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06

NEWS

10

GOSSAGE

Gossage:Gossip

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12

RITTAL

After five years of development work, Rittal has unveiled its new VX25 large enclosure system at the 2018 Hanover Trade Fair.



14

TEST & MEASUREMENT

Effective earthing is essential for the safe operation of wind farms, but accurately measuring earth resistance at these locations presents multiple challenges.

18

OMICRON

The ENA recommendations for G59 give the required settings for generators to connect to the Grid, witnessed on-site by the Distribution Network Operator (DNO).

20

BENDER

Bender UK is penetrating the electric vehicle (EV) market further, with the addition of the Chargespot Berlin - a new and innovative smart commercial electric vehicle charge station.



22

ARC FLASH

ESUK is a specialist company concerned with the safe management of risk associated with all electrical work activities.

26

ELAND

Introducing the first BSI Kitemark approved cables



28

SURGE PROTECTION

In today's hyper-competitive market, companies are tasked with reducing costs, increasing revenue and saving energy to help them retain their competitive edge



32

AUTOMATION

European industrial IT and automation expert Novotek has launched its UK and Ireland brand following the acquisition of Glasgow-based Kerrco Automation



36

RAIL

ABB explains how a smart automation approach to software and hardware is helping Network Rail achieve its vision of electrification for the Great Western Electrification Programme (GWEP).

39

PRODUCT WATCH

New housing minister

Bsria has welcomed the announcement of Dominic Raab as the new housing minister as part of the prime minister's reshuffle to her cabinet.

He has replaced Alok Sharma after just seven months and becomes the seventh housing minister since 2010. Mr Raab, a leading Brexiter, had previously served as justice minister, with Mr Sharma now becoming the new employment minister at the Department of Work and Pensions.

Julia Evans, chief executive, Bsria, said: "On behalf of Bsria members – we welcome Mr Raab into this important role. But we need to know that there is stability ahead for, not only our members, but also for the industry at large. This post has seen a flurry of figures in the last few years – so a level of constancy is now needed.

As ever – Bsria is calling for Mr Raab to continue to foster and deliver robust housing policies. We learned in the recent government Autumn Statement that the housing industry is set to receive £44bn in financial incentives to increase supply to 300,000 new homes a year by the mid-2020s, the biggest annual increase in housing supply since 1970. However, BSRIA stresses that: quantity must not be at the cost of quality.

And in this respect – BSRIA invites the minister to work closely with industry. Building houses must be considered a strategic race, not a tactical sprint."

A lawyer by profession, Mr Raab worked for the Foreign & Commonwealth Office before his election to Parliament in 2010. His appointment comes a day after Sajid Javid had housing added to his ministerial brief under the reshuffle. Formerly he was secretary of state for communities and local government but the shakeup means Javid is now Secretary of State for Housing, Communities and Local Government.



IET and BSI announce official changes to BS 7671 for the 18th Edition IET Wiring Regulations



Ahead of the publication of BS 7671:2018, the Institution of Engineering and Technology (IET) and the British Standards Institution (BSI) have now released the official list of changes that will be included in the 18th Edition of the IET Wiring Regulations.

The essential publication for all professionals working in the electrical industry, due for publication in July 2018, forms the national standard to which all new and amended electrical installations in the UK are to comply. The IET is now urging all electrical professionals to ensure they are familiar with the changes before the new requirements come into force from January 2019.

Significant changes include: the requirement for a 'switching device' to be implemented in the installation of renewable energy storage systems, recommendations for Arc Fault Detection Devices (AFDDs) in AC final circuits, a change to the requirement for the methods of supporting wiring systems within buildings against their premature collapse in the event of a fire, requirements for devices for protection against overvoltage and a new appendix focusing on energy efficiency.

Changes have also been made to the requirements for electric vehicle charging installations with PME supplies (the most common form of earthing in new installations) as well as new guidance for the design and erection of electrical installations that have local production and storage of energy for optimising efficiency.

Mark Coles, Head of Technical Regulations at the IET, said: "The IET is the authority for electrical installation in the UK and ensures

that JPEL/64, the national Wiring Regulations committee carefully considers all necessary updates to the Regulations to ensure they best meet the needs of the industry.

"The 18th Edition of the IET Wiring Regulations contains some significant changes to the way all electrical professionals are required to carry out their work in order to safeguard themselves and the public. With this in mind, it is essential that all electrical professionals ensure that they are up to speed with the new requirements.

"The IET will make the amended IET Wiring Regulations available in traditional print format, and from our digital platforms, meaning there is no excuse for not being familiar with the current requirements for electrical wiring."

The changes to BS 7671 come from changes to international and European standards, of which the UK is obliged to take on the technical intent. JPEL/64 members represent the UK on many of these international committees and the content to be included is discussed in terms of the impact on UK industry, before a new update to BS 7671 is agreed and published.

The full list of changes to BS 7671 can be found at www.theiet.org/18th-changes-pr and will be published in the 18th Edition of the IET Wiring Regulations, due for release in July 2018. Pre-orders can be placed with the IET by visiting: www.theiet.org/wiringbooks.

To find out more about the new requirements for electrical installations, you can also speak to an expert at the IET on 01438 765599 or email technical@theiet.org

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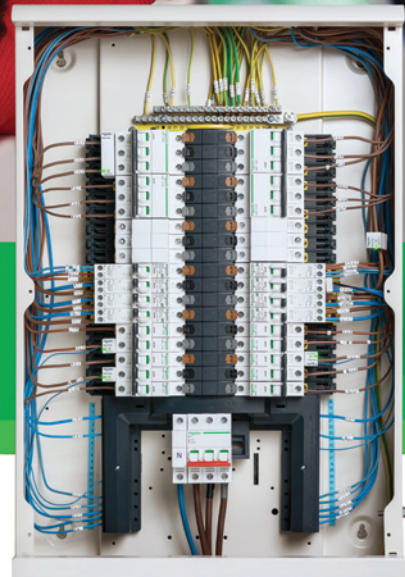
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Electrical training specialist makes senior appointments

TradeSkills 4U (TS4U) has appointed Adam Bain as its new chief operations officer and Paul Constantine as its new financial controller as part of a planned expansion of the management team to support the company's continued growth and expansion.

Established in 2005, TS4U specialises in electrical training, delivering courses to over 3,000 aspiring electricians per year. It aims to develop individuals with no previous electrical experience, including ex-military staff who are looking to gain skills and enter the profession. It also facilitates courses for qualified technicians that are keen to broaden their skills.

In 2017, TS4U was backed by Palatine Private Equity's £100m Impact Fund, which targets businesses with a positive social and/or environmental impact. Since the investment, TS4U opened a £1m facility in Leeds, marking its fourth training centre in the UK. It also has premises in Gatwick, Central London and Warrington.



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. Not surprisingly, his bosses and workmates at Meldrum Limited are very proud of his achievement.

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. I think everyone at Meldrum's would agree

that this well deserved accolade couldn't have gone to a nicer young man. Well done Jack – you're a worthy winner and hopefully this will be the first of many accolades in your career. I would also like to give special recognition and a huge thank you to Martin Hand, whose mentoring skills, help and support for Jack and his fellow apprentices, ensure they are where they are today. His dedication and support has been paramount in the success of these young apprentices and Meldrum."

Training officer Gary Hodgkison - from electrical work-based training provider JTL - was happy to add his congratulations: "In this role, JTL training officers are privileged to work with a number of apprentices across many employers and whilst most of them are excellent, some really stand out from the crowd and Jack has been there from the early days of starting his apprenticeship, showing his quality and willing to work hard and go the extra mile in what he does day to day. I am not surprised that he has achieved this award – it's just reward for the dedication he has shown over the past four years."

Jack is understandably delighted to have been recognised in this way: "It's difficult to believe that I've been singled out from all the apprentices working in the Vinci Energies UK organisation. I'd like to thank those who decided I should get this award – it's a profession I really enjoy and I've found my apprenticeship really worthwhile if occasionally challenging. I'd recommend an apprenticeship to anyone who wants to learn a profession. The opportunity to earn while you learn is something that attracted me, and I'd like to thank everyone that has helped me over the past four years. I'm excited by the challenges ahead as I qualify and move on in my chosen career."

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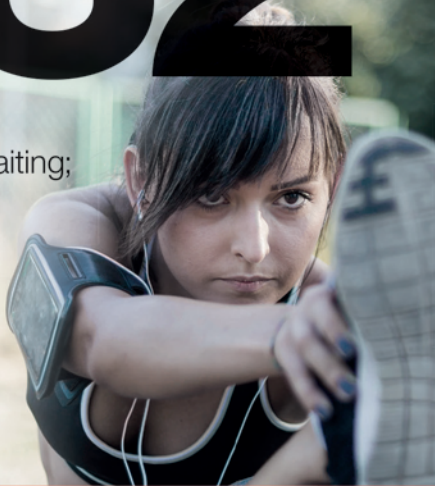
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GOSSAGE

LIGHTING UP GATESHEAD

Much fuss is being made about the decision by Gateshead Council to issue a formal cautionary document. This seeks to rebut a whole variety of scare stories that have been appearing on social media, not least the Council's Facebook page. These have been reinforced by discussions with voters at local councilors' constituency surgeries.

The worries being expressed centre round the installation of new high-efficiency LED street lighting, fitted with transceiver devices. Specifically that this kind of illumination spreads cancers. Apparently of all types. Throughout the human body.

To counter these concerns, Gateshead Council has sprinkled their publication with reassurances from Public Health England to the effect that there is absolutely no scientific evidence whatsoever that LEDs, whether in street-lighting or anywhere else, are in the slightest bit deleterious to anybody's health. Unequivocally: "The street lights in Gateshead will not give you cancer."

What though has been puzzling both Gateshead councilors and public health professionals is where on earth such ill-founded rumours can have started from?

There seems to be absolutely no scientific research ever published which has pointed to any such health concerns whatsoever. Their statement adds "we don't know how these conspiracy theories start."

I though can reveal the most likely source of the hysteria. It is a tweet issued at 08.39hours on October 17 2015. It said: "Remember, new 'environment friendly' lightbulbs can cause cancer. Be careful- the idiots who came up with this stuff don't care".

And the author of this tweet? Why, the twittermaster with over 20 million daily followers. The President of the United States of America, Donald J Trump himself.

LESS IS MORE

The National Grid seems yet again to be wrong-footing some of the most loud-mouthed commentators upon the electricity market. This summer it is projecting that during the period between June and August, peak transmission system demand will go no higher than 33.7 gigawatts. And could well fall as low as just 17 gigawatts. These are numbers unrecorded for approaching 80 years.

Just to put this into context, total installed renewables capacity is already up at 38.9 gigawatts.

These ever diminishing figures are though part of a very consistent trend. Year on year demand for electricity from the grid has been consistently dropping. Government figures for total electricity consumption in 2016 were recorded as 355 terawatt hours. Last year they fell by 2%, to just 348 Twh.

Since 2010 electricity sales have crashed by some 10%. The UK is not unique: in France demand is down 5%, in Germany 2%.

Before they get too smug, it is worth remembering that, back in 2006, National Grid's median forecast for peak electricity demand in 2013 was that it would reach 68 gigawatts. The actual figure recorded that year was just 57 gigawatts. So even the Grid itself has historically been guilty of planning for capacity significantly higher than required. Such inflated forecasts push up system prices, to everybody's cost.

Perhaps those blowhards who keep being quoted in our tabloids, predicting the Armageddon of "our lights going out if we don't build masses of new power plants", will henceforth try to relate their commentaries to what is happening in the real world? But somehow I doubt it.

SMART METERS ARE DUMB

For many years I have been warning my devoted readers about the escalating costs of the official policy, of installing 63 million so-called smart meters into homes and smaller businesses. Four years ago the Government acknowledged that what had begun as a likely £6bn programme had escalated to £8bn, and was now reckoned to cost some £11bn. That is still the official figure.

Even at the time insiders were telling me that the correct expenditure figure was closer to £14bn. Now the Daily Mail has undertaken a special investigation. This concludes that total costs will be around £20bn. Or even more than the Hinkley Point C nuclear power station.

What is this astronomic sum achieving? Already around 9 million meters have been installed. Apart from providing consumption information in £s as opposed to kilowatt hours, the answer is: absolutely nothing.

There is no evidence that these meters are reducing profligate usage one jot. That was the entire initial justification, one that I note no Minister ever dares cite any more.

In fact, the "smartness" can be positively regressive. Installed meters stop working when the user alters energy supplier. They eliminate multiple tariff usage – even dear old Economy Seven can't operate. They don't work compatibly with smart phones.

That is not to say that, out in the marketplace, there aren't smart meters available worthy of the name. There are. It is just the Government doesn't mandate them for installation.

Instead obligated suppliers are still installing completely obsolete technologies. If you take the analogy with telephony, what is being installed is the equivalent of the old 8-kilo chunky handheld mobile phones prevalent in the 1990s. With no facility to text, or go online, let alone take photographs.

And the most disgraceful aspect is that, to "persuade" customers to have these antiques installed, several of the electricity suppliers are withholding access to their lowest tariffs to "refuseniks." No wonder customer satisfaction levels with energy suppliers are so woefully low.

SAYING OF THE MONTH

"There are clear issues with nuclear technology at present. The nuclear industry has created a product so expensive that no one can afford to buy it."

Prof John Loughhead, chief scientist at the energy department, BEIS, speaking at the UK Royal Society symposium 'Decarbonising UK energy'

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Systematically innovative enclosures

After five years of development work, Rittal has unveiled its new VX25 large enclosure system at the 2018 Hanover Trade Fair.

After five years of development work, Rittal has unveiled its new VX25 large enclosure system at the 2018 Hanover Trade Fair.

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

With the "SYSTEM PERFECTION." slogan, Rittal has made a major innovative leap; a leap which has come from its depth of experience, as well as intensive customer feedback and involvement.

The VX25 offers the highest possible quality and consistency of data, reduced complexity and savings in time, as well as safe assembly. More than 25 registered patent and trademark applications demonstrate the high level of innovation that was involved.

How can the best be made even better? This is the question that Rittal asked itself as it began developing a new enclosure system.

"The market needs an enclosure that cuts throughput times in engineering and assembly, reduces complexity and that finds a place for itself as a full-grown module in the megatrend of digitisation," said Dr Thomas Steffen, managing director research and development at Rittal.

He added that: "The new Rittal large enclosure has now become 100% Industry 4.0-capable. With the combination of a real enclosure and its digital twin, the new development will meet every future digitization needs – from online configuration and engineering to assembly, as well as automation, logistics and maintenance."

STUDY: OBSERVE, LISTEN AND LEARN

Intensive dialogue with Rittal customers was a crucial factor in the development of the new large enclosure system.

During a large-scale, scientifically based, usability study, researchers used words, images and moving film to document the everyday working life of control and switchgear manufacturers, covering ten companies in Germany, eight in the USA and six in China, including small, medium-sized and large companies.

"This user analysis was an eye-opener. In some cases, we spotted problems that the customers themselves hadn't yet identified," said Dr Steffen.

As a result, 150 systematically recorded and specific requirements for a new enclosure emerged, providing developers and product managers with a robust guide for the actual development work.

Rittal supplemented its findings with those of the customer advisory council (who were also involved). Later, during the development phase, Rittal did not omit one single, essential point.

THE RESULT: PURE CUSTOMER BENEFITS!

The result was the new VX25 large enclosure system.

The name VX25 stands for three elements: the versatility of options; the fulfilment of "x" customer requirements; and for its perfect symmetry through a consistent 25-mm pitch pattern.

"What is new is that no enclosure system has ever been previously developed so consistently and systematically to ensure maximum customer benefit. The VX25 matches the way the control and switchgear manufacturer thinks and works – both in functions and processes," says Dr Steffen.

Rittal – The System.

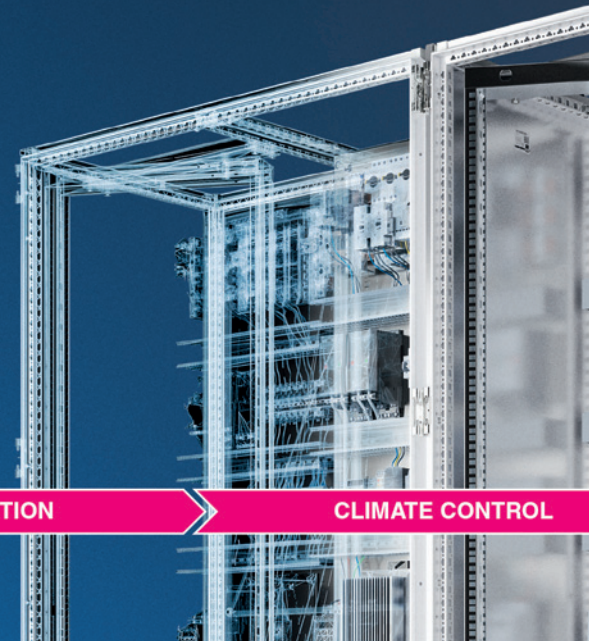
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Customer benefits across the entire value chain of control and switchgear manufacturing can be summarised in three key points: maximum data quality and a constant supply of data; reduced complexity and savings in time; as well as safe assembly.

PATENTS: A HIGH DEGREE OF INNOVATION

The heart of the innovation is the newly developed frame section. This determines the installation space, the efficiency in engineering and assembly, the expansion options, the stability and thus the reliability and flexibility in the customer's workshop.

With the new large enclosure system, Rittal's engineers could maintain all the important and established product features of the existing, worldwide TS 8 large enclosure system, expanding them significantly with a multitude of new functions and customer benefits.

There were more than 25 registered patent and trademark applications, which demonstrate the high level of innovation in the VX25.

PRODUCTION: MAXIMUM QUALITY

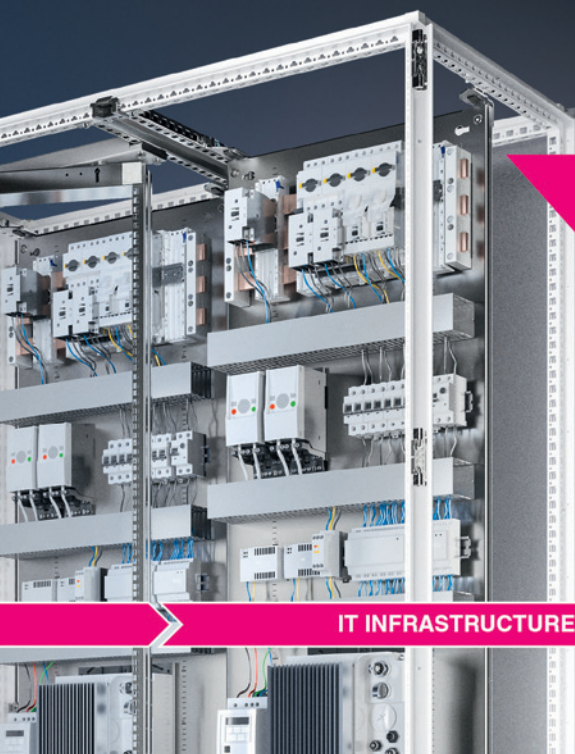
For Rittal, SYSTEM PERFECTION also involves high-tech manufacturing.

It has invested in new state-of-the-art production facilities to manufacture the new frame section of the VX25.

New and fully automatic profiling systems and volume production lines, with a total of 31 welding and handling robots, are witness to the focus on top quality combined with precision and stability.

The result is that the frame section of the VX25, which has a consistent 25-mm pitch pattern, is clearly more stable than its TS 8 predecessor, although the weight is the same.

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



VX25.
SYSTEM
PERFECTION.



VX25. SYSTEM PERFECTION.

There are always two versions of this enclosure - real and digital. The maximum data quality of the VX25 ensures greater flexibility for configuration, manufacturing and assembly. And with the "digital twin", the person who knows your company best - you yourself - can plan, order, process and do much more besides.

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Keeping wind farms safe

Effective earthing is essential for the safe operation of wind farms, but accurately measuring earth resistance at these locations presents multiple challenges. Ahmed El-Rasheed from Megger, explains how Megger and SSE are working together to address these

When they are operating normally, the hazards wind farms pose to the general public are minuscule. But, like any other type of electrical installation, wind turbines can develop faults and these can, albeit very rarely, lead to large currents flowing in their earthing system. This will have been designed to take into account the local earth resistance at the site and can be expected to handle the fault currents safely provided that this resistance has not changed significantly.

If the earth resistance has significantly increased however, possibly due to a long spell of dry weather, faults can lead to

hazards that could imperil members of the general public who happen to be in the vicinity. This is a particular concern in Scotland where "Right to Roam" legislation means that the public has almost unrestricted access to all areas of the countryside.

Two key issues related to wind farm faults are step voltage and touch voltage. Current flowing in the earth leads to a potential gradient at the surface of the earth. Because of this, anyone walking in the area affected will experience a potential difference – the step voltage – between their feet. A combination of high earth current due to a fault and unexpectedly high earth resistance can produce a step voltage large enough to

cause a dangerous electric shock.

Touch voltage is similar, but relates to the voltage between an earthed object – for example, a metal fence surrounding a wind farm – and a person who touches it. Once again, this voltage results from current flow in the earth and its magnitude depends to a large extent on earth resistance.

Wind farm operators go to great lengths to eliminate these hazards. Before a wind farm is constructed, detailed earth resistance surveys are carried out and the earthing systems are designed, with the results of these surveys in mind, to deal with worst-case fault conditions. However, as has been mentioned, earth resistance can change over time. To ensure that ►

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wind farm earthing systems remain safe and effective it is therefore, highly desirable to make regular measurements to confirm that the earth resistance has not increased significantly.

Unfortunately, such measurements are far from easy to make. While the wind turbines are operating, they produce electrical noise in the earth surrounding them, and this makes accurate earth resistance measurement difficult. The seemingly obvious solution of stopping the turbines while the measurements are being made is impractical, for operational reasons and also because of the high costs associated with shutting down a complete site.

Another problem relates to lead length. To deliver accurate results in wind farm applications, the fall-of-potential method of determining earth resistance must be used. This is a three-pole test – one connection is made to the earth bar of the turbine whose earth system is being tested, and a second to a temporary earth spike outside the sphere of influence of the earth system. In practice, this means at least 500 m away from the first connection. The third connection is made to another temporary earth spike, which is moved between the other two connections in 10% distance increments, with readings taken at each increment.

In order to make it easy to handle, the lead for the moveable spike is accommodated on a cable drum but, particularly when the spike is close to the turbine, the coil of the wire round the drum adds a considerable amount of inductance to the test circuit. Practical experience has shown that this can lead to measurements indicating that the earth resistance is lower than its true value – a situation that is potentially dangerous.

With all of these issues in mind, Megger and SSE, one of the UK's largest energy companies, have been carrying out trials with the primary aim of determining whether it is possible to make reliable earth resistance measurements on wind farm sites without taking the site out of service.

The trials were performed on a site in Scotland where 16 wind turbines are in operation. Measurements were made using Megger instruments and, for comparison purposes, non-Megger instruments. The first step was to make measurements of the electrical noise present in the earthing systems at various locations around the site.

As expected, these tests revealed the



presence of significant levels of noise, much of it concentrated around harmonics of the supply frequency. The Megger engineers were confident, however, that the noise would not affect the results delivered by the high-end earth resistance test sets in the Megger range, which are designed to provide accurate and repeatable measurements even in difficult conditions.

The results of the tests were illuminating. The measurements made with Megger's DET4 were unstable and consistently lower than those produced by the other Megger instruments used in the trial. This was not altogether unexpected. The DET4 is a cost-effective instrument that has proven itself to consistently meet the needs of users in "standard" applications. It was never intended for use in challenging locations such as in-service wind farms.

In contrast, the Megger DET2/2, a high performance instrument developed for use in even the most demanding conditions, delivered consistent and credible results in all of the tests. It was, in fact, the only instrument to do so – the non-Megger instruments in the trial performed no better than the DET4.

As further validation of the results produced by the DET2/2, these were compared with the historical earth resistance measurements made when the wind farm site was initially surveyed. Excellent agreement was found in every case, confirming that the DET2/2 can be

relied upon for measuring earth resistance in wind farm installations, even while the turbines are in service.

There is, however, one caveat. For this initial trial, SSE and Megger elected to carry out measurements on the earth systems associated with turbines around the edge of the site, largely because of the difficulty in achieving sufficient spacing for the test electrodes at the centre of the site, where the turbines are closer together. Work is ongoing to address this limitation.

In the meantime, both SSE and Megger consider the results produced to date to be of great value and significance, not least because it is unlikely that the centre of a wind farm site would be affected by conditions so localised that they would materially change its earth resistance without this change being reflected, to some extent at least, by a change in the earth resistance of the peripheral areas of the site.

The joint trials carried out by Megger and SSE have shown that earth resistance measurement on an in-service wind farm is every bit as challenging as had been expected. Nevertheless, with commercial equipment that's readily available right now, it is possible to obtain accurate, reliable results, making routine periodic testing a realistic and financially viable option. Such testing has a major role to play in helping operators keep their wind farms safe, and to minimise risk to the public, even under fault conditions. **ER**



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G59 testing

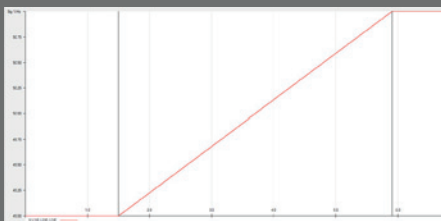
The ENA recommendations for G59 give the required settings for generators to connect to the Grid, witnessed on-site by the Distribution Network Operator (DNO). The protection functions defined are for Calibration and Accuracy Tests with the implementation of Stability Tests for voltage, frequency, and Rate Of Change Of Frequency (ROCOF).

For the Small Power Station protection, the settings might be for 110V LV Protection or 230V HV Protection. Over and Under nominal values are 2 Stage functions.

Even though the nominal voltages are defined as either 110V or 230V, a site-specific voltage could be implemented.

A particular change has been made to the ROCOF settings. It has now been re-defined to be either 0.5Hz/s or 1Hz/s with a tripping time between 0.5s t 1s.

ROCOF is now defined with very specific stability settings. The duration of a stability test with a ROCOF of 0.5Hz/s must be 4.4s, from 49Hz to 51Hz. With the OMICRON test set, this can be very easily implemented.



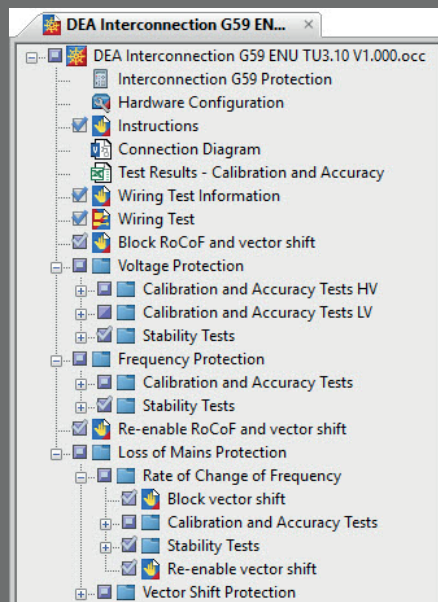
Some DNOs witness the testing are not in favour of a fully automated test file and prefer to view tests one-by-one. OMICRON is well known for its automated test files, but we have a G59 Test Template that can be run without automation.

Tests can run one-by-one as the DNO requires with the added advantage that the report is created at the same time and in a 1 page format. Detailing limits, Pass/Fail criteria and results recorded as Ph-Ph (HV) or Ph-N (LV).

HV Protection - Calibration and Accuracy Tests						
Over and Undervoltage Protection Tests						
Element	Phase	Setting	Time Delay	Pickup Voltage		Time Delay
				Measured Value	Test Value	Measured Value
Stage 1 Overvoltage	L1 - L2	121.0 V	1.0 s	121.49 V	123.49 V	1.01 s
	L2 - L3			121.49 V	123.49 V	1.00 s
	L3 - L1			121.49 V	123.49 V	1.01 s
Stage 2 Overvoltage	L1 - L2	124.3 V	0.5 s	125.10 V	127.10 V	0.50 s
	L2 - L3			124.47 V	126.47 V	0.51 s
	L3 - L1			123.85 V	125.85 V	0.51 s
Stage 1 Undervoltage	L1 - L2	95.7 V	2.0 s	94.69 V	92.69 V	2.50 s
	L2 - L3			94.69 V	92.69 V	2.52 s
	L3 - L1			94.69 V	92.69 V	2.51 s
Stage 2 Undervoltage	L1 - L2	88.0 V	0.5 s	87.88 V	85.88 V	0.51 s
	L2 - L3			87.88 V	85.88 V	0.52 s
	L3 - L1			87.88 V	85.88 V	0.51 s
Over and Underfrequency Protection Tests						
Element	-	Setting	Time Delay	Pickup Frequency		Time Delay
				Measured Value	Frequency Step	Measured Value
Stage 1 Overfrequency	-	51.5 Hz	90.0 s	51.55 Hz	51.3 Hz to 51.8 Hz	90.00 s
	-			52.0 Hz	0.5 s	52.06 Hz
Stage 1 Underfrequency	-	47.5 Hz	20.0 s	47.41 Hz	47.8 Hz to 47.2 Hz	20.00 s
	-			47.0 Hz	0.5 s	46.96 Hz
Loss-of-Mains (LOM) Protection Tests - ROCoF						
Element	Test	Setting	Time Delay	Pickup		Time Delay
				Measured Value	Test Condition	Measured Value
ROCOF	Increasing Freq.	0.500 Hz/s	> 0.500 s and < 1.000 s	0.518 Hz/s	0.550 Hz	0.802 s
ROCOF	Reducing Freq.	-0.500 Hz/s	> 0.500 s and < 1.000 s	-0.518 Hz/s	-0.550 Hz	0.778 s

An embedded Excel Worksheet in the template automatically stores the results for printing/pdf.

With the OMICRON Test Universe software, the Test Template contains all the test files required to successfully test a relay programmed with G59 settings. One big advantage is that the only function required to be disabled for testing is ROCOF. All Stage 1 protection settings can remain active. ROCOF tests are the last to perform so the user will not forget to re-activate the function.



The ENA settings are already loaded in the test file, the user only has a few parameters to set that will be particular to the site under test.

It is easy to set these settings within the software. Here you can set the correct HV or LV, System Nominal Voltage level, Pre-fault time to allow the relay to stabilise before testing, and the option to select whether the relay has a Start Contact or not.

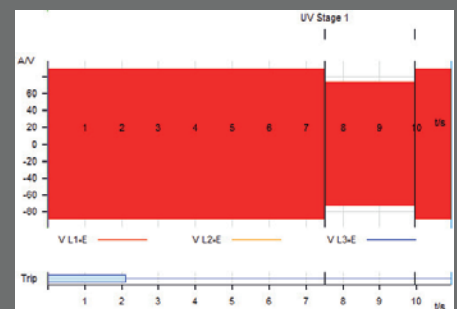
System Data				
Stat	Name	Description	Value	Unit
✓	Nominal Frequency	Nominal Fr	50 Hz	
✓	LV or HV Protection	LV: VNOM i		HV
✓	System Nominal Vo	System No	110.0 V	
✓	Supervision Delay	Pre fault tim	5.00	s
✓	Trigger Mode for Pi	If "No Start	Start Contac	

The only other settings to set is for the ROCOF.

Rate of Change of Frequency Protection				
Stat	Name	Description	Value	Unit
✓	RoCoF Setting	RoCoF Setting	0.500	Hz/s

The DNO can review each test result as it is made, and if desired, can re-run the test with the new result overwriting the previous in the Excel Report.

With stability tests, for example the UV Stage 1, we generate a graphic of the result where we see the change in applied voltage, and that monitoring of the trip contact showed it remained inactive.



The DEEA Interconnection G59 Test Template can be downloaded for free from the Protection Testing Library (PTL) in the Customer Portal on our website. www.omicronenergy.com



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Our 3-phase test set **CMC 430** is the newest member of the CMC family and combines its outstanding performance as a relay tester and calibrator with hybrid measurement and recording facilities. Its lightweight and rugged design ensures excellent portability. Appropriate software tools also allow numerous applications from quick manual testing to distributed scheme tests which makes the CMC 430 a highly flexible solution.

Discover our new CMC family member.

www.omicronenergy.com/newCMC430

Electric vehicle charge station launched through Bender UK

Bender UK is penetrating the electric vehicle (EV) market further, with the addition of the **Chargespot Berlin** - a new and innovative smart commercial electric vehicle charge station.

Chargespot Berlin is manufactured by **Ebee**, a Bender Group company, based in Berlin. This Mode-3 electric vehicle charging station (for public and commercial applications) is a safe, fast charging solution that is designed to mount on streetlight columns, street furniture and walls. It meets all regulatory standards and requirements including ISO 15118, for a wide range of electric vehicles. It is totally flexible in terms of where it can be sited, how the operator collects payment and has a power rating up to 22kW, although other options are available.

Inside the charge station is a compact Bender integrated charge controller (CC612) launched in 2017, which is sold separately to companies developing their own charge stations. The CC612 incorporates a power supply, contactor, charging socket, IEC 61851 Mode-3 commercial charge controller and remote access for software updates and monitoring. It includes payment options such as employee coded RFID user interface and credit cards. The charge station links to the customer's billing mechanisms to offer a universal access system, compatible with different bespoke backend software.

Lee Slater, Business Manager at Bender UK said:

"Safety and reliability lies at the heart of the requirement for cost-effective and efficient electrical vehicle charging capabilities. We are delighted to have a compliant charge station that is proven, tested and ready to take to market. Prior to this we have been working with charge station developers providing the CC612 charge controller for incorporation into their own charge solutions. This means the Chargespot Berlin is a technology game-changer for Bender UK. It gives us the ability to offer both a complete solution for local authorities and other commercial enterprises requiring commercial EV charging solutions, alongside the supply of Bender technology to developers and original equipment manufacturers".

Collectively the Ebee Chargespot Berlin and CC612 charge controller adds to Bender's already strong **EV technology portfolio**. Bender UK has been highly successful in working with Formula 1, Formula E, electric and hybrid fleet, bus and vehicle manufacturers supplying insulation monitoring devices to forewarn of developing earth faults in battery systems.

In the United Kingdom and Ireland, Bender UK develops market applications and supplies Bender products to a range of seCTIOs that require early notification of electrical faults, cannot afford to lose power or demand that the highest level of electrical safety is assured.

Based in Ulverston, South Cumbria and established in the UK for more for two decades



CC611 Charge controller sold separately in 2017



Bender UK has a team of technical experts, project managers and field service engineers who are highly equipped to provide 24/7 service, technical support 365 days of the year, installation, commissioning and project managements services, alongside the day to day supply of Bender components.

Lisa Hudson, Marketing Manager at Bender UK added: The introduction of this new electric vehicle charge station is a natural fit for our business. We can tap into our existing in-house expertise to support the market launch and provide full technical and installation support to those who require it. Our components are already widely used by electric and hybrid vehicle manufacturers to safeguard their vehicles and customers, and this new commercial charging solution further strengthens our position within the electric vehicle seCTIOr."



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EV CHARGE TECHNOLOGY



NEW PRODUCT



Arc flash risk management

ESUK is a specialist company concerned with the safe management of risk associated with all electrical work activities. With unrivalled years of experience, Electrical Safety have pioneered the European approach to Arc Flash hazard assessment and management. Paul Hopton explains

As an Electrical Safety Consultant, I meet many clients whilst helping them with their electrical problems. As part of this special feature on arc flash, I thought I would share with you some of my recent observations from around the World. The first thing to note is that the client's perception of arc flash can often be somewhat different to reality. For example, many people will be concerned about the arc flash risk on their high voltage network (HV>1000 Volts).

When we first meet, customers often want to discuss carrying out a study on their high voltage network. If you consider that the only way you can be injured by an arc flash event is if you are exposed to sufficient incident energy that it harms you. You need to consider two key things, the amount of energy that can be released during an arc flash incident and how you can come in to contact with that energy. If you think about it, as an electrical person working in a typical

industrial environment you are more likely to encounter arc flash at low voltage than at high voltage for two main reasons:

1. there is likely to be more LV equipment on site than HV equipment
2. you are more likely to be working on or near LV equipment whilst it is energised

When carrying out arc flash incident energy calculations we find that high incident energy can often be found at LV and it is in fact just as prevalent at LV as it is at HV. ►

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The issue of corporate standards comes up regularly during my visits to clients, quite often American owned businesses operating in the UK will quote IEEE 1584 and NFPA 70E as the two standards that must be complied with. This generally does not cause an issue as NFPA 70E includes risk assessment and the principle of hierarchy of controls, with Personal Protective Equipment (PPE) being the

●● The issue of PPE and the supply of PPE to businesses ●●

control measure of last resort. This does however bring up the issue of PPE and the supply of PPE to businesses and sites that have not carried out an arc flash study. It is a requirement of the Personal Protective Equipment at Work Regulations 1992 that employers shall risk assess before instructing personnel to wear PPE and that the PPE provided should

be appropriate for the risks involved.

The incident energy calculations that we carry out as part of an arc flash study give you the severity of the hazard, the risk assessment process then considers how this hazard can be realised. If you have implemented a blanket PPE policy without first carrying out an arc flash study, you could be leaving yourself open to criticism under current legislation.

It is important to note that there are many ways to reduce arc flash risk without the use of PPE. We could consider any of the following when trying to reduce the incident energy levels:

- Protection setting changes
- Protection scheme design changes
- Arc Flash Relays
- Use of current limiting fuses/breakers e.g. fast acting breakers or fuses
- System configuration can be used to reduce available fault current e.g. smaller kVA transformers
- Current limiting reactors
- Detect potential failures e.g. partial discharge monitoring; thermography; VESDA; maintenance inspection and test
- Decommission and remove redundant electrical equipment

As part of our arc flash studies for

each piece of equipment that has an incident energy value above a certain value we consider what options are available to reduce the incident energy. We recommend the most appropriate option as well as providing an order of magnitude cost. We also give guidance on what might be an appropriate level of expenditure to comply with the "as low as reasonably practicable" (ALARP) requirements of legislation.

Finally, the Regulator's expectations having been changing for many years when it comes to the management of arc flash risk. We were made aware recently of a business that was given an improvement notice by the HSE to carry out an arc flash risk assessment following a routine inspection. When I worked as a Technical Authority and in Corporate Engineering I had experience of HSE specialist inspectors asking about arc flash, and how we were managing the risk.

In conclusion, it is not difficult or expensive to manage arc flash risk. Arc flash events may be relatively infrequent, but they do happen, and the consequences can be fatal. Put your house in order, do an arc flash study and prevent an arc flash incident from happening on your watch. **ER**

Circuit Protection ?




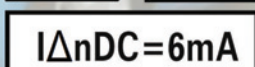



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Introducing the first BSI Kitemark™ approved cables

Described by BSI as “a new benchmark in cable compliance” the BSI Kitemark for Cable Batch Verification is a new programme regulated and under the rigorous surveillance of the British Standards Institute. It sees cables extensively tested against British, European and international standards in a UKAS-accredited laboratory.

The BSI Cable Batch Verification Kitemark has been achieved by one company, Eland Cables. The technical experts in their ISO17025 accredited facility, The Cable Lab®, have worked with BSI to develop the scheme over the last two years, during which time the wider cable market has become more and more focused on compliance.

BSI CABLE BATCH VERIFICATION KITEMARK TESTING

Compliance is determined by testing the individual components – the conductor, the insulation and other constructional layers – elements that are themselves bound by British and European standards. For example, conductor resistance needs to meet the requirements of BS EN 60228.

For the Kitemark to be applied, each batch of cables (in that core configuration and cross-sectional area size) has been examined and tested. BSI Kitemark approval gives demonstrable evidence that cables meet these underlying standards, as well as the overall cable standard where applicable.

The Kitemark is widely recognised with 82% of UK adults believing it stands as a mark of quality, safety and trust. Alongside that, testing must be undertaken in a UKAS accredited facility: the United Kingdom Accreditation Service is the highest certification for a testing facility, assessing the impartiality and validity of its test methodologies. They have strict criteria to meet with equipment carefully calibrated, and so having an ISO17025 UKAS facility is an enormous achievement in itself. What it means to customers is that the company and the cable carry the trust of these two important third-party certification bodies.

A NEW RANGE OF KITEMARK TESTED CABLES – VERIFLEX®

To mark the launch of the Kitemark, Eland Cables is launching its own range of industrial automation cables, called Veriflex®, which includes SY, CY, YY, Servo, PUR and fieldbus cables. With BSI Kitemark testing it allows the company to verify the quality, safety and performance of these cables against relevant British and European standards. For Eland Cables it's about continuing its drive to provide consistency and continuity and putting compliance at the top of the agenda in every conversation.

The extensive testing and the confirmed compliance also sees Eland Cables provide an extended warranty on the Veriflex® range, pushing an industry-standard 12 month guarantee out to 24 months for LSZH cables and 36 months for PVC cables. It's one more way they have underlined the commitment to compliance



that is core to their operation.

Eland Cables is known for its customer service too, so the Veriflex® range doesn't disappoint here either. Available direct from UK stockholding for next-day delivery to UK mainland, and within 48-72 hours for most of mainland Europe, there's an availability and speed of supply that makes these cables an attractive proposition compared to a marketplace where the traditional lead-times are 5-7 days.

FINAL WORDS FROM BSI

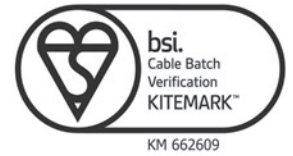
Paul Turner, Certification Technical Expert at BSI said: “As the first company to achieve the BSI Cable Batch Verification Kitemark, Eland Cables sets a new benchmark in cable compliance. The rigorous and extensive testing programme they undertake in their UKAS laboratory, under our ongoing surveillance, tests the cables to British and international standards for key safety criteria. The BSI Kitemark is one of the most recognised symbols of quality and safety and by certifying their cables against the scheme, Eland Cables can demonstrate that its cables meet the highest standards.”

For more information on the BSI Cable Batch Verification Kitemark and the Veriflex® range of cables, please visit elandcables.com



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“As the first company to achieve the **BSI Cable Batch Verification Kitemark**, Eland Cables sets a **new benchmark in cable compliance**. The Kitemark is applied to products, including the Veriflex SY, CY and YY range of PVC and LSZH control cables, under strict UKAS test parameters and subject to **BSI’s rigorous surveillance programme**. The range of tests provide third-party assurance that cables meet **relevant British and international standards for key safety criteria**, making them fit for use in appropriate applications.”

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Connected circuit protection

In today's hyper-competitive market, companies are tasked with reducing costs, increasing revenue and saving energy to help them retain their competitive edge. Extending the life of a company's electrical assets is an avenue many are choosing, putting effective circuit protection back in the spotlight. The motivations are clear. Damage from surges or faults endanger the health of the electrical circuit. Potential business disruption and the added cost of repairs are a real danger for today's businesses. Gary Buckingham, product and segment marketing manager at Schneider Electric explains

To avoid the risk to circuit health and smooth business operation, many businesses are now adopting cutting-edge solutions to enhance circuit protection and facilitate an alternative, predictive maintenance strategy. These innovations in circuit-level energy monitoring are crucial to ensuring a superior level of operational building intelligence, maintenance and circuit protection.

SAME ROLE, NEW DEMANDS

Technological progress can seem both a blessing and a curse for today's building managers. Advancing sensors and the

emergence of the Internet of Things (IoT) has optimised certain parts of their roles while also revealing new challenges and responsibilities. In addition to their familiar role in keeping their facilities operational, they are now expected to cut costs while growing revenues.

This is possible by improving maintenance practices and efficiency to extend the lifespan of their equipment. Yet, when it comes to circuit and equipment protection, many are simply going through the motions. Facing limited resources and an endless, expensive cycle of maintenance, organisations would greatly benefit from being able to predict problems such as ►

“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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electrical faults, cable overloads, short circuits and insulation faults before they become a costly issue.

To overcome this challenge, building managers must have full oversight of their electrical assets at all times. While this is impossible physically, connected devices coupled with remote monitoring offer unrivalled visibility over all electrical assets in the building.

INCREASED RELIABILITY AND EFFICIENCY

Recent advances have produced truly intelligent circuit breaker sensors. They form the foundation of a more effective, condition-based approach to asset maintenance. Leveraging operational and environmental data, it is key to protecting electrical circuits and reducing the costs associated with frequent repairs.

The advantage of smart solutions, such as Schneider Electric's PowerTag, is their connectivity. Connected to the Building Management System through the Internet of Things, they provide building managers real-time data on power flow, energy and device health in the moment. They are able to detect problems, such as unstable loads, and identify the source of the issue before it can snowball into a larger crisis.

●● The cost of maintenance has been a universal problem ●●

When positioned to maximum effect, these devices are able to collate the most granular of data from previously untapped and inaccessible parts of a facility's infrastructure, helping to improve the overall monitoring process. By analysing this data and learning how and when the energy is being consumed across the building, a clearer picture of the infrastructure's overall health can be collected; providing alerts to any faults, power overloads or even any energy waste.

Connected sensors increase the reliability, efficiency and condition of key electrical assets by helping to monitor and measure currents, voltages, power factors and energy. This is necessary not only for the accurate monitoring of a business's energy consumption, but also as a means to maintain the health of its equipment.

AN ALTERNATIVE MAINTENANCE STRATEGY

The cost of maintenance and servicing, particularly around switchgear has been an almost universal problem for building managers. However, rather than resulting from the innate challenges of the building itself, high costs more often stem from failings in the current maintenance schedule.

Traditionally, building managers have followed a maintenance plan composed of regular, scheduled check-ups and corrective repairs once a breakdown occurs. The main drawback of this system is its inattentiveness. Equipment is checked at a set time periodically and regardless of its actual health. Wear and tear, damage and faults can certainly be



detected using this approach, but it is mostly left to chance whether they are discovered before the damage is done. In the worst case, faults and electrical damage are found after the event and must be repaired, at great cost and disruption.

Recently, however, more effective 'predictive' approaches have emerged. These utilise connected sensors to detect faults, and use environmental data to predict when an asset will likely fail. Corrective action is then organised automatically before, and not after, business disruption is caused. The predictive approach prevents asset and facility downtime and can result in considerable savings and efficiencies.

Yet remote monitoring takes this approach to the next level, while accommodating the changing role of the facility manager. As their working practices evolve, building managers may find they are spending more time off-site or working between different sites as their responsibilities increase and the number of sites they control grows. This can mean the maintenance and management of numerous buildings, each with its own occupancy classifications, unique requirements and provisions.

However, remote monitoring tools, such as Schneider Electric's EcoStruxure Facility Expert, allow teams to keep on top of monitoring no matter where they are. They can keep track of usage patterns at any time and any place, from the convenience of a mobile device such as a phone or tablet and especially when they are outside of the facility. With a centralised BMS and control capabilities, managers can adjust environmental settings in an instant with a phone swipe.

Using connected devices at the circuit level ensures the safety of a building's assets by sharing the relevant environmental data, at unprecedented speed, to those who need to see it. The more data they have, the faster and more targeted the responses can be. Connected devices, predictive maintenance and remote monitoring are fast becoming central to corporate circuit protection. **ER**

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Racks & Enclosures

Automation expert launches UK brand

European industrial IT and automation expert Novotek has launched its UK and Ireland brand following the acquisition of Glasgow-based Kerrco Automation



The rebranded Novotek UK and Ireland will help businesses across the manufacturing, utilities, process and energy sectors to improve all aspects of operational effectiveness. The company aims to deliver this through smart use of both existing and new technologies to connect, analyse and visualise operation data.

Novotek UK and Ireland will fulfil the growing demand for digitalisation and interconnectivity in the UK market. The company is the UK and Ireland channel partner for GE Digital and GE Automation and Controls, allowing Novotek to supply UK businesses with fourth generation HMI and SCADA systems, such as the iFix HMI software, as well as the Predix industrial internet of things (IIoT) platform.

“ A selection of new digital products ”

In addition to its GE offerings, Kerrco Automation's rebranding as Novotek UK and Ireland gives it access to a selection of new digital products and systems through the Novotek Group.

The full portfolio of Novotek includes the Kepware suite of connectivity and Auvesy's market leading versioning product for automation equipment as well as Novotek's specially ▶

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designed components for iFix and Historian by GE Digital. These components packages provide additional functionality to the standard products, allowing plant and facilities managers to improve the effectiveness of their systems.

“There has been a transformation in the UK IoT market in the past twelve months,” explains George Walker, managing

●● A growing interest in the digitalisation of critical infrastructure ●●

director of Novotek UK and Ireland. “More sectors are now identifying the value to be found in the convergence of IT and operational technology (OT). It’s no longer a predominately industrial movement; we’re seeing a growing interest in the digitalisation of critical infrastructure and utilities, such as energy and water, with automation technologies.

“As part of the Novotek Group, we can apply the company’s insight into similar projects across Europe to better meet the needs of the UK market. Novotek has a history of providing creative solutions to customer requests in other regions, with the company often guiding customers out of their typical

comfort zone to think differently and achieve more. By bringing this approach to the region, we can help businesses across the UK and Ireland to realise their full potential with modern, digital technologies.”

According to a recent global IoT survey, roughly one third of businesses will be looking to invest between \$100,000 and \$1 million over the next five years. However, Novotek argues that the amount that businesses are willing to invest in IoT is not necessarily as important as how the technology is implemented and how adoption is handled.

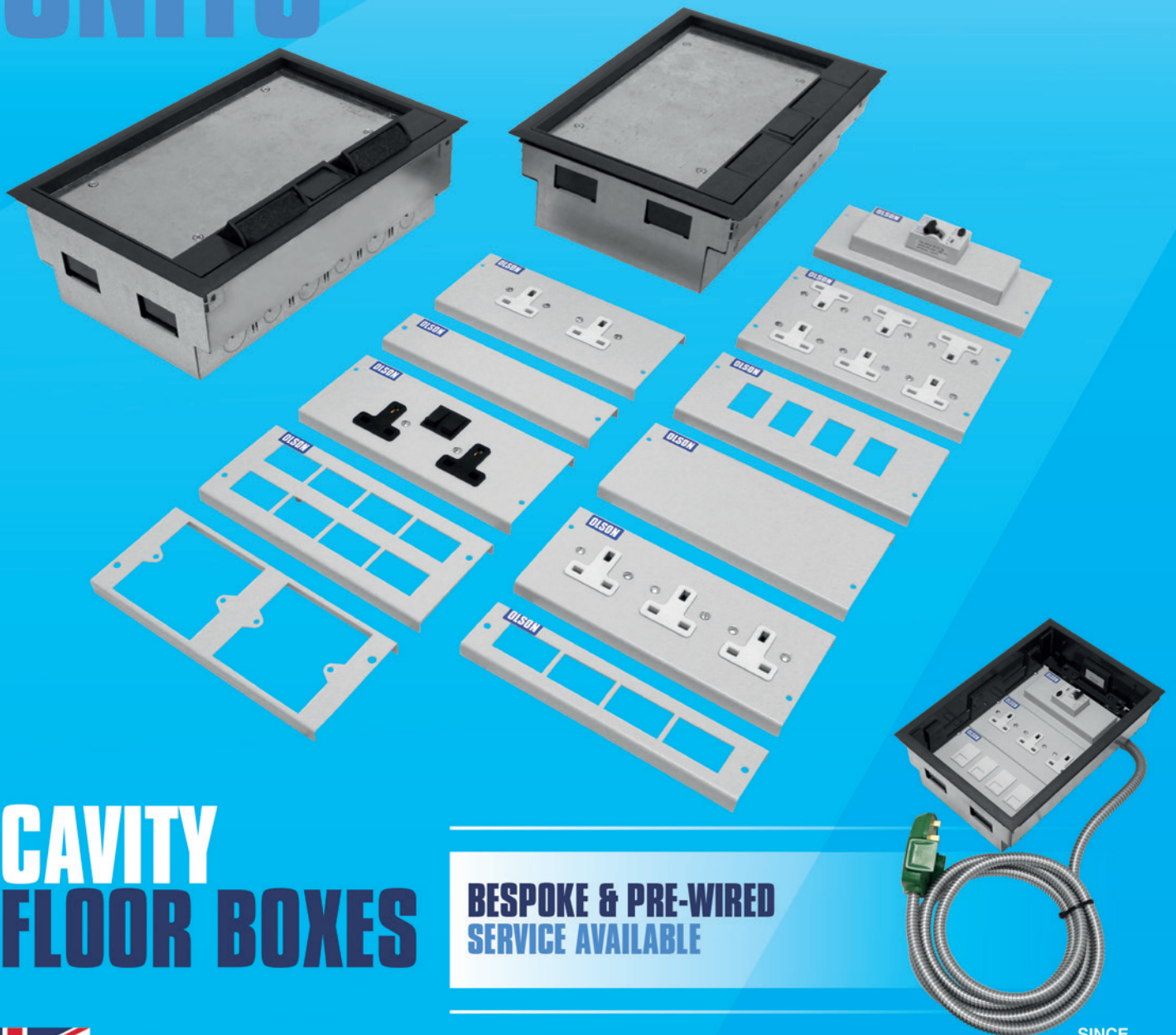
“The key to successfully adopting digitalisation is expertise and experience,” says Tobias Antius, CEO of Novotek. “Kerrco Automation and Novotek both had the technical capabilities, product portfolio and industry experience to provide this expertise. This brought the two companies together and, by pooling our resources, we are able to help more UK businesses lead from the front of the IoT market, as well as better serve our existing customers in the region.”

The Novotek Group, which is headquartered in Sweden and listed on the Nasdaq Stockholm, has experienced significant growth in the UK and Irish markets in recent months. This is due in part to the region’s growing interest in digitalisation, driven by the UK’s Made Smarter review and a wider industry awareness of the IIoT.

As part of its launch, Novotek UK and Ireland is calling for plant and utilities managers and engineers to experience the value and viability of modernising their automation systems and digitalising operations. **ER**



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RATS makes the difference for Network Rail

ABB explains how a smart automation approach to software and hardware is helping Network Rail achieve its vision of electrification for the Great Western Electrification Programme (GWEP).

In 2014, ABB and its partner UK Power Networks Services were appointed to deliver the trackside power infrastructure for the Great Western Route Modernisation programme. The overall goal is to enable more reliable, green and smooth electric train travel for communities along the Great Western route.

During the project, ABB's scope includes designing and delivering 31 trackside feeder substations along 235 miles of electrified track between London Paddington and Cardiff. These receive power from National Grid's 400 kilovolt (kV) network and step it down to a 25-0-25 kV power supply for catenary lines.

The conventional approach to rail electrification is to divide the railway line into sections, each of which is controlled by at least one circuit breaker.

However, Network Rail's design engineers spotted the potential to reduce the level of investment during the early GRIP (Governance for Railway Investment Projects) stages of the project by using load break switches instead of circuit breakers in some instances. These load break switches would also control the flow of electricity but are less costly than circuit breakers. This is because unlike circuit breakers, load break switches are not designed to tolerate high-level fault currents.

RATS CONCEPT

To enable the use of load break switches, Network Rail created a new concept called the Rationalised Autotransformer Scheme

(RATS). This is a novel approach to protection and control based on IEC 61850 smart grid communication. Under RATS, load break switches are protected from ever experiencing high-level fault currents by circuit breakers. These are controlled by Intelligent Electronic Devices (IEDs) that will open circuit breakers when a fault is detected.

In the case of a fault, communication between the IEDs will identify its location to within a few kilometres. The scheme will then reconfigure the network to isolate the fault and re-connect healthy sections of track. A three-stage process of tripping, reconfiguration and restoration must all take place within a few seconds.

The RATS concept minimises the length of track affected, as well as the resources needed for inspection, rectification and restoration of power to the railway lines. The overall result is less outage time and shorter possessions, with less risk to operating staff working along the rail corridor.

The RATS concept can be achieved with digital communication over fibre-optic lines based on the IEC 61850 protocol. This is the international standard that governs the protection and control of substation automation equipment. It is based on the philosophy of using a single future-proofed communication protocol, a common format for storing data and compatibility across equipment that has been supplied by different vendors. IEC 61850 makes use of GOOSE (Generic Object Oriented Substation Event) messaging, which is a ►



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controlled messaging mechanism where data is grouped into a data set and transmitted within four milliseconds.

ABB's deployment of the scheme will make use of around 800 IEDs at 31 substations to protect and control the power supply to four electrified tracks. These control communication between the equipment serving each substation and between individual substations using Network Rail's fibre optic Fixed Telecom Network.

During the project, ABB is installing the IEDs and accessories into protection and control cubicles which are installed inside Auxiliary Equipment Enclosures (AEEs), which are delivered to site ready to plug and play.

FACTORY TESTING AND VERIFICATION

An important element of the project was an extensive testing and verification process carried out at ABB's facility in Stone, Staffordshire. This 'transportable commissioning' philosophy means that the RATS protection and control equipment was only delivered to site after being configured and commissioned under controlled factory conditions.

The bench testing typically took place with equipment for around six substations at once, featuring more than 100 IEDS at a time in 40 test racks and evaluating the system response to around 100 possible scenarios.

The approach enabled a high level of quality control. Test engineers used a dedicated test set to mimic real-life conditions on the network and evaluate the response. The status of circuit breakers, disconnecting switches, earth switches and load break switches was programmed into the IEDs, with no need for any external hardware simulators.

In addition, the real-life performance of the devices was programmed into the IEDs in terms of tripping and closing times, and the timing of test sets was synchronised. This was used to ensure realistic evaluation of time taken to complete the automation sequence for each scenario.

The verification team then carried out de-bugging and troubleshooting for each scenario by using the data from time-stamped event lists. A structured approach helped the team overcome the challenge of analysing a large number of GOOSE messages and logical combinations from multiple IEDs in the complex network.

Ultimately, the bench testing demonstrated that the protection and control scheme could successfully complete automatic fault detection and clearance within a few seconds. After this, the scheme will hand over to a human operator to evaluate the fault and initiate manual inspection and rectification.

The process has demonstrated that offline verification is an effective way to mitigate project risk before delivery to site. And it has been shown to reduce the overall final commissioning time on site.

MODULAR AND ENVIRONMENTALLY FRIENDLY SWITCHGEAR

From a hardware perspective, ABB developed a new approach for GWEP in the form of its SMOS (Structure Mounted Outdoor Switchgear) Light. This modular switchgear is



designed for straightforward installation and maintenance at trackside substations.

The switchgear is delivered to site as modules that are ready to plug and play. It integrates all the components required to isolate the power supply to the catenary line and to sectionalise individual parts of the track for maintenance and inspection. Individual components include the Network Rail PADS approved FSKII+ 25kV circuit breakers and disconnectors as well as current and voltage transformers, all factory-mounted on a steel structure.

Integrating the FSKII+ into the SMOS Light concept has reduced project risk and cost in the construction phase of rail electrification projects. It saves time on-site by up to 30 percent as there is no need to install and commission separate components.

SMOS Light switchgear has also been adopted on the Crossrail project in London, where it has been installed on network traction substations on the western and eastern surface sections of the route.

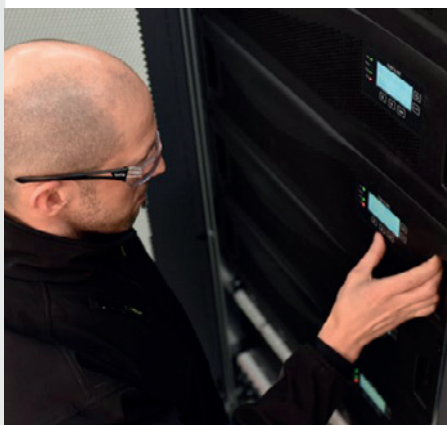
Once in operation, the switchgear has high reliability and is maintenance-free as it uses the FSKII+. This is a robust and well-proved vacuum circuit breaker that combines a magnetic actuator and electronic controller. The breaker has achieved more than 10,000 operations under test conditions, which is equivalent to a service life of more than 20 years.

A major benefit for Network Rail is its use of vacuum as an insulating medium. This eliminates the need for SF6 gas in trackside substations. As this gas has an elevated global warming potential, adopting vacuum-insulated switchgear supports the operator's environmental credentials.

While RATS was developed for use with autotransformer systems, the concept provides significant efficiencies for both classic 25 kV and autotransformer 25-0-25 kV system designs. Network Rail is looking at how this may be employed to reduce electrification costs on new systems. **ER**

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HARTING has added a number of new models to its MICA industrial computer product to further its development into a universal modular platform to capture data, process it at the machine level, and exchange it in wireless and wired fashion. The new MICA versions include the MICA 2, which offers three to five times the computing power of the MICA Basic for demanding data acquisition and processing; the MICA Wireless with 2G/3G/4G, 802.11a/b/g/n and Glonass for data acquisition and communication without cabling; and the MICA Energy, which allows data from current meters and current transformers to be read, compressed and transferred to MES, ERP and Cloud systems.



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