In what could be called a remarkable feat of engineering and logistics, a 10 MVA purpose-built mobile substation will be delivered to Eskom’s Mpumalanga Operating Unit during the last week of August. Manufactured and supplied by Zest Energy, a Zest WEG Group company, the 10 MVA substation is the first of three units ordered by Eskom for use during fixed type substation refurbishments, maintenance and breakdowns as well as to improve the reliability of its grid network by limiting the duration of power interruptions. A 40 MVA unit will be delivered in October and a 20 MVA unit is scheduled for delivery in November.

The mobile outdoor substation equipment will be mounted and installed on custom-engineered trailers that comply with South African road ordinance legislation for weight and overall equipment dimensions. During transportation, the effects of trailer flex and movement on the integrity of the transformer design were important considerations to be taken into account by engineers at Zest Energy.

“Our parent organisation WEG has built this type of mobile substation for more than a decade and has supplied units extensively to South America,” Coenraad Vrey, managing director of Zest Energy, says. “We’re drawing on WEG’s capabilities and experience for this order and WEG’s broad range of international references gave Eskom peace of mind that we were able to deliver a solution to suit their requirements. In the planning stages of this contract, our design team consulted extensively with Eskom engineers to ensure that we gained a full understanding of their standard specifications and project engineering requirements.

“The transformer is the specialist aspect of the Eskom units and Zest Energy, in consultation with Eskom and our WEG counterparts, has been able to come up with a compact design specific to local conditions.”

Zest WEG Group has supplied power transformers to Eskom for several years already, but these are the first mobile substations the company has been asked to manufacture for the power utility. The technical and legislative requirements for these substations call for extensive engineering and testing to design a product that is compliant. The transformers for the mobile substations are imported from WEG in Brazil and the substation’s switchgear is also imported from various international countries, but all other substation components are being manufactured in South Africa, which is where the substations will also be assembled to promote maximum local content.

Vrey says that the concept of a purpose-built mobile substation is “an ideal solution in this application”, because the units can be utilised wherever needed within the region to save time, while providing the flexibility of being able to connect to several different high and medium voltage networks, especially when it comes to interfacing with Eskom’s older networks. This is achieved by using multi-ratio transformers. The transformers were designed with very low impedances, capable of interfacing with Eskom’s current network infrastructure and limitations. Furthermore, the resulting designs were developed to be robust enough to withstand the internal forces that could be experienced during fault conditions.

The contract includes for the training of Eskom’s drivers on the 20 MVA and the 40 MVA mobile substations, both of which have steerable axles for improved manoeuvrability. Zest Energy has received an official order for three more units that will be utilised at Eskom’s North West Operating Unit.

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- Protection indication lamps
- Power reset switch
- Stacked three-pin plug power connection
- The Multi-Plug carries a 820 000 connected warranty against damages caused by lightning and surge-related incidents and a two-year product warranty.
Personality of the Month

Love life and it loves you back

CLIVE Beeton, director at Advanced Lighting Systems, is the personification of the ‘Duracell bunny.’ His boundless energy and infectious enthusiasm make him a popular member of this country’s lighting fraternity and especially the Johannesburg branch of ESSA where he serves on its committee.

He’s always willing to lend a hand and has walked many a long mile, beyond going the ‘call of duty’ to help his fellow ESSA members, colleagues and friends.

Sparks: Where were you educated?
Claire: I went to Rembrandt Park Primary School and then went to King Edward VII (KES) High School in Johannesburg. After matric, I went to Wits Technikon where I completed a diploma course in purchasing and marketing.

Sparks: How long have you been involved in the electrical industry?
Claire: I’ve been in this industry for 24 years.

Sparks: When and where did you start your career?
Claire: I started out manufacturing cast aluminium light fittings for a company called Ledbury Lamps, where I worked for four years before moving to Advanced Lighting Systems, which was previously known as Luminaire Component Industries (LCI).

Sparks: What are the greatest challenges you have faced over the years?
Claire: The lighting industry has seen huge technological changes over the past 15 years. For me the most exciting change has been in LED lighting, which is constantly being improved – almost daily – and this is a challenge that I really enjoy.

Sparks: What major projects have you worked on and what is your greatest accomplishment?
Claire: When I first started in lighting, I worked on projects such as Sun City and some major shopping centres.

I was involved in the manufacture of the world’s second biggest chandelier (at that time), which was designed and manufactured for Stuttafords and that was quite a highlight in my career.

Sparks: Who has been your inspiration or have you had a mentor who has influenced your career?
Claire: I have had so many mentors: Eric Esterhuysen, Cheryl Mayhew, Steve Sherwood and Brian Cousins have all inspired me and taught me things about lighting and life that are invaluable.

Sparks: What, to your mind, is one of the biggest challenges facing the industry at this time?
Claire: I would say that the biggest challenges are compliance, specifications and regulations … or rather, the lack thereof.

Sparks: What do you enjoy most about your job?
Claire: I love my job! Every day is exciting for me and I look forward to my work day. The day I wake up and don’t want to go into the office is the day I move on.

Sparks: How do you motivate your staff?
Claire: The people on the staff at ALS are the backbone of the company and if the company does well, then so do they. I am not a dictator at work and certainly no Hitler; I would say that I am more of a colleague to them. I like to inspire them so that we all love what we do each and every day.

Spark: If you could do it all again, would you change anything? If so, what would that be?
Claire: I have been super blessed in my life and work career so I wouldn’t change anything. But, if I had a gun to my head and had to do it all over again, I’d say that I would have concentrated on my sport and gone professional. I still swim, run, cycle and play waterpolo.

Sparks: Would you advise a person leaving school to enter the electrical industry? And why?
Claire: No. I would rather advise them to go and buy a surf board and become a beach bum … Seriously though, lighting is an exciting career – especially as we move into the new era of energy efficient LEDs – and I wouldn’t hesitate for a single moment to recommend it as a career.

Sparks: What is your advice to electrical contractors and or electrical engineers?
Claire: This has been said many times but it bears being repeated: Look for quality products with accredited backing and support, and leave the words ‘cheap’ and ‘cost effective’ out of your discussions. Remember you get what you pay for.

Sparks: What is your favourite quote?
Claire: It has to be: “Love life and it loves you back”

Sparks: Name three things on your ‘bucket list’ (things you want to do before you kick the bucket).
Claire: I have done it all if I want something, then I work my butt off to achieve it. I have simple things on my bucket list: Walk my daughters down the aisle; celebrate my 100th wedding anniversary; and live long enough to see all my kids leave home so I can fulfil a promise to myself that the day the last child leaves the nest, I am going to park my Ferrari in the garage.

Acquisition of well-known lighting company

ACTOM has acquired Genlux Lighting, a leading designer and manufacturer of outdoor and industrial luminaires.

Genlux, which specializes in outdoor luminaires for floodlighting, roadways and commercial properties and luminaires for industrial applications, will form part of ACTOM Electrical Products, the ACTOM group’s distribution arm, which operates a network of branches around South Africa and in Namibia.

“Genius is a strong player in the local market and is widely recognised for the high quality of its products and its depth of expertise in the field,” says Neil van Blerk, ACTOM Electrical Products’ business development executive.

“The acquisition, which took effect on April 1, strengthens ACTOM Electrical Products’ already well-established presence in the local lighting market, particularly with municipalities and large commercial and industrial users of luminaires.

“Genius has a technological partnership with a leading international designer and manufacturer of luminaries and operates its own network of branches in Germiston, Durban, Cape Town and Port Elizabeth.

“It is our intention to maintain these branches in their present form as dedicated outlets for Genlux to complement ACTOM Electrical Products’ 14 branches, which are located in Germiston, Pretoria, Durban, Cape Town, Bloemfontein, Port Elizabeth, East London, Nelspruit, Middelsburg, Polokwane, Welkom, Steelport, Rustenburg and Windhoek,” Van Blerk concludes.
Mark Palmer, Gauteng Electrical Inspection Authority

The requirements for testing in SANS 10142-1 – how are these policed?

It has become increasingly apparent within the electrical contracting industry that the testing requirements for valid Certificates of Compliance are inadequate – and this is of great concern to me. Over the past few years, training has generally been inadequate and, in many cases, has not met the required levels. These shortcomings are calling into question the validity of the compliance tests and the safety of installations. The domino effect in practice is most worrying. Electrical testing, by its very nature, involves a great degree of risk by Registered Persons and their employees. For this reason, it is imperative that the provisions of the Occupational Health and Safety Act are complied with to ensure the safety of Registered Persons and their employees whilst these tests are conducted. It is not only the safety considerations that have to be considered but also the safety of the testing equipment, in particular test leads. It cannot be over emphasised that dangerous voltages occur not only in the electrical installations themselves but potential shock risk also exists in voltages generated by the instruments.

Further consideration must also be taken when encountering devices such as uninterruptible power supplies and capacitive loads. I believe the accuracy of instrumentation is a long overdue compulsory requirement even though SANS 10142-1 requires that instruments be accurate to within 5% or better. The problem here, as with the installation itself, lies in the policing thereof and I am not aware of any effective policing being done regarding this aspect. Furthermore, how would a Registered Person determine the 5% accuracy factor?

Surely this can only be done against a calibrated instrument! In light of the current problems in this area, it becomes critical for Registered Persons to continually monitor the accuracy of their instrumentation. This can be done to some level of accuracy by ensuring that a monitoring system is in place. Calibration at the outset, however, is not negotiable. What should such a system then comprise? Simply, a detailed record of all measurements must be kept over specified time frames in order for these results to be compared with any other calibrated instruments so that cross checks can be performed at regular intervals.

Required tests
The provision of SANS 10142-1 Section 8.7 details all the required tests and also gives guidance as to the correct methods of performing these required tests. It must also be understood that definite warnings are given when performing certain tests and cognisance must be given to the general warning: “Certain tests shall not be carried out in hazardous locations. Due to the characteristics of the intrinsic safety features of equipment, such equipment can be damaged by certain tests. Certain tests might be impractical in existing installations already under power.”

The second important factor details that the Registered Person should conduct all tests and complete a copy of “Section 4: Tests for each distribution board and supply (normal and alternative supplies). It is very seldom that I see such additional tests being completed and it must be noted that failure to carry out these tests would render a Certificate of Compliance invalid.

Further requirements are also detailed for the following general testing aspects:

- Additional tests may be required for large installations and where alternative supplies are installed.
- For the testing of installations that are fully or partially in hazardous or specialised locations, see the relevant standards, and complete the additional report(s). (see 8.8.2 for medical locations and 8.8.3 for hazardous locations).
- For cases where multiple tests are required, record the worst-case measurement on the test report.
- In the case of failure in any test, the test shall be repeated after the fault has been rectified. Other tests that might have been influenced by the fault shall also be repeated. The fundamental requirements of each test are also clearly outlined. However, it is the lack of training mentioned in my opening comments that is all too evident in many of the tests, which are either incorrectly performed or the results incorrectly recorded. I will discuss these issues in next month’s column.

It is not only the safety considerations that have to be considered but also the safety of the testing equipment, in particular test leads. It cannot be over emphasised that dangerous voltages occur not only in the electrical installations themselves but potential shock risk also exists in voltages generated by the instruments.
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A lesson for independent power producers

Working knowledge by Terry McKenzie-Hoy

YOU have heard the expression to ‘boot up a computer’. It comes from the phrase ‘to lift oneself up by your boot straps’. If you look it up on Wikipedia, it says: “… refers to the starting of a self-sustaining process … the term usually refers to the process of loading the basic software into the memory of a computer after power on…”

Now, if you are wearing boots and try to lift yourself up by pulling on them (say the laces) then naturally you won’t rise up at all … it’s impossible. But if you load a micro program into a computer and it then allows a mini program to load, you will have a working computer.

I write about this because I had an interesting discussion with a firm that is planning to install a gas turbine to generate power into the grid at peak times. Now, we must remember that gas turbines don’t really have to run on gas; they can also run on diesel – that is sprayed into a combustion chamber – or methanol or gas. Anyway, this firm planned to use diesel. So, I asked about the economics of using privately-owned gas turbines to supply power to the grid being fuelled by diesel. The firm had it all worked out but it was all a bit much for me, so I asked two questions:

1) If a power producer pays R10.00 for a litre of diesel fuel, is it not the case that 250 ml produces one kWh of energy and thus the selling cost per kWh to the grid is at least a quarter of R10.00 or R2.50; and
2) Assuming you want to get back more than just the fuel cost, would you not have to sell at 2 x R2.50 per kWh = R5.00 and would the grid pay for this? The firm’s guy was very interested and said, “Oh, no, no, no …” and told me I had it all wrong. He said the grid would pay them R12.00 per kWh and it only cost them R1.00 per kWh. And I said, “I don’t believe it.”

For a start, there is no way, using diesel, that you can get 1 kWh for R1.00. The firm’s guy showed me all his calculations. What was apparent was that the grid (in this case, Eskom) would pay them R1.00 per kWh and R12.00 per kVA by which they reduced the local maximum demand, provided that the ratio of kWh generated to kVA generated was 0.85 or less. If you don’t understand what this means, don’t worry. What it does mean is that the gas turbine people have got the equation very wrong and are not going to make any money at all.

The question is: How did they get it all so wrong? The answer lies in the following ‘boot strap’ phenomena on: The gas turbine salesman sees the tender from (in this case) Eskom. He doesn’t understand the technical stuff really but puts the other numbers – installation costs, running costs – together and works out a selling cost and revenue requirement.

The managers, who don’t realise that no one has quite grasped the technical stuff, assume that the underlings have got it all in hand, yet the financial offer with a fine tooth comb and put it forward. Nobody attempts to check that all the assumptions are correct. No one got the point that there is a gulf between the meaning of kilowatt hour (kWh) and kilowatt amp (kVA).

The reason for this is the increasing use of smart phone Apps and Internet information. These allow anyone with mediocre talents to appear really clever because they can produce sheets of discounted cash flow projections and revenue streams and income projections, all based on assumptions that apply to one set of circumstances but are wrong in others.

It’s a real shame, particularly for the gas turbine people. My advice to all out there: If you are part of a generation project, which you believe will make you millions, first ask yourself whether or not all the assumptions have been made by someone who is competent to make them. And importantly: How much will I lose if they are not right?

Smart drill works overtime

ADVANCED Lithium-Ion (Li-Ion) battery technology is the main driving force behind Bosch’s powerful new PSR 18 LI-2 drill/driver. Senior brand manager, Jürgen Lauer, says the tool offers improved performance, “The new 18 V Li-Ion battery features a ‘Smart Li-Ion+’ electronic control system, which ensures that the battery delivers the exact amount of power required for a specific application.”

According to Lauer, the system saves energy and results in fewer charging cycles to complete larger projects, in addition, L-ion technology reduces self-discharge and memory effect of the battery. “The 18 V Li-Ion battery with 2,0 Ah results in a reduction of charging cycles, which increases the life of the battery. The battery also features Electronic Cell Protection (ECP), which ensures a longer battery life, and protects the battery from overload, overheating and deep discharge,” he explains. The Bosch PSR 18 LI-2 can drive up to 400 small screws (4 mm x 30 mm) in softwood with a single battery charge. For larger screws (10 mm x 100 mm), the PSR 18 LI-2 can drive 200 screws with four charging cycles, one third less than standard battery technology.

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NEW! The GSB 36 V-LI by Bosch is the world’s first cordless impact drill/driver powered by a 36-volt lithium-ion battery. As powerful as corded, it can drill up to 88 holes (9 x 50 mm Li-masonry) with only one battery charge, and its enormous power enables it to drive 12 mm screws without a drop in speed. Housed within the “Duro-Glidk” Housing it can survive drops of up to two metres onto concrete. The Electronic Cell Protection (ECP) protects the battery against overload, overheating and deep discharge. More power and durability make it a powerful multi-function tool for impact drilling, drilling and screwdriving. Blue power tools for trade and industry.

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POOR quality power can damage equipment, which results in downtime, affects productivity and increases energy costs. The K6315 Power Quality Analyser has easy-to-use settings that allow the user to simultaneously record power and power quality measurements in one survey. The instrument measures power quality, instantaneous values, waveform and Vector display, wiring check and harmonics up to 63rd. The K6310 power quality functions include inrush current, transients, flicker, unbalance rate, swells and dips and capacitance calculations. The instrument features built-in screen print, built-in input and output for external signals or alarms and comes with options for ac power and a dual power supply battery. The meter measures leakage current when using the optional leak clamp sensors. The K6315 has logging intervals from 1 second up to 1 hour, complies with IEC61010-1 CAT IV 300V, CATIII 600V, CATII 1000V safety standards and comes with a lifetime warranty. The K6315 meter has large memory capabilities and can store up to 8 GB. Measured data can be saved on the SD card or the 1.8 MB internal memory; and the data can be transmitted to PC via USB or Bluetooth. Measured data can be checked on Android devices in real-time by using the Bluetooth function. Free Android software ‘Kew smart 6315’ is available through the Google Play Store. "Using the K6305 power recorder it is as easy as 1-2-3: set up the instrument, check the wiring and record," says Major Tech’s Werner Grobbelaar. Compact power meter Major Tech’s rugged compact power meter offers comprehensive real-time monitoring, recording and analysis of single or three-phase systems, 1P2W, 1P3W, 3P3W and 3P4W. It can be used for instantaneous values (V/A/W/VA/PF), integration measurements (Wh/Vah) or demand measurement. "This instrument has an automatic wiring check function to prevent incorrect connections," explains Grobbelaar. "The meter checks the connections and displays the results on the LCD screen." A wide selection of clamp sensors allows measurements from 0.1 A to 3 000 A. "The instrument automatically recognises what kind of clamp sensor is connected to it," says Grobbelaar. The K6305 meter has large memory capabilities and can store up to 2 GB. Measured data can be saved on the SD card or the internal memory and data can be transmitted to a PC via USB or Bluetooth. Measured data can be checked on Android devices in real-time by using the Bluetooth function. Free Android software ‘Kew smart 6305’ is available from the Google Play Store. The K6305 complies with IEC61010-1, CAT III 600V safety standards and includes power and energy measurement features such as: voltage (True RMS); current (True RMS); active power; apparent power; reactive power; active energy; apparent energy; reactive energy; power factor (cosφ); frequency; demand measurement and current flowing on the neutral line (only on three-phase four-wire measurements). Major Tech’s K6315 and K6305 are easy-to-use power meters and will help users to locate, predict, prevent and troubleshoot problems in power distribution systems. “These meters are essential additions to electricians’ toolkits,” says Grobbelaar.

Enquiries: +27 11 872-5500

CONSTRUCTION is well underway within the Coega Development Corporation’s Industrial Development Zone (CDC) and is providing job opportunities for residents living in Nelson Mandela Bay with about 1 800 people benefitting from construction-related jobs. “Construction expansion of existing businesses is a sign of current investors’ business growth and an improving economic climate," said CDC head of marketing and communication, Dr Ayanda Vilakazi. Companies currently under construction include gas suppliers Air Product (R300m investment) and Afrox (R100m); electricity generator, Dedisa Peaking Power Plant (R2.2-billion); while cold chain logistics facilitators Vector Logistics investment is valued at (R140-million); Digistics expansion (R30-million); ID Logistics (R30-million) and UTi Distribution (R30-million). More than a third of the work has been completed on Dedisa Peaking Power Plant. On completion, the plant will consist of two open-cycle gas turbines able to produce 335 MW of electricity, which is roughly half of Nelson Mandela Bay’s power requirement. The establishment of the plant will provide value added assistance to a number of growing industries established in the IDZ, and an estimated 1 000 permanent employment opportunities will be created.

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Knipex has a range of VDE 1000 V rated cable knives, manufactured in Germany. The knives’ handles are ergonomically designed for easy handling and come with a comfortable slip guard. A thumb recess and finger hook at the end of the handle ensures a good transmission of force when the blade is pulled. The blades are manufactured from special tool steel, which is oil hardened. There are five models in the range: straight blade; straight blade rear blade plastic-coated; fixed hook blade; sickle-shaped blade; and fixed hook blade with guide shoe.

Power products now CE compliant

GIGAVAC, manufacturer of advanced switching solutions, has announced that its line of power products, including contactors and battery disconnect switches, are now CE approved. The approval includes standard Gigavac Epic sealed contactors both GX, industrial, and MX, hi-reliability series. Other Gigavac products covered under the CE mark are the BD and HBD manual switch series along with the upcoming HX series of high voltage contactors.

According to Markus Beck, vice-president of sales and power products, “Customers for our contactors and manual disconnect switches have been asking for CE compliance and we listened. CE approval is a major step for Gigavac in meeting the compliance requirements of the European Union and European Free Trade Association regions. It opens new possibilities to grow our business in these markets.”

Details in the CE Declaration of Conformance and other Gigavac certifications can be found at http://www.gigavac.com/about/certifications.html.


Representatives throughout the world can deliver the products in the user’s country and currency at the lowest possible cost.

Fire resistant cables with SABS approval

ABERDARE Cables’ Flamosafe range of fire resistant cables is designed to minimise the extent of damage and reduce the dangers associated with fires. The cables cover a range of applications found in industrial, commercial and residential environments where conditions range from buried, free ventilating to confined spaces where people gather, such as in cinemas, hospitals, shopping centres, high rise buildings and mines.

Throughout the world, all modern buildings – domestic, commercial and industrial – contain a large quantity of electric cable. These cables provide energy, information and control, and are distributed throughout the buildings in ducts, tunnels, basements and ceiling cavities, linking every part of the building. Electric cables are potentially able to propagate fires along their length and can cause rapid spreading of a fire throughout the cable network and associated buildings if not stopped by some means. In addition to the spread of fire into adjacent areas, the generation of smoke may prevent the escape of persons trapped in the fire through lack of visibility or incapacitation. A further concern is that the smoke and gases released by the fire may contain toxic and corrosive elements, causing harm to people and equipment.

A cable is declared flame retardant in accordance with a particular category if the materials and the construction of the cable limit the spread of fire, dependent on its rating, along the cable or bundle of cables under specified conditions. Cables that make use of PVC materials require the PVC to have a limiting oxygen index (LOI) of at least 27% to indicate the percentage of oxygen required for supporting the combustion of the material.

Flamosafe cables address each of the four major areas of performance in fire situations: flame propagation; generation of smoke; generation of toxic and corrosive elements, and circuit integrity.

Flamosafe cables address each of the four major areas of performance in fire situations: flame propagation; generation of smoke; generation of toxic and corrosive elements, and circuit integrity.

Aberdare’s Flamosafe range of LV fire performance cables include Pyrgard, Lohal, Lotos and Fyrsure, all of which are at the very least fire (flame) retardant to IEC 60332-3-24.

Fire resistant cables are required to pass a combination of tests in a hierarchy ranging from least to most capable. More advanced cables address the problems of emission of acid gases, and still more advanced cables address the problems of smoke and toxic gas emission. At the top of the Flamosafe range are cables capable of continuing to operate under defined conditions of fire and abuse, including water and mechanical shock, while maintaining reliable circuit integrity. All cables bear the SABS mark of approval and comply with international standards where applicable.

The appropriate selection of a suitable cable type from the Aberdare Flamosafe range will minimise the extent of damage, reduce the dangers associated with fires and improve public safety.
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to kill people...
...OR TO PROTECT LIVES!

There are many sub-standard, misrepresented electrical products and services being offered for sale in South Africa. These can present serious safety and functionality risks to users - and as such pose potentially serious consequences for the supplier.

Safehouse members are committed to an ethical code of conduct and providing only products and services that are safe and fit for purpose.

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The South African Safehouse Association is an independent, registered, non-profit organization established by the electrical industry and committed to communicating with customers.

For more information contact: Pierre Nothard
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Email: pierren@safehousesa.co.za

www.safehousesa.co.za

*For the most up to date list of members please go to www.safehousesa.co.za
Composite insulator for disconnectors developed

ACTOM High Voltage Equipment has developed a 132 kV/550 BIL composite post insulator with a porcelain core for use on its disconnectors and other support functions.

The new insulator is ACTOM High Voltage Equipment’s first ACTOM branded insulator product. “It has been designed by us and is manufactured by an approved overseas manufacturer to our specifications in accordance with international quality standards,” says Venter. Hard on the heels of the division’s development of the new product in mid-2013, Namibia’s power utility NamPower awarded it a R20-million contract in September to manufacture and supply 28 x 132 kV and 45 x 245 kV disconnectors. A total of 288 of the new composite post insulators were used on the 132 kV units.

Alstom, ACTOM’s technology partner, supplied the 245 kV units equipped with composite insulators. The disconnectors, delivered on schedule in April this year, are earmarked for installation at NamPower’s Lithops and Khan transmission substations in the Namib Desert. Khan is an existing 220 kV/132 kV substation that is being built.

If a redundant disk in a RAID array fails, the failure does not prevent the RAID array from performing its required function of supplying critical data at any time. However, the disk failure does prevent a component of the disk array from performing its required function of supplying storage capacity. Therefore, according to the first definition, this is not a failure, but according to the second definition, it is a failure.

Example 1: If a redundant disk in a RAID array fails, the failure does not prevent the RAID array from performing its required function of supplying critical data at any time. However, the disk failure does prevent a component of the disk array from performing its required function of supplying storage capacity. Therefore, according to the first definition, this is not a failure, but according to the second definition, it is a failure.

Example 2: If the inverter of an uninterruptible power supply (UPS) fails and the UPS switches to static bypass, the failure does not prevent the UPS from performing its required function, which is supplying power to the critical load. However, the inverter failure does prevent a component of the UPS from performing its required function of supplying conditioned power. Similar to the previous example, this is only a failure by the second definition.

What is ‘failure’ in MTBF?

As a commonly used IT buzzword, ’MTBF’, which stands for ‘mean time between failures’, is applied across many industries. Unfortunately though, it has become widely abused in some.

The white paper, ’Mean Time Between Failure: Explanation and Standards’, published by energy management specialist, Schneider Electric, says that numbers (relating to MTBF) are thrown around without an understanding of what they truly represent. The paper further argues that while MTBF is an indication of reliability, it does not represent the expected service life of the product.

Ultimately, the paper concludes, a MTBF value is meaningless if failure is undefined and assumptions are unrealistic or altogether missing. This is because MTBF is largely based on assumptions and definition of failure, and attention to these details are paramount to proper interpretation.

Importantly, the business reliability target may not be achieved without a solid understanding of MTBF.

So what is a failure? According to the paper, MTBF is often quoted without providing a definition of failure. The energy management specialist company believes that this practice is not only misleading, but also completely useless. A similar practice would be to advertise the fuel efficiency of an automobile as ‘kilometres per tank’ without defining the capacity of the tank in litres. To address this ambiguity, there are two basic definitions of a failure in line with IEC-50:

1. The termination of the ability of the product as a whole to perform its required function.
2. The termination of the ability of any individual component to perform its required function, but not the termination of the ability of the product as a whole to perform.

The following two examples published in the paper illustrate how a particular failure mode in a product may or may not be classified as a failure, depending on the definition chosen:

Example 1: If a redundant disk in a RAID array fails, the failure does not prevent the RAID array from performing its required function of supplying critical data at any time. However, the disk failure does prevent a component of the disk array from performing its required function of supplying storage capacity. Therefore, according to the first definition, this is not a failure, but according to the second definition, it is a failure.

Example 2: If the inverter of an uninterruptible power supply (UPS) fails and the UPS switches to static bypass, the failure does not prevent the UPS from performing its required function, which is supplying power to the critical load. However, the inverter failure does prevent a component of the UPS from performing its required function of supplying conditioned power. Similar to the previous example, this is only a failure by the second definition.

However, if there existed only two definitions, then defining a failure would seem rather simple. Unfortunately, when product reputation is on the line, the matter becomes almost as complicated as MTBF itself. In reality, there are more than two definitions of failure, in fact, there are infinitely.

The paper further investigates the fact that definitions of failure are dependent on the type of product. Manufacturers that are quality driven are paramount to proper interpretation.

Importantly, the business reliability target may not be achieved without a solid understanding of MTBF.
This year is rapidly rushing to an end and, by the time you read this, there will only be 13 or so weeks to Christmas, maybe even less. This leads me to Section 12 of the Occupational Health and Safety Act (Act 85 1993):

12. Duty to inform

Without derogating from any specific duty imposed on an employer by this Act, every employer shall (a) As far as is reasonably practicable, cause every employee to be made conversant with the hazards to his health and safety attached to any work that he has to perform, any article or substance, which he has to produce, process, use, handle, store or transport and any plant or machine which he is required to use, as well as with the precautionary measures that should be taken and observed with respect to those hazards.

We touched on similar ground in my April column when I went into the induction procedures of employers, which is the process whereby a new employee or visitor to a site or plant is made aware of the safety requirements at that site or plant. This process can also include further instruction, which will include the areas mentioned in paragraph (a).

Without going into great detail, just think of the hazards that are faced daily by people working in the following industries: iron and steel smelters, liquefied petroleum gas (LPG), plants manufacturing acetylene, grain storage silos and farming. It’s quite easy to identify the dangers of working with molten metal and, similarly, the dangers associated with LPG are also quite easy to comprehend. However, there are some hidden dangers inherent in the manufacturing of acetylene, for instance. In certain manufacturing processes for acetylene (used with oxygen in the welding gas mix), a chemical – calcium carbide – is used. This chemical is manufactured at temperatures up to 2 000 °C – in itself a fairly dangerous process because of the extreme heat. The result of this process is a solid substance, which resembles the large stones used with cement when mixing concrete. And this is where the danger of this substance lies. The moment these calcium carbide ‘stones’ come into contact with water, a rapid chemical reaction starts producing acetylene, a highly flammable and explosive gas.

You may wonder how dangerous grain silos could possibly be, other than the extreme height what else could be so dangerous that the employer has to take special care and inform me thereof? Well, for starters, if you fall into a silo full of corn or wheat, you have little chance of getting out alive. The dry grains are worse than quicksand and you will sink very quickly, literally ‘drowning’ in it. The product stored in grain silos is Canola seeds, which are rapidly ‘drowning’ in it. Another product used with cement when mixing concrete. And this is where the danger of this substance lies. The moment these calcium carbide ‘stones’ come into contact with water, a rapid chemical reaction starts producing acetylene, a highly flammable and explosive gas.

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Full range of fire alarm systems

Remote control systems
**Security lighting**

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**Emergency lighting**

| ACDC Dynamics | Full range of emergency lighting: wall and ceiling mounted in maintained and non-maintained options offering IP20, IP40, IP42 and IP65 with full range of accessories |
| Acton Low Voltage Equipment | Full range of emergency lighting |
| belco | Full range of emergency lighting |
| AB Reef Lighting | Full range of emergency lighting |
| Belco | Full range of emergency lighting |
| Eaton Electric SA | Full range of emergency lighting |
| Regal Distributors | Full range of emergency lighting |
| MCE Global Supplies | Full range of emergency lighting |
| Osram | Full range of emergency lighting |
| Regal Distributors | Full range of emergency lighting |
| Genlux Lighting | Full range of emergency lighting |
| ILM Lighting Distributors | Full range of emergency lighting |

**Standby and backup**

| ACDC Dynamics | Full range of standby and backup equipment |
| Acton Low Voltage Equipment | Full range of standby and backup equipment |
| belco | Full range of standby and backup equipment |
| AB Reef Lighting | Full range of standby and backup equipment |
| Belco | Full range of standby and backup equipment |
| Eaton Electric SA | Full range of standby and backup equipment |
| Regal Distributors | Full range of standby and backup equipment |
| MCE Global Supplies | Full range of standby and backup equipment |

**Surveillance systems**

| ACDC Dynamics | Full range of surveillance systems for residential and commercial installation in colour and black and white solutions |
| Lemay Electrical | Full range of surveillance systems |
| Regal Distributors | Full range of surveillance systems |
| Schneider Electric | Full range of surveillance systems |

**Automated gates**

| ACDC Dynamics | Variety of domestic automated gate motors |
| Lemay Electrical | Range of automated gates |
| Regal Distributors | Range of automated gates |
| TRI Bpt Automation | Range of automated gates |

**Official Distributors**

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| Belco | +27 11 396 8140 |
| AB Reef Lighting | +27 11 396 8000 |
| Genlux Lighting | +27 11 439 0000 |
| Osram | +27 11 822 1551 |
| Osram | +27 11 663 0641 |
| Osram | +27 11 334 2737 |
| Osram | +27 11 256 6400 |
| Osram | +27 11 102 3300 |
| Osram | +27 11 207 5600 |
| Osram | +27 21 448 8229 |
Practice without theory is like sailing without a compass

I was privileged to visit to the global travelling exhibition, ‘Da Vinci – the Genius’, an inspirational exhibition held in Woodmead, Sandton in July. Anyone who has seen this amazing exhibition would attest to the fact that Da Vinci was way ahead of his time.

Today, 500 years after Da Vinci conceptualised his numerous inventions, we still use many of his designs – ball bearings, levers, jacks and the bicycle to name but a few; and of all his brilliant principles, the principle of flight is still the backbone of modern flight.

I believe Da Vinci was a true artisan – as well as an engineer, inventor, mathematician, anatomist, architect and an artist who produced timeless paintings, sculptures and many other amazing things, I am in awe of Da Vinci – a genius, indeed.

As I am involved in training, one of Da Vinci’s quotes struck a chord with me: “He who loves practice without theory is like the sailor who boards a ship without a rudder and compass and never knows where he may cast.” It made me realise that many of today’s artisans seem to believe that foundational knowledge is just a waste of time. These artisans are easy to recognise – they’re the ones who get in and do instead of first reading and understanding and then doing. Our wives and girlfriends (or husbands and boyfriends) will be the first to testify that we, as artisans, do not read the instructions before we begin to build something. We will tackle the project first and, when we get stuck, we may eventually resort to the instructions to see where we deviated from the requirements and then finish the job according to those instructions … and everyone will be happy.

This is how many of us approach most of the projects or tasks we are required to do and, in many instances, the thing will work, but more often than not, we will have a few bolts or other parts left over and be quick to add they were not needed in the first place!

So, as Leonardo da Vinci indicated a long time ago, if we don’t know the theory behind what we are attempting to do – or even why we are doing it – we will be like sailors sailing on a ship without a rudder and compass. Yes, it is possible that we may get the task done, but it will always take longer and, in many instances, the task will not be completed according to the manufacturers’ specifications and requirements.

I do believe, however, that the issue is more serious. There are those who believe if you do not like to do schoolwork and do not like to read and do maths, well, then you are destined to become an artisan. This, in fact, could not be further from the truth. As any good artisan will tell you, there are many calculations and mathematical elements involved with most artisans’ activities. If it is not measuring then it is calculating and designing – or understanding designs. Artisans require a thorough knowledge of science – including levers, chemical reactions, and the consequences of heat, to name but a few.

Youngsters who have the potential to become successful artisans need to be taught the value of doing well in mathematics and science at school and reminded that these two subjects form the basis of an artisan’s daily work. When we allow potential artisans to change subjects at school and drop ‘pure’ maths in favour of maths literacy, we are not doing them any favours.

Yes, they may pass maths literacy but if they are going to become artisans they will find the going very tough because there are a lot of mathematical calculations involved in ensuring a safe and compliant electrical installation.

I believe we should encourage them and nurture a love of maths and science.

Exhibitions such as Da Vinci – the Genius go a long way towards fostering a sense of wonder about maths and science in young people.

Being an artisan is not only about doing the practical work, it is also about having the theoretical knowledge – and having the ability to read, write and interpret text in the context of the workplace.

We may not have the genius of Leonardo da Vinci, but we can take a lesson from him and love the theory as much as the practical.

Visual IR thermometer’s sharper resolution detects issues instantly

The Comtest Group, Fluke’s authorised Test and Measurement distributor for South and southern Africa, has introduced the Fluke VT04 visual IR thermometer – the latest in troubleshooting tools with built-in digital camera and thermal heat map overlay. The device bridges the gap between traditional IR thermometers and infrared cameras.

Building on the extremely popular Fluke VT02, the VT04 adds PyroBlend Plus, with a four-times sharper resolution than the VT02, and automatic alarm features. It is an ideal frontline troubleshooting tool for electrical, industrial maintenance, HVAC/R, and automotive applications. The ultra-compact Fluke VT04 is fully automatic with built-in intelligence, so issues can be detected instantly without no training required.

The VT04 includes advanced alarm features for troubleshooting stubborn intermittent issues, including a hi/lo temperature alarm that flashes on the screen if the user-selected temperature goes out of the selected range; a time-lapse image capture that can be set to capture images in 30-second to one-hour intervals; and an auto-monitor alarm that initiates image capture automatically after a temperature alarm has been triggered, allowing users to automatically capture images – even while the VT04 is unattended – using the universal tripod mount.

It displays and saves images as full digital, full infrared, or in three blended modes (25, 50, and 75%) with 40% wider field of view than the VT02. Markers pinpoint hot and cold spots indicating the hottest and coldest temperatures on the screen. A temperature reading is provided at the centre point. Images are saved to the included micro-SD card, eliminating the need for additional memory or on-site software to produce professional reports that document problems detected or repairs made for management and customer review.

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Training and development by Nick du Plessis
New distributor agreement announced

ACDC Dynamics has recently confirmed a strategic partnership with Innovolt, a US-based company, to become the distributor of its power management devices in southern Africa and Africa. “This substantially extends ACDC’s protection device range with an internationally recognised, high quality brand,” says Sara Ross, corporate marketing manager at ACDC Dynamics, adding, “Innovolt has manufacturing operations in the Far East and has been active in South Africa for over a year.”

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Ross says that Innovolt offers an intelligent electronics management platform that combines patented sensor technology with comprehensive analytics software to safeguard and optimise the performance, productivity and usable life of essential electronic equipment.

“The through the remediation of power disturbances including sags, overages, brown outs, surges and harmful effects of a blackout as well as a cloud-based management dashboard, customers achieve improved electronic uptime, lower repair costs and increased revenue,” explains Ross.

“As the most common power disturbance, a voltage sag is a small ‘brown out’ or short period of low voltage. An air conditioner starts and the lights dip for less than a second – you have just witnessed a voltage sag. These happen frequently as machines switch on and off. The voltage drop itself can cause problems but as the voltage drops, so the current increases and these correspond- ing current surges are the biggest cause of problems with digital electronics,” says Ross.

“Equipment jamming, satellite decoders rebooting, VOD calls dropping and premature death of products – these are all caused by voltage sags. A small percentage of problems are caused by voltage surges (lightning) while statistically, the vast majority are caused by voltage sags. The products also include surge protection so as to offer complete protection,” adds Ross.

She says the devices record the time and type of each event. The event is displayed on a built-in screen and can be downloaded to compile important stats relating to the quality of power and the events that have taken place over a period of time. They can be downloaded to an iPhone or a PC and then uploaded to the Innovolt management cloud to analyse the data. Ross says, “Innovolt is so convinced of the value and quality of its product that it offers R20 000 insurance cover for each installation. The client simply has to register online for cover.”

“The product is an in-line appliance. Plug it in and it works,” says Ross. Ross says the range currently includes 16 A and 30 A options. “The PM30 is 30 A rated and ideal for computer servers or printing machines that exceed 16 A. There is a choice of two down-loading devices, one for iPhone and one for PC. An industrial hardened DIN mounting version is to be released later this year, which is intended for the protection of industrial electronics.”

For more information and prices of the Innovolt range of power management and protection devices, go to the contact centre: www.acdc.co.za.

Solar PV training for installers

SUNCybernetics will be hosting its solar PV introductory training course at the Solar Training Centre of SA, North West University (NWU), Potchefstroom on Thursday, 25 September 2014, from 10 am to 4 pm. The course is for beginners and those who want to explore the possibilities of PV technology in South Africa. Topics to be covered include technical considerations such as fuse choices, over-voltage and EMI protection, monitoring, metering, cabling, electrical circuits as well as troubleshooting PV plants, module types, project planning, installation and inverters. SUNFarming installed a PV plant at NWU, which is used as the practical training module for the Solar PV introductory course and provides valuable information about specific market conditions and requirements applicable to South African technologies and standards. It demonstrates the preparation, planning, project execution, installation techniques and commissioning of PV plant installations on different roof areas.

A key driver for the centre is to enhance job creation through skills transfer. Therefore, the partnership between SUNFarming Germany and SUNCybernetics in South Africa provides practical training opportunities at NWU for persons who require a comprehensive theoretical and practical understanding of PV solar systems. The training modules are generic and have been developed to South African requirements by SUNFarming Germany’s trainers. Train-the-trainer programmes have ensured that the skills remain in South Africa. The Solar PV introductory course costs R1 500 per person. Book online at www.suncy.com
Forging a robust safety track record

ELECTRICAL construction company EnI Electrical has committed to a long-term vision of changing the way in which electrical construction work is conducted. To achieve this, the company is repositioning itself by applying the same principles its holding company, the Zest WEG Group, has harnessed to achieve its own extensive growth and success.

“It is our intention to become the largest electrical construction company in Africa,” Trevor Naudé, managing director of EnI Electrical, says. “We’re cognisant of the ever-changing needs of our market, as well as the shifting dynamics of our clients’ requirements. Our response is to challenge the market’s perception of electrical construction as a sector characterised by low tender pricing and utilising scope changes to be profitable.”

Naudé says that over the past three decades EnI Electrical has established a solid track record of successful completion of electrical construction projects. Since the Zest WEG Group acquired the company in 2008, processes and procedures have been developed to take this successful medium-sized company to the level where it will be acknowledged as a world class player.

“Operating in Africa requires a certain mindset and it’s essential for companies to clearly understand the factors that drive successful project execution in this region, including the issues associated with logistics. Our access to a core of South Africans with the necessary skill sets is a major advantage, as these teams are then able to train and develop local communities, leaving them skilled and capable of supporting the client in our absence,” Naudé says.

EnI Electrical has completed projects as far afield as Mali, Burkina Faso and Ghana in West Africa and Tanzania in East Africa, as well as throughout the SADC region. With successful operations in Ghana, Zambia, Tanzania and Mozambique, the company is now poised to open facilities in Liberia and Namibia. These will support recently awarded contracts for the Western Range Iron Project in Liberia and the Husab Project in Swakopmund. The new entities are being locally registered and will provide employment opportunities.

The increased emphasis on safety throughout all industries has made compliance with safety requirements a basic necessity. Naudé believes safety goes much further than simply meeting legislative requirements and, by making it the cornerstone of the company, EnI Electrical has forged a robust safety track record across all operational sites.

Risk assessments are undertaken on each project and dedicated safety officers, supported by an in-house safety manager, take responsibility for safety on site.

Ongoing safety training company-wide ensures that personnel are kept abreast of the latest technologies, applications and safety requirements. Environmental obligations are also high priority and care is taken to meet all requisites.

Free courses for electricians

IN September, Comtest will present free courses in Johannesburg – an insulation resistance testing seminar and a thermography workshop.

Insulation resistance testing

This free seminar will be presented by Gavin van Rooy and Gerrit Barnard on Tuesday, 30 September from 10 am to 1 pm at Comtest House, 10 Enterprise Close, Linbro Park. Refreshments will be provided. Application has been made to the National Laboratory Association for CPD points grading.

The seminar will cover the effects of electrical insulation resistance problems on industrial, commercial and residential systems, which can range from minor inconvenience to costly downtime.

Insulation resistance testing covers the fundamentals of insulation resistance quality, monitoring and troubleshooting.

Common insulation resistance measurements will be introduced with an overview of measurement and application processes, comprising:

- Measurement and maintenance principles
- The instruments to use when performing insulation resistance tests.
- How to identify problems and develop appropriate solutions to minimise equipment and production downtime.
- When to use insulation resistance testing.

To register to attend, email Tracey Johnson: jjohnson@comtest.co.za

Thermography workshop

A free Fluke thermography workshop will be held at Comtest House, 10 Enterprise Close, Linbro Park on Thursday, 25 September from 10 am to 3 pm. The course will be presented by Jeanri Mellanby and will cover basic theory, applications, choosing the right camera for the job, SmartView software; and the return on investment calculator.

To register to attend, email Jeanri Mellanby: jmellanby@comtest.co.za
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Completing challenging at-height tasks using tools of the trade

The quality of maintenance work carried out in hard-to-reach areas is only as good as the tools that are used, and a rope access specialist, Skyriders, delivers the highest standards of at-height maintenance work in numerous industries by making use of the Bosch Blue range of industrial power tools.

Skyriders has extensive experience in providing rope access inspection, non-destructive testing (NDT) and work-at-height maintenance solutions to high-profile clients in the local and international power generation, mining, construction, petrochemical and industrial sectors. Marketing manager Mike Zinn says the quality of tools used in this type of work is of critical importance.

“Most of our work is undertaken at time-sensitive projects. Due to the difficult locations in which we operate, we cannot afford to climb 80 m up a vertical rope only to find that the tool is of a sub-standard quality, which ultimately causes unnecessary delays and additional costs,” he notes.

As a result, Skyriders makes use of a vast range of professional tools distributed locally through the South African division of Bosch Power Tools – a world leader in portable electric power tools and accessories. “Bosch Blue power tools are highly-reliable and cost-effective in the long run, which ultimately ensures that Skyriders technicians get the job done right the first time,” adds Zinn.

For maintenance tasks, rope access technicians from Skyriders make use of a wide variety of Bosch Blue industrial tools, including the GWS 7-115 angle grinder for concrete work and steel preparation for painting; the GSB 21-2 RE and GSB20-2 impact drills for the placement of anchors; as well as the GDS 30 impact wrenches for bolting tasks on steel erection projects.

“The GWS 7-115 angle grinder features a powerful 720 W motor and weighs just 1,9 kg for continuous use, while a flat gear head allows for convenient working in tight spaces. What’s more, the GSB 21-2 RE impact drill boasts a high-performance 1 100 W motor with high torque for the most heavy-duty applications that require large diameters,” explains Bosch Industrial Power Tools SA senior brand manager Craig Berridge.

Zinn states that all Bosch Blue industrial power tools have proven to be highly-effective to date. “The tools are all light enough to carry along the ropes with ease, while boasting considerable power and durability. After-sales support from Bosch is excellent, and this value-added offering ensures that minimal downtime is encountered, even on the most demanding projects,” he concludes.

Enquiries: +27 11 651 9600

Transformers and substations: 2014

ELECTRICITY+CONTROL has published a new handbook – Transformers and substations: 2014. Technical director, Ian Jandrell, in his foreword, reminds us that: “Once upon a time, the substation was the ‘building over there’, or the ‘room in the basement’, and the transformer was ‘the thing with tubes that hums’.” The articles in Transformers and Substations: 2014 show that those perceptions are no longer relevant.

The four chapters cover:

• Design and manufacture of transformers.
• Design and installation of a substation.
• Substation automation.
• Maintenance.

To obtain a copy at only R250, contact: Electricity+Control editor: Wendy Izgorsek at email: ec@crown.co.za Advertising managers: Heidi Jandrell at email: heidi@tiscali.co.za or Helen Couvaras at helencou@crown.co.za

Enquiries: +27 11 622 4770
LEGRAND's range of Arteor wiring devices, launched in South Africa over four years ago, has been enhanced to offer even more electrical control functions in home automation - from simple stand-alone solutions, to complicated automation tasks and fully networked installations.

"With new functions and features for easier operation and greater energy efficiency in home automation, design engineers and electrical contractors are able to offer appropriate solutions for every installation. The modern design of Arteor, which creates the impression that the device is floating on the wall, combines a stylish finish and leading edge technology for enhanced aesthetics and total flexibility in commercial and residential environments," explains Johan Bosch, sales manager, Legrand Southern Africa. "Users are able to mix and match a wide choice of design options with any type of finish, including wood, leather or woven metal. These combinations can be changed at any time to suit exact requirements."

Every control function, which is compatible with local and international socket and flush-mounting box standards, is now available in round and square versions. New products in the Arteor home automation range are MyHOME_Screen 3.5 and 10, a new local display with four functions in a single device, an eight function pushbutton control device and a display thermostat unit. The new wall mounting MyHOME_Screen 10, with new features for energy management, multimedia and door entry functions, has a new graphic user interface for central control of the entire installation. This single device also manages multimedia content (photographs, audio and video) and internet connection. User profiles are fully customisable, with navigation room by room. This system, which is adjusted to suit the needs and conditions of each installation, provides real time display and management of electricity, gas and water consumption. The consumption display also allows the user to monitor the energy and hot water obtained by using photovoltaic (PV) modules or solar panels. MyHOME_Screen 3.5, with an enhanced user interface for intuitive navigation, also includes new features for energy management. The new Arteor local display unit incorporates four functions in a single device. These include scenario control, sound distribution, temperature control and energy management. The newly launched pushbutton control device, with easily identifiable symbols, enables easy customising of up to eight functions. Temperature control can be set individually in each room, or centrally for the entire installation. Legrand has also launched new Arteor hotel equipment, USB chargers, audio and video sockets, as well as energy and load shedding management devices.

World's smallest IR camera for industrial applications

OPTRIS, a specialist in non-contact temperature measurement, has launched Optris PI 640 – the smallest measuring video graphics array (VGA) infrared camera, worldwide. With an optical resolution of 640 x 480 pixels, the PI 640 delivers pin sharp radiometric pictures and videos in real time. With a body size of 45 x 56 x 90 mm and weighing only 320 g (lens included), the PI 640 counts among the most compact thermal imaging cameras on the market. It can be delivered with industrial thermal imager equipment and comes with extensive license-free thermography software, which enables users to monitor and document measurements and to edit infrared video imagery. Key specifications of the PI 640 high-resolution infrared camera find application in industrial applications where pin-sharp infrared pictures and videos are essential for process monitoring and optimisation. The real-time thermographic images prove especially valuable for surveillance and quality assurance in the automotive sector, plastics, as well as semiconductor and photovoltaic industries.
MCCBs offer high performance and durability

Easy-to-use enclosures

Fibox Tempo enclosures are designed to save time and money in assembly and installation and are compatible with the most common enclosures in the market. The large plain cover offers space for printing, labels and marking. The new range of circuit breakers, with its compact, modular design, is simple and safe to install, operate and maintain. It also offers a high level of performance and protection at the most competitive price. The adjustable thresholds and a service breaking capacity rated at 100% of the ultimate breaking capacity make it one of the most durable products in the market.

EasyPact CVS complements Schneider Electric’s already established EasyPact MV5 and Compact NSX range of MCCBs in the region. While the successful EasyPact MV5 range of low voltage power circuit breakers and switch disconnectors covers applications from 800 to 4,000 A, the Compact NSX range of MCCBs is widely used in critical installations such as hospitals, oil and gas facilities, airports, data centres, and high end buildings.

With the new EasyPact CVS range, Schneider Electric aims to target the fast growing real estate market in southern Africa for both medium-sized buildings and residential projects, whose requirements are different from those of critical infrastructure projects. We hope to widen our scope and reach in the market with EasyPact CVS,” says Levy Moholola, low voltage product manager at Schneider Electric South Africa. He adds that EasyPact CVS offers “great value for money” with a global quality assurance from the specialist in energy management and protection. “While serving the requirements of customers more effectively, it also provides better margins to partners and panel builders,” he says. EasyPact CVS range is suitable for isolation, guaranteed to the IEC 60947-2 standard, and provides a highly visible and lockable contact position indicator to ensure operator confidence.

Features such as extended current limiting and thermal protection can greatly reduce the stresses on equipment due to short circuits and their associated effects. In the event of a circuit fault, simple visual indicators help maintenance personnel quickly locate the tripped breaker and take steps to rectify the problem. The EasyPact CVS range of circuit breakers is fully tested and ISO certified to meet all relevant local and international safety standards. Reflecting the company’s comprehensive approach to environmental responsibility, the new product line complies with the environmental standards for manufacturing, including RoHS and REACH. It is also engineered for easy disassembly and recycling.

Lube extends lifetime of switches

GIGAVAC has announced a new addition to its extensive line of advanced switching solutions. The HBD series of manual service disconnect switches incorporates new patent pending technology to deliver unprecedented protection from hostile environments. The HBD series is the first hermetically sealed disconnect and all models exceed IP67 and IP69 requirements.

The first combination is made up of one standard three-pin South African socket outlet, three slimline South African socket outlets and a single switch to control all four sockets - one of the most popular combinations requested by electricians.

Hermetically sealed battery disconnects ideal for harsh environments

GIGAVAC has announced a new addition to its range of automotive, military, aerospace, industrial and domestic switch manufacturing sectors. The range of lubricants has been developed to accommodate the many advances in these industries and combines excellent electrical properties and lubricity with plastics compatibility.

Contact lubricants are specially formulated greases and oils that reduce friction and enhance the electrical performance of current carrying metal interfaces in switches and connectors. Electrolube products are electrically insulative in thick films, and prevent tracking in ultra-thin films, that is between closed metal contacts they allow the current to flow owing to the Quantum Tunneling Effect. They also exhibit a neutral pH thereby avoiding surface corrosion.

The effectiveness of even perfectly designed switches can be improved by contact lubrication and, when considered at the design stage, significant production cost savings can be achieved by the use of less expensive plastics and contact metals. Tests have shown that contact lubrication can extend the lifetime of switches by more than 300%, producing excellent performance under all circumstances and preventing the need for expensive maintenance.

New range of monoblock sockets

THE success of Veti’s modular series can be attributed to the fact that Major Tech assesses feedback from clients to ensure sufficient stock of the most popular combinations available from Veti’s extensive range of modules. Listening to clients’ needs also prompted the introduction of two new combinations in the monoblock system. The first combination is made up of one standard three-pin South African socket outlet, two slimline South African socket outlets and a single switch to control all four sockets – one of the most popular combinations requested by electricians.

The second combination is made up of two standard three-pin South African socket outlets and two slimline South African socket outlets. Rhodam Evans, Veti divisional manager, says socket outlets running off alternate household power feeds do not require a switch so this combination is becoming a popular choice as customers realise the advantage of having an additional socket outlet instead of a switch that is rarely used. With Veti socket outlets, all four sockets can be used simultaneously. Both combinations have been tested and approved to international and South African standards.
Megger relay test set with improved precision

Megger’s SMRT36 is a smaller and lighter protective relay test set and has more output power than any other comparable three-phase instrument available. The SMRT36 has a unique constant power output, produces a compliance voltage of 50 V up to 4 A (200 W/phase), and maintains 200 VA output power up to 30 A, making it ideal for testing in today’s installations and legacy plants.

The SMRT36 is Megger’s fourth generation of automated relay test sets. This test set takes full advantage of Megger’s patented developments from previous models to produce an instrument that offers greater precision than its predecessors, with reduced size and a reduced weight of only 12 kg.

The SMRT Power Box is specifically designed to test protective relays that are used in conjunction with CTs having 1 A and 5 A secondaries. It combines the capacity to simulate high current faults with the amplifier precision needed to satisfy even the most demanding requirements. The instrument has three current output channels, plus three convertible channels that can be configured as either voltage or current outputs. This makes it possible, for example, to test numerical current differential relays that require six currents.

Its patented design allows the SMRT36 to deliver high power in both the voltage and current channels as needed in high-demand applications, such as testing electromechanical relays. The unique Constant Power Output of the current amplifiers produces a compliance voltage of 50 V at up to 4 A (200 W/phase), and maintains 200 VA output power up to 30 A. Two current outputs can be series connected to double the compliance voltage to 100 V and provide a constant 400 VA output power at 4 A and up. To facilitate panel testing, and the testing of high-burden electromechanical distance protection relays, the high constant power output is also available from the PowerV voltage amplifiers. From 30 V to 150 V, these deliver a constant 150 VA, providing high current output at difficult low test voltages.

Of equal benefit is the high current output capability. The SMRT current amplifiers can deliver 30 A per phase continuously and up to 60 A per phase for short durations. For instantaneous overcurrent test applications, the SMRT36 can provide up to 180 A, at high power.

Megger’s SMRT36 Protective relay test set can be controlled manually with the optional Smart Touch View Interface® (STVI), which provides a simple way of testing even the most complex relays. The STVI, with its large full-colour high-resolution touchscreen, allows users to perform manual, steady-state and dynamic tests quickly and easily, and has built-in preset test routines for most popular relays. For fully automated testing, the SMRT is supplied standard with AVTS, Megger’s advanced visual test software package.

The unique Constant Power Output and high current output capability of the SMRT allows the instrument to test protective relays in TN-C, TN-S, TN-C-S, and TN systems using the same instrument for the entire system.

Protection for signals and instrumentation

Saltek’s FLP-B+C MAXI VS/1+1 is a Class 1 and Class 2 combined lightning current arrester designed to protect LV single phase TT (TN-S, TN-C-S) networks against surge voltages due to direct or indirect lightning strikes.

The DEHNcord Type 2 surge arrester, both two-pole and single-pole, can be fitted in installation systems such as the terminal compartments of end loads, cable ducts or flush-mounted systems. The DEHNcord can be installed in the cable duct, DEHNcord is the ideal solution thanks to its flexible design. The new DEHNcord surge arrester reliably protects from surges caused by lightning interference. This device can be installed in flush type boxes, cable ducts and flush mounted systems and reliably protects outdoor LED lights from surges. Compact in design, DEHNcord can be installed wherever the performance of a standard Type 3 surge protective device for terminal equipment reaches its limits. DEHNcord ensures surge protection wherever space is restricted and can also be used at the transition from lightning protection zone (LPZ) 0B to 1 or higher. DEHNcord meets the requirements of EN/IEC 61643-11. It has a short-circuit current withstand capability of 25 kA rms in case of mains-side overcurrent protection and a total discharge current of 20 kA (8/20 µs).

The unique Constant Power Output of the Lightning & Surge Protection from Saltek

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The modular two-pole lightning current arrester is a combination of heavy duty gas discharge tubes (GDT) rated at 25 kA (10/350 µs pulse) with a high energy varistor. This proven technology guarantees no follow on current, no leakage current and low residual voltage.

The replaceable module has a visual fault indicator which changes to red when faulty, immediately informing the user of the operating state of the surge arrester.

The lightning current arresters are used at the boundary of ULP 0 and ULP 1 or higher. With a 100 ns response time, the module has overcurrent protection, mounts on a DIN rail and meets IP20 protection requirements and complies with the EN 61643-11 standard. Saltek is represented locally by Surgetek.
The ability to dim lights and even groups of lights within the same room in most modern homes, boardrooms and even offices nowadays, is considered a necessity.

This is mainly for the aesthetic value that dimming adds to a living or working environment. Justifiably, during earlier times when the national grid was not under pressure and electricity prices were of less concern, and conventional lamps were cheap to replace, it was not necessary to consider the possible added benefits that the dimming of lamps can provide.

This has all changed. The grid is constantly under pressure, electricity prices are sky rocketing and even conventional lamps are becoming expensive. Fortunately, the LED revolution ‘came to the rescue’ and, due to the low energy consumption of LEDs, some relief from high electricity costs has been provided.

However, since dimmable LED lamps are slightly more expensive than their non-dimmable counterparts, buyers now have to decide whether or not they actually want to dim the lights. If the ‘nonvisual’ benefits of dimming LED lamps are considered, especially the additional energy saving possibilities and the increased lamp lifetime, the decision whether to dim or not would be much easier.

Figure 1 shows the measured energy consumption versus measured light level of a conventional 50 W GU10 halogen lamp, a typical 10 W GU10 LED lamp and a typical 10 W MR16 LED lamp with an electronic transformer. It can be seen that, besides the obviously much higher energy consumption of the halogen lamp and much lower initial light output, its consumption curve when dimming is non-linear. LED lamps, on the other hand, not only show a much higher initial (non-dimmed) light output, but also exhibit a virtually linear consumption curve as the lamp is dimmed.

In order to better appreciate the implication of these characteristics, Figure 2 shows the energy savings as a percentage of the initial (non-dimmed) energy consumption versus the percentage of measured light output. It can be seen that if the lamps are dimmed to 50% lux output, the halogen lamp saves only 26% energy, which is very little when considering that it consumes close to 50 W when not dimmed. This is due to the fact that the majority of the energy is used to ignite the gas and produce heat – the visible light output is only a small percentage of total consumption.

The LED, however, has an electronic component that has an inherent non-linear energy consumption versus light output, which is the opposite to that of a halogen or incandescent lamp. With LED light sources, the energy savings are remarkable when dimming as can be seen from Figure 2. When dimmed to 50% light output, the 10 W GU10 LED saves a staggering 62% energy, effectively consuming only 3.8 W. Owing to the losses associated with the electronic transformer; the 10 W MR16 LED performs less efficiently but still saves a respectable 48% energy, which is enough to reduce only consuming 5.2 W. Results differ from brand to brand and even possibly between different models within a brand, but the general tendency will be the same or similar for all LED lamps.

Interestingly, due to the high lumen output of the LED lamps, the MR16 measures around 400 lux (1 m from source) and the GU10 approximately 450 lux compared to the a low 150 lux of the halogen lamp when dimmed to 50%.

New industrial branch manager takes up the reigns

PAUL Nicolai, the Industrial Branch Manager of BEKA Schréder, has announced his retirement after seven years with the company.

Nicola successfully established the BEKA Schréder industrial branch in September 2007, the purpose of which was to incorporate all of the company’s industrial lighting activities. “We wish Paul a happy retirement and thank him for his dedication and hard work,” says Wimpie Ludwick, national sales manager.

Philip Vermulen has taken over as branch manager from Paul Nicolai. Vermulen joined the company in 2008, and with his 20 years of experience in the lighting and allied electrical industries, he has played a significant role in the success of the industrial branch. “We wish Philip success in his new role,” says Ludwick.

When an LED is dimmed, the current through the module reduces and the junction temperature correspondingly reduces (typically non-linear). This has a profound effect on the lumen maintenance of the LED as can be seen from Figure 3, which shows a graph of the expected LED module lifetime versus its internal temperature. Additionally, the driver built into the LED lamp also suffers degradation due to increased temperature but dimming the lamp reduces the overall temperature.

Measurement of a typical 10 W GU10 LED showed that the aluminium housing temperature reduced from about 40 °C above ambient when at full intensity to about 5 °C above ambient when dimmed to its lowest intensity – this much reduced temperature has an obviously beneficial implication on the lifetime of the lamps driver. Thus, the energy savings are real when dimming LEDs – the more you dim, the more you save. The more you dim, the cooler the lamp operates and this results in reduced lumen depreciation as well as a longer lifetime of the LEDs driver.

However, always ensure that the correct dimmer type is used for dimming a particular LED. If a dimmer is not matched or approved for a specific LED it can result in reduced product lifetime.
A new dimension of light with intelligent management systems

LIGHT management is much more than the use of motion sensors. It is the optimal connection of user interfaces, control units, daylight and motion sensors, and electronic control gears that offer highly efficient lighting solutions as energy expenditure rises globally.

Stricter directives, such as the EPBD (Energy Performance of Buildings Directive), can be adhered to more easily with application-oriented control systems such as Osram’s light management, which uses intelligent sensors.

Professional light management also offers distinct advantages: Visually stimulating illuminations that save energy and make shopping in retail outlets a pleasurable experience for ‘retail therapy’; or making guests in a restaurant more comfortable by using luminaires to stage different ‘moods’.

Osram has a reputation as an international lighting solutions provider and more clients are discovering that they can install new illumination with energy-saving potential using professional light management solutions from Osram.

The company has vast experience as a project contractor on small and complex illumination projects providing tailor-made, energy efficient and innovative lighting concepts – from a single room solution to integrated building solutions.

One such contract was the Fraunhofer Institute in Jena, which opted for an Osram lighting upgrade. The building has always stood for innovation at the highest level and now, the same holds true for its lighting. It is equipped with modern LMS (in full) and LED solutions by Osram. An intelligent light management system was implemented at the Fraunhofer Institute using a matched mix of standard luminaires and special luminaires, developed specifically for the project, which included general, exterior and architectural lighting.

Impresses and creates atmosphere
Light doesn’t just make things bright. It can accentuate and even reinterpret architecture; in shops light can enhance products, and in hotels, it goes a long way to creating an exciting first impression, creating a pleasant atmosphere and even providing orientation.

Museums require an enormous amount of flexibility to achieve the perfect lighting scenario for each new exhibit – and Osram’s lighting solutions achieve this perfectly.

Osram’s Easy Colour Control system with up to 64 channels enables direct control of a variety of luminaires for large and small applications. This lighting system can transform a quiet sedate restaurant with subdued lighting into a club with a vibrant party atmosphere with just a click.

The best part is that scenarios can be individually adjusted and easily saved – and the desired configurations can be recalled instantly.

Editorial supplied by Osram.

Committed to a brighter future

AIDAN Brennan, projects manager at the Radiant Group, says the company offers “one of the most comprehensive ranges of lighting products available in Southern Africa today”.

He says that Radiant Group has three product divisions: light fittings, lamps and light bulbs; and electrical products while Radiant Group’s key markets are construction, new infrastructure, development and housing, residential, industrial and commercial.

“We provide lighting and electrical solutions that are beautifully designed and created to complement any living space. At our head office in Johannesburg, we have what is arguably the largest lighting showroom in Africa and there is another showroom in Cape Town,” he says.

“Radiant Group is focused on driving innovation and technology and is constantly expanding its range of products to bring the splendour of light to any environment,” Brennan adds.

He stresses that conservation of the environment is “an integral part” of Radiant Group’s value system. “Radiant is committed to a brighter future by creating energy-efficient products that are beautifully designed and inspired by the environment. To this end, we continue to develop more eco-conscious solutions and pertinent energy-saving tips found on our packaging underscore the company’s commitment to the environment.”

Brennan says the Radiant brand is recognisable in the African market “due to its reputation as a supplier of a wide range of high-quality, competitively priced products” available from electrical wholesalers, mass retailers, specialised lighting shops and lighting designers.

“The application of Radiant products can be seen in multiple venues ranging from shopping centres, retail outlets and corporate offices to industrial warehouses, hotels and residential homes.”

Past projects include Montecasino, Fourways, Johannesburg; Standard Bank; Spar national franchises in South Africa; Pick n Pay stores nationally; the Rosebank Hotel in Johannesburg, and other hotels throughout Africa and in India.

Enquiries: +27 11 386-0000
Bright Sparks

The shy squirrel

Mr and Mrs Green were strolling through the local park when they spotted a squirrel clinging to the trunk of a tree of about head height. They immediately approached it, but the squirrel scuttled round to the far side of the tree. They moved round the tree, but the squirrel kept moving so that it was on the far side of the trunk and all they could see was its tail. “It knows we are walking round it!” exclaimed Mrs Green. “But we aren’t walking round it,” replied Mr Green, “because it is always facing us and we are never behind it. However, we are walking round the tree.” “Certainly,” replied his wife, “but the tree isn’t moving, and the squirrel is.”

What do you think? Were they walking round the squirrel or not?

Hut’s a tricky one

This is the only solution, apart from slight adjustments of the paths.

OCTOBER FEATURES

ENERGY MEASUREMENT & SUPPLY

MV/LV systems, transformers, mini-sub, suspension devices, poles, switchgear, control gear, quality of supply protection, load control, cables and cable accessories, cable jointing techniques, metering, energy management, energy efficiency, timers, load shedding, load balancing, testing equipment, hazardous areas, flameproof equipment.

MOTOR CONTROL CENTRES AND MOTOR PROTECTION

Panel building, gauges, displays, maintenance, protection, protection relays, starters, drives, motor types, sizing, starting, stopping, refurbishment, controlling, enclosures, switches, push buttons, LEDs, digital displays, relays, timers, temperature control, process, building management, insulation testing, vibration monitoring, maintenance, flameproof equipment.

The ifm SA customer support team:
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ifm electronic SA

Major Tech Insulated Tools offer Performance, Quality, Value, and are individually tested to 10,000V

Cutters & Pliers - designed by electricians for electricians!

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This cutters and pliers range feature a cutting edge hardener suitable for both hard and soft wire. The superb ergonomic handles design have finger stops to prevent slipping, plus the heavy duty insulating orange insulation on hand grips. The most popular EP0109 has a terminal crimping slot.

1000V Hand Tools...
Safety Design for Electricians

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