AMEU NEWS
THE ASSOCIATION OF MUNICIPAL ELECTRICITY UTILITIES OF SOUTHERN AFRICA
LEADING THE ELECTRICITY DISTRIBUTION INDUSTRY

A MESSAGE FROM THE AMEU PRESIDENT...

This message comes to you during a period of turmoil of a kind that we have never seen or experienced before, neither here in South Africa nor anywhere else in the world. Quite simply, the Corona virus outbreak has forced us all to re-think how we live our lives whether at home, at work or even at play. Our living and working conditions have changed dramatically in ways we could never have imagined a few short months ago.

But in spite of this, life goes on, and in the context of this newsletter we carry on and try to find ways of keeping our utilities operating and delivering on our mission of supplying electricity to our customers.

While Central Government has led the way in making the overall rules that are essential to cope with the effects of this pandemic, Local Authorities - by virtue of their close relationship to most citizens through the provision of essential services - have had to carry a huge burden of keeping essential services flowing at the same time as they try to ensure that the staff required to do so are kept safe from infection.

And if that isn't all bad enough we have to cope with the added complexity of suppliers of our essential materials and equipment to supply our needs to keep the lights working, and who are under similar severe strains, to the extent that many companies are battling to keep open, and to deliver the items we need.

Let me assure you then that in all of this the AMEU Executive have been proactively adapting to the new circumstances and setting plans into motion that they believe will best serve our industry's basic needs.

Thanks to the efforts of our Secretariat and the Strategic Advisor, supported by the Executive Committee, we have been able to assist, advise and co-ordinate many of the actions that need to be followed to keep the lights burning. Our organisation is offering technical advice and general assistance whenever it is needed, and our move to virtual meetings to speed up decision-making is working extremely well, and at the same time, reducing our expenses.

You may already know that some drastic changes have had to be made in our programmes. One of the most important is the postponement of our 2020 annual Convention which was planned for later this year in Durban. This has affected me personally as my term of office – as well as those of the Executive - have now been extended for a year and, all being well, I will hand over the baton to Deputy President Jayshree Pershad at the next "normal" convention now scheduled to be held in Durban in 2021, a year later than expected.

I close with my best wishes for your good health, and offer my sincere thanks to each and every one who has played a role in all the many extraordinary actions and activities that have taken place these past few months.

Sincere greetings.

Refilwe Mokogosi

INSIDE...

A CHANGING WORLD... SEE PAGE 16

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LIGHT AND HOPE FOR CHINTSA

Unless they are local residents or frequent visitors to the East London area, motorists travelling on the N2 north will take little notice of a signboard barely 20 km out of the City that marks the turnoff to Chintsa.

Those more familiar with the area will know that a jewel in the Eastern Cape's string of coastal holiday resorts straddles the Cintsa river about 40km north of East London.

The permanent residents number about 2000 and many live in a village, Chintsa East, located just a few kilometres from the ocean and the beaches. A local charity "African Angels" runs a primary school in the area and caters for around a hundred local children. The organisation also takes a keen interest in the affairs of the local community.

African Angels started a teaching program in 2012 and their schooling now extends beyond academic learning. Facilities include a community computer lab, a boys' mentoring project and an early childhood development project. Their mission is to grow well-rounded citizens who are able to play leadership roles in the community and the nation.

Following enquiries by the local Beka-Schreder representative, one of the identified needs of the village community was that of street lighting. Thanks to the generosity of Beka-Schreder, and the co-operation of the Great Kei Municipality and Eskom, this need has now been filled. A total of 160 ZIYA-E LED streetlights are now installed and illuminating the township.

The installation was met with great excitement by the community. There is a newfound freedom after dark in the village where kids can play in the street and the community can move safely around. This colab project is a wonderful example of how South Africans can work together to make things better for all.

(View a video of the installation on https://youtu.be/CuhjlkuSnbg)

BEKA Schréder locally develops and manufactures energy-efficient LED lighting products, designed and suitable for local conditions, and are extremely proud to be associated with this very special project in bringing lighting and hope to a community.

For further enquiries, contact Peter Badenhorst at 043 726 0493 or p.badenhorst@beka-schreder.co.za

There is a newfound freedom after dark in Chintsa East, with BEKA Schréder's donated streetlights making the community feel safer

The ZIYA-E illuminates Chintsa East, making the community feel safer

BEKA-SCHRÉDER NOW B-BBEE LEVEL 3

BEKA Schréder, local manufacturers of quality lighting products, believe in sustainability and in contributing to the economy and local communities. They aim to add value to South Africa by contributing to the growth and training of our youth, empowering suppliers and driving various socio-economic development initiatives.

Their commitment to transformation, development and growth is supported by their latest audited B-BBEE rating of Level 3.

PIESA NEWS...

Many of our readers will be familiar with the work done by PIESA (Power Institute of East and Southern Africa) and will know that our AMEU Strategic Adviser, Vally Padayachee is also Executive Officer of PIESA.
With the limitations imposed by the current lockdown conditions, PIESA has been quick to fill the void created by not being able to meet in person on traditional training courses and at conferences, by arranging virtual training sessions.

A webinar covering the subject "Electricity Utility Management" has recently been held by PIESA and some 260 participant registered for all 11 of the training sessions. These ran for 2 hours per day and were spread over a period from 17 June to 1 July 2020.

The program included the following;

Willie de Beer
- ESI Overview
- Utility Definition and Management Overview

Vera Kriel
- Governance and Regulation
- The Utility in Context

At v.d. Merwe
- Utility Sustainability
- Utility Sustainability
- Tariff Revenue Requirements

Ayanda Noah
- Revenue Management
- Revenue Management

Vally Padayachee
- DSM, EE; Load shedding Energy Storage

In addition to PIESA and AMEU participants, the webinar also attracted a global audience including a large number of participants from the Philippines.

The webinar was sponsored by IERE (International Electric Research Exchange) a research organisation headquartered in Tokyo, Japan and their Secretary General, Dr Takao Watanabe, personally participated in some of the sessions.

From the comments received it is clear that the delegates gained valuable insights into the various subjects and the discussions that followed.

On behalf of the PIESA Leadership we extend sincere thanks and appreciation to all the speakers and participants, both national and international, and to IERE for their generous sponsorship of the event.

PIESA will take the learnings from this webinar into similar AMEU and PIESA webinars in the future. ■

VIRTUAL PANEL DISCUSSION

The AMEU will be hosting a Virtual Panel Discussion on "ZERO BASED BUDGETING" at 10-00 hr - 12-00 hr on 29th July 2020.

It will be moderated by AMEU Strategic Adviser Vally Padayachee and the participants will be;

- Director, Local Government, National Treasury;
- Chief Financial Officer, eThekwini Metro;
- City Manager, City of Johannesburg;
- Executive Director (Energy) City of Cape Town;
- Chief Financial Officer nominee, Eskom Group;
- Chief Financial Officer, Municipal Finance, SALGA.

The objective of the discussions will be to increase the understanding of ZBB methodology for use in municipal electricity utilities. ■

For more information contact Vally Padayachee on vally@vdw.co.za or 083 297 2287

HIGHVELD

The first of the virtual meetings of the various AMEU branches took place on 5th June, 2020, hosted by the Highveld Branch and was chaired by Mrs Mokgadi Magemba of City Power. Included in the meetings proceedings were feedback and developments with the WiE program, which included a report on a recent workshop with WiE members and Vaal University of Technology students during which - amongst other things - challenges and achievements of the movement were shared.

There was an update on Exco affairs from the AMEU Strategic Adviser, Vally Padayachee, in which he highlighted the decisions taken concerning the postponement of the 2020 Convention and the concomitant extension of the terms of office of the President and various elected Committee members, all directly related to the effects of the Covid-19 pandemic. Amongst other items, he updated delegates on the solar water heating pilot program of 2018 and the current situation in that regard.

He also advised delegates that municipalities are now in debt to Eskom to an amount of some R26bn . There are 44 municipalities each owing in excess of R100m. There are ongoing negotiations with Eskom concerning a variety of matters including the problem of the Notified Maximum Demand rules.

Among the other items covered was that of the MISA "National Framework Contracts" that are available for municipalities to use when they require ground and pole mounted transformers, professional services for electrification projects, and maintenance and construction contracts for electrification projects. The TID "roll over" project was also discussed including mention of various resources and assistance which municipalities can call on as and when required.

There were two technical presentations

Paul Vermeulen, City Power, discussed the effects of Covid-19 on the local electrical industry including the practical ways of working within the lock-down regulations that the Utility has implemented in the workspace, and effects of safety procedures. Other matters highlighted were the challenges utilities face within the framework of the IRP and the potential benefits to be obtained when energy storage or co-generation is available for flattening load curves.

Richard Pinnoch, AFRY, of Zurich, Switzerland, then followed with details of the effects of Covid-19 on the international electrical scene. He presented information on the reduction in loads on the networks in various countries and losses in revenue resulting there from. A follow-up presentation will be arranged for a future meeting.

The procedures and technical operations for the meeting went off smoothly. ■

IN MEMORIUM - IAN MCRAE

It is with regret that we record the passing of Dr. Ian Campbell McRae, a former CEO of Eskom and, after his retirement in 1995, the founding Chairman of the electricity regulatory body that was to become the NERSA we know today.

During his 10 years as CEO of Eskom he developed a close working relationship with the AMEU and regularly hosted Exco and Committee meetings at Megawatt Park.

He was born into a VFP/Eskom household in Germiston in 1929 and started his working career as an apprentice fitter and turner in 1947 with the company. During this period he was awarded a bursary and in due course qualified with a B.Sc.in Mechanical Engineering from Wits in 1953. Interestingly, he was required to complete his apprenticeship by working "on the bench" during weekends and holidays. By 1985 he had worked his way through the ranks in Eskom and was finally appointed its CEO, a position he held with distinction until his retirement in 1995.

One of the many projects for which he will always be remembered is Eskom's "Electricity for All" programme which not only required innovative thinking to resolve the many technical problems involved, but also drive, courage and diplomacy to overcome the minefield of political issues that were inherent in it. He passionately believed in electricity being the best driver for economic and social development.

He inspired his staff to do "impossible" things and as a result took Eskom to previously unheard of levels as an organisation. Under his leadership Eskom won both national and international recognition as a top company, with an operational efficiency of world class.

He was pre-deceased by Jess, his wife of 64 years, who died in 2019. May he rest in peace.

Max Clarke, Editor

SARPA NEWS

With COVID-19 rampant and staff away from the office, some working at home, others working shorter hours, SARPA has decided to give something back to municipal members by running two virtual training courses a month for the period August to November 2020.

The programme will start with a workshop for members only in July on essential infrastructure crime solutions. From August, two courses per month will be presented: basic, management, advanced, as well as infrastructure crime courses.

In October a newly developed "Specialized course" will be presented for the first time. All courses will be conducted on the Microsoft Teams platform.

It must be noted that the goal of the SARPA Revenue Protection training programme is to give delegates several tools to help them become self-motivated, in order to deal effectively with the relevant challenges and threats they face on a daily basis. The training sessions will also cover goal setting and influencing skills. Delegates will be taught how to become champions in combating crucial issues within the Revenue Protection field.

More information is available on the SARPA webpage: www.sarpa.co.za ■

UPDATE ON THE TID - 2024 ROLL-OVER...

In one form or other electronic-based financial transactions have been around for longer than most people can remember. In the 1990s, driven largely by Eskom's electricity-for-all program, pre-payment for electricity came into widespread usage, and electronic financial transactions took another leap forward..

One of the problems in this usage was the need for compatibility between different meter manufacturers and vending systems. By 1997 the Standard Transfer System was developed and an STS Association was established to manage its use.

The STS is an international industry standard described in IEC62055-41, -51 and -52 and now serves some 60 million meters in 500 utilities in 94 countries worldwide. More than 9 million of these meters are in South Africa.

Many of our readers will recall that in a report on Good Hope Branch affairs - carried in the November 2018 issue of AMEU News – it was recorded that Don Taylor, Chairman of the STS Association, had made a presentation on the TID "roll-over problem". The basic details were given of the operational software embedded in all pre-payment meters and how the earlier models would be affected by the passage of time.

It was made clear that on 24th November, 2024 these particular meters in their current form would no longer accept codes for energy purchases, and would not dispense any further electricity to the customer.

To overcome the problem it is essential for every meter using the particular software to have a special code entered through its keyboard. While this is a relatively simple operation that can be carried out by anyone with the basic information for the particular meter, the scale of the operation is significant.

In the South African context consider the following...

- 9.7 million meters need to be reset within the next approximately 910 working days, requiring a rate of some 10,600 meter resets per day.
- Written notifications have been hand delivered to 244 municipalities (local, district and metros) and to Eskom.
- Written notifications have been delivered to 228 sub-metering entities (housing complexes)

REMEDIAL ACTIONS THAT ARE REQUIRED

1) Ensure that the prepayment token vending system and security modules are upgraded and certified to comply with the latest STS Edition 2 specifications. This needs to be done in collaboration with your vending system supplier.
2) Apply to the key management centre for a new supply group code (SGC) key that is linked to the new 2014 base date and load it into the vending system security module. Both the current and the new SGC are thus loaded together, enabling the vending system to vend to current meters on base date 1993 and also to new meters on base date 2014.
3) It has been a mandatory requirement for all meters to comply with the "reset" functionality from inception in 1993, but this could only be tested since 2014. There is thus a small risk that some meters which were certified prior to 2014 may not comply, so we recommend that these be re-checked on a sample basis. A list of suspect meters is available on the TID Rollover website. A sample of such meters can be sent to the STS Association to be tested and certified.
4) Once the vending system has been upgraded and certified to STS Edition 2, new meters purchased should be coded to the new base date of 2014. This will be done by the meter manufacturer, but the municipality has to specify this requirement on the tender document or purchase order.
5) Formulate an execution plan to visit each installed meter to insert the two special "reset" tokens. **This part of the process requires the most resources and should not be under estimated**. Two options can be considered:
   a) Issue the two tokens to the end-customer when he does his next credit purchase. The customer then enters the two special tokens into the meter before entering the newly purchased credit token. A dedicated help-desk needs to deal with exceptions;
   b) Make use of a dedicated task team that enters the two special tokens into each meter in the field. This method has the advantage that a technical audit can be performed on each meter and detect/remedy any fraud or faults at the same time;

A selective combination of the above two methods, depending on particular circumstances and customer demographics can also be used.

SUPPORT IS AVAILABLE FROM THE STS ASSOCIATION

- A help line, guidelines and reference documents can be found on the dedicated website https://www.tidrollover.com or an email may be sent to tid@sts.org.za.
- The STS Association will also test sample meters (certified prior 2014) upon request, and free of charge.
- Arrangements can be made by sending an email to tid@sts.org.za or via the website.

COMMENDABLY, SOME SOUTH AFRICAN MUNICIPALITIES HAVE ALREADY STARTED IMPLEMENTING THE TID ROLLOVER PROGRAMME

eThekwini Municipality is almost ready to commence the rollover process for about 400 000 meters. An extensive public communications strategy has been developed to promote awareness, and identify and engage stakeholders that are key to the success of the program.

For **Buffalo City**, the TID rollover program has been active since April 2019. After dealing with challenges such as lack of resources to get to each of their 129 000 meters, as well as low consumer awareness, they engaged the Mayor's office and local ward councillors in a marketing drive to inform the public about the rollover and their approach to making it happen. As a result, Buffalo City is on track to complete their TID rollover project by the end of 2021.

Dr Beyers Naude, seated in Graaff Reinet , though a smaller municipality with only 11 000 meters requiring attention, had far less access to technical resources to get the job done than much larger utilities. Since beginning the first phase in July 2019, they collaborated with local government in an awareness campaign and engaged with registered electrical contractors for ground auditing. Dr Beyers Naude is aiming for completion of the entire project by mid 2020.

Together, these three municipalities are excellent case studies for how efficiently the TID rollover project can be run with the right communication and implementation strategies.

Latest news is that the **City of Cape Town**, with approximately 560 000 prepayment customers, to date have upgraded their prepayment vending to STS6 to handle the TID role-over and are currently in the process of procuring the TID-compliant security modules. Once these are installed and tested the following steps will take place;

1. Start purchasing all new meters on the new TID date (2014)
2. Embark on a customer and stakeholder engagement communication process.
3. Issuing of Key Change Tokens to customers
   a. Phased approach, Split geographical area into logical block areas
   b. Customers' education and communication, incentives
   c. Issue key change codes on the token upon next purchase
4. Education of staff, management and politicians
5. Call center and Back-office staff available for queries
6. FLR field-staff on standby for on-site assistance
7. Media releases to deal with fallout

Also, news from **Polokwane** is that they have a contract for the supply of meters in place and the responsibility to make our meters TID-2024 is part of the scope of work included in the contract. ■

N.B. All utility engineers who have not yet commenced with this project in their areas are urged to please make a start now - there really is no time to waste !

CONGRATULATIONS

Vally Padayachee elected to chair the NRS Association Management Committee

The NRS Association is a voluntary non-profit organisation developed to support the ESI in developing rationalised, non-mandatory electro-technical guidelines and specifications for the industry, through which technology standardisation is provided. Membership of the Association is voluntary and open to anyone who can promote standardisation with the electrical supply industry.

Currently the core membership of the NRS Association are:

1. Eight metropolitan Category A municipalities
2. AMEU
3. SABS
4. NERSA
5. Eskom and
6. PIESA

Co-opted members from industry may be added by invitation from time to time.

The affairs of the NRS Association are managed by the NRS Association Management Committee and assisted by a Secretariat provided by Eskom. ■

(Vally is the AMEU's Strategic Adviser and the position is for 2 years from March 2020. AMEU News wishes him well and every success with his new responsibilities. Ed)

UPDATE FROM EKURHULENI (TID)

The summary below gives an indication of the progress being made by the City of Ekurhuleni (CoE) with regard to their TID roll-over plans;

1. The electricity prepayment vending system upgraded and certified to comply with TID requirements - **Completed.**
2. Testing the current and future processes on the integrated Automated Business Process management system with CoE Billing and electricity prepayment vending system in test environment – **Started, Possible completion end August 2020.**
3. Integration of Automated Business Process management system with CoE Billing and electricity prepayment vending system - positive test outcome to inform the upgrade on the *production* electricity prepayment vending system – **to start immediately after point 2 , no timelines yet – envisaged to be completed by end September 2020.**
4. Upgrade security modules to comply with TID requirements – **to start immediately after point 3, no timelines yet - envisaged to be completed by end November 2020.**
5. Apply for new vending keys at KMC and load it into vending system's security module together with current vending keys, enabling vending system to vend to current meters on base date 1993 and also to a new meters on base date 2014 (i.e. fully backward compatible with current installed meters), this to include tests – **to start immediately after point 4, no timelines yet.**
6. Execution plan to start in 2-fold: automated generation of key changes (via units purchases) and physical visits to each installed meter, depending on a particular circumstances – **to start immediately after point 5, no timelines yet**
7. Purchase new meters on base date 2014 – to start immediately after point 4, as and when required – also already part of manufacturing configuration data sheets.
8. Notify the end users as soon as the necessary support infrastructure is ready for use – **to be done via CoE Communication, Marketing and Brand Department, to start 2 months before execution after point 5 and ongoing throughout until the last meter is reset to base date 2014.** ■

REVENUE PROTECTION - QUO VADIS?

The March 2020 issue of AMEU News carried two papers on the massive problems facing the municipal authorities arising from illegal activities occurring in their Electricity and Water service delivery areas.

In case you missed them, here is a reminder

Amongst other things the City of Ekurhuleni estimates that there are some 90 000 illegal connections to their electricity network.

Also, Johannesburg Water estimates that about 20% of the connections to their water reticulation system are illegal.

In addition, Buffalo City reported a disturbing emergence of criminal elements that have installed rogue meters to divert funds directly to rogue bank accounts.

So, what's being done about these and similar developments?

SARPA is doing its best to assist municipalities to protect their revenue streams by running training courses in matters directly related to the scourge, and they are working on ways to introduce AI (artificial intelligence) and ML (machine learning) into revenue protection processes. They are also developing new and relevant courses.

More recent on-the-ground developments in related matters are that the City of Johannesburg recently called in the military to assist in a "clean up" of Diepsloot where illegal connections had proliferated to such an extent that network overloads – and severe damage resulting from this illegal activity - were being regularly experienced...

Ekurhuleni Electricity has set up a program to target illegal connections for the remainder of 2020 including parts of Tembisa (**E**stimated **I**llegal **C**onnections (EIC), 19 000), Brakpan (EIC 9 500), Germiston (EIC 12 000), Alberton (EIC 10 000), Boksburg (EIC 26 300), Edenvale (EIC 26 300), Springs (EIC 3 000), Benoni (EIC 13 500) - an estimated total of 98 300.

Executive Mayor Masina has announced extraordinary measures to combat this crime. Following extensive power outages resulting from over-loading he has appointed Members of the Mayoral Committee as "Energy Champions" to work with area engineers and report back regularly on the progress being made to resolve this problem. A timeline of three weeks has been set for a speedy resolution to the unplanned and sporadic energy outages in the City caused largely by these illegal connections.

In other news CPI (**Combined Private Investigations**) reports that 2 suspects have been found guilty of stealing batteries from a Telkom installation, valued at some R20 000 and have each been sentenced in the Vosloorus Court to a total of 17 years imprisonment in February 2020.

In another incident, in January 2020, members of a syndicate operating in the Heuningspruit/ Rooiwal area were sentenced to a combined total of 415 years and 6 months direct imprisonment in the Kroonstad Court for stealing co-axial cables and other equipment from a Transnet installation. ■

DID YOU KNOW?

ELECTRIC PLANES

The ready availability of drones for recreational and commercial purposes serves as a reminder that electricity-powered aircraft are a reality. But most of us have already forgotten that the Solar Impulse flew around the world powered by PV cells built into its wings and parts of the fuselage just a few years ago.

Research is on-going. You may be interested to know that the speed record for electricity-powered aircraft stands at 210mph (338km/h) achieved in 2017 by a Siemens-engineered machine.

Not to be outdone, Rolls-Royce have now unveiled an aircraft that they plan to use later in 2020 to try to reach an breathtaking 300mph (483km/h). The aircraft's batteries are capable of driving it for 200 miles. ■

Photos sourced from Internet

TAMING THE SONIC BOOM

One of the reasons why commercial aviation has never taken to supersonic aircraft other than the London-to-New York Concorde a few years ago, is because of the effect of the sonic boom on human habitation under the flight path. Concord's flight plan ensured that the "boom" only occurred once the aircraft was over the Atlantic Ocean in each direction.

Now Lockheed Martin has a research plane under construction, with plans to fly it in 2021. This is a supersonic machine that is designed in such a way that flying through the sound barrier will result in a gentle "thump", not the usual disturbing "boom". ■

PROTECTING INFRASTRUCTURE AGAINST THEFT AND VANDALISM; A GUIDE TO SOME ACTION STEPS

Considering that vandalism, theft and related illegal activities affecting EDI infrastructure cost our industry somewhere in the region of R15bn a year, it is not surprising that the question often asked by officials responsible for electrical distribution networks is, "What can be done to prevent infrastructure theft and damage, and what services and technologies are available?"

The following notes and comments are edited from a document prepared by AMEU Past President Hannes Roos and will hopefully assist our colleagues to find solutions to this complex problem in their particular environment and help their understanding of how the available services link up with each other..

1. Security Risk Assessment

This is one of the first processes that needs to be carried out to determine what services and technologies are required on individual items of plant or sites for the effective implementation of protective measures. Hazards must be identified that could negatively impact an organization's ability to conduct business and measures, processes and controls must be pinpointed to reduce the impact of these risks to business operations.

2. Technology

It is essential that protective structures for miniature substations, meter boxes, kiosks, and so on, are based on proper mechanical designs and that they include well designed locking systems, sensors and appropriate communication equipment.

Depending on the type of equipment and/or the structure or site, the design, installation, implementation, and maintenance of additional types of security systems must be considered and evaluated. These may include lighting, cable alarm monitoring systems, pepper spray and CCTV capable of facilitating facial recognition and human behavioral analysis and other items. They should be used at particularly critical sites to assist in preventing unauthorized access and in apprehending the criminals involved in the event of an incident of some type, and their successful prosecution in a court of law.

Proper end-to-end communication solutions to a centralized control room are vital links in the system. Similarly, effective back-up response personnel must be available at all times.

The main function of the technologies is to delay access to the infrastructure and to be the ears and eyes that will trigger the response personnel.

3. Control Room

Off-site 24-hour monitoring of an organization's plant, equipment and sites is essential to maximize the benefits of the investment in technology and the equipment installed, to prevent or reduce the damage and losses resulting from criminal activity. The employment of skilled and highly trained controllers is a pre-requisite for this key function.

4. Response/Investigation teams

No security system can operate successfully without a Response Team. The members, who must receive specialised training and be equipped for rapid deployment, are the public face of the response leg of the organisation. Their function is to prevent damage to equipment and the apprehension of criminal intruders.

Thereafter, for the successful prosecution of apprehended criminals it is important that the Response Team(s) have legal backup. Ideally this should be "in-house". Successful convictions follow from meticulous attention to detail in the on-site investigations and the legal processes necessary for each incident.

Court procedures are usually complex. In-house legal teams monitor and assist with court cases, ensure dockets are completed with all relevant information to be presented at court, advise at bail hearings, ensure witnesses are informed in respect of court attendance, provide a watching brief over sensitive cases, testify on behalf of clients as and when necessary and/or appoint legal advisors from the private sector should the need arise.

The synergy between refined intelligence-driven operations and technological aids provides the impetus for successful convictions.

5. Intelligence

Any successful monitoring and protection service must include a network of informants who have successfully infiltrated syndicates, informal organisations and unscrupulous receivers of stolen material. A network of informants and agents which can be deployed at any institution to gather valuable information is a key facility for any provider of effective security services. Their ongoing recruitment and retention form an essential part of any such providers' organisation.

6. Forensic Laboratory

Forensic scientists collect, preserve and analyse scientific evidence during the course of an investigation. While some forensic scientists travel to the scene of the crime to collect the evidence themselves, others occupy a laboratory role, performing analysis on objects brought to them by other individuals.

In addition to their laboratory role, forensic scientists testify as expert witness in both criminal and civil cases and can work for either the prosecution or the defence and form an essential part of the security team.

7. Aviation

For many large utilities, their extensive and widespread layouts require flexibility in the ability of response teams to quickly reach incident localities. Helicopters provide such a facility and when required must be equipped with the latest surveillance technology to ensure high levels of efficiency during both day and night operations.

Typically this technology includes a gyro stabilised FLIR (Forward Looking Infra Red camera/ Thermal Imaging System), a Spectrolab search light as well as other essential law enforcement equipment.

Teams should comprise highly qualified and experienced aviators, including both pilots and tactical flight officers, who are on standby 24/7 and can deploy at a moment's notice as required,

8. Guarding services

While technology serves as an aid to assist investigations and prevents and/or deters theft and damage, it is sometimes appropriate to deploy guards on sites, for example where construction is under way, cable networks are being installed, buildings are under construction, or access control is required at workshops or sites.

For cost effectiveness a balance must be achieved between the selective use of guards or technology to suit site conditions.

9. Illegal Connections

Dealing with illegal connections requires a different approach from that needed for dealing with infrastructure theft and vandalism of an electrical distribution network. These connections are inherently unsafe as they are often done by people with limited technical training who not only risk electrocuting themselves, but also expose other people to the risk of injury and death. The connections often lie across pathways and walkways where the risk of community members accidentally making contact is high. An additional risk is that illegally connected wires often make contact with structures such as roofs, gutters, and washing lines, with the potential of these items becoming "live" from damaged or non-existent insulation.

The removal of illegal connections is normally a team effort consisting of Municipal officials from the electrical department, the municipal police department, the political representative of the area, SAPS and outsourced security.

It is of utmost importance that once the illegal connections are removed, the area is monitored to prevent the installation of these connections again by the community who installed tehm in the first place.

Ideally, having a project in place to electrify these same areas with a properly designed reticulation network is likely to eliminate or reduce this form of vandalism, and can reduce wasted expenditure.

10. Legal Framework

It must be noted that on 15 December 2015 the President signed the Criminal Matters Amendment Act into legislation. The Act classifies the theft of ferrous and non-ferrous metal as infrastructure crime. It came into effect as of 01 June 2016. (Crime code 3200 to be used for reporting all Infrastructure theft at SAPS)

There is a saying that you can let your favourite Rugby or Soccer team play without some of their team players, but they will not win the game ! If you want to deal with infrastructure theft and vandalism effectively, you must consider having all processes, services and technologies described above as part of the team. ■

(Past-President Hannes Roos is a Consultant (Technical Support) to CPI, a well known company which has been successfully supplying security-related services for the past 20 years. Anyone requiring further information should contact him on 083 469 3933 or Hannes.Roos@combinedpi.co.za Ed.)

DEON CONRADIE RETIRES....

Our AMEU Exco members and many of our Engineer Members were recently surprised to hear that Deon Conradie, one of Eskom's most regular delegates to AMEU Tariff Committee meetings, our Conventions and other meetings of our Association and industry-related organisations, has taken early retirement.

In a message to the AMEU Executive he announced that he ended some 36 years of service in the national power utility on 30th April, 2020.

Readers will be interested to know that he started his career as an Engineer-in-Training in Eskom in 1984, and progressed through the ranks to end as the Senior Manager for Electricity Pricing. He has led the team responsible for tariff design with distinction and - particularly in recent times - had the unenviable job of finding ways to determine and optimise tariffs to maximise Eskom's income stream, more often than not under extreme pressure.

Deon attended many Tariff Committee meetings of the AMEU Executive, often having to explain the reasoning behind decisions that had been taken. He always did this in a friendly and professional manner.

He was born and brought up in Pretoria and graduated from Pretoria University in 1983 with a B.Eng (Hons) having obtained his B.Eng a year earlier. In 1992 he graduated from UNISA with an MBL.

His first appointment was in the Test and Telecoms Section at Simmerpan in 1984. He moved to many other sections of the organisation, including a spell in National Control, various positions in the Free State Region, the Eastern Transvaal Region, and even a year in Taiwan with the Taiwan Power Company as a Distribution representative.

In 1997 he assumed the position of Senior Manager (Electricity Pricing) based in Megawatt Park.

Deon lives in Pretoria with his wife Teresa, and they have two children.

On behalf of our many readers who consider him to be a friend, AMEU News wishes him many more years of health and happiness in his retirement. ■

OPINION PIECE: THE HIDDEN COSTS OF BUYING CHEAP

Penalties, reputational damage and system failure can rack up massive costs on a sub-standard power installation, warns Tank Industries.

By Clive Maasch, General Manager at Tank Industries

There is an Afrikaans saying: 'Goedkoop is duur koop', which, translates to 'buying cheap is buying expensive'. This is particularly relevant in the power sector, where getting it wrong by using inferior products and unreliable suppliers can incur massive additional costs.

As sub-Saharan Africa races to address the power deficit, we will see a growing number of power facilities being rolled out across the region. As with any sector boom, a wave of suppliers will enter the market looking to cash in on the growth. Some of them will be fly-by-night companies offering inferior products at bargain basement prices.

Contractors and installers looking to boost their margins should view these suppliers with caution, however. On the face of it, cutting the cost of cable and accessories may appear to be a good way to cut the project costs and win the tender. But in the long term, there are hidden costs associated with partnering with un-trusted suppliers.

For example, should a supplier lack nationwide technical support resources, an installer might lose days on the installation while awaiting technical back-up from the vendor. If the supplier has insufficient cable and accessories in stock, an installation could be delayed for weeks awaiting an order from overseas. These delays can impact on the switch-on deadline and cause the contractor to incur high penalties.

If the cables and accessories are sub-standard, systems failures a year or two down the line impact the contractor's reputation, the utility's service delivery and the end customer's experience – all of which result in additional costs.

Should the supplier be unable to supply product training for staff, the contractor, utility and local authorities could suffer costly delays and future downtime due to faulty installation.

The most cost-effective power installation is the one that rolls out efficiently, on time, and operates reliably for upwards of 15 years. Achieving this depends on a combination of industry-leading cables and accessories and a supplier who does more than just drop off products; but instead actively partners with the contractor in ensuring a successful roll-out.

Tank Industries, a market leader in low and medium voltage cable accessories, has a proven track record of supplying the South African power sector with TE Connectivity's industry-leading Raychem products. JSE-listed Reunert Group member, Tank Industries fields the best niche technical skills and training available in South Africa, and supports contractors nationwide with its expert technical support team and multi-million rand in-country stockholdings.

Tank Industries is the Sole Distributor for TE Connectivity's industry-leading Raychem products in South Africa.

About Tank Industries
Tank Industries is a specialist manufacturer of telecoms, fiber optic, power and electronics accessories, with a 30-year track record of exporting world-class products for the global and pan-African market. As a subsidiary of the Reunert Group, Tank Industries is based in Cape Town, where it produces high quality tubing, enclosures, joints, connectors and more for the power and telecoms sectors.

Contact details: Tank Industries, Clive Maasch - General Manager, Tel: 021 700 4380, Email: clive.maasch@tank.co.za

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AMEU MEETINGS TO GO " VIRTUAL"

One of the many impacts that the Covid Pandemic has had on the way businesses conduct their affairs is the widespread use of electronic media in ways that many would not have thought possible just a few months ago.

The AMEU has not been spared and the AMEU Executive and Committees, The WiE, the Branches, the Affiliates are now "meeting by wire" as never before...

AMEU Branch Officers decided unanimously to go with a virtual programme for all future AMEU Branch meetings to ensure that we continue to support and add value to all our members. The virtual programme will be open to all AMEU members as well as SARPA municipal members, PIESA utility members and in some cases IERE members.

The Branch programs will generally be in the form of webinars hosted by various branches and held every 2 months, as per the following proposed schedule..

1	HIGHVELD	5 June 2020	10h00 – 12 noon (completed)
2	GOOD HOPE	7 Aug 2020	10h00 – 12 noon
3	KZN	2 Oct 2020	10h00 – 12 noon
4	EASTERN CAPE	4 Dec 2020	10h00 – 12 noon
5	LIMPOPO	15 Jan 2021	10h00 – 12 noon
6	MPUMULANGA	5 March 2021	10h00 – 12 noon
7	CENTRAL	7 May 2021	10h00 – 12 noon

The format that will be followed is as follows;

HOSTED BY THE AMEU XYZ BRANCH
DATE: XYZ MONTH
TIME: 10H00-12H00
AGENDA:

1. Welcome
2. Virtual meetings ground rules and protocols
3. Apologies
4. Confirmation of agenda and inclusion of priority items (if any)
5. AMEU XYZ Branch/Affiliates matters - feedback and/or presentations **(60 mins)**
6. AMEU Strategic Adviser's report/feedback – Vally Padayachee **(30 mins)**
7. Local and international presenters/speakers **(30 mins)**
6. Closure

TRACKING-TECHNOLOGY AT ITS BEST

The marvels of modern electrical technology and equipment are many and varied, but this marine turtle is carrying things to extremes!

In the November 2019 (No 99) issue AMEU News carried a story of a shark that was tagged in the Western Cape's Breede River and ended up in Mozambique waters.

News has now been released of a turtle that was tagged in Cape Town's Two Oceans aquarium, and then released on the Atlantic seaboard. After swimming an average of 48km every day for more than two years, it is sending signals from the other side of the Indian Ocean, in the waters north-west of Australia.

In the case of turtles, the tags are glued to the body shell of the animal just behind the neck

Photo: website

area. Because turtles surface to breathe, the transmitter is able to send signals via satellite to the research centre on a regular basis.

The durability of the sensors, transmitter, the electronic components in general, and the battery (some types keep operating for an impressive 8 to 10 years), all of which are operating in a very harsh environment, speak mountains for the quality and design of the devices used in this field of research.

Anyone wishing to have more information on the Turtle Rescue Program - and the research being undertaken – should contact the Two Oceans Aquarium in Cape town. Any support which you can provide will be welcomed and appreciated. Ed.

PITFALLS OF PRE-PAID TARIFFS

A recent flurry of comments in the media resulted from a "warning" from an un-named source that indicated that City Power was considering a significant increase in their pre-paid electricity tariff. The increase proposed was to be an additional fixed charge of R200 per month over and above the Regulator's recommended increase on kWh unit prices. The City Council did not approve the tariff; and it was withdrawn from the NERSA application for the year.

The background is interesting and carries an important message for all utilities.

As a general observation, the original prepaid tariffs were meant for the low income residential sector, where part of the subsidy to those consumers came about as no separate fixed network cost was included in the tariff, and a minimal network charge was blended into the unit rate. The type of service connection for which the tariff was designed was the 20 Amp supply to a typical RDP house. In effect, only consumed energy was charged for.

At the time of the introduction of the prepaid tariff, all the 60 to 80 amp single phase and three-phase residential connections were on a post-paid billing basis that was a three part tariff with separate unit charges for energy, a fixed network charge and a small admin charge – a conventional and much more sustainable tariff structure. The design of this tariff took into consideration the likelihood of the household having a geyser and an electric stove which defined the quantum of the network charge.

Two related developments pushed the demand for prepaid metering in the 60 to 80 Amp service connection sector in Johannesburg at the time. First was the infamous billing crisis – frustrated by inaccurate billing and resulting cut-offs, customers demanded conversion to prepaid electricity tariffs. Secondly, due to interruptions in the revenue stream from the sector, City Power itself pushed for the conversion to prepaid tariffs in the 60 to 80 Amp sector, with the additional belief that prepaid tariffs also 'puts the money in the bank up-front' and able to earn interest.

For whatever reason – either done unwittingly, or as a result of the politics around the notion that equal charges should apply to everyone in the residential sector, the critical mistake was that the conversion to prepaid was done using the existing prepaid tariff intended for the subsidized low income residential sector. Worse still, the situation was made even more complex by pressure from the Regulator for the conversion of the prepaid tariffs from a flat rate basis to an Inclining Block Tariff scheme.

There should have been a different tariff altogether for the 60 to 80 Amp prepaid sector, either with a fixed charge added to the rates bill, if using the same unit energy charges as for the 20 Amp service connections. Alternatively, with unit charges plus the network charge blended in to the unit charge.

A cost of supply study for City Power in 2017 revealed that before a single kWh is sold, the actual cost to keep the grid alive to each residence - both low income and high income residential consumers in Johannesburg -- is around R750 per month.

It is patently obvious that if this cost is not recovered, particularly where there are substantial water heating, cooking and space heating loads, that City Power will not remain a sustainable business going into the future. Ironically, the net result over time has been that the prepaid upper income residential sector is in receipt of an unjustifiable subsidy, not particularly to the detriment of the low income residential sector, but rather at the expense of the commercial and industrial sector.

Other municipalities have managed to avoid falling into the trap, but unfortunately it seems that some may have copied City Power over the years and are now in the same precarious situation.

Just how this will be resolved is unclear, and with Eskom soon to be launching new and structurally different tariffs we can expect some interesting debates in the not-too-distant-future ! ■

(Special thanks to Paul Vermeulen, City Power, for this interesting and thought-provoking article. Ed.)

UPDATE ON BATTERY DEVELOPMENTS...

"Familiarity breeds contempt" is a well worn phrase that is often used in a kind of throw-away manner that belies the accuracy of the words and true meaning of the expression...

When something as everyday as a motorcar undergoes subtle and sometimes not-so-subtle changes we quickly accept these as norms and give no further thought to how or from where they originate.Think of the improvements in engines and gearboxes over the years, and what some would call gimmicks like rain-sensitive windscreen wipers, automatic headlamps that come on at dusk, lane-change alerts, warnings of the close proximity of obstacles and other vehicles, tyre-pressure sensors - the list is endless.

So where does the inspiration originate?

You may be surprised to know that a significant amount springs from motor racing. In recent years in particular, the F1 series has inspired manufacturers in more ways than we can ever imagine. For a start, engines are more efficient and develop more power - transmission and suspension systems are almost unrecognisable,as are brakes, brake pads and braking systems.

And then, six years ago a new kid appeared on the racing block.....

Inaugurated in 2014, Formula E racing has already made an impact on the electrical technology built into the machines. For a start, the original vehicles could reach top speeds of some 225 km/ph. The latest models are reaching 280 km/ph. Electric

Photos sourced from Internet

motor designs are being refined as are control systems and regenerative braking systems. Incredibly, battery energy storage capacity has doubled as a result. ■

RENEWABLE POWER UPDATE

TIDAL

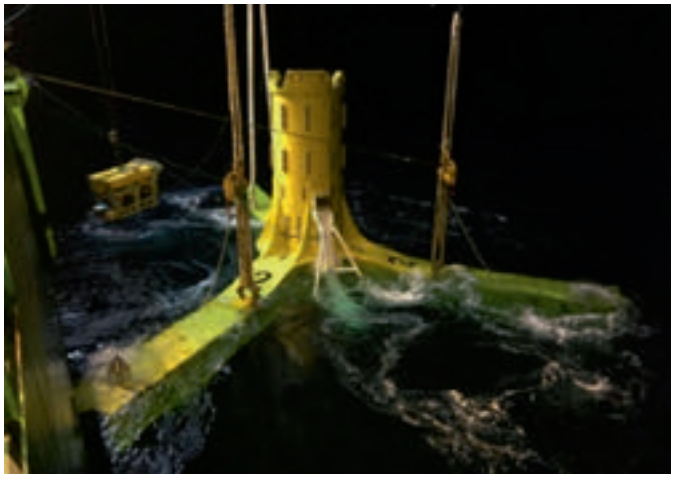
The Orkney Islands are a group of more than seventy islands, twenty of which are permanently inhabited, located some sixteen kilometres off the coast of northern Scotland. They effectively form a barrier between the southern waters of the North Atlantic Ocean and the North Sea – or Norwegian Ocean.

Because of the geography of the area, the tidal movement of the waters between these two parts of ocean are entirely predictable for every day of the year, and every phase of the moon.

The main channel, Penland Firth, has significant tidal currents which are amongst the fastest in the British Isles. Research indicates that under-water tidal water turbines could potentially generate close to 2GW of electricity if fully developed.

The first pilot project to utilise this potential was launched in the nid-1960's and recent reports indicate that one of the world's largest tidal-development companies MeyGen has completed the longest ever run of uninterrupted generation by multi-megawatt tidal turbines.

The four turbines have now exported 24.7 GWh of renewable energy to the national grid in the first phase of a project that is planned to eventually incorporate 250 submerged turbines.



The 1,5MW turbines can cater for the changes in the tidal flow and are mounted on substantial 3-arm bases that are both weighted down and anchor-bolted into the sea bed. Some idea of the magnitude of the project can be gauged from these pictures.

A further develoment in the area is that of floating turbines. The company EMEC is at an advaced stage of development of a 2MW turbine that will hang from a cigar-shaped flotation vessel which will be anchored in the tidal race. The sweep area of the blades is 600 square meters and the first unit is expected to be operating by year-end 2020 and fully operational in 2021. A 4MW unit is planned for 2022.

WIND

Meanwhile wind turbines are multiplying at a high rate. By the beginning of February 2020, wind power production facilities comprised 10,429 wind turbines with a total installed capacity of over 22 gigawatts: 13,575 megawatts of this was onshore capacity and 8,483 megawatts of offshore capacity. This placed the United Kingdom at this time as the world's sixth largest producer of wind power.

SOLAR

The U.K. government has given the green-light for plans to develop the country's largest solar park, a sprawling project which will cover a large chunk of land on the north Kent coast about 15km north-west of the city of Canterbury.

A joint venture between Hive Energy and Wirsol Energy, the £450 million ($555 million) Cleve Hill Solar Park will be located near the towns of Faversham and Whitstable.

The subsidy-free 350 megawatt scheme will use 880,000 solar panels and is set to include an energy storage facility. ■

A CHANGING WORLD

Many of our AMEU News readers will know that in addition to the +/- 2200 printed copies of the newsletter that are posted to readers on our mailing list, since June 2008 - (No.65) - an e-version of AMEU News has been freely available on the AMEU Website. This was done as a first step to try to meet readers changing preferences and reading habits as electronic communications became increasingly popular. From the stats on visits to the site it seems that although the figures vary seasonally, on average 3 viewers look at the e-version of the newsletters each day for a couple of months after it was first placed.

Life-style changes have continued and the dramatic influences of the past 5 months of 2020, as the national and international lock-downs have taken effect, coupled with the concomitant mushrooming demand for electronic communications, have again focussed our attention on reading preferences and it has been decided that the time is ripe for yet another change.

This issue (No.101) will primarily be available on the AMEU website. All Association members and each reader on the mailing list who make their e-mail address available to the office will be sent an e-mail with the link that will take them directly to the e-version. A number of print-copies will be run off and held in the AMEU Office and will be posted to any reader who requests one.

Please let us have your feed-back - we want to do the best for you, our readers.

Thanks, and enjoy the read.

Max Clarke
Editor

SURPRISE INNOVATIONS FROM AN UNEXPECTED SOURCE

Most of our AMEU News readers will have heard of Estonia, a country often loosely grouped as "one of the Baltic States". It is situated just south of the Gulf of Finland, across the Baltic Sea from Sweden, west of Russia and north of Latvia. It is some 45 000sq.km in area, including over 2000 islands lying just off the coast in the Baltic Sea. It has a population of about 13 million and historians believe it has been inhabited from about 9000 BC.

Modern Estonia is up there with the best. For example, it is not generally known, but three Estonians were in the five-man Scandinavian team that developed the Skype program.

Engineering manufacturing has not been a strong component of the nation's lifestyle and according to the website, Estonia has only been home to small motorcycle and bus manufacturers.

But this could soon change if the company NOBE Cars has their way

The company has developed a 3-wheel all-wheel-drive electric car that targets city drivers. Depending on the model, the range is about 200km per battery charge. It uses a dual battery system with the secondary battery powering the supporting systems such as lights, heating and radio.

At the Geneva motor show, the company apparently received advance orders from European and American customers and as a result, are now expanding their factory space. This is located in the city of Tallinn. ■

Photos sourced from Internet

(I well remember seeing numerous 3-wheeled petrol-powered "Morgan" cars on the roads in the UK while I was training at the old BTH factory in Rugby in 1951/2. With modern technologies, materials and the move to greener living, perhaps the time for 3-wheelers is now, who can tell - .Ed)

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