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Electrical Review

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Lightning protection - Take no chances

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Cable management
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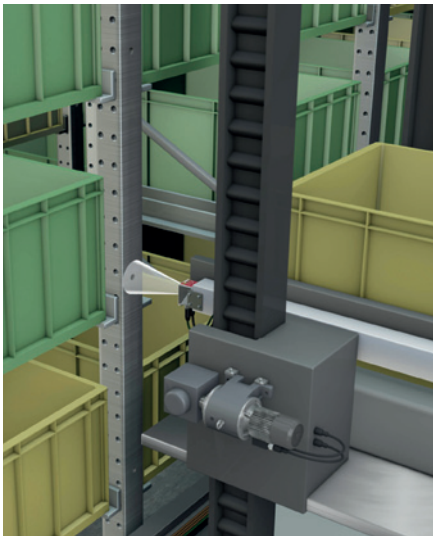

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PRODUCT WATCH
A round up of this month's new technologies

Boiler Plus uncovered

When Boiler Plus was first rolled out in April of this year, it was warmly welcomed by the heating controls industry. After all, this new legislation not only sets a new minimum performance standard of 92% ErP for domestic gas boilers in England for both new and replacement installations.

For the first time ever it also made timers and room thermostats an explicit requirement. Electrical Review spoke to Dean Jepson, European managing director at SALUS (pictured)

The thinking behind Boiler Plus is to give consumers the power to achieve the greatest comfort and energy savings in their home. At the same time, it helps the government step up its Clean Growth Strategy and brings the UK heating market in line with other EU countriesHowever, due to the poorly worded first draft of Boiler Plus that was released in October 2017, the government (BIES) had to issue a revised draft in January 2018, following by two sets of FAQs in an attempt to clear up the confusion.

Unfortunately, the confusion surrounding Boiler Plus remains, and lies in the simple yet wholly misleading definition of a 'Smart Thermostat' by Part L Building Regulations. A Smart thermostat complete with automisation and optimisation is now one of the four added efficiency measures that the homeowner must take when installing a combi boiler according to Boiler Plus. However, Part L's definition of a Smart Thermostat is one that does NOT require remote control or internet connectivity. This outright contradicts the definition by BEIS and HHIC which clearly states that Smart Thermostats are products that enable remote control of a central heating system via a tablet, smartphone or desktop.

This inaccurate definition has sparked a trade war within the heating controls industry with many unscrupulous manufacturers exploiting this loophole and claiming that their Smart Thermostats are fully compliant with Boiler Plus. In reality, however, they are not connected thermostats but cheaper non-connected devices that offer minimal advantages to the consumer.

The Department for Business, Energy and Industrial Strategy has pledged to review Boiler Plus in April 2019 , its prime concern being to ensure onsumers are not being adversely affected by the confusion. From a manufacturer's perspective, a one year period where this uncertainty is allowed to continue is wholly unacceptable. It is entirely incompatible with the supply chain and the product development period required to bring appropriate products to market. Further grievances of Boiler Plus are that it was rushed through in a mere six month period when a standard phase-in phase out period for products following new regulations is normally two-three years minimum. Also, should next year's policy review rightfully conclude that Smart Thermostats are indeed internet connected, who will compensate the homeowners and suppliers who have already installed non-connected solutions that were wrongly marketed as Boiler Plus compliant?

Thousands of young people to benefit from engineering programme with rail giant

Hitachi Rail is launching an educational programme with Primary Engineer that will see 2,700 5 to 11 year olds learn about engineering with the help of experts in the field.

The announcement came during Rail Week (8-14 Oct) and the initiative is part of the Year of Engineering campaign. It aims to help tackle a serious shortage of engineers in the UK. On current projections, there will be a gap of 55,000 engineers and skilled workers by 2020, according to the Strategic Transport Apprenticeship Taskforce, with not enough qualified people to deliver key national projects like HS2, Heathrow expansion and Crossrail 2.

The scheme will eventually see 50 schools from Ashford, Doncaster, Bristol, Newton Aycliffe and West London partner with engineers from Hitachi's nearby train depots.

Conquering one of the Seven Wonders of the World

The Electrical Industries Charity (EIC) has announced a team of three trekkers are back from the biggest challenge of the year – the Great Wall of China 2018.

In September, trekkers including Mark Doré of Edmundson Electrical, Monika Gaubyte of Keystone Communications and Jess Vailima of the Electrical Industries Charity (EIC), embarked on the 10-day journey to raise money for the Dickinson family.

The adventure of a lifetime started in the small town of Huyangyaguan which is located 75 miles from downtown Beijing in the valley of the Yanshan Mountains, where the team tackled over 22,000 steep renovated steps until they reached the 'Heaven's Ladder'.

Mark Doré of Edmundson Electrical, said: "We met up as 14 strangers, shared amazing experiences, laughed our way through the hard times and came back the closest of friends with memories to savour for the rest of our lives."

In 10 days, the team completed over 158,000 steps and trekked an incredible 107 kilometres to show their support for

the Dickinson family. The Challenge for a Cause campaign has so far raised £161,881 out of the initial £250,000 target. You can still show your support by donating on the Electrical Industries Charity's website and help to transform a house into a home for the Dickinson family.

Caz's husband Mick in his letter to the team, said: "Your sheer dedication, courage and determination on this trip has been absolutely amazing. For each and every one of you to take the time, money, effort and commitment to do what you have done for our family, I am not sure I will ever be able to thank you enough and will never forget what you have done for us."

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Constant chaos

In the midst of news about 500m of cable allegedly annihilated by an Hitachi train causing mass chaos on routes into and out of Paddington station, it was also revealed three peaceful protestors against fracking in Lancashire have been released from prison following an appeal.

One of the protestors, Rich Loizou, commented: " the court's decision "affirmed that when people peacefully break the law out of a moral obligation to prevent the expansion of fossil fuel industries, they should not be sent to prison".

The Lord Chief Justice Lord Burnett said an "immediate custodial sentence in the case of these appellants was manifestly excessive".

Public decisions made

Meeting climate change targets should be a priority, but automotive companies must begin offering vehicles that are not only as robust as petrol and diesel vehicles, but also better for the environment. It's this like-for-like performance that will likely win over the public.

A major barrier to the wide adoption of electric vehicles (EVs) is the design of components. For all their inefficiencies, the components used in internal combustion vehicles are certainly robust. To keep pace with consumer demand, automotive companies need to solve the challenges posed by electric vehicle design, such as how to efficiently manage braking energy.

There are components like water-cooled braking resistors that can achieve this and use the heat generated from braking to heat the cabin and provide effective pre-heating to the car's batteries in cold weather. But until these components are widely adopted, the disparity between diesel car performance and that of EVs may continue to deter many drivers. Automotive manufacturers need to not only guarantee environmental friendliness, but efficiently provide high performance to spur public adoption of EVs and endorse the government's plans.

Bursary helps more women in to electrical industry

NICEIC has been helping more women into the electrical industry through its Jobs for the Girls Bursary Scheme.

The scheme offers grants to women already working in the industry or looking to get a helping hand at the start of their career. It is open to females of all ages and designed to cover training or other associated costs up to a maximum of £500.

One of those who benefited from a bursary was 40-year-old Amanda Pugh from Buckinghamshire. She used the funding to set up a website for her business Amanda Electrics:

"I was just starting out on my own and although I had help with some of the training, and was fortunate to have a good amount of tools I still had to pay for additional courses, books, registration, insurance, website fees, business cards, work clothing and other tools.

"The set up costs were more than I anticipated but the bursary from the NICEIC helped to offset some of these costs and meant I was able to start making money from my work sooner."

Coleen Everitt, runs Alto Electrical in Lincolnshire. She used the money to buy materials for circuit boards, which she custom builds and uses for talks in local schools and colleges.

"I am a keen advocate of promoting a career in the trades to young boys and girls. By offering a hands on practical lesson I want to encourage both boys and girls into the construction sector.

"It was great to get support from NICEIC and as a female in the trade I fully support the Jobs for the Girls campaign."

Another one to benefit was 18 year-old Britany Douglas. She had just started an apprenticeship and used the money to buy tools and the latest 18th Edition wiring regulations.

She said: "The bursary meant I was able to buy the tools I needed to start my apprenticeship. There are a lot of things you need to buy when just starting out so it was great that I could get a helping hand."

Pictured: Britany Douglas who received a bursary in 2018.

Lords to consider fake news and the impact of tech on consumers

On Tuesday 23 October technical journalists from The Times and Wired and an expert from Which?, a consumer rights group, gave evidence to the House of Lords Communications Committee for its inquiry on internet regulation.

In the first session journalists who write about the impact of digital technology dicussed the risks that internet poses to individuals and society. In the second session the committee took evidence on the consumer rights perspective of online regulation.

More information will follow in the next issue!

Line of duty

In the last moth, a domestic property close to where I live caught fire at 9.30pm, leaving a couple and their three month baby to escape. An LFB fire investigation has shown the cause of the fire to be an electrical fault with a tumble dryer by a very well known brand.

The family have literally been left with nothing and had to run even without putting shoes on - thank goodness they are alive. Which leaves one to wonder, why did smoke alarms not activate - at least giving them a few more minutes to get out safely. The rumour is, and I emphasise rumour, our local council - it was a council or housing association property - had not reconnected said fire alarms following some maintenance work. IF this were to be the case - who would/should be accountable for this travesty, even worse had there been fatalities?

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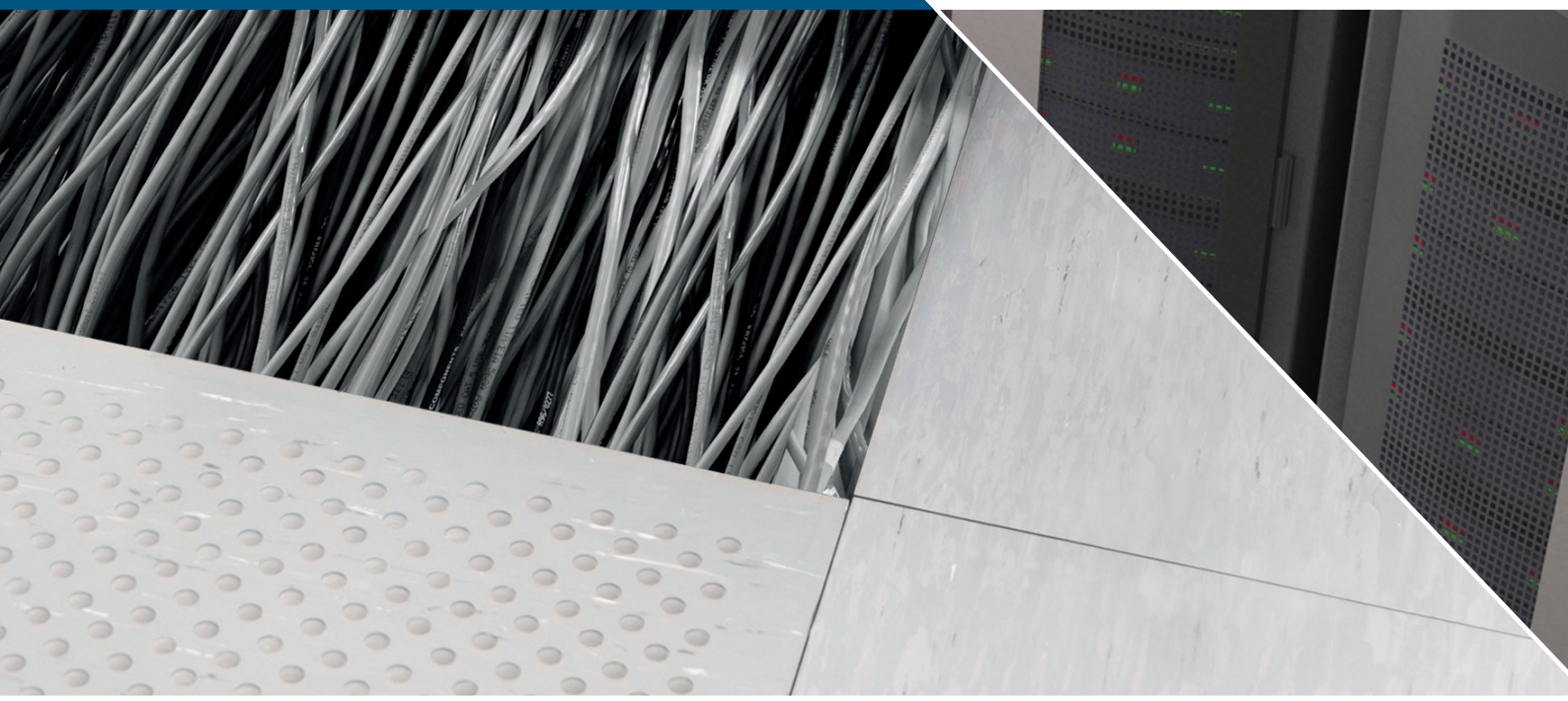

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GOSSAGE

NUKES IN THE NAVY

For years, British proponents of nuclear power have strenuously denied any connection between the production of nuclear weapons and that of electricity. Remember that compelling slogan Atoms For Peace?

The first public concession came at a select committee hearing in the House of Commons in 2015 when Stephen Lovegrove first became the Permanent Secretary for Defence. Having just transferred from energy, he plainly acknowledged that the absence of trained personnel in the civil field had serious repercussion for skills within the military. This was clearly a taboo subject, as never again in the UK has any official, let alone politician, subsequently even hinted at the suggestion there was any linkage at all.

Such reservations are not entirely shared in Washington DC. For instance, last month the Centre for Strategic & International Studies held a high level symposium together with the Naval Historical Foundation. It focussed entirely upon the '"impact the commercial nuclear energy industry has on the navy" . Nuclear reactors are to be found in over 100 submarines and aircraft carriers. "This capability is tied to the fate of commercial nuclear energy " – specifically to its "nuclear fuel cycle, vendor base and engineering talent".

Originally, the event was titled "Atomic Power Near Critical". Over the past 30 years, many elderly power stations have been retired, without any news one opening – very largely due to their appalling economics. So the official blurb emphasised that " nuclear energy production is directly connected to the US ability to exert geopolitical influence."

The crux of the symposium was to discuss "US government action moving forward to mitigate the impact of a declining nuclear power industry upon the Navy and national security". In other words, what subsidies can the military press for to keep atomic power struggling on.

It was President Eisenhower, way back in 1959, who warned about the dangers of the "military-industrial complex." Sixty years on, you couldn't have a more blatant example of that conspiracy. And it won't surprise you to learn that what was initially intended as an open symposium swiftly became strictly "invitation only."

SEEING THE WOOD FOR THE TREES

Clearing operations at Germany's embattled Hambach Forest , to make way for utility RWE's proposed expansion of a lignite coal mine, were halted by a Munster court. Asked to decide whether the forest is protected by EU environmental rules, the judges said RWE did not provide sufficient evidence why cutting down the old forest is , as claimed, to maintain energy supply security. They ordered that deforestation be stopped.

The judgement follows extensive protests by campaigners, including a group of porn actresses ,who joined the campaign to save the forest - thus elevating its public profile enormously.

RWE instantly warned that "the economic loss resulting from the expected operational restrictions to be over 100 million euros per year."

But that latest new blockbuster report from the Intergovernmental Panel on Climate Change is focussed on the dire warning that the role of forests in combating climate change risks is being overlooked by the world's governments. The scientists are saying that halting deforestation is "just as urgent" as eliminating the use of fossil fuels, and that protecting and restoring forests would achieve 18% of the emissions mitigation needed by 2030 to avoid runaway climate change.

So, a double whammy for RWE. It couldn't happen to a nicer company.

THE SLOW DEATH OF CCS

The International Energy Agency in Paris has long been a champion of carbon capture and storage development. Nine years ago, they were solemnly projecting that there would be over one hundred CCS plants operating across the developed world by 2020..

Subsequently, progress on CCS has been glacially slow, with concerns about the cost leading the UK to abandon its much touted £1 billion CCS competition in 2015, after several years of keeping such a scheme on offer. That was seen by someeven then as very unwise. However the slowdown was replicated elsewhere, with work on the flagship US Kemper coal CCS project being halted. Norway, already a CCS pioneer with its enhanced oil recovery technology, has now cut its annual CCS funding 360 million kroner ($45m) to just 20 million kroner ($2.5m)

Some project work continues like the Texan Petra Nova scheme.. But the overall message seems to be that for the moment it is game over for CCS. The emergence of renewables costing below seven euro cent per kilowatt hour means there is simply no room for CCS in the power sector. As the present chairman of Eurelectric, ENEL CEO Francesco Starace has pronounced: "I think CCS has not been successful .It doesn't work. Let us call it what it is – it is simply too expensive, too cumbersome, the technology didn't fly."

Recognising the realities, the UK Department of Business, Energy and Industrial Strategy's latest official projections now have CCS at only 1GW installed in the UK by 2035. And that may be optimistic.I wonder what the IEA's latest projections are?

WRONG TITLE

The struggling tabloid "I" newspaper was chuffed to be sponsored by Octopus Energy for a four page supplement. It was entitled Energy Saving Special. Which largely consisted of advertising and editorial, urging householders to switch to buying electricity from Octopus.

Doing so might (or might not) result in saving money. But, despite the supplement's title, it wouldn't save a single kilowatt of energy

The only long term way to radically reduce residential fuel consumption is by installing insulation and using more energy efficient technologies for heating, lighting, refrigerating and washing. Use these, and overall energy bills can easily be cut in half . Sadly the supplement never made mention of any of these things.

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Inductive loads such as motors, pumps and fans can cause your site’s supply power factor to drop, reducing the amount of the power supplied that you can effectively use and potentially leading to financial penalties from your utility. Since the introduction of DCP161 by OFGEM in April 2018, many industrial and commercial businesses with half-hourly (HH) metered supplies are now finding unpleasant surprises in their utility bills. This is because DCP161 imposes excess capacity charges, potentially in excess of 100%, on any location that exceeds its agreed electricity consumption level. **abb.com/powerquality**

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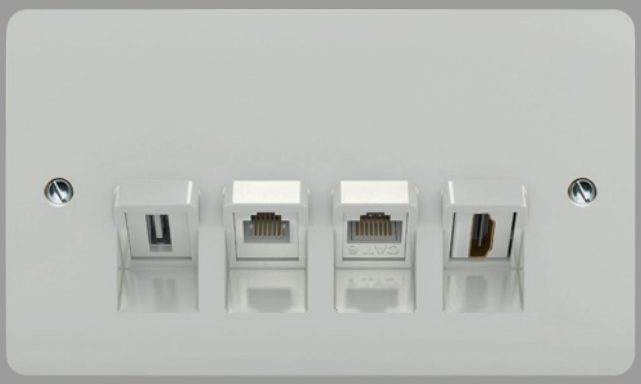

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Take no chances

Changes to the 18th Edition (BS 7671) mean contractors will need to carry out a risk assessment to determine whether surge protection devices are not to be installed in electrical installations, Paul Appleby, circuit protection product manager at BG Electrical, told Electrical Review

The arrival of the 18th Edition of the IET Wiring Regulations further reshapes the regulatory landscape for electrical contractors.

A number of important areas have been scrutinised and reviewed; among them is the issue of surge protection and devices designed to mitigate any excess voltage risks.

Surge protection devices (SPDs) are designed to prevent electric shock and having excess voltage damaging the installation's wiring infrastructure. Should an overvoltage event occur, the SPD diverts the resulting excess current flow to Earth.

Regulation 443.4 requires, except for single dwelling units where the total value of the installation and equipment therein does not justify such protection, that protection against transient overvoltages is provided where the consequence caused by overvoltage could result in serious injury, damage to culturally sensitive places, interruption of supply or affect large numbers of co-located persons.

> **Any electronic equipment may be vulnerable to transient overvoltages, which can be caused by lightning activity or a switching event**

For all other installations a risk assessment should be carried out to determine whether SPDs should be installed. Where a risk assessment is not carried out, then SPDs should be installed.

Electrical installations in single dwelling units are not required to have SPDs installed, but their use is not precluded and it may be that in discussion with a client such devices are installed, reducing significantly risks associated with transient overvoltages.

This is something contractors have not previously had to consider to any great extent, and will need to be taken account of, both in terms of time allocation for project completion as well as cost add-ons for the customer.

Any electronic equipment may be vulnerable to transient overvoltages, which can be caused by lightning activity or a switching event. This creates a voltage spike increasing the wave's magnitude to potentially several thousand volts. This could cause expensive and instant damage or significantly reduce an item of equipment's lifespan.

The need for SPDs will depend on many differing factors. These include the level of exposure of a building to lightning-induced voltage transients, the sensitivity and value of the equipment, the type of equipment used within the installation, and whether there is equipment within the installation that could generate voltage transients.

While the shift in responsibility of risk assessment falling on the contractor is likely to be a surprise to many, by accessing the correct support they can seamlessly integrate this function into their traditional work approach and ensure adherence to the new regulations. ER

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Apprentice-led or retraining?

Elinore Mackay, editor of Electrical Review, spoke to Colin Sanders of Millbrook First about training in the lightning protection sector, be it apprentice-led or retraining

Colin, what are the main challenges faced by the lightning protection sector at present?
One of the main problems is the imminent closer of the only place that offers training for lightning protection apprentices, the college at NCC East (National Construction College) Bircham Newton, there is no clear indication from CITB regarding the training provision of lightning protection apprentices after 2020, if fact right now CITB have not officially confirmed that the 2019 intake will actually happen, reasoning is that the associated funding has not been confirmed and that it is a two year course and should the college shut in 2020, where would the second year of this 2019 intake take place. This will effect the apprentices only, but there is another option available via the adult route as detailed below.

In terms of training, is it mainly apprentices or adult learners looking to keep their knowledge up to date?
In the past the main training is via the NVQ apprentice route at the college this provides a comprehensive programme allowing the applicant to tick all the boxes in the NVQ qualification, the only other way is for an adult learner to gain the necessary knowledge & experience whilst in the employ of a lightning protection company, and get the specialist lightning protection training required in-house using the skillset available through existing employees of a lighting protection company.

How big a part does test and inspection play in lightning protection systems?
It is a huge part of the overall lighting protection industry as systems are a vital part of a structure providing critical protection to the structure and persons within, and potentially more important these days the electronic data and communications hardware/software systems located and used within the structure.

> **“Millbrook First is really the only single source private training provider”**

You need it when completing an installation as it plays a major part of the commissioning for the protection system allowing the documentation required to be competed in full and with the relevant information to be inserted into the O&M manual, but also it is vitally important as the lighting protection standards require testing & inspections to be carried out in a given period to ensure the protection system still complies with the relevant standard and matches the protection required for the use of the structure.

It was determined so important that in the past 10 years a ‘stand alone’ qualification was required, and an NVQ developed and introduced for the testing & inspection of lightning protection, the official title being;

- CSkills Awards Level 3 (Referenced as NCON 600/6844/9 – Previously referenced as QUF 855)
- NVQ Diploma in Accessing Operations and Rigging (Construction) Lightning Protective Systems Inspection and Testing
- CSCS Gold Skills Card

How many colleges across the UK offer this type of training would you say? Or does the job mainly fall to private training companies?
As mentioned above there is only the one for apprentices, NCC East at Bircham Newton and baring a major turn around from CITB, I feel that they have backed themselves in to a corner where this is just not going to be financially viable to keep the college open for just the likes of lightning protection apprentices.

There are a few private training providers for lightning protection, but these mainly concentrate on the office-based risk assessment/design side of lighting protection.

Millbrook First is really the only single source private training provider of lightning protection for the test/inspect & installation engineers.

Presumably working at heights plays a large part of any LPS training?
Yes, it does!

The very basic requirements for the NVQ's is the safe use of ladders, roof crawlers and fall protection equipment which is covered at the college or via an accredited ATLAS (Association of Technical Lightning & Access Specialists – Previously the Industry Federation) training provider.

Any specialist W@H training such as PASMA (Tower Scaffolds), IPAF (Mobile Operating Platforms/Gene Booms/Scissor Lifts), IRATA/ Industrial Rope Access, Etc! are currently offered by the college to apprentices only, and this will be questioned in the future as they only really need to be taught the basics for the NVQ qualification as detailed above.

All of the above mentioned specialist W@H courses are openly available to anyone requiring them by numerous private training providers.

Could you tell me a little more about the varying qualifications relevant to the sector and how long they could possibly take to complete? Could you expand on the limitations faced by those wishing to learn, has it traditionally been existing LPS company employees who request such training?
There are only three NVQ qualifications available in the lightning protection industry;

- **NVQ Level 2 –** Lightning Conductor Engineer (Installer) – CSCS Blue Skills Card, there are three ways this is available;
  - 2 Year Apprenticeship as detailed below.
  - OSAT (On-Site Assessment Training) route, up to 2 years.
  - EWPA (Experienced Worker Practical Assessment) route, for engineers that have been in the industry, have the skillset and knowledge, for whatever reason do not have an official qualification, this can be done over a very short 2 to 3 Day period.
- **NVQ Level 3 –** Lightning Conductor Engineer (Advanced/Senior Installer) – CSCS Gold Skills Card
  - OSAT (On-Site Assessment Training) route, up to 2 years.
- **NVQ Level 3 –** Lightning Protection Tests & Inspection Engineer – CSCS Gold Skills Card
  - OSAT (On-Site Assessment Training) route, up to 2 years.

The two 'Installation' qualifications have been available for many years and as detailed above, the newer 'Test & Inspection' qualification has only been introduced in the past few years;

The NVQ Apprenticeship at CITB's NCC East (National Construction College) Bircham Newton, this is spread over a two year period where the applicants have to attend the college on a residential basis, consisting of 2 x 4 week blocks & a 3 week block in the first year, followed by 3 x 3 week blocks in the second year (20 weeks in total), this is a residential course where funding is available as long as the employing company is paying the CITB Levy, and also that the employing company is a lightning protection company, as the apprentices will need supervision and guidance whilst back with the parent company.

Over the past few years adult applicants/ learners would need to be employed by a lightning protection company that can provide them with the necessary support, supervision and training over a period of time, register them via an OSAT (On-Site Assessment Training) route or EWPA (Experienced Worker Practical Assessment) route, but this could only happen if the applicant/learner was employed by said lightning protection company that could offer the support, training & supervision.

However, the NVQ Level 3 qualification for the testing & inspection of lightning protection is a new qualification introduced just over 5 years ago and the only way until now would be via the OSAT route and being employed by a lightning protection company.

Now they are all available via a private provider (Millbrook First) who in addition to the training/assessments can provide a

technical support back up following the training to allow the applicants to carry out their work/tasks whilst gathering the experience & knowledge over a period to move towards the NVQ qualifications.

In the past when electrical companies have asked where they can get training so they can get their electrical engineers to carry out the testing & inspection of lightning protection, have basically been told there is none unless they wanted to go through the apprenticeship route, the main reasoning behind this is that an electrician has no problems regarding the understanding of the testing side, the carrying out of earth resistance tests, the calculations relating to the working out of overall earth resistances, or doing continuity tests on lightning protection systems, experience has shown that it is the inspection side where they struggle and the gaining of the experience & knowledge following their training of the structural make up of lightning protection systems to the relevant standards, which is normally provided by the parent company.

This has been identified as a major problem in the past but in the past 12 months Millbrook First has developed a training plan/course for the testing & inspection of lightning protection which mirrors exactly that which is required for the NVQ qualifications, providing the initial training, a starting place for electrical engineers and dependant on the client/ customers' requirements whom have placed applicants on the course with the back-up/ technical support structure so that they have access to someone who provide all aspects of the knowledge required to test & inspect a lightning protection system i.e. exactly what a lightning protection company provides their employees on their way to achieving an lightning protection qualification. ER

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THE POWER BEHIND YOUR BUSINESS

NICEIC ELECSA JTL TRAINING PEOPLE

Substation automation systems fully under control – Immerse yourself in your SAS

By Thomas Schossig, Product Manager Business Development Power Utility Communication at OMICRON electronics

During the commissioning of Substation Automation Systems (SAS) with Protection, Automation and Control (PAC), traditionally the focus of testing is on the protection system and its settings. Protection testing uses established methods, such as parameter testing per IED, or new approaches like system-based testing. Standardization and proper testing tools dramatically increase the efficiency and reliability of protection testing.

When looking at the time spent during commissioning, testing the automation and communication system nowadays consumes even more time than testing the protection. Automation systems have become increasingly complex and the efforts for testing communication and the proper operation of all signals transmitted to Supervisory Control and Data Acquisition (SCADA) systems have grown dramatically.

A new and innovative approach, implemented in StationScout, offers a way out of this dilemma in all phases of the life cycle of modern SAS. By utilizing the capabilities of the IEC 61850 engineering process and the data available in Substation Configuration Description (SCD) files, it is possible to introduce new and more efficient methods for Factory Acceptance Testing (FAT) and Site Acceptance Testing (SAT). The approach identifies potential signals to be tested in the SCD file. Communication links and the IEC 61850 services employed are recognized, documented and can be used for generating test plans. These test templates can be created during the specification phase, adapted for FAT and subsequently reused during SAT.

This unique testing solution consists of software and hardware. While the software offers a toolbox for the different tasks, the use of a dedicated test set (MBX1) instead of just another PC software opens up a number of advantages to the test engineer:

- Guaranteed cyber security and safe connection to the substation network
- Real time capabilities to calculate Sampled Values and GOOSE
- Making it possible to deliver multi-IP simulation
- Connection to several networks
- Update possibility for security patches
- Licensing

Cyber security is very important when connecting a universal software based test system, such as a laptop, directly to a SAS. That's why OMICRON has implemented a firewall system to the MBX1 that separates the testing system from the critical environment.

SYSTEM UNDER TEST

The entire SAS is visualized using all the information available in the SCD file. This also covers the information in the substation section (voltage level, bay, etc.). The current standard defines possibilities to model the elements of single line diagrams while the standard presently under development, IEC 61850-6-2, will extend this feature. Current SCD files do not, in most cases, contain this information. Therefore, the proposal is to work with "zero line" to visualize the assets. Zero line means grouping by voltage level and arranging the bays and corresponding assets. The navigation in huge SAS can then be done as it is in map systems. Clicking "Go-live" visualizes the existing status.

TRACING SIGNALS

Within a SAS, the messages are transferred from their source to all receivers. If any error occurs during this communication, the commissioning engineers need to follow the signal on its way through the SAS. Finding such errors was very time consuming in copper wired networks, with IEC 61850 this becomes almost impossible to do manually. StationScout visualizes all links and allows engineers to view how signals propagate through the SAS. To reduce complexity, filters focus the display on the relevant elements. This includes tracing signals communicated as GOOSE as well as Reports and makes troubleshooting communication problems straightforward.

SIMPLE NAMING

Because IEC61850 naming could be very confusing, StationScout recognizes the names of the respective elements in their data model, detects their purpose and visualizes them accordingly. These names could be adapted, for instance, into the local language.

SIMULATION

One of its essential functionalities is to simulate a SAS at any stage, for example to test the communication during the installation phase when some IEDs are not yet implemented

OUTLOOK

In the future, the new StationScout will enable test engineers to execute logic testing and easy testing after firmware upgrades. All of these processes can be added to test plans that will automate and accelerate the test procedures.

Alexander Apostolov
IEC 61850 Expert

What's going on in my Substation Automation System?

As an expert in the world of IEC 61850, I know how important testing the SAS is. **StationScout** provides a really simple and clear overview of the communication within automation and control. Both the behavior of IEDs and all signals transmitted are visualized transparently. The dedicated powerful test set establishes a cyber-safe connection to the station network. StationScout is the ideal tool during the entire lifecycle of IEC 61850 systems.

www.omicronenergy.com/StationScout

OMICRON

Finding and fixing cable faults

Within any company, a defective electrical cable has the power to cause significant disruption. Heightened safety risks and interruptions to business operations mean that detecting and resolving these problems is crucial – especially when high voltages are involved. Dan Wagner, operations manager at Smith Brothers, explores the methods, apparatus and expertise involved in specialist cable fault testing

As with many technical issues, it always seems to be the case that cable faults occur at the most inconvenient of times – when an interruption to the power supply is not just an annoyance, but can also have significant financial implications. For instance, an outage in the middle of a production line can create havoc for a manufacturer, whilst downtime for even a few hours can be very costly for a busy office. And of course, with any electrical infrastructure, safety is of paramount concern.

But for cable faults that occur below the ground, accurately locating the defect and carrying out the necessary repairs can be difficult – not to mention disruptive where power supply is concerned. Technical expertise and specialist equipment are therefore essential, to ensure the issue can be found and dealt with efficiently.

UNDERLYING ISSUES

A cable fault might occur due to a number of underlying problems – including water ingress, mechanical damage, poor materials, subpar jointing practice, partial discharge or age-related deterioration – many of which often aren't immediately apparent. Such issues can impact all types of electrical cable, no matter the age or voltage. And it's only once the power supply starts being affected that it becomes clear there's an underlying problem.

Arising from these complications, the most common are short circuit faults – which can be phase-to-phase or phase-to-earth – and open circuit faults, where a break in the cable occurs. A combination of the two can also take place and in many instances, the defect starts as a minor point of damage to the cable or joint. This is then exacerbated by a gradual ingress of water, causing a breakdown in insulation resistance to the point where flashover occurs – triggering the protective device and cutting off the mains supply.

In some instances, such faults clear once the protection has kicked in and are therefore known as transient faults. Although these may sound like more temporary glitches, they can be extremely disruptive. In fact, detecting such intermittent problems tends to be more difficult than identifying a perpetual issue, resulting in an increased chance of the defect recurring in the future – often leading to a permanent fault.

Where the outer casing of the cable has broken, this is classified as a sheath fault. As with open and short circuit faults, this can lead to a far greater issue if water ingress occurs. However, if detected early enough, such external damage can be repaired, preventing possible cable failure in the future.

FINDING AND FIXING FAULTS

Whilst the causes and catalysts behind cable faults are well-known, finding and repairing

them is a complex process that requires advanced equipment and technical expertise. Where there is suspected circuit damage, it's therefore vital to enlist an electrical cabling specialist to locate the fault, fix the problem and restore the power supply.

Following a call-out, engineers will review any protection that has been activated and conduct an insulation resistance test. Depending on the results of this initial assessment, they may attempt to re-energise the system entirely or in part, to re-establish mains supply where possible. They will then walk the length of the circuit route, inspecting the visible cabling, joints and terminations for signs of failure and additionally looking out for potential sites of cable damage – including new structures or recent excavations, for example.

The next stage is to run preliminary tests to determine the characteristics of the fault. The observations from these are then used ▶

VENTILUX

THE EMERGENCY LIGHTING SPECIALISTS

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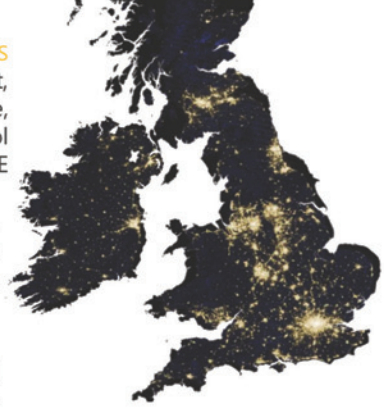
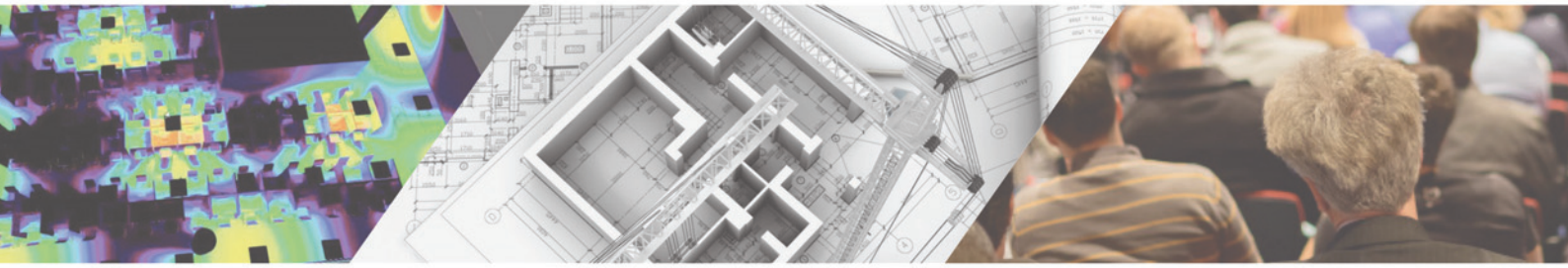


Ventilux designs, manufactures and offers an extensive range of safety system products and services, including Emergency Lighting, Central Battery Systems, Emergency Lighting Commissioning, Service and Maintenance. Ventilux was founded in 1986, and has since grown steadily to become one of the largest Independent Emergency Lighting Manufacturers in Europe & the Middle East.

Ventilux operate, and are certified to, ISO: 9001:2015.Modern manufacturing technology combined with stringent quality control ensures that Ventilux products provide the customer with top quality and excellent value for money.

LUX LIGHTING DESIGN, QUOTATION SERVICE & BIM FILE PROJECT SUPPORT



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DIALux

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Lighting Design & Quotation Service Overview

VENTILUX prides itself on its flexible Engineering Design Department. This department consists of technical expert engineers all highly trained graduates dedicated to developing cost effective Emergency Lighting designs. Our design experts plan, budget and design for client specific requirements. Our design team utilise's a state-of-the-art lighting design software package called DIALux to ensure quality and compliance in our Emergency Lighting designs. Ventilux also has the ability to Project Manage small, medium and large projects from design phase, to commissioning and handover. We have specialist engineers to provide technical assistance at all times to ensure complete peace of mind.

BIM Support Service Overview

Ventilux are proud to now offer Building Information Modeling (BIM) files for majority of their Emergency Lighting range. Ventilux prides itself on its in house design department. This department consists of industry technical expert engineers, all highly trained graduates dedicated to developing cost effective Emergency Lighting Solutions. These files are available for download for specific product pages, for more information please visit **www.ventilux.com/services/bim-file-support** to view our BIM file demonstration video.

CERTIFIED PROFESSIONAL DEVELOPMENT PRESENTATIONS

Subject
British Standards BS5266-1 :2016.
Topics

- **Scope of the standards**
- **Specific Lux Levels Requirements**
- **Practical Solutions**

CPD MEMBER
The CPD Certification Service

CPD CERTIFIED
The CPD Certification Service

Seminar Overview

The British Standard provides the emergency lighting designer with laid down guide lines which form the general basis for the designer to work to. British Standard BS 5266: Part 1: 2016. This seminar will provide; An overview of the BS5266: Part 1: 2016 Standard, identifying particular locations and the recommended Lux levels and response times for those locations.

The requirement for testing of the emergency lighting, financial implications, reduction of risk and the feasibility of the use of automatic testing of the emergency lighting system. Practical Solutions will also be discussed on how these specific requirements can be achieved.

to inform which specialist equipment needs to be employed to locate it. Firstly, the general site of the fault is pre-located, then a more exact position pinpointed within this identified area, before excavations are conducted and further visual inspections carried out.

Portable TDRs (Time Domain Reflecto-meters) are usually employed at this stage for both open and short circuit faults. Combining advanced high voltage surge wave and arc reflection technology, this apparatus has a receiver that utilises acoustic and electromagnetic pinpointing, enabling the fault to be located within inches. Using such equipment, circuit lengths of up to three miles can be tested, making it invaluable for large-scale connections and infrastructure.

Although less technologically advanced, High Resistance Fault Locators are also widely used in the pre-location phase, for particularly difficult-to-find high resistance defects. Incorporating bridge technology – a tried-and-tested method that has been used for many years – this apparatus remains pertinent in the identification process for high resistance faults.

After the fault position has been identified, the necessary repairs to the cabling, joints and terminations are then carried out by the engineers. Once rectified, insulation resistance testing and continuity assessments can be conducted, to confirm all issues are resolved before the circuit is re-energised. VLF (very low frequency) testing is also often performed at this stage, to ensure any further cabling problems have been identified prior to the supply being restored.

SPEED AND SAFETY

Cable fault call-outs are often urgent, so a swift response is essential to minimise disruption – especially in industrial or manufacturing settings. After safety, the next priority is to get systems back up and running, so seeking assistance from specialist engineers with experience in the latest and fastest fault finding techniques is vital.

No one can predict when a cable fault will occur and by the time symptoms appear, the underlying issue will inevitably have worsened over time. But whilst reactive response is essential in such instances, there are preventive measures that can be taken to deter the need for emergency assistance.

To reduce the requirement for critical fault finding and repairs, enlisting a contractor to conduct routine tests and carry out the necessary upkeep on cabling circuits is a good idea. Not only does proactive preventive maintenance mean that minor issues are spotted before they turn into larger problems, it can also be a cost-saving option for businesses in the long run – minimising possible downtime and removing the need for urgent call-outs, tests and repairs.

5 ESSENTIAL FAULT FINDING STEPS

1. ISOLATE AND IDENTIFY

Where there are multiple cables, determining the defective one immediately is crucial to protecting workers and decreasing disruption. In most cases, the cable fault will be permanent, meaning protection devices at either – or both – ends of the cable will have been triggered. Safety is of paramount importance, so once the faulty cable has been detected, ensuring it is isolated and earthed is the main priority.

2. DIAGNOSE

Once the correct cable has been identified, tracing the circuit route and working out the phase where the fault has occurred – and whether this is of high or low resistance – is the next step. This test will determine what technique and equipment is needed to diagnose and locate the fault. If below 100 Ohms, a low voltage pulse from a TDR (time domain reflectometer) can usually be employed, whilst faults above 100 Ohms require bridge technology or shock discharge from an impulse generator.

3. PRE-LOCATE

Efficiency is key to the pre-location phase, as this enables the fault position to be determined to a small percentage of the overall cable length and significantly reduces pinpointing time. For low resistance faults, pre-location might be all that's needed to find the precise position of the defect, whilst high resistance ones require additional testing methods such as arc reflection.

4. PINPOINT

Pre-location allows engineers to find the fault position with a 5% margin of error, but greater accuracy is essential for the safe and swift rectification of cable defects. Following this initial locating phase with acoustic methods – alongside a shock discharge generator – therefore enables the fault site to be identified within a 0.1% distance.

5. REPAIR AND RE-ENERGISE

Once the exact fault location has been pinpointed, excavation can take place, to enable the necessary repairs and safety testing to be conducted. After the fault has been fixed and signed off by the contractor, the cable can then be re-energised and the power supply reinstated.

“It takes 20 years to build a reputation and 5 minutes to ruin it. If you think about that, you'll do things differently.”

Warren Buffett

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Quality Assurance & Cable Testing: Have you done your due diligence?

QA testing is part of any company's quality management processes but to what degree should you expect a company to check its goods? If you're buying from a supplier will they rely on the manufacturer's testing and does that influence or mitigate their responsibility to you? QA protocols – in whatever their form – are a key indicator of the quality and compliance of a cable, and rigorous testing as part of this process can provide the due diligence you might need to use them in your project.

The gold standard for test facilities in the UK is to hold UKAS accreditation to ISO 17025. The United Kingdom Accreditation Service certifies the standard of testing, confirms impartiality and accuracy of results produced, and dictates the methodology employed to achieve this. A UKAS accredited laboratory is recognised as a centre of technical excellence for testing.

Quality Assurance testing in a UK-based UKAS laboratory doesn't replace cable accreditation bodies such as BASEC or LPCB. These bodies will test regularly through the year and give certification to all the cables of that type coming from the manufacturer. What QA testing can and does do is to verify that the delivery of cables received by the supplier has not been subject to anomalous conditions during manufacturing not caught in the in-house QA, that they have been stored and transported to remain in optimal condition, and determine that the cable in hand can directly be seen to meet performance requirements as set out in the standards. It provides that valuable extra layer of security and confidence that you're getting what you expect. Essentially, another pair of expert eyes working on your behalf.

Of course, QA testing can't test every individual cable – for a more granular assessment there's testing under the BSI Cable Testing Verification Kitemark (as held by Eland Cables) or even the option to commission comprehensive third-party test reports. However, when there are strict QA processes for testing in place, and these high levels of quality and compliance awareness are communicated throughout the business, it helps protect the customer from most issues that could impact a project.

So what should you look for from your cable supplier? The UKAS accreditation is obviously a big pointer – The Cable Lab® is Eland Cables' ISO 17025 test facility. Look also for strong and readily-available technical support from industry experts – you need experiences and trusted hands to give you the confidence in compliance. Bear in mind, it's no small investment to provide this but what it means is you can demonstrate that you've consciously considered your own company's reputation and responsibilities when choosing your preferred cable supplier. After all, responsibility lies throughout the supply chain, and if you can achieve peace of mind through someone else's effective QA testing then surely it's an easy choice to make?

Eland Cables' ISO 17025 UKAS laboratory conducts QA testing on its own products, BSI Kitemark cable testing, and assessments on cables from third-party sources.

Tests include but are not limited to the following: Cable Construction and Dimensional testing, Vertical Flame testing, Conductor Resistance testing, Cable Insulation Tensile & Elongation measurement, Heat Shock testing, Hot Set testing for Cross-Linked Materials, RoHS Testing, Pressure testing at High Temperatures, Cold Bend testing, Tensile testing after Ageing

For more information: www.elandcables.com/the-cable-lab or contact our technical team on 020 7241 8500

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When you need certainty The Cable Lab® can help. Providing rigorous QA tests on Eland Cables' portfolio, BSI Kitemark™ testing, and third-party testing for when results matter.

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Simplifying standby power

Mikael Greis, product manager for Saft, explained to Elinore Mackay how Saft has upgraded its well-established nickel backup battery technology to offer more straightforward charging that enables them to provide a direct replacement for lead-acid batteries

The main priorities for industrial backup batteries is that they should deliver value for money as well as proven ability to provide reliable power at a moment's notice.

They need to deliver the right combination of power and energy for applications such as safe plant shut down, powering control equipment or switchgear operation. Furthermore, they may need to ensure continuity of mission-critical loads or data services by bridging the period until standby generators come online. Other possible applications are to support emergency loads such as lighting, security systems or fire alarms.

The list of possible applications is long – but what they have in common is that they all demand batteries that are reliable. Other challenges that they also share are a combination of limited access, remote location, tightly controlled regulations around safety procedures and reliance on certified and qualified technicians.

There is a constant pressure on battery manufacturers to deliver batteries capable of ensuring process continuity and service uptime while also offering a cost-effective solution. Therefore, Saft's research team has focused on introducing some major upgrades to the design of our well-established Uptimax nickel pocket plate batteries.

Batteries of this type are proven technology, with an established fleet in industrial sites such as upstream oil and gas installations, unmanned substations and in highly-automated manufacturing facilities.

ADOPTING SIMPLIFIED CHARGING PROCEDURES

Many industrial customers still rely on lead-acid batteries to power their backup applications. The reason is that, while they appreciate the performance, reliability and long-life advantages of nickel pocket plate batteries, there is a perception that they may require more complex and costly charging arrangements.

However, there has been a continuous evolution in the design of pocket plate nickel batteries. This enables the new generation, such as Saft's Uptimax, to offer improved chargeability alongside their high level of reliability. This improved chargeability now enables the batteries to be charged with a more straightforward charging system.

When a battery is being charged, its voltage will rise as its State of Charge (SOC) rises. For conventional nickel batteries the voltage window for charging is relatively wide. In general, this means that they have to be charged by chargers capable of delivering a boost charge to bring the battery up to capacity and then followed by a nominal 'float' charging voltage to maintain the charge.

Therefore, to be able to deliver the two charging levels for nickel batteries, additional dropping diodes must be built into the charger units. The charger provides the boost charge and when it detects the voltage rise it then switches over to deliver the float charge.

This arrangement differs from other battery technologies, such as lead-acid and lithium-ion (Li-ion), which are able to be charged at constant current and constant voltage.

Many operators have existing legacy installations with lead-acid batteries – and crucially, these are fitted with battery chargers that are not equipped to deliver the combination of boost charge/float charge. Therefore, they have held back from upgrading to nickel technology batteries and benefiting from their low Total Cost of Ownership (TCO).

UPDATING THE ELECTROCHEMISTRY

Recognising this challenge, Saft's research and development team in Bordeaux, France, and product development team in Oskarshamn, Sweden worked on an important upgrade to our Uptimax pocket plate nickel batteries.

Small but significant changes to the active electrochemical materials have enhanced the chargeability of the batteries. While the voltage still increases during the charging process, the updated technology has a much

narrower voltage window of 1.39 V/cell. This innovation has eliminated the need for boost charging. An added advantage is that if a fast recharge is needed then 95 percent SOC can be reached in just 8 hours at 1.45 V/cell, ensuring minimum downtime and optimal availability.

Most importantly, the new Uptimax batteries have removed the obstacle to using nickel backup batteries in existing backup installations. The updated batteries are compatible with all commonly used Direct Current (DC) charging systems. Therefore, for the first time, nickel batteries can now be installed as a direct replacement for lead-acid installations, as well as in new-build projects and to replace existing time-served nickel battery systems.

CONTROLLING TOTAL COST OF OWNERSHIP (TCO)

Nickel technology batteries have the advantage of low TCO thanks to a combination of a long and predictable service life, low maintenance requirements and a wide operating temperature range – particularly when compared to traditional lead-acid batteries. While lead-acid batteries are well known and used widely, they require regular maintenance and capacity testing.

In addition, lead-acid electrochemistry can experience something called sudden death syndrome. This describes the immediate and irreversible failure of a battery that can happen when the internal lead structure of the battery loses its mechanical stability after repeated electrochemical reactions have affected its strength.

As it is based on a completely separate type of chemistry, sudden death does not affect nickel technology batteries. While their performance does decline over time, it remains predictable – and this helps operators manage assets and optimise maintenance schedules.

Another benefit to nickel technology is its longevity. In fact, our customers regularly tell us that their backup batteries are still performing well after more than 20 years. Long life is particularly helpful to operators of remote and isolated sites, where transport and logistics can make battery replacement challenging, time consuming and costly.

Low maintenance requirements and relatively light weight are two more areas where nickel compares favourably with lead-acid technology. Batteries such as the Uptimax don't need to be topped up with electrolyte during their life. This helps to keep the number of service visits to a minimum and avoids the need to schedule technician attention just to serve the batteries. In addition, their light weight means that they don't need the same level of support for lifting and handling.

OPERATING TEMPERATURE RANGE

Another factor that affects reliability and TCO is the operating temperature. All types of electrochemistry experience a drop-off in performance at extremes of heat and cold as temperature affects the reactivity of active materials.

However, nickel battery technology is less susceptible to both heat and cold than lead-acid. For example, at 30 ˚C lead-acid batteries will provide only five years of service, whereas nickel batteries will last 16 years. This significant advantage can help to control costs and ensure reliable uptime.

At low temperatures, the power output of all batteries falls away. Engineers overcome this issue by oversizing battery installations to ensure that they can deliver the right combination of power and energy in all conditions. Nickel batteries perform better in cold conditions than lead-acid and this limits the need to oversize the system, saving space and reducing the overall size of the enclosure.

Having a wider operating temperature range reduces or eliminates the need for HVAC (heating, ventilation and air conditioning) – and this saves on the capital cost of purchasing and installing equipment, as well as the lifetime costs for operation and maintenance.

STRAIGHTFORWARD CHARGING

With nickel battery technology offering the advantages of low maintenance, long service life and high reliability, it's no wonder that operators are keen to use it as a direct replacement for conventional lead-acid batteries.

The enhanced chargeability and narrow voltage window means that there is no longer a need for switching between different voltage levels. As a result, dropping diodes can be eliminated from the battery charger.

The simplified arrangement means that the battery is able to support the loads without the need to rely on additional electronic components. Therefore, reducing the number of components makes the backup system inherently more reliable as well as being less costly.

NARROW VOLTAGE WINDOW IN THE SAME MECHANICAL PACKAGE

Having introduced the updated version of Uptimax with a narrow voltage window, we have shifted production over fully in September to the narrow-voltage model.

The shift has been welcomed by customers, who have been quick to see the potential benefits that enable real-world savings from enhanced reliability and lower maintenance costs.

An advantage to existing customers is that the mechanical design of the batteries remains the same as the previous version. As a result, the new batteries can be installed as a direct replacement for either lead-acid or for previous generations of the same batteries. In addition, being mechanically identical, spare parts are the same, ensuring compatibility and availability in coming years.

Having upgraded the technology to eliminate dual-voltage charging, our researchers have now changed focus to future improvements. For example, they are now looking at ways to reduce the operational costs to customers while preserving high reliability. ER

EUROPE'S BIGGEST ANNUAL LIGHTING EVENT

The lighting industry, already convulsed by the tiny LED, is being assaulted by a new generation of companies who don't play by the rules

Uber owns no vehicles; AirBnB no rooms; Facebook no content but they've all managed to disrupt their respective industries, sending established players into a tailspin.

Likewise, the lighting industry, already convulsed by the tiny LED, is being assaulted by a new generation of companies who don't play by the rules.

These upstart start-ups are on a mission to take customers off traditional brands with unique business models, compelling service offers and inventive technologies.

They are the disruptors of our age and in recent years, they've made the lighting industry their playground.

This year's LuxLive 2018 is when many will truly announce their arrival and lay out their challenges to the big boys.

LUXLIVE 2018 EXHIBITION

The LuxLive 2018 exhibition takes place on Wednesday 14 November and Thursday 15 November 2018 at ExCeL London.

The show includes no fewer than eight conference tracks.

See the full programme and exhibitor list, and register for free, HERE.

LUXLIVE: 10 DISRUPTORS TO MEET

WeWork – taking the office rental market by storm

pureLifi – allowing access to the internet via lights

Gooee – providing a IoT lighting toolbox

Coelux – causing a sensation with 'natural' light

Bluetooth – changing control with mesh platform

EnOcean – making wireless, power-free switches

Igor – enabling the use of Cat cables for LEDs

Lightly – providing an alternative to OLED

LuxBox – shaking up emergency lighting

Silvair – writing the software for Bluetooth mesh

Igor, for instance, is changing the way we wire up LED lighting. The US tech firm will use the show to unveil its easy-to-use power-over-Ethernet kit, which allows you to use Cat cables instead of the conventional twin-and-earth to energise and control your LED lights.

Bluetooth, meanwhile, is set to shake up the lighting control sector with its new mesh standard, which is aiming to kill the customary box-in-the-cupboard approach.

Alongside them is Silvair, who will be discussing its special firmware, which lighting manufacturers can use to integrate Bluetooth mesh into their luminaires.

PureLifi, by contrast, says its tech will allow us to use visible light from LED luminaires to access the internet. The so-called 'Godfather of Li-Fi', Harald Haas, will explore the innovation in the Property Technology Live conference at the show.

Gooee, who pioneered internet-connected lighting by providing a high tech tool box which can turn fixtures into smart sensors, will be on hand to explain their vision of the future.

WeWork, disruptor of the office rental market with youth-orientated workspaces with funky interiors and funkier lighting, will reveal its distinct approach in two presentations by its head of lighting, Star Davis.

Coelux, inventors of the artificial skylight which caused a sensation in the industry with its uncannily natural-looking light, will unveil the LS Matte, a commercial version designed for applications in offices, hospitals, retail and hospitality.

EnOcean will display its extraordinary alternative to the light switch - a wireless, Bluetooth-connected unit which requires no battery.

Lightly will be exhibiting its unique alternative to flat-panel LEDs and OLEDs: the 3.2mm thick Hikari SQ.

Meanwhile, the emergency lighting sector is being targeted for disruption by LuxBox with its Swiss-made components, full integration and five-year warranty.

Philips OEM will host a special 'speakers' corner' to explore the latest technologies that can make luminaires smarter.

The company – a gold sponsor of the event – will host a range of presentations and discussions in the zone, which is located in the Property Technology Live arena.

David Vanbeselaere, global product manager for LED modules, will contribute a talk on how to create a human-centric environment, while Simon den Uijl, global indoor positioning partnership manager, will talk about applications for indoor positioning and how partnerships can help facilitate this.

The man credited with pioneering the ground-breaking technology of Li-Fi will explore its future in offices and public spaces in a special presentation at the exhibition.

Professor Harald Haas, dubbed the so-called 'godfather of Li-Fi' will explain how the transmission of data by visible light from LED lighting can turn lights into Internet access points and free up congested bandwidth.

Haas, the chief commercial officer of pioneering Scottish start-up, pureLiFi, will outline an exciting future in which lighting and digital services can merge to create responsive workplaces.

Other top names speaking in the Property Technology Live 2018 arena at LuxLive include CBRE, British Land, JLL and WeWork.

Are your generation projects ready for ENA G99?

If you work in power generation in the UK, whether that is thermal, solar, wind, hydro or any of the other technologies, you are probably aware there is a new standard coming into force called ENA G99. This new standard will radically alter the design and planning process for all new generation projects and make life much more challenging for schemes larger than 1MW, it also provides specific rules on energy storage systems and other emerging technology

The new standard will apply to the UK distribution network from 27 April 2019 and replaces the well-known G59 standard, bringing it into line with many requirements of the grid code. As with the previous standards, G99 is applicable to generators with a rating above 16A/phase, and its companion standard G98 applies to generators with a rating below 16A/phase and replaces G83.

So, the big question is 'Who will be affected? The companies likely to see the biggest changes are developers of medium sized generating facilities rated at more than 10MW, as these will involve a more complexity in the design process. Developers of sites rated between 1MW and 10MW will see some changes and some new design issues, but there should be no fundamental shifts. Developers of smaller sites rated under 1MW should see minimal disruption. Generators that operate in parallel with the grid and export power. Peak shaving plants, standby generating plants and equipment designed only for short term parallel operation will also see very few changes.

An obvious question, is what is driving the change of the new standard? The simple answer is that the amount of embedded generation connected at 11kV, 33kV and 132kV has far exceeded expectations, and many of the larger traditional thermal generation plants are mothballed or nearing the end of their life. This has shifted how electricity is generated and distributed within the UK and the Distributed Network Operators (DNOs) need to actively manage their network in a way they haven't needed to before, and they are transitioning from to become Distributed System Operators (DSOs).

> **"The big question is - Who will be affected?"**

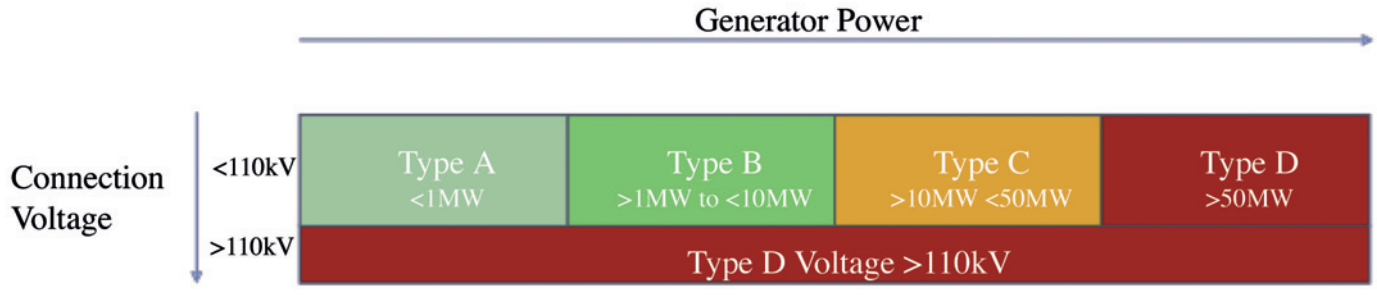
The first major change is that projects are now grouped into different types depending on their rated capacity (MW) and their connection voltage. Each type has additional rules applied to it, with the requirements become more stringent at each level. The new types are summarised here:

- Type A – Generators <1MW and connected at less than 110kV
- Type B – Generators >1MW and <10MW and connected at less than 110kV
- Type C – Generators >10MW and <50MW and connected at less than 110kV
- Type D – Generators >50MW or connected at a voltage greater than 110kV

In practical terms Type C and Type D are treated in a similar manner for design purposes, although Type D has some slightly more complex requirements for system analysis purposes. To further complicate matters, there are another set of thresholds, where if the overall Power Generating Facility, exceeds certain power thresholds based on its location (N. Scotland, S. Scotland or England & Wales), and in these cases the National Grid Code will also apply.

TYPE A GENERATORS (GENERATORS <1MW)

Type A generation systems will be very similar in design and application to the general requirements defined in the old G59 standard, although some of these requirements have now been formalised ▶



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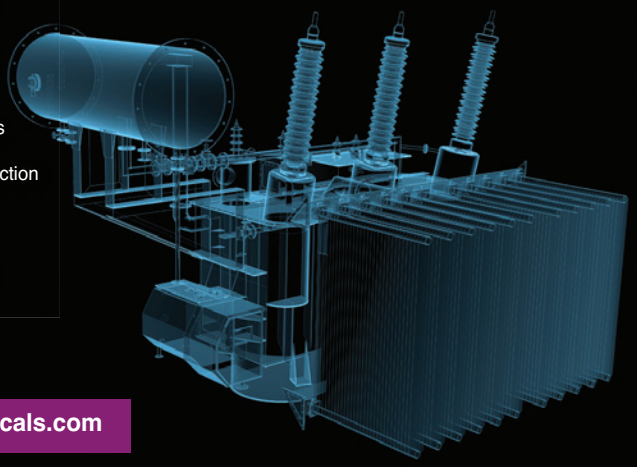

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in slightly more detail. The following list details some of the main requirements.

- Receive a remote signal from the DNO to stop generation.
- Operate for specified times, following a network frequency deviation.
- Constant power output down to 49.5Hz, after this point a linear drop off can occur of 5% to 47Hz.
- An ability to reduce their power output in response to a rising frequency.
- Ability to provide constant power for a DNO network voltage deviation of ±10%
- Operation between 0.95 lag and 0.95 lead power factor.

“Interested in understanding how this translates...”

TYPE B GENERATORS (GENERATORS >1MW AND <10MW)

Type B generation systems will be broadly similar in design and application to the general requirements defined in G59, however there will a number of further design studies to be carried out. The big changes are that the manufacturers design and specification will need to improve, additional power system studies will be required to demonstrate compliance and there will SCADA interfaces to the DNO.

- Receive a remote signal from the DNO that that can reduce their power from 100% to 0%
- Operate for specified times, following a network frequency deviation
- Constant power output down to 49.5Hz, after this point a linear drop off can occur of 5% to 47Hz
- An ability to reduce their power output in response to a rising frequency
- Generators must remain connected and stable for two specific fault scenarios on the DNO network
- Ability to provide constant power for a DNO network voltage deviation of ±10% and synchronous generators must have a flexible excitation system
- Operation between 0.95 lag and 0.95 lead PF at registered capacity and operate for a wider range below full capacity
- Need for local SCADA / Telecontrol equipment to monitor performance

TYPE C AND D GENERATORS (GENERATORS >10MW OR CONNECTED AT >110KV)

Type C & D generation systems will see a large change and face many design challenges. This will result in more power system studies being required to demonstrate compliance, complex controllers and interfaces to the DNO and an increased need for reactive power compensation equipment.

- Receive full active control of power output by the DNO
- Operate for specified times, following a network frequency deviation
- Constant power output down to 49.5Hz, after this point a linear drop off can occur of 5% to 47Hz
- An ability to reduce their power output in response to a rising frequency
- An ability to increase their power output in response to a falling frequency
- Generators will require a full frequency-based control system
- Generators must remain connected and stable for four specific fault scenarios on the DNO network
- Provide constant power for a DNO network voltage deviation of ±10% and synchronous generators must have a flexible excitation system
- Operate between 0.95 lag and 0.95 lead power factor at registered capacity for all voltage between 95% and 105% and operate for a much wider range below full capacity
- An ability to inject current into the system during fault conditions to help stabilise grid, additional requirements exist for connections >110kV.
- Full real-time / time stamped data exchange with the DNO

EXAMPLES

Let us take a step back from the detailed technical requirements for a moment and consider some typical projects to identify which classification they would fall under:

Example 1: A 0.5MW Solar Farm connected at 11kV →Type A
Example 2: A 900kW Wind Turbine connected at 33kV →Type A
Example 3: A 1MW Solar Farm connected at 11kV →Type B
Example 4: A 4.5MW Wind Farm connected at 33kV →Type B
Example 5: A 30MW STOR generator site connected at 33kV →Type C
Example 6: A 20MW Solar Farm connected at 132kV →Type D
Example 7: A 50MW STOR site connected at 66kV →Type D
Example 8: A 1MW generator added to an existing 11kV site to export power →Type B
Example 9: A 2MW generator added to an existing 11kV site to peak shave (no export) → Type A
Example 10: A new 10MW industrial plant connected at 33kV with a 500kW LV emergency generator → Non-specific (similar to G59)

SUMMARY

If you are a developer, you will probably be most interested in understanding how this translates into practical impact! Initially there is likely to be a lot of confusion on the requirements, so plan for extra time in getting approvals. The general impact will be more study and design work required in the early stages of a project, specifically we would expect:

- Type A schemes (<1MW) - There will be limited practical difference
- Type B schemes (>1MW to <10MW) - There will be some more studies / design to do.
- Type C schemes (>10MW to <50MW) - There will be a lot more studies / design to do and developers should expect to have to provide more equipment.
- Type D scheme (>50MW or >110kV) – Similar to Type C

A word of warning! This article is only intended as a brief guide to G99 and should not be regarded as exhaustive - if you would like to discuss your upcoming projects, please do not hesitate to contact SPE Electrical for guidance! ER

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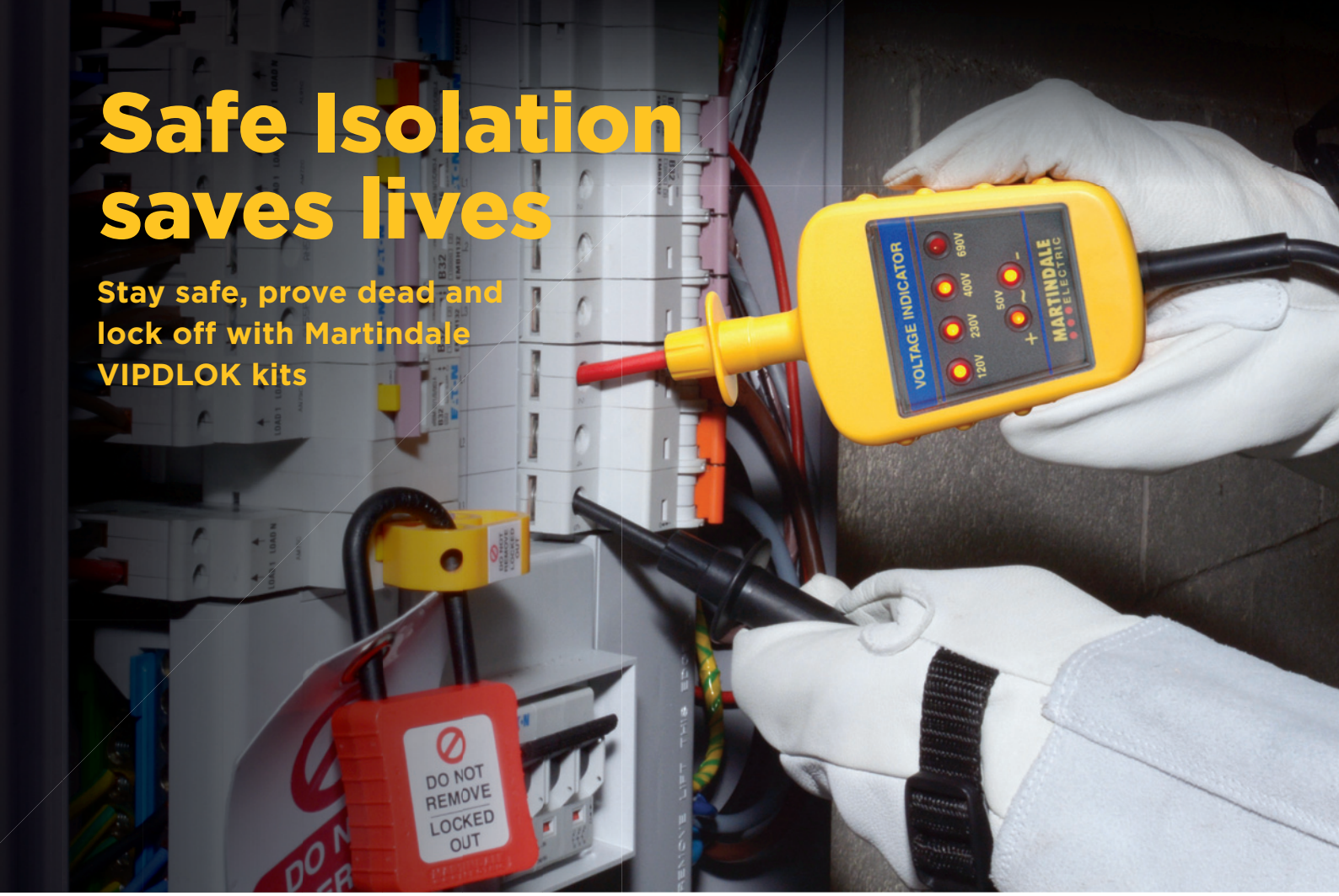

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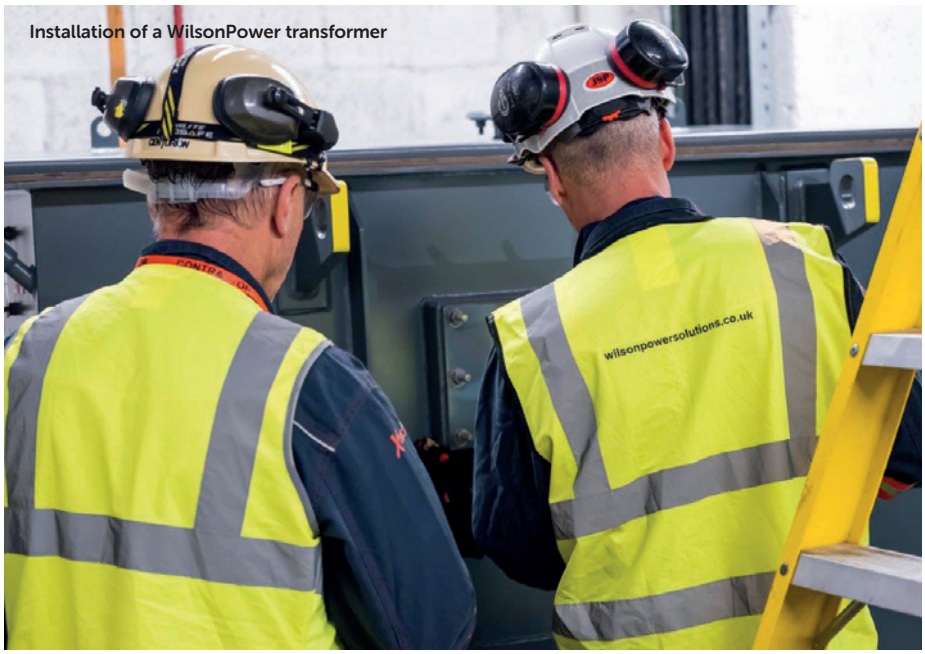
Voltage management at source

The average supply voltage in the UK is 242V. Because of that electricity supplied to many sites across the UK is higher than necessary and responsible for energy losses in voltage dependant equipment. Electrical Review spoke to Wilson Power Solution



Installation of a WilsonPower transformer


Old 1960's transformer in substation

Voltage management is an energy saving technique addressing this issue by modifying supply voltage to a site in order to reduce losses in voltage dependent equipment. There are a number of dedicated voltage management solution providers in the UK. But it's an increasingly well know "secret" that for sites with MV supply, a simple, straight forward and cost effective solution exists that doesn't require any dedicated voltage management equipment: Managing site supply voltage at source via MV/LV supply transformer(s).

TAP DOWN YOUR EXISTING TRANSFORMER - THE BASIC OPTION

Most distribution transformers have off-circuit selectors installed to allow for manual ratio adjustment to LV side voltage. These 'tap changers' typically offer a range of ±5% either in one per cent or 2.5% steps. Tapping down an existing transformer where site supply voltage is higher than required is a low cost option which can lead to a quick, if limited, reduction in energy use. Despite the comparatively moderate savings it is always worthwhile to ensure that transformers are running on the best possible tap setting for a site's requirements and can be a temporary measure where installation of new equipment is not an option.

Replace existing MV/LV transformer(s) with modern super low loss amorphous transformers

Many sites with MV supply are currently operating a supply transformer that is designed to provide a nominal phase voltage of 240V. Where sites can benefit from reducing supply voltage, replacing existing transformer(s) with modern units (such as a super low loss amorphous transformer) that offer a nominal voltage of 230V alongside an extended tapping range which would operate satisfactorily down to 207V can be an extremely cost effective solution. That is because replacing the supply transformer does not require any additional equipment to be installed. This avoids additional system losses, minimises the total plant footprint and is virtually maintenance free. In addition site owners benefit from guaranteed energy efficiency savings through reduced transformer losses and improved site resilience. ▶

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Numerous case studies by independent power quality experts such as IPMC have shown that optimising site voltage through supply transformers can achieve the same (if not better) levels of savings as comparable, fixed ratio voltage management units – at no extra costs. What's more, in addition to savings made through voltage management site owners benefit from often significant energy savings through reduced transformer losses. A recent case study at a large hospital in Tayside showed for example that combined savings from voltage management and reduced transformer losses will deliver cost savings of over £7,300 pa.

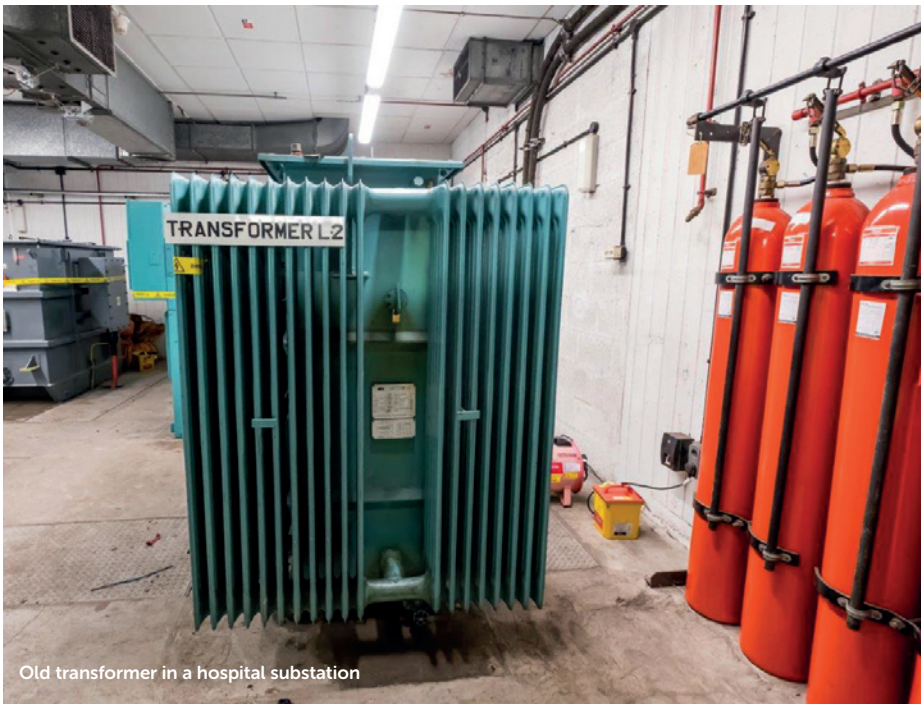
ADDRESSING 'DIRTY' SUPPLY FROM THE GRID - DISTRIBUTION TRANSFORMERS WITH ON LOAD TAP CHANGERS

Most sites in the UK experience some level of network supply fluctuations. These are typically cyclic with voltage levels rising during the night as a result of overall drop in demand and are usually moderate. There are however instances where supply to site fluctuates significantly. This can be due to temporary industrial loads (for example an in-store bakery in a large supermarket) that are causing network voltage drops for periods of time. In addition the integration of intermittent generation from renewable sources and increasing loads from electric vehicle chargers for example is causing further strain.

To mitigate the risk of supply voltage fluctuations and increase site resilience as well as maximise the savings that can be obtained from optimising site voltage, more and more customers are choosing a new generation of super low loss distribution transformers. These units operate on load tap changers (OLTC's) that maintain the required LV side voltage within a desired bandwidth. Investing in a distribution transformer with OLTC's will help secure safe and resilient operation of sites under increasing pressure from ever increasing challenging supply scenarios.

Modern supply transformers are a cost effective, simple and easily replicable energy efficiency measure 'beyond the low hanging fruit'.

Transformers are ubiquitous infrastructure components across many public and industrial estates in the UK. With an ageing transformer population across many sites, transformer replacement projects can deliver substantial benefits on comparatively modest investments (time and capital).



Old transformer in a hospital substation

INDEPENDENTLY VERIFIED

- Ageing electrical supply infrastructure common issue for estates across the UK
- Old supply transformers waste significant amounts of electricity through losses (would not commute to work in a car from 1967!)
- Transformer technology has improved significantly – super low loss transformers already exceed strict new Eco Design losses requirements for transformers due to come into force in 2021 – even when compared to modern standard units super low loss transformers offer significant opex benefits
- Modern supply transformers have a lower nominal voltage (11kV/415V) and are typically supplied with an additional tap setting (+7.5%). Because of that they can serve as cost efficient voltage management devices that regulate site supply voltage at source offering substantial additional savings (older transformers are rated 11kV/433V and only have limited tap changer positions)
- Comprehensive power quality studies are recommended prior to any large scale replacement project in particular to assess presence of harmonics that can require de-rating of transformers (where appropriate filters have not been installed or are faulty), amount of voltage dependent loads, voltage drop across the site and requirement for existing power factor correction equipment.

Early indications show that the replacement project at a large hospital in Tayside will deliver energy savings of 60,862kWh per annum for a single 1967 transformer replacement. Payback on the complete project (including installation costs) will be achieved in less than 5 years. The typical life expectancy of the replacement transformer is 30 years and will therefore provide 25 years of savings that can be invested in other projects.

This demonstrates how energy and carbon savings can be realised at the same time as meeting infrastructure life-cycle replacement and upgrade needs, thus resulting in major financial, environmental and site resilience benefits for decades to come. ER

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Connected, integrated control solution

Modernisation can deliver multiple technological, operational and legislative benefits, even in industries where automation has not traditionally played a key role. Elinore Mackay spoke to Alexey Chernik, head of the automation and drives department at Azov Controls

One example of this modernisation would be in metalworking foundries, which are often highly mechanised and do not deploy automation on a scale similar to other major industries. Through modernisation however, these types of sites can realise significant performance gains, while also more effectively addressing ever-stronger legislation concerning energy use and harmful emissions.

Integrated iron and steel works can actively use modern technologies to increase the efficiency of controlling industrial and business processes. A classic example of production automation is the 'Enterprise in plain sight' system of visualisation and monitoring of technological processes, which was implemented at the Zaporizhstal PJSC in 2016.

Zaporizhstal PJSC turned to Ukraine-based Rockwell Automation Recognised System Integrator, Azov Controls LLC, to not only replace and build the control systems for its fifth and sixth sinter strands, but also design and populate a brand new central control room.

The display system operates 24 hours a day and the processing speed of the received data is a matter of seconds. This provides round-the-clock access to the most up-to-date information on

production processes, online monitoring of production, making of informed decisions, and implementation of control actions.

The project was huge! Technologically, the shop comprises six continuously operated sinter strands. In order to provide pollutant emissions control for these sinter strands, they are equipped with process-gas cleaning and air-aspiration systems to cater for the intense sources of dust generated by the sintering process.

In the course of this turnkey project, Azov Controls had to gain an in-depth understanding of the customer's precise needs and then develop a system that met these needs; undertaking implementation, installation, commissioning and all other major project activities, including reconstruction and site surveys.

In addition to the scale of the project, time was another major factor. In view of maintaining as continuous production as possible, the works had to be performed under a tight schedule, using a phased approach – requiring incredibly robust management.

Each and every control and electrical component had to be replaced. The power and control circuit supply systems were to be completely reconstructed and new hardware components introduced.

The brains of the new process control system is the programmable automation controller (PAC) from Rockwell Automation, which communicates with a number of networked devices and cells through multiple EtherNet/IP-based device level rings (DLR).

As an integrated control system, CIP and CIP Safety is achieved through the connectivity with an Allen-Bradley SmartGuard 600 safety controller , delivering capabilities and connected PowerFlex 753 variable-speed drives for the mixing drum rotor & DC drive controls the sinter belt.

The integrated process control system uses the proven process solutions for, hardware- and software-redundant Server. Integrated engineering tools are being used to configure, develop and test the high end plant controls and visuals based upon existing graphics.

The new central control room was built 'from scratch' in a completely new building, with the layout being determined by the tasks to be undertaken by the operators. Console-type monitors were used for the local management of workstations and a mixture of 27 and 55 in industrial monitors are used in a video wall to display the information served by the FactoryTalk software.

Using this new infrastructure, the operational staff at Zaporizhstal PJSC are able to accurately and clearly monitor key parameters such as temperature, pressure, humidity, machine speed and equipment status, while also being able to obtain real-time information about possible malfunctions and issues.

Azov Controls, as a Rockwell Automation Recognised System Integrator, makes a commitment to deliver the highest technical solutions and customer service, leading with Rockwell Automation technologies. These integrators have a mutually supportive relationship with the Rockwell Automation sales and/or distributors they work with.

The result of all the work undertaken by Azov Controls has resulted in a truly modern sinter shop control room at Zaporizhstal PJSC.

The new facility allows the operational services of the plant to not only monitor and control the main technological parameters of all workshop equipment, but also to perform automated management of these processes.

The deployment of Allen-Bradley PACs in conjunction with FactoryTalk software has delivered remote monitoring, far more accurate production process control, intelligent energy regulation and greater plant productivity. Indeed, according to Alexey Chernik, head of the automation and drives department at Azov Controls: "The capabilities of the system we created are actually beyond the scope of the original terms of reference; and at the moment the system is actively still developing and improving. The next stage of the reconstruction will be the modernisation of the control systems for the batch-feeding conveyors and sintering machine No. 4.

Mr. Dronov, head of automation at Zaporizhstall said: "We are very satisfied with the solutions delivered and we are currently striving to extract even more capabilities and savings out of the system. We have several other projects in the pipeline related to the sinter and blast-furnace shops and the data we are seeing from this new installation is already being used in the MES track-and-trace module at the plant. ER

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LED inspires a new breed of High-Bays

The roll out of LED lighting has changed in character over recent years. Early LED luminaire designs owed a great deal to the legacy lighting it replaced. Increasingly we are beginning to see new generations of lights that embrace all the advantages of the new chip-based technology. New lighting schemes within the warehousing and distribution sector are no exception. Like other applications, commercial and Industrial facilities were initially attracted to LED by lower energy costs. However other benefits have quickly become 'in-demand'. Toughness is a key advantage of the new solid-state luminaires, compared to fragile filaments and tubes of legacy lamps. Integral LED's new 'Tough-Shell' High Bay family has taken up the challenge of being one of the most durable industrial luminaires available and it aims to prove its worth as a multi-functional light unit designed for the distribution hub of the future.

The typical modern warehouse has developed into a complex facility where a wide spectrum of work practices are undertaken under one roof. The many challenges facing today's warehouse managers include a need to reduce lead times, increase productivity, reduce costs, improve customer service and maintain health and safety standards. The lighting scheme is an important resource in support of an efficient logistics hub. On a practical level, illumination is needed between racking to mark the routes and aisle-ways where both personnel and forklifts operate. The key challenge is to avoid shadow and to provide a consistent and safe level of visibility over the entire workspace. Accuracy in identifying stock inventories and matching complex labels is critical. Therefore, lighting the front of racking bays is another priority. Then there is a conflicting need to provide optimal conditions for screen use for warehouse staff and avoiding the incidence of glare.

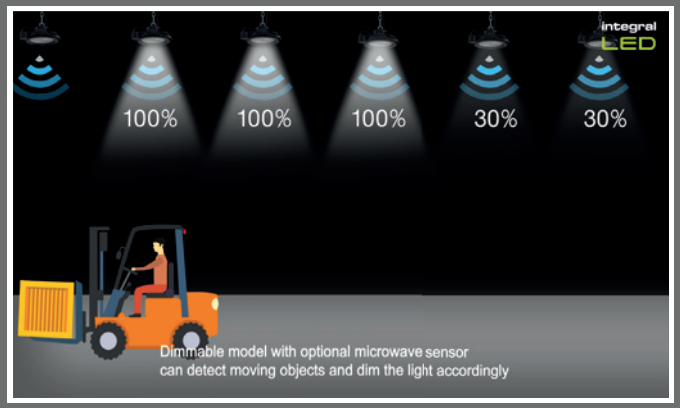
In creating the ultimate High-Bay for factories and warehouses Integral's aim was to use all the advances of LED to produce an efficient luminaire with high lumens, whilst being fit for some of the most demanding environments. The result was the new Tough-Shell model, a robust high bay that runs at a highly efficient 130-150lm/W, delivering significant savings to the customer. It's a powerful light unit that delivers up to 36,000lm of illumination, enough to provide the required functional lighting levels from the existing infrastructure. The specific lighting needs of a wide array of functions within warehouses are answered by the availability of a choice of beam angles; 60°,90° and 120° models, designed to direct the light exactly where it is needed.

Tough-Shell's uniquely designed aluminium body provides optimal heat management within a high impact casing.

So, these luminaires are more than a match for the bumps and scrapes that could occur in warehouse and factory environments especially where high-rise racking is utilised. Select models of the High Bay are rated IK10, which is enough to withstand 20 joules of impact. Additionally, the Tough-Shell's distinctive conical form factor prevents the accumulation of dust, further cutting down on maintenance cycles. The units are also supplied with an array of fixings made from materials that will resist coastal and other corrosive atmospheres.

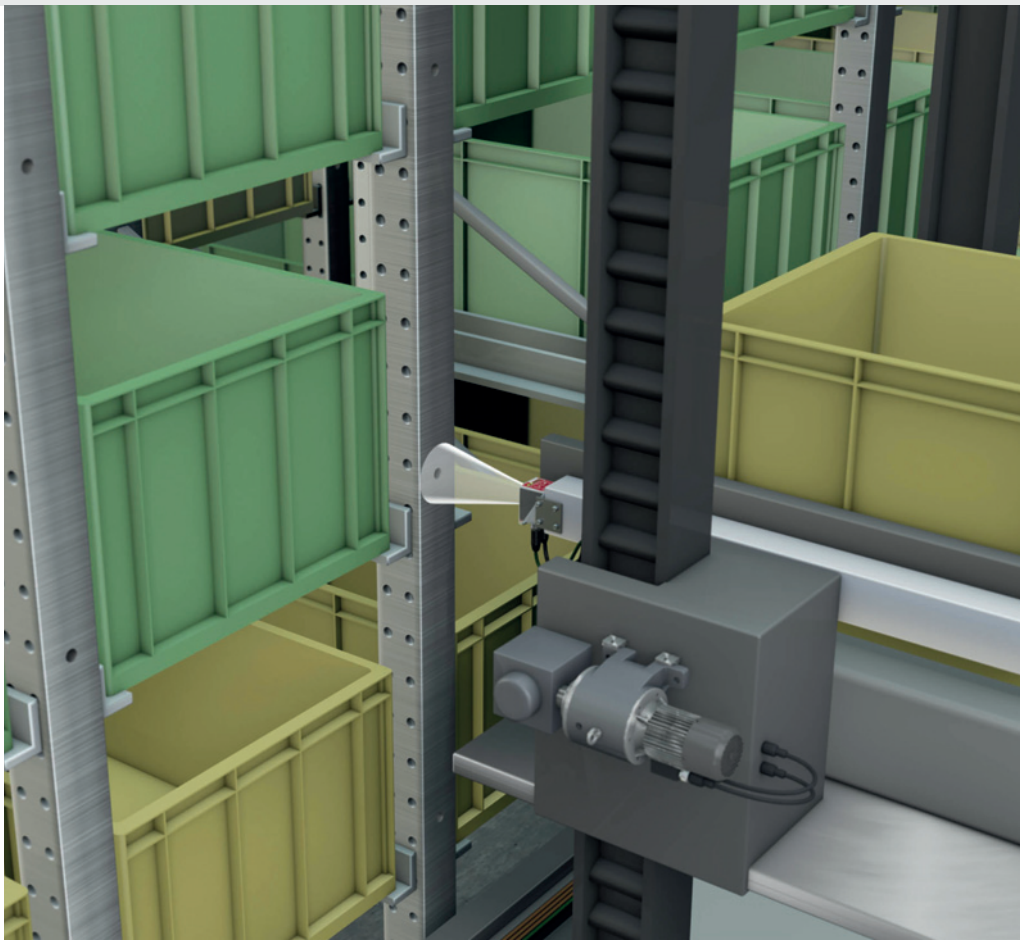
"Lighting is a vital function within today's modern warehouse or logistics hub. These highly efficient spaces demand robust solutions that can be tailored to highly complex work practices. On one level Tough-Shell has been designed to offer a flexible solution that can light all activities to maximise effectiveness whilst at the same time, it connects with the digital controls required to take full advantage of cost savings," commented Ricardo Colombo, Senior Product Manager, Integral LED.

LED lighting is a perfect partner for digital lighting controls. Fast on/off operation and a quick response to dimming control makes the light source a highly responsive partner with automatic sensor control. After all, the most cost-effective light is one that is switched off when not needed. The new Tough-Shell range can be paired with a movement sensor and other automated control accessories, to enable maximised savings. Such options include App control via Zigbee for fine-tuning of a scheme. There is a wide range of accessories too, including reflector hoods and glare reducing diffusers so you can modify the Tough-Shell High Bay to suit the requirements of any installation.



Always in front of the right rack

At a recent automation-focused meeting in London, Elinore Mackay spoke with Sven Abraham, Leuze Electronic, on the topic of less downtime for compartment fine positioning with camera-based positioning sensors



High-bay warehouses are continuously subjected to movement due to different loading conditions, temperature-related expansion, or manufacturing tolerances. Providing fault-free compartment fine positioning of the high-bay storage device is a challenging proposition for the sensor system in such an environment. In addition, users are increasingly expecting the sensor system to provide diagnostics options and predictive maintenance in the spirit of Industry 4.0. For this purpose, it is necessary to exchange diagnostic and configuration data with the sensor.

Camera-based positioning systems with an evaluation algorithm that is tailored to the specific application bring these performance characteristics together and frequently offer a faster and more elegant solution than previously possible with traditional, binary sensors. Solutions where the camera and evaluation unit are integrated in a compact system are particularly popular with users. These offer straightforward commissioning and operation, without the need for special knowledge. With the IPS 200i, Leuze electronic is launching the smallest camera-based sensor for the compartment fine positioning of high-bay storage devices. Using an additional quality score, the unit facilitates decreasing the downtime of high-bay storage devices, thus meeting the demand for condition monitoring.

Leuze electronic is bringing to market the smallest camera-based positioning sensor (Imaging Positioning Sensor) for the compartment fine positioning of pallets in high-bay warehouses or for small-part container storages. With this device, the company is offering a smart alternative to conventional vertical and horizontal shelf positioning with multiple diffuse reflection sensors. Tedious mounting, aligning, and readjusting during operation is no longer required, saving the customer valuable time. Using a novel quality score, the IPS 200i notifies of changes on the sensor or rack and thus assists the user in identifying possible faults early, so that predictive maintenance can be implemented: the quality score helps to identify unique issues, such as contamination or an overhanging film at any given position. The endangered part of the system is found in due time, thus preventing a standstill of the system stemming from inaccurate positioning. The quality score also facilitates identifying particularities that may precede a system failure, so that the endangered system components can be duly removed. Maintenance times can be planned preventatively with this information, downtime can be minimised, and the cost effectiveness increased. This approach is very advantageous when time and costs are important, and it is a significant factor in terms of the total cost of ownership. Thanks to the integrated web server, all relevant data is available worldwide, without having to access the control system.

FAST COMMISSIONING AND HIGH READING PERFORMANCE

For easy and quick commissioning and operation. The web-based, multi-language configuration tool with a user-guided wizard reduces the times it takes for commissioning to a minimum. It can also be configured per XML commands or

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intuitively started up and operated via just two buttons, without being connected to a PC. Innovative feedback LEDs offer instant feedback, which makes aligning the sensors as easy as parking a car. Similar to an acoustic distance sensor in a car, the position of the marker is displayed in relation to the sensor by means of four LEDs mounted on the side. Each side LED corresponds to a single quadrant. If the marker is located in one of the quadrants, the corresponding LED illuminates or flashes. If the marker is in the centre (coordinate origin), all four LEDs light up simultaneously. Then the sensor is optimally positioned. In addition, in alignment mode the flashing frequency provides visual indication of the distance from the marker to the origin coordinates.

The new sensor, which is optimised for depth of field, features a fixed focus position and, after rough positioning, is used for optical fine positioning of a high-bay storage device in the X or Y direction. It is capable of transmitting the correction coordinates for the precise positioning of a rack to a high-bay storage device. This is how it works: The smart sensor detects round holes or reflectors in a single-depth bar or column of a pallet storage and determines the positional deviation of the pallets or containers in the X or Y direction relative to the target position. The positioning sensor generates one or more images as the gray value. First, the sensor searches for a defined, round marking (hole/reflector) in this image. The X/Y deviation is output in millimeters to the target position or as quadrants by means of the available switching outputs.

CAN BE USED IN DIFFERENT TEMPERATURE RANGES

The small IPS 200i dimensioned 66 x 43 x 44 millimeters with an industrial design in compliance with degree of protection IP65 is suitable both for normal temperature ranges or, with optional integrated heating, for deep-freeze use down to -30 °C. The standard variant from Leuze electronic features a plastic housing hood, which can be optionally replaced with a glass housing hood. Thanks to its assembly options on three sides, the compact sensor can be flexibly mounted to the high-bay storage device. The powerful, ambient-light-independent infrared LED illumination (Light-Emitting Diode) ensures flexible use in conveyor and storage systems. It provides for a short exposure time for moving objects, and no additional external illumination is needed. The high object speed in combination with a high depth of field also supports the flexibility of the new positioning sensor of Leuze electronic. Intelligent image processing algorithms ensure reliable positioning as well as a high throughput.

> “Optimised for depth of field”

EASY INTEGRATION INTO EXISTING NETWORK ENVIRONMENT

With the integrated Ethernet interface (TCP/IP or UDP) and the planned PROFINET interface, both direct integration into the customer’s network environment and quick, location-independent diagnostics via remote control are possible. “With the quality score, the IPS 200i now makes it possible to detect the cause of standstill of a high-bay storage device early on. A significant step toward predictive maintenance, one of the most frequently mentioned applications of Industry 4.0,” summarised Sven Abraham, Product Manager Ident + Vision at Leuze electronic. “Compartment fine positioning with a camera-based solution is a future-oriented and smart solution that will also be winning out in terms of cost in the long term.” ER

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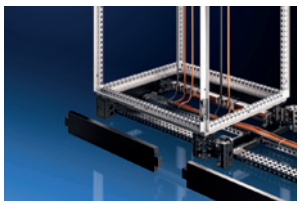
RITTAL: A BASE FOR EVERY SEASON

Rittal's new base/plinth system for enclosures and IT racks combines all benefits of the existing TS and Flex-Block base/plinth systems in one solution. For example, engineers can install VX25 enclosure accessories, while the base/plinth can also be used as an intelligent cable chamber.

The new base/plinth system VX25 from Rittal is designed for the new large enclosure system, as well as being fully compatible with Rittal's existing enclosure solutions, the TS, TS IT, SE, CM, PC, IW, TP and TE ranges.

The new system combines all the functions and benefits of the Flex-Block and TS base/plinths, which it will soon replace. As well as an extensive range of accessories, the base/plinth system offers users virtually limitless options around siting, transportation, cable routing, cable attachment and base/plinth configuration.

The VX25 is the first enclosure system that has been fully developed to meet the requirements for increased productivity in control and switchgear manufacturing and along the Industry 4.0 value chains.



Rittal • 01709 704000
www.rittal.com

READILY ACCESSIBLE

Following the acquisition by the Scolmore Group earlier this year of Sangamo, the specialist supplier of time switches and heating controls, it has now been announced that the Sangamo range of products will be available from group company, ESP (Elite Security Products). This will make the Sangamo range much more widely and readily accessible to customers through the electrical wholesale channel.

Established since 1921 and based in Glasgow, Sangamo has built up an excellent reputation in the industry and offers an extensive product portfolio, which will now sit alongside ESP's growing range of CCTV, Access Control, Fire Protection, Emergency Lighting and Essentials products.

ESP • 01527 515150
www.espuk.com

SPACE STATION DELIVERY

GS Yuasa lithium-ion cells have been delivered to the International Space Station (ISS) for the second time. The cells were delivered into space by the ISS's H-II Transfer Vehicle, which was launched by Japan Aerospace Exploration Agency (JAXA) on 23 September from the Tanegashima Space Centre. This was the second of four batches of lithium-ion batteries to be delivered to the ISS – the first delivery being back in December 2016.

The lithium-ion cells will replace older nickel-metal hydride (NiMH) cells currently installed on board the ISS. Just 24 of the new lithium-ion cells will deliver the same performance provided by 48 nickel-metal hydride batteries. This means only half the number of cells are needed to provide the same capacity and high energy density, therefore contributing to a reduction in transportation costs.

Yuasa • 01793 833555
www.yuasa.uk

FLEXIBLE SOLUTION

Martindale Electric – UK market leaders in safe isolation – is pleased to announce the arrival of its latest CABLOK series, which provides installers and maintenance teams with a simple and reliable solution for locking off multiple breakers, switches and valves, to prevent the re-energising of circuits and systems during maintenance, as part of a safe isolation procedure.

The latest range of adjustable cable lockouts feature a flexible, PVC-insulated steel cable which is easy to thread and, can be simply adjusted to suit the required length before locking off with a simple squeeze action. Incorporating a built-in safety hasp, with space for up to six padlocks to be securely fixed, it allows multiple operatives to safely work on the same system. For additional safety, the system cannot be re-energised until all padlocks have been released.

Martindale Electric • 01923 441717
www.martindale-electric.co.uk

ABOVE AND BEYOND WITH SAFETY SOCKET RANGE

Scolmore has launched a brand-new range of safety sockets, which have been designed to exceed the required safety standards, and offer the ultimate electrical protection across a range of applications including healthcare, social housing and school installations.

This latest new product development is the result of increasing demand from specification teams working on domestic and commercial projects where improved safety features are beneficial, such as hospitals, schools and nurseries.

The sockets have been designed to feature a modified safety shutter operation, which means that it cannot be operated using only one terminal. The standard shutter on conventional sockets is spring loaded and it is moved when the angled section in the earth terminal is pushed down. This can be operated by any foreign object, for example a screw driver. Once the earth is engaged, there is unobstructed access to the live and neutral connections, which makes it very easy to gain access to potentially live terminals.

Scolmore • 01827 63454
www.scolmore.com

LOOKING RADIANT

Sylvania changes the way we look at LED lamps with the new ToLEDo Radiance

The Sylvania ToLEDo™ Radiance changes the entire look of the room with a simple flick of a switch. It merges the boundaries between lamp and luminaire and provides an imaginative retrofit solution to change the feel of a space. The unique circular shape makes it a far more stylish and attractive looking lamp than conventional LED retrofit solutions, ensuring it can be incorporated into any interior décor.

"The ToLEDo™ Radiance is a creative design with features that are both special and unique," comments Anuj senior product line manager LED lamps at Sylvania. "Its unconventional design and elegant shape are going to appeal to everyone and make it stand out from the crowd."

The lamp offers a diffused lit effect ensuring the light is always bright and uniform.

Sylvania • 020 7011 9700
www.sylvania-lighting.co.uk

PORTABLE AND SCALABLE

With its new CPCSync feature, Omicron's modular and mobile CPC 100 multi-functional testing system can be used as a mobile and scalable HV source for on-site induced voltage tests on dry-type transformers (DTT) and gas-insulated switchgears.

The voltage required to energise these test objects can often exceed the power ratings of only one CPC 100 device and matching transformer. Now with the new CPCSync function, users can easily synchronise up to three CPC 100 devices with matching transformers to create an HV source with up to 15 kVA. By connecting several matching transformers in series, the overall output voltage can be increased resulting in a three times higher test voltage.

Omicron Electronics UK • 01785 848100
www.omicronenergy.com

BEST NEW PRODUCT AWARD

ESP is delighted to announce that its GuardCam Deco Wi-Fi security camera and LED floodlight system has been voted 'Best New Product' in the Select Industry Awards 2018.

GuardCam Deco is a combined Wi-Fi security camera and LED floodlight system, designed to be easily set up and including the option for remote monitoring via smartphone or tablet, using the GuardCam Deco APP.

With a built in camera that offers full 1080p HD live viewing and recording, it is the perfect all in one solution for domestic, commercial or industrial applications.

ESP • 01527 515150
www.espuk.com

EMERGENCY LIGHTING FOR BIG BUILD SPECIAL

As part of the BBC's DIY SOS: Big Build project, Mackwell provided its emergency lighting systems and technical expertise to an ambitious project to create the North Kensington Community Centre and rebuild the Dale Youth Boxing Club which was destroyed in the Grenfell Tower fire.

The team at DIY SOS: Big Build, led by presenter Nick Knowles, was determined to do something to help those involved to recover from the trauma and devastation of the fire. After consulting with the Grenfell community, a plan was put in place to build a bespoke facility to provide both the community space and a new home for the Dale Youth Boxing Club, which was previously located on the second floor of the tower.

Architect Featherstone Young offered its skills to the project pro bono and many other companies, including the main contractor Galliard Homes, donated goods and services to a value approaching £2m.

Mackwell • 01922 742145
www.mackwell.com

GIS4SMARTGRID 2018, 20-22 NOVEMBER, AMSTERDAM, SMART GRID FORUMS

In-depth research carried out with 30+ GIS leaders working in the power grid sector has uncovered that utilities are in the process of radically overhauling their GIS systems and infrastructure. Investment in upgrading these systems has grown sharply in recent years, along with pressure on IT teams and GIS specialists to deliver next-generation functionality, more detailed data, and cross-platform support for a wider range of business end-users to support smarter performance of the grid.

While the scope for utilising GIS is increasing, it is still too often viewed as just a legacy system for performing basic report- and map-generation functions. Moreover, as the energy transition picks up pace network operators will be more reliant on accurate and complete data, but in many cases their geospatial and topological data is not up to this standard. "GIS has a huge part to play in the evolution of the smart grid," said Robin Sarfas, conference producer at Smart grid Forums, organiser of GIS4SmartGrid 2018.

SMART GRID FORUMS

Smart Grid Forums • 020 8349 6360
www.smartgrid-forums.com

CLOUD-BASED HOMEGUARD PRO

ERA, the UK's home security specialist, recently launched the new HomeGuard Pro, the first of its kind, cloud-based alarm system to combine security with smart living.

The Cloud takes away constraints that a localised alarm system brings, with the immediate benefit being no control panel, just a hub. There is no complicated set up, as this is all done via smartphone app and should the panel be damaged, all settings and data is safely stored in the cloud. Just get another hub and you are quickly up and running again.

ERA • 01922 490000
www.eraeverywhere.com

FIRE SOLUTION PACKAGE WELCOMED

The new generation of Total Fire Solutions products for the built environment from AEI Cables has been welcomed amid increasing concerns about the quality of cabling in the marketplace.

Specifiers and installers have recognised the highest levels of quality and safety offered by the Firetec Total Fire Solutions range using the very latest in technology and science, offering enhanced fire performance cabling, accessories and technical support from one source.

The new generation AEI Cables' fire performance cabling ensures critical fire-safety circuits can continue to operate in the event of a fire from 30 minutes up to 120 minutes.

AEI Cables • 0191 410 3111
www.aeicables.co.uk

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