started implementing ICT policies, and their GDP increased by 9%. This boost spurred numerous tech startups, making Kenya a leader on the continent."

In South Africa, SimSciex is impacting rural and urban connectivity. She adds that they also offer quick-to-market solutions, such as Wi-Fi to homes, LTE, and fixed wireless broadband access, aiming to relax Information and Communication Policies (ICPs) and improve connectivity in rural areas.

Broadband infrastructure is paramount for South Africa's economic growth. Studies have revealed that connectivity is key to unlocking opportunities, with a notable increase in employment rates by 7-13%.

According to Mondli Gungubele, Minister of Communications and Digital Technologies, internet connectivity and penetration have improved from a mere 21.1% in 2011 to a staggering 79% in 2022, but there is still a lot of work to be done here at home and across the continent. Thus, Nomso isn't targeting South Africa alone.

Simsciex already has its sights set on the rest of the continent, starting with Tanzania, where it is exploring broadband infrastructure opportunities. This is critical as studies show that between 2010 and 2021, the internet penetration rate across Africa grew from 9.6% to 33%. There are still a lot of people who are not efficiently connected.

Nomso and Simsciex Technologies are gearing up to paint Africa with the colours of connectivity. Africa—the future's looking brighter and more connected than ever before! wn

Women can flourish in South African STEM fields

Peaceful Makhoba, an electrical engineer in Eaton South Africa's Estimation department, urges young women to consider diverse career opportunities and conduct thorough research before taking the plunge.

As of 2022, the South African Government reported that while 35% of STEM students in higher education globally were women, only 13% of Science, Technology, Engineering, and Mathematics (STEM) graduates were women. According to Peaceful Makhoba, the low voltage (LV) and medium (MV) Estimator at Eaton South Africa, this level drops sharply into the first few years of work.

"When I joined the Graduate Training Programme at Eaton in 2016, there were only two women out of a group of numerous graduates, with me being one of the two," she says. "Now, I am the only woman in a similar technical role across various departments, from Estimation to Engineering, which is not due to a lack of opportunity or any obstructive forces against women entering the field.

"I think we have a long way to go in bridging the gap of presenting the depth of opportunities in STEM fields in the South African economy while also adapting the sector to be highly inclusive," Peaceful says.

In December 2015, Peaceful completed her Diploma in Electrical Engineering from Mangosuthu University of Technology in KwaZulu-Natal. She then joined the Estimations department at Eaton, focusing on the mining sector.

She had already completed a work integration programme at Transnet's Saldanha Bay Iron Ore operation.

In this specialised role, she works with clients to develop commercial smart electrical systems plans, define project scope, and estimate various resources required to tailor a solution to each customer's needs.

"I can always remember wanting to go into electrical engineering as a child. I was always fascinated by electricity and wondered how it worked and how Eskom brings power into our homes to make our lights work," she says.

She worked in the mining department from 2016 until 2022, gaining valuable experience before transitioning into the fast-growing data sector team. Despite the male-dominated environment, Peaceful persevered, demonstrating her capabilities and dedication. She remained current across all heavy industries, including mining, showcasing her adaptability and versatility.

Acknowledging the challenges inherent in her work, Peaceful admits that the role demands a unique set of skills that prioritises analysis, problem-solving and direct communication. She has proven herself capable and resilient, highlighting the importance of women's contributions in STEM fields.

"Remember, your contributions matter, and your voice deserves to be heard in shaping the future of technology and innovation," says Peaceful. In these sectors, assertiveness and clear communication are crucial skills. While

it may feel daunting initially, don't let fear hold you back. Embrace your ability to communicate effectively and confidently and express your ideas.

Peaceful notes that while electrical engineering remains male-dominated, nothing is holding women back at this time in the country's history. She emphasises that the only reason most senior executive roles are still predominantly held by men is because women haven't really contested them in a significant way.

"We have the same brains and ability as men, and we can bring a different dynamic in our interactions," she adds. "I believe young women should explore diverse opportunities, particularly in STEM. It is essential to be passionate about the field you choose.

Before pursuing a STEM career, do thorough research to ensure that you enjoy the subject matter. It's not just about monetary gain but also about finding fulfilment and making a meaningful impact," concludes Peaceful. wn

RS South Africa is Celebrating Women In Engineering

- ENCOURAGING YOUNG WOMEN TO PURSUE STEM CAREERS

International Women in Engineering Day (INWED), an annual event that celebrates the incredible contributions of women engineers worldwide, marks its 11th anniversary on 23 June under the theme of #EnhancedByEngineering.

This year, INWED celebrated women engineers who have enhanced lives and livelihoods through their work. These remarkable individuals contribute to building a brighter future for all of us.

RS SOUTH AFRICA SUPPORTS WOMEN ENGINEERS

RS South Africa is a trading brand of RS Group plc (LSE: RS1), a global product and service solutions provider for industrial customers. In honour of INWED 2024, RS is highlighting the achievements of women in engineering. This profile piece showcases inspiring women making significant contributions to the field and motivating the next generation of female engineers.

CELEBRATING WOMEN IN ENGINEERING: INSPIRING ACHIEVEMENTS AND FUTURE LEADERS IN STEM

Through its collaboration with Nelson Mandela University (NMU), RS South Africa champions women in engineering by funding various student projects and hosting career readiness workshops.

One such initiative is the Women in Engineering Leadership Association (WELA) at NMU, which provides professional and academic workshops designed to support and inspire women in engineering. RS South Africa plans to integrate its Education initiatives into the WELA programme, further equipping these young women with the tools and confidence to succeed in their careers.

DR. MARSHALL SHELDON, Executive Dean of NMU's Faculty of Engineering, epitomises the leadership driving these efforts. With over 25 years of experience in higher education and a solid background in chemical engineering, Dr. Sheldon passionately advocates for narrowing the gender gap in STEM fields. She highlights engineering's

transformative impact and underscores the pivotal role women play in advancing the discipline.

"By breaking down gender stereotypes and encouraging more women to enter and thrive in engineering, we can enrich the industry with unique problem-solving approaches and different leadership styles. In addition, women engineers can serve as role models, inspiring the next generation of female engineers to pursue STEM careers, thus fostering a more balanced and dynamic engineering landscape," concludes Sheldon.

Dr. Sheldon emphasises that women can significantly contribute to this year's #EnhancedbyEngineering theme by leveraging their diverse perspectives, creativity, expertise, and knowledge to drive innovative solutions. Their participation in engineering projects can lead to more inclusive technologies that cater to a broader audience.

INSPIRING THE NEXT GENERATION: KARLI OOSTHUIZEN'S JOURNEY

KARLI OOSTHUIZEN, a final-year BEng Mechatronics student at NMU, embodies the spirit of innovation and determination. With a passion for sustainable engineering and a commitment to diversity, Karli is a role model for aspiring engineers. She actively participates in outreach efforts, encouraging young people from all backgrounds to pursue engineering.

"All engineers should strive to enhance life through engineering. Women in engineering should focus on enhancing and improving areas where women struggle most, things only we would know," says Karli.

Her message to young girls considering engineering is clear and empowering: "If you work hard and have faith, the right doors will open, and you will be successful. You are more than capable, and there is nothing someone can tell you that will change that."

RS South Africa's Commitment to Education and Innovation

RS South Africa remains committed to fostering education and innovation in engineering. Supporting initiatives like WELA at NMU, RS celebrates the achievements of women in engineering and encourages the next generation to explore and excel in STEM careers.

RS South Africa is a proud Level 2 B-BBEE accredited company. Visit the RS South Africa website for more information on how RS champions education and innovation.

The Impact of Women in South Africa's Engineering Sector

The increasing participation of women in the predominantly male-dominated engineering sector, is gradually changing the landscape and benefiting the industry in the process. In South Africa, the presence of women in engineering is not only promoting diversity but also driving innovation and economic growth.

Globally, women in engineering still represent a minority, making up approximately 13% of engineers in the United States as of recent reports. South Africa mirrors these statistics, where gender disparities in STEM fields are evident. However, strides are being made to improve these figures. Efforts to increase female representation in engineering are seen through various educational and professional initiatives aimed at young girls and women.

The inclusion of women in engineering roles has several benefits. In South Africa, women engineers are increasingly contributing to sectors such as construction, banking, mining, and technology, bringing new ideas and leadership styles that foster inclusive workplace cultures.

Despite the positive trends, women in South Africa's engineering sector face significant challenges. These include lack of mentorship, and limited opportunities for advancement. According to a report by the Saturday Star, gender equality in South African engineering is hindered by societal attitudes and structural barriers that need to be addressed to create a more supportive environment for women engineers.

Programmes aimed at tackling these challenges are essential. Initiatives like mentorship programmes, networking opportunities, and professional development programmes specifically for women can help bridge the gap. The South African government and private sector companies are increasingly recognising the need for such programmes to support women's advancement in engineering, one notable organisation making a significant impact is TechnoGirl Trust.

This initiative focuses on supporting young girls from disadvantaged socio-economic backgrounds to pursue careers in STEM fields, including engineering. Through its comprehensive programme, the TechnoGirl Trust developed a job shadowing programme which is implemented virtually in schools and face-to-face in participating host organisations, post school mentorship, and a digital skills training programme for unemployed youth. This helps the beneficiaries to develop the skills and confidence needed to succeed in engineering and other STEM career fields.

TechnoGirl Trust collaborates with various stakeholders, including schools, public and private sector organisations, to create opportunities for young girls and women. Their programmes are designed to expose girls to real-world STEM environments, provide role models, and build networks that can support their career aspirations. By doing so, TechnoGirl Trust is not only helping individual girls but also contributing to the broader goal of increasing female participation in South

Africa's engineering sector. The impact of women in South Africa's engineering sector is profound, driving innovation, economic growth, and diversity. While challenges remain, initiatives like TechnoGirl Programme are crucial in paving the way for the next generation of female engineers.

By continuing to support and expand such programmes, South Africa can work towards a more inclusive and dynamic engineering landscape.

Quick Stats from the World Economic forum which can easily be changed by engaging with the TechnoGirl Trust:

1. Women make up nearly 11% of the total number of engineers registered with the Engineering Council of South Africa (ECSA). However, only about 4% of professional engineers are women, indicating a significant underrepresentation in higher professional levels
2. A significant challenge in the sector is retention. Approximately 70% of women who graduate with engineering degrees leave the industry after starting their careers due to feelings of isolation and lack of support in the workplace
3. South Africa faces a shortage of engineers in critical fields like electrical, civil, and mechanical engineering. Increasing the number of women in these fields could help address this skills gap and drive national development wn

MEMBERSHIP FEES EFFECTIVE 1 DECEMBER 2023

The Council meeting held on 1 September 2023 approved subscription & entrance fees as from 01 December 2023 as per schedule indicated below.

PLEASE NOTE: In terms of Bylaw 3.2 annual subscriptions are due on 1st December 2023

MEMBERSHIP FEES CAN BE PAID IN MONTHLY RECURRING PAYMENTS

Council agreed to a discount for fees paid before 31 March 2024. Members are therefore encouraged to pay promptly to minimize increase impact.

Grade of Membership	Annual Subscriptions paid before 31 March 2024		Annual Subscriptions paid after 31 March 2024		New Members FEES * see Notes 1 & 4 below.	
	RSA incl VAT (R)	Outside RSA excl VAT (R)	RSA incl VAT (R)	Outside RSA excl VAT (R)	RSA incl VAT (R)	Outside RSA excl VAT (R)
Student	173	150	208	180	208	180
After 6 yrs study	1 800	1 565	2 160	1 878	2 160	1 878
Associate	1 800	1 565	2 160	1 878	2 160	1 878
Member	1 989	1 730	2 387	2 076	2 387	2 076
after 6 years	2 325	2 021	2 789	2 426	2 789	2 426
after 10 years	2 433	2 116	2 919	2 539	2 919	2 539
Senior Member	2 433	2 116	2 919	2 539	2 919	2 539
after 6yrs/age 40	2 637	2 293	3 164	2 751	3 164	2 751
Fellow	2 637	2 293	3 164	2 751	3 164	2 751
Retired Member (By-law B3.7.1)	1 118	972	1 342	1 167	n/a	n/a
Retired Member (By-law B3.7.3)	nil	nil	nil	nil	n/a	n/a

1. The fee for all new applications is R3337.00 which includes an entrance fee of R950.00. On election to the applicable grade of membership the new member's account will be adjusted accordingly and refunds/additional payment made on request. Entrance fee for Students is free and new Student applicants require payment of R208.00.

2. Transfer fee to a higher grade is free for all grades of membership.

3. Members are encouraged to transfer to a higher grade when they qualify. It will be noted that the fees of Member and Senior Member grades after 10 and 6 years respectively are equal to the fees of the next higher grade.

4. Members elected after May 2024 pay a reduced subscription fee.

5. By-law B3.7.1 reads “Where a member in the age group of 55 to 70 years has retired from substantive employment in the engineering profession, such member may make written application to Council for recognition as a retired person and a reduced membership fee".

6. By-law B3.7.3 reads “any member complying with the conditions of B3.7.1 but who has been a member of the Institute for not less than 25 consecutive years, shall be exempt from the payment of further subscriptions.” Members who comply with the requirements of By-Law B3.7.3 may make written application to Council for exemption from paying subscriptions".

7. By-law B3.9 reads “any member in good standing who has been a member for fifty (50) consecutive years shall be exempt from the payment of further subscriptions.”

8. Members not in good standing by failing to pay their subscriptions by end of June of each year will, subject to Council decree, be struck-off the SAIEE membership role.

9. Members in good standing and no longer in substantive employment and do not receive payment or salary for work done may apply to Council for a reduction in their annual subscriptions.

10. The members monthly magazine ("wattnow") is available on line and members who require a hard copy may acquire same on request and for a nominal fee subject to minimum uptake numbers.

11. Members who wish to pay their membership fees in recurring payments should activate the payments on their banking portal. Members will receive the early bird discount only if their fees are fully paid by 31 March 2024.

2024 SAIEE MEMBER BENEFITS

STUDENT MEMBER	ASSOCIATE MEMBER	MEMBER	SENIOR MEMBER	FELLOW
Jobs portal for WIL	Jobs portal access	Jobs portal access	Jobs portal access	Jobs portal access
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CPD training discounts	CPD training discounts	CPD training discounts	Exclusive Networking Events	Exclusive Networking Events
Charge Reward Programme earnings	Charge Reward Programme earnings	Charge Reward Programme earnings	CPD training discounts	CPD training discounts
Bursary programme	Bursary programme	Long standing member gifts	Charge Reward Programme earnings	Charge Reward Programme earnings
Publication access (**watt**now & ARJ)	Publication access (**watt**now & ARJ)	Bursary programme	Long standing member gifts	Long standing member gifts
Site visits	Site visits	Publication access (**watt**now & ARJ)	Bursary programme	Bursary programme
SAIEE Centres	SAIEE Centres	Site visits	Publication access (**watt**now & ARJ)	Publication access (**watt**now & ARJ)
		SAIEE Centres	Site visits	Site visits
			SAIEE Centres	SAIEE Centres
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AUGUST 2024

06/08/2024	Project Management for Engineers
07/08/2024	The Innovation Dilemma
13/08/2024	Planning Feasibility Studies: An Engineer's Perspective
13/08/2024	SAIEE Lightning Chapter webinar
14/08/2024	Earthing & Lightning Protection
16/08/2024	KZN Centre Celebrating Women's Wellness Day, Durban
27 - 28/08/2024	Solar & Storage Live Conference - Cape Town
27/08/2024	Photovoltaic Solar Systems - East London
28/08/2024	LV/MV/HV Switch Gear Operation, Safety, Maintenance and Management

SEPTEMBER 2024

02/09/2024	Earthing & Lightning Protection - Gqeberha
03/09/2024	Introduction to 5G Communication Networks
05/09/2024	High Voltage Measurement and Testing
10/09/2024	Fundamentals Of Practical Lighting Design for Commercial and Industrial Application
11/09/2024	Fundamentals of Developing Renewable Energy Plants
11/09/2024	Incident Investigation and Management (Root Cause Analysis)
11/09/2024	Arc Flash
18/09/2024	Introduction to Artificial Intelligence for Professionals
18/09/2024	Earthing & Lightning Protection - East London
19 - 21/09/2024	South Africa International Industrial Expo - Sandton
26/09/2024	SAIEE BP Lecture - Wits University

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