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Electrical Review

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Electrical Review EXCELLENCE AWARDS 2018

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An evening to celebrate outstanding achievements, innovation and collaboration

The Awards will recognise projects that embrace the latest in electrical engineering, display forward-thinking design and implementation, and champion the highest environmental, safety and energy efficiency standards.

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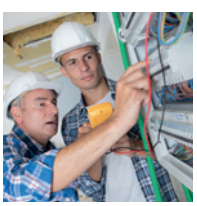

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Visit **www.electricalreview.co.uk/awards**

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Winners will be announced on 24 May 2018, during the Awards dinner at The Dorchester Hotel on London's Park Lane.

Vinci Energies Apprentice of the Year

A bright young man who chose to follow an apprenticeship in the electrical sector when he left school, is today celebrating a major accolade as he strives to develop a career in his chosen profession.

Huge congratulations go to Jack Hodgson from Carlisle, one of five JTL apprentices working at Meldrum Limited, a local company that has recently become part of VINCI Energies UK and Republic. He has taken on 'all comers' within the VINCI Energies & ROI, to be crowned Apprentice of the Year 2017 – quite a feat to come top of the tree from all the apprentices working in the company across all of the Infrastructure, Industrial and ICT Sectors. Jack left school at 16 and started work at Meldrum Ltd in Carlisle on an Electrical Installation Diploma Course, attending Carlisle College, supported by his JTL training officer Gary Hodgkison and his mentor at Meldrum Limited, Sector manager Martin Hand. He has passed all his exams and only has his FS, AM2 and his portfolio to complete this year after which he'll have successfully completed his apprenticeship, have qualified and be moving on in his career. During his working week, Jack works mainly in highly regulated industrial environments for his employer up and down the Cumbrian coast, including working at Sellafield and BAe Barrow in Furness.

Business unit manager, Steven Holliday said: "It was a very proud moment yesterday when Jack Hodgson became the 2017 VINCI Energies UK apprentice of the year. After much stiff competition Jack came out on top and has clearly demonstrated his working ability.".

Real-time Visibility of critical data centre assets

IP House, a new entrant to the UK colocation market, are located at the edge of London's financial district

They have selected Schneider Electric's industry leading EcoStruxure IT platform to provide proactive 24/7 monitoring of their ISO-accredited, 2MW data centre

Once operational, the facility will host a total of 512 racks across two technical data suites

London, United Kingdom, March 19th 2018 – IP House, a London-based data centre startup and new entrant to the UK colocation market, have selected EcoStruxure IT, the next generation cloud-based Data Centre Infrastructure Management (DCIM) platform, to provide 24/7 monitoring of their ISO-accredited facility.

"During the planning stages we chose to utilise software from an industry-leading vendor. One that had a reputation for innovation and a focus on continual improvement," said Vinny Vaghani, operations and commercial manager, IP House, "One of the biggest drivers for selecting EcoStruxure IT was its vendor-neutrality and ability to integrate with different products to provide detailed data in a single dashboard. As a colocation provider we have to adhere to the highest standards of uptime and resiliency, monitoring and management is therefore an absolute necessity for our customers."

IP House's carrier-neutral data centre has been built to Tier III standards on the edge of London's financial district. It contains 14,000 Sqft. of white space across two technical suites and will be operational later this month. The facility also utilises key components from Schneider Electric's EcoStruxure for data centers architecture, including Power Distrubution (PDU), Switchgear, NetShelter Racks and Symmetra PX UPS.

"Our clients depend on both uptime and 24/7 connectivity to business-critical applications hosted within the data centre." said Sean Hilliar, data centre manager, IP House. "Having the ability to proactively monitor all elements of the infrastructure with an advanced software solution like EcoStruxure IT will reassure customers that we're providing them with a secure, competitive and resilient colocation service, that safeguards them against downtime."

Building better homes faster

BSRIA's Building Better Homes Faster 2 event took place on Friday 12 January 2018. Key messages included: culture, challenges and clarity (3Cs).

Tassos Kougionis, principal consultant for residential (BSRIA Chair)

Kougionis discussed current housing construction challenges and opportunities. Main areas of focus included increased delivery, quality and the robustness of the supply chain.

With a government's aim to increase housing supply to 300,000 new homes per year, Kougionis argued industry must enter a new era of technology, data collection and advanced standards. Maintaining high standards is critical to safe guarding the health and well-being of the occupants, as well as to achieving a good reputation for new homes, he said.

He highlighted the then recent government cabinet reshuffle saw another new housing minister in post – the third in a year – which industry has to work with. Changes are unavoidable, but where do we stand as a sector and what are we trying to achieve? Where is our initiative and pride in the job?

Barry Turner, director of technical policy, LABC, discussed key findings in the Building Regulations and Fire Safety Review – Interim Report.

Turner kicked off by mentioning previous changes in Approved Documents and how the industry reacted to these – where the amendments appropriate? He added that the current regulatory system for ensuring fire safety in high-rise and complex buildings is "not fit for purpose", and that any changes need to be considered holistically to avoid knock-on effects.

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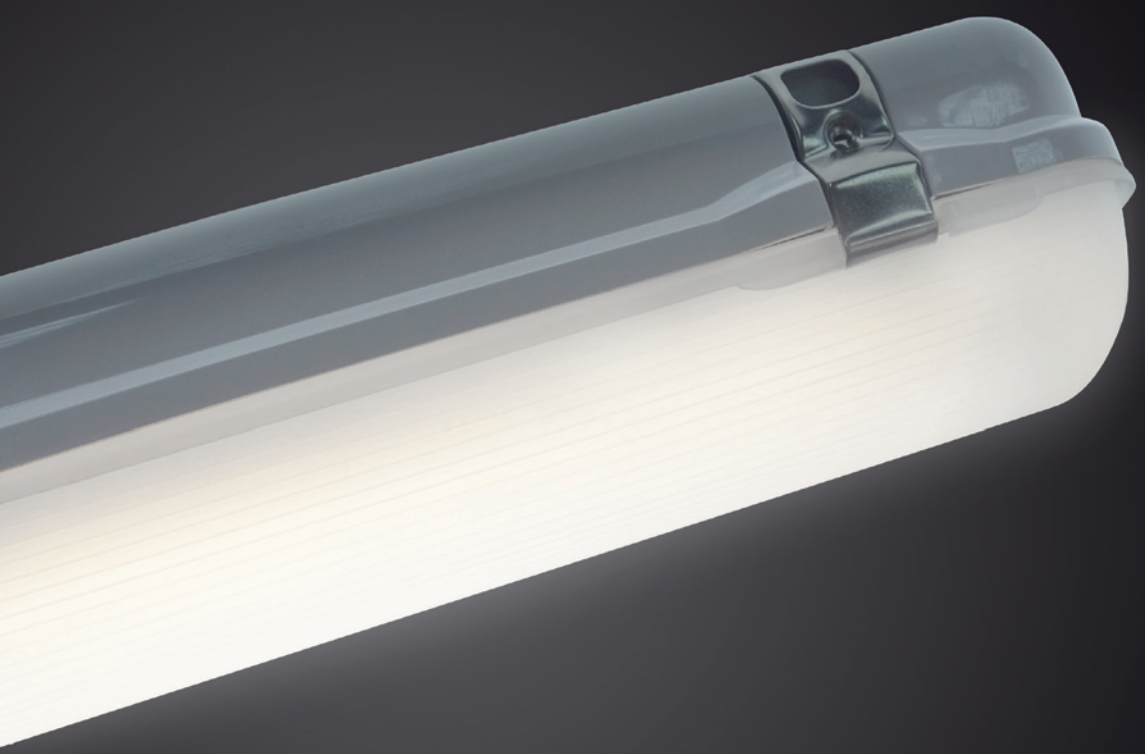

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Lighting the past and the future

Thorn Lighting celebrates its milestone 90th anniversary on 29 March 2018 and the company remains a major force in the global lighting industry. Today, after nine decades of lighting innovation, Thorn has an enviable reputation for smart and reliable high-performance lighting solutions with integrated controls, serving countless applications. The Thorn name is associated with iconic projects worldwide, such as Wembley Stadium, Hong Kong Airport and the City of Oslo. More recent successes include a German Design Award for its Civiteq product, supplying lighting for the redeveloped and expanded Oslo Airport and winning the contract to light the new Tottenham Hotspur football ground in London, as part of the Zumtobel Group.

The Thorn story begins in March 1928, when Jules Thorn started what would become one of Britain's most successful businesses, with a simple mission: to make great lighting easy. Born in Austria in 1899, Jules Thorn first came to Britain as a sales rep for a company making gas mantles. But he soon decided to set up on his own company, and founded the Electric Lamp Service Company. Thorn soon proved himself to be an innovative businessman with a remarkable ability to see opportunities where others couldn't.

Lou Bedocs, lighting applications advisor at Thorn, and one of the company's longest-serving employees, remembers: "Everybody thought Jules was mad when he decided to build a 30-million-a-year capacity lamp factory. But he went ahead and built more than 70 factories around the world not just for lamps but also for luminaires, control gears and lighting accessories. Now 90 years later we can look back on a true pioneer who left his mark on the world of industry."

Calls for regulation and the G20 Summit

The cryptocurrency space has been fraught with cases of fraud and scams and with it being such a new industry with little in the way of regulation, it has been an ongoing focus of governments. This focus has only increased in recent months due to the number of high profile incidents, such as the theft of $500 million of digital money from the Coincheck Exchange.

This incident, and subsequent action from the regulators, added to the ongoing pressures to introduce regulation into the cryptocurrency space; assuming that we haven't seen a bubble burst, it was one of the major contributing factors to the fear, uncertainty and doubt that has seen a cryptocurrency crash and an ongoing bear market, prices having fallen over 70% from all-time highs set in December 2017 and January 2018.

The discussions around Cryptocurrency regulations have even reached as high as the recent G20 Summit in Argentina (March 19th 2018).

Whilst some key concerns around cryptocurrency dangers were highlighted (such as consumer and investment protections and their use to shield illicit activity and for money laundering and terrorist financing), the G20 has rejected calls for regulation and have instead been urged to lessen the risks by working together to improve conduct, market integrity and cyber resilience in the cryptocurrency sector.

This has alleviated some of the fears in the industry of any major regulation being implemented any time soon and opens up opportunity for the industry to work with governments and take action to ensure this delay of regulation becomes permanent.

In a proactive move, The Japan Blockchain Association (JBA) and the Japan Cryptocurrency Business Association are expected to merge to create a new self-regulatory organisation to strengthen self-regulation which, if approved, could act as an independent regulatory body of the government.

The UK has followed suit with seven British cryptocurrency companies having set up CryptoUK, a crypto trade association intended to improve industry standards and engage policy makers. Meanwhile in South Korea 66 members have signed up to the Korean Blockchain Association including 25 of the biggest crypto exchanges with a view to self-regulate.

Pre-order your copy of the 18th Edition and save money

Contractors can save up to 20% on selected bundles

Electrical contractors looking to stay ahead of the competition can now pre-order their copy of the upcoming 18th Edition from NICEIC and ELECSA.

The 18th Edition will be available on 2 July. Contractors who pre-order their copy will ensure they get the book when it first comes out – and also make a saving in the process.

The new standard is expected to retail at £95 when it launches. Contractors who pre-order their book early will receive a 10% discount – ensuring they get the book for £85.50 – with even more great savings available if bought as a wider package.

"Once it launches contractors will have a six month period to get up to speed with the changes," commented NICEIC and ELECSA's technical development manager, Darren Staniforth.

"From 1 January, it will be a requirement that all electrical installations designed after this date comply with BS 7671:2018, 18th Edition (2018).

"Everyone involved in the electotechnical industry will need to be able to demonstrate a level of understanding and awareness of the changes.

"Therefore, many contractors will be keen to get a copy of the blue book as soon as it becomes available. By pre-ordering a copy now, they can ensure they get a copy as soon it comes out and have the maximum amount of time to make any necessary changes to the way they work.

"They can also make some great savings in the process."

In addition to the book itself, there are also various bundle packages available including the 18th Edition book + NICEIC and ELECSA Site Guide for £95.

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GOSSAGE

Organised hypocrisy

Ever since the referendum result, the Daily Mail has poured scorn upon anybody who has dealings with any European Union institutions. Traitors, enemies of the people, parasites: all epithets emblazoned across its front page. Especially loathed are those that take money from Brussels, described as snouts placed firmly in the trough. Such overt bias apparently rules out any qualification ever to be listened to again.

However there is one new hydro-electric project based in the Scottish Highlands which somehow has miraculously managed to escape the Daily Mail's righteous ire. This is a new 1.2MW scheme sited on the Langwell estate near Ullapool. The dam, turbines, pipeline and powerhouse were completed last year. And the project stands to earn over £15million during the next 20 years in subsidies from the European Union

The scheme is 60% owned by HG Hydro Ltd. And 40% by the Canaird River Company Ltd – which stands to earn around £6million for that company's proprietor. The head of Canaird is not a Scot, but a late middle-aged foul-mouthed millionaire living in London.

And who is the lucky absentee landlord in question, exploiting the European system so profitably for himself? It is none other than Paul Dacre. And what is Mr Dacre's main line of business? Why, he is the editor-in-chief of that scourge of those ever taking the Brussels shilling, the Daily Mail.

"Blow, blow, thou winter wind"

As wind power becomes more and more viable economically, its opponents tend to revert to two primary objections. Both of these are primarily environmental.

The first is that windfarms are frequently ideally sited in, hence damaging to, areas of beautiful countryside. That was the argument adopted by the Conservative Party in both the 2015 and 2017 general elections, as a result of which many of the best opportunities for cost-effective new windparks have subsequently been forgone under Ministerial fiat. At least in England: neither the Scots nor the Welsh are so purblind to good value investments. Instead the big push has been towards offshore wind generation. Which may now be cheaper than nuclear fission, but is still several times more costly than onshore wing power.

But the second hostile environmental argument is that wind turbines kill birds. Both on land, and at sea. Latest on that bandwagon is the American interior (e.g. Home) secretary, Ryan Zinke. Speaking to (surprise, surprise) a conference of oil and gas industry executives, he announced that the biggest objection to such turbines is that in America they are killing 750,000 birds every year. It was, he argued, a key reason for blocking such developments.

Leave aside that the Sierra Club reckon that the correct statistic is closer to 250,000 dead birds, such statistics can only be relevant if everybody is aware of the impact of other causes of ornithological mortality. For instance, across America the annual toll for bird deaths include buildings glass (599 million), motor accidents (199.6million), and even cats (2.41 billion).

German measles

I foresee a big change in attitudes regarding German energy policy. For the past decade champions of renewable electricity- and opponents of coal-fired power stations - have eulogised Germany for its Energiewende policy. Largely because the policy promotes windpower in particular, and seeks to reduce coal consumption drastically.

I predict this, even despite the new Berlin government having precisely the same political shape as it its two predecessors, led by the Christian Democrats under Chancellor Angela Merkel with the Social Democrats (SDP) as the junior partner.

Why my forecast? Because at a time of crucial decisions and potential conflicts regarding the future direction of Energiewende policy, the new minister in charge of energy and the economy is one Peter Altmaier. As head of the Chancellery, he has become a very close ally of Merkel's.

Like her, he is a former environment minister. But unlike her, whilst in this post he irked ecologists and renewables champions like mad with his conservatism. And below him there are two further changes in personnel that remove two keen eco-warriors, and promote a couple of far less radical people.

Out have gone both the fiery SDP environment minister Barbara Hendricks, in favour of the bland Svenja Schulze. And also crucially the most senior civil servant for energy, Rainer Baake, whose hostility to coal made him so many enemies in his native Nord Rhine-Westphalia, has "resigned." In his place is Winfried Horstmann, who has long worked under Altmaier, and is best described as a "capable bureaucrat unlikely to push any political agenda of his own."After many years on the defensive, look forward to a return of the "back to normality" energy policy creed from Europe's largest economy. Remember, when Germany sneezes, the rest of continental Europe tends to catch cold.

A burning apology

Drax plc power station in Yorkshire has called out FERN, a Europe-wide NGO campaigning to protect European forests, for making basic errors.

These appeared in a paper entitled "Covered in smoke" that FERN shared with MEPs ahead of a vote on renewable energy in the European Parliament in Strasbourg. The paper, which highlighted the health implications of burning wood, contained "significant inaccuracies," according to Drax , even as reported on FERN's Twitter feed.

Unusually, FERN has completely acknowledged the errors and updated the paper. Magnanimously Drax has responded by saying: "Thank you. We will have a read." Somehow implying they hadn't really done so in the first place.

So, following Zinke's logic, we should only permit the construction of wind parks if we are prepared to spend our lives underground, never travel anywhere, and cast off all our feline friends. Sacrifices all transparently well worth making in Trump's America.

Common emergency lighting mistakes

Operating commercial premises can present many challenges. As well as providing and maintaining the comfort and welfare of the occupants who may be employees, students or patients, attention must be paid to health and safety. Peter Adams, support services manager at Mackwell outlines some of the common mistakes and how to correct them

Unlike residential and private dwellings, buildings which are used for the intentions outlined above must comply with various regulations and legislation driven by government orders and the Health and Safety executive.

Safety critical resources must be put in place such as fire detection warning and escape systems, sprinkler systems and emergency lighting.

Emergency lighting is lighting provided for use when the normal lighting fails in order that occupants can evacuate the building in a safe and orderly manner.

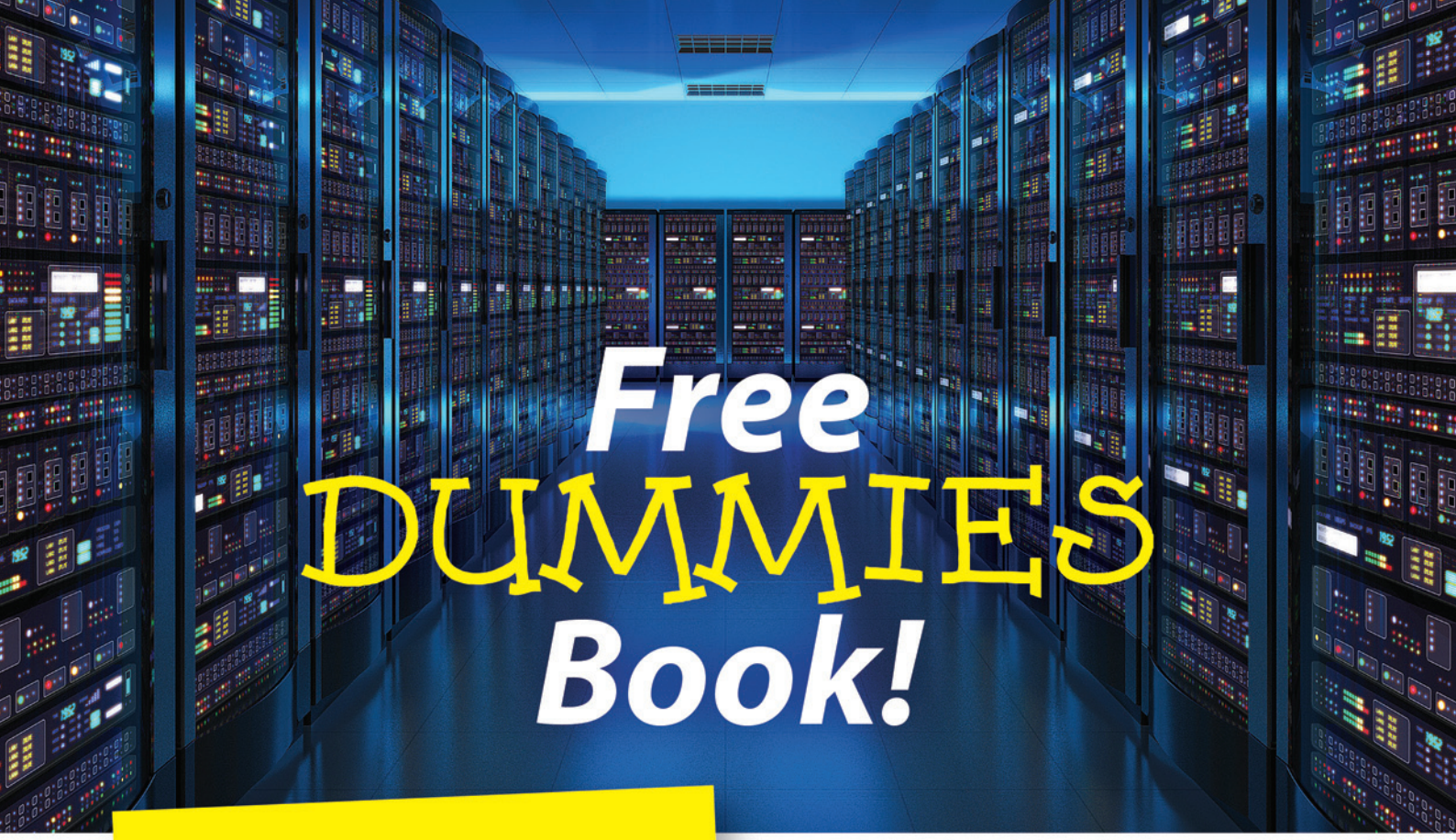
Outlined below are some of the most common mistakes together with recommendations and advice on how to correct them to remain compliant.

MISSING RISK ASSESSMENTS

Risk assessments are a legal requirement for commercial premises and should be undertaken at design stage and regularly thereafter but more importantly at times of alteration to the fabric or structure, changes to the internal design such as partitions and other measures which may impact on the building layout.

Failure to carry out regular and efficient risk assessments can result in many long-term problems, particularly when it comes to the emergency lighting scheme. Furthermore, failure to adhere to the right procedures and booking regular risk assessments may result in new requirements and legislation being missed.

Risk assessments should be completed by a 'Competent Person' who has received the proper training for assessing a building fully. If using external companies to carry out risk assessments on a consistent basis, they should be fully accredited and competent. Alternatively the task can be assigned to an employee subject to adequate training being ▶



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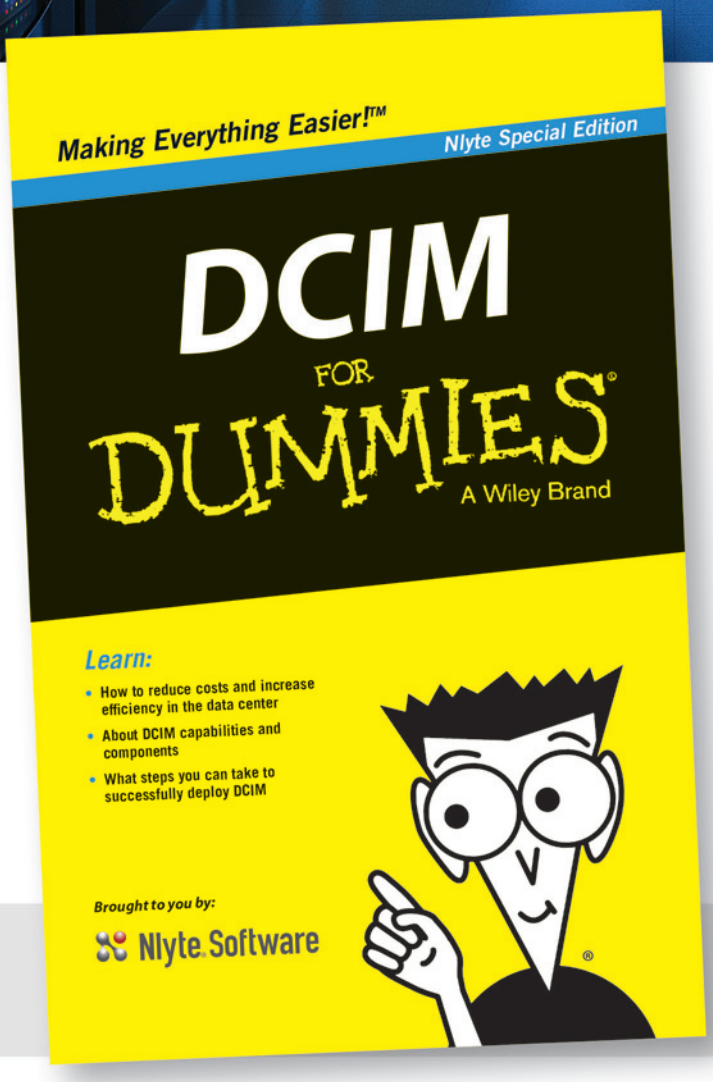

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provided and undertaken.

Documenting risk assessments is also a vital part of the process. Having solid evidence that these important appraisals have been completed allows them to be submitted to fire authorities or other appropriate legislative bodies when requested.

FAILURE TO COMPLY WITH OTHER LEGISLATION

Completion of the initial risk assessment will determine the emergency lighting requirement for the building. Upon the implementation of the emergency lighting, there are a number of factors governed by legislation which must be adhered to in order to deliver a compliant scheme.

Failure to familiarise oneself fully with this legislation may result in the scheme being non-compliant. There are however a number of industry standards which are in place to help support the design and implementation process which the designer should be familiar with. As a starting point it is recommended that a copy of the emergency lighting code of practice, BS: EN 5266-1is referred to. This lists all of the various standards which provide the relevant recommendations and guidelines.

FAILURE TO ADHERE TO BRITISH STANDARDS

These standards are not merely in place as 'box tickers' or to be used superficially. Together they form a definitive guide covering all aspects of emergency lighting including self-contained and central battery systems, standby lighting, and defined lux levels including high risk task areas as well as providing essential information on the placement of necessary signage. In addition to design and scheme standards there are others such as BS: EN 61347 series covering control gears and BS: EN 60598 pts 1 and 2 to cover luminaires. Compliance to these standards goes a long way to reassuring end users that they are using the very best equipment.

NOT COMPLETING REGULAR TESTS OF THE SYSTEM

Designing and implementing a compliant emergency lighting scheme shows a high level of diligence however this is only the start. In order to maintain on-going compliance, routine maintenance and testing is critical.

Many companies and businesses choose to implement an automatic testing system, which enables tests to take place regularly, at periods of low risk and in accordance with the relevant standards. An automatic test system can be taken to the next level with the addition of a monitoring system which utilises a communication protocol such as DALI.

N-light is Mackwell's proprietary test and monitoring system. Developed specifically for self-contained emergency lighting systems, N-lights intuitive touch-screen puts the user in full control. Tests are scheduled and any faults identified in accordance with BS: EN 50172 and BS: EN 62034. Incorporating an on-board log book which can be downloaded, N-light ensures the emergency lighting scheme remains compliant.

TESTING AND MAINTENANCE

It is easy to recognise the benefits an automatic test and monitoring system brings but it should not be a wholesale replacement for routine maintenance. The system will identify and diagnose faults but unless it is regularly monitored the faults will remain.

For detailed information on how to implement the correct system and advice on which emergency lighting system is most suitable for your premises, contact Mackwell today on 01922 458 255. ER

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Keep up with surge protection standards

Samad Khan, global product and standardisation manager for Furse, explains the logic behind the changes to surge protection requirements and test standards in the 18th Edition of the IET Wiring Regulations – and what the industry needs to know about them

What are the big trends driving changes in surge protection?

Sophisticated electronic devices are becoming ever-more important in every aspect of life, with the Internet of Things (IoT) opening up many new applications for sensors, diagnostics, control and management systems that demand reliable data.

Today, electronic systems pervade many aspects of our lives at work, leisure and everywhere in between. We rely on electronics to monitor consumption, manage payments, fulfil orders and manage logistics for everything from fuelling the car to shopping at the local supermarket.

Reliance on computers, electronic process controls and telecoms has increased exponentially during the last three decades and will continue to do so. According to some studies, 20 billion devices will have their own IP address by 2021 as the IoT grows.

At the same time, the physical size of the electronics is reducing to meet demand for products that are more compact or that pack in more performance. In turn, this reduction in size means that components can suffer damage from surges that contain less energy than previously. As a result, electronic systems are more sensitive than they once were and this is driving the need for surge protection devices.

The other major driver is the growth in renewable energy. Solar photovoltaic (PV) panels and wind turbines can be vulnerable to lightning surges as a result of their design and location, which combine to make them a route to earth for lightning. As a result, the electronics in the inverters, converters and condition monitoring systems in such systems all need protection.

Therefore, global surge protection standards and surge protection designs have been updated. This will ensure optimised system protection for renewables.

WHY DO SURGES ARISE?

Also known as transient overvoltages, electrical surges are spikes in voltage on power or signal lines. They are large, short-lived and can overload components, leading to failure.

Lightning strikes cause the largest surges and these can cause spikes of up to 6,000 V within an electrical installation. Lightning can even have devastating consequences when it strikes the ground from up to a kilometre away from the structure itself!

However, there is another source of surges that is more frequent, although lower in amplitude. Electrical switching of transformers, motors and drives or other inductive loads will create a spike ▶

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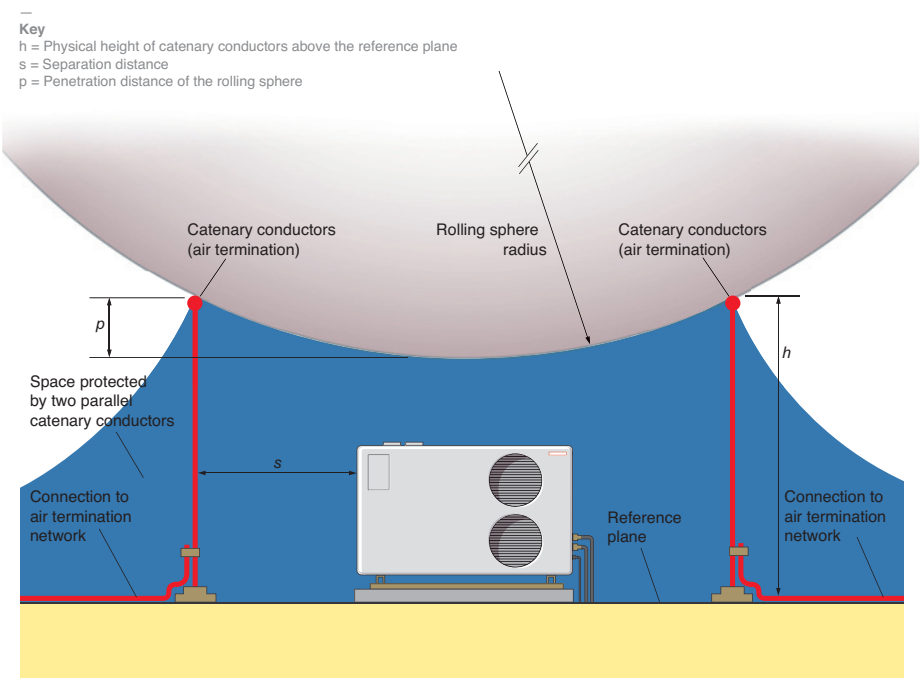
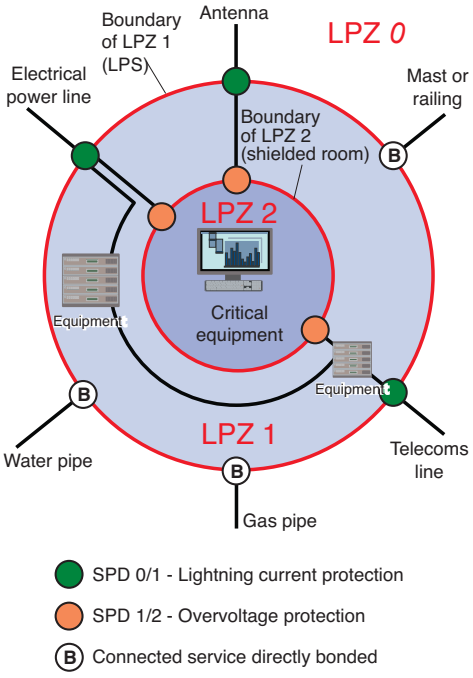
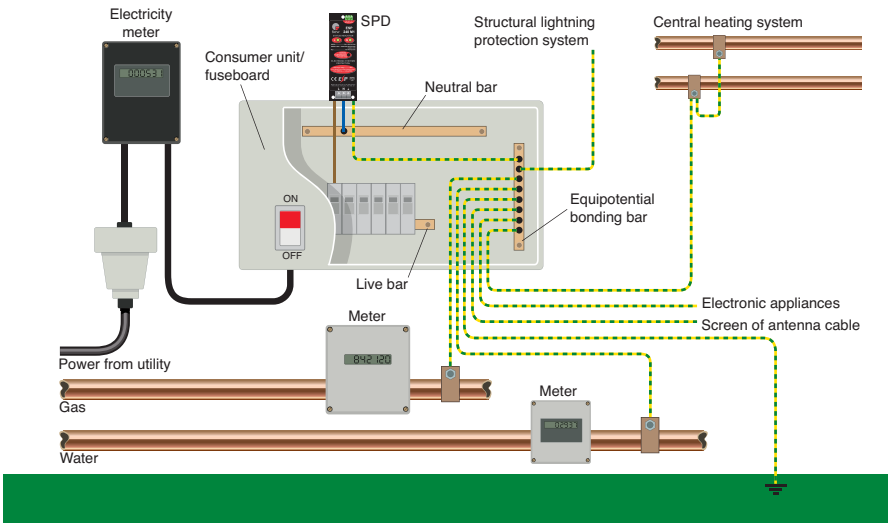






that may affect other devices connected to the same electrical network. Such equipment is common in commercial and industrial facilities, from lifts or escalators to conveyors and other driven equipment. Without protection against such surges, electronic systems will experience constant stress, leading to failures and outages.

What lightning and switching transients share in common is that they result in the "four D's" of surges: disruption, degradation, damage and downtime.

Ultimately, these impact the bottom line through loss of productivity, potential risk to health and safety, product spoilage, additional staffing costs, delays and loss of reputation and sales.

WHAT ARE THE CHANGES IN THE REGULATIONS?

There will be an important change to Chapter 44 of the 18th Edition of the IET Wiring Regulations (BS 7671:2018). This covers protection against voltage disturbances and electromagnetic disturbances and deals with protection against transient overvoltages, whether due to lightning or switching.

Previously, the regulations used the "AQ criteria" to determine if protection against transient overvoltages was needed. These took account of external conditions that influence lightning).

However the AQ criteria method has been removed from the 18th edition.

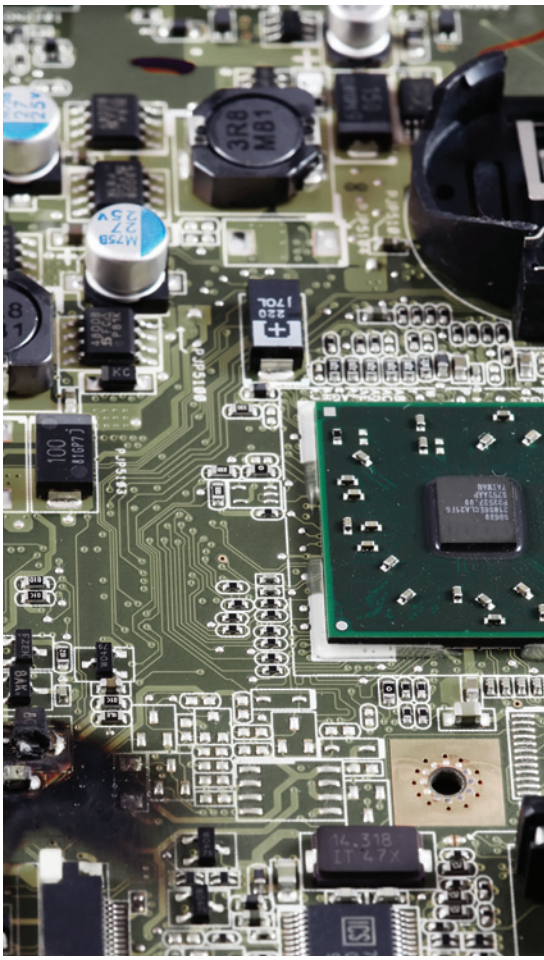
Instead, electrical designers and installers must include protection against transient overvoltages where there may be serious consequences. These include potential for serious injury or loss of life, interruption to public services or commercial activity, damage to cultural heritage, or impact on a site with a large number of people.

In all other cases, simplified risk assessments must be performed. These will determine whether surge protection devices (SPDs) are required to protect against transient overvoltages – with an exception not to provide protection for single dwellings in some situations.

For high risk sites such as nuclear or chemical facilities, transient overvoltages have potential to result in consequences that are more significant and harmful. As a result, for those working on such facilities, the 18th Edition of the IET Wiring Regulations requires a full risk assessment as detailed in BS EN 62305-2.

In general where there is a risk of direct lightning strike to any structure itself or to overhead lines connected with the structure, the 18th edition requires SPDs to be installed to the level specified in the BS EN 62305 standard.

There are also some changes planned to the BS EN and IEC 62305 standards. It's likely that the International Electrotechnical Committee (IEC) will publish the third edition of IEC 62305 before the end of 2018. This is the standard that covers protection against lightning. UK and European markets use the BS EN version, and this should be ▶



published afterwards, once CENELEC (the European Committee for Electrotechnical Standardisation) has reviewed the changes in the IEC standard and amended them to suit the UK and European markets.

WHAT DO THE CHANGES MEAN TO THE INDUSTRY?

Ultimately, the new wiring regulations mean that electrical professionals will need to specify SPDs for many commercial, public and industrial buildings. It is important to use suitable SPDs that have been developed and tested for each task, whether for mains, signal or telecoms lines.

Furse regularly test their SPDs to the latest product standards, particularly in terms of safety, to ensure that they will offer the right protection against repeated "worst case" transients.

WHAT SPD TYPES ARE AVAILABLE?

There are three Types of SPD on the market (Types 1, 2 and 3).

Type 1 SPDs have the role of protecting against loss of life or serious injury in the case of a direct lightning strike. They should be installed at the service entrance of a facility to protect against dangerous sparking. This can result in fire hazard as it represents a risk of flashover, where the voltage exceeds the impulse voltage rating of cables or equipment insulation.

These are referred to equipotential bonding SPDs throughout the BS EN 62305 standard series and they protect against loss of life, which is Risk R1 in the standard.

However, Type 1 SPDs do not offer protection against electronic systems. To quote part 4 of BS EN 62305, which is dedicated to protection of electrical and electronic systems, Type 1 SPDs alone "provide no effective protection against failure of sensitive electrical or electronic systems".

As a result, it's important to use Type 2 and Type 3 overvoltage SPDs. These further reduce the size of transient overvoltages to safe levels protect electronic and electrical equipment.

Type 2 SPDs provide further overvoltage protection to fixed equipment inside the structure . Type 3 SPDs should be installed to protect particularly sensitive or critical loads particularly against switching transients.

Cumulatively, the three types are referred to as a co-ordinated SPD set.

It's worth knowing that there are also SPDs on the market that combine the function of two or more Types – e.g. Type 1+2+3 within the same SPD unit. These have the particular advantage of offering technical, practical and economic benefits over installing multiple single Type SPDs.

Such Combined Type SPDs can handle high surge currents as well as overvoltage protection.

With multiple specialist SPDs available for power, signal and telecoms lines and in single or Combined Types, selecting the right products can seem complex. Furse publishes detailed and freely available guidance on its website to help explain the different roles and performance of its surge protection portfolio. ER

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The Electrical Industries Charity shows support for apprentices

The Electrical Industries Charity is calling on the industry to show support for young apprentices and help them to build a better future by signing up to the Apprentice Support Programme.

Apprenticeships are an effective way of bringing talented individuals to the workforce while giving them a great opportunity to earn while they learn - and one of the ways the electrical sector can remain competitively skilled in the future. However, although more and more young talented people are entering the electrical sector via the apprenticeship route, not all of them can complete their studies and progress further.

In the electrical sector, there are hundreds of young apprentices who are currently faced with a wide range of struggles such as having to care for elderly or unwell loved ones or suffering financial problems, which over time can put their performance and progression at risk and lead to mental health problems.

Currently, one in six young workers are experiencing some form of mental health problem but very often don't reach out for help. Recently, the Guardian revealed that

> **Mental health stigma can be a silent killer**

75% of young people with mental health problems are not receiving help and more than half of them feel embarrassed about their mental illness.

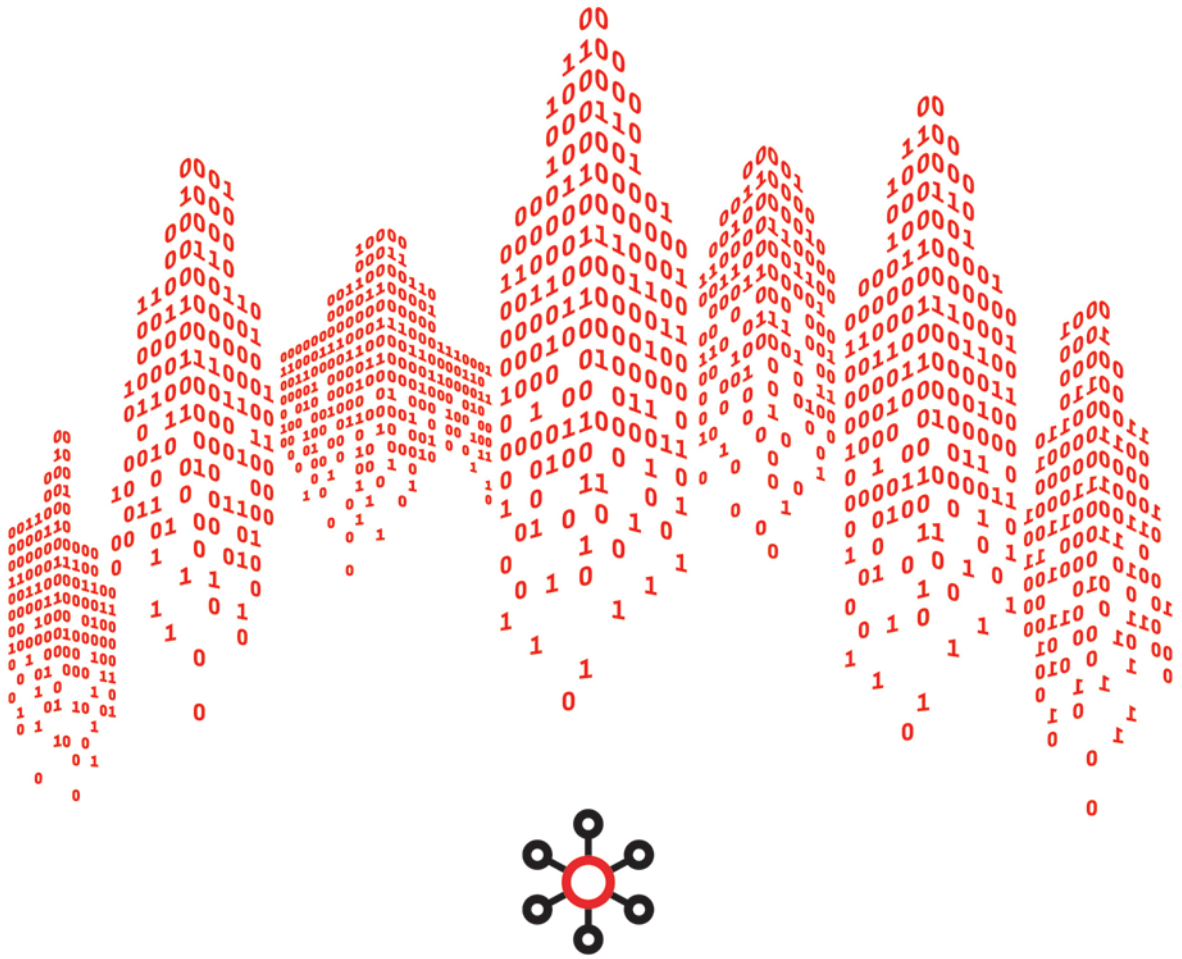
Mental health stigma can be a silent killer. In the electrical sector alone, around 200 construction workers commit suicide each year. The Office of National Statistics showed that suicide is the biggest killer of young people aged 20-34 in the UK each year, which is greater than it has been for the past 10 years. In 2015 alone, 1,660 young people under 35 years old took their own lives; 58 more than the previously recorded highest figure.

An apprentice going through a rough patch needs support to allow progression and achieve a lifetime of productive and satisfying work. To help young people to strive towards excellence in their chosen careers while assisting them in creating a brighter future for themselves, the Electrical Industries Charity has launched the Employee Assistance Programme, of which the Apprentice Support Programme is part of.

The Apprentice Support Programme was designed to help young people in the electrical sector to deal with some of the key challenges that affect them as they embark on their chosen career path. The support services include debt management, financial assistance, counselling, support for carers, scholarships, apprentice bursary scheme, engineering scholarship, legal support, complex case management support and career development and transition assistance.

Early intervention and a solid support network can have a huge impact on young individuals who are struggling to reach their goals due to obstacles standing in their way. The Charity continuously offers that much needed support to meet the challenges faced when starting out in a new career and achieve lifetime goals for the future.

Sign up for the Charity's Apprentice Support Programme today and help young people to reach their potential and secure a brighter future. ER



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Framework agreement with British based multinational company Centrica

Powerstar has announced, in late 2017, it signed a framework agreement with multinational utility company Centrica plc, owner of British Gas

The terms of the agreement outline Powerstar as a preferred supplier, and highlights Powerstar's commitment to provide Centrica with behind-the-meter (where a client utilises energy storage onsite) energy storage systems during an exciting and evolving energy market.

As a market leading solution, Powerstar VIRTUE already accounts for more than 75% of all behind-the-meter battery energy storage systems in the UK. Powerstar's bespoke VIRTUE energy storage solution ranges from 50kW up to 10MW and has recently been awarded European and USA Patents.

The co-operation between the two companies will support the wider adoption of energy storage solutions in the UK with an emphasis on delivering complete behind-the-meter energy solutions.

Crucially, this bespoke solution can provide power resilience to organisations through its seamless Uninterruptible Power Supply (UPS) capabilities and allow businesses to make cost savings on network charges through peak DUoS shaving and Triad avoidance, as well as generate revenue from grid services. Power resilience is a particularly important issue highlighted by Centrica itself in a recent energy resilience report which showed that energy related failures can cost businesses up to 17% of their revenues.

> Supporting the wider adoption of energy storage

The framework agreement has commenced with the order of two 500kW Powerstar VIRTUE systems for the Centrica head office in Windsor. The Windsor systems will have full load seamless UPS capacities and will be integrated with the award-winning Powerstar voltage regulation technology to provide energy optimisation. The systems will be fully demonstrated to Centrica's clients to showcase behind-the-meter storage solutions.

Dr. Alex Mardapittas, founder and chief executive officer of Powerstar, said: "To secure a framework agreement with an industry titan such as Centrica is a proud milestone for Powerstar during a period that has been filled with continued growth and development.

"I believe this Framework is a testament to the quality of our systems which is a direct result of the investments in R&D we have made in the last decade. We look forward to embracing the future opportunities it will provide."

Cooling units now with new output class

Rittal's Blue e+ cooling units are acknowledged as the most efficient of their kind on the market. Independent tests have shown they are – incredibly – 75% more energy efficient than previous cooling solutions

On the back of this success, the company is now extending the Blue e+ range. The new unit to be launched in the first quarter of 2018 will provide an output class as low as 1.6 kW, extending the existing range of between 2 to 6kW.

"This new unit is an important milestone for the Blue e+ cooling unit range and is designed to increase the flexibility of our offering and meet a growing need for compact cooling units for efficient enclosure climate control," explains Karl Lycett, Rittal's product manager for climate.

The Blue e+ cooling units feature inbuilt, innovative, patented hybrid technology. This combines an inverter driven cooling circuit with an independent heat pipe to provide passive cooling. This has a significant role in delivering the unit's exceptionally high efficiency ratings.

The inverter driven cooling circuit of the new Blue e+ range is also rated as highly energy efficient. Frequency converters precisely adjust the speed of the DC motors controlling the fans and compressor via voltage control, this allows the cooling output to be tailored to the current environmental requirements and deliver demand based cooling. This results in a significant reduction of energy consumption over conventional solutions.

This precise, demand based cooling ensures minimal thermal stress for components within enclosures, so constant temperature fluctuations (such as in the conventional two-point control systems) can be considered as a thing of the past. This not only increases the service life of the cooling units and enclosure components, it also means higher process reliability.

All the units in the new range can be operated in all standard grids worldwide thanks to the innovative multi-voltage capability. Permissible input voltage ranges from 110 V (single-phase) to 480 V (three-phase) in conjunction with a mains frequency of 50 Hz or 60 Hz.

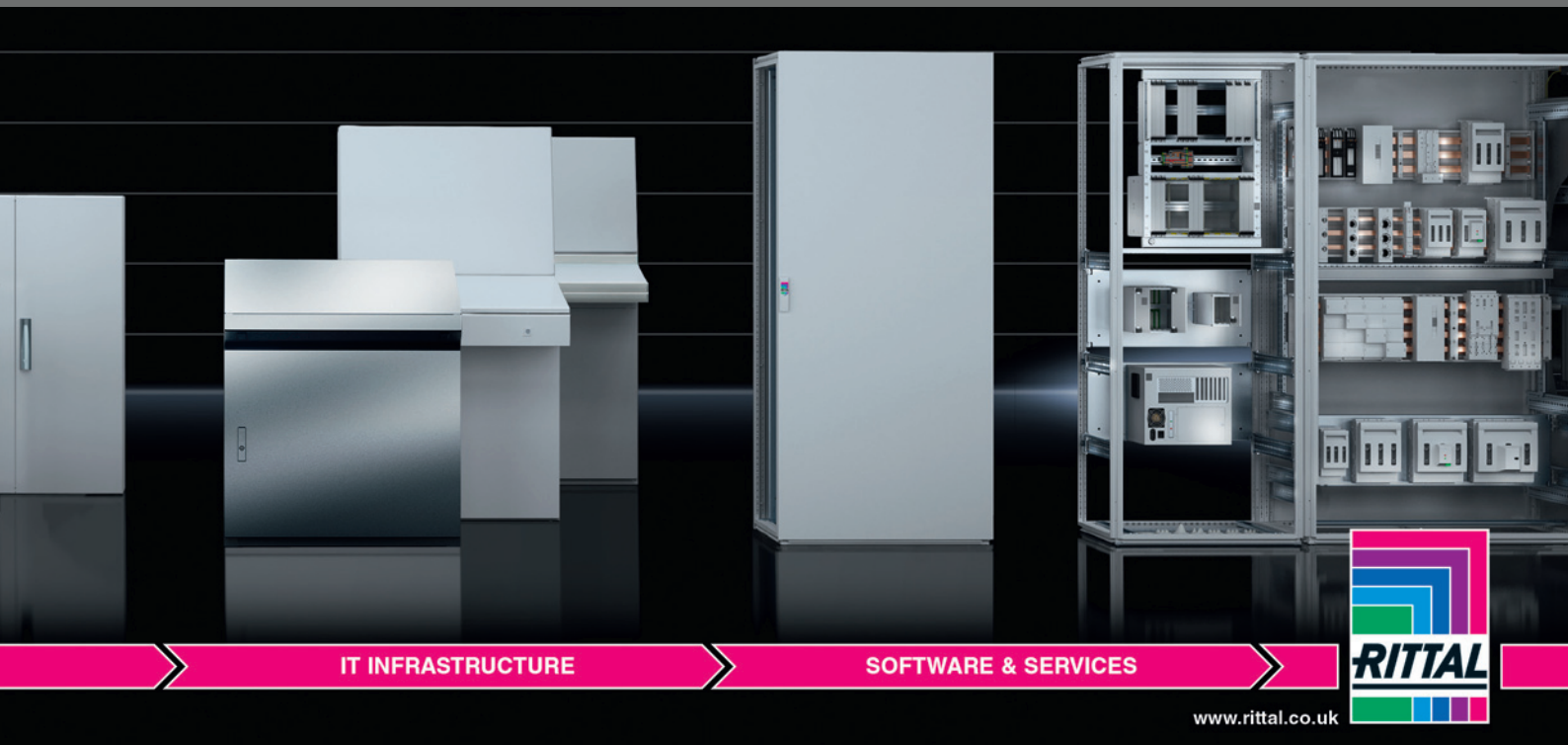
Blue e+ units also excel in terms of connectivity, safety and handling. The units feature a graphical touchscreen control panel which displays all key information at a glance. System messages appear as plain text and are multi-lingual while standardised communication interfaces ensure easy integration into a production plant's control systems.

Meanwhile, the newly released IoT interface means Blue e+ units can link to customer-owned monitoring, energy management and/or superordinate systems via OPC-UA, Profinet, SNMP, Modbus TCP and CANopen, enabling predictive maintenance, data analytics and more.

In addition to the CULUS listing, Rittal cooling units and fan-

and-filter units also now have a UL listing in the new "FTTA" (Environmental-rated Accessories for Enclosures) category. "The FTTA approval, means the type rating/IP protection class of the climate-controlled enclosure is certified by UL. It's a common question on user groups, and I'm delighted we can offer an authoritative response," says Karl.

Further information at www.rittal.co.uk and www.friedhelm-loh-group.com or on twitter @rittal_ltd.



Make the right specification choices

Tim Brown from cable management specialist, Unitrunk, shares insights from the company's CIBSE-accredited CPD outlining the different materials used to fabricate cable management systems, the performance capabilities associated with each and the considerations for correct specification of the most appropriate solution for varied environments

While many still consider cable management to be a commodity item that is incidental to the cabling installation, the reality is that systems vary considerably and the correct choice of cable management can have a significant influence on a wide range of factors. Not only does system selection affect speed and ease of installation, it can also aid or inhibit installation design and layout due to fixings, loadings and bend radii, for example. Post installation, correct specification of the cable management system not only affects future-proofing and scalable capacity, it can also determine whether the infrastructure is fit for purpose, robust enough to withstand normal levels of vibration for the installation environment or able to deliver the intended service life.

While system type and design are critical across all these considerations, it is the material type that will determine the longevity of a correctly installed system of the right type and capacity. Under-specification can result in corrosion and a shortened service life. Meanwhile, over-specification can lead to increased material costs and installation times without delivering any additional value in terms of durability or service life.

Unitrunk's CIBSE-accredited CPD has been developed to help overcome the confusion surrounding the optimum material choice for varying environments and this general guidance should be supported by project-specific technical support from the supply chain for individual schemes.

TAILORED TO REQUIREMENTS

Specifying the correct cable management for different environments can be a minefield that even experienced electrical consultants, engineers and contractors struggle to navigate effectively. Not only are basic decisions about whether cable ladder, cable tray, cable basket or cable trunking offers the most appropriate solution for each element of the build required, but the right size (width and depth), the right weight (heavy, medium or standard duty) and the right material or finish are also essential decisions.

Indeed, the number of variables is so extensive that there should never be a one-size-fits-all or copy-and-paste approach to cable management specification.

The starting point for selecting the right cable management materials must be consideration of the environmental factors affecting each element of the project. For example, is the cable management required indoors, where it will be protected from the elements, or outdoors where it will be exposed? If it's going to be indoors, will the atmosphere be clean or polluted? And if it's going to be outdoors, will it be inland or in a coastal or marine location where a saline atmosphere is a factor?

The specification considerations should also include the expectations of the client or the end user. While the standard service life of a building is considered to be 60 years, the client or end user may have different expectations from this norm. They may also have specific parameters in mind for the maintenance period required for the installation and require accountability for the environmental impact of the materials chosen.

CORROSION RISK

As standard cable management systems are usually pre-galvanised or hot-dip galvanised steel, it's important to understand corrosion risk categories for zinc. There are six categories in all, ranging from C1 (very low), which would typically be inside an insulated building with relative humidity <60 per cent where zinc loss in the first year would be measured at <0.1µm. The scale rises to C5I (very high industrial) where the system is installed in an external environment with considerable humidity and an aggressive atmosphere or an interior location with almost constant water condensation and high levels of ▶

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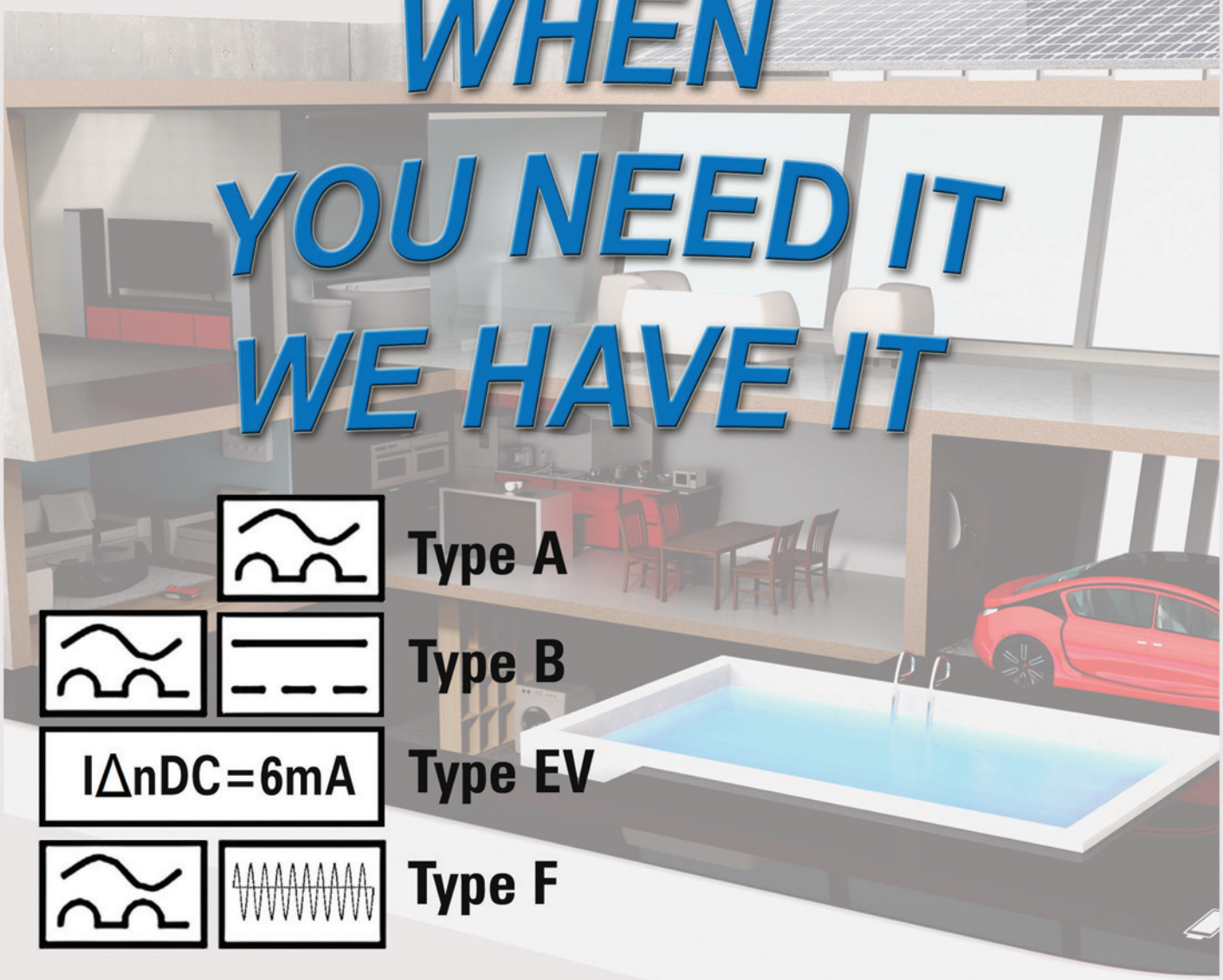

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pollution or C5M (very high maritime) for coastal areas with high salinity and anticipated 1st year zinc loss of 4.2 - 8.4 µm.

For indoor environments it should be simple to understand the conditions to which the cable management will routinely be subjected. For outdoor locations, it is advisable to consult the British Galvanisers 'Corrosion Map of the UK' which highlights the locations most at risk of accelerated corrosion. www.galvanizing.org.uk

Galvanisation is used to protect the base metal from rust but it's important to understand that there are other corrosion risks associated with galvanised cable management.

'White rust' is a wet storage stain that occurs as a white, powdery and porous substance when a fresh zinc surface is stored in a wet environment with limited oxygen and carbon dioxide. The white rust is around 100 times greater in volume than the zinc consumed

> **Galvanisation is used to protect base metal from rust**

so, for most cable management products, it will not be detrimental to the integrity of the item. However, for electro-zinc or pre-galvanised products where the zinc coating is lighter, some damage may occur. Deposits should be removed when they occur and it's advisable to be mindful of the storage conditions for all galvanised materials to prevent white rust risk.

Galvanic or bimetallic corrosion occurs when two dissimilar metals are immersed in a conductive solution and are electrically connected. One metal (the cathode) is protected, whilst the other (the anode) is corroded.

'Zinc Whiskers' are metallic filaments that can grow on any galvanised surface and detach into the atmosphere. Considered a particular risk to business critical equipment in data centres, they are a form of corrosion that should be considered in the specification for any environment where there could be a risk to sensitive equipment. Where this risk needs to be avoided, a powder coated or stainless steel alternative to galvanised cable management solutions should be specified.

UNDERSTANDING GALVANISED PRODUCTS

One of the biggest hurdles to selection of a cable management material that provides the best fit solution for a particular installation is the level of ambiguity surrounding different materials and how they are formed. Over-specification can be costly and the cost increases exponentially with the size of the project. However, under-specification can be equally costly for the client if the installation is not sufficiently robust.

Galvanising steel is a cost-effective way of protecting the material, which works in three ways; firstly, the zinc coating weathers at a very slow rate giving a long and predictable life. Secondly, the zinc coating corrodes preferentially to provide sacrificial protection to any small areas of exposed steel and thirdly, on larger exposed areas, the surrounding zinc prevents 'creepage'.

However, there is often confusion surrounding the terms 'pre-galvanised' and 'hot dipped galvanised'. Pre-galvanised refers to sheet steel that has been through a hot dipped galvanising process at the point of manufacture, with a typical galvanising application of 8-20µm. Hot dipped galvanised products, meanwhile are completely immersed in a bath of molten zinc at a temperature of around 450 degrees until the temperature of the item is the same as that of the zinc. During this process the molten zinc reacts with the surface of the steel to form a series of zinc/iron alloys. When the item is removed from the zinc bath, it has a 55-85µm coating of zinc and the surface solidifies, with excess zinc removed to ensure a smooth finish. This increased covering of zinc during the hot dip process makes hot-dipped cable management solutions much more robust and corrosion resistant.

MAKING THE RIGHT CHOICES

With a better understanding of galvanisation terminology it's easy to see why pre-galvanised cable management should only be utilised for dry, interior environments and this smooth finish is ideal for exposed cable management installations where the services are on show. Similarly, Electro-zinc finishes, which provide low-cost and attractive protection with the ability to achieve colours including gold, black or olive by post-treatment, also offer a suitable indoor solution for non-corrosive environments.

Meanwhile, hot-dipped galvanised cable management may be more expensive but offers enhanced protection (provided any exposed steel after cutting is coated with a galvanised paint), and can be used for external installations where there is no additional corrosion risk, such as chemical or marine environments. It should be noted, also, that standard cable trunking cannot be hot-dip galvanised as the thickness of the material deforms the item during the process so the specifier must consider whether to downgrade the trunking to pre-galvanised or upgrade to stainless steel and should seek advice from the system supplier in this regard.

For more demanding environments, stainless steel is advisable. Stainless steel 304L offers good weldability and is ideal for brewery, dairy, food and pharmaceutical production environments. 316L stainless steel provides even greater corrosion resistance thanks to the addition of molybdenum, and is sometimes referred to as 'marine grade'.

For installations where an extended service life is required, Corten A steel may provide a suitable solution. This material is galvanised after manufacture, with a thicker steel and higher silicon content, which attracts more zinc in the galvanising bath.

COST VS VALUE

Clearly cost and performance have to be considered in tandem, with pre-galvanised and electro-zinc providing the most attractive price point, and hot dipped galvanised cable management typically costing 35-40 per cent more. Stainless steel and Corten silicon rich cable management will cost around 40 per cent more again than hot dipped galvanised.

However, all specification decisions should factor in whole life and installation costs rather than looking at material costs in isolation, taking account of replacement intervals and operational efficiency as part of the material selection strategy. ER

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Manageable monitoring

When it comes to monitoring a substation, whether it's part of a transmission system, a distribution system, a renewable energy installation or even a large industrial plant, the big problem is rarely lack of data – it's far more likely to be too much data. But, says Paul McClean of embedded monitoring system specialist eMS, this deluge of data can now be harnessed and transformed into useful information

Today, comprehensive monitoring of substations and plant rooms is more important than ever before. For companies operating transmission and distribution systems, the high costs associated not only with replacing or repairing faulty equipment, but also with meeting customer interruption (CI) and customer minutes lost (CML) penalties make it imperative to monitor equipment as an aid to preventative maintenance and also so that, should a fault occur, it can be diagnosed and rectified in the minimum possible time.

In the renewables and industrial sectors, the consequences of inefficient – or even non-existent – substation monitoring can be equally severe, most usually taking the form of loss of income as well as the inevitable costly repairs.

Some might think that substation monitoring would be easy to implement. All key circuits will, after all, be provided with instrument-grade VTs and CTs. Most circuit breakers will also have contact status transducers, and transformers will typically have temperature sensors and other instrumentation.

In short, there's plenty of data available for monitoring, but therein lies the problem. How can this data be used effectively so that it warns of developing faults and provides alerts in real time for critical conditions? Simply making the raw data accessible and even recording it is not enough – its sheer volume means that the substation operators will not have time to sift through it and, even if they did, important and even critical data would be likely to be missed because it is buried in a mass of routine results.

What's needed is a device that will not just monitor and record the substation data, but also analyse it then classify and prioritise the results, before communicating them with the technicians and engineers charged with supervising the substation. Developing such a device is, however, no trivial matter. It must, for example, be compact, as the space available for installing additional equipment in substations can be very limited, yet it must be capable of monitoring large numbers of inputs from a diverse range of devices, not just standard VTs and CTs.

It must offer a range of concurrent recording modes whose recording speeds and periods cover the variations found on modern power systems. For example, some parameters may under normal conditions only need to be measured and recorded every few seconds or even minutes. Under fault conditions however, this interval will often need to be drastically reduced to ensure that comprehensive data about the fault is captured. Further, the monitoring device should also support triggered recording modes, where certain data is recorded only under user-specified conditions.

As we have seen, a key function of an effective power monitoring device is data analysis. It might seem that given the diversity of input data, the analytical functions would have to be fully programmable. In reality, this is not necessary because substations typically use only a limited range of equipment and the data from this can be catered for by analytical functionality that is, to a large extent, standardised. This means that the users of the monitoring device have no need for specialist programming knowledge but can still customise its operation to match their needs using a straightforward process of parameterisation.

With the data collected analysed to turn it into useful information and this information prioritised, the next function of the substation monitoring device is to send the results to the supervising engineers and technicians. To maximise its value to them, the information needs to be formatted so that it is easily understood, and filtered so that they are not constantly bombarded with reports that contain information that may well be useful but is not urgent.

This doesn't mean that non-urgent information can be discarded, but that it should be delivered at appropriate intervals – hourly, daily or even weekly, for example – rather than as soon as it becomes available. Another option is for some types of information to be made available on demand, rather than being delivered automatically. This is particularly useful, for example, ▶

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CRITICAL POWER : When it matters most

for very dense and detailed information such as COMTRADE recordings relating to the period around a fault.

The next question to consider is how the device should communicate with those who need the information it provides. For most users, email is one of the most effective and most convenient reporting mechanisms. Emails can be easily retrieved on a wide range of devices from desktop computers to smartphones and a well-designed monitoring device will produce messages that are formatted to be fast and easy to understand, while also providing detailed, comprehensive information.

Other reporting mechanisms also have a role to play. For example, a network connection will provide convenient access to information covering all aspects of the equipment being monitored, as well as supporting the bi-directional communication needed for users to 'dig down' for further details of the information presented. There is, however, a potential catch here. It's not unknown for monitoring systems to use proprietary protocols for communication and to require the use of special software for remote access. This can be a very costly approach, as licensing fees for the software are typically payable annually and are rarely insignificant.

A much better approach is for the monitoring system to provide access via a standard web browser. Not only does this dramatically reduce costs, it also minimises the learning curve for the system, as engineers and technicians will already be using web browsers on a regular basis.

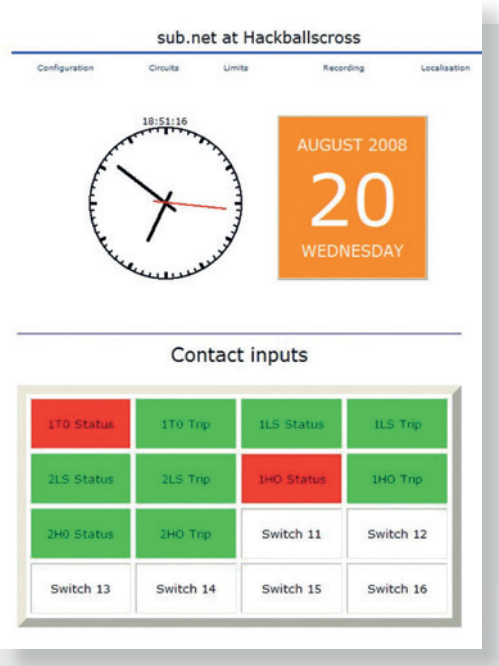
A further desirable communications option in many applications is support for industrial networking protocols such as Modbus and DNP3, as these can be used, for example, to make measured values available to SCADA systems.

An example of a versatile multifunction power monitoring system developed to meet the requirements identified in this article is sub.net from eMS. This is an exceptionally scalable solution that can support more than 180 trend inputs, and it provides all of the features that have been discussed in a compact unit with very low power consumption.

Many major organisations have already been attracted by these benefits and current users of sub.net include, wind and solar power generators, transmission system operators, distribution network operators, high energy physics labs in their unique in-house supply systems, broadcasters, and datacentres. All of these users benefit from comprehensive facilities for monitoring the quality of supply, disturbance recording, phasor measurement, fault location and much more.

With the type of equipment discussed in this article, a comprehensive substation monitoring system can be implemented cost-effectively and with a minimum of disruption. And, because it monitors and provides visibility of the user's network assets 24/7/365, it will significantly reduce engineering fault analysis time, assist in planning and evaluating network improvements, and aid fault location – all of which means fewer and shorter costly supply interruptions.

In a nutshell, a versatile and efficient monitoring system should be considered a key requirement for every substation and plant room, especially as the benefits it offers mean that it will pay for itself very quickly.



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Precise testing processes

Maintaining high data transfer speeds and uptime are highly meaningful for financial institutions, where performance drops or cabling systems failures can cause expensive outages. Together with new EU financial trading 'equality' regulations such as 'MiFID II' coming into force, it is essential that cabling infrastructure performs as specified and within regulation criteria

Cabling infrastructure is a critical component in today's colocation data centre and enterprise environments. Performance and reliability have always been important, but now the margins for error are even finer. With financial organisations deploying high speed optical networks such as 100Gb/s Ethernet and 128Gb/s Fibre Channel, and with an eye on upgrades to 400Gbs, the network stakeholders must have accurate knowledge of the fibre cable performance against the application standards.

The leading cable manufacturer work closely with key financial institutions to assure customers that all supplied links provide a warranty-backed solution compatible with cabling standards. Today, cable manufacturers are providing innovative solutions to European finance houses to facilitate the fibre cabling systems that meet MiFID II criteria.

As network performance requirements has increased, the specification on components used in the fibre cable plant have become more defined and rigorous. Since the standardisation of 10Gbs Ethernet in 2002, the 2.55dB total Channel Insertion Loss (CIL) for 50/125µm OM3 laser-optimised multimode fibre has been reduced to 1.9dB for 40GBase-SR4 (and 100GBASE-SR10). Today, a maximum total connector loss of 1.0dB is required for a 150m OM4 channel that may contain multiple connector interfaces.

Current plug and play multimode fibre structured cabling systems assembled around LC and MTP connector systems have minimal insertion loss compared to the required cabling and component standards. Current cabling standards and application standards (Ethernet and Fibre Channel) require that no mated connector pair exceed 0.75dB Insertion Loss (IL). The latest multimode LC connectors offer average losses of less than 0.1dB and leading vendors offer ultra-performance MPO connectors that show no more than 0.25dB Insertion Loss.

After cabling installation, the permanent links are qualified against cabling standards with nearly ideal patch cords, that yield excellent loss measurement repeatability and reproducibility. This type of measurement with "reference grade" patch cords confirms that the chance of costly measurement errors is minimized and the links are tested and commissioned in a timely fashion.

Testing is a serious business, and the use of legacy test equipment (designed for SC cable plant) can produce anomalous results, as the SC connector heads on the test gear must be adapted to the LC-style cable plant via the use of 'hybrid' jumpers (SC to LC). This introduces extra connector interfaces into the measurement which can have a significant impact on the efficacy of field testing of links with LC or MPO connectors. The potential to produce false fail results and false passing results increases markedly with in-field testing. False fails impact the customer's ability to deploy links on schedule, increase wastage, and add installer time. False passes can reduce reliability and create potential warranty claims.

To reliably measure the loss of a 30m OM3 pre-terminated permanent link in field to the relevant standards requirements, where the expected total loss is a little over 1.6dB, the measurement system repeatability and reproducibility needs to be a fraction of 1.6dB. In fact, the industry recommendation is 20-30% of the test limit (so the range of measurement error should be 0.32dB to 0.48). This is further constrained when customers desire to measure to "engineered limits" (much lower than the 0.75dB for mated pair connector loss as stated in the standard). One must be cognisant of the limits of the test equipment with respect to the limit that they have chosen to measure to. At some point, the test equipment (and operator) start to make significant quantities of measurement errors for these low loss test limits.

Next generation cabling solutions are already here, and OM4+ and OM5+ fibre systems allow for increased cable runs to over 200m, providing highly versatility single mode fibre applications. This new era of high performance cabling such as OM5 and permanent links installed with low-loss multimode fibre (MMF), will increasingly witness the need for ultra-low loss connectors that support higher speed protocols. These cabling systems require compliance with tight customer and industry specifications and highly accurate and reliable insertion-loss measurement processes. ER

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INTELLIGENT EMERGENCY DRIVER

The new ELEDD Micro launching early summer 2018 by Mackwell completes the ELEDD family and provides a new intelligent emergency driver capable of driving multiple output levels in maintained and non-maintained operation. Designed as a truly flexible driver platform the output and test duration can be pre-set to meet the requirements of the connected emergency LED.

Suitable for a range of battery chemistries the ELEDD Micro is designed to use nickel cadmium (NiCd) and nickel metal hydride (NiMH) as these currently are the only battery chemistries for emergency lighting approved by ICEL. The modular approach to the design of ELEDD Micro ensures that developing battery technologies can be accommodated in the future.

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ESP EXPANDS DUCERI EMERGENCY LIGHTING RANGE

As it continues to introduce new and improved additions to its expanding Duceri emergency lighting range, ESP launches two new LED products – an IP40-rated, non-maintained emergency Twinspot and a 4W maintained emergency Flush Bulkhead.

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The new modernised 4W LED bulkhead is designed for recessed mounting to provide a more discreet method of installing a bulkhead without compromising building interiors. With the aim of highlighting escape routes and open areas when lighting to premises is lost, the new flush bulkhead features a 30 SMD 283 LED lamp and produces a mains light output of 131 lumens and an emergency light output of 105 lumens.

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Luceco and Advanced Interior Solutions (AIS) have recently completed an LED lighting installation at Vinyl Graphics Ltd with LuxBay, a cost-effective LED luminaire ideal for high ceiling mounting positions in industrial and warehouse environments.

Vinyl Graphics Ltd (VGL), based in Reading, is a family run screen and digital print company with a reputation for quality and innovation. During the 1980's VGL introduced the UK's first computer aided sign-cutting machine and have remained at the forefront of digital print technology ever since.

VGL's production facilities were poorly lit following the initial base build installation inherited when they took the building. Given the high-quality graphic works produced, there were issues with precision technical equipment not working correctly under the original lighting levels. With the combined expertise of Luceco and Advanced Interior Solutions, a full lighting design was produced, and luminaires installed to ensure the correct lux levels for the environment.

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