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electrical news



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DoL to make "concerted effort" to build up electrical industry in SA

AT the Department of Labour's 'Electrical Safety Indaba' held in Johannesburg on 18 June. Tibor Szana, DoL's newly appointed chief inspector, gave his assurance that the DoL is going to make a "concerted effort" to build up the electrical industry in South Africa and that it is working on a "framework" for the electrical industry to move forward.

While this framework was not revealed, the indaba addressed developments in the electrical industry. Various presentations were given, and these included: the role of the South African National Accreditation System (SANAS); the certification of electrical products by the National Regulator for Compulsory Specifications (NRCS); the role of Accredited Inspection Authorities (AIAs); and feedback from the ECA(SA).

Szana said the electrical industry is "complex" and needs a "structured approach" to make it work. He admitted that, over the past few years, the industry had become "fractured".

"However, we can no longer tolerate a situation where more than 20 000 electricians roam freely as a law unto themselves," he warned and reiterated that "health and safety are non-negotiable".

"It is the public that pays the price if this department doesn't do its job – and there are regulations to ensure that minimum requirements are in place," said Szana. "Hazards must be removed or reduced – this is not an industry where you get a second chance."

He stated that the DoL wants to work "together with this industry and move forward".

"Let's deal with the problems as they arise and before they become major problems," he said.

"I'm not interested in stories – an installation is either right or it is wrong – and anyone who endangers the health and safety of another person is contravening Section 9 of the Occupational Health and Safety Act," he warned, adding that DoL will "take offenders to task".

Szana mentioned a personal experience with "shoddy" electrical work when he moved into his new home and found loose, live wires in the ceiling void even though he had a 'valid' Certificate of Compliance. "How many more problems and unsafe situations exist out there?" he asked.

He admitted that the DoL would have to move faster to resolve issues and one of these issues is an unintended consequence of load shedding: "Generators are being connected to installations without adhering to the regulations," he said, again issuing a stern warning that anyone who breaks the law would be punished.

He appealed to the legitimate electrical industry – the registered electrical contractors – to report suspect installations and pirate contractors to the DoL. "We want to know about the 'funny' things happening out there. And there will be successful prosecutions," he stressed.

"Without structure, this complex industry will not



The presenters at the Department of Labour's 'electrical safety indaba' held in Johannesburg on 18 June were Jacob Malatse, director at the Department of Labour (DoL); Thabo Mabena (inspection manager and technical specialist at the National Regulator for Compulsory Specifications (NRCS)); Mark Palmer (Electrical Approved Inspection Authority Southern Africa); Linda Grundlingh, field manager, Inspection at the South African National Accreditation System (SANAS); Mark Mfikoe, national director at the Electrical Contractors Association (ECA); Pieter Laubscher, deputy director at the Department of Labour and Patrick Mmapheto, technical assistant at DoL. Absent: Tibor Szana, chief inspector, DoL.

work," he said, adding his assurance that the directorate for Electrical and Mechanical Engineering would assist the industry.

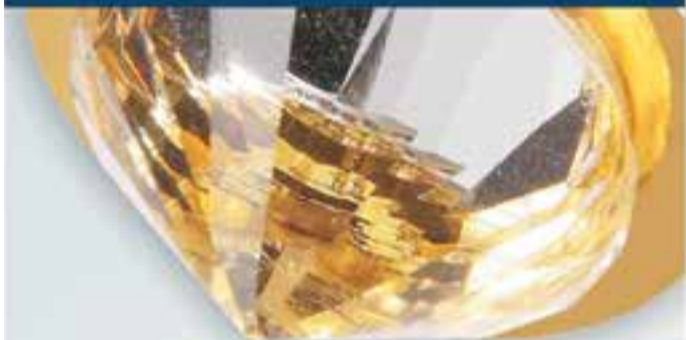
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Personality of the Month

Knowledge will give you power but character respect



Trevor Manas.

MANAGING director at Pontins in Johannesburg, Trevor Manas, has lightning protection encoded in his DNA blueprint, which explains his fascination with this awe-inspiring natural phenomenon that is also one of the most deadly and destructive forces known to man.

Highly regarded by his peers as a specialist in this field, Trevor is well-respected in the lightning protection industry. He is considered a genuine 'mensch' and the proverbial Mr Nice Guy who goes out of his way for his clients, even if it involves going an extra mile (or three).

He is where he is today because he has worked hard, climbing the ladder a rung at a time, with the backing of his family and the support of loyal staff members.

Sparks: Where were you educated?

TM: I matriculated at Roosevelt High School and then studied a B Com at Rand Afrikaans Universiteit (RAU) and at Wits University. I also studied 'Human Movement' at Wits.

Sparks: How long have you been involved in the electrical industry?

TM: I've been in this industry since 1994.

Sparks: When and where did you start your career?

TM: I started my career at Pontins in 1994 as an installation technician, learning the ropes by working on various sites and doing physical installations. Within two years, I was promoted to sales engineer, where I was involved in site assessments, soil resistivity surveys and compiling quotations. In 1997, I was promoted to director and was in charge of ensuring the company's compliance with the relevant SABS earthing and lightning protection codes of practice. In 1999, I became Pontins' managing director and have remained in this position for the past 16 years.

Sparks: What are the greatest changes you have seen over the years?

TM: There two major changes that I can think of: In 2010, the SABS adopted the IEC lightning protection codes of practice, which brought about a whole new set of requirements in the way lightning protection systems are designed and installed. Even today, there are a number of lightning protection specialists who struggle to comply with these standards. The second and probably the biggest change that has impacted our industry is the rapid technological progress that has been made in the past 10 years. The constant miniaturisation of electronic equipment has required us to develop innovative lightning protection measures.

Sparks: What major projects have you worked on and what is your greatest accomplishment?

TM: Pontins was established in 1972 and over the past 43 years we have successfully protected thousands of facilities, including Koeberg Nuclear Power Station. I have personally been involved in many interesting projects, which include some of South Africa's largest and most prestigious projects. Some of the more memorable include Soccer City, Gautrain, ORT International Airport, DSTV City, Overberg Missile Test Base, Sasol Project Turbo as well as the Kusilie and Medupi Power Stations. At present we are extremely busy designing and installing earthing and lightning protection systems for various wind and solar farms.

Our greatest accomplishment to date is the lightning protection system that we designed and installed at the ABSA Project Lumen in 2014 because of the innovative design and cutting edge technology we used to protect the largest LED screens in the world from lightning.

Sparks: Have you won any awards?

TM: We have won numerous health and safety awards, which is an important part of our installation ethos. We also won the 'Most Innovative Project' as awarded by DEHN Africa in 2014.

Sparks: Who has been your inspiration or have you had a mentor who has influenced your career?

TM: I am lucky enough to have been mentored by two men who have probably contributed more than any other individuals in founding earthing and lightning protection as an industry in South Africa. First and foremost my father, Joe Manas, who is an absolute legend in our industry, guided me from the day I started.

His guidance taught me the importance of conducting business in an ethical manner, to never compromise on quality, and to always conform to the relevant codes of practice and

standards. My father has continued to inspire me even though he retired in 2010, and for this I will be forever grateful. The second person who has played a major part in my career is my uncle, Hans Slagter (ex Surgetek). He has, through many years of guidance, helped me develop my skills in the surge protection side of lightning protection design and through his advice encouraged me, as MD of Pontins, to develop our partnership with DEHN Africa. So, as you can see, lightning protection is in my blood. From an early age, I can remember listening to my father and my uncle discussing lightning protection philosophies and protection theories.

Sparks: What, to your mind, is one of the biggest challenges facing the industry at this time?

TM: I think that education of electrical engineers and contractors is critical. I have always believed that an educated client makes informed decisions and with ever changing and evolving technologies, our lightning protection designs must evolve to provide effective protection solutions. A large part of what I do is to constantly inform our clients of the latest changes in the codes of practice and the latest thinking worldwide in lightning protection principles. I do this through seminars and regular White Papers, which are sent to electrical engineers and contractors.

Sparks: What do you enjoy most about your job?

TM: I love the diversity of projects that we are lucky enough to get

involved in. We provide lightning protection solutions across all industry sectors and I really enjoy challenging projects where innovation is required to protect people, property and equipment from the hazards of lightning.

Continued on page 4

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Cable company expands operations

Alvern Cables' accounts team: Estelle Buitendach; Anna Carelse; Jeaneth Mogofe; David Brodryk; Krish Govender; and Dorris Nkosi (seated).

LOCAL cable manufacturer, Alvern Cables, has moved into its newly constructed premises and commercial director, Stephen Liasides, is optimistic about the move.

"Our growth over the years has necessitated this change and the new building is conducive to the company's further progress," he explains.

While Alvern's new premises are located in Branch Road, Driehoek, Germiston, the factory will remain in Knights, Witfield.

Liasides says that the space that has been now become available in the factory will allow the installation of new state-of-the-art equipment. "This will make Alvern even more competitive in the cable market," predicts Liasides.

A privately-owned business, Alvern Cables began operating in 1967 manufacturing low voltage electrical cables for domestic and industrial use. In November 2014, Laurence Hendy (managing director), Willem Smit (financial director) and Stephen Liasides (commercial director) were joined by two new shareholders: Dorothy Botsi-Thulare (executive director) and Jaycen Padiachy (works director). This took the company to Level 2 B-BBEE status, in keeping with current policy in South Africa.

In addition, Alvern Cables has opened a new distribution division, which focuses on the buying and selling of products that are in short supply, as well as specialised cables.

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Continued from page 3

Knowledge will give you power but character respect

Sparks: How do you motivate your staff?

TM: Pontins employs at present over 180 staff and our policy of providing promotion from within the company is a real motivating factor. We give individuals the opportunity to better themselves through promotion to higher positions before looking for new employees from outside sources. We have many cases of individuals being promoted from an installation technician to a sales engineer or project manager and our staff members are well aware that self-improvement is possible within the company. Our extremely low level of staff resignations and dismissals is testament to this.

Sparks: If you could 'do it all again', would you change anything? If so, what would that be?

TM: I have been truly blessed with the opportunities that have been afforded me and looking back, with hindsight I probably would have studied electrical engineering instead of commerce.

Sparks: Would you advise a person leaving school to enter the electrical industry? And why?

TM: Yes, I would, I believe that with the shortage of skills in our country there will always be a demand for skilled persons in the electrical industry.

Sparks: What is your advice to electrical contractors and/or electrical engineers?

TM: I would encourage all electrical engineers to have a good background knowledge of the earthing and lightning protection codes of practice and standards. To this end, engineers can attend one of the many seminars that we run.

Sparks: What is your favourite quote?

TM: "Knowledge will give you power but character respect." – Bruce Lee

Sparks: Name three things on your 'bucket list' (things you want to do before you 'kick the bucket').

TM: I have a long bucket list, but here are three: 1) Finish the Cape Epic; 2) Visit Machu Picchu; and 3) Experience the great migration of the Masai Mara.

Continued from page 1

DoL to make "concerted effort" to build up electrical industry in SA

Director at the Electrical and Mechanical Engineering directorate at DoL, Jake Malatse, appealed to the electrical industry to play a role in restoring the industry standards. He said that the DoL was playing its part and that the "turnaround time for registration of electrical contractors is now two to three weeks". Discussing training, he said training providers must ensure that people are trained properly and that unit standards are adhered to – and that role players must "take this industry seriously".

"This is an exciting time," he said, "solar panels are being connected to the grid and the renewable industry presents many opportunities for the electrical industry – and only "clean" registered electricians will get work on wind and solar farm projects."

"DoL is here to protect the electrical industry and we will be watching the municipalities to see that they do their work properly."

He said that electricians who "want to do the right thing" can report unscrupulous operators to the DoL at one of its nine provincial offices and 123 labour centres, or SMS any information about unscrupulous electrical contractors and dangerous installations to 082 774 0320

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- Look for authentication of quality on the cable markings, such as an SABS mark.
- If in doubt, contact the SABS or the supplier for authentication.
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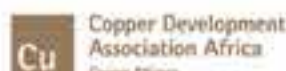
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Getting to grips with SANS 10142-1 by Hannes Baard

Cut corners ... but heaven help you if something goes wrong

In last month's column, I had barely scratched the surface of the first paragraph of The Occupational Health and Safety Act (Act 85 1993) Section 43 when it was time to go. Let's have another stab at it.

As I said some time ago, a Regulation is essentially a law, but it draws its life not from the decision of a legislative assembly directly, but indirectly. Most regulations are made under an Act of Parliament, thus the opening sentence of the Section 43 in The Occupational Health and Safety Act reads: 'The Minister may make Regulations ...'

On the other hand, when you hear economists, business and ordinary people refer to 'a regulation' or 'regulations', they usually mean legislation that affects people outside government such as we electricians and contractors. Municipal by-laws also feature in this 'in-between' stage of the legislation in terms of your (and my) daily lives. So, it's perhaps the perfect time to have a quick look at the differences between 'regulations' and 'by-laws'.

Regulations

Regulations are promulgated by Government Notices; for example as in Government Gazette No 31975 where Government Notice (GN) No R242 of 6 March 2009, issued Electrical Installation Regulations in terms of the

Occupational Health and Safety Act (Act No. 85 of 1993). The Electrical Installation Regulations from Act 85 1993, must not be confused with the Installation Rules for the Wiring of Premises (South African National Standard 10142-1), a South African Bureau of Standards (SABS) publication. The Electrical Installation Regulations are divided into (individual) regulations, sub-regulations and paragraphs.

By-laws

By-laws are passed by municipal councils. Such councils can also promulgate original legislation, because they are representative and deliberative legislative bodies. We will, therefore, come across municipal by-laws that dictate the type of earthing methodology required for that particular area. By-laws assist the electrician with what works and what does not work in that particular area when earthing an electrical installation to the general mass of earth. By-laws are divided into sections, sub-sections and paragraphs.

So now... onto the Regulations as defined in the Occupational Health and Safety Act.

43. Regulations

(1) The Minister may make regulations -
(a) As to any matter which in terms of this Act shall or may be prescribed ...

The above is quite a far-reaching

statement come to think of it... Let's hope the Minister and his fellow parliamentarians do not get it into their heads to regulate the way I tie my shoes; they already tell me what type of shoes I must wear in the workplace and whether I can wear long pants or not. Next... when you've read through Section 43 (b), I hope you still feel like going to work in the morning, especially if you are in a managerial position.

As we said, the Minister may make regulations ...

(b) Which in the opinion of the Minister are necessary or expedient in the interest of the health and safety of persons at work or the health and safety of persons in connection with the use of plant or machinery, or the protection of persons other than persons at work against risks to health and safety arising from or connected with the activities of persons at work, including regulations as to -

- (i) The planning, layout, construction, use, alteration, repair, maintenance or demolition of buildings;
- (ii) The design, manufacture, construction, installation, operation, use, handling, alteration, repair, maintenance or conveyance of plant, machinery or health and safety equipment;
- (iii) The training, safety equipment or facilities to be provided by employers

- or users, the persons to whom and the circumstances in which they are to be provided and the application thereof;
- (iv) The health or safety measures to be taken by employers or users;
- (v) The occupational hygiene measures to be taken by employers or users;
- (vi) Any matter regarding the biological monitoring or medical surveillance of employees;
- (vii) The production, processing, use, handling, storage or transport of, and the exposure of employees and other persons to, hazardous articles, substances or organisms or potentially hazardous articles, substances or organisms, including specific limits, thresholds or indices of or for such exposure;
- (viii) The performance of work in hazardous or potentially hazardous conditions or circumstances;
- (ix) The emergency equipment and medicine to be held available by employers and users, the places where such equipment and medicine are to be held, the requirements with which such equipment and medicine shall comply, the inspection of such equipment and medicine, the application of first-aid and the qualifications which persons applying first aid shall possess;
- (x) The compilation by employers of health and safety directives in respect of a workplace, the matters to be dealt with in such directives and the manner in which such directives shall be brought to the attention of employees and other persons at such a workplace;
- (xi) The registration of persons performing hazardous work or using or handling plant or machinery, the qualifications which such persons shall possess and the fees payable to the State in respect of such registration;
- (xii) The accreditation, functions, duties and activities of approved inspection authorities;
- (xiii) The consultations between an employer

- and employees on matters of health and safety;
- (xiv) Subject to section 36, the provision of information by an employer or user to employees or the public on any matter to which this Act relates;
- (xv) The conditions under which any employer is prohibited from permitting any person to partake of food or to smoke on or in any premises where a specified activity is carried out; and
- (xvi) The conditions under which the manufacture of explosives and activities incidental thereto may take place ...

Now, whether or not you consciously or sub-consciously started to tick the above boxes, you have to concede that perhaps it is a blessing in disguise that the Department of Labour (DoL) cannot perform its duties optimally as contemplated in the Occupational Health and Safety Act (Act No. 85 of 1993), because if it did (or could), do any of you honestly think you could operate in any industry without contravening some kind of rule or regulation every second of every working day?

And yet when you have a legitimate gripe or complaint and ask the DoL to do something about it, they seem to do nothing. Take the health and safety issues that are locked up in various Regulations (Environmental Regulations for the Workplace, General Safety Regulations and Construction Regulations, to name a few), which, at times, add thousands of rand to even the simplest of projects, just because the client's safety officer is scared of being prosecuted... and it appears as though the 'powers that be' at DoL are not prepared to rework the OHS Act's requirements to accommodate specific requirements. There is no 'one size fits all'.

It's quite noticeable how people who are not active in the practical side of things want to dictate how things should be done by the person who's actually doing the job.

It just does not make sense, does it? Why have all the legislation if you do not have the political will to work with the industry and actually enforce it?

Till our regular (regulated or not) date next time ...

Understanding backup systems

By Jonathan Palmer, managing director, PowerMan

WITH backup systems becoming more in demand than ever before, it is important that the installer understands the different technologies that are available and knows what to look for in the specifications of the machines.

There are essentially two types of UPSs available to the purchaser: the off-line UPS and the on-line UPS. There is still much debate about which unit it is better to buy as both machines have advantages and disadvantages, I will give a brief overview of the two types of machines and outline the positive and negative aspects of each machine.

Off-line UPS

The off-line UPS or 'line interactive UPS' takes in the normal mains, drives the load and keeps the battery fully charged. The input is monitored and as soon as the mains drops below a pre-set level or fails completely, the unit switches to battery inverted power. The line interactive machine is also fitted with a voltage regulator so that small changes in voltage can be corrected without transferring to battery power.

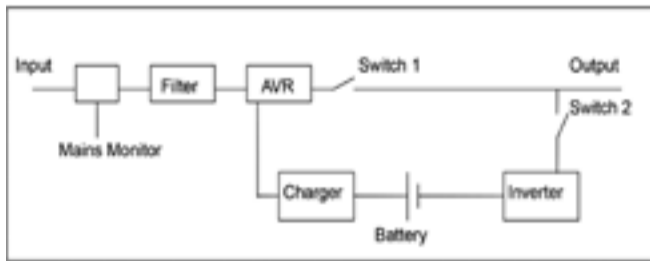


Figure 1: Off-line UPS block diagram.

The big buzzword in the industry today is 'inverter'. Essentially, an inverter is there just to turn the dc from the batteries into ac. Modern inverters have built-in chargers and automatically switch on once the mains fails - and they have simply become a variation of an off-line UPS.

Advantages of off-line UPSs

- Small compact machines.
- Cheap and cost-effective.
- No electrical installation required.
- Silent operation.

Disadvantages of off-line UPSs

- Does not offer isolation between input and output.
- Cannot correct poor input wave-forms from a supply such as a small generator set that could damage sensitive electronic equipment.
- Only offers moderate regulation on the input voltage.
- The AVR in the UPS is designed to protect the batteries in the UPS not the load.
- Output wave forms vary from machine to machine; generally the cheaper units have modified wave forms not pure sine wave.

Recommended applications

- Single user PCs.

- Long run time home or office applications.

On-line double conversion UPS

The on-line double conversion UPS takes the incoming mains and converts it directly into dc. This dc power is used to charge the batteries and to drive the inverter, which in turn runs the load. Should the mains fail, the batteries will simply carry on driving the inverter and start to discharge as opposed to charging. The units have a built-in static bypass feature that enables the machine to transfer the load to normal mains under certain conditions.

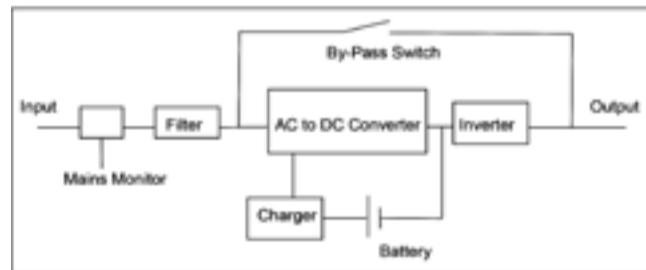


Figure 2: On-line UPS block diagram.

Advantages of on-line UPSs

- Complete regeneration of the output from the dc section guarantees that the load has 100% clean power.
- Can correct poor input wave forms.
- Will always supply steady voltage as the voltage regulation is dynamic.
- Sine wave output.
- Battery time can be extended to suit the users' needs.
- There is no switching time when the mains either fails or returns.

Disadvantages of on-line UPSs

- The on-line UPS is more expensive than a similarly sized off-line unit.
- Needs to be installed by an electrician, which incurs expense (only on units above 3 KVA).

Recommended applications

- Office networks.
- Point of sale systems (POS).
- PABX
- Larger home requirements, such as entertainment systems.

Selecting a backup system

When selecting a backup system for a home or office one has to look carefully at the specifications of the units on offer. With the recent problems that Eskom has had and the introduction of load shedding, the demand for backup systems has increased drastically - and the number of suppliers has grown.

An on-line UPS will offer the best technical solution to 99% of the power issues but it is often more expensive. When deciding between an off-line UPS or inverter, make sure that the unit is relatively quiet when running and that it has a sine wave output as some TV sets will have a distorted picture when running from a modified wave form.

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Working knowledge by Terry McKenzie-Hoy

Different voltages and frequencies ... in a nutshell

THE very first battery, made by Alessandro Volta in 1800, consisted of a pile of pairs of copper and zinc discs. When no current is drawn from the pile, each cell generates 0.76 V with a salt electrolyte. The voltages from the cells in the pile add, so six cells generate 4.56 V of electromotive force – and we can quickly see that 25 such groups connected in series will produce 114 V.

Thomas Edison was one of the inventors of the lightbulb and in the late 1870s, he found that the filament of a bulb would burn out if the current

was too high. Thus, he designed a lightbulb to operate at 110 V, if necessary off batteries consisting of 25 groups of 4.5 V batteries.

Edison believed in a system of dc transmission. There was no backup for ac transmission systems but dc could be easily backed up with batteries, which in turn, could be charged by dc generators. Edison's rival, George Westinghouse, originally manufactured air brakes for trains but went into the electrical business using the services of Nikolai Tesla, who was way ahead of his

time. Tesla realised that ac power systems were much better than dc power systems since the transmission voltage could easily be transformed from a low to a high level (where the transmission current was low and thus the conductors were not very heavy); and then back from a high level to low-level consumer point. This allowed Westinghouse to create a power system that could supply consumers up to 20 km from a given supply point. Tesla had worked out that the best frequency for power generation was 60 Hz.

At this frequency, motors and transformers can be made physically smaller than at 50 Hz.

However, the first European generating facility was built by AEG and they used the metric standard unit sequence of 1, 2, 5. The frequency of 60 Hz did not fit into the sequence and so 50 Hz was adopted. At 50 Hz transmission is about 12% less effective and transformers have to be about 30% larger for the same power. Similarly 60 Hz electric motors produce more shaft power for the same frame size than 50 Hz motors.

Westinghouse and Tesla also wanted to use higher voltages than 110 V. But they realised that if they supplied houses at these higher voltages, then the light bulbs would all have to be replaced. Consequently, they supplied houses with a power supply consisting of three wires: two live wires and a ground wire. From the ground to a live wire was 110 V – and between the live wires was 220 V. Thus stoves, for example, could run on 220 V while the lights were still run on almost 110 V.

When AEG started generating electricity, they decided to adopt 220 V but at 50 Hz instead of 60 Hz to better fit the metric standards and this spread to Europe and Britain. The various countries agreed to differ but navy ships, which belonged to NATO have to be compatible. Consequently they all run on 60 Hz but to make motors smaller, their operating voltage is 440 V (three phase). Motor manufacturers now often make motors that can run either at 400 V (three phase) and 50 Hz or 440 V and 60 Hz. However, it is only motors that are made with this dual voltage, dual frequency capacity. Many appliances are made to only operate on 50 Hz or 60 Hz. As a rule, if the operating voltage is 220 V then the appliance can operate on 50 Hz or 60 Hz if the appliance was originally designed for 50 Hz. However, if an appliance is originally designed to operate on 60 Hz, it should never be operated at 50 Hz as it will draw too much current and will probably burn out.

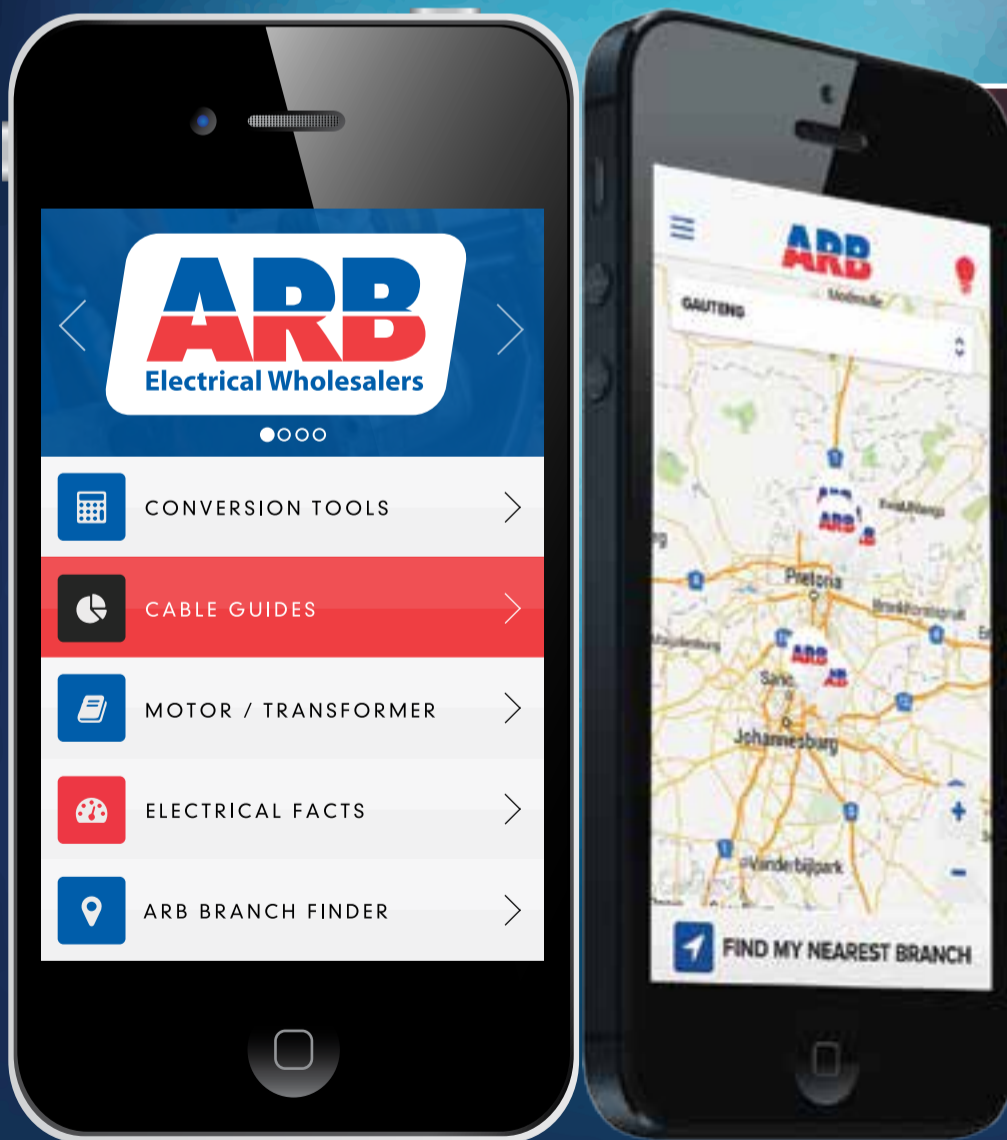
It's a great waste of resources to have different frequencies and different voltages throughout the world. One would have expected that business leaders should have realised that to have a common unity in these matters would have benefitted all. But this never happens. The simple cell phone battery charger connection has about 10 variations. Data cable connections have variations without number. So, while we don't learn from history it is very interesting to see it repeat itself.

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New appointments



Legrand SA has announced two important appointments at its Johannesburg office. Johan Bosch (above) has been appointed as general manager, and Brian Ndlozi (below) as export manager.



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CABLES

Driven by Powertech 

Battery analyser increases accuracy and safety

TO help ensure reliability, stationary batteries need to be maintained and tested regularly – and because they can deteriorate over time,

even 'maintenance-free' batteries require regular testing.

Leanne Cole at the Comtest Group says it takes one battery in a string to fail to take an entire string off-line.

"One bad battery will affect the usable life of adjacent batteries by raising their charge voltage. Worse still, a battery or interconnect with a high impedance could overheat, ignite, or explode during a discharge," she explains. "In addition to providing backup power, stationary batteries are increasingly used to store renewable energy, such as solar and wind. Those batteries are subject to the same potential degradation and need to be tested regularly."

She says that while battery testers have been around for quite a while, recently Fluke noticed a gap between what was available and what was needed to effectively test stationary battery systems. "Most of the battery testers on the market had either no CAT rating or a low CAT rating, and so Fluke developed a battery analyser that is not only

more efficient but also has a CAT III safety rating," says Cole.

"Fluke had the advantage of being able to develop its battery analysers from the ground up to address the requirements of the IEEE Standard 1188, which was established in 2005 after most other battery analysers on the market had been developed. This standard governs maintenance, test schedules, and testing procedures for optimising the life and performance of stationary batteries. Fluke started with the IEEE standard and then made those tests safer, resulting in the development of Fluke 500 Series battery analysers."

She says the Fluke 500 Series is "intuitive and specifically designed for measuring all kinds of stationary batteries", including GEL, AGM (absorbed glass MAT), lithium-ion, and wet-cell lead-acid. "The 500 Series analysers offer improved impedance test performance even in high-ripple environments. The intuitive user interface and intelligent test probes simplify the testing process by guiding technicians quickly through setups. The result is reduced measurement complexity and cost, and increased accuracy, safety, and operational efficiency," Cole explains.

Multiple tests at the same time

All three Fluke 500 Series battery analysers offer a broad range of battery test functions including simultaneously measuring dc voltage while testing internal resistance, and full condition testing using automated string function testing.

The Fluke BT520 and BT521 include an 'intelligent test probe' with an integrated LCD



The Fluke 500 Series battery analyser comes with shoulder strap and magnetic hanger for hands-free operation.



The Fluke BT521 test probes include an integrated temperature sensor.

display that shows measurements on the probe. "Measurements can be captured automatically in sequence mode or manually by pressing the save button on the probe. The LCD display indicates that the measurement has been taken and saved and uses audible voice cues to indicate which measurements in the sequence have been made.

The voice count battery ID identifies which battery is being tested to help keep track of progress, and this is especially handy when testing a long string of batteries.

The BTL21 intelligent probe on the BT521 analyser adds an infrared temperature sensor to measure temperature and up to two other data points simultaneously – 1 000 V dc, 600 V ac, and ripple – to provide a more complete view of battery health.

After testing, the battery analyser can be plugged into a PC via the USB port and measurements are exported using Fluke battery management software, so that users can easily compare results, analyse trends, and generate battery analysis reports.

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Revolutionary new charging system for cordless power tools

THE launch this year of a wireless charging system from Bosch makes working with cordless tools more time- and cost-efficient.

This is a first-of-its-kind system that utilises the advantages of inductive energy transfer for use with cordless tools.

The Bosch wireless charging system was introduced locally with the GAL 1830 W charger and the GBA 18 V 2.0 Ah MW-B 18 V lithium-ion battery.

"Through this technology, which has already proven to be successful on other devices

such as charging stations for electric toothbrushes and cell phones, an alternating magnetic field is generated in the transmitter using a coil. The receiver also contains a coil, which is penetrated by the alternating magnetic field. This induces a voltage and generates a current flow," he explains.

The charger emits a magnetic field that is received by the battery and transformed into charging current. However, the power transferred is more than 50 times greater than that used in ordinary electric toothbrushes (one watt), in order to reach the same charging times as those provided by conventional power tool battery chargers.

"It is considerably more cost-effective than conventional charging systems as it eliminates the need for a second battery or expensive industrial charging stations. The batteries stay in the tool and can be parked on the charging station during every work interruption to charge – and the tools are always ready to be used," he continues.

According to Lauer, the Bosch wireless charging system also offers complete flexibility as the inductive batteries within a voltage class continue to be compatible with all tools in that class.

Bosch starts 'the new era' of the wireless charging system with the



GAL 1830 W Professional charger and the GBA 18 V 2.0 Ah MW-B Professional battery. The GAL 1830 W Professional is compact and currently the smallest charger available on the market for 18 V lithium-ion batteries.

It also features 'wireless intelligence' – an electronic system that ensures communication between charger and battery – which starts the charging process and adapts it to the current state of the battery.

He adds that the system solution also includes a frame suitable for stationary applications. It can be mounted on workbenches, shelves or other work surfaces, and serves as a flexible and secure holder for the charger, battery and tool.

Enquiries: +27 11 651 9600

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Why do we have standards?

AT the Department of Labour's Electrical Safety Indaba, held on 18 June, various presentations were given on compliance to specific sets of standards.

Chief inspector, Tibor Szana, told delegates that the DoL wants to work with the electrical industry to rid it of pirate contractors and that the DoL wants to work with 'industry leaders' as partners. In the same vein, deputy director, Jake Malatse, asked delegates to report "unscrupulous operators" – in other words, people who flout the standards and break the laws.

Standards have become such integral components of our economic, social and legal systems that they are frequently taken for granted and their crucial role in a modern society is often not recognised.

So, what is a standard? Here are some extracts from the South African Bureau of Standards (SABS) website: *Put at its simplest, a standard is an agreed, repeatable way of doing something. It is a published document that contains a technical specification or other precise criteria designed to be used consistently as a rule, guideline, or definition.*

Standards are created by bringing together the experience and expertise of all interested parties such as the producers, sellers, buyers, users and regulators of a particular material, product, process or service in order to increase the reliability and efficacy of the many goods and services we use.

In South Africa, our standards enhance competitiveness and provide the basis for consumer protection, and health and safety. Standards ensure improved quality and reliability; that consumers are protected from hazards to their health and safety and have easier access to and greater choice in goods and services; promote and protect economic interests of consumers; ensure better operation and compatibility between products and services; and ensure the availability of effective consumer redress.

Finally, standards regulate and monitor industry to prevent dodgy business practices and to make laws consistent. And to sum up: standards offer an alternative to regulation – with less red tape and business costs – while still ensuring that products and services are safe and healthy.

In my daily work, I consult on skills implementation in organisations as well as

general auditing and approvals; and my primary activities are to ensure that a common set of agreed standards are applied in similar situations and environments.

Compliance to set standards is what allows us to function effectively with others. So, I am always amused when people complain about other people who don't apply the standards or rules without realising they are, in fact, guilty of the same thing!

Here's an example: You're stuck in traffic and a taxi passes you in the emergency lane and you sit there fuming, wishing there was a traffic officer

around and that he'd pull the taxi driver over and fine him for not obeying the rules of the road ... Not long afterwards, you drive 65 km/h in a 60 km zone or you don't come to a complete halt at a stop street ... perhaps you dash through an intersection when the traffic lights have already changed to orange ... and you think this is okay.

Are you any different from the taxi driver?

In my experience, this is how many people view the Electrical Approved Inspection Authorities (EAIAs). They believe the EAIAs should focus on the people who are breaking the important laws

... "not on me when I only break little laws ..."

If we didn't have standards we would have chaos. You need to ask yourself whether you follow the standards to the letter or do you use them to formulate your own set of rules, convinced that your interpretation is correct.

Even though you apply the standards as you interpret them (based on your experience) it is always wise to verify that your interpretation is correct – and ask for advice, training or support.

To learn more on standards, visit https://www.sabs.co.za/standardss/standards_about.asp

Locally manufactured cables for PRASA and Transnet

ABERDARE Cables, a Powertech company within the JSE-listed Altron Group, today launched a new production line within its existing plant in Pietermaritzburg, KwaZulu-Natal. The line, supported by the South African Department of Trade and Industry's (dti) designation programme, is specifically designed to manufacture locomotive cables for the Passenger Rail Agency of SA (PRASA) and Transnet.

At the launch, Nomfuneko Majaja, chief director: Advanced Manufacturing at the dti said, "We welcome Aberdare Cable's investment in bolstering South Africa's manufacturing economy. This is especially significant because it supports the National Development Plan's (NDP) priorities in two ways: job creation and a clear focus on creating locally made products that support the revitalisation and upgrading of South Africa's critical rail infrastructure and services."

These national locomotive and rails projects will, in their entirety, equate to a value of around R100-billion over a 10-year period. Currently, South Africa has one of the largest wholesale renewal and general overhaul rail programmes in Africa, and serves as a strong manufacturing hub for rolling stock.

"Aberdare Cables has invested R20-million into the expansion of its plants in Pietermaritzburg and Gauteng in order to enhance production, create additional jobs and drive skills development within this crucial economic sector," says Keith Edmond, CEO, Aberdare Cables.

Enquiries: +27 11 396 8000



DLX2069M Tool Set

Continuous Innovation

DHP456ZK 18V Cordless Impact Drill/Driver

Protects battery from over discharge and high temperatures.

Capacity: - Masonry:	13mm
- Steel:	13mm
- Wood:	38mm
Impacts per minute:	Hi: 0 - 22,500 / Lo: 0 - 6,000
No load speed (r/min):	Hi: 0 - 1,500 / Lo: 0 - 400
Max. fastening torque:	Hard: 50Nm / Soft: 36Nm
Net weight:	1,6kg

The model below is powered by two 18V batteries in series to supply the same power as a 36V machine.

DHR263ZK - 36V (18V + 18V) Cordless Combination Hammer

18v + 18v → **36v**


Outstanding Performance and Compact Design.

Capacity: - Concrete:	26mm
- Steel:	13mm
- Wood:	32mm
Blows per min (b/min):	0 - 4,800
No load speed (r/min):	0 - 1,200

- Powered by two 18V Li-ion batteries in series.
- LED job light.
- 3 mode operation - rotation only, hammering with rotation and hammering only.
- Compatible with 1.5Ah, 3.0Ah and 4.0Ah batteries.

The Tool Set includes:
 DHP456Z Cordless 18V Impact Driver Drill, DHR263Z Cordless 18V + 18V Rotary Hammer - 36V, 3 x BL1840 4.0Ah Rechargeable Batteries, DC18RC Charger and a 16 Pocket Tool Bag.



Limited Availability

Tools are not supplied with drill bits, discs, etc. unless otherwise stated.



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ACDC Dynamics
Aurora Lighting
Crabtree Electrical Accessories
Denver Technical Products
Eaton Electric SA
Genlux Lighting
Legrand
Magnitech
Nordland
Osram
Radiant Lighting
Shuttle Lighting Control Systems

Distributors

ACDC Dynamics
ACTOM Electrical Products
ARB Electrical Wholesalers
Aurora Lighting
BEKA Schröder
Bellco Electrical
Citilec
Crabtree Electrical Accessories
Denver Technical Products
Eurolux
Genlux Lighting
Magnet Electrical Supplies
Magnitech
Major Tech
MCE Global Suppliers
Nordland
Osram
Power Process Systems
Superlume
Voltex
Voltex Lighting
Waco

HID lamps

ACDC Dynamics
 Full range of HID lamps and associated switchgear
ACTOM Electrical Products
 Distributors of GE brand: mercury vapour, high pressure sodium – standard/XO Superlife, metal halide quartz, ceramic metal halide
ARB Electrical Wholesalers
 Full range of HID lamps
Bellco
 Distributor of HID lamps
Citilec
 Full range of HID lamps
Eurolux
 Metal Halide – G8.5, G12, RX7s, tubular, elliptic, pulse start, ceramic, high pressure sodium – tubular and elliptic mercury vapour
Genlux Lighting
 HID lamps
Magnet Electrical Supplies
 Philips, Osram
Magnitech
 Full range of HID lamps
Nordland
 Full range of HID lamps
Osram
 Metal halide, quartz and ceramic burners; high pressure sodium lamps; low pressure sodium lamps; mercury vapour lamps; mercury blended lamps
Radiant Lighting
 Metal halide tubular (250 W, 400 W, 1 000 W); metal halide elliptical (250 W, 400 W, 70 W, 150 W) HPS tubular (100 W, 150 W, 250 W, 400 W, 1 000 W), HPS Elliptical (70 W internal ignite, 150 W, 250 W, 400 W)
Superlume
 Wide range of HID lamps
Voltex
 Distributor of HID lamps
Waco
 Distributor of HID lamps

Contact

ACDC Dynamics
 Richard Huyerman
ACTOM Electrical Products
 Neil van Blerk
ARB Electrical Wholesalers
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 Warwick Webber
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 Sales
Bellco Electrical
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Crabtree Electrical Accessories
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Denver Technical Products
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Legrand SA
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Electronic ballasts/LED drivers

ACDC Dynamics
 Electronic ballasts for all applications, pre-heat, rapid start and dimmable
ARB Electrical Wholesalers
 Full range of electronic ballasts
Bellco Electrical
 Distributor of electronic ballasts
Citilec
 Full range of electronic ballasts
Crabtree Electrical Accessories
 Open and closed channel fittings
Denver Technical Products
 Dc electronic ballasts
Eurolux
 T5 electronic ballasts, T8 electronic ballast luminaires
Magnet Electrical Supplies
 Philips, Osram, Vossloh-Schwabe
Magnitech
 Full range of electronic ballasts
Nordland
 Full range of electronic ballasts
Osram
 Full range of electronic ballasts
Power Process Systems
 Full range of electronic ballasts
Superlume
 Wide range of electronic ballasts
Voltex
 Full range of electronic ballasts
Voltex Lighting
 Full range of electronic ballasts
Waco
 Wide range of electronic ballasts

Transformers for halogen lamps

ACDC Dynamics
 Full range of linear and electronic lighting transformers
ARB Electrical Wholesalers
 Full range of transformers for halogen lamps
Bellco Electrical
 Distributor of transformers for halogen lamps
Citilec
 Full range of transformers for halogen lamps
Eurolux
 Electronic and magnetic transformers
Magnet Electrical Supplies
 Osram
Osram
 Full range of electronic transformers for halogen lamps
Voltex
 Distributor of transformers for halogen lamps
Waco
 Distributor of transformers for halogen lamps

Lighting control systems

ACDC Dynamics
 DMX controllers, dimmers and RGB controllers for LED lighting applications; remote control switching and automation products such as occupancy sensors and timers
ARB Electrical Wholesalers
 Lighting control systems
Aurora Lighting
 LEDs; smart lighting
Bellco Electrical
 Distributor of lighting control systems
Citilec
 Full range of lighting control systems
Denver Technical Products
 Emergency lighting systems
Genlux Lighting
 Full range of lighting control systems
Legrand SA
 Lighting control systems
Magnet Electrical Supplies
 Full range of lighting control systems
Magnitech
 Full range of lighting control systems
Major Tech
 Full range of analogue and digital programmable timers, infrared motion sensors, day/night control switches, microwave sensor light switches and ceiling sensor light switches
MCE Global Suppliers
 O-Lite energy saving occupancy micro sensitive and PIR sensors; O-Lite night switches; O-Lite light control sensor – DIN rail
Legrand SA
 Lighting control systems
Osram
 Full range of commercial, industrial, domestic, and specialised lighting control; DALI digital interface
Power Process Systems
 Full range of lighting control systems
Shuttle Lighting Control Systems
 Full range of lighting control systems
Voltex
 Distributor of lighting control systems
Voltex Lighting
 Distributor of lighting control systems
Waco
 Distributor of lighting control systems

Disclaimer: Information will be published as supplied. Only distributors and manufacturers who meet the deadline are included in the guide. The onus is on distributors and manufacturers to ensure that the editor is notified of any changes to existing listings.
 Email: sparks@crowm.co.za

Linear fluorescent lamps

ACDC Dynamics
 Full range of linear fluorescent lamps T5 and T8 in all popular wattages with retrofit options from T8 to T5 for energy savings
ACTOM Electrical Products
 Distributors of GE brand: T12, T8 – standard/triphosphor/CovRguard; T5; energy saving retrofit: T8 Wattmiser, T5 Wattmiser
ARB Electrical Wholesalers
 Full range of linear fluorescent lamps
Bellco
 Distributor of linear fluorescent lamps
Citilec
 Full range of linear fluorescent lamps
Eurolux
 T4, T5 8 W – 54 W; T8 10 W – 58 W; Circline T6 and T8 22 W, 32 W and 40 W; 2D 16 W and 28 W
Genlux Lighting
 Full range of linear fluorescent lamps
Magnet Electrical Supplies
 Philips, Osram
Magnitech
 Full range of linear fluorescent lamps
Nordland
 Full range of linear fluorescent lamps
Osram
 T2, T8 standard and Lumilux, T12 circular and Endura
Power Process Systems
 Full range of linear fluorescent lamps
Radiant Lighting
 2ft 18W white/warm white/daylight; 3ft 30W cool white/warm white; 4ft 36W cool white/ warm white and daylight; 5ft 58W cool white/warm white and daylight
Voltex
 Distributor of linear fluorescent lamps
Waco
 Distributor of linear fluorescent lamps

Halogen lamps

ACDC Dynamics
 Full range of halogen lamps, energy saving halogen bulbs and candle lamps
ACTOM Electrical Products
 Distributors of GE brand: MR16, GU10, capsules, linear halogen; energy saving: MR16, linear halogen, halogen energy efficient incandescent shapes
ARB Electrical Wholesalers
 Full range of halogen lamps
Bellco
 Distributor of halogen lamps
Citilec
 Full range of halogen lamps
Eurolux
 Full range: candles, golfballs, reflector lamps G4, G9, RX7s, AR111, GU10, GU5.3
Magnet Electrical Supplies
 Osram, Philips
Magnitech
 Full range of halogen lamps
Major Tech
 Full range of security lighting (180° 150 W and 100 W floodlights), 150 W, 500 W and 1 500 W halogen floodlights, 150 W, 2 x 500 W halogen telescopic work lights, 150 W and 500 W halogen work lights
Osram
 Single- and double-ended line voltage halogens; capsule and reflector types of LV halogens
Radiant Lighting
 Halogen energy saving lamps in GLS and candle, frosted and clear, 28W and 42W
Voltex
 Distributor of halogen lamps
Waco
 Distributor of halogen lamps

LEDs

ACDC Dynamics

Full range of LED lamps, strips, modules and complete fittings and all associated power supplies and accessories

ACTOM Electrical Products

Distributor of GE brand: Retrofit R50, R63, GU10, PAR30; lighting solutions – retail display units, cove lighting, contour lighting, refrigeration, architectural – various; VIO LED

ARB Electrical Wholesalers

Full range of LEDs

Aurora Lighting

Full range of LEDs

Bellco Electrical

Distributor of LEDs

Citilec

Full range of LEDs

Denver Technical Products

Smith Light long life LED industrial safety light

Eurolux

GU10 – dimmable and non-dimmable, GU5.3, globes, golfballs, candles, G4, reflector lamps, strip lighting, T8 replacements

Genlux Lighting

Full range of LEDs

Magnet Electrical Supplies

Philips, Osram, Vossloh-Schwabe

Magnitech

Full range of LEDs

Major Tech

High powered dimmable L1A MR16 spotlights and dimmable and non-dimmable L2A GU10 globes available in cool white and warm white with a 60° angle supplied in 3 W, 5 W and 7 W versions with a high quality COB inside giving the same light source as a standard 50 W halogen lamp

MCE Global Suppliers

O-Lite LED lighting; Cyclops down lights and panel lights; new Nouveau outdoor LED light fittings; LED light bulbs, lamps and tubes; LED floodlights; LED strip lights

Nordland

Full range of LEDs

Osram

Full range of LEDs

Power Process Systems

Full range of LEDs

Radiant Lighting

Full range of LEDs – neutral white, cool white, warm white; frosted and clear, candle and golf ball

Shuttle Lighting Control Systems

Full range of LEDs

Voltex

Distributor of LEDs

Voltex Lighting

Distributor of LEDs

Waco

Distributor of LEDs

Compact fluorescent lamps (CFLs)

ACDC Dynamics

Full range of CFLs in a variety of formats

ACTOM Electrical Products

Distributors of GE brand: T3 9/11/15/18 W; T3 11/15/20 W spiral; T4 15 W day/nite sensor, T3 20 W dimmable

ARB Electrical Wholesalers

Full range of CFLs

Bellco Electrical

Distributor of CFLs

Citilec

Full range of CFLs

Eurolux

Full range: 9-20 W 3U including 'bullets' for rough service applications; Day/night sensor lamps, GU10 and MR16, G9; Reflectors; spirals in multiple colours; R7 retrofits; candles; golfballs; globes and maxi-globes; PL lamps

Genlux Lighting

Full range of CFLs

Magnet Electrical Supplies

Philips, Osram

Magnitech

Full range of CFLs

Major Tech

Camping lantern torch, 2 x 4 W fluorescent rechargeable camping lantern, rechargeable camping lanterns, 2 x 20 W and 2 x 10 W emergency lights, 180° 24 W CFL security lights with LED night lights and 180° 2 x 24 W CFL security lights, 180° 24 W CFL security light, 180° 24 W aluminium security light with sensor, 180° 2 x 24 W aluminium security light with sensor, 15 W energy saving floodlight, 24 W and 2 x 24 W aluminium energy saving floodlights, energy saving telescopic work lights and energy saving work lights

Nordland

Full range of CFLs

Osram

Dulux S, D, T, F, and L; Dulux S/E, D/E, and T/E; Dulux with integrip base; economy and long life; Sensor; Vario; Globe; Reflector CFLs

Radiant Lighting

3U energy saving lamps, 8 W cool white, 11W and 14W in cool white and warm white; spiral energy saving lamps 8 W, 12 W, 15 W, 23 W cool white and warm white

Superlume

Wide range of CFLs

Voltex

Distributor of CFLs

Waco

Distributor of CFLs

Lighting capacitors

ACDC Dynamics

Full range of lighting capacitors

ARB Electrical Wholesalers

Full range of lighting capacitors

Citilec

Full range of lighting capacitors

Magnet Electrical Supplies

Vossloh-Schwabe

Magnitech

Full range of lighting capacitors

Voltex

Distributor of lighting capacitors

Waco

Distributor of lighting capacitors

Magnetic (conventional) ballasts

ACDC Dynamics

Magnetic ballasts for fluorescent and discharge lamps and associated switchgear such as starters and igniters

ARB Electrical Wholesalers

Full range of magnetic ballasts

Bellco Electrical

Distributor of magnetic ballasts

Citilec

Full range of magnetic ballasts

Crabtree Electrical Accessories

Open and closed channel fittings

Eurolux

70 W – 600 W metal halide, high pressure sodium and mercury vapour magnetic ballasts

Magnet Electrical Supplies

Vossloh-Schwabe

Magnitech

Full range of magnetic ballasts

Nordland

Full range of magnetic ballasts

Voltex

Distributor of magnetic ballasts

Waco Industries

Distributor of magnetic ballasts

Incandescent lamps

ACTOM Electrical Products

Distributors of GE brand: GLS, candles, round, pygmy, reflectors

ARB Electrical Wholesalers

Full range of incandescent lamps

Citilec

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Mark Palmer – Electrical Approved Inspection Authority Southern Africa (EAIASA)

The law and 'reasonably practicable' – it's quite simple

LAST month, I briefly discussed the concept of 'reasonably safe' as detailed in the Electrical Installation Regulations (EIR) and the application of this concept within the context of 'reasonably practicable' as enshrined in the Occupational Health and Safety Act 85 of 1993 (the Act).

The legal implications of this principle to registered persons are, in fact, profound when dealing with the Act as a whole. What is often missed when issuing Certificates of Compliance (CoCs), which rely on the 'reasonably safe' concept, is that most CoCs are issued by registered persons who are self-employed. This aspect alone should make registered persons sit up and pay attention to their prescribed duties, which if not done, may result in invalid CoCs being issued.

Let's look at Section 9 (2) of the Occupational Health and Safety Act 85 of 1993:

General duties of employers and self-employed persons to persons other than their employees
Every self-employed person shall conduct his undertaking in such a manner as to ensure, as far as is reasonably practicable, that he and other persons who may be directly affected by his activities are not thereby exposed to hazards to their health or safety ...

To carry out this duty according to the law, it is imperative that, as a self-employed person, due diligence is applied, in particular, to the aspects covered by the inspection, testing and verification requirements of SANS 10142-1 Wiring of Premises.

So, how does such a registered person determine whether they have acted within the bounds of the 'reasonably practicable' principle?

It is quite simple. Let's start at the beginning.

Dangers and hazards

To establish whether the inspection and test has been adequately performed, it is essential that the registered person understands the reasoning behind this requirement – essentially to determine if any 'dangers' exist that may expose other persons to hazards as detailed in Section 9.2 of the Act.

To make this determination, it is essential to understand the meaning of 'danger and hazards'. First, a 'danger' is defined as 'anything which may cause injury or damage to persons or property'. The important word is 'anything'. In this context, 'anything' is a physical thing that has the potential to injure people or damage property.

Secondly, we need to look at a 'hazard', which is defined as meaning a 'source of or exposure to danger'. Technically, it means that the definition of hazard can be read as 'a source which may cause injury or damage to persons or property'.

Because a source could be anything, one can then say that in certain cases a danger is, in fact, a hazard.

The definition of 'risk' however, is even more important. 'Risk' means "the probability that injury or damage will occur". This essentially means that the risk must always be the indicator for action to be taken. A better definition would have been 'the probability that a hazard can result in injury or damage'.

In the framework of an electrical installation, it is evident that such risk would exist everywhere. In order to then remove or mitigate the effect of this risk, the steps to be taken need to be within the bounds of 'reasonably practicable'.

This concept has four parts, namely:

- The severity and scope of the risk or hazard concerned.
- The state of knowledge reasonably available concerning that hazard or risk and of any means of removal or mitigation.
- The availability and suitability of means to remove or mitigate that hazard or risk.
- The cost-to-benefit ratio of removing that hazard or risk.

Let's look at each of these aspects individually.

The severity and scope of the risk or hazard concerned:

Registered Persons have to look at the electrical installation and ask questions such as: What can go wrong? Who can be affected? And, how can they be affected?

The level of the risk, the number of people and who these people are, will lead the registered person to the next aspect.

The state of knowledge reasonably available concerning that hazard or risk and of any means of removal or mitigation: When dealing with this aspect, one has to assume that the answers to the questions asked above are of such a nature that *something has to be done in order to reduce the risk to an acceptable level*. Now, one has to see if any knowledge or means exist to remove or mitigate the hazard or risk. It should, however, be clearly understood that such knowledge or means must firstly, be aimed at removing the hazard and, secondly, at mitigating the hazard. If such knowledge or means do exist, then one has to deal with the next part.

The availability and suitability of means to remove or mitigate that hazard or risk: Basically, this means one has to determine whether one has access (the means) to the hazard or risk; and how suitable or appropriate it is for one's specific circumstances. If one does have access to it and it is suitable for the application, then one has to deal with the next paragraph:

The cost to benefit ratio of removing that hazard or risk: Of great importance here is the amount of money that would have to be spent in order to lower the unacceptable risk to an acceptable level. This is where the registered person has to use their knowledge, training and understanding of the standards in order to establish whether the amount of money that will be spent is justifiable in relation to the benefits deriving from it. These benefits should always, in the context of an electrical installation, be looked at as the saving of lives and protection of property against fire risks.

My suggestion to registered persons, therefore, is that when issuing a CoC they should forget what others may say is 'compliant' or 'not compliant' because it is ill-advised to rely on 'hearsay'. Look at the principles of law, place yourself in the position of a 'diligent father' and understand the consequences of your actions as a self-employed person. The person who lives within an electrical installation that you have certified would like to know that the electrical installation is as safe as the one in your own home.

'Safe' as opposed to 'reasonably safe' is also defined meaning 'free from any hazard'!

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AS the only manufacturer of circuit breakers and related devices on the African continent, CBI-electric exports the majority of its products and has established subsidiaries and distribution channels in North America, Australia, Asia and Europe.

Coen Esterhuizen, managing director of CBI-Electric says the company maintains its "leadership position by investing extensively in skills development, machinery, systems, facilities and equipment".

"This is supported by leading edge in-house research complemented by our design, development, manufacturing and testing capabilities."

He adds that, in addition to the locally manufactured products that CBI-electric exports, it has long-term partnerships with reputable international organisations such as Mitsubishi Electric and Eaton. "CBI-electric is the only manufacturer in the Southern Hemisphere with its own 65 kA, 44 000 V SANAS-accredited test station with certifications witnessed by SABS, UL, VDE and CQC. We will soon launch a new state-of-the-art web-based design system and, to complement the system, we will also launch new product ranges with a specific focus on our Australian and American subsidiaries," says Esterhuizen, adding that these products are "also applicable to the South African market".

Products supplied by CBI-electric are for the residential, commercial, industrial, mining, utilities sectors and original equipment manufacturers (OEMs).

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Labour brokers: the CCMA confirms ECA(SA) interpretation

IN March this year, the ECA(SA) decided to go on a roadshow and hold a series of workshops to train members on the latest amendments to the Labour Relations Act (LRA). In order to achieve this objective, the director of HR and labour relations at the ECA(SA), Stephen Khola and I had to write and edit a manual to be used for training.

The challenge with this project was that we had to rely on our own training on the interpretation of statutes in order to provide reliable information to workshop attendees. Any law that has not been authoritatively interpreted by the courts represents 'virgin territory'... and the way in which the LRA demands to be interpreted made the challenge even more exciting.

The LRA has to be interpreted in such a manner that the result of such interpretation is one that would give effect to its intention. This means that a literal interpretation, where you simply allow the words to say to you what they are saying, is not sufficient. Contextual interpretation – where you

look at the whole Act in order to arrive at what the context dictates – is equally inconclusive.

The interpretation required is a purposive one to the extent that such interpretation would not result in an absurdity, ambiguity or nonsensical outcomes. The intention of the lawmaker as far as the enactment of the LRA is concerned, cannot be frustrated by an interpretation that does not promote its purpose.

According to the ECA(SA) training manual, employees who have been 'supplied' to a client by a labour broker and have been with a client in excess of three months, are deemed the employees of the client only and not of the labour broker any longer – by operation of the law. In other words the LRA effectively terminates the employment relationship with the labour broker and the relation of employee/employer between the employee and the employer comes into being by automatic application of the law. The only exception is applied to employees whose jobs are

essentially temporary, that is, those who are 'replacing' employees who are temporarily absent, or who are working in positions that are recognised by a collective agreement or sectoral determination as temporary.

I am pleased to report that the Commission for Conciliation, Mediation and Arbitration (CCMA) arrived at the same conclusions and has confirmed the principles of interpretation of the LRA adopted by the authors of the ECA(SA) training manual.

This matter relates to a case involving Assign Services (Pty) Ltd (applicant) and Krost Shelving and Racking (Pty) Ltd and NUMSA as first and second respondents, respectively.

The question that the CCMA was confronted with was whether Section 198A of the LRA as amended made employees supplied by labour broker the employees of the client or both the employee of the client and that of the labour broker at the same time.

Advocate Anton Myburgh SC and Advocate

Greg Fourie represented the applicant and argued that Section 198A made an employee supplied by a labour broker a joint employee of the labour broker and the employer/client. This was labelled a 'dual employer' position.

According to the arbitration award (ECEL1652-15) Advocate Van der Riet SC argued a 'single employer' position on behalf of NUMSA. He argued that a dual employer interpretation would create confusion, uncertainty and prejudice for the vulnerable employees that the law sought to protect. The commissioner referred to an article written by Professor Paul Benjamin, 'To regulate or to ban', in which the learned professor indicated that there was evidence from studies of arbitration awards and sociological research, which indicates that employees are often not aware whether they are employed by the agency (labour broker) or by the business where they work. He argued, and I agree, that it is an entirely "artificial construction" – and one that gives rise to

immense scope for abuse – to make an agency the employer of an employee working on an ongoing and indefinite basis for a client merely because the employees' pay is routed through the agency.

The commissioner further pointed out some practical problems that could arise out of the dual employment interpretation, referring to the question of which disciplinary code would be applicable to such employees – that of the labour broker or that of the workplace where they are employed?

If such employees were to get an award directing that they be re-instated in the case of a successful unfair dismissal dispute, where would such a re-instatement happen in a case where the dual employment interpretation applies? The commissioner further dismissed the contextual interpretation, which argued that Section 198A lent itself to a dual employment outcome in paragraph 5.15 where the learned commissioner stated:

"... Sec 198 (4a) does not make reference to joint and several liability in terms of Section 198A(3)(b)(i), but that joint and several liability only refers to Section 198(4) and the reading of the above-mentioned sections cannot therefore support the arguments for dual employment."

This interpretation, which also relied on Constitutional Court judgements regarding the interpretation of the LRA, is the state of the law. All application must be in line with a purposive interpretation.

This award certainly reinforces confidence in the CCMA as a dispute resolution forum and the skills within the ECA(SA) in terms of its application and interpretation of labour law.

Two new thermal imagers on the market

FLUKE, represented locally by the Comtest Group, has introduced two new thermal imagers: the Ti105 and TiR105 – the latest additions to Fluke's series of lightweight, rugged, and easy-to-use imagers – specifically designed for use by maintenance professionals.

The Ti105 and TiR105 offer the popular Fluke IR-Fusion technology feature, not usually found in thermal imagers in this price class. The Ti105 and TiR105 find application in industrial (manufacturing, process, petrochemical, etc); plants; commercial buildings and facilities; government buildings; schools; hospitals; electrical, water and natural gas utilities; and residential dwellings.

The Ti105, specifically, helps plant technicians, HVAC/R professionals and electricians maintain and

inspect electrical and mechanical equipment and components, enabling them to save time and money by finding potential problems before they become costly failures. The Ti105 allows technicians to troubleshoot in seconds, lessens the likelihood of unplanned downtime, and allows regular inspections from a safe distance.

The TiR105 is uniquely designed for building inspection and energy audit professionals to evaluate and report insulation problems, air leakage, moisture issues, or construction defects delivering a huge competitive advantage by helping them work faster and more efficiently. It quickly documents visible proof of problems so that repairs can be made and then verifies that the repairs have been done correctly.

Fluke's newest extended imagers help users do more in less time, even within the harshest of environments. They are light, rugged, and the easiest-to-use of Fluke's range of professional thermal imagers, with features such as:

- IR-OptiFlex focus system allows the user to discover issues significantly faster whilst giving optimum focus. Manual focus is also available, on the same machine, for optimal flexibility.
- IR-Fusion technology – the industry's only point-and-shoot IR-Fusion camera. Fluke patented technology blends digital and infrared images into a single image to precisely document problem areas.
- Multi-mode video recording. Troubleshooting is made simple with the thermal imager that records focus-free video in visible light and infrared with full IR-fusion capabilities. It monitors processes over time and creates infrared video reports, troubleshooting frame-by-frame, which are downloadable to PC for video viewing and analysis.
- IR-PhotoNotes annotation system – exact references to problem areas can be noted by capturing up to three digital photos per file. Images of equipment, motor nameplates, workroom doors or any other



useful or critical information can be added.

- Superior image quality and IR performance.
- 160 x 120 FPA uncooled Microbolometers.
- 3.5" colour LCD with clear protective cover and adjustable brightness for easy viewing in most conditions.
- Excellent thermal sensitivity (NETD) to see even the smallest temperature differences.

The Ti/TiR105s' advanced features include the Fluke-patented IR-Fusion (picture in picture) technology, which overlays a PIP infrared image over a full-spectrum image allowing users to identify and document problem areas.

Enquiries: +27 11 608 8520

Switchgear for local electricians' businesses

SCHNEIDER Electric has launched its Easy9 switchgear, a new range to help electricians with the provision of reliable switchboards in southern African homes and small-sized buildings.

A leader in switchgear technologies since the 1920s, Schneider Electric has engineered Easy9 to be affordable without compromising on safety and reliability.

According to Christo Janse van Rensburg, product manager: final distribution, at Schneider Electric South Africa, Easy9 answers the need for electricians to have access to robust products that are widely available, and will also help them to complete their installations swiftly and professionally.

The range covers miniature circuit breakers, residual current circuit breakers, surge protection devices, comb busbars, and switchboard enclosures.

All Easy9 products are manufactured in ISO9000-certified plants belonging to Schneider Electric and are approved by independent authorities as compliant with local electrical safety standards. "We work closely with electricians worldwide to help bring safe electricity to homes and buildings around the globe. With Easy9 electricians can take pride in delivering the enhanced safety and peace of mind their customers deserve. An advantage too is that it is a high-end device available at a mid-range price," adds Janse van Rensburg.

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Things to consider before investing in an infrared camera

BUYING an infrared camera is a significant commitment and, even though prices have fallen dramatically over the past few years, it's still important to ensure that the chosen model represents the best value for money and that it will serve you well in the long term. For some, cost will be the driving force, while for others, key hardware or software features are more important.

While dynamic development continues to extend the application potential of thermography, it also presents the purchaser with a lot of choices. The range now extends from pocket-sized models and low-cost point-and-shoot troubleshooting cameras to the high-end models with every function necessary for the professional thermographer. So how do you assess the best model for your needs? Here are some important pointers.

Buy the best your budget allows

Most thermal imaging cameras have fewer pixels than visible light cameras, so pay close attention to detection resolution. Higher resolution infrared cameras can measure smaller targets from farther away and create sharper thermal images, both of which result in more precise and reliable measurements.

Also be aware of the difference between detector and display resolution. Some manufacturers will boast about a high resolution LCD to mask their low resolution detector when it's the detector resolution that matters most.

For instance, LCD resolution may spec at 640 x 480, capable of displaying 307 200 pixels of image content. But if the IR detector pixel resolution is only 160 x 120, giving 19 200 measurement points, the greater display resolution accomplishes nothing as the quality of the thermal image and its measurement data are always determined by detector resolution.

Higher resolution thermal imaging provides more accurate quantitative results and can also be very effective in showing findings in finer details to others. This can help speed the decision-making process for improvements and repairs.

Accurate and repeatable results

Consistency of measurement accuracy is a very important factor when determining the value of a camera. For best results, look for a model that meets or exceeds $\pm 2\%$ accuracy and ask the supplier for details of how they assure the manufacturing quality of the detector to guarantee this. That isn't the only criteria, however.

In order to produce correct and repeatable results, your camera should include in-built tools for entering both values for emissivity – the measure of efficiency in which a surface emits

thermal energy – and also reflected temperature.

A model that gives you an easy way to input and adjust both of those parameters will produce the accurate temperature measurements you need in the field. Other helpful diagnostics to consider are multiple moveable spots and area boxes for isolating and annotating temperature measurements that can be saved as radiometric data and incorporated into reports.

Standard file formats

Many thermal imaging cameras store images in a proprietary format that can only be read and analysed by specialised software. Others have an optional JPEG storage capability that lacks temperature information. Clearly, the most useful is a format that offers standard JPEG with full temperature analysis embedded. This allows you to email IR images without losing vital information.

Radiometric JPEGs can also be imported from wi-fi compatible cameras to select mobile devices using apps that allow further image editing, analysis and sharing. Also, look out for models that allow you to stream MPEG 4 video via USB to computers and monitors. This is especially useful for capturing dynamic thermal activity where heating and cooling occurs rapidly and for recording motorised equipment or processes in motion.

Some cameras feature composite video output for cabling to digital recorders while others include HDMI outputs. And new mobile applications have also been developed that allow streaming video over wi-fi. All these capabilities help you share findings more effectively and enhance your infrared inspections and reports.

Software, study the options

Today most thermal imaging cameras come with free software so you can perform basic image analysis and create simple reports. Advanced software for more in-depth and customisable reports is also available, allowing you to take full advantage of your camera's capability and features. Investigate these tailored software programmes thoroughly to see which makes the most sense for your needs.

And finally, don't underestimate the importance of training; the best thermal imaging camera in the world is only valuable in the hands of a skilled operator.

These guidelines are extracted from a new guide from FLIR Systems entitled '12 things to consider before buying an infrared camera'. To download a copy go to: <http://www.flir.co.uk/instruments/display/?id=18092>

Enquiries: +27 78 706 9532



Reliable medium voltage motor control capability

WITH medium voltage motors typically being some of the largest consumers of power in heavy industries, implementing precise, smart motor control is an effective way of significantly reducing power consumption and energy costs, along with significantly better process control.

Rockwell Automation's Henry Craukamp, power control sales manager – South Africa and sub-Saharan Africa says since they were first manufactured in 1983, Rockwell Automation Allen-Bradley medium voltage drives "have earned a reputation for reliable, efficient motor control across the industry's most demanding applications". The company recently extended this medium voltage motor control range with the addition of the PowerFlex 6000, providing a cost-effective and fit-for-purpose drive.

"The PowerFlex 6000 supplements the existing PowerFlex 7000 range in providing a cost-effective motor control solution that is ideal for new and retrofit centrifugal fan and pump applications rated up to 10 kV.

"Utilising the industry-accepted and robust Cascaded 'H' Bridge (CHB) voltage source inverter (VSI) topology, the PowerFlex 6000 drive provides low-input harmonics and near-unity power factor, ultimately reducing power system issues and maximising motor efficiency while providing simple use and maintenance requirements," says Craukamp.

PowerFlex 6000 is an air-cooled drive designed exclusively for induction motors. Designed for smaller field applications, the PowerFlex 6000

supports motor cable lengths of up to 300 m (the PowerFlex 7000 supports motors from lengths of up to 15 km). It has a seven-inch WinCE Color Touch Screen and supports Modbus-RTU RS485, Modbus-TCP, Modbus-PLUS RS485, Profibus RS485 and EtherNet/IP communications protocols.

The PowerFlex 7000 remains the flagship PowerFlex product, offering multiple configurations and high-performance, customisable options for the diverse control needs of heavy industrial requirements. Utilising Active Front End (AFE) technology and a patented switching technique, the PowerFlex 7000 product line, rated from 2.4 kV to 6.6 kV, guarantees industrial applications the highest overall system efficiency whilst complying to stringent international standards. The drive achieves lower line harmonics and improved power quality through the AFE rectifier, which features a single rectifier bridge to maintain the lowest component count and system complexity," adds Craukamp.

A control solution for the future

Through the power of the Rockwell Automation networked control platform, the expanded Allen-Bradley PowerFlex medium voltage drive product line enables a high level of production optimisation, and increases information sharing across the enterprise. By empowering users to quickly and easily gain access to valuable performance and resource information from their systems, companies can attain higher asset availability, reduced energy and maintenance costs and enhanced asset and personnel protection."

All PowerFlex medium voltage drives are compatible with standard motors without derating and do not require an inverter duty motor. PowerFlex configurations have near-sinusoidal output current and voltage waveforms at all speeds and loads.

"As the global economy continues to expand, constraints to growth arise as the demand for energy approaches – and in some instances exceeds – power generating capabilities. The Rockwell Automation Allen-Bradley Medium Voltage PowerFlex range enhances the performance of medium voltage motor control for the most efficient industrial enterprise," says Craukamp.

Rockwell Automation has been developing leading medium voltage motor control technology for over 80 years, from across-the-line starters and soft starters to variable speed drives, all which deliver enhanced motor protection for industrial applications.

Enquiries: +27 11 654 9700

Strategic alliance agreement signed



BMG and Danfoss Drives have consolidated a long-standing partnership, signing of a strategic alliance agreement recently. Seen at the signing event are, from left: Mick Baugh (sales manager, BMG Electronics); David Dyce (division manager, BMG Electronics); Marco Airola (senior sales director, southern Europe, Danfoss); Leif Flojgaard (president Middle East & Africa, Danfoss); Gavin Pelsler (managing director, BMG Engineering); and Roland Sargent (sales manager, South Africa, Danfoss).

BMG and Danfoss Drives have consolidated a long-standing partnership, with the official signing of a strategic alliance agreement that augers well for both companies, stakeholders and customers.

"This new development formalises and strengthens the original distribution agreement for Danfoss variable speed drives and the soft starter range, which has been in place since 2007," says David Dyce,

division manager, BMG Electronics – Bearing Man Group. "Through this firm alliance, BMG is set to increase awareness of the Danfoss brand; create a stabilised pricing structure and ensure efficient enquiry turnaround times and a reliable support service of Danfoss systems.

"The Danfoss range of technically advanced variable speed drives and soft starter systems, available from BMG's national branch network of

over 140 outlets, enhances energy savings, food preservation, care for the environment and optimum productivity.

"BMG and Danfoss, with a complementary product and customer base and a perfect business ethics fit, are committed to working closely with industry to achieve a more efficient and sustainable environment and a highly productive and globally competitive region."

BMG's R350-million expansion of the distribution and engineering facilities in Johannesburg, includes new electronic workshops and a technical resources centre for the repair, maintenance and commissioning of the Danfoss product range. This 24-hour service is supported by mobile technicians who conduct onsite breakdown and routine maintenance when necessary.

Enquiries: +27 11 620 1530



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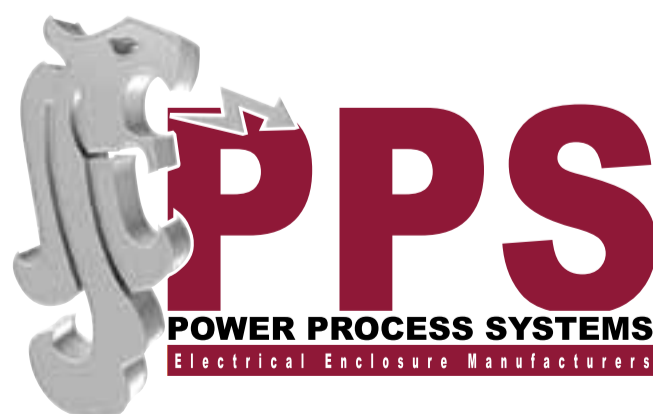
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Selecting the optimum generator set solution is 'critical'

THE current power constraints facing South Africa and Africa have resulted in companies being requested to cut their power consumption by at least 10% in order to alleviate the pressure on the overburdened transmission and distribution infrastructure. This appeal will, of necessity, result in companies seeking alternative power sources to accommodate the energy requirements shortfall.

However, cautions Craig Bouwer, sales engineer at Zest WEG Group's Generator Set Division, there is an apparent lack of understanding of the many issues surrounding standby power. "Companies are generally unaware of how to assess the standby power requirements of a facility or building. By implication, this suggests that companies are also often unaware of what the optimal solution for a given application should be." A standby power solution is an important capex decision that needs to be considered carefully in terms of the company's overall requirements. Moreover, the supplier needs to have the necessary technical expertise and relevant experience to offer a customised solution. A key consideration for a standby power solution is to understand the environment in which the generator set has to function.

Original equipment manufacturer Zest WEG Group's Generator Set Division has a dedicated facility in Cape Town and offers generator sets ranging from 20 kVA units up to 250 kVA off-the-shelf products, 300 kVA to 2 000 kVA individual customised units as well as multiple sets to achieve turnkey solutions in excess of 12 MVA for large-scale applications or projects. The company has supplied a large number of bespoke generator set solutions based on the specific application and environment in which they operate.

"A couple of recent

examples include the containerised three-generator unit we designed and manufactured for DRA Minerals' Liqhobong Diamond Mine in Lesotho and a turnkey power station for AVI Group's Indigo Brands. At Liqhobong, we designed a generator set container with a collapsible snow roof. When the roof is collapsed it facilitates easy transportation and once deployed on site prevents the build-up of snow on top of the container, and the subsequent blocking of the louvres," says Bradley van der Spreng, project engineer, Zest WEG Group's Generator Set Division.

The scope of supply on the Indigo Brands project comprises three 1 000 kVA generator sets and three 1 000 kVA transformers. "What makes this project unique is that Zest WEG Group's Generator Set Division is designing a custom built distribution system and electrical panel for synchronisation. The company is also supplying a 23 000 litre bulk fuel storage system to support this installation" adds Van der Spreng.

The successful implementation of these projects hinges on the company's ability to determine potential solutions for the customer. Amongst these are consideration for sound restructuring methods, fuel systems, electrical reticulation and interfacing, the load and the duration that this load is required to be powered.

"The type of load and the total power drawn should be measured by a qualified team from the generator supplier prior to recommending a particular diesel generator set. Following this,



A view inside a containerised generator set from Zest WEG Group's Generator Set Division.



Zest WEG Group's Generator Set Division is able to offer from a single diesel driven generator (seen here) to total standby power solutions.

accurate load calculations can be carried out and a suitable system recommended. We look at the entire electrical infrastructure and not just the generator set itself. In this way we are able to recommend the power rating of the generator set," says Bouwer.

Another area where Zest WEG Group's Generator Set Division's experience comes to the fore is its knowledge of local regulations pertaining to different metropolitan areas.

Regulations also differ with regard to the particulate levels of diesel fuel storage and sound decibel levels related to noise attenuation. In order to disseminate relevant and important information, we form close working relationships with consultants and, wherever possible, we become involved during the design stage of a project," says Van der Spreng.

All equipment supplied by Zest WEG Group's Generator Set Division is standard with a 12 month warranty. The Group has a dedicated service department, which offers basic maintenance contracts that include measures such as replacing the generator sets' oil and filters. Extended or long term maintenance contracts are also offered where the equipment is for critical applications such as standby power at a hospital.

Bouwer cautions that, while maintenance is critical, companies should take ownership of their generator sets. "We propose to mitigate risk and that a dedicated member of the customer's staff be trained through our manufacture, test, installation and commissioning process.

This enables the customer to be more self-sufficient and compliments all aspects of aftermarket support.

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Single unit protection for pump motors

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Hotel group cuts electricity consumption across four hotels



THE Faircity Hotel Group worked with an energy services company (ESCO) to conduct a lighting energy usage assessment at four hotels: The Quatermain and Falstaff in Sandton, Mapungubwe in Johannesburg and Roodevallei near Pretoria.

Lukas van der Westhuizen, managing director of Faircity Hotels, says the move to optimise the efficiency of lighting technologies was prompted by the need to reduce energy costs, lower operating costs and advance towards reducing the group's carbon footprint.

Some 7 353 energy intensive lamps were removed in the four hotels in less than a month:

- In public areas –
 - 50 W halogen downlights were replaced with 7W LEDs;
 - 35 W halogen downlights with 5 W LEDs;
 - 60 W incandescent bulbs with 7 W LEDs; and
 - 100 W incandescent bulbs with 10 W LEDs.
- In rooms and staff areas –
 - 50 W halogen downlights were replaced with 7 W LEDs;
 - 35 W halogen downlights with 5 W LEDs;
 - 60 W incandescent bulbs with 7 W LEDs; and
 - 100 W incandescent bulbs with 10 W LEDs.

LEDs were chosen for their energy efficiency but also

because they produce a colour temperature comparable to incandescent bulbs and give off a similar warm yellow glow. Colour temperature plays a crucial role in how people perceive colour and experience thermal comfort, two important considerations in the context of the 'home-from-home' expectations of hotel guests, Lukas says.

Aside from using about 85% less energy than incandescent lamps, LEDs last up to five times longer than compact fluorescent lamps (CFLs), which last about six times longer than incandescent bulbs. Moreover, LEDs have a quick start up time, produce their full light capacity as soon as they are switched on and turn off immediately without any fading as the bulb cools down.

The four hotels also replaced energy intensive T8 fluorescent tubes with energy efficient T5 tubes. Outside, HID floodlights were switched to LED floodlights.

In addition to saving electricity, the lighting retrofit also helped the Faircity Hotels Group to make positive strides towards reducing their carbon emissions, an increasingly important consideration for environmentally aware national and international travelers.

By reducing energy consumption from 195 199 MWh to 25 632 MWh per month, the four hotels have reduced their carbon emissions from 193 247 to 25 376 tons per month and saved about 232 307 kilolitres of water per month from being lost to the electricity

producing process. "Faircity shows that a lighting retrofit, relatively quick and easy to implement, can reap impressive energy efficiency results. Lighting is often one of the most overlooked low-cost opportunities for reducing electricity consumption in hospitality establishments without impacting the guest experience," comments Andrew Etzinger, senior general manager of Eskom's Integrated Demand Management (IDM) department.

Eskom energy advisors

Eskom is committed to implementing and rolling out national initiatives and programmes aimed at saving energy and assisting the business sector to utilise its energy sources as efficiently and sustainably as possible. One of the most impactful of these programmes is Eskom's Energy Advisory Services offering advice to business in the commercial, industrial, mining and agricultural sectors on a wide range of energy efficiency measures and interventions, including how to:

- Reduce energy usage;
- Do walk-through energy assessments to identify energy usage patterns, energy needs, areas of energy wastage and energy saving opportunities;
- Optimise operations and maintenance;
- Improve electrical systems and processes; and
- Measure and verify energy savings.

Having a variety of tariffs on hand to work with, drawing on outside technical assistance and understanding the latest energy efficient electro-technologies, Eskom's energy advisors are equipped to make specialist energy efficiency recommendations in regard to tariffs and appropriate energy sources – whether electrical or renewable – based on in-depth energy assessments.

Consultations also include offering advice and information on funding opportunities for energy efficiency projects; and manufacturers and suppliers of energy efficient electro-technologies.

The project was done by Alternative Living and Technical Solutions for Africa (ALISA). The measurement and verification of the energy savings was conducted by the Tshwane University of Technology. Visit www.eskom.co.za/idm for more information.

Run five essential lighting tests in 30 seconds ...

BUILDING maintenance technicians for commercial, retail, or institutional facilities with fluorescent lighting, have hundreds, if not thousands of fluorescent tubes that have to be routinely checked and maintained.

Even though those tubes last for tens of thousands of hours, they do ultimately fail – some prematurely – and some stop working because of other problems with the installation ballast.

In the past, this type of maintenance has usually meant a lot of 'trial and error'. And if a light is found to be out, the technician has to climb a ladder, open up the cover, remove the bad tube and replace it. If the new tube doesn't light, the technician has to try again, call an electrician or bring out a voltage tester.

Addressing the needs of users in the field

Fluke has now developed a tool that takes the trial and error – and a significant amount of time – out of maintaining fluorescent lighting. Specifically designed for building maintenance professionals, the Fluke 1000FLT fluorescent light tester is an all-in-one fluorescent lamp tester, ballast tester, non-contact voltage tester, pin continuity tester, and ballast-type discriminator.

The 1000FLT is able to make all of the following measurements:

- **Lamp test:** Allows testing without removing the



tube from the ballast. The tester sends a pulse of energy, which lights up the tube if there is gas in it. The 1000FLT is compatible with T5, T8, and T12 fluorescent tubes.

- **Ballast test:** Determines whether the ballast is working.
- **Non-contact voltage test:** Checks for the presence of voltage without touching the source.
- **Pin continuity test:** Tests whether filaments in the tube have continuity.
- **Ballast-type discriminator:** The 1000FLT is the first multi-function tester to include this feature, allowing technicians to easily identify whether the ballast is electronic or magnetic without taking the fixture apart or even climbing a ladder. The tester is aimed at the ballast from the ground

and it immediately identifies if the tube is the old-style, power hungry magnetic ballast, for maintenance or replacement.

Its user interface was designed to be as simple as possible, with all tests delivering instant results. The ballast, voltage, and pin continuity tests indicate

results with either a 'go' or 'no go' indicator lights.

The ballast-type discriminator lights up either the 'magnetic' or 'electronic' LED on the face of the tester, while the lamp test result is determined by the user if the tube lights up or not.

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Energy efficiency meets 'human centric' lighting

GENLUX Lighting's philosophy to energy management is focused fundamentally on lighting technologies and applications. The company approaches lighting design, technologies and controls as not merely a plug-and-play solution, but rather as a holistic system approach to achieve reliable and sustainable improvements, says William Blackbeard, technical and R&D quality manager at Genlux.

"At Genlux Lighting we ensure cost savings and waste reductions through energy efficient lighting design and control systems. We believe that a good lighting design incorporates a good control design. The goal of an effective control system is to support the lighting application and design that often translates into elimination of energy waste while providing a productive visual environment," he explains.

"Although Genlux Lighting's core business has been traditionally focused on outdoor industrial, commercial and roadway lighting solutions, we are widening our approach and we are introducing to our product offering a range of indoor commercial, retail and, in selected areas, residential lighting solutions," he adds.

"With the rapid ongoing improvements in the flexibility and efficiency of LED light sources (certain manufacturers are testing the boundaries of 300 lm/W in chip sets in laboratories), we envisage a fundamental shift towards indoor lighting solutions that will be tailored around individual customer requirements. Some of this will include occupancy and presence detection, which removes the human interface; daylight harvesting; using natural light more effectively; and utilising 'tunable' white light – all of which improve productivity and biological health in office spaces."

Blackbeard says that, in addition to this, there is "a whole world" of customisable options for the home user to pre-set individual preferences using technologies in development – for example, the Internet of

Things (IoT) – and technologies already available from reputable companies such as OSRAM (Lightify) and Vossloh-Schwabe (LiCS- indoor lighting control systems).

"Lighting technologies are rapidly becoming very important elements of energy management and saving and are unquestionably linked to human wellbeing and productivity," says Blackbeard.

"At Genlux, our vision for the future is aligned with our approach to lighting design, lighting control and its applications," concludes Blackbeard.

The Genlux range of products can be viewed on www.genluxlighting.co.za

Enquiries: +27 11 825 3144



Elegant LEDs for urban areas



BEKA Schröder recently launched the new YOA luminaire – round, slim and decorative – to introduce "a subtle and refined presence in the urban space", says Wimpie Ludwick.

"The luminaire offers an outstanding finish, particularly noticeable due to its elaborated crown and its patterned glass protector associated with an embellishment plate for a detailed aesthetic finish. This elegance houses the last generation of the most performing LED engine, the LensoFlex 2," he explains. "This photometric engine offers high-performance photometry optimised for each specific application with minimum energy consumption."

Ludwick says the Yoa is manufactured from sustainable and recyclable materials – aluminium and glass.

"The Yoa has an IP 66 tightness level for long lasting performance; and the photometric engine and electronic assembly can be easily replaced, ensuring our luminaires can be upgraded in the future to newer generation LEDs, keeping our promise of FutureProof."

"The Yoa offers flexible combinations of LED modules, driving currents and dimming options to provide the most cost-effective lighting solution whilst improving the well-being and safety for people," he says.

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YOA

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LED

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Decorative LED lighting – adding form to function

ADDING form to function has been the motivation behind Major Tech's new interactive LED lighting showroom, where an extended range of top LED lighting products can be viewed, touched and operated – along with expert technical advice from Major Tech's staff.

The state-of-the-art showroom displays working demonstrations of the LED range of decorative lighting – from ceiling spot lights and downlights to step lights, wall lights, starlights, midi and mini ceiling lights, pendant lights and garden lights.

The showroom takes the guesswork out of selecting the perfect lights for an installation and offers clients the opportunity to experience the unlimited lighting possibilities of the beautiful, modern stainless steel and acrylic range of LED lighting.

Major Tech QR Code

To visit Major Tech's lighting showroom, download the QR code reader app from Android Market or the App Store. Scan the QR code on the right and watch the video.



LED ceiling spotlights

Major Tech's recessed and swivel LED ceiling lights are the perfect replacement for traditional lights," says Rhodam Evans, Major Tech's product manager. "The high quality Epistar LEDs – in warm white for a gently soothing ambiance or in cool white for areas that call for a clear 'icy' white light quality – need very little maintenance due to the long lifetime of the globes. Evans says the LED ceiling spotlights come in dimmable and non-dimmable versions and are ideal for homes, offices, hotels, shops, restaurants and general lighting applications.

LED downlights

Whether the lighting requirement is for retail lighting, accent lighting or an uncomplicated LED downlight for passages or hallways, this range is the "ideal solution" says Evans. "The obvious benefit of using these low voltage downlights is the wide beam and high wattages that meets the needs of commercial clients. Add to that the cost saving on electricity bills and you have a win-win situation." Major Tech's LED downlight range offers modern recessed lighting combined with a highly functional lighting solution along with a clean, visually appealing space in which to work, cook, eat, entertain or relax," he says.

LED starlights

When it comes to adding a touch of sophistication to modern style, Major Tech's LED starlights are available with clear and frosted acrylic lenses and supplied in 'sand nickel', 'chrome', 'gold', 'zinc alloy' and 'aluminium' colours to suit every colour scheme. Depending on personal preference, there is a choice of warm white at 3 000 Kelvin or cool white at 6 500 Kelvin. "The B2 LED Starlight range can be installed in ceilings, stairways and closets and on walls and floors – in fact, wherever accent lighting is desired," explains Evans. "Even though these ceiling lights are supplied as non-dimmable, Major Tech has developed drivers and dimmers that can dim these lights from 3 W and upwards, with a minimum of 3 x 1 W for a dimmable option." He says these lights are ideal for bulkheads, bar counters and reception canopies when installed in homes, offices, hotels, bars, restaurants, kitchens or bathrooms.

LED midi ceiling lights

The midi light range has been designed for those 'in between' installations where a large fixture is inappropriate and a small star light won't create enough light. One does not require a large fixture and neither a small star light. "The Major Tech range allows you to make a statement in your light design by offering the choice of a round or square-shaped and a clear or matt finish. These elegant recessed light fixtures add an extra touch to a stylish installation," explains Evans.

LED mini ceiling lights

The compact acrylic finish of the miniature recessed ceiling lights in the range take 'mood lighting' to a whole new dimension. "When lit, the clear acrylic version seems to hide the lens and highlight the surface and light itself," Evans continues. "The LED colours available are warm white or cool white and this would depend on personal preference and individual lighting applications. This range is suitable to install in cabinets, cupboards and canopies as well as in many other applications.

"Our recessed lights are compact enough to fit just about anywhere. Tiny LED lights can be embedded in ceilings and are

perfect for safely lighting stairs and other feature lighting designs. If three or more of these fittings are connected together, Major Tech has developed a dimmable solution to meet the need for a comfortable or mood setting light scene," says Evans.

LED wall lights

"These LED wall lights offer lighting solutions that reflects individual personalities, preferences and plans. At Major Tech, we believe that lighting should go beyond functionality – lighting should also transform spaces into stunning, inspiring settings," he says. "Lighting one wall of a living room or bedroom and adding wall lights to a hallway or walkway provides a beautiful touch to a functional necessity" says Evans. The standard light fitting offers a 100% light output and certain models have been designed with a dimmable function for areas where a more comfortable lighting environment is required.

LED pendant lights

Major Tech's new lighting range includes modern pendant lights that are perfect for kitchens, breakfast nooks and centre island units. "Our contemporary pendant lights offer more than adequate task lighting so they're not only practical and functional but are also stylish," he says, adding that they can also be used successfully in homes, offices, bars, restaurants and hotels. "Apart from offering ample illumination, pendants bring balance, beauty and contemporary style." The acrylic lens pendant lights have 3 W LEDs and are available in cool white, warm white and RGB. He explains that the RGB fittings are supplied with a remote control to change the colour manually or to select the desired colour-changing program. "The cool white and warm white versions are available with a dimmable function and in various shapes and sizes to suit different environments," he says.

LED step lights

The comprehensive selection of high performance, durable LED step lights are suitable for indoor and outdoor step requirements – with various IP protection ratings available for outdoor applications. Step lights add style to gardens, patios, pools and spa areas and enhance the safety and security of any property. "The low profile design, with no visible fasteners, provides seamless integration with all architectural styles along with LED energy efficiency. The logical, modular design elements facilitate fast, fool-proof installation in all types of wall surfaces – including drywall, concrete pour or bricks," explains Evans.

LED garden lights

"Of course, LED garden lights have to be weatherproof and rustproof – so it makes perfect sense to use IP65-rated aluminium lights – and LED lamps to ensure low maintenance," says Evans. Major Tech's G1 LED garden lights are constructed of seamless, heavy-duty aluminium and a tough acrylic lens.

The outdoor lamp range includes bollards, which are sealed with gaskets to keep out water and contaminants – and the IP65 rating means that the lights can be used in wet locations. The sleek, contemporary bollards – featuring LED lamp sources, concealed LED drivers and low glare fixed optics – are designed for walkways, entrances, driveways and other small-area lighting applications where low mounting heights are required. The easy-to-install bollards come in various heights – from 30 to 100 cm – and operate on 230 V ac.

Informed choice

"The selection of appropriate lighting shouldn't happen at the last minute when the electrician asks about the location of sockets and the position of spotlights," says Evans

"Make time to plan and find exactly the right lighting so there won't be any regrets," he advises. "Illuminating your home takes thought and consideration so that the end result is beautiful and, at the same time, practical. After all, finding that there is not enough light over the kitchen island unit can result in a costly modification to the lighting." Evans says Major Tech has now completed its new, modern and functional lighting showroom to display the extended Major Tech lighting offer. "Take time to browse through our lighting showroom and let our experienced sales people explain what is on offer in terms of illumination, light sources, dimming capabilities and other practical considerations so that you can make an informed choice of lighting," he says.



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AURORA IS LIGHTING THE WAY



Neil Salt, Aurora's Chief Product & Marketing Officer, outlines the revenue generation opportunities awaiting the IT savvy lighting contractor and explains lighting's role in the IoT.

M2M, IoT, IoE & the Cloud – Why should you care?

You've probably heard the acronyms M2M (Machine to Machine), IoT (Internet of Things) or IoE (Internet of Everything – the latest trendy word for the IoT!) banded around of late, but what does it all really mean and how is it relevant to lighting?

Let's start with a basic '101' of M2M and how the IoT/IoE has evolved from it.

M2M is 'things' of a similar type talking to each other, predominantly in a local environment. A good example of this is the Oyster card system employed in London underground or machines in a factory reporting back on their performance for operational efficiency and production data.

The IoT or IoE is about connecting a multitude of different 'things' together and getting them to communicate via the Internet across multiple applications with new revenue opportunities.

Unconstrained by physical location or device type, this allows remote control and reporting and for one device to trigger an action or event on another device.

For example, your lights could include motion sensors that detect when no one is in the house and then turn your Hive or Nest thermostat down and send a text if someone has broken it.

So how does the 'cloud' play a part in all this? In the IoT world, the cloud refers to the off-site servers that hold all the data that is collected and analysed.

Lighting is the most pervasive, ubiquitous element in any environment. There's more luminaires than any other device – it's the 'Trojan Horse' into the IoT. If lighting is to play its rightful part at the epicentre of a smart, connected environment, four core components are required in a successful ecosystem - we call this revolution 'Lighting 3.0'.

1. Luminaire & Sensors – The networked endpoint that provides illumination and sends data from inbuilt sensors and energy usage.

2. Communications – Modules and hubs that take the data from the luminaire to the cloud.

3. Cloud infrastructure – Servers that store and crunch the data to provide energy-saving suggestions, control and interoperability with other systems.

4. Operating system – The software that overlays the ecosystem and provides a control interface and visible access to the data.

A cost-effective, easy-to-install ecosystem deployed on a mass scale will

transform how lighting is designed, sold, installed and monetised.

The value is shifting from hardware to software and from products to services. Contractors will become systems integrators that connect devices and provide value-added services and benefits, ultimately creating new revenue-generating opportunities.

This isn't fiction; this is happening now across a multitude of industries – lighting is next.

FACTOIDS:

- Each day we consume more data than our grandparents did in their lifetime.
- 90% of the world's data was created in last 2yrs
- An estimated 16 billion connected devices in 2015
- x7 connected devices per home in 2014, estimated x24 by 2020
- The IoT space is predicted to generate \$19 trillion by 2020



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Bright Spark

Chopping the chocolate

BARRY was the happy owner of a giant chocolate bar, which he wanted to break up into 35 small squares. However, he couldn't decide how to do it. He thought of breaking it into five strips and then breaking up the strips, but then he wondered whether he should break it instead into two large rectangles, and break up each of those separately; Naturally, he wanted to make as few breaks as possible. Can you say what was the smallest number of breaks needed?

July solution

A match puzzle

In any knockout tournament, each match knocks out one player. Therefore, if there are 35 players there will have to be 34 matches to leave one winner. This will be so however the matches are arranged, and however the byes are organised.

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