wattnow

SAIEE SUPPORTS ENERGY EFFICIENCY AND THE ENVIRONMENT

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THE PRESIDENTIAL ISSUE

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SAIEE THE OFFICIAL MOUTHPIECE OF THE SOUTH AFRICAN INSTITUTE OF ELECTRICAL ENGINEERS | **MAY 2014**

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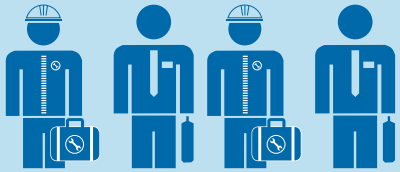

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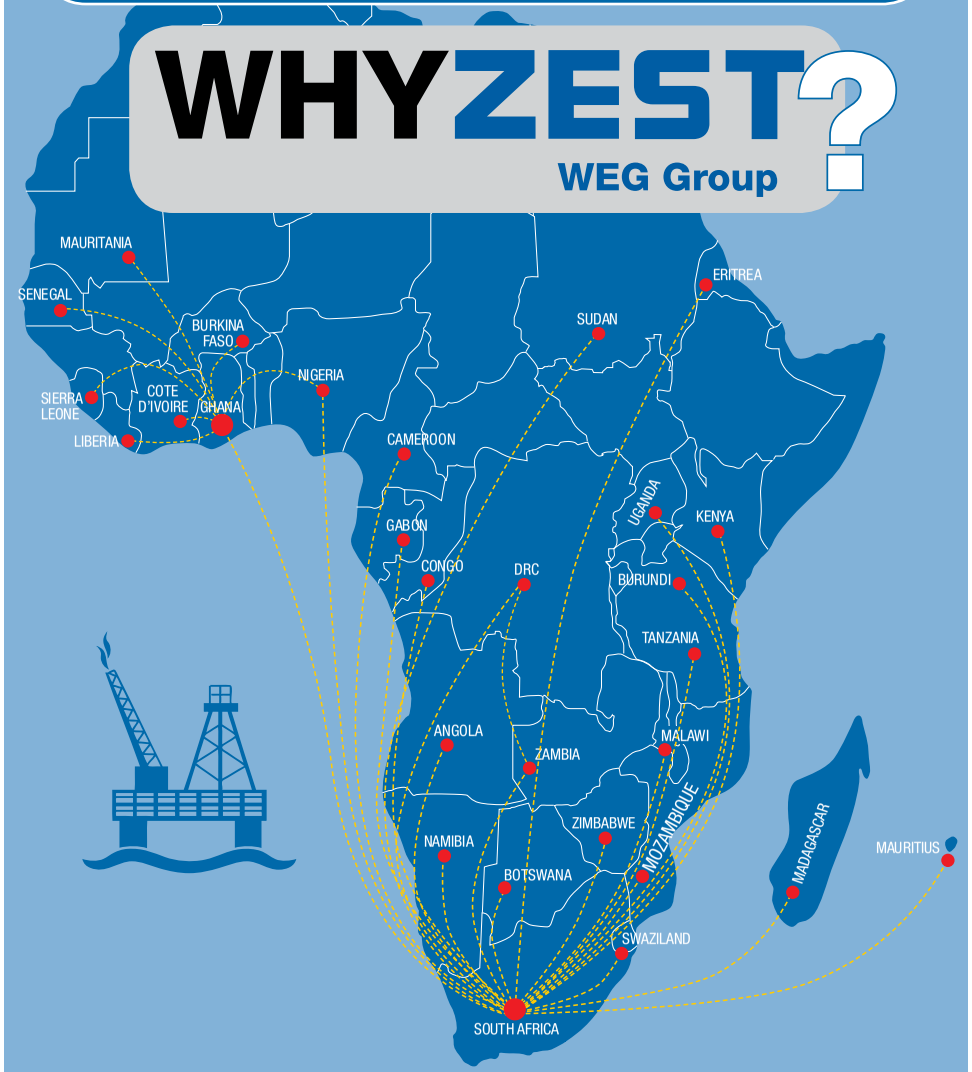

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wattnow magazine

MANAGING EDITOR
Minx Avrabos | minx@saiee.org.za

EDITORS
Derek Woodburn
Jane-Anne Buisson-Street

CONTRIBUTORS
Dr Pat Naidoo
Jane Buisson-Street
Dr Willem du Toit
Barry Gass
Nathan Venter
du Toit Grobler
André Hoffmann
Angela Price

EVENTS
Gerda Geyer | geyerg@saiee.org.za

PHOTOGRAPHER
Heather McCann | 011 682 3298

CPD & COURSE ACCREDITATION
Sue Moseley | suem@saiee.org.za

MEMBERSHIP & TECHNOLOGY LEADERSHIP
Ansie Smith | smitha@saiee.org.za

ADVERTISING
Avenue Advertising
T 011 463 7940 | **F** 086 518 9936
E barbara@avenue.co.za

PUBLISHER
South African Institute of Electrical Engineers

SAIEE HEAD OFFICE
P.O. Box 751253 | Gardenview | 2047
T 011 487 3003 | **F** 011 487 3002
E wattnow@saiee.org.za | **W** www.saiee.org.za
Office Hours: 8am-4pm

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This issue of **watt**now focuses on all what's good about South Africa and its people. It's very easy to get pulled into the political soapie which gets portrayed in the media everyday, but behind the scene, you'll find remarkable people who have put South Africa on the map.

One of those people is Dr Pat Naidoo, the recently inaugurated 2014 SAIEE President. Read his address at the AGM on page 6.

Jane Buisson-Street compiled our feature on page 26. She recants stories of some South Africans who made history and have changed the face of the nation.

The SAIEE Business Director, Stan Bridgens, recently received an old "ESCOM" magazine, dated May 1937, from Roy Reed, one of our retired members. Within this magazine, Dr H. J. van der Bijl, then the Chairman of the Electricity Supply Commission (ESCOM) wrote a letter to their readers celebrating the first year of the "ESCOM magazine", which reads as follows:

"The first year in a new venture is always the most difficult, and ESCOM Magazine has not been unusual in this regard. It has, however, made many thousands of friends in all parts of the country. It is only with the continued and extended co-operation of consumers of electricity that ESCOM can fulfil its mission. I feel that that mission is an important one and as the Magazine continues to achieve its object, so it will be performing a service to the people of South Africa. Primarily ESCOM seeks to bring to the notice of South Africans the services of Electricity to the community – not only its domestic services, but also those to industry and in the everyday needs of modern life. How vast those are we all will realise if we pause to consider for a few moments. So ESCOM, I trust, will continue to provide useful and informative articles and will flourish to enjoy many more birthdays." – Dr. H.J. van der Bijl

On this note, enjoy the May issue. Until next time, enjoy the read.

Minx

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Engineering Electrical Engineers for a World Class South Africa

South Africa is the sparkling diamond of the world. In the passage of time, South African engineers have delivered world first and world class solutions to the agricultural, industrial and post industrial societies.

BY I DR. PAT NAIDOO **I** 2014 SAIEE PRESIDENT

Relocate yourself to any part of the global community and look at South Africa. You will see unlimited opportunity for its people. We have a respected and free country with constitutionally embedded human rights. We have a country with the world's best banking and financial systems. We have the best weather conditions with gentle winds, rain, sunshine and storms.

We have an open country that thrives with all that nature can offer; from the marine life in our two oceans to the wild game in our natural parks; from the fruits of the valleys of the Cape to the abundant bread basket of Central South Africa; from the rolling sugar cane fields of Kwa Zulu Natal to the gold, diamond, coal and platinum natural resources of the Highveld. We have health, wealth, and an abundance of resources with unlimited opportunity for all.

During the passage of time, South African engineers have delivered sterling solutions to the agricultural, industrial and post industrial societies. In every discipline, we have and continue to deliver world first designs and solutions. SAIEE members are professionals engaged in the full spectrum of activities; from academic research to industrial mining and manufacturing processes to providing every day engineering solutions for society. The discipline of activities spans the traditional industries of electronics, telecommunications, information technology, energy, power, mining and transportation. Engineers create wealth and have a direct impact on the quality of life of all our people.

SAIEE, established in 1909, is a world respected learned society of Electrical Engineers. Our founding task was(and still is) to promote electrical engineering and its application for the benefit of South Africans. In 2014, our focus will be on membership. The task at hand is to engineer electrical engineers for a world class South Africa.

TASK 1: TOWARDS A WORLD CLASS SOUTH AFRICA

South Africa, two decades into democracy, continues to face difficult challenges with respect to providing a better quality of life for its entire people. The 20th century industrial-era public infrastructure, designed, built and operated to world class standards, now requires major maintenance, upgrade and refurbishment.

The communities that lacked infrastructure either continue to have no infrastructure or if infrastructure was delivered, in the past twenty years, the quality and affordability of the service remain a challenge. South Africans are generally restless with respect to public utility services. This restlessness is directly impacting on the economic productivity of the nation.

The nation has all the ingredients for providing to its entire people, the best quality public utility services. South Africa has the political goodwill, the natural resources, the financial resources, the technology, the factories, the machinery, plant and equipment and skilled, energetic and empowered human resources to deliver the required solutions.

What mystery holds us back from serving our citizens? Where is that gap? Which technology requires more research and development before application? What is the barrier to world class service delivery? Why are we not delivering on the basic human rights of communications, of water and sanitation, of energy as in electricity and gas?

The gap, to my understanding, is a lack of engineering leadership with sharp customer focus. The sharper the focus is on the customer, the greater will be the purpose of business. By appointment, engineers must lead and manage public utilities and enterprises; the country's rewards will be efficiency and effectiveness of service delivery. Engineers are trained and skilled to employ resources, to design, operate and maintain solutions to customer delight. The positive gains will accrue and will include world class quality service at the least cost.

Our best example of solid engineering leadership with sharp customer focus was Eskom. This was at the turn of the century with global awards and recognition that included the world's top utility and world's lowest cost producer of electrical energy. Quality electricity at the world's lowest cost powered South Africa's engines as we changed political leadership and embraced an open and free society for all.

Another sound example of strong engineering leadership with sharp customer focus is the Peoples Republic of China. The top leadership of the Chinese ruling party are all engineers; the quality of life of its people has greatly improved and the impact of China on the global community has overshadowed even the great superpowers of USA and Russia. China has moved hundreds of millions of its people from poverty to prosperity. We can do it too.

In both examples, the ingredients and resources for success existed. The solution emanated from *"public infrastructural leadership"* [customer focussed engineers] that employed all the existing ingredients and resources and delivered the sterling results.

In association with our sister institutes, we will debate and promote our influence at the highest levels of national government for public infrastructural leadership to be provided by customer focussed engineers.

TASK 2: GROWING WORLD CLASS, CUSTOMER FOCUSSED, ELECTRICAL ENGINEERS

We need each other. In the triangular relationship between Institute member, academia and industry; we need to mentor, coach and guide our electrical engineers to become customer aware, customer sensitive and customer focussed. The service we will receive as a society will be directly proportional to the efforts we make in preparing the electrical engineer.

It is too late to complain of the lights being off, of the unavailability of water or the poor state of the engineering infrastructure when we have not delivered on the development of the electrical engineer that could deliver to our expectations?

We, as the SAIEE must lead. We must gather our members from industry and reach out to our members in academia. We must work together in growing world class electrical engineers. We need to bring into the workplace the students for in-service training and on-the-job learning. Our students need quality work assignments. They need in-depth experiential challenges. We must provide the mentors and supervisors.

This must commence as early as possible in their education; preferably in their first and second years of study. On graduation, we will have solid assistant engineers who could deliver quality work outputs under close supervision and mentorship. With the passing of time, we will develop competent engineers who will take extreme care of our service delivery and who will produce creative and innovative solutions for our businesses. After many years, the professional engineer is finally delivered.

The end is still far away.
The professional engineer will continue to require continuous professional development. Our service as an Institute never ceases. With time, the SAIEE needs to grow from strength to strength and continue to serve new and existing members. All our collective efforts will yield the net result of a growing economy. The status of world class South Africa will be achieved and sustained.

Back to the start of growing engineers; we will need to excite the scholars to pursue a

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career in electrical engineering. Without a strong stream of incoming scholars, the electrical engineering pipeline will become dry and all our efforts will collapse. We call upon all members to contribute to growing the excitement in all our up and coming fellow South Africans. We task every member to adopt their local community primary and high schools; to engage with the school leadership and governing body and to make periodic and regular contributions to growing and enhancing the career of an electrical engineer. This is a noble and honourable output for each member; voluntary and in community.

TASK 3: GROWING OUR MEMBERS' CAPACITY TO SERVE SOUTH AFRICA

Our key members that sustain and grow our contributions to society are located in industries and academia. Without their tireless efforts and sacrifices, we will not achieve the goal of growing the young engineers and attaining the high benchmark of a world class South Africa.

The SAIEE must lead.

We need to create an environment for our members in industry and academia to excel. This environment can emanate if we collectively promote the *"Buy South Africa"* strategy.

The strategy is simple.

We must actively support our members in industry and academia to get a larger slice of the country's orders. This is not an easy call. We cannot edge out our competition by rules and regulations that will erect barriers to competitive practices. This will be false and we will create failed enterprises.

The answer is in greater investments in research and development, in local manufacturing and production, in promoting new materials and technologies and in marketing all our outputs in an increasingly open and competitive market.

We now have a greater call for all our research and development investments to be pooled in the name of South Africa Incorporated. Our plans for 2014 are to get closer to the Ministries of Science and Technology and Trade and Industry, to the National Research Foundation, to the Council for Science and Industry Research, to the Captains of Industry and to the Professors of Academia.

We must pool our collective research and investigations investments, our local product innovation and technology development outputs and our introduction of new materials and designs. We must get the maximum *"bang for the buck"* for South Africa Incorporated. To this end, we will charter and promote *"Corporate Partners"* of the Institute; the collective use of our distributed facilities of test, research and investigations in electrical sciences and new marketing opportunities for members across the border into Southern Africa, Continental Africa and the Global Markets.

TASK 4: GLOBALIZATION OF OUR MEMBERS

Our collective efforts in growing world class engineers will result in our engineers being mobile and global. South African Electrical Engineers will be sought after by the opportunities in the global community. We must continue to serve and export our best skills and our best engineers. To this end, we are actively promoting close working relations with all the local, regional, continental and international Institutes of Electrical Engineers.

In 2013, we concluded and signed a joint memorandum of agreement with IEEE. Originally founded in the United States of America, IEEE is diverse and international with growing membership in Middle East, China, India and Latin America. With English as a common language, IEEE is being challenged to deliver in French, Portuguese, Mandarin, Arabic and Hindu languages.

At the 2013 Innovative Smart Grid Technologies Conference held in Sao Paulo, Brazil, many of the sessions were delivered in Portuguese, the native language of Brazil. In our offering of Continuous Professional Development, we will need to open opportunities for our members to learn and understand the languages of the world.

We have commenced discussions with the British founded IET. We are keen to work with our sister institute in London. We seek for our members Chartered Engineer recognition and qualification. This new initiative will open many more doors for our engineers; especially those countries that comprise the British Commonwealth. We are pursuing similar discussions with the French based Cigre; the Council for Large Electrical Power Systems.

Earlier this year, the Past President and I met with the European Union leader on Utility Telecommunications. The International Utility Telecommunications Council is keen to launch the African Utility Telecommunications Council as their next initiative to grow and support the telecommunications and information technology industry across the African

continent. We have captured this request with both hands. We will make every effort to secure for South Africa and our members their leadership role in this new African effort.

For 2014, we want our members to get active in the cross border markets of Southern Africa. The economy of Southern Africa, of Central Africa, of Eastern Africa and Western Africa is growing from strength to strength. Africa is on the radar for global economic prosperity. We have easy access to all of Africa's markets.

Starting with Southern Africa, we will grow working relations and arrangements with our sister institutes across the border. We will start with the SADC based Southern African Power Pool and then individually work our way through all fourteen countries of SADC.

TASK 5: LEADERSHIP FOR STERLING BUSINESS RESULTS

The Institute is actively served by a dedicated team of members that comprise the Council and by a professional administration that supports Council. Our administration and financial strength has been built up since 1909.

For 2014, we will make every effort to further strengthen our administration of the institute. We will seek all opportunities to reduce cost of service to members and to increase our longer term financial sustainability. Our driving strategy is to administer the institute for neither profit nor loss and to grow our financial investments for longer term prosperity.

"What gets measured, get done".

For 2014, we will continue Council's aggressive approach to achieve sterling business results in the key institute performance areas - see table 1.

CONCLUSION

Society has produced engineers and the expectation of society is to receive service excellence from all our engineers. It is no good to complain when the lights go off, or when the water does not arrive on opening the tap or when potholes litter the roads that you travel upon. It is no good to look towards our political leadership, past and present, to deliver our basic services.

Late President Mandela and his team have done their work; surely we do not expect them to return and now provide all our essential services such as sanitation, water, electricity and gas. Why do we seek answers from Pretoria? The answer lies with us; engineers are trained and skilled to deliver the essential services to society. We need to do our work with excellence and passion.

Engineers never work as individuals. We always work as a team. Teams promote the collection of the best skills, the best experience and the opportunity to train, develop and empower the young and learning engineers. In addition to work based teams, make available your ideas for voluntary work and service to society.

I am always of the view that one obtains multiple gains from a single investment of one's capacity and capability in a voluntary institute. If you invest much more energy and time into the institute, which in itself is a collection of voluntary energies of many members, then by the laws of nature, your gains will be in the multiples. The challenge is with each and every engineer; make that attitude change and join in the workings, management and leadership of the Institute. Your efforts will grow that World Class South Africa.

IN APPRECIATION OF THE ELECTRICITY SUPPLY COMMISSION OF SOUTH AFRICA

My past four decade foundation in engineering commenced with the special efforts of my academic coach, Late Professor Reg Horn, at the vibrant University of Durban Westville. He called upon his colleague, Dr Ian McRae of the Electricity Supply Commission of South Africa, to open doors for graduates from UDW.

In 1983, Tony Britten of Eskom Test and Research, Rosherville, was assigned as my first mentor. My journey with the Electricity Supply Commission, now Eskom, grew from Engineer-in-Training to Senior General Manager of Transmission.

Dr McRae, supported by past CFO Mr Larry Harper and the late Mr. Bruce Crookes, then Transmission Executive Director and later Generation Executive Director, grew me further in engineering our power system, in energising our engineers and employees in serving our customers and South Africa. Our non-negotiable business results were zero accident to employee, contractor, member of the public and the environment; zero disturbances of the electrical power supply; 100% availability and sustainability of power supply; all to be delivered by satisfied employees to delighted customers at the world's lowest cost. This is the Eskom we know of and continue to aspire for South Africa.

Dr McRae, on retirement, handed me over to Mr. Allen Morgan and Chairman Reuel

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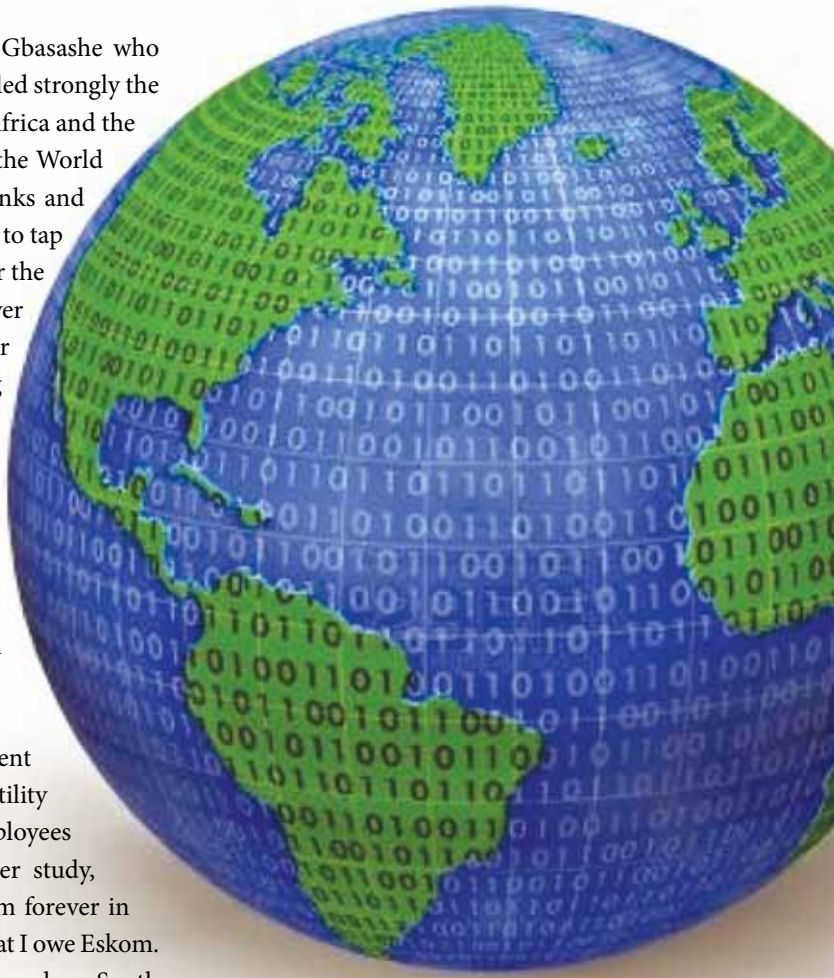
LEADERSHIP TASK	OUTCOME	MEASURE
Task 1: Towards a World Class South Africa	Improved Service Delivery to the benchmark of World Class.	Engagements with National and Local Government
		Conference with Fellow Engineering Institutes and Public Organisations
		Enhanced Decision Making with the Engineering Council of SA
		Active Membership Support for our Public Utilities and Public Enterprises
		Active University Support for Engineering Leadership and Management Development
Task 2 : Growing World Class, Customer Focussed, Electrical Engineers	Delighted Members of Industry and Academia (Universities, High Schools and Primary Schools)	Established and Operating Student Chapters at all South African Universities
		Register of Student Chapter Leaders, Student Members, Industry Supervisors, Academic Supervisors, and Institute Mentors.
		Register of Members and their Adopted Community Based Primary and High Schools
		Asset Register of Promotional Materials for Promoting a Career in Electrical Engineering
Task 3: Growing our Members Capacity to Serve South Africa	Globally competitive industries with active investments in continuous research and development	Active Promotion to Buy South African; to Manufacture Locally and to create new, quality jobs for all.
		Workshop Supplier Development and Localization Strategies and Opportunities
		SA Inc. Pool of Facilities for Electrical Science Test, Research and Investigations
		Register of Existing and New Academic Chairs of Research and Corporate Partners
		Celebrate New Products and Technologies Developed by Members
Task 4 : Globalization of our Members	Open access for all our members to the global community	Joint MOU's with local, regional, continental and international institutes of electrical engineering
		Chartered Engineer Recognition for Members
Task 5 : Leadership for Sterling Business Results	Longer Term Sustainable Institute for Members	A Non Negotiable Business Result of ZERO ACCIDENT to member, to staff, to members of the public and impact to the environment.
		Financial Discipline
		Values of the Institute
		Grow our membership nationally, regionally, continentally and internationally. Target sectors are practicing engineers locally and regionally and students.
		Sustain and grow CPD offerings to members
		Grow new markets in CPD courses to become the service provider of choice to public utilities and public enterprises.

Table 1

Khoza. The next journey with Eskom, introduced me to South Africa's re-admittance to the world community and the start of the Southern African Power Pool; the establishment, operations and management of the Power Pool and the Co-Ordination Centre in Harare, Zimbabwe. We proudly raised the Southern African Power Pool, SADC flag side by side with the National Flag of South Africa and that of Eskom at Eskom's National Control Complex in Germiston. This signalled our start of the vast interconnection of the regional power grid from Cape Town to Kinshasa; from Maputo to Windhoek.

Mr. Morgan, on retirement, handed me over to Mr. Thulani Gbasashe who promptly took me into his office as Senior General Manager. He led strongly the Eskom Enterprise drive for greater workings with Continental Africa and the International Community. He actively harnessed the inputs of the World Energy Council, the World Bank and Global Development Banks and set the wheels in motion for the greatest engineering assignment to tap the natural, renewable energy of the free flowing Congo River for the benefit of all of SADC and Continental Africa. The Western Power Corridor Company was born under his watch. He went further and built strong links with all the international engineering institutes and the power utilities of the world, especially that of China and India. He supported Eskom Enterprises growth and Eskom successfully concluded many consultancy and engineering assignments in Africa, India and China. In fact, Eskom engineers consulted and engineered China's first 750 kV North West Grid pilot project and India's first 765 kV Sipat to Senoi Transmission Circuit. China and India continue to grow in capability and capacity to that of world super power status.



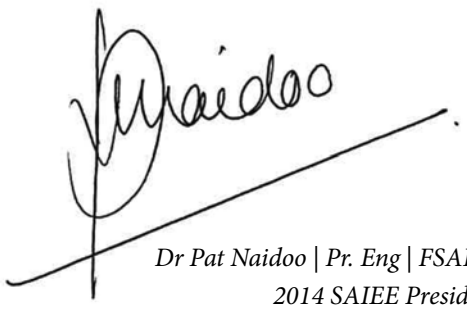
Eskom grew from strength to strength and in 2001, Thulani went to New York and collected the Financial Times Global Power Utility Award. As Eskom grew, our customers prospered and we as employees also got the opportunity to grow our own careers by further study, publication and participation with our international peers. I am forever in service of Eskom and continue my workings in the confidence that I owe Eskom. Thank you to Eskom and to all my mentors and leaders. You have done South Africa proud and delivered the sparkling diamond of the global community. Our task on hand is to polish up that diamond.

Thank you to all my colleagues at all the institutes locally, regionally, continentally and internationally. Thank you to all my industry and academic work teams at all the sites scattered across the globe. You have made my career as an engineer exciting and enjoyable; my journey in work assignments and academic study continues for another three decades. Your guidance, coaching and mentorship continue to energise me forward.

Thank you to our members, our Centre, Section and Committee Chairs, the Members of Council, all Past Presidents, our Business Director and all our employees for the opportunity to lead the team in 2014.

We have exciting work ahead. Let us all add our energy, our strength and creative ideas in making South Africa World Class.

Thank you.



Dr Pat Naidoo | Pr. Eng | FSAIEE
2014 SAIEE President

WATTSHOT

Mother's Day 2014 is taking place on 11th of May.
Herewith a few ideas to treat the special Mother in your life....
and do not forget the Mother-in-Law!

Mother's day Bloom

Amaze your Special Mom or Partner with this exciting Chocolate arrangement. For info, visit www.sweetbouquet.co.za
Price: R299 (incl.)

Pâté and Red Wine Hamper

A gift box containing 3 assorted pâtés, Melba Toast & a bottle of Leopard's Leap Cabernet Sauvignon wine.
www.kalahari.com. Price: R400 (incl.)

Illy Coffee and Lindt Chocolate Hamper

This is the perfect hamper for those who love coffee. www.kalahari.com
Price: R975 (incl.)

Lindt Chocolate Hamper

The perfect hamper that will keep her happy for days.www.flir.com www.kalahari.com
Price: R810 (incl.)

Charlotte Rhys Travel Hamper

This hamper is ideal for the frequent travelling Mother-in-Law.
www.kalahari.com Price: R430 (incl.)

Gardeners Therapy Box

This perfect gift for the avid gardener. Protect those hands and nails. www.kalahari.com Price: R260 (incl.)

Foot spa Box

Refreshing fig, pear & vanilla scented foot balm and spray, foot file and nailbrush. www.thelittlebox.co.za. Price: R280 (incl.)

Classic Ladies Box

Relax & enjoy a delicious hot chocolate with a selection of chocolates, nougat & biscotti! www.thelittlebox.co.za Price: R400 (incl.)

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Biscotti, dried fruits, nuts & chocolates to enjoy with a cup of chai rooibos tea. www.thelittlebox.co.za Price: R350 (incl.)

Pampering Mini-break for Two, Plettenberg Bay

Stay two nights at the Whalesong Hotel and Hydro situated on the beautiful Garden Route coastline just outside Plettenberg Bay. This exquisitely appointed getaway is perfect for that romantic mini-break. Breakfast can be enjoyed out on the balcony near the pool with endless views across the ocean. Look out for whales! With a multitude of awesome activities on your doorstep you are certain to enjoy your breakaway in this lively town. For more info, visit www.giftexperiencesouthafrica.co.za. T&C's apply. Price: R3 799 (incl.)

Art Classes- JHB

Enjoy a 4 class introduction to the great world of mixed media art. Price: R979 (incl.) www.giftexperiencesouthafrica.co.za.

Mood Enhancing Candles

Create soothing aromas in your home with these 3-piece luxury mood enhancing candles from CaraMia. Go ahead, spoil her! www.kalahari.com Price: R198.36 (incl.)

Willow Tree You and Me Figure

This piece represents a couple who are navigating life together - the challenges, the joys and the daily decisions that come with being a family. It expresses an appreciation of the little things that make life interesting. It is the trust and support of each other day in and day out that strengthen love and keep us in it for the long haul. Hand crafted from resin but resembles carved wood. Hand painted. Gift Box. www.kalahari.com Price: R599 (incl)

WATTSUP

SAIEE Annual General Meeting

The 2014 SAIEE President, Dr Pat Naidoo was inaugurated at the annual general meeting held at the SA Museum of Military History in Johannesburg. Paul van Niekerk handed a cheque from the 2013 SAIEE Charity Golf Day proceeds to Ingrid Dyzel from Girls & Boys Town.

Mr Mario Babolini was appointed as Honorary Vice President and Mr Jacob Machinjike was inducted as Junior Vice President.

A premium and certificate were awarded to T Walingo and Prof. F Takawira for their paper titled: *"Cross Layer Extended Parameter Call Admission Control For Future Networks"* published in the March 2013 issue of the SAIEE Africa Research Journal.

L – R: Paul van Niekerk (2013 SAIEE President) congratulating the newly inaugurated 2014 SAIEE President, Dr Pat Naidoo.

Paul van Niekerk with Ingrid Dyzel of Girls & Boys Town.

Prof Takawira accepted the award for best ARJ paper from Paul van Niekerk.

Maureen Naidoo handing flowers to the Immediate Past President's wife, Elizabeth van Niekerk.

Dr Pat Naidoo with Junior Vice President, Jacob Machinjike.

The Naidoo family.

Honorary Vice President, Mario Babolini.

Stan Bridgens with Minx Avrabos.

Events Organiser, Gerda Geyer.

SAIEE Visit to the Airplane Factory

I have seldom been so excited by the presence of numerous beautiful small aeroplanes, all perfectly designed and built at this impressive factory in the south of Johannesburg. The trade name of the product is "Sling 2" or "Sling 4" depending on number of seats.

The machines which cuts the aluminium and punch rivet holes are very impressive. It is numerically controlled monsters and the parts that are produced, are perfect. Some aeroplanes are assembled by the resident expert teams and others are shipped all over the world in containers ready for assembly. The engines, which are imported from Austria, are works of art.

The afternoon ended with excellent snacks and refreshments.

Airplane Factory Director, Mike Blyth, has promised to take some of our members for flips at the next visit and I'm sure that will be an equally interesting and impressive visit. We all felt very proud of this South African achievement!

Mike Crouch
Past President SAIEE

SAIEE members were in 'high' spirit after the site visit.

Director of the Airplane Factory, Mike Blyth with one of his trusted aircraft mechanics.

Zest WEG Group restructures its Executive Team

The Zest WEG Group has announced a complete restructure of its executive team, with the intention of establishing the skills and focus needed to accelerate the growth of the Group's activities into other African markets.

"The WEG Group, our parent organisation, has set in motion a strategic plan to increase its sales by at least 17% year on year until 2020, when it aims to arrive at a turnover of US$10-billion. To this end we've set in motion a number of initiatives to increase our presence in other African countries," Louis Meiring, Zest WEG Group CEO, says. *"These initiatives will not in any way compromise the service and support currently enjoyed by our South African customer base, because we're adjusting our business to enhance the skills of our existing personnel and also bringing additional people on board."*

One of the major changes within the Zest WEG Group's executive team is the appointment of an additional board member to fulfil the newly-created role of group automation and systems director. This board member, currently being relocated to the South African operation from WEG in Brazil, will focus on driving the expansion of the Group's automation and systems business, which encompasses Shaw Controls, EnI Electrical and the genset division, beyond South Africa.

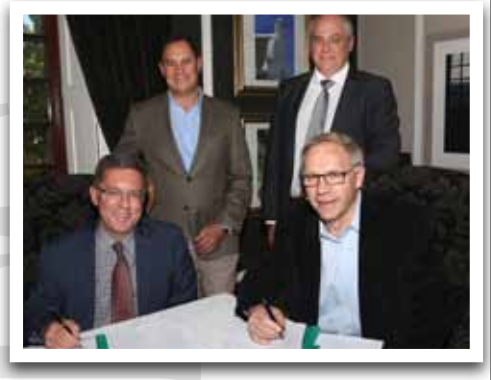
Another change in the executive team structure will see Gary Daines, group sales and marketing director, take on more responsibility — notably driving the strategic growth of WEG Transformers Africa and Zest Energy. Each Zest WEG Group company will retain its existing managing directors, who report in to the executive team.

"We estimate that the number of people employed by the Zest WEG Group today will not be sufficient to achieve our own specific 2020 goals," says Meiring. *"To address this, the executive team has started adjusting our business model and gearing up, in terms of training and developing the skills of our people, to be able to achieve the necessary future technical capabilities."*

Louis Meiring, Zest WEG Group CEO

SOLAR ENERGY RESEARCH BOOSTED

South Africa's renewable energy research capacity has been bolstered through establishment of the Scatec Solar Chair in Photovoltaic (PV) Systems at Stellenbosch University (SU).



Prof Eugene Cloete, Vice-Rector: Research and Innovation at Stellenbosch University (SU) and Mr Raymond Carlsen, CEO of Scatec Solar. At the back are Prof Wikus van Niekerk, Director of the Centre for Renewable and Sustainable Energy Studies at SU and Prof Hansie Knoetze, Dean of the Faculty of Engineering at SU.

The Chair is supported by Norwegian global solar energy provider Scatec Solar, which is the first company to supply electricity to South Africa's national grid under the country's Renewable Energy Independent Power Producer Programme (REIPPPP).

Scatec Solar recently signed a contract with SU to establish the new Chair, which will enable the university to expand its leading role in renewable energy research in South Africa. SU's Centre for Renewable and Sustainable Energy Studies and a number of departments work together in such fields as solar thermal energy, bio-fuels, wind turbine technology and ocean energy.

According to Professor Wikus van Niekerk, Director of the Centre for Renewable and Sustainable Energy Studies: *"The support from Scatec Solar will be used to appoint a leading academic as a professor in the Department of Electrical and Electronic Engineering with the task to coordinate and expand existing PV research."* The department's current focus on grid integration of small-scale rooftop PV systems will be expanded to incorporate utility scale PV power plants.

"Research will focus on optimising electricity generation from PV plants and will cover photovoltaic modules, inverters, support structures, system performance and the effects of soiling, grid integration and stability, and other technical issues," explains Scatec Solar CEO Raymond Carlsen. *"The Chair will form partnerships with other research institutions in the general field of PV systems, including the development of collaborative projects, specialised consulting services for industry, and establishing additional funding streams for PV research at SU."*

The Chair will provide support for a PV industry, which is set to show phenomenal growth in South Africa, from a mere 30 megawatts (MW) of installed capacity in 2012 to between 12 000MW and 20 000MW by 2035, according to a study commissioned by the SA Photovoltaic Industry Association, the Department of Trade and Industry and the World Wildlife Fund. PV market growth will be driven not only by utility-scale projects under the REIPPPP, says the study, but even more so by companies that install the technology to reduce their exposure to rising electricity tariffs and carbon taxes, and to some extent by homeowners.

Government has already contracted 1 484MW of PV capacity from independent producers under the REIPPPP. Scatec Solar is developing three PV plants with combined installed capacity of 190MW. Its first project, the 75MW Kalkbult park in the Northern Cape, was completed three months ahead of schedule late last year and became the first utility-scale renewable energy plant to supply electricity to South Africa's national grid. Scatec Solar and partners are also developing East Africa's first utility-scale PV plant in Rwanda.

INTELLIGENT ENERGY MANAGEMENT COMPANY MANUFACTURES LOCALLY

carbonTRACK South Africa, the local representative of an Australian company that developed a smart energy management platform to allow corporate and private users to remotely measure, monitor and manage their electricity consumption using their phone, tablet or desktop, all in real-time, has begun manufacturing the intelligent devices in South Africa.

carbonTRACK interfaces with conventional electrical hot water geysers, renewable energy devices such as solar water heating geysers, heat pumps and tracks solar panel energy generation.

In this way, the platform allows business and homeowners to take advantage of direct savings by better monitoring and controlling their energy consumption in real-time. The interface is simple and easy to understand; savings are transparent and understandable. Under certain conditions, energy savings in the residential sector have peaked at 40% of the energy bill.

According to carbonTRACK SA's CEO, Irvan Damon, the decision to manufacture locally marks the completion of three year process to attune the smart platform to the local environment, and highlights the firm's commitment to South Africa and the continent.

Damon, a local supporter of the Internet of Things, said that, possibly more than anywhere else in the world, electricity grids in Africa are under enormous pressure and the lack of supply has severe repercussions across many residential and business sectors, including manufacturing, distribution and retail.

"The Internet of Things (IoTs) – or as I would prefer – the Internet of Green Things (IoGTS), refers to a network of connected machines or appliances embedded with sensors, digitally

communicating bytes of information across the internet to devices like your smart phone, tablet or desktop," he said.

"Technology experts such as Cisco's Internet Business Solutions Group (IBSG) predict that by 2020 the number of devices on the planet will fast approach 50 billion – seven for every person. These intelligent devices will accelerate lifestyle improvements, business efficiencies, household safety, healthcare innovations and could have a profound ability to change the way we deal with climate change. carbonTRACK is firmly embedded into the IoT economy.

"For example, in the cold and hot chain sector in Australia, the technology has been used to track critical temperatures and protect assets. In South Africa, this sector generates almost 10% of our GDP.

"In South Africa, with its spiralling electricity tariffs representing an increasingly important cost centre for consumers, monitoring and switching energy loads, flow and temperature real-time is an urgent requirement. Embracing IoGT technologies like the carbonTRACK platform will allow us as a nation to more effectively control factory floors, utilities and traffic flow as well as our precious natural resources.

"Furthermore, the South African insurance sector replaces 250 000 electrical geysers every year. carbonTRACK's pre-emptive alerts will reduce the resultant damage caused by faulty geysers, reducing direct costs to the insurers and premium increases for policy holders," he said.

Leading up to the appointment of a local manufacturing partner, CarbonTRACK SA piloted extensively amongst residential to commercial entities as well as power utility, Eskom. These included leading banking instiutions, Samsung, South Africa's national mobile operators, Highergrround Restaurant, Kong Restaurant, and certain insurance houses.

Having recently been endorsed by the Eskom rebate programme, the locally manufactured units have complied with all local and international performance and safety tests:

- SANS IEC 60950/SANS IEC 61010/ SANS IEC 60730
- Electromagnetic Compatibility
- ICASA-approved
- SANS IEC 60669/SANS 181:2004
- LOAs issued by the NRCS/RCC number 1302637

They've also garnered the SABS mark of approval and are a member of Proudly South African, while the manufacturing partner has more than 20 years' experience in the sector and is ISO 9001 compliant.

NEW SMART METER FOR AFRICA

A new variant of the OMNIPOWER smart meter, laid out for British Standard Plugs, is announced by Kamstrup. Leveraging the benefits of smart metering, the meter offers a truly reliable solution to the challenges of managing a strained African energy infrastructure.

When the power supply is on a knife edge and demand is close to exceeding the supply capability, the need for controlling the demand side is high.

The ability to limit load, control time of use and monitor consumption become crucial. While this is the prevailing situation in many African regions, help can be found in a new smart meter.

Though difficult to quantify, electricity theft is generally considered a major contributor to the problems of African power supply.

While campaigns can help building awareness about the problem, the actual detection of theft is still a hurdle. With anti-theft technology electronic smart meters can monitor a meter installation 24/7 and detect tampering and theft.

Country Manager of Kamstrup South Africa, Petrus Van Heerden says: *"Electricity theft is a major problem in our region that can only be addressed by the roll out of smart meters and smart meter infrastructure.*

Electricity is stolen through illegal power connections, meter tampering and bypassing, illegal electrifications, and the sale of illegal prepaid electricity vouchers from stolen vending machines. It causes massive lost revenue and imposes a high workload on the utilities.

The OMNIPOWER smart meter warns immediately in case of tamper and attempts to physically access the meter and secures accurate and reliable metering data for billing and documentation purposes in near real time."

Smart meters will communicate consumption data to the utility wirelessly and provide immediate notification of irregularities, peaks and power-outs. Being able to foresee problems, utilities can respond quicker and shorten power restoration times.

The OMNIPOWER smart meter also holds a remote controlled breaker function, which enables the utility to disconnect supply to non-critical installations in case of overload. The same breaker can be used as an updated version of traditional prepayment functionality, allowing the smart meter to connect or disconnect supply according to the kWh paid up front.

With an own power consumption of only 0,6W, the OMNIPOWER smart meter also takes a lead in low-power.

Sales Manager, Hans Peter Kyk, says: "Not many consider the fact, that smart meters too are consuming power. But changing to a low-power unit, utilities can benefit from power savings from day 1 and with an expected life time of 10+ years, considerable savings can be achieved on this account".

In search of brilliance . . .

Eskom's Energy Efficient Lighting Design Competition is challenging the finest design engineering talent in the country to merge creative flair and trend-setting artistry with no-nonsense functionality – and come up with beautiful solutions in lighting design that will last a lifetime.

Few design elements are as versatile and wield as much power to define and transfigure a space as does light. Yet, despite its endless possibilities, the power of lighting as a design tool is often underestimated.

Engineers, electrical contractors, DIY-homeowners and other artistic souls are challenged to think beyond convention, and use their intuition and imagination to design (and build) a lamp prototype that not only works, but makes use of energy-efficient technology, such as compact fluorescent lamps (CFLs), light-emitting diodes (LEDs), fibre optic or any energy-efficient lighting system or product suitable for residential application.

The call is to meet the challenge of striking the perfect balance between functionality and creative expression.

PRIZES

The total prize value of R200 000 is awarded as follows:

Category A: Residential Luminaire Design (Students)

Full-time students at all tertiary institutions (universities, colleges, design centres and schools of design) in South Africa are invited to submit a luminaire design using an energy efficient light source, suitable for use in the home.

First prize:	R30 000
Second prize:	R20 000
Third prize:	R10 000
Educational institution prize:	R10 000
Top regional finalists (6):	
Lenovo 7" Android tablet (wifi and 3G enabled)	
Total prize value:	R85 000

Category B: Innovative Energy Efficient Lighting Design (Professional)

In Category B, professional graphic designers, architects, electrical engineers, product designers, researchers and anyone with a passion for design are invited to submit innovative energy efficient designs, systems or products, suitable for residential application.

First prize:	R 40 000
Top regional finalists (6):	R 5 000 each
Total prize money:	R 70 000

Category C: Most Promising Young Designer (Learners)

Promising young designers from secondary schools and FET or independent colleges, between the age of 14 and 20, are invited to submit innovative energy efficient designs, systems or products, suitable for residential application.

Most Promising Designer (Individual):	R 10 000
Top regional finalists (6):	
Lenovo 7" Android tablet (wifi and 3G enabled)	
Educational institution prize money:	R10 000
Total prize value:	R 35 000

Special Discretionary Award:

Most Promising Designer (Individual):	R 10 000
Total prize money:	R 10 000

If you have the ability to achieve that magical mix of artistry and functionality, let your imagination run wild! The closing date for entries is 15 August 2014. For more information on specifications, evaluation criteria and entry forms, visit www.lighting-design.co.za, or send an e-mail to karin@dalajunction.co.za.









A number of wind turbine projects are being planned to help address South Africa's crippling power shortage with more sustainable forms of electricity generation.

Harnessing the power of wind

While solar energy remains a leading light in terms of renewable energy resources, wind power generation does have an important role to play in regions like the Eastern Cape and other exposed areas where consistent wind is experienced and the landscape is not conducive to solar options.

A leading supplier of cabling for all renewable energy projects in South Africa, Helukabel South Africa, is stocking-up and preparing for the sheer number of projects that it expects to be approved in the nearby future, both in South Africa and elsewhere in Africa. The company already supplies a massive amount of cables for both forms of renewable power generation in the region and has tailored its offering with dedicated cables that are designed specifically for each type of plant.

TECHNOLOGY COMES OF AGE

Heluwind power cables and dedicated accessories are designed to fit seamlessly into each step of the assembly of a wind turbine plant, making the entire electrical installation project a far simpler undertaking. Stock holdings, ordering and statutory requirements (in terms of compliances and quality control) are also simplified with the use of a single-source supplier.

"Helukabel has been integrally involved with those specialists worldwide who originally developed the technologies that are used in wind turbines today. Since those early days we have continued to work with them to develop cabling technology that is suitable for every aspect of the project from infrastructural and tower cables, to electrical, transmission, data and communications cables and even the security and monitoring systems.

"That means that the designers usually look no further than Helukabel when they are designing a wind turbine plant, as all cables are custom-made for wind power generation and have all the necessary certifications and approvals that are required internationally for this type of plant," says Doug Gunnewegh.

RAPID DEPLOYMENT

He continues that interlinking the complex cabling systems within a plant is seamless when using Helukabel accessories that match the different types of cables used on these plants. This can significantly speed up installation time and leads to tidier, neater and safer terminations and joints throughout the plant. Similarly the types of cables used are manufactured to have the right properties required for the task and are designed to minimise problems during the installation phase, as well as throughout its entire useful life.

In the case of Heluwind and other dedicated wind turbine cables supplied by Helukabel, they are designed to far exceed the requested life span. So despite cables being subjected to extreme stress, torsion in these harsh conditions on a daily basis, they will still maintain their integrity throughout their required length of service. *"These cables are specially made to withstand the specific stresses and strains of the roles that they are intended for. This includes anything from the ability to withstand great torsion as a result of the extreme height that the cables are drawn to, or even the onslaught of rodents that may be attracted to heat sources etc in rural areas where the towers are usually situated. Its fair to say that after more than 30 years of manufacturing specialty cables for this industry, our engineers have seen it all and have learned to cater for almost any eventuality,"* Doug adds.

FIT FOR PURPOSE

Helukabel cables are tested at the company's research institute in Germany. Tests include the full requirement of electrical, torsion (to more than 16 000 cycles) and other tests as required to ensure functional properties are correct. Further testing is also conducted to ensure that the cables' operational reliability is significantly longer than the standard lifetime of a wind turbine.

As a result, the company's cables are installed in thousands of wind turbines worldwide, providing reliable service onshore and offshore under climate conditions as diverse as those found in the cold blustery climes of Scandinavia to harsh climates of Africa. wn

Tobias Nittel
Field Technology Manager
SEW-Eurodrive

The growing trend of energy efficiency

Specialist drive engineering company SEW-EURODRIVE recently hosted several informative presentations regarding the latest technological developments in the food and beverage industry, with particular focus on the growing trend of energy efficiency within industry.

Tobias Nittel, Field Technology Manager at SEW-Eurodrive explains that energy efficiency is no longer a market trend, but a market development. "This means that we develop an end-value for a product. One end-value that is being increasingly discussed is energy saving, reduction of energy consumption and reduction of power supply in general. It is not only a monetary saving, but also how to lessen the installed power and to optimise transformer power, installation and wiring."

There is a new standard that for the first time has internationally harmonised energy efficiency for three phase electrical motors. Every supplier who sells electrical motors for a three phase system has to commit to these efficiency regulations, specified by the International Electrotechnical Commission (IEC). There are four energy efficiency classes under the new standard; IE1, IE2, IE3 and IE4. With the introduction of the new efficiency class, Nittel points out that SEW-Eurodrive has had to change its motor portfolio.

He adds that there are two ways to increase the energy efficiency of a motor. "One way to increase the energy efficiency of a motor is to increase the physical volume in relation to its rated power.

However, this can pose a problem for customers, as a physically bigger motor means that a larger area is required and the motor can be more difficult to handle and install. A second option is to use a higher quality material, which increases the energy efficiency, while allowing the motor to remain small in size."

SEW-Eurodrive recently introduced the mechatronic MOVIGEAR and DRC motors as a more accurate and precise process solution. With the MOVIGEAR and DRC motors, SEW-Eurodrive has tried to create the best package and the best system solution for an application. "MOVIGEAR servomotors are higher quality motors. They feature a new characteristic, which is the integration of the gearbox, servomotor and inverter, which has not been done in the past. It is an integrated drive solution, whereas the DRC motor, which features only integrated inverter and servo-motor is a flexible, universal drive solution."

The integrated electronics of the MOVIGEAR and DRC systems means that there is less cabling and wiring, which results in a more efficient system. This has created a more compact and powerful drive solution for conveying, adds Nittel.

"MOVIGEAR is the ideal solution for horizontal conveying, as well as incline and decline conveying within several industries. The housing has been designed with no fan or fan guard, making it ideal for use in industries where there are strict hygiene standards and regular cleaning processes.

These drive systems from SEW-Eurodrive are made from die-cast aluminium. This saves energy during the production of the units, as well as having the added benefit of reducing the carbon footprint. The units are also lighter and easier to handle.

The DRC motors are based on the same philosophy as MOVIGEAR. In order to make them more flexible, however, they do not feature a gearbox, which allows for larger power and torque ranges. The system efficiency of these motors depends on the choice of gearbox.

In order to have the highest system efficiency, it is important to select the best gearbox. Integrating the electronics into the motor also reduces the losses. To maximise the energy efficiency of a drive system, Nittel believes that it is necessary to integrate the electronics on the motor.

"Energy efficiency does not only relate to the drive, but also to the controls, infrastructure, and the efficiency of the infrastructure for installing, start-up time and time for finding problems. Our food packaging is a decentralised installation. We have the electronics on the motor with the SEW drive infrastructure. There are applications where cabinet based invertors must be used, but there are additional losses with a cabinet based installation," he continues.

As part of the drive to simplify installation and minimize start-up time, SEW has developed the Single Line Network Installation concept for use with MOVIGEAR and DRC. This development allows for a single 4 core cable to be daisy-chained from one SEW controller to 10 MOVIGEAR or DRC slaves. This single cable carriers both the power and communication to the slaves.

SEW-Eurodrive has developed a special High Protection (HP) 200 coating for use on the MOVIGEAR units. HP200 is a powdered coat that is baked onto the unit at a high temperature before assembly. It is more resistant than paint to the chemicals and cleaning agents used in cleaning meat, chicken, fish and dairy processing lines. This process is more environmentally friendly as traditional painting of the units also adds dramatically to the unit's carbon footprint.

MOVIGEAR drives reduce the number of variants in a system, and allows for operating speed control and positioning control, thereby optimising the system as a whole. "Many customers have been discussing the IEC classes and more people are starting to look at energy saving. SEW-EURODRIVE is looking for a solution to reduce energy in all operational conditions. In addition to energy efficiency, we can also increase the functionality of the drives in positioning applications in the line, in order to reduce the number of variants," Nittel concludes. wn

Quantifying the benefit of network visibility (NV) on medium voltage (MV) lines

An EON delegation consisting of Bertha Dlamini (MD, EON Consulting), Mark Mitchell (Director, Engineering Consulting at EON Consulting) and Dieter Gütschow (Principle Consultant at EON Consulting) attended the combined POWER-GEN and DistribuTECH Africa conference in Cape Town recently.

The conference saw a large number of local and international industry experts sharing their views on issues affecting power generation, transmission and distribution on the African continent. The need for a shared energy vision and long-term energy planning in Africa to unlock Africa's huge energy potential was a central theme throughout the conference. The keynote speeches were delivered by amongst others Dr Wolsey Barnard, Deputy Director General: Programmes and Projects (South African Department of Energy), Mr Daniel Poneman, Deputy Secretary of Energy (US Department of Energy), and Dr Steve Lennon, Group Executive for Sustainability (Eskom).

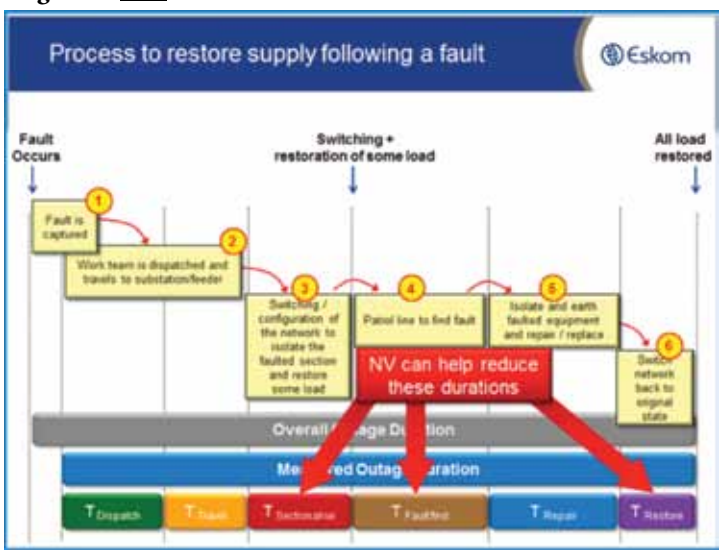
Over the three conference days more than 150 presentations were made and more than a 100 companies exhibited their products and services. The DistribuTECH section of the conference focused very much on smart grid development and communication, business operations, and asset management.

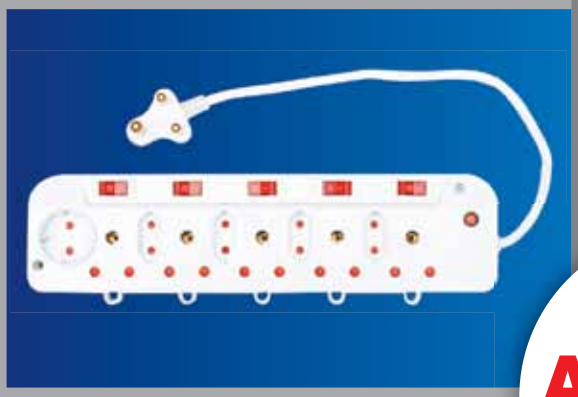
Aligned with the themes of smart grid and operational efficiency, Dieter Gütschow co-authored a paper with Kenneth Brown (from Eskom) entitled *"Quantifying the benefit of network visibility on overhead MV lines."* The paper was the result of five years of research and examined the methodology that EON (Martin Cameron, Johanette van der Merwe, Johan Coetzer and Dieter Gütschow) developed to quantify the impact on reliability, as well as costs and benefits, of various capital interventions such as network visibility on Eskom's MV network.

The presentation elicited a great deal of praise, especially from international experts who commended Eskom and EON on the initiative and quality of work done. Most other companies that presented similar topics focused on theoretical benefits of various interventions. What distinguishes Eskom/EON's presentation and approach is that the results are based on investment scenarios using Eskom's actual MV network data e.g. length of feeders, number of customers, equipment installed etc. For example, some of the scenarios involve the optimal placement of more than 30 000 devices on Eskom's network.

The results show that benefit-cost ratios vary – not only on the type of intervention and equipment involved, but that the sequence of interventions was also critical to yield the maximum economic benefit for least investment cost. This is a significant finding which challenges the traditional thinking that it's more beneficial to install auto-reclosers before fault path indicators. The results will enable Eskom to optimise its investment strategies for network visibility to improve network reliability.

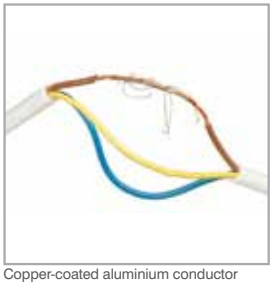
The complete paper will be published in the June issue of wattnow magazine. wn



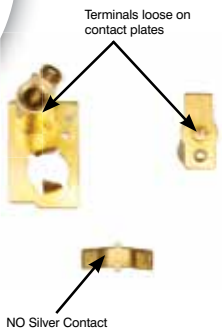


BE AWARE!

Make the right choice



Copper-coated aluminium conductor



These products *are unsafe!*

How can you tell?

There are many sub-standard electrical products and services on offer to South African individuals and organizations, usually at lower prices than those that meet safety and functionality requirements.

The blatant flouting of regulations applicable to many of these products and services is one issue. The danger that these offerings pose to users is of much greater concern.

SAFE™ HOUSE
Suppliers you can trust

The South African Safehouse Association has been established to combat this proliferation of dangerous products and services by:

- Making the market aware of the risks in using such products and services
- Exposing sub-standard products and services
- Persuading specifiers, suppliers and distribution channels not to recommend or to offer such products and services for sale

The products depicted here are but a handful, typifying how easily such products can be purchased or specified, often without the buyer being able to see or recognize their deficiencies. These products each contravene one or more of the following compulsory standards: **SANS 164-1, SANS IEC 60884-1, SANS 164 - 2, SANS 164 - 6, SANS 60884-1 and SANS 60227-5.**

If you cannot see the danger, ask for products and services supplied by a Safehouse member.
Safehouse members have signed a code of conduct - your assurance of their commitment to responsible behaviour.

The SA Safehouse Association is an independent, registered, non-profit organization established by the electrical industry and committed to communicating with customers. For more information about the SAFEhouse Association: Pierre Nothard Cell: 083 414 4980
Tel: 011 396 8140 | Email: pierren@safehousesa.co.za | **www.safehousesa.co.za**

Be Safe. Recommend and use SAFEhouse members' products and services:

ABERDARE CABLES · APEX · ARB Electrical Wholesalers · Buildit · Hi electric · CED · Crabtree · DYNAMIC DISTRIBUTORS · *ElectroBase · ELLIES · eurolux · HellermannTyton · legrand · MAJOR · M·E·S · PMCG PRETORIA MOTOR CONTROL GEAR PRODUCTS · Schneider Electric · THREE-D · TVE · voltex

*For participating members please see the Safehouse website **www.safehousesa.co.za**

As at 19/03/2014

LOOKING BACK...

South African Inventions, Innovations, Firsts and Interesting Facts

Where would you expect to find the inventor of the CAT scan, the makers of the "speed gun" used in cricket ovals the world over, or the world's first oil-from-coal refinery? There's a wide range of innovative and entrepreneurial activity in South Africa, backed up by a number of organisations that provide support for budding inventors and innovators. Some of the world firsts South Africa can lay claim to are depicted in this article.

COMPILED BY | JANE BUISSON-STREET
SMSAIEE | PMIITPSA

1882: ELECTRIC STREET LIGHTS

Kimberly was the first town in the southern hemisphere to install electric street lights on 2nd September.

1925: AFRIKAANS

The youngest language in the world, Afrikaans was first recognised as an official language in 1925.

1927: OIL FROM COAL

Sasol is the world's first, and largest, oil-from-coal refinery, providing 40% of South Africa's fuel.

The history of Sasol began in 1927 when a White Paper was tabled in Parliament to investigate the establishment of a South African oil-from-coal industry.

1938: THE COELACANTH

Believed to have been extinct since the end of the Cretaceous period – about 145.5 million years ago - the first Coelacanth was found off the east coast of South Africa off the Chalumna River.

1950: Q20

A KwaZulu-Natal resident, Mr Robertson,

invented the product to displace water from the distributor caps of his VW Beetle, notorious for stalling in wet weather. Initially he did not know what to call it, but since it had 20 answers to 20 questions Q20 seemed the obvious choice.

LATE 1950S: VENTER TRAILERS

Venter is not so much a brand as a South African icon, since the Venter family started producing collapsible caravans in the late 1950's in Naboomspruit, the name has become synonymous with transporting everything from commercial goods to holiday luggage.

1958: POWER-FREE FOETAL HEART MONITOR

This portable and extremely useful device developed by Cape Town paediatrician Dr Dave Woods and a team from Freeplay Energy, uses ultrasound to measure a baby's heart rate during labour, scanning the womb and taking printable "pictures" of the foetus. If the baby's heart rate slows during a contraction, this is a sign that it is not receiving enough oxygen, and could die. The heart rate signals are shown on an LCD monitor and are also played through built-in loudspeakers.

Looking Back....

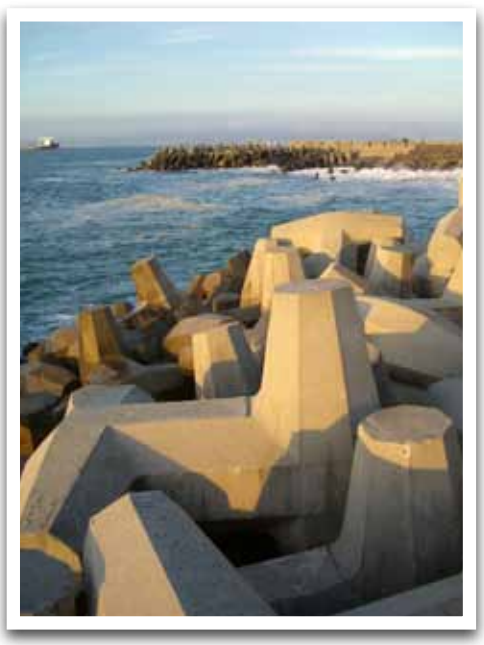
continues from page 27

1959: THE TELLUROMETER

Before 1955, land surveying depended on time-consuming and complicated manual methods of distance measurement. Trevor Wadley revolutionised the world of map-making with his Tellurometer which could measure distances of up to 50km with an accuracy of millimetres. It was developed from radar techniques developed during World War II.

EARLY 1960S: PRATLEY'S PUTTY

South African George Pratley invented Pratley's Putty while trying to create glue that would hold components in an electrical box. It is reputed to be the only South African invention to have travelled to the Moon (NASA chose it as one of the adhesives used on the Ranger Moon Module Project back in 1967), Pratley Putty is the stuff of legends. It was also used to repair a crack in one of the main supports of San Francisco's Golden Gate Bridge, and to repair holes in two ships that had sunk off the South African coast. In other words, the stuff works.



1963: DOLOSSE

It's interesting to note those oddly shaped concrete blocks you usually spot along coastal areas such as the Waterfront, were first developed here in South Africa.

They were the invention of East London harbour engineer Eric Merrifield after a storm ripped into the Eastern Cape coast of South Africa in 1963 and tore off 60% of East London harbour's armour. They are designed to break up wave action and protect harbour walls and they can weigh as much as 20 tonne each.

1967: FIRST HEART TRANSPLANT

Probably the most well-known of all local achievements. Dr Chris Barnard made history in Cape Town in1967 when he performed the operation on Louis Washkansky.

EARLY 1970S: SHEFFEL BOGIE

The narrow-gauge railways of southern Africa were slowing down railway development; a solution was needed. The person who provided it was a mechanical engineer, Dr Herbert Sheffel, who worked in the rolling stock design section of the South African Railways (SAR).

Sheffel realised that he could solve the problem if he redesigned the suspension of the bogie, the four-wheeled undercarriage at either end of a railway coach.

1974: KREEPY KRAULY

It keeps most pool owners happy, but has been known to scare little children - and it was invented in Springs, South Africa. Ferdinand Chauvier was simply just trying to figure out a way to take the hassle out of pool cleaning…

1975: RETINAL CRYOPROBE

Selig Percy Amoils developed a new method of cataract surgery at the Baragwaneth hospital in Soweto. His achievement was widely recognised and in 1975 he received a Queen's Award for Technological Innovation.

1979: THE COMPUTED AXIAL TOMOGRAPHY SCAN OR CAT SCAN

Cape Town physicist Allan Cormack and his associate Godfrey Hounsfield won the Nobel Prize for medicine in 1979 for their mathematical technique in which an X-ray source and electronic detectors are rotated about the body and the resulting data then provides a cross-section map of the body. In other words: the scanner made it possible to take three-dimensional X-rays of the human body to detect diseased tissue.

1992: SPEED GUN

There is no denying that South Africa is a sports mad nation, which could explain how Henri Johnson came to invent the speedball in 1992, the device measures speeding objects such as cricket and tennis balls, accurately reporting distance, speed and angle.

1992: SMARTLOCK SAFETY SYRINGES

Conceptualised by a group of designers (Hendrikus J. van der Meyden and Alexis A. Wadman) at the Vaal University of Technology, it is a three-piece single use syringe that provides protection against needle-stick contamination.

1993: ACTION POTENTIAL STIMULATION (APS)

Invented by Gervan Lubbe, it is an electromagnetic device that can be used to treat a range of painful medical

issues like arthritis and sports injuries by electronically stimulating the body's natural nerve impulses to relieve pain.

1996: CYBERTRACKER

Louis Liebenberg and Lindsay Steventon invented the Cybertracker, hand-held computer technology that is connected to a satellite navigational system, a method of tracking animals in the field. The graphic interface makes it possible for illiterate people to enter very detailed information, which helps scientists carry out their reasearch.

1996: THE VIBÖL EXHAUST VIBRATION BALANCER

Capetonian Cobus Cronje invented an exhaust vibration balancer which solves the problem of stress and fatigue on vehicles caused by the vibration from heavy diesel engines. Cronje also invented the Turböl Turbine Exhaust Silencer, a simple, environmentally friendly component that processes exhaust gases from diesel engines. Turböl uses the energy of the gases that escape from the exhaust to turn a series of turbines inside the silencer, which reduce the noise level substantially. It also has a particle trap that captures most of the toxic wastes.

1997: THE HIPPO WATER ROLLER

The 'Hippo Water Roller' is a classic example of design with SA conditions in mind. The roller is intended for use by communities without access to tap water. It enables people to pull a 90-litre drum of water (instead of carrying it by hand) with a minimum of effort.

2001: OIL-CAN GUITAR

The Afri-can guitar was first made by engineer Graeme Wells in 2001 using five-litre oil cans and bottle tops. He spent many years experimenting with the oil-can guitar concept, developed from the "Rampie" - a long-necked lute with fine strings and tuning pegs - first used in the Cape area in the 18th and 19th centuries.

2001: THE COBB OVEN IS FEATURED IN TIME MAGAZINE

Ken Hall has been given an accolade by Time magazine for his plastic mini-oven which he invented to reduce the risk of fires in squatter camps. He said he designed his oven, called the 'Cobb', after realising how people and children in squatter camps were burned because of exploding paraffin stoves. The "oven" uses six charcoal brickets which provide heat for more than two hours.

2002: AUTOMATIC MICROWAVE POPCORN VENDING MACHINE

Peter Ramsay and Mark Beagle from KwaZulu-Natal developed the world's first automatic microwave popcorn vending machine. It dispenses a fresh hot-popped 100g pack of microwave popcorn at the push of a button.

The Pop King stores 200 x 100g packs of popcorn in four magazines, thus allowing four different flavours to be dispensed. The hygienic packs are sealed with popcorn oil and flavouring. On selection the pack is pushed into the uniquely-designed microwave and dispensed after 90 seconds.

2003: QUIET CELLULAR ANTENNA TECHNOLOGY

Dr Gordon Mayhew-Ridgers and Paul van Jaarsveld gave South Africa a boost with its Square Kilometre Array (SKA) plans by inventing cellular antenna technology which reduces "noisy" emissions from cellular base stations in the area.

They did this by developing an antenna based on phased-array principles, providing omnidirectional coverage but also blocking the RF transmissions along a single direction (that would correspond with the bearing of the SKA core site).

MID-2000S: CHEAPER SOLAR POWER

An invention in solar power by Professor Vivian Alberts at the University of Johannesburg, which uses a micro-thin metallic film, has made solar electricity five times less expensive than solar photovoltaic cells. For the first time, solar electricity is economically feasible and cheaper than coal.

Looking Back....

continues from page 29

2006: MXIT

Mxit, one of the more popular methods that teenagers used to communicate with each other is Instant Message (IM) platform, was started by Herman Heunis from Stellenbosch. Mxit was developed because of the high cost of SMSs in South Africa, and the need to make it cheap for users to send mobile text messages to each other across mobile data networks. Mxit was officially born in 2006, and is now used by millions of users in 120 countries.

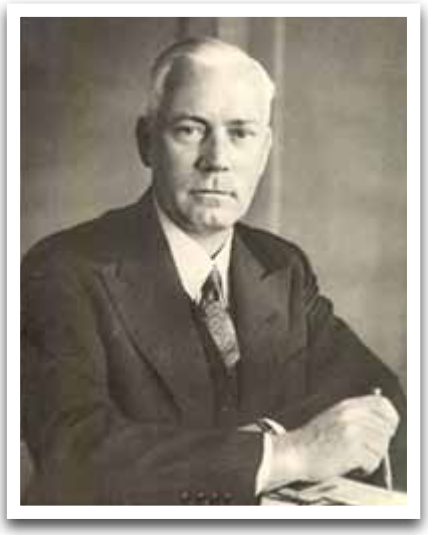
2008: MULTI-LAYERED MULTI-DISK TABLETS (MLMDT)

Prof. Viness Pillay and his team from the University of the Witwatersrand's Department of Pharmacy and Pharmacology invented MLMDT. These tablets assist people who struggle to ingest medicine; the tablet is swallowed it will release the required dosage of medicine at the appropriate time and then "switch off". When the next dose is required it will kick back on and release the medicine.

SOME FACTS…

- South Africa has the longest wine route in the world, the R62 wine route.
- South Africa has the second highest number of official languages, with India in first place with 22 official languages.
- Johannesburg telecoms engineer Ivo Lazic came up with the idea of making otherwise unsightly cellphone masts look like giant palm trees.
- South Africa is the world's leader in mining and Gold minerals. It has nearly 90% of the platinum metals on earth, 80% of the manganese, 73% of the chrome, 45% of the vanadium and 41% of the gold.
- More than 50% of the Paragliding world records have been set in South Africa.
- There are about 280 000 windmills on farms across South Africa, second in number only to Australia.
- South African architect, Shaun Killa, designed the innovative Bahrain World Trade Centre - the first skyscraper in the world to integrate wind turbines into its design.

SOME CLEVER SOUTH AFRICANS

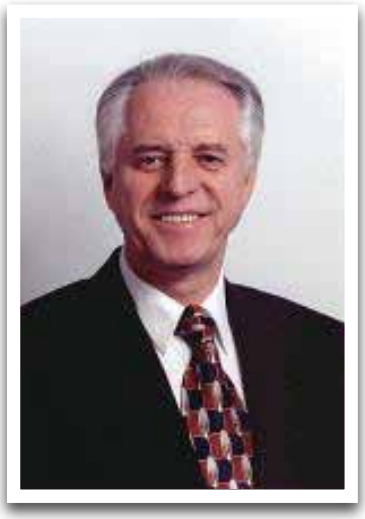


Dr Hendrik Johannes van der Bijl
(23 November 1887 – 2 December 1948)
was a South African electrical engineer and industrialist. Below are just some of his remarkable achievements:

- President of the South African Institute of Electrical Engineers (SAIEE);
- Founder of the Electricity Supply Commission (Escom - 1923);
- Founder of the South African Iron and Steel Industrial Corporation (Iscor - 1928);
- Founder of the African Metals Corporation (Amcor - 1937);
- Founder of the Industrial Development Corporation (IDC);
- Founder of the South African shipping company (Safmarine, now part of A.P. Moller-Maersk Group);
- Obtained a PhD with a thesis on the behaviour of pure liquid under the influence of radioactivity;
- Chancellor of the University of Pretoria from 1934 to 1948;
- Father of 'Electron Tube Theory';
- Developer of the thermionic vacuum tube, which enabled wireless telephony to be transmitted over a distance of 4 800 km.

Joseph Albert Mokoena (1919 – 1969)
Joseph Albert Mokoena had a natural flair for mathematics. He studied extensively in South Africa and briefly abroad, before becoming a lecturer. Through various teaching posts across Africa, Mokoena aimed to instill in learners a solid understanding and love for maths as a subject. He was regarded as one of the continent's most brilliant academics and a great mathematician, who never gave up on his dream to help develop Africa through an appreciation of mathematics. Mokoena was posthumously awarded the South African Order of Ikhamanga Gold in 2004 for his contribution to the field of mathematics.

Trevor Lloyd Wadley
(1920 – 21 May 1981)
Another South African electrical engineer, best known for his development of the Wadley Loop circuit for greater stability



in communications receivers. Some interesting facts about Wadley:

- He was one of a family of twelve children.
- He was known as a student for his habit of rarely, if ever, taking notes in lectures due to his near-eidetic memory.
- During World War II, he was recruited into the Special Signal Services and trained on the British RADAR project.
- He developed an ionosonde for measuring Earth's ionosphere.
- He invented the Wadley Loop receiver, which allowed precision tuning over wide bands, a task that had previously required switching out multiple crystals.

  The Wadley Loop was first used in the Racal RA-17 a 1950s top of the range British military short wave receiver still considered one of the finest radio receivers ever made and later in the South African made commercially available "Barlow-Wadley XCR-30" radio.
- He also invented the tellurometer, which could measure up to a distance of 80 km; it was used in land surveying. Today, it is used in a wide range of equipment but modified with current technology.

Ron Hickman

(21 October 1932 – 17 February 2011)

Ronald Price Hickman was born in South Africa and based in Jersey car designer and inventor who designed the original Lotus Elan, the Lotus Elan +2 and the Lotus Europa, as well as the Black & Decker Workmate.

Rory Byrne

(10 January 1944 -)

Rory is a South African engineer and car designer, most famous for being the chief designer at the Benetton and Scuderia Ferrari Formula One teams. Since joining Ferrari in 1997 Byrne-designed cars have won over seventy Grands Prix, seven constructors' titles and six drivers' titles. This makes Byrne the third most successful Formula One designer, behind rivals Adrian Newey and Colin Chapman.

Professor Himla Soodyall

(1963 -)

She is renowned across the globe for her ground-breaking genetic research into the peoples of sub-Saharan Africa. Her studies have identified some of the oldest DNA found in living people today, adding weight to the theory that modern humans evolved in the area now known as Southern Africa.

In 1999, Soodyall received the President's Award from the National Research Foundation (NRF) and the Vice-Chancellor's Award for Research from Wits University, and in 2005 the Bronze National Order of Mapungubwe from President Thabo Mbeki for outstanding contribution in the field of science.

In 2005, she was appointed the sub-Saharan African principal investigator on the Genographic Project – a five-year, worldwide project undertaken by the National Geographic Society to map humanity's migratory history.

Looking Back....

continues from page 31

Soodyall is Director of the Human Genomic Diversity & Disease Research Unit at Wits.

Elon Musk

(28 June 1971 -)

In 1995, at the age of 24 he dropped out of Stanford University after just two days of classes, to start his first company called Zip2 Corporation. Zip2 Corporation was an online city guide that provided content for the new online versions of the New York Times and the Chicago Tribune newspapers. This company was later sold to Compaq Computer Corporation.

In 1999, he started his next company, called X.com, which was an online bank. In 2000, X.com bought a company called Confinity, which had started an Internet money-transfer process called PayPal. Musk dropped the company's online banking focus to concentrate on becoming a global payment transfer provider. In 2002, eBay bought PayPal.

Also in 2002 Musk co-founded his third company with rocket propulsion engineer Tom Mueller, Space Exploration Technologies (SpaceX). SpaceX develops and manufactures space launch vehicles with a focus on advancing the state of rocket technology. The company's first two launch vehicles are the Falcon 1 and Falcon 9 rockets, and its first spacecraft is the Dragon.

In 2004 Musk started Tesla Motors to build electric vehicles. The Tesla Roadster is a battery electric vehicle sports car, and the first highway-capable all-electric vehicle in serial production for sale in the US.

Mark Shuttleworth

(18 September 1973 -)

South African entrepreneur Mark Shuttleworth is best known as the founder of Ubuntu, the free software operating system, as well as for being the first African in space. He was a student at the University of Cape Town, and in 1995, he founded Thawte, a company that specialised in digital certificates and Internet security.

He sold Thawte to US-based company VeriSign in December 1999. In 2001, he formed the Shuttleworth Foundation, a non-profit organisation dedicated to social innovation, which funds educational, free, and open source software projects. wn

This list is by no means definitive especially as the Managing Editor has restricted me to a maximum of 1000 words.

ELSPEC Impact Energy

Innovative Power Quality Solutions

EQUALIZER-ST

Medium and Low Voltage Motor Startup Solution

Equalizer-ST System Overview

The EQUALIZER-ST is a real-time, dynamic reactive power compensation system that utilizes a proven industrial technology to provide an additional solution for the challenges related to large motor startups. The system itself operates at low voltage and by utilizing a step-up transformer, the EQUALIZER-ST is also able to to compensate for medium voltage networks.

Centralized Motor Startup Compensation

The EQUALIZER-ST is a centralized motor startup solution, that provides fast compensation in real-time. In an environment of many motors, one EQUALIZER-ST system serves any number of motors, assuming that two motors are not started simultaneously. Eliminating the need to use individual soft start devices for each motor, makes the EQUALIZER-ST more cost effective than conventional compensation systems.

Appointed
ELSPEC
Distributors in
Southern Africa
Suite 1, Heritage Park
51 Norfolk Terrace, Westville 3629
Telephone: 0861-357732 0861-ELSPEC
email: elspec@impactenergy.co.za

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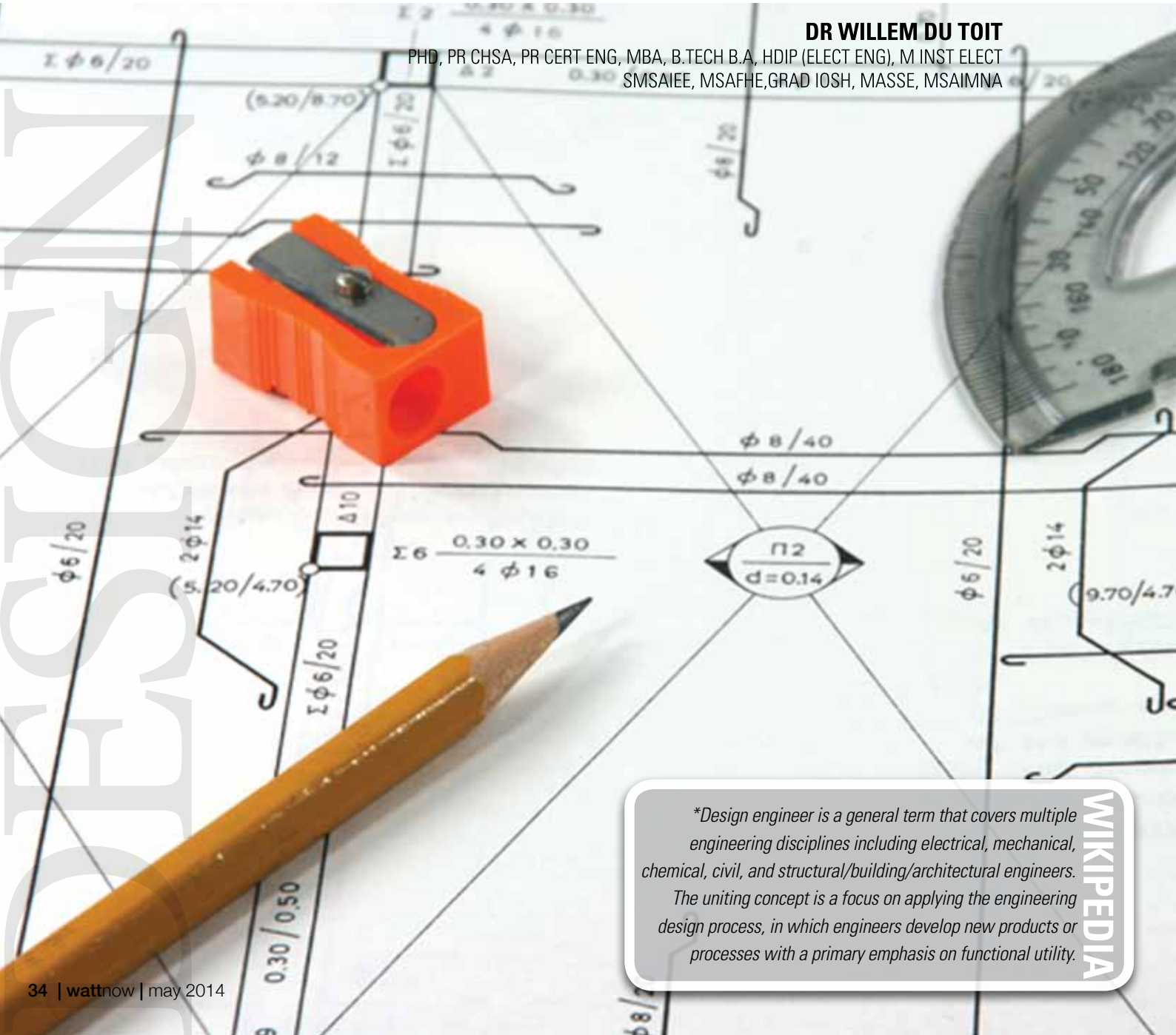
Earn CPD Credits

RESPONSIBILITY AND ACCOUNTABILITY

What every design engineer* should know

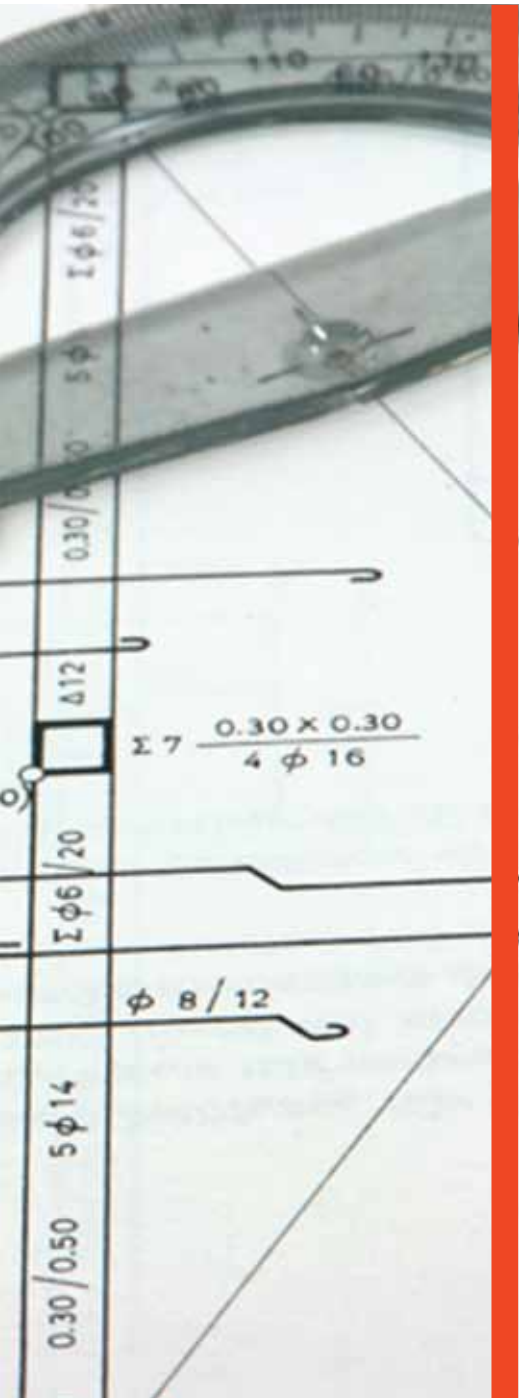
DR WILLEM DU TOIT
PHD, PR CHSA, PR CERT ENG, MBA, B.TECH B.A, HDIP (ELECT ENG), M INST ELECT SMSAIEE, MSAFHE,GRAD IOSH, MASSE, MSAIMNA



WIKIPEDIA

**Design engineer is a general term that covers multiple engineering disciplines including electrical, mechanical, chemical, civil, and structural/building/architectural engineers. The uniting concept is a focus on applying the engineering design process, in which engineers develop new products or processes with a primary emphasis on functional utility.*

The new construction regulations place new emphasis on design engineers' responsibilities. Design engineers need to comprehend the impact that these regulations will have on their involvement in projects. This will not be limited to the design phase but will include responsibility for both the safe installation of their designs as well as the usage and maintenance of the end product.



The approach to design engineering has always been to place more emphasis on design criteria than interaction with quality management and/or the usage of design systems and installations.

However, with the new construction regulations, promulgated in February 2014, design engineers' role and accountability for their designs in terms of risk related to health and safety have been expanded to certification and interaction with health and safety professionals. This should not only ensure good designs but also designs that will afford safety to construction, installers and maintenance workers of such systems.

The responsibility for ensuring the safe installation and the quality of the end constructed products, in the build environment, is largely the duty of the principle contractor and specific specialists, such as subcontractors.

They must not only ensure correct operation but, as in the case of certain electrical installations, the certification according to the specific legislative regulations and standards or codes of practice. The design engineer however now also becomes involved to ensure required specific method statements and procedures are available for the safe installation of designed projects.

The construction regulations refer to construction activities such as: any work in connection with the construction, erection, alteration, renovation, repair, demolition or dismantling of, or addition to, a building or any similar structure. This includes mechanical and electrical installations of such building or similar structure.

THE DESIGNER

According to the new construction regulations, designers are defined as 'a competent person' who: prepares checks and approves a design and includes an architect or engineer contributing to, or having overall responsibility for, a design. Designers also include building service engineers who design details for fixed plant. This refers to mechanical, electrical and related service engineers. An understanding of the Construction Regulations is thus imperative.

Electrical and Mechanical engineering designers, according to Construction Regulations 6, are responsible:

- To ensure that the applicable safety standards incorporated into the construction regulations and applicable regulations are complied with in their designs (e.g. SANS 10142 for electrical installations);
- To take into consideration the health and safety specification submitted by

What every design engineer should know...

continues from page 35

the client, before a contract is put out to tender, and make available in a report to the client all relevant health and safety information about the design and installation of the relevant structure that may affect the pricing of the construction work;

- To inform the client in writing of any known or anticipated dangers or hazards relating to the installation and construction work of their design.
- To make available all relevant information required for the safe execution of the work they designed, or any subsequently altered designed work (this includes safe work procedures for their specific installation);
- To refrain from including anything in their design that requires or necessitates the use of dangerous procedures or materials, hazardous to the health and safety of the persons doing the installation and construction work, which can be avoided by modifying the design or by substituting materials;
- To take into account the hazards relating to any subsequent maintenance of the relevant structure or installation and make provision in their design for that work to be performed, in order to minimize the risk of future maintenance activities required;
- When given a mandate by the client, to carry out necessary inspections at appropriate stages to verify that the construction and installation of their designs are carried out in accordance with the design's specifications; if the designer is not so mandated by the client, the client's agent, (e.g. Professional health and safety agent - Pr CHSA) will be responsible to carry out such inspections;
- The designer or the client's agent (e.g. Pr CHSA) must stop any contractor from carrying out any construction work which is not in accordance with the relevant design's health and safety aspects; if the designer is not so mandated, the client's appointed agent (e.g. Pr CHSA) must stop that contractor from executing that construction work;
- When mandated by the client, the designer, must do a final inspection of the completed structure, in accordance with the National Building Regulations, and include the health and safety aspects of the structure. Then as far as is reasonably practicable, declare the structure safe for use, and issue a completion certificate to the client and a copy thereof to the contractor, and
- The designer must, during the design stage, take cognisance of ergonomic design principles in order to minimize ergonomic related hazards in all phases of the life cycle of the structure.

DESIGN FOR SAFE MAINTENANCE

The mental-construct a designer has of the final designed product, the usage and interaction that maintenance, operators and other people will have with the final product, should form part of the mental view the designer has. This will be transferred into a visual and descriptive concept of the design and will require an understanding of health and safety aspects interacting with the design.

Designers should be capable and able to analyse risks involved in their design, to gauge specific risk and, depending on the complexity of relevant designs, do quantitative and qualitative risk profiling analyses. Various tools are available to determine such risks related to specific projects.

The determination of specific risk factors, by either a quantitative risk matrix or by descriptive qualitative methods, should assist the designer to develop risk mitigation procedures related to specific hazards.

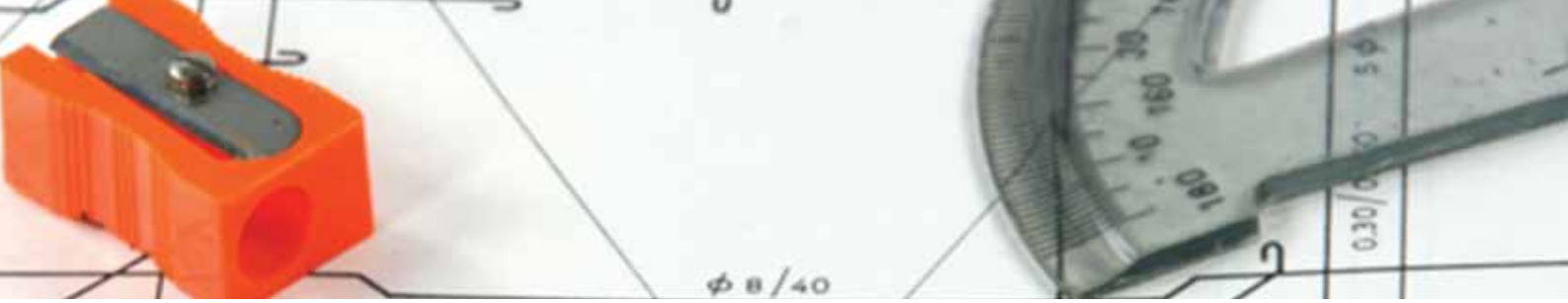
Analysis tools such as 'pareto analysis' and 'fault tree analysis' and other deductive failure analysis tools can be employed to determine probabilities in failures of system designs. This analysis should guife the development of method statements for correct installation, maintenance and operation of engineered systems. This should prevent incidents that can adversely affect not only plant and equipment but people's health and safety as well.

METHOD STATEMENTS

Method statements for the safe installation of services are not generic but specific to job tasks that are not routinely conducted. These tasks are usually in a maintenance and construction environment that due to the nature of new work, require guidance on specific procedures. Procedures may include manufacturer's installation methods and acceptable written engineering practices or international and local safety standards.

Design engineering is to advise on correct and safe methods to install specific plant equipment and installations, and to ensure that the procedures followed do not increase the risk of injuries but rather mitigate any risk identified. Designers need to take cognisance of the fact that an incorrect method statement can be used against them in legal proceedings.

What needs to be kept in mind is that each new installation is different from other similar construction installations and



requires the design engineer to identify risk, as described in a quantitative and qualitative way, and how to mitigate such risk factors. Examples of engineering method statements include the installation of switchgear in an awkward position, or a new type of product that needs to be commissioned. The engineer is required to stipulate the switching and testing procedures and coordinate same with the supplier, to ensure correct acceptable engineering practices are followed, in order to prevent any incidents during commissioning and operation. The same is applicable to other services that involve lifting heavy equipment, such as demolishing or removing old plant, structures and equipment. Should a new elevator be installed that requires a new lift shaft in an existing building, a method statement is required for core drilling and removing floor levels. This will involve not only the electrical engineer but also the structural engineer for advising on a method statement to remove the slab amongst others.

THE CLIENT

The client's role and responsibilities, in terms of the new construction regulations, has expanded dramatically and it would be advisable for clients of large projects to seek professional health and safety assistance (e.g. Pr CHSA) with new projects.

Such professional health and safety specialists must be selected based on their knowledge and experience related to specific projects, not only on their legislative knowledge but also their engineering knowledge of the specific project.

The Construction regulations required from the client are, inter alia:

- To prepare a baseline risk assessment for an intended construction work project;
- To prepare a suitable, sufficiently documented and coherent, site specific health and safety specification for the intended construction work based on the baseline risk assessment;
- To provide the designer with the health and safety specification;
- To ensure that the designer takes the health and safety specification into consideration during the design stage;
- To ensure that the designer carries out all responsibilities required in the construction regulations;
- To include the health and safety specification in the tender documents;
- Where changes are brought about to the design or construction work, to make sufficient health and safety information and appropriate resources available to the principal contractor to execute the work safely;
- Where additional work is to be performed as a result of a design change or an error in construction due to the actions of the client, the client must ensure that sufficient safety information and appropriate additional resources are available to execute the required work safely, and
- Where a construction work permit is required as contemplated in construction regulation 3(1), the client must, without derogating from his or her health and safety responsibilities or liabilities, appoint a competent person in writing as an agent (Pr CHSA) to act as his or her representative.

THE PROFESSIONAL HEALTH AND SAFETY AGENT

The introduction of a professional advisor in terms of health and safety heralds a new era where health and safety is not merely seen as a compliance with administrative and legislative standards or the advice and management by non-technical people on aspects of construction and maintenance activities, but the real input by people that would have the knowledge, qualifications and experience of engineering concepts to understand real engineering impacts on workers' health and safety and people exposed to construction and installation activities.

The concepts of safety engineering, process safety and the professionalisation of engineers who specialise in human safety environments, are not that well established in South Africa. However, the formation and regulation of people with proper knowledge of the built environment and an understanding of engineering principles to guide design engineers and architects will assist in the decrease of construction related incidents. The registration of this entity by SACPCMP (South African Council for the Project and Construction Management Professions) will address the critical need of the shortage in this field of safety engineering in South Africa.

CONCLUSION

It is clear that an understanding of the requirements for designers, in terms of the new Construction Regulations incorporated in the Occupational Health and Safety Act is essential. This includes the role health and safety specifications have and the interaction with Professional Construction Health and Safety Agents (Pr CHSA), who are registered with the SACPCMP, will become imperative to avoid not only criminal indictment but also civil proceedings against design engineer professionals. wn

Earn CPD Credits

Dangers and Hazards of entry into live Substations and enclosures

This paper looks at the dangers and hazards of entering and working in live substations and enclosures. It looks at some specific examples and incidents, and highlights the reasons why persons entering these areas MUST be trained, and deemed Competent to work unsupervised in a substation. It looks at the pre-entry requirements, as well as identifying potential or actual dangers and hazards, and legal requirements. There are many dangers and hazards, which have to be taken into account when entering live substations and enclosures, and many accidents can be avoided if the correct action is taken. Consider the following:

BY I BARRY GASS **I** CITY AND GUILDS **I** SAMTRAC

SAFETY

INCIDENTS

Incident 1:

Two competent electricians were working in a live 11kV substation containing Oil Circuit Breakers (OCBs) when a fault occurred. Both the circuit breaker feeding the fault and the incoming circuit breaker failed to trip. The upstream protection was slow in operating and the circuit breaker feeding the fault exploded, killing both of the electricians in the substation. In the ensuing accident investigation it was found that the DC supply at the substation had failed. It is, therefore, recommended that when working in a substation the batteries and charger are checked and a load test carried out if facilities exist.

Incident 2:

This incident involved an OCB which exploded; fortunately there was no one in the substation at the time. The force of the explosion was so great that it blew out a section of the substation brick wall. The investigation revealed an internal fault inside the circuit breaker.

Incident 3:

A fault occurred on a circuit breaker panel in a 33kV substation. The force of the explosion blew the breaker out of the panel over 10 metres away. Anyone working in the substation at the time would have been injured, had they been near the breaker at the time.

Incident 4:

Two Protection Technicians had to conduct current transformer tests on an 88kV transformer situated at a power station.

Dangers in Substations

continues from page 39

Permission was obtained from Control to do the tests. The gates to the 88kV yard were open (the lock was damaged and unable to be locked). The technicians made their way to the correct transformer and checked that the links feeding the the transformer were open (however, there was a double busbar and the other set of links were closed and the transformer was alive).

Assuming the transformer was dead they decided to discharge the conductors before climbing on top of the transformer using a portable earthing lead. As soon as the lead came close to the line there was a flash over and an explosion. The two technicians both received arc flash burns to the face and hands and injury to their legs jumping down from the transformer. An investigation revealed the following:

- Control incorrectly gave permission for work to be carried out.
- The gate to the 88kV yard was open and could not be locked.
- Both of the technicians were not trained on High Voltage and could not identify the hazards and follow the correct procedures and were, therefore, not competent to enter the yard by themselves.
- No testing or earthing had been carried out.
- No work permit had been issued.
- No risk assessment had been conducted.

Incident 5:

A new switchboard was being installed at a substation and a temporary 11kV supply was taken from a spare circuit breaker, on the existing feeder board, to the incoming panel of the new switchboard. Once the permanent supply was installed and ready for connection, it was decided to leave the temporary cable in as a back-up supply. In order to do this, the spare breaker on the existing feeder board was isolated and locked out and the cable on the new switchboard was disconnected and left open at the back of the panel.

A contractor, completing his punch list, was numbering cables. He opened the substation door and left his non-competent worker inside to complete the list. The worker walked around the back of the switchgear, where he trod on the exposed cable, causing ionisation to earth, which caused a phase-to-phase fault. The flash caused by this fault generated third degree burns to 80% of his body and he died in hospital four days later. The investigation revealed that the circuit breaker on the existing feeder board feeding this cable had tripped on earth and phase-to-phase fault. Who racked the circuit breaker in and closed is not known. Why the ends of the temporary cable had not been removed from the switchgear on the existing feeder board and starred out and earthed either side is not known.

Looking at all five of the above incidents it is clear that a risk assessment needs to be conducted when entering these areas, to identify the hazards, put in place remedial measures and inform workers of dangers and hazards present.

CATEGORIES OF PERSONS ALLOWED TO ENTER LIVE SUBSTATIONS AND ENCLOSURES

Competent Person: A person that complies with Section A1 (vii) of the OHS Act and is in possession of a competency certificate for the classes of work he is deemed to be competent to work without constant supervision.

Authorised Person: A person recommended, in writing, by the Electrical Engineer or his nominee, and appointed by the Designated Person to carry out switching, isolating, testing and earthing procedures on MV/HV mains and/or apparatus in liaison with and under the instructions of a Control Officer as applicable and to issue work permits in respect of such mains and apparatus.

Specifically Trained Person: A person who has been sufficiently trained to undertake certain tasks on or near live electrical apparatus without being under the constant supervision of a competent person.

Non-Competent/Pre-Competent Person: Under the direct and personal supervision of a Competent Person.

Duties of the above persons when entering a live substation or enclosure:

- Accept responsibility for all persons assisting him and for Non-Competent Persons personally supervised by him.
- At all times exercise proper control over these persons and issue explicit and proper instructions and obtain confirmation that the instructions are understood.
- Ensure that only necessary persons enter a live substation, yard or enclosure.
- Ensure that all persons under his control are warned of the danger of inadvertent contact with live conductors and apparatus.
- Be responsible after entering that no unauthorised person can get access.
- Be responsible for the barricading and/or demarcating of any doors or gates left open during the work.
- Erect temporary barriers to prevent

persons coming into inadvertent contact with or encroaching safety clearance to live mains/apparatus.

- On leaving the substation or enclosure be responsible for ensuring that the door or gate is locked and that the key is removed.
- Where adjacent equipment is live, delimit the section which is set aside for work to be carried out by the use of barriers arranged so that safety/section clearances are maintained.
- Delimit the area at ground floor level and the structure or apparatus on which the work is to be carried out.
- When it is impracticable to provide adequate barriers and screens, arrangements shall be made for a Competent Person to watch continuously the men at work to ensure that they incur no risk.
- Use of portable ladders and long objects where there are exposed live conductors:- Portable ladders and other long objects shall not be used without the permission of an Appointed Person who shall define the conditions of use to the Person-in-Charge of the work. The movement and erection of such ladders shall then be carried out only under the direct supervision of the Person-in-Charge of the work and when moved at ground level they shall be carried only in a horizontal position and as near the ground as practicable.

OHSAct (1993) Section 8 lists the General duties of employers to their employees:

- Every employer shall provide and maintain, as far as is reasonably practicable, a working environment that is safe and without risk to the health of his employees.

Without derogating from the generality of an employer's duties under subsection (1), the matters to which those duties refer include in particular –

- The provision and maintenance of systems of work, plant and machinery that, as far as is reasonably practicable, are safe and without risks to health;
- Taking such steps as may be reasonably practicable to eliminate or mitigate any hazard or potential hazard to the safety or health of employees, before resorting to personal protective equipment;
- Making arrangements for ensuring, as far as is reasonably practicable, the safety and absence of risks to health in connection with the production, processing, use, handling, storage or transport of articles or substances;
- Establishing, as far as is reasonably practicable, what hazards to the health or safety of persons are attached to any work which is performed, any article or substance which is produced, processed, used, handled, stored or transported and any plant or machinery which is used in his business, and he shall, as far as is reasonably practicable, further establish what precautionary measures should be taken with respect to such work, article, substance, plant or machinery in order to protect the health and safety of persons, and he shall provide the necessary means to apply such precautionary measures;
- Providing such information, instructions, training and supervision as may be necessary to ensure, as far as is reasonably practicable, the health and safety at work of his employees;
- As far as is reasonably practicable, not permitting any employee to do any work or to produce, process, use, handle, store or transport any article or substance or to operate any plant or machinery, unless the precautionary measures contemplated in paragraphs (b) and (d), or any other precautionary measures which may be prescribed, have been taken;
- Taking all necessary measures to ensure that the requirements of this Act are complied with by every person in his employment or on premises under his control where plant or machinery is used;
- Enforcing such measures as may be necessary in the interest of health and safety;
- Ensuring that work is performed and that plant or machinery is used under the general supervision of a person trained to understand the hazards associated with it and who have the authority to ensure

Dangers in Substations

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that precautionary measures taken by the employer are implemented; and
- Causing all employees to be informed regarding the scope of their authority as contemplated in section 37 (1) (b).

SECTION 14: GENERAL DUTIES OF EMPLOYEES AT WORK

Every employee shall at work:
- Take reasonable care for the health and safety of himself and of other persons who may be affected by his acts or omissions;
- As regards any duty or requirement imposed by his employer or any other person by this Act, co-operate with such an employer or person to enable that duty or requirement to be complied with;
- Carry out any lawful order given to him, and obey the health and safety rules and procedures laid down by his employer or by anyone authorised thereto by his employer, in the interest of health or safety;
- If any situation which is unsafe or unhealthy comes to his attention, as soon as practicable, report such situation to his employer or to the health and safety representative for his workplace or section thereof, as the case may be, who shall report it to the employer; and if he is involved in any incident which may affect his health or which has caused an injury to himself, report such incident to his employer or to anyone authorised thereto by the employer, or to his health and safety representative, as soon as practicable, but not later than the end of the particular shift during which the incident occurred, unless the circumstances were such that the reporting of the incident was not possible, in which case he shall report the incident as soon as practicable thereafter.

NRS 040-3:1995

4.7.9 No switching whilst work is in progress in a live chamber or enclosure:

Should any switching, other than emergency switching, at any station, on apparatus in a live chamber or live enclosure in which inspection or maintenance work is in progress, all persons shall be withdrawn from the chamber or enclosure until such switching has been completed.

4.8.2 Emergency Switching:

Any person is authorised to carry out emergency switching. When emergency switching has been carried out the Control Officer should be informed as soon as possible.

Please note that emergency switching refers to the opening only of switchgear for the two following conditions: in order to prevent injury to a person or damage to equipment.

DEFINITIONS

Substation:

Any building, room containing electrical apparatus used for control, distribution and supply of electrical power.

Enclosure:

An indoor or outdoor site where electrical apparatus is enclosed, and the access locked to prevent unauthorised entry.

Live Enclosure:

Any room, chamber, yard or enclosed area, in which it is possible for a person, from ground floor level, to make inadvertent contact with, or infringe on safety clearance, to live conductors or apparatus or any room, chamber, or enclosed area fitted with an automatic fire suppression system.

Safety Clearance:

The minimum distance that any part of a person's body or work tool may come close to bare, unearthed Low Voltage (LV) conductor or unscreened, unearthed Medium or High Voltage (MV/HV) conductor.

Section Clearance:

In the case of any bare live LV conductor and an unscreened live MV/HV conductor, the minimum clearance of the conductor, from any point on permanent equipment, measured from the position of his feet.

Live Chamber:

Any chamber or situation in which contact with conductors or live parts of electrical apparatus, working at High Voltage, is possible from ground floor level.

Prohibited Area:

An enclosed area, in which live conductors or live parts of electrical apparatus, working at High Voltage, are accessible, but situated in such a position that inadvertent contact is not possible from ground floor level.

Restricted Area:

An enclosed area, that is neither a live chamber nor a prohibited area, as defined, and that is enclosed for the purpose of power system security, and the safety of personnel.

In both live chambers and prohibited areas, live High Voltage conductors are present, but in a live chamber, these live conductors can be touched from ground floor level, whilst in a prohibited area they cannot be touched from ground floor level.

Barrier:

Any device that is designed to restrict approach to live electrical apparatus, excavations or other dangerous conditions.

Breaker/Circuit Breaker:

A mechanical switching device, capable of making, carrying and breaking of currents under normal circuit conditions, and also making, carrying for a specified time, and breaking currents under specified abnormal conditions, such as fault conditions.

Earthed:

Connected to the general mass of earth in such a manner as to ensure an immediate safe discharge of electrical energy.

Isolate:

To physically disconnect from all possible sources of electrical potential. This can be achieved by opening of links, removing of fuses, racking out switchgear, locking off and placing a danger tag.

SUBSTATION PRE-ENTRY

Before entering a substation there are certain pre-requisites that should be carried out:

1 Check and disable any fire suppression system. This is imperative, as a person's life can be endangered, if the fire suppression system is triggered. There are several systems, but the most common are $C0_2$ and Argon/Nitrogen mixxed gasses.
2 Check there is at least one fire extinguisher present, its condition and when it was last tested.
3 Check substation signage and that you have correct personal protective equipment (PPE).
4 Before staff enters the substation, check for any hazardous conditions; give safety talk, explaining dangers, hazards and emergency assembly point.

ENTRY

After entry, certain things must be done/ checked before any work is carried out:

1 Sign substation logbook and look for any abnormal conditions that could compromise your safety during your task.
2 Call Control (if there is a Control Centre) and inform them that you are at the substation and the reason that you are there.
3 Conduct a risk assessment (Take 5) and assess any dangerous condition, discuss with staff and obtain their signatures.
4 Use your senses, look for hazards, listen and smell for any arcing.
5 Mitigate any hazard identified, e.g. barricade any live parts.
6 Ensure that no unauthorised person can gain access to the area whilst work is being carried out.
7 Check condition of all the circuit breakers against the drawings.
8 Check for any alarms and discrepancies.
9 Check first aid kit available.
10 Check all equipment and operating tools are available before starting task.
11 Check battery tripping unit (BTU) and perform load test.

RISK ASSESSMENT (TAKE 5)

A written risk assessment must be conducted before any task is carried out. This is generally referred to as a Take 5, which means that you should take 5 minutes to stand back and assess the risks before starting the work. This should not be an over complicated or over designed document, as a general risk assessment (Code of Practice) should already exist and different hazards occur at different work sites, even though the task remains the same.

When any risk is noted, control measures must be put in place - remember the Hierarchy of Control:

- Elimination
- Replace (Method or Process)
- Redesign (Engineering)
- Separation (Isolation or Guard)
- Administration (Training Process)
- Personal Protective Equipment (PPE)

You will note that PPE is the last resort and not the first line of defence, as many people think.

EXAMPLES OF DANGERS AND HAZARDS

- Working in a capacitor bank enclosure – close proximity to unscreened, unearthed conductors. A control point earth must be placed at the circuit breaker and a working earth between the harmonic filters and the capacitor bank. The fence surrounding the capacitor bank, as well as any metal structure within the High Voltage yard, must be effectively earthed (permanently) to prevent them from becoming alive via induction from the overhead lines.
- Working in an area protected by a fire suppression system – $C0_2$ gas could be released, and the worker's life would be at risk. Isolate the fire suppression system before working in the area.
- Circuit breaker racked out of the panel and the shutter unlocked, this would allow access to live connections. Lock off all live (potentially live) shutters, busbar and cable.
- Determine the task specific hazards (hazard prompt list above can be used as a reference).
- Assess the hazards identified, using the risk rating tables (raw risk). If the risk rating is above 9, then additional controls must be implemented. After additional controls are implemented, a final risk rating (residual risk) must be

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MECHANICAL	MATERIALS	ELECTRICAL	HEALTH	ENVIRONMENT	OTHER
Slipping	$C0_2$ Gas	Shock	Gas	Air pollution	No supervision
Tripping	Argonite	Burns	Dust	Water pollution	Not trained
Moving machinery	Fire	Explosion	Noise	Ground Pollution	Remote control operation
Unsupported loads	Solvents	Switching	Lighting	Spillage	Not complying with rules
Tools	Asbestos	Lock out	Ergonomic	Waste disposal	Complacency
Flying objects	Acid	Isolating wrong circuit	Fumes		Safety clearance
Hot work	Hot Metal	Electrocution	Heat		Sharp edges

Table 1: Examples of Dangers & Hazards

EXAMPLE OF A TAKE 5 RISK ASSESSMENT

SEVERITY / CONSEQUENCE						
Weighting	1	2	3	4	5	6
Effect	No Impact	Minor	Moderate	Major	Severe	Catastrophic
Explanation	No Injury	First Aid Case	Serious Medical Treatment	Lost time Injury	Fatality; Permanent Disability	Multiple Fatalities

Risk Rating = Severity X Probability

PROBABILITY / LIKELIHOOD						
Weighting	1	2	3	4	5	6
Frequency	Rare	Unlikely	Possible	Likely	Almost certain	Certain
Explanation	Expected never to happen	Can happen once/year.	Can happen once/month	Can happen once/week	Can happen daily	Many times a day

RISK RATING							
PROBABILTY	6	6	12	18	24	30	36
	5	5	10	15	20	25	30
	4	4	8	12	16	20	24
	3	3	6	9	12	15	18
	2	2	4	6	8	10	12
	1	1	2	3	4	5	6
	SEVERITY LEVEL	1	2	3	4	5	6
		SEVERITY					

calculated. If the final risk rating is not below 10 the hazard must be signed off by the responsible person.
- All members of the workforce must be aware of any risks involved and must sign the risk assessment to acknowledge the risk controls to be implemented.

LEGAL REQUIREMENTS

Notices:

Without detracting from any specific duty imposed on users of machinery by the Act, the user shall create notices in official languages to be exhibited within, and at all designated entrances to the premises, as the case may be, on which generating plant and transforming, switching or linking apparatus are situated, which notices prohibit unauthorised persons from entering such premises;
- Prohibit unauthorised persons from handling or interfering with electrical machinery;
- Contain directions of procedures to be followed in case of fire; and
- Contain directions on how to resuscitate persons suffering from the effects of electric shock.

This regulation shall not apply to miniature substations (MSS) and distribution boxes, on condition and their access doors can be locked or bolted and that only authorised persons are permitted to open them and work thereon.

Switch and Transformer Premises:

The user shall cause enclosed premises housing switchgear and transformers -
- To be of ample size so as to provide clear working space for operating and maintenance staff;
- To be sufficiently ventilated to maintain the equipment at a safe working temperature;
- To be, as far as is practicable, constructed so as to be proof against rodents, leakage, seepage and flooding;
- Where necessary, to be provided with lighting that will enable all equipment, thoroughfares and working areas to be clearly distinguished and all instruments, labels and notices to be easily read;
- To have doors or gates which can be readily opened from the inside, opening outwards;
- To be provided with fire extinguishing appliances, which are suitable for use on electrical machinery and which are in good working order. In the case of unattended premises, suitable fire extinguishing appliances need only be made available at such premises when work is in progress thereon or therein; and;
- To be of such construction that persons cannot reach in and touch bare conductors or exposed live parts of the electrical machinery.

No person, other than a person authorised thereto by the user, shall enter, or be required or permitted by the user to enter premises housing switchgear or transformers unless all live conductors are insulated against inadvertent contact or are screened off: Provided that the person so authorised may be accompanied by any other person acting under his control.

General:

All live substations and enclosures should be kept closed and locked to prevent unauthorised entry. Without limiting the responsibility of all employees to comply with applicable laws at all times, particular attention should be paid to the following:

The responsible person shall ensure that all persons working in a substation or enclosure are adequately trained to perform work in a substation.

CONCLUSION

One can see that it is not only a legal requirement for all staff entering a substation to be trained (or under the direct and personal supervision of a Competent Person), it is necessary to prevent injury or even death, therefore, training is essential.

So often, at the workplace, we hear production before safety, not safety before production. No operation or urgency of service can ever justify endangering the life of anyone. Before doing any job, ask yourself this question, would I let my 16 year old son or daughter do this job? If not why, should I be doing it? Or expect anyone else to do it! wn

ACKNOWLEDGEMENTS

Occupational Health and Safety Act (1993) (OHSAct)
NRS 040
Operating Regulations for High Voltage Systems (ORHVS)
Abaqulusi Municipality Safety Rules

Rapid growth for SA's solar PV industry

The Renewable Energy Independent Power Provider Programme (REIPPP) kick-started a revolution in the solar photovoltaic (PV) industry in South Africa and many of its mechanisms, aimed at driving rapid expansion, have created the opportunity to grow the market yet further into sub-Saharan Africa.

BY | NATHAN VENTER
GENERAL MANAGER | SCHLETTER SOUTH AFRICA

Ghana, Senegal, Zimbabwe, Namibia and more countries are all on the lips of manufacturers and suppliers in the solar PV industry.

The discussion in solar PV circles has changed significantly from pre-2011 when it was about small-scale, rural electrification projects in Africa to become grid-feeding independent power production today.

One of the results of the rapid expansion of the industry due to the REIPPP has been the reliance on widespread employment as suppliers work in conjunction with SA national, regional and local governmental organisations and bodies. Employment in remote locations has been extensively boosted thanks to localisation demands put in place by government at the outset of the programme and the continual rise of these localisation efforts.

Labour in South Africa, as is the case elsewhere in the world, features its own idiosyncrasies. One of the reasons behind this is that REIPPP implementation projects occur in diverse and disparate communities all around the country. People in each different region are fundamentally different from one another. Local politicians, too, have unique requirements based on the needs of their communities.

In any unique situation there is an implicit lack of process or model that necessitates a non-standard approach.

In working on several of these projects to date we have learned extensively how to engage with these individual and unique communities. We are not a human resources (HR) organisation nor do we claim to be HR experts but we have learned to deal with individuals and groups of people who work on these projects at the remote locations where we implement them. These lessons we have learned do not form the basis of a labour model but are rather guidelines that lead to successful implementations in which everybody wins: local labour, local communities, us, the implementers, the consortiums with which we work, government and the people of South Africa who rely on electricity daily.

My top nine lessons are:

1 You need considerable emotional intelligence;
2 You must recognise the need for local expertise and have faith in this expertise to follow through;
3 Where skills are lacking it is imperative to get involved and offer the necessary guidance to allow for the local capacity to develop and subsequently follow through;
4 Develop a clear and concise strategy that negotiates with local politicians and navigates its way alongside ward councillors. It is important that this strategy avoids using any numbers as this usually creates unforeseen problems and considerable expectations;
5 Active and consistent engagement with local employees from the community is integral;
6 Identification of community champions;
7 The appointment of skilled contractors that have had the experience of dealing with the local community but also have the requisite skill to build a solar PV plant;
8 Decisive management that is in touch with local demands; and
9 Rapid decision-making when the initial strategy is derailed. Plan B, C and D should be ready if all else fails.

Many local companies struggle to effectively engage local labour even though they have long been exposed to the habits of the local market. International companies have a potentially tougher time when they attempt to implement their processes from abroad. It is essential, therefore, that international companies entering the local market to engage around the REIPPP recognise that they will experience a degree of discomfort as they engage local labour. Local partners form an integral component in leading them through the process so that successful implementations continue for all concerned parties.

At the core of the top nine lessons we have learned are the three Ps: Patience, Persistence and Politeness. International companies operating in South Africa for the REIPPP have to be aware of the labour volatility in South Africa and learn to work with the issues that present themselves in order to facilitate successful projects.

Ongoing management through conversation and engagement is a really powerful enabler for businesses as they capitalise on the opportunities presented by the effective rollout of the REIPPP. wn

Earn CPD Credits

Renewable energy and the 12L energy efficiency tax incentive

As an end-of-year bonus to the energy efficiency industry the long awaited "Regulations in terms of Section 12L of the Income Tax Act, 1962, on the allowance for energy efficiency savings" was promulgated and came into operation on 1 November 2013.

BY I YOLANDA DE LANGE

The allowance is for the purpose of determining the taxable income derived by any person from carrying on any trade in respect of any year of assessment ending before 1 January 2020. It stipulates that there must be allowed as a deduction from the income of that person an amount in respect of energy efficiency savings by that person in respect of that year of assessment.

Our country is embarking in unknown territory and since the promulgation, 12L has raised many questions, which are opening up new markets to stimulate energy efficiency. Through participation and involvement will these markets evolve and grow towards solid structures and processes that can support future similar incentives.

One of the most pertinent questions asked is: *"Is renewables to be, or not to be allowed as part of the 12L energy efficiency tax incentive?"*

The answer should quite logically be: Energy efficiency = demand side; renewable energy = generation side, therefore not part of energy efficiency, but part of alternative ways of generating energy – which by the way should also be used efficiently, like all energy resources.

12L is an incentive for using the energy which is generated from sources, which are harmful to the climate, more efficiently. However, renewables probably deserve such an incentive in its own right, but it is excluded from Section 12L.

REGULATION 6 EXCLUDES RENEWABLES

Regulation 6 of 12 L depicts that a person may not receive the allowance *"in respect of energy generated from renewable sources or co-generation, which means energy from waste and combined heat and power, other than energy generated from waste heat recovery"*. The renewable sources excluded are listed as biomass, geothermal, hydro, ocean currents, solar, tidal waves or wind. Waste heat recovery is defined as *"utilising waste heat or underutilised energy generated during an industrial process"*. Therefore only energy generated using waste heat recovery will be considered.

ONE EXCEPTION TO THE RULE FOR RENEWABLES

But 12L does make an exception through the inclusion of Captive Power Plants which encourages self-generation on a large scale. Generating energy for your own use is seen as a Captive Power Plant and an allowance can only be claimed should the *"kWh or the equivalent kWh of energy output of the captive power plant"* i.r.o. an assessment year is *"more than 35% of the kWhs or the equivalent kWhs of energy input in respect of that year of assessment"*.

The definition in the Regulation stipulates that *"A captive power plant means where generation of energy takes place for the purposes of the use of that energy solely by the person generating that energy"*. This is interpreted as the self-generated energy, albeit from whichever source, is not being fed into the grid, but used within the reticulation system of the respective project or plant for which the energy

efficiency allowance is being claimed. It is an incentive to up the implementation of self-generation in excess of 35% of the requirements of a project or plant.

So in effect renewable energy that is generated for own use and which constitutes in excess of 35% of the kWhs of energy input in the year of claiming, will be allowed. Clarifying the matter, Barry Bredenkamp, Senior Manager: Energy Efficiency at SANEDI said *"Captive Power Plants is the ONE exception to the rule where renewable energy technology may be used"*.

SANEDI is the body that evaluates energy savings reports and issues tax certificates to organisations for submission to SARS to claim section 12i and 12L tax incentives and invites organisations to pursue the energy efficiency tax incentive. Follow these steps to make use of the 12L incentive:

1 Appoint a Measurement & Verification Professional, from a SANAS accredited M&V Inspection Body, to compile a report containing a computation of the energy efficiency savings in respect of that person for that year of assessment. Inspection bodies are listed on the SANAS website.
2 Register with SANEDI for energy efficiency tax allowance claims at www.saneditax.org.za
3 Submit the M&V Professional's report to SANEDI.
4 SANEDI will furnish you with the approval for continuance.

On the successful completion of the tax allowance approval process SANEDI will issue a formal energy savings certificate. The certificate is then submitted to the South African Revenue Service (SARS) together with the claim for the tax allowance as part of the customary tax returns.

The systems in place have been used over the last 4 years for the 12i tax incentive, and already over 60 projects are registered for 12L and being processed. wn

CHAPTER 5 | ENGINEERING COUNCIL OF SOUTH AFRICA

Earn CPD Credits

BY | DU TOIT GROBLER
INTPI(SA)(EE), PRING(EE), PRDIPLING(EM), BSC(ING) (ELEK)(PRET), FSAIEE, SMICMEEESA

"Decades of Engineering Excellence" is a 216 page hardcover prestige coffee table publication of the Engineering Council of South Africa.

"Decades of Engineering Excellence"

The Engineering Council of South Africa (ECSA) is a statutory body established in terms of the Engineering Profession Act, 2000 (Act No. 46 of 2000) ("EPAct"). ECSA registers engineering practitioners in a number of categories and regulates the engineering profession in South Africa.

The Council of ECSA has 50 members appointed by the Minister of Public Works in terms of the EPAct for a four year term of office from nominations made to represent the following groups:

1. Registered Persons: Thirty members nominated by Voluntary Associations, Employers and Registered

Persons. Members must be registered with ECSA in professional or specified categories and must collectively be representative of all registration categories and engineering disciplines.

2. Government Nominees: Ten members of whom six must be registered with ECSA in professional or specified categories, nominated by the three tiers of Government.

3. Public Nominees: Ten members nominated by the public.

The 2012 – 2016 Council was inaugurated on 2012-07-05. Council Members may not serve more than two consecutive terms.

VISION STATEMENT

ECSA's vision is to ensure that South Africa enjoys all the benefits of a strong, competent, growing, sustainable and representative Engineering Profession, able to provide all the expertise necessary for the socio-economic needs of the country and to exert a positive influence in South Africa.

MISSION STATEMENT

ECSA's mission is to create the circumstances in which society is confident that the engineering profession in South Africa is able to carry out the functions necessary for the socio-economic growth in the country.

ECSA ACHIEVES THIS OBJECTIVE THROUGH:

- Setting and monitoring standards to international norms;
- Certifying and ensuring the competence of individuals through registration;
- Ensuring quality of engineering education through accreditation;
- Regulating professional conduct of registered practitioners; and
- Growing the profession in quantity and quality.

STATUTORY FUNCTIONS OF ECSA

In order to achieve the main focus of the EPAct, ECSA is empowered to perform a variety of functions, such as: Setting and auditing of academic standards; Prescribing requirements for Continuing Professional Development; Prescribing a Code of Conduct and Codes of Practice; Prescribing a framework for the Identification of Engineering Work of an Engineering nature that should be reserved for registered persons; Advising the Council for the Built Environment and the Minister of Public Works on matters relating to the Engineering Profession; Recognises voluntary associations; Publishes tariff of fees for consulting work, and do such other things as may be necessary for the proper performance of its functions.

THE ORGANISATION STRUCTURE OF THE ENGINEERING COUNCIL OF SOUTH AFRICA.

The Chief Executive Officer is responsible for the execution of the Statutory Functions of the Council with the assistance of full time staff, consultants and more than 500 members of Council and volunteers, mostly nominated by VA and who are registered with ECSA, representatives for educational institutions and government departments.

COMMITTEES OF ECSA COUNCIL

Most of the work of ECSA is done in committees of Council which are chaired by registered persons and with the administrative support of members of ECSA staff.

The Council of ECSA meets four times a year and during the recesses between meetings an Executive Committee acts on behalf of Council. The Chairperson and Vice-Chairpersons of the high impact committees are appointed by Council from Council members. Chairpersons of the nine (9) high impact committees of ECSA serve on the Executive Committee

ACTIVITIES OF ECSA

- **ENGINEERING EDUCATION**
  ECSA's functions relating to Engineering education stem from the education requirements for registration. The criteria to be met to register in a professional or specified category with ECSA are twofold:
- The applicant must meet the education requirement defined by the ECSA for the category; and
- The applicant must demonstrate competence against standards determined by the ECSA for the category. Quality engineering education is an essential part of professional development.

The educational requirements for registration may be met in several ways:

- Accredited qualification: The attainment of a qualification accredited by ECSA for the category of registration is the first stage toward becoming registered in the category;
- Recognised qualification: Holding a qualification accredited by a signatory to an international educational agreement (Washington, Sydney and Dublin Accords); and
- Educational evaluation: The applicant submits detailed documentation of his/her qualification(s) for evaluation to establish whether it is substantially equivalent to an accredited qualification.

If the qualification does not meet all the requirements, this process may be extended to examination of the applicant by ECSA or other bodies determined by ECSA.

ECSA has legal empowerment and processes to accredit Engineering programmes offered by South African higher education providers, to establish international recognition agreements and to evaluate qualifications that are not accredited or recognised.

Decades of Engineering Excellence

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In addition, ECSA promotes the quality of Engineering education programmes and policies and practices to increase the number of graduates to meet national needs.

ACCREDITATION OF ENGINEERING EDUCATION PROGRAMMES

ECSA is empowered to conduct accreditation visits to Educational institutions that offer Engineering programmes to determine whether the Engineering qualifications offered can be recognised by the Council for purposes of registration. The educational programmes considered for accreditation and the categories of registration for which each type of programme satisfies the education requirements are as follows:

PROGRAMME TYPE	MEETS EDUCATIONAL REQUIREMENTS FOR REGISTRATION AS:
BSc(Eng), BEng, or BIng ("BEng-type")	Candidate Engineer and Professional Engineer
BTech (Eng)	Candidate Engineering Technologist, and Professional Engineering Technologist
National Diploma in Engineering	Candidate Engineering Technician and Professional Engineering Technician
All of the above programmes and National N Diploma	Acceptance as a Candidate for the Government Certificate of Competency examination, which is required for registration as a Candidate Certificated Engineer and Professional Certificated Engineer

ECSA has two accreditation processes for engineering (BEng-type) and engineering technology (BTech/ National Diploma) programmes respectively. Programmes for persons working toward the Government Certificates of Competency are dealt with differently.

-Qualifications for Certificated Engineers

The Certificated Engineers Accreditation Committee advises the various Commissions of Examiners for the Government Certificates of Competency (GCC) on qualifications for acceptance as candidates for the GCC examinations.

INTERNATIONAL RECOGNITION

In view of the mobility of individuals, trans-border services and common minimum standards, countries have bonded together to ease the recognition of standards and qualifications. ECSA is a signatory to three such agreements: Washington Accord (Engineers), Sydney Accord (Technologists) and Dublin Accord (Technicians). The signatories of these accords have developed agreed statements of Graduate Attributes, that is, outcomes with level descriptors and knowledge profiles for education programmes for engineers, engineering technologists and engineering technicians.

REGISTRATION OF ENGINEERING PRACTITIONERS WITH ECSA

The EPAct empowers ECSA to register persons in prescribed Categories of Registration. Section 18(2) states: "A person may not practise in any of the categories contemplated in subsection (1), unless he/she is registered in that category".

The Candidate Category only provides for the registration of persons who meet the academic requirements for registration in the Professional Categories and who are undergoing professional development (preferably) under a Commitment and Undertaking.

The Specified Category provides for the registration of persons who can not register in the professional category, but who perform critically important work of an Engineering nature which has a direct impact on public safety and health as detailed in below.

PROFESSIONAL CATEGORIES

- Candidate: Engineer
- Profession: Professional Engineer
- Qualifcation: An accredited four (4) year BSc (Eng) / BEng / BIng degree in one of the nine (9) disciplines

- Candidate: Engineering Technologist
- Profession: Professional Engineering Technologist
- Qualification: An accredited three (3) year BTech (Eng) degree

- Candidate: Certificated Engineer
- Profession: Professional Certificated Engineer
- Qualification: One of seven (7) Government Certificates of Competency

- Candidate: Engineering Technician
- Profession: Professional Engineering Technician
- Qualification: An accredited National

Diploma in Engineering

SPECIFIED CATEGORIES

- Registered Lift Inspector
- Registered Lifting Machinery Inspector
- Registered Medical Equipment Maintainer
- Registered Fire Protection System Inspector

INTERNATIONAL CATEGORIES

- International Professional Engineer on the SA Register of the Engineers Mobility Forum
- International Professional Engineering Technologist on the SA Register of the Engineering Technologist Mobility Forum
- Professional Engineer (Civil) via the Mutual Exemption Agreement with the Institution of Civil Engineers, London, UK (ICE)
- Professional Engineer (Civil) via the Mutual Exemption Agreement with Engineers Ireland
- Professional Engineer (Electrical) via the Mutual Exemption Agreement With Engineers Ireland
- Professional Engineer (Mechanical) via the Mutual Exemption Agreement With Engineers Ireland

ABBREVIATIONS AND ACRONYMS OF REGISTRATION TITLES

Since the coming into effect of the EPAct, the Council is charged with the responsibility to determine the abbreviations or acronyms of the titles referred to in Section 21 of the Act.

Abbreviations published in Government Gazette No. 25242, Board Notice No. 61 on 1 August 2003 in terms of the EPAct

TITLE	ABBREVIATION
Professional Engineer	Pr Eng
Professionele Ingenieur	Pr Ing
Professional Engineering Technologist	Pr Tech Eng
Professionele Ingenieurstegnoloog	Pr Teg Ing
Professional Certificated Engineer	Pr Cert Eng
Professionele Gediplomeerde Ingenieur	Pr Dipl Ing
Professional Engineering Technician	Pr Techni Eng
Professionele Ingenieurstegnikus	Pr Tegni Ing

WHY REGISTER?

For the individual

- Peer recognition of qualification and experience
- Public confidence in professional competence
- Eligibility for membership of certain voluntary associations: Certain VAs require that a person must be registered in a professional category before corporate membership will be granted to a person. The Institution of Certificated Mechanical and Electrical Engineers, SA requires registration as a Professional Certificated Engineer as a prerequisite for acceptance as a Senior Member.
- International recognition
- Lifestyle benefits
- Marketability in employment market
- Exclusive use of reserved names: Every registered person is entitled by the EPAct to use a particular name which describes the particular type and category of registration. Non-registered persons who use any of the reserved names or abbreviations are guilty of a criminal offense and may be prosecuted.
- Statutory empowerment: The EPAct provides for the reservation of work of an Engineering nature for the exclusive performance by registered persons.

For employers and clients

- Confidence in professionalism and competence of staff
- Recourse in the event of improper conduct
- Marketability of the organization
- Compliance with statutory requirements

For the profession

- Recognition amongst other professions
- Public recognition of competence and adherence to minimum standards

For the country

-Protection of the safety, health and interests of society
-Preservation of professional standards
-International recognition

APPLICATION FOR REGISTRATION WITH ECSA

The process to apply for registration with ECSA is well documented on the ECSA Webpages. Application forms for registration can also be down loaded from the Website.

The assessment of applications for registration is based on a peer judgment principle. In order to bring the assessors

Decades of Engineering Excellence

continues from page 53

closer to the applicant, ECSA requires confidential referee reports from registered professionals who have personal knowledge of the applicant's performance, competence, professional conduct and applicable legal knowledge.

New registration system

The ECSA Council has approved new policies and standards for registration that will be phased in at different times for the various categories of registration. Applicants for various categories are affected by changes at different times. Persons who intend applying for registration should therefore check how and when changes affect their category in sections 1 to 7 below.

Two changes will take place:
Changes to the registration policy, standards and process. The most important change is in structuring of the eleven (11) outcomes of Engineering competencies divided into five groups which applicants must meet in order to qualify for registration, i.e.

- Group A: Knowledge-based Engineering Problem solving
  - Outcome 1: Define, Investigate and Analyse Engineering problems.
  - Outcome 2: Design or develop solutions to Engineering problems.
  - Outcome 3: Comprehend and apply knowledge to the solution of Engineering problems: principles, specialist knowledge, jurisdictional and local knowledge.

- Group B: Manage Engineering Activities
  - Outcome 4: Manage part or all of one or more Engineering activities.
  - Outcome 5: Communicates clearly with others (superiors, peers, subordinates, employers, clients, suppliers, etc.) in the course of his or her Engineering activities.

- Group C: Impacts of Engineering Activities
  - Outcome 6: Recognise and address the reasonable foreseeable social cultural and environmental effects of his or her Engineering activities.
  - Outcome 7: Meet all legal and regulatory requirements and protect the safety and health of persons in the course of his or her Engineering activities.

- Group D: Exercise judgment, take responsibility and act ethically
  - Outcome 8: Conduct his or her Engineering activities ethically.
  - Outcome 9: Exercise sound judgment in the course of his or her Engineering activities.
  - Outcome 10: Be responsible for making decisions on part or all of his or her Engineering activities.

- Group E: Continuing Professional Development (CPD)
  - Outcome 11: Undertake Professional Development activities sufficient to maintain and extend his or her Engineering competence.

Introduction of an on-line application process. This is an independent development and announcements will be made on this page from time to time.

The new system for registration as Professional Engineers was introduced on 2013-04-01. Until 2015-03-31 the legacy and new registration systems will run in parallel. New systems for all other categories of registration as well as the introduction of an on-line registration process will follow.

WHO IS REGISTERED?

Anybody can check his or her registration details or that of anybody else on the ECSA website.

TRANSFORMATION OF THE ENGINEERING PROFESSION

Since its inception of the SA Council for Professional Engineers in 1969, the regulation of the Engineering Profession has been involved in transformation, initially rather slowly but later gaining momentum exponentially.

Transformation is aimed at making registration and representation on ECSA Council, committees and accreditation teams more inclusive and representative of the demographics of the country, in order to ensure maximum efficiency in the delivery of ECSA's core mandate and consequently improve its service to the Engineering Profession and the public at large.

REGULATION OF THE ENGINEERING PROFESSION

- Code of Conduct
  ECSA is responsible for regulating the practice of engineering in SA. All registered persons are required to abide by the Code of Conduct and to conduct their Engineering practice strictly within their area of competence.

- Continuing Professional Development
  The 5 yearly renewal of registration and continuing professional development (CPD) as a prerequisite was introduced on 2007-01-01. CPD credits can be earned in three categories and must be obtained in at least two of the three categories listed below, with at least five credits per five year cycle from Category 1.

Category 1: Developmental Activities: 4 credits
Category 2: Work-based Activities:

- Engineering Work: 2 credits
- Professional mentoring of candidate engineering practitioners: 1 credit

Category 3: Individual Activities:

- Membership of a voluntary association: 1 credit (not linked to hours)
- Other activities: 3 credits
- Engenius - this is a programme initiated and supported by ECSA, in collaboration with Voluntary Associations and other partners in order to promote the Engineering Profession to primary and secondary school and FET college learners.
- Identification of Engineering work
  ECSA has drawn up the framework for the identification of engineering work and the regulations for the implementation of the identification of reservation of engineering work.

  The Regulation have been approved by the council for the Built Environment and submitted to the Competition Commission together with those of the other six professions in the Built environment.

SPECIFIED CATEGORIES

Activities associated with the performance of tasks specified by ECSA.

- Recognition of voluntary associations
  ECSA recognises qualifying voluntary association representing registered engineering practitioners and engineering providers in three (3) categories.

- President's forum
  The President's Forum is a bi-annual gathering of representatives of VAs. These meetings provide opportunities to share information with the VAs.

CONTACT DETAILS

If you are interested in obtaining a copy of the book, contact du Toit on 083 666 6855 or du.toit.grobler@gmail.com

IN MY OPINION : ANDRÉ HOFFMANN

Barriers to cost-effective Broadband in South Africa

In this opinion paper I will discuss some of the less obvious challenges to cost effective Broadband delivery in South Africa, and will unpack some of the complexity and impact these have on the retail consumer cost of Broadband services.

BY | ANDRÉ HOFFMANN | FSAIEE

BARRIER # 1: FIEFDOMS

There are new entrants to the Broadband access network and Last-Mile 'blockade' and these are the 'fiefdoms' as I like to refer to them, the gated community, complex and business or residential estate developers who seem to think that this is a new revenue stream opportunity for them. They effectively 'lock-out' all Service Providers and force them (at cost) to use their Last Mile networks within their properties to get access to any tenants within 'their' development.

Some it seems are even going so far as to consider building out and operating complete local access networks between their facilities and the nearest open access data center. It is clear that they have not thought this through and if they even get out of the starting blocks they will find the 'headwinds' of operating such a network particularly draining on their resources.

This of course presents problem for the tenant or erf owner who wants choice in Service Provider and now has an uncontrolled, generally non-value adding cost component in-between them and the services and content they desire to reach.

Consequently this presents easy pickings for fixed wireless and mobile data services and satellite Service Providers such as DSTV and others to bypass these fiefdoms and reach consumers through their walls and windows. Consumers of course are then forced to pay a premium for the wireless connection when all that would be required is for the estate manager to be reasonable and open the door to all fixed line Service Providers on equal and fair terms. This is regrettably not the case and in many instances consumers are paying for this shortsighted philosophy by property managers.

eToll - The argument tabled by the property developer is that they have absorbed the cost of the *Last Mile network* infrastructure within their property and they need to recover that investment.

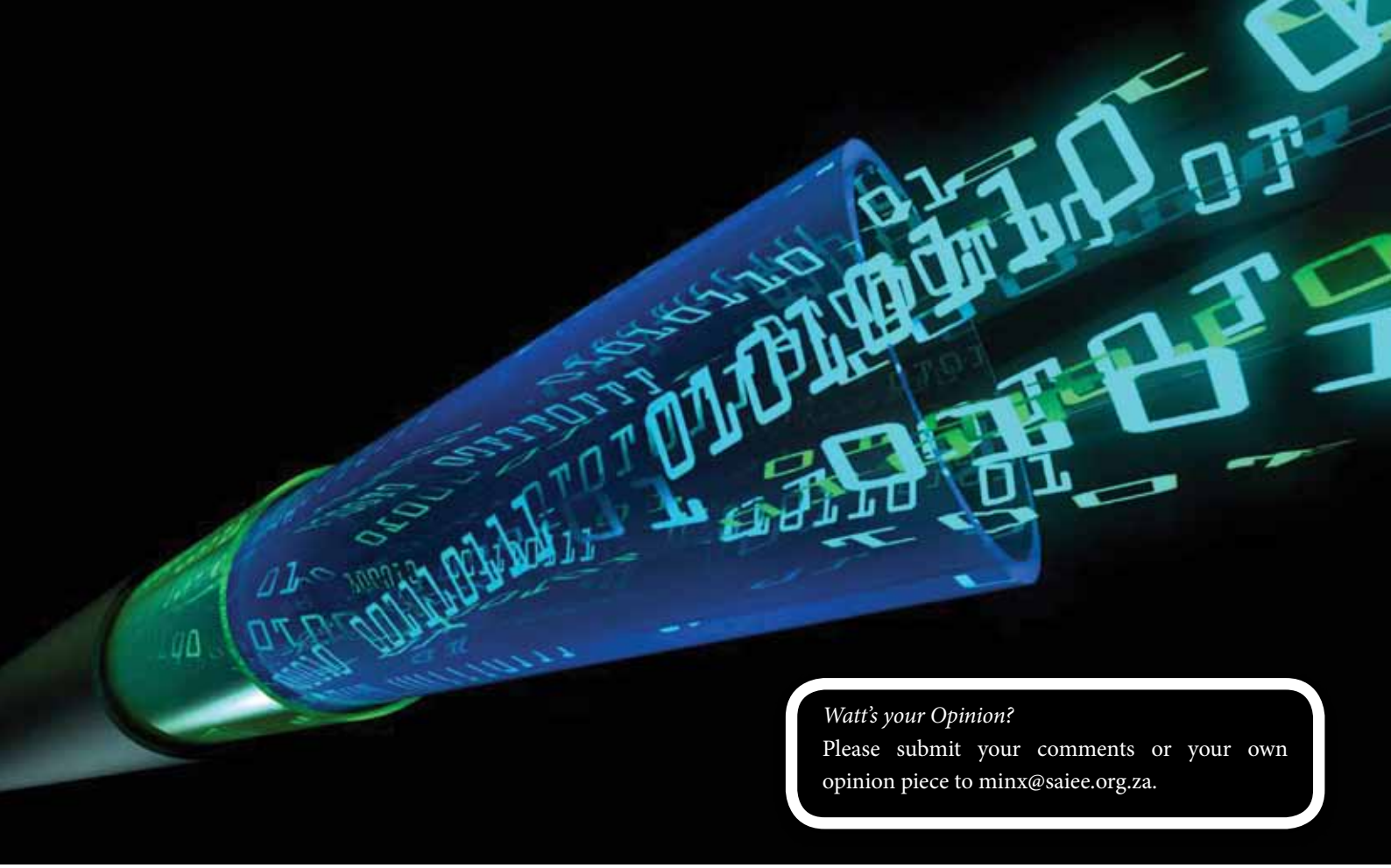
On the surface that seems like a reasonable request (milady), however they have chosen to recover this cost, not from their tenants or owners BUT from the Service Providers wanting to deliver communication services into the facility on behalf of the same tenants and owners!

That is like saying I have built the road and driveway to your property from the gate but anyone wanting to drive to your house on that road must pay me a toll fee.

Does that make sense? In my mind any additional cost to the Broadband service delivery chain is potentially taking South Africa backwards.

Any competent telecommunication Service Provider, working with the developer can build and operate its own last mile access network through any development more cost effectively and less intrusively.

One can argue that the Regulator (ICASA) issued license entitles any Service Provider



Watt's your Opinion?
Please submit your comments or your own opinion piece to minx@saiee.org.za.

to force their way into any property, private or public and deliver its services.

The reality is that to have such an adversarial relationship with stakeholders is not conducive to effective provision and assurance of such services over time. Does the fiefdom expect a return on the supply of other services such as water, electricity and waste-water removal? No.

Then why so for telecoms? Is it simply greed that drives the developer to seek other revenue streams that they are ill equipped and capacitated to build or operate over time. The risk for the tenant or owner in such a development is that they get left *'holding the baby'*, when the network falls over (which it inevitably will) and the cost will not be trivial.

It seems that anyone with a little IT and networking knowledge, a backroom switch and router now thinks they can now build and operate a mini-telco…. Well here is a news-flash - You can't! Besides the obvious interconnection complexity and regulatory compliance issues, the reason is one of scale and the complexity of multiple services and the associated fulfilment, assurance and billing thereof. Just because you can do it for your office of 10 or 20 people does not mean that you can scale that to an estate of a 100's or 1000's of connection points with multiple Service Providers and content requirements.

Until property developers and their IT minions realise that they should *'stick to their knitting'* the tenants and owners of these laagered communities will have to a) pay an artificially high premium for broadband services and b) be constrained by reduced choice of service provider which I don't believe is anyone's best interests at the end of the day.

BARRIER #2 – LOCAL GOVERNMENT

Yellow Card! – no this is not a new MTN pre-paid product… it refers *(using a Soccer penalty analogy)* to an even bigger and potentially more sinister problem that is artificially constraining ubiquitous and cost effective Broadband roll out in South Africa.

That is the highly conflicted and unethical direct involvement of government agencies in commercial Telco service provider operations outside of natural monopolies. When a public funded institution thinks that it can operate commercially in a viable and competitive market something is wrong. On the one hand government wants to collect rates and taxes, ostensibly to fund government and provide basic services and with the same hand it wants to take food off the table of its tax paying citizens? How can that be morally and ethically justified?

Only in the sense of greed and corruption is that in any way explainable. How can local government set itself up as Judge, Jury and Executioner? It is both custodian of the servitude and now exploits that position of power to a) feather its own nest and b) keep the competition out? – Yellow card! at least in my view!

Barriers to Broadband in SA

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Unfortunately when government confuses its roll and goes beyond natural monopolies and 'enablement' of the economic systems in the country, it enters the gray and murky waters that are fertile ground for corruption to flourish.

When government goes beyond involvement in natural monopolies, then it opens itself up for criticism and in the case of local government involvement in broadband networks in and around metros such as eThekwini, Johannesburg and Cape Town, this indeed the case.

Sadly this involvement implies that the tax payer takes a double whammy. Firstly the tax/rate payer does not get proper municipal services, manifested by ineffective billing systems, degrading water and sanitation systems, ineffective traffic signal systems and degrading road surfaces.

Furthermore, the overburdened rate-payer is then also over-paying by a factor of 4 or 5 for a government funded broadband network that is little chance of being economical sustainable or of being operated effectively over time.

Despite all the rhetoric and good intentions it is my view that such a poorly run network is unlikely to receive any serious market support from the larger carriers or Service Providers and will end up being a Government subsidized drain on the already overburdened rate payer in any metro that tries to build and operate such a network.

It's one thing for government to provide for its own Broadband requirements, but besides taking government business *'off the table'* in an already challenging market, it proposes to further take other market shares off the table and compete in an unnatural monopoly market place. This in a situation where economies of scale are critical for economic viability.

Local government, instead of using public funds responsibly and negotiating preferential 'anchor tenant' terms in a Public Private Partnership (PPP), it decides to augment its internal revenue streams and play in the realm of its already over taxed citizens.

Sadly the reality is that this 'benefit' does not find its way back to the regional Fiscus but rather to some select individuals who have positioned themselves at the feeding trough through convoluted government controlled commercial entities.

Maybe we should escalate this to a Red Card? What do you say?

BARRIER # 3 - THE STRATEGY TO 'OWN IT ALL' BY SERVICE PROVIDERS

Strategically the Service Providers tend to want to 'own' the complete end-to-end service delivery chain as they see this two-fold. Firstly, as a barrier to entry for competitors and secondly, as a barrier to switch for the consumer.

With copper struggling to maintain the demand for 'speed' and distance despite the best efforts of engineers in development of copper based DSL technologies, copper suffers from systemic environmental problems such as copper theft and lightning that make it a challenge to implement and operate. The alternatives are wireless and optical fibre. Suffice to say that wireless is working well but is limited by available spectrum, especially in built up areas where the competition for spectrum is intense.

That leaves optical fibre as the next option for deployment in the access layer of the network. Optical fibre has no scalability problems in its capacity to convey high capacity signals, especially in the access network. Its limitation is that it costs a lot in capital investment to lay out and operate. With good design an optical access network can bring many benefits to all stakeholders from Government, Service Providers and consumers alike.

What is disturbing for me is the hell-bent drive by Service Providers, particular the larger ones to build out more and more duplicated optical fibre in the access network? Have they not read the Regulator's intent to avoid duplication and abortive cost in this area and insist of facilities sharing?

Assuming optical fibre is the medium of choice for a future Broadband enabled network, then why do we need to each build our own fibre access networks, along with the commensurate civil disturbances of new trenches and infrastructure all over the place? Is there not a case for support one or two open access Dark Fibre and Layer-2 carrier Ethernet networks that are shared by everyone in the game?

Joe Blogger - The internet is a complex system with many potential bottlenecks between client and server. By laying fibre in the last mile one effectively removes this as a bottleneck and potentially scales the bandwidth capability to each user on this network to terabits (or higher).

The average 'Joe Blogger' however will never need or be able to use such bandwidth even if it was made available to them in bucket loads. Given the nature of the Internet 'beast', tests have shown that the download bandwidth reaches an asymptote (peak) rate at somewhere between 10Mbit/s and 20Mbit/s for Internet based services even under optimal conditions. Let's face it, almost everything today can be delivered over the Internet. So why insist on owning and operating all that fibre if one can only monetize the few megabits of bandwidth throughput that can effectively be carried?

Hobson's Choice – the reason might be a commercial one. *Back to the reason that Service Providers want to own the complete end-to-end service delivery channel.* If they can own that, then they can effectively own all the customers' business. Consumers would effectively have to relocate to new premises to get a new Service Provider and seldom does that make sense so they just buckle under and accept higher prices and potentially lower service levels.

This should provide two warning flags to the Regulator that seeks to enable lower cost Broadband to consumers at better quality:

1 Be careful in unbundling that you don't simply swap one monopoly in the whole country with multiple regional monopolies precipitated by a 'land-grab' that favours only the cash flush Service Providers. *(NB this is a global environment and would also raise interest from overseas players).*

2 Be aware that by letting a Service Provider capture the whole service delivery chain right to the last mile, you are de facto eliminating reasonable choice for consumers in the local loop and thereby opening them up to the risk of price creep.

IN CONCLUSION

- Property Developers – stick to developing property and giving your tenants and owners a fair deal. Don't think you can do justice to making and delivering pizzas and newspapers as well. I am not sure if you have enough cash in the bank and enough lawyers to play this game.

- Local Government – Stick to running the Municipality, set policy, regulate and provide basic services but keep you noses out of business. We, the citizens of this country, pay your salaries. Stop interfering with our livelihoods and taking the food from our children's mouths! You have no right to use public funds to go beyond 'enablement' in the economic environment. If you want to enter business then leave government and join the fray. You can't have your cake and eat it too. We are watching you!

- Service Providers – Play nicely now, be reasonable and share like your mother taught you, you actually don't have to be all things to all people all the time.

- The Regulator (ICASA) – Be bold! Be strong! You have sound policy documents on the table; don't be afraid to implement them forcefully and with confidence. Someone has to wave the flag for Joe Blogger against the less than philanthropic interests that seek to milk the proletariat for excessive personal gain.

South Africa needs a coordinated Broadband implementation plan and cannot afford to allow sideshow agendas to derail the common good. wn

Made in SA

First conceived at the Presidential Job Summit in 1998, the Proudly South African Campaign was born out of the socio-economic necessity to create jobs.

BY I ANGELA PRICE

The Proudly South African "buy local" campaign encourages the nation to buy local products and make use of local services, in an effort to stimulate the local economy and help create jobs. Proudly SA also promotes national pride, patriotism and social cohesion.

Africans are recognised as good inventors, not for the sake of getting rich but for the sake of necessity. Africa ain't for sissies and it dishes up some pretty unique challenges, many of which have been overcome with *"'n Boer maak 'n plan"* inventiveness. If you want to feel proudly South African, just think *Pratley Putty, Q20* and the *Kreepy Crawly* to name but a few.

However, with the recent spate of newspaper headlines you may have found yourself thinking some very anti-South African thoughts (well, maybe anti-certain South Africans). I for one, found myself looking at my British passport and pondering just how little vitamin D I could actually survive on.

I had to ask myself 'Am I still proudly South African'?

Actions speak louder than words – so maybe being proudly South African is more about being measured by your actions. *Lead SA* and the *Imperial 'I Pledge'* campaigns have taken the proudly South African baton and run with it, launching initiatives which encourage people to consider the impact they/their actions can have for the greater good of the others – *the spirit of Ubuntu.*

I love the fact that I live in a country where we have a wide diversity of race and culture.

Just the other day my young daughter very thoughtfully informed me that *"God must have used black sand to make black people, brown sand to make brown people and a little bit of brown sand mixed with white sand to make peach coloured people"* (who said kids don't see colour?)

Unlike the UK - where it is terribly taboo and politically incorrect to draw attention to the fact that different people have different coloured skins, different types of hair etc. - here in SA we are free to explore these differences (in a respectful manner).

The way that we act towards one another and treat each other can make us stand out to the rest of the world – it can make or break us as being '*proudly South African*'.

Ubuntu, forgiveness, love, tolerance and understanding in the face of great odds (crime, unemployment, racial diversity, history and politics) are what make us unique on the global stage and speak volumes to the rest of the world, who continue to watch us with interest.

Whilst I may not have invented anything that I can stick a 'Made in SA' logo onto, my husband and I are blessed to have produced two wonderful children – proudly made in SA, with love. To date, they are the greatest thing that I can give back to my country. I hope that raising them in this wonderful (at times frustrating) country will make them truly proudly South African.

Our children are the arrows that we shoot into the future, our greatest hope.

But for those who are still left questioning their patriotic status I have compiled a little quiz. Circle your answer, see end for test results.

Are you Proudly South African?

When a robot turns green you:

a Look left, look right and then proceed with caution.

b Robot?

c Wait to make way for taxis speeding in the opposite direction.

When stopped by a traffic officer you:

a Roll down the window, offer him your licence and politely ask "What seems to be the problem officer?"

b Who said anything about stopping?!

c Accidently drop a R100 note whilst hunting for your licence.

You shop for 'odd' little novelty items:

a Online

b At the local China mart

c At the robot waiting for the lights to change

When you spot an empty coke bottle lying on your front lawn you instantly think:

a 'Wonderful, another item for the recycling bin!'

b About that program you saw where they are turning plastic bottles into jeans for Woolworths.

c That it is a secret code for the local thieves that tells them your house is good to burgle.

When you see the headline 'Oscar' your thoughts go to:

a Celebrities, red carpets and golden statutes.

b Who's Oscar?

c Just how like a woman most men do/don't sound when they scream.

Acceptable baby names include:

a Apple

b Blanket

c Given

'Now, now' is:

a A comforting term much like 'there, there ... .'

b A typo error.

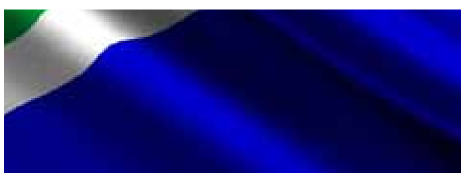
c Anything from a minute to a month.

When the lights suddenly go out you:

a First check your DB board.

b Stumble around in darkness hunting for that old candle stub in the back of the drawer.

c Check to see if your neighbour's lights are still on.



RESULTS:

Mostly A – you may want to consider applying for that Aussie visa

Mostly B – which rock are you living under?

Mostly C – congratulations, you are truly South African! wn

If you want to see your function or event listed here, please send the details to Minx Avrabos at minx@saiee.org.za

Calendar of events

MAY 2014

5-7	POWER-GEN INDIA 2014	New Delhi, India - Asia	www.power-genindia.com
6-9	IEEE Wireless Communications and Networking Conference, Istanbul, Turkey		wcnc2014.ieee-wcnc.org
8-10	2014 IET 7th PEMD	Manchester, United Kingdom	www.theiet.org.com
10	Cape Peninsula University of Technology	Open Day: Bellville Campus, Cape Town	www.cput.ac.za
13-14	Africa Utility Week	Cape Town Convention Centre, Cape Town	www.african-utility-week.com
14-18	yebo Gogga yebo amaBlomo	East Campus, Wits	www.wits.ac.za

JUNE 2014

3-5	Renewable Energy World Europe 2014	Koelnmesse, Cologne, Germany	www.renewableenergyworld-europe.com
21-22	3rd Intl Conf Economics & Social Sciences	Durban University of Technology, Durban	www.ifrnd.org
24-27	Language Conference	Johannesburg, South Africa	conference2014.linguistics@wits.ac.za
30-11/7	Training enterprise resource planning	Course, NQF Level 6 Cape Town Campus, CT	www.cput.ac.za

JULY 2014

1-2	Africa Ports and Harbours Show	Sandton Convention Centre, Johannesburg	www.terrapinn.com

AUGUST 2014

12-15	SAERA 2014 Conference	Southern Sun Elangeni Hotel, Durban	www.ukzn.ac.za
27-29	2014 IEEE 11th International Conference on Group IV Photonics	Paris, France	www.ieee.org.com

Explore

creative ideas for efficient lighting!

Local designers are invited to meet the real-world challenge of the 2014 Eskom Energy Efficient Lighting Design Competition with homegrown flair.

The 2014 Eskom Energy Efficient Lighting Design Competition will once again showcase local lighting designs that exude individuality and challenge convention. The search is on for talented South Africans with creative flair and design savvy, for the kind of artistic intuition that sparks new trends. And above all: that special gift that has the ability to turn pure science into pure art ...

Few design elements are as versatile and wield as much power to define and transfigure a space as does light. Yet, despite its endless possibilities, the power of lighting as a design tool is often underestimated. This is therefore a call for all designers (students, professionals and high school learners) to meet the challenge of striking the perfect balance between functionality and creative expression.

Engineers and designers – whether 'professional' or not – are invited to design a luminaire (light fitting) that makes use of energy-efficient technology, such as compact fluorescent lamps (CFLs), light-emitting diodes (LEDs), fibre optic or any energy efficient lighting system or product suitable for residential application.

If you are a creative South African who possesses the kind of artistic intuition that will spark new trends, we are looking for you. The closing date for entries is **15 August 2014**, and the total prize value is **R200 000**. Entrants may participate in any of three categories, namely a student, professional or high school learner category. For more information on specifications, evaluation criteria and entry forms, visit www.lighting-design.co.za, or send an e-mail to karin@dalajunction.co.za.

SAIEE COUNCIL MEMBERS

GRADE	NAME & SURNAME	CONTACT DETAILS	EMAIL ADDRESS
President	Dr. Pat Naidoo	031 409 3130	pat@patnaidoo.co.za
Deputy President	Andre Hoffmann	011 783 9330	andreleohoffmann@gmail.com
Senior Vice President	T.C. Madikane	031 536 7300	tc@igoda.co.za
Junior Vice President	Jacob Machinjike	011 800 3539	Jacob.machinjike@eskom.co.za
Immediate Past President	Paul van Niekerk	011 789 1384	paulvn@telkomsa.net
Honorary Treasurer	Viv Crone		vivcrone@gmail.com
Honorary Vice President	Mario Barbolini	044 620 2559	Barbolini@telkomsa.net
Past President	Stan Bridgens	011 487 9048	s.bridgens@saiee.org.za
Past President	Mike Cary	011 425 3497	carymbc@netactive.co.za
Past President	Mike Crouch	011 728 2852	michaelac@intekom.co.za
Past President	John Gosling	011 651 6266	gosling@worldonline.co.za
Past President	du Toit Grobler	011 498 5025	du.toit.grobler@gmail.com
Past President	Rod Harker	021 553 2632	raharker@telkomsa.net
Past President	Dr. Angus Hay	011 585 0490	angus.hay@neotel.co.za
Past President	Ian McKechnie	012 667 5151	ianmac@gafrica.com
Past President	Andries Tshabalala	011 820 5094	andries.tshabalala@actom.co.za
Fellow	Lt. Col. Bill Bergman	011 346 0395	william@bergman.co.za
Fellow	Hermann Broschk	011 728 4071	hbroschk@absamail.co.za
Fellow	Viv Cohen	011 485 2567	vivcohen@telkomsa.net
Fellow	George Debbo	012 991 3748	george.debbo@gdtelecom.co.za
Fellow	Prof. Jan de Kock	018 299 1970	Jan.Dekock@nwu.ac.za
Fellow	Tom Eichbaum	011 652 2226	thomas.eichbaum@siemens.com
Fellow	Dr. Hendri Geldenhuys	084 625 5522	hendri.geldenhuys@eskom.co.za
Fellow	Sy Gourrah	087 809 4700	s.gourrah@ompetha.com
Fellow	Paul Johnson	012 428 7647	paul.johnson@sabs.co.za
Fellow	Collin Matlala	011 997 8900	matlalac@global.co.za

SAIEE COUNCIL MEMBERS

GRADE	NAME & SURNAME	CONTACT DETAILS	EMAIL ADDRESS
Fellow	Prince Moyo	011 800 4659	prince.moyo@eskom.co.za
Fellow	Prof. Jan-Harm Pretorius	011 559 3377	jhcpretorius@uj.ac.za
Fellow	Prof. Rex Van Olst	011 717 7220	Rex.VanOlst@wits.ac.za
Fellow	Dries Wolmarans	011 793 9335	dwol@mweb.co.za
Fellow	Derek Woodburn	011 609 5013	woodb1@mweb.co.za
Senior Member	Jane-Anne Buisson-Street		buisson@mweb.co.za
Senior Member	M. Chauke	012 661 2346	chaukemx@gmail.com
Senior Member	John Dal Lago	011 800 2657	John.dallago@eskom.co.za
Senior Member	Theuns Erasmus	016 960 2496	theuns.erasmus@sasol.com
Senior Member	Prof Sunil Maharaj	012 420 4636	Sunil.maharaj@up.ac.za
Senior Member	Hope Mashele	011 312 9902	hope.nga.mashele@gmail.com
Senior Member	Prof. Johan Meyer	011 559 3880	estherl@uj.ac.za
Senior Member	Patrick O'Halloran	011 490 7485	pohalloran@citypower.co.za
Senior Member	Leon Staphorst	012 841 3236	lstaphorst@csir.co.za
Senior Member	William Stucke	011 566 3009	wstucke@icasa.org.za
Member	Wayne Fisher	011 679 3481	wayne@bergmanfisher.co.za
Member	Thavenesen Govender	011 629 5738	thavenesen.govender@eskom.co.za
Member	Dr. Mike Grant	011 717 7256	michael.grant@wits.ac.za
Member	Phillip Konig	011 239 5348	PKonig@hatch.co.za
Member	Prudence Madiba	011 800 4212	Prudence.madiba@eskom.co.za
Member	Dr. Nicholas West	012 656 1266	njwplasma@gmail.com
Chairman - E&S Section	Ian Gebbie	011 202 8758	igebbie@drasa.co.za
Chairperson - Power Section	Refilwe Buthelezi	011 629 5355	ButhelSR@eskom.co.za
Chairman - Historical Section	Max Clarke	011 476 5925	mppc@mweb.co.za
IEEE Representative	Prof Willie Cronje	011 717 7224	willie.cronje@wits.ac.za
RMWG Representative	Mario Kuisis	011 326 2708	mario@martec.co.za

Kwa-Zulu Natal Centre

Chairman | Veer Ramnarain

Postal Address | eThekwini Electricity | 1 Jelf Taylor Place, Durban, 4000

T| 031 311 9008 **F**| 086 693 4283 **E**| RamnarainV@elec.durban.gov.za

Western Cape Centre

Chairman | Phumelelo Ngxonono

Postal Address | Eskom, Eskom Road, Brackenfell

T|083 276 4028 **E**|phumie.ngxono@gmail.com

Southern Cape Centre

Chairman | Robbie Evans

Postal Address | P O Box 744, Wilderness, 6560

T| 044 801 2151 **E**|robbie.evans@eskom.co.za

Eastern Cape Centre

Chairman | Dawid Bester

Postal Address | 66 Havelock Street, Port Elizabeth, 6001

T|041 585 7559 **E**|dawidb@cadutoitec.co.za

Mpumalanga Centre

Chairman | Ntsika Bengu

Postal Address | PO Box 432, Secunda, 2302

T|+27 17 610 3221 **E**|ntsika.bengu@sasol.com

Bloemfontein Centre

Chairman | Ben Kotze

Postal Address | Univ. of Technology Free State, Private Bag X20539, Bloemfontein, 9300

T|051 507 3088 **E**|bkotze@cut.ac.za

Vaal Centre

Chairman | Danver Jacobs

Postal Address | 38 Rembrandt Street, Sasolburg, 1947

T|016 960 5104 **E**|danver.jacobs@sasol.com

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